

Drone Flying Practice Drills



[Beginner to Pro]

Andrew Stapleton

Drone flying practice drills [Beginner to Pro]

When you are learning to fly a drone you are only as good as your maximum level of confidence. Slowly expanding your confidence level to include more and more complex drills and movements is the only way to get better. Whether you want to become a first-person view drone racing pilot or, maybe you would like to just fly more safely. Whatever it is, learning to control your drone with precision and accuracy is the answer to becoming a better pilot. In this article, we are going to go over all of the drone flying practice drills that you should do regularly so that they become second nature.

Some of the best drone flying practice drills include learning to hover without GPS stabilisation, manually emulating automatic shots like dronies, and learning to fly the drone toward yourself to do advanced moves like the figure of eight arraigned cones or gates.

This article is split up into basic skills, camera drone skills (where we will look at all of the important skills required for operating a drone to capture awesome footage) and first person view, racing, drone drills. As with everything in life you should start with the basics and build a strong foundation before rushing ahead. Getting out and flying will be the number one thing that you can do to make sure that you are always improving. If you find that you are not flying to the level that you want take a step back and work on the foundational skills before jumping ahead. I know I have a tendency to rush learning and I would hate for you to rush ahead and miss out on really nailing skills that will last you a lifetime.

Let's start with the basic skills...

Basic skills

These basic skills are what every single drone pilot needs to master before they are able to do more complex manoeuvres or comfortably capture amazing footage. Taking the time to master these skills will pay off 100% in the future. Also, these skills are something that you need to refresh about once a year. Just take a little bit of time to refresh your memory and go back to basics. Set your ego aside as there is always an opportunity to learn the basics better.

Basic controls

The first thing you should do before flying a drone is to completely understand every button and joystick on your remote control. While you are flying you need to have these basic controls completely memorised and it should feel like second nature to you when operating and flying your drone.

Some drone remote controls can be programmed so that the joysticks are swapped, or their controls are modified from the factory defaults. If you are unsure about what the basic controls should be use this table to make sure that your drone is doing everything you wanted to do.

Left joystick

The left joystick is responsible for altitude control and rotating the drone around its centre axis. Here are what the movements of the joystick correlate with in terms of drone movement:

- Yaw: This means that your drone rotates clockwise or counterclockwise around its center. It doesn't move forward or backward but remains stationary when performing this movement
- Throttle: this refers to how much power the motors put out pushing up increases the throttle and sends the drone higher. While reducing the throttle will reduce the height of the drone until it lands.

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Right joystick

The right stick of a controller moves your drone forward, backward, and side to side. It doesn't change the direction of the nose of the drone (that is done by the left stick). In the drone flying world we call these actions pitch and roll:

- **Pitch:** this moves the nose of the drone upwards or downwards causing the drone to move forward and backward.
- **Roll:** This is like pitch but moves each side of the drone down or up and causes the drone to move side to side.

Camera pitch

If you have a drone with a camera you often have a wheel that you can rotate to move the position of the camera up and down. On the DJI Mavic controllers these are at the top of the drone controller on the left-hand side.

The wheel is pulled or pushed left to right to move the camera. On the DJI drones I think of the action in relation to what my finger is doing. If I extend my finger and push the wheel away from my hand I am extending the view of the camera upwards while the opposite, pulling the wheel towards my hand, causes the camera to curl under.

Programmable buttons

On some camera DJI and other controllers, there are some buttons on the controller that you can program from within the app for different quick actions. This is handy for things like:

- Quickly changing the camera position – I use this a lot
- Opening up the camera settings – important for capturing the perfect shots
- Toggling between different camera modes – photography and video settings for example

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Set them as you need. If you are new to drone flying you will probably need a bit of time flying the drone before you know which functions you use the most and would like to assign to the different features of your drone. For me, it was opening up the camera settings on the front and lifting the camera position so that it faces forward – helps me navigate and provide a front-facing live view.

Now that you have got an idea of the important features of your drone remote controller it's taken a look at the most important drills. If you want to know more about how to fly drone check out my other article – [how to fly drone like a pro – click here to be taken to the article.](#)

Take off and landing

Taking off and landing is an integral part of every single mission.

You could be taking off from a landing pad, the ground, a bit of concrete, or even launching from a boat or your hand. Taking off safely is an important part of drone and it is where the majority of [accidents](#) happen.

On some drones, like DJI drones, takeoff is as simple as swiping right on a software button. You can also choose to take off manually by firstly holding down the left and right joystick until the motors spool up and then slowly increasing the altitude by pushing the left hand stick up.

However you choose to take off – make sure that you are comfortable doing the other one as well.

When you are landing you need to make sure that you are completely over your desired landing spot. You can check this by looking through the first person view camera and pointing the camera straight down or you can get a line of sight check on the drone position.

