



## BASIC FLIGHT PROFICIENCY TRAINING

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This lesson is for those of you who have never flown a multirotor system before.

Unlike what you might see with other civil aviation authorities in other countries, here in the U.S., the FAA does not require you to demonstrate flight proficiency as part of their Part 107 certification process.

This means that you can get your Remote Pilot Certificate without ever needing to prove that you can fly an unmanned aircraft.

Here at Drone Pilot Ground School, we hold our students to a higher standard than the FAA and encourage you to start logging flight time as soon as possible.

In this lecture, we'll go over 9 flight sequences you can practice on your way to mastering multirotor proficiency.

There are many types of small unmanned aircraft systems (sUAS). When it comes to flight proficiency, we will not be covering fixed-wing aircraft in this lecture. So, models like the [PrecisionHawk Lancaster](#) or the [senseFly eBee](#) will not be covered here.



Instead, we'll cover multirotor systems — your quadcopters and hexacopters and octocopters — and using a dual joystick transmitter to thrust, yaw, pitch and roll your aircraft model around the skies.

Here's the thing. If you're flying a more advanced system, it can be really fun to jump into some autonomous, intelligent features like return-to-home and follow-me and to rely on GPS and other sensors while you're flying.

However, we highly recommend establishing yourself as a strong, technical pilot first, which means that you first lay the foundation by mastering basic multirotor orientation.

The other important thing is to log flight hours to gain experience and to get comfortable. If you're just getting started, you've got to put in some stick time, either on a real model or on a simulator.

## **Mastering Basic Flight Proficiency**

### **1. Hover At Eye-Level**

First, let's practice hovering at eye-level.

I know — boring, right? But listen up, because this is where we always begin. If you can't hover at eye-level WITHOUT the help of stabilization sensors, you're not a proficient multirotor pilot.

Even experienced pilots will hover at eye-level at the beginning of every single flight as part of their pre-flight checklist. The goal here is to listen and look for any abnormalities — anything that sounds loose, weird vibrations, and anything else that's out of the ordinary. You may need to adjust the trim on your transmitter if necessary. You may also need to land and re-calibrate your system.

So, let's see this in action. You want to make sure the nose of your aircraft is positioned directly away from you. Slowly increase your throttle to take off. Hover at eye level for 10-15 seconds and listen and look for any abnormalities.

## 2. Hover & Yaw

Next, let's throw some yaw into the mix. If you haven't heard the term "yaw" before, it describes the 360° rotation that you can influence by moving your left thumb to the left and to the right.

*A quick note about my current setup with my left and right thumbs — this setup is called Mode 2. In Mode 2, the left stick controls throttle and yaw, and the right stick controls pitch and roll. Most sUAS models default to Mode 2, and this is how most people prefer to fly, but you can always invert these controls if you'd like to. Throughout this lecture, I'll be flying in Mode 2.*

OK, so back to hover & yaw. Here, you're also hovering at eye-level, but you're focusing on your yaw control, where you're rotating your aircraft left and right. Think about your rotations like the face of a clock. Take your left thumb and



move the joystick to the left and to the right to hover at 10 and 2, then more extreme at 9 and 3. Finally, try a full 360° degree yaw to the left and then one to the right.

### **3. Target Practice**

Here you're practicing targeted take-offs and landings. Mark two spots at least 10 feet (or 3 meters) away from each other. Practice taking off from spot number one, flying up to about eye-level, then toward spot number two, and then landing at spot number two.

Then go back and forth, doing several rounds of taking off and landing from your two different spots. Pretend they're like lily pads in a lake, and you're just hopping back and forth between them. This exercise will help you learn to throttle up and down really effectively.

### **4. Square Pattern (No Yaw)**

Our first pattern! This one is pretty straightforward. Here you're flying at eye-level in a square pattern, where each side of the square is 10 feet (or 3 meters) long.

At each turn in the square, you're not going to rotate your aircraft, so you'll be keeping the nose pointed forward at all times.

### **5. Circle Pattern (No Yaw)**

Same idea as the square, except that instead of a rigid flight path with distinct turns, you're flying in a smoother, circular pattern. Again, you're not going to touch the yaw at all and instead keep the nose pointed away from you at all times.

Doing this isolates the right thumb for pitching and rolling. It may take you a while to get this one right. Check out what my thumbs are doing here as you follow along.

## **6. Out, Back & Land**

Now we're going to start adding in rotation. Fly out away from yourself, rotate the multirotor  $180^\circ$ , and then practice flying back towards you and landing.

Remember that as you fly back towards yourself with the nose of the multirotor pointing towards you that your controls will be inverted.

With enough practice you'll be able to fly just as well inverted as you can in normal, nose-forward orientation.

## **7. Square Pattern (With Yaw)**

With this square pattern, you're rotating  $90^\circ$  at each of the square's turns, which means you're pointing the nose of your multirotor in the same direction that you're flying.

## 8. Birds-Eye View

If you plan to do any kind of aerial videography, this is a nice shot to have in your wheelhouse.

In a birds-eye view shot, you position your gimbal to face downward, and you slowly throttle up.

Check out my left thumb. See how I'm throttling upwards, but I'm ever-so-slightly yawing a bit to the left. This adds a nice dramatic effect to the shot without being too dizzying.

## 9. Orbit

As you begin to gain confidence with your multirotor, you may want to start experimenting with some cinematic shots.

The orbit is a really cool technique where you're using both of your thumbs at the same time as you roll and yaw smoothly around an object to give it that kind of dramatic cinematic effect.

As you practice your orbits, really focus on slow and smooth shots. No jerky movements.



Of course, this is just one of many examples of higher-quality shots that professional aerial videographers use to tell stories from the air.

This wraps up some of the flight proficiency milestones that you should hit as you're learning how to master your multirotor system.

I hope you enjoyed this lecture on basic flight proficiency training and the kind of flight patterns and milestones to work toward being able to complete as you're learning to master your multirotor system. See you in the next lecture!