Student's Name	
Class / Period	
Date	

Outdoor Hands-On Flight Notes - Manual Flight(s)

Word	Definition	Paraphrase	Picture
AGL			
Bank Turn			
Flight Crew			
FOV			
FPV			
Headless Mode			
Hover			
Line of Sight			
Pitch			
Return to Home			
Roll			
Throttle			
Yaw			

I. Manual Flight(s)

A.

B. GPS, computer vision data, and barometer are not used.

II. Pre-Flight Checklist

A. Home / Classroom

1.

2. Identify launch site

3. Bring permits (if needed)

4.

5. Check propellers and rotors

6. Insert memory card

7.

8.

B. Deployment Site

1. Reach the launch site

2. Connect the drone to the controller

3.

4. Warm up the battery if necessary

5. Check propellers and rotors

6.

7.

III. Compass Calibration

A.

B.

C. When performing the calibration, stay away from metal and concrete objects

IV. Setting the "Home Point" (Return to Home)

A.

B. You can also set the altitude of the home point so that your drone flies back and hovers.

C. If you are flying in a wooded area, you may want to set the home point to a higher altitude. This will help your drone steer clear of trees on the return flight.

V. Taking Off and Hovering

A. Take Off Automatically

1.

2. Beginners should use automatic takeoff until they gain some experience.

B. Manual Take Off

1.

2. The manual launch is more difficult than you thought. That's because you need to carefully control the takeoff speed. Lifting off too fast or too slow can cause an imbalance and crash.

C. Flight Modes

1.

a.

b.

c. When you press the control stick, the drone moves. When you stop pressing it, the drone hovers. This makes it easy to control.

d.

e. You can also set a flight path before you fly. This way, your drone will fly autonomously according to the preset path.

f. Under the GPS mode, sometimes there are a few sub-modes that you can choose from. For example, a Sport mode where your drone flies faster. Or a Cinematic mode where your drone flies slower and smoother.

2.

a.

b. The drone can fly at the same altitude smoothly. But it drifts around in the wind. That means it doesn't have an automatic brake. You have to push the control stick to the opposite side to brake.

c. For example, if you push up on the right control stick and then release it, your drone will move forward and then continue to slowly glide forward. Your drone will not stop immediately as it does in GPS mode. Instead, your drone will continue to move forward with inertia.

3.

a.

b. For example, a "Follow Me" mode prompts your drone to follow a specific object. Or an "Orbit" mode where your drone orbits a specific object.

c. These modes allow beginners to easily perform difficult shooting tricks.

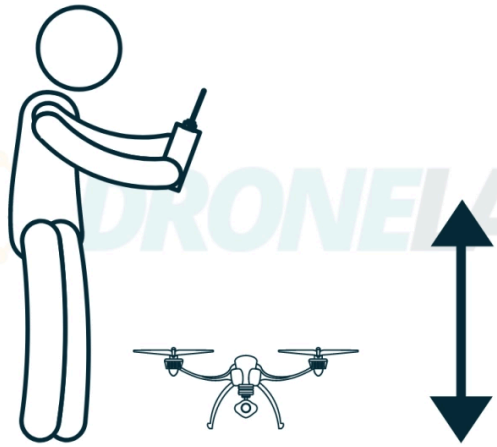
VI. Flying a Drone - Basics

A. 5ft Take Off and Landing

1.

2. Use automatic takeoff and landing if your drone has it.

3. Manual is an advanced skill and you can practise it when you are more familiar with controls.

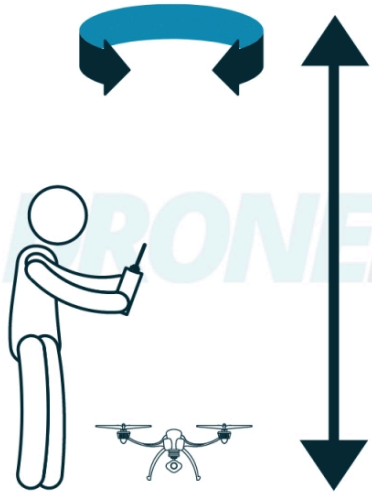


B. Take-Off to 10ft and Rotate

1.

