

# **DRAGANFLY**<sup>TM</sup>

I N N O V A T I O N S I N C



## **DRAGANFLYER**

**Indoor Small Electric Helicopter**

**FLIGHT TRAINING**

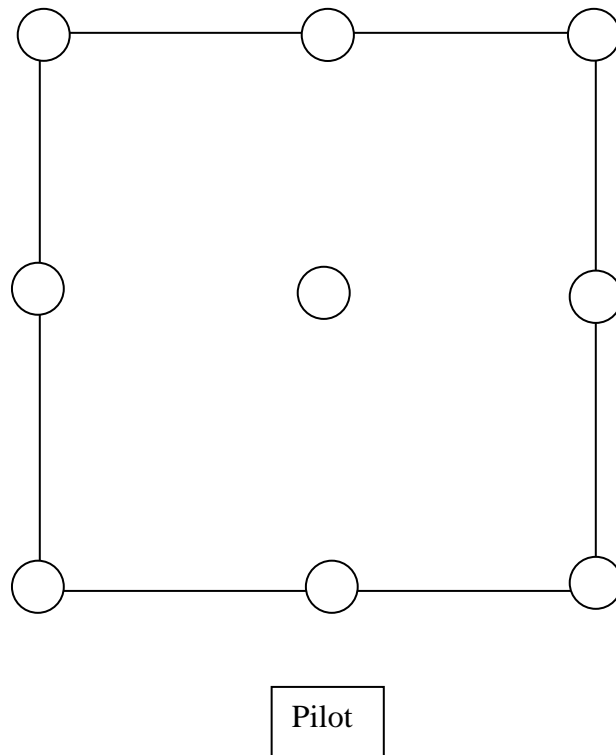
# Draganflyer Indoor Small Electric Helicopter Flight Training

## Indoor Electric Coaxial Helicopter Training

In this section, you will learn how to fly a helicopter with similar control concepts as the Draganflyer X6 or X4. As most customers of the Draganflyer X6 or X4 UAV are new to RC flying, we have sent you a training helicopter, an indoor electric coaxial helicopter. This is a standard, hobby grade RC helicopter whose basic flight characteristics closely match those of the X6 or X4. Using the training helicopter means that the small mishaps that happen to everyone while learning how to fly are inexpensive. We recommend that you practice the following flight exercises with your training helicopter before attempting to fly the Draganflyer X6 or X4.

### Setting Up the Practice Flight Area:

Find an indoor area free of obstructions (an average living room will do), and set up a practice area resembling the figure 1 below. You can use any easy to see objects as markers.



**Figure 1 – How to Set Up the Practice Flight Area**

### **Flight Exercises**

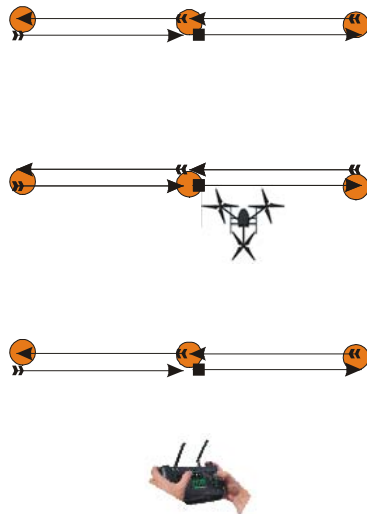
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## Exercise #1-Hover:

The first exercise is relatively simple. Get your training helicopter ready for flight by following the instructions that came with it. Set the helicopter on the floor in the center of the markers that you set up earlier, and slowly increase the throttle to around 50%. The helicopter should take off and start rising. Back off on the throttle a small amount and try to maintain a hover. If required use the trim tabs for roll, pitch and yaw to try to keep the helicopter hovering in one spot. When setting trims make only small adjustments then see how the helicopter reacts to the adjustment. Don't use any of the other flight controls unless the helicopter starts to drift. Hold the helicopter in a steady hover for a few minutes, then slowly decrease the throttle and allow it to settle to the ground. Ideally, the helicopter should stay at exactly the same spot over the ground while hovering. To help you keep track of its position above the ground, use the markers set up earlier.

## Exercise #2- Roll:

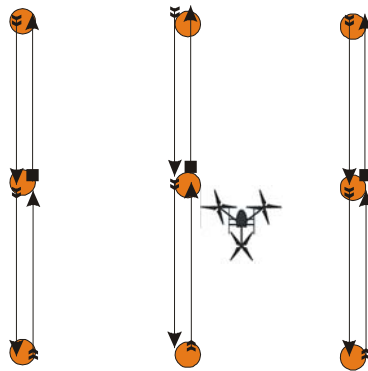
Once you are confident hovering in one place, you can try moving the helicopter around. Begin by hovering above a marker, and then gently push the right transmitter stick to the left. Don't push it too far, just enough to make it start to move to the left. This will cause the helicopter to tilt over slightly and begin moving to the left. As long as you apply inputs the helicopter will continue moving in the direction you are applying direction to. As you near the next marker move the joystick back to center this should cause the helicopter to again be vertical and directional movement should discontinue after any speed has been depleted. Hover momentarily at that marker then move the joystick to the right to move the helicopter back to the center marker and then onto the right marker. Practice moving it left and right until you are confident, then move on to the next exercise. You will find the more input you provide the steeper the angle of the helicopter is which causes an increase in the speed of the flight.