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Slowly descend by pulling the left joystick down and the drone may land automatically in the last metre or so. If your drone doesn't automatically land in the last metre you should continue to pull down on the left hand stick until the drone it lands safely and then quickly kill the motors so that any small amount of down wash doesn't move around any debris in the landing area.

If you want to find out more about landing pads for your drone check out my other article – [do I need a landing pad for my drone? A complete guide – click here to be taken to article.](#)

Hovering

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Hovering is an important part of flying a drone as if your drone doesn't have a GPS module it will require you to manually correct for wind and other environmental conditions.

Even if your drone does auto stabilise at a specific altitude or position, I recommend that you turn off GPS and fly in ATTI mode so that you get an idea of what it's like to hover your drone manually.

You should take off and hover at approximately 5 m. Turn off your GPS location stabilisation and try and keep the drone stable in one area. If you are able to do this within a 3 m radius of your hovering position that is excellent.

Once you are comfortable with the hovering you should land the drone whilst also correcting for position manually.

Waypoint

The next skill and drill to master is to navigate at a fixed altitude between different locations or waypoints.

To do this simply set out a series of cones on the ground and navigate between them. I recommend setting at a square of cones which are spaced at 5 m gaps. Alternatively, you can use drone gates to mark out the [waypoints](#) that you need to navigate to. The great thing about drone gates is that they can be suspended at a certain height which means that you will also have to keep your altitude the same. They are a little bit more expensive but if you're serious about getting better as a drone pilot they are well worth the expense.

Square

Flying in a square pattern is one of the most basic and simple drills that you should get comfortable with. There are two ways that you should fly in a square:

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- firstly, you should fly in a square while keeping the drone facing in one direction. This will test your ability to roll and pitch the drone accurately.
- Secondly, you should fly in a square while pointing the nose of the drone towards each target. This will help you understand the interplay between pitch and yaw while flying. Also, as the drone is pointing towards you the controls will be reversed so that the left and right roles will need to be reversed in your mind.

Practice this simple square flying pattern and you will think yourself for it.

Figure of eight

A much more complicated basic skill (yes I'm aware of the contradiction of that term :-)) is the figure of eight. The figure of eight movement will allow you to smoothly capture footage by combining forward pitch with yaw and roll.

This isn't an easy manoeuvre but it will help you with a load of the different camera shots that you will typically collect during your flight missions.

To practice the figure of eight simply set out to cones and fly between and around them in a figure of eight. Always keep the drone pointing in the same direction as the flight.

Next, we will have a look at camera drone drills.

Camera drone drills

Arguably, the reason most people buy a drone is because they are like cameras in the sky. Many people decide to buy a drone because they have seen some awesome footage captured by an increasingly inexpensive gadget. Capturing something that would have required many thousands of dollars and a [helicopter](#) can now be captured with a piece of equipment that you can find for under US\$500.

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Although drones are very good at capturing many types of shot automatically there are still some very important aspects that need to be practised because you are not only flying a drone but also capturing the perfect shot while flying. Two complicated skills combined into one.

Framing

The first thing you should do is practice framing with your drone camera.

The majority of photos that you are going to take with your drone are landscape photos. Landscape photos from a drone are incredible to capture some awe-inspiring shots. Here are the important parts for framing your landscape drone photographs and videos.:

- Add a sense of scale – shows something in the photo that they can relate to. Sometimes an awesome landscape can look unimpressive because we don't know how big some of the features are. Add in a car or a person or a tree and your photo will be much better.
- Put a point of interest in the rule of thirds – without a clear point of interest sometimes the viewer's eyes will get lost in a photo. A point of interest can be anything from a rock, a person, an animal, a tree, or a building. Framing a photo using the rule of thirds to capture this in the image.

Practice framing your drone image by using the your functions and changing the camera pitch until the sense of scale and the point of interest align perfectly...

Follow me

If you are into drone videography then a follow me drill is very important for you to feel comfortable with.

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Ask a friend to move normally through a landscape. For your first follow me shots you should do it in an open space which is clear of any obstacles which could damage your drone. Follow your friend and watch the footage back. Does it look like a drone is being flown or does it look smoother than that. Your objective here is to move the drone through the landscape whilst keeping your friend in the frame and not making it look like a drone has NOT taken that shot.

As you get more comfortable with the follow me aspects of drone you can increase the complexity of the environment and even do flying through wooded areas.

Circle around point of interest

Try creating a smooth circle around a fixed point of interest. This could be a water tower, a tree, a pond, or a friend that is stood still. Once again, the objective of this drill is to make it look like you're not using a drone to capture the image but rather a massive boom or a [helicopter](#).