2. Then rotate it counterclockwise another 360 degrees.

3. Make sure the tail of the drone is facing you.



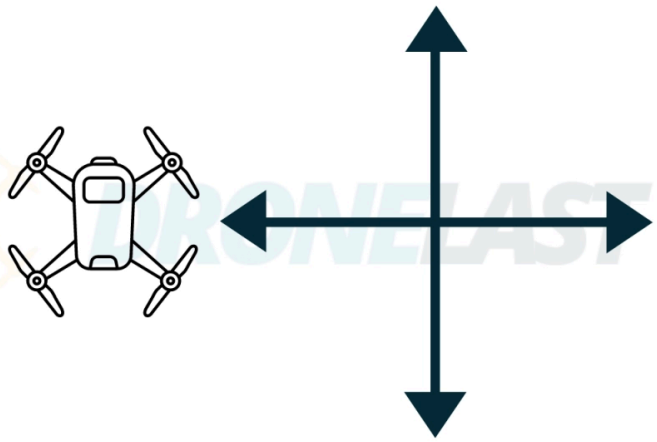
C. 10ft Pitch and Roll

1.

2.

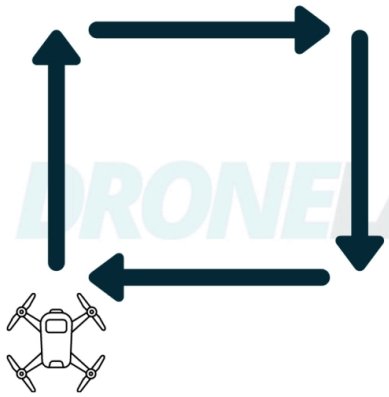
3.

4.



D. Draw a Square

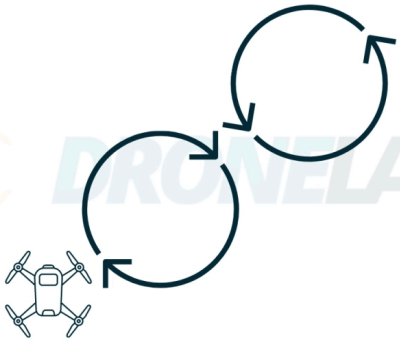
1.

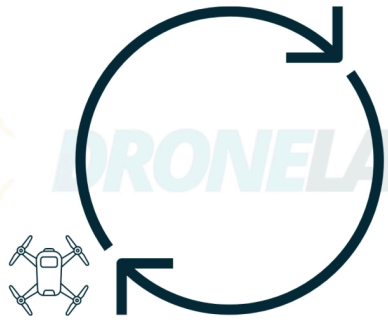


E. Draw a Circle(s)

1.

2. Once you have mastered the circle, draw two circles continuously but in a different direction.

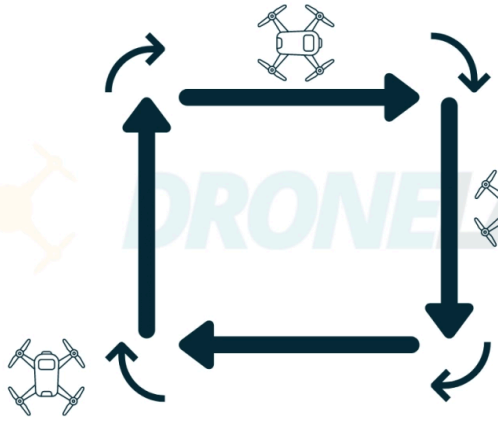




F. Draw a Square w/ Drone's Head as Guide

1.