Watch back the footage and look for any bumps or wobbles in the footage. Also check that your rate of curvature around the object of interest is the same throughout the entire shot. It is the consistency and stability of the shots that separate the beginners from the professionals. Practice until you are able to get a shot with no bumps or obvious jitters.

Dronie

One of the best shots that you can capture on a drone is known as a Dronie. This is where you have your subject centre frame and then quickly pull back on the right joystick while increasing altitude with the left joystick. This is an incredible shot which allows you to reveal the surroundings and turn your subject into a small speck in a massive landscape.

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Learn to do this smoothly so that your clients (or audience) doesn't know that it is a drone that took this footage. Once again you are looking for smooth footage throughout the entire movement of the drones travel.

Combining 3 movements

Okay, if you only take one tip away from this section let it be this one. When you are creating cinematic panning shots you should combine 3 movements (two minimum for the perfect shot. Let me explain why...

When I first started out with drone footage, I would rely on static shots and single movement shots. This still created some awesome moments – but I wasn't sure I was nailing it! This is when I discovered the power of combining multiple movements – and the results spoke for themselves.

The biggest tip I have for you to make the most of your drone shots is to combine three or more movements to maximize the cinematographic feelings of your videos. By that I mean you have these movements and rotations of axis to choose from:

- Yaw right/left
- Pitch up/down
- Roll right/left
- Throttle up/down
- Camera pan up/down
- Camera pan left right (on some models)

What I like to do is start moving the drone in one direction. Then add another movement with the other joystick. Then I add a third with the camera or adjustments to the joystick.

The trick is to hold the sticks and gimbal wheels steady so that you achieve a smooth movement for at least ten seconds. When you come to edit the footage, you will have some that will be smooth and long enough for you to speed up if you need to!

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There are the best drone flying practice drills that you can do for a camera drone. However, some people want to race drones and now we will go over the best first person view racing drone drills that you can use to improve your time and speed and accuracy.

FPV racing drills

The thing about all the skills above is that they are not under any time pressure. The moment that you put time pressure on to the above skills there is a massive increase in the errors that people make. The drone will become more erratic and it will be harder to control the position and direction of the drone when you are flying through the air at high speed because you have to account for the momentum which the drone has built up.

Accounting and correcting for the extra momentum that is introduced to the drone flight while moving quickly through the air is an easy thing to practice. This is where you probably need to consider seriously getting some practice gates as well as cones so that you can truly test and improve your skills.

Passing through gates

Get yourself some gates! They are relatively inexpensive but will keep you honest with yourself. If you do not make it through the gate you have failed – it is as easy as that. There are two important aspects to flying through gates and we will go through them here.

Forward and back

The first thing you should do is fly forward between the gates and then reverse through the gate. The reversing aspect you should practice with direct line of sight as the first person (forward facing camera) view will not allow you to see the reverse direction.

Turning forward and back

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The second way to use the gates is to use one gate go through it as quickly as you can do a complete circle and return through the same gate. This is the equivalent of the figure of eight using cones but is much more complicated as you have to return through the same centre point multiple times. You can do this drill using the forward facing camera as you should always be keeping the centre gate in view.

With both of the gate exercises keep on practising until you can do it [faster](#) and faster without colliding with the gate. Having a stopwatch with you and timing 10 repetitions of the same exercise will give you an idea of how well you are improving as you are then measuring the average speed of 10 repetitions.

Navigating over cones

If you want to get better at flying and racing you should also consider buying some cones which you can use to do more complicated manoeuvres and drills.

Practice rolls

With the cones laid on the floor practice keeping the drone facing the same direction and move between four or five different cones. This will allow you to practice your bowing and also adjusting the direction slightly with yaw as you go.

Circle

Place a series of cones in a large circle and fly around them as quickly as you can while keeping your drone facing in the direction of travel. This allows you to practice your speed flying whilst continually compensating for centrifugal force.

As you get more confident with this movement you can include an oval path which will allow you to then correct for straits and cornering. Do this as quickly as you can 10 times and time it until you get better and better.

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Figure 8

As above, one of the best things you can do is practice your figure of eight but this time as quickly as possible. Lay the two cones out on the floor and quickly moved between them as fast as you can creating a figure of eight.

To increase the complexity of this drill you can also include gates which you need to fly through at the extremes of the eight pattern. Include gates at different heights so that you can also practice your altitude control.

Summary

In this article we have gone over some of the best drills that you can use if you want to get better at flying your drone. This included if you are flying a camera drone or if you are looking to increase your speed during drone racing.

With the simple addition of some gates and cones you can easily practice your skills and increase your ability and confidence in some of the most challenging drills.

Remember to always push the boundaries of what you want to achieve and do it slowly. If you ever feel like you are uncomfortable with a certain drill go back to a simpler version of it and get better. This is about slowly building on skills as opposed to trying to do everything at once.