2. Feel the coordination required between the left and right control sticks

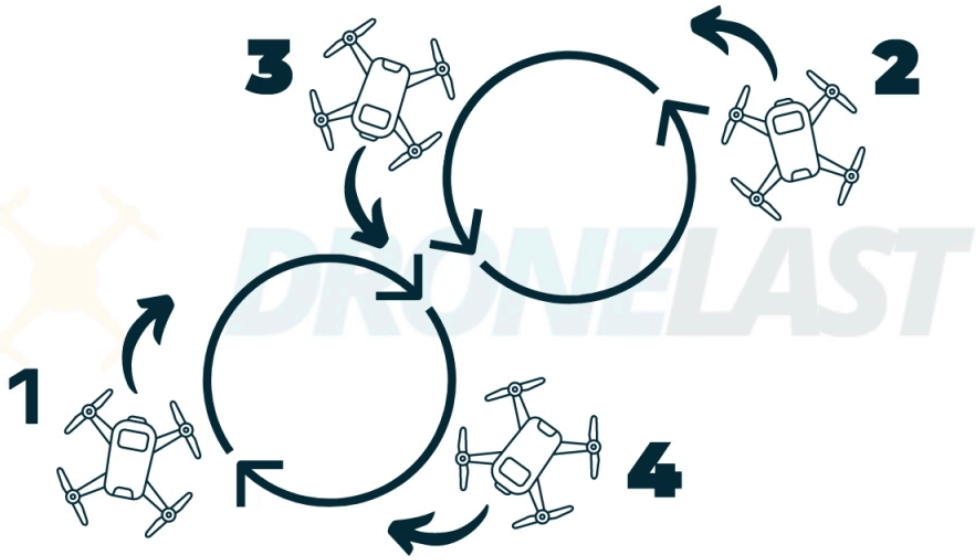


G. Draw a Figure 8

1.

2. This can be quite a challenge for a beginner. Make sure there are no obstacles nearby.

3. If you get confused or panic, release both sticks to hover the drone. Pause for a second until you understand the sense of the controls.



VII. Switching Between Looking at the Aircraft and the Screen

A.

VIII. Landing Safely

A. Like launching, you can choose to land automatically or manually.

B.

1. When you land automatically, you lower your drone to the lowest altitude it can reach. Many drones prevent further lowering at 3 to 5 feet above the ground. Then you can press the auto-landing button to ask the drone to land automatically.

C.

1. If you are landing manually, do the same by hovering the drone 3 to 5 feet above the ground. Then, transition to descent bit by bit. Being slow is key.

2. When you are sure that your drone has fully touched down on the ground, stop the rotors. Pull both control sticks down and then inward toward each other. All rotors should be cut off immediately.

D.

1. Land on a flat open area. Land on a soft surface such as grassland. If your drone tilts slightly, the propellers may hit the rocks on the ground. Or the propellers may break at high speed and scatter everywhere. This can lead to injuries.

E.

1. Sometimes you may be too relaxed at the end of the flight mission. Or you may be in a hurry to swap batteries. In either situation, you may be distracted and not aware of the obstacles above.

2. Common obstacles include power lines, streetlights, and tree branches.

F.

1. Some people like to play it safe by using a landing pad. Its sole purpose is to warn people not to step into the landing zone. Deploy one if you envision your launch site is busy.

G.

1. When the battery is running low, say only 30% left, you should return and prepare to land. Otherwise, your drone will return to the home point and land automatically when the battery is at 10% or less.

2. If there are battery anomalies, such as a rapid drop in battery level, do not risk flying. Land and inspect the drone immediately.

3. If your drone is out of control or shows a significant delay in response, return and check it. Interference may come in a sudden.

IX. Flight Record Keeping and Debriefing

A.

1. The first essential rule regarding drone safety is once a flight has been completed the time of flight must be logged. This will include the start and end times of the flight and the duration and also any incidents must be noted and logged (or reported depending on the severity of the incident).

2. The UAV will be inspected and any maintenance that is required must be recorded.

B.

1. The crew will (discuss) be debriefed on the aspects of the flight and how it went.

2. If there were any minor incidents or occurrences this would be a good time to notify the crew and discuss how to prevent similar events from happening in the future.

C.

1. After the UAV has safely landed, powered down and the battery removed the crew will then be able to inspect the UAV for signs of wear and tear or damage. Repair as needed and test for safety to confirm it is airworthy for the next mission.