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## Exercise #3 - Pitch:

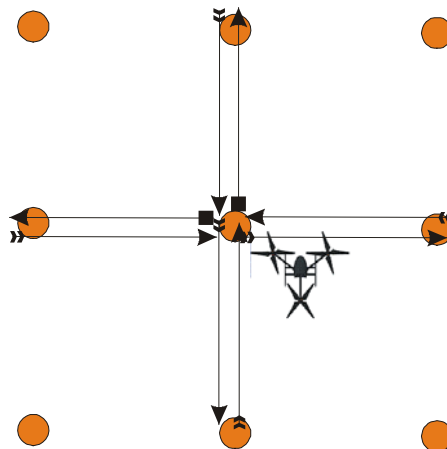
Start in a hover like before, and push the right transmitter stick forward slightly. This will cause the helicopter's nose to drop, and the helicopter will start to travel forward. As with the roll inputs the same type of reaction applies to pitch. To eliminate forward movement re-centre the right joystick, this will cause forward motion to cease once any momentum is depleted. If you move the joystick back past centre it will cause the helicopter to fly backward. Practices moving from marker to marker to become familiar with the pitch control.



## Exercise #4- Pitch & Roll:

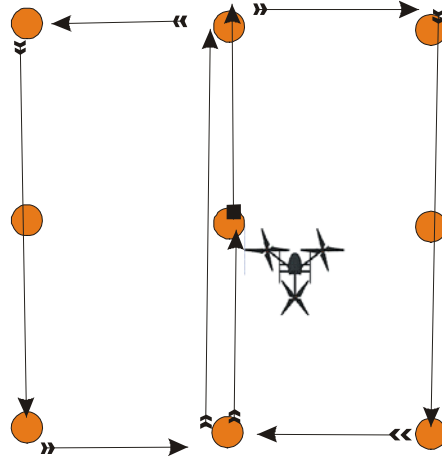
Using the cones as a pattern start at center

- Establish hover in center of cone layout
- Move to each of 4 points in cross pattern establish hover at each, return to center and establish hover before moving to the next point.

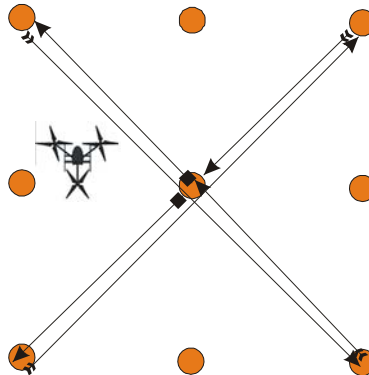


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- Perform a square Figure 8 keeping nose out



- Perform diagonal 45 to left , then right



REPEAT THE ABOVE EXERCISES NOSE IN, NOSE RIGHT AND NOSE LEFT –

### Exercise #5 - Yaw:

The training helicopter can rotate, pointing the nose in a new direction. Control yaw (rotational motion) by nudging the left transmitter stick left or right. Cancel out any spin you cause by nudging the stick in the opposite direction to re-centre it.

Practice flying the training helicopter around the perimeter of the rectangle of markers set up earlier, keeping the nose pointing in these positions:

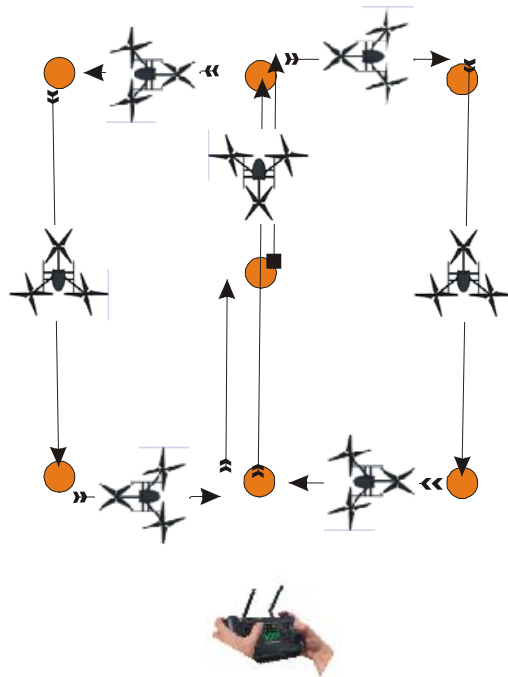
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- 1) Left
- 2) Right
- 3) Towards you
- 4) Always flying forward.



### Exercise #6: Circles

Once you become confident holding the nose in these positions, try flying a square figure 8 while holding the nose in a given position. The figure 8 should be flat, with the helicopter maintaining the same altitude throughout the maneuver. You can also try flying in diagonal movements by incorporating both pitch and roll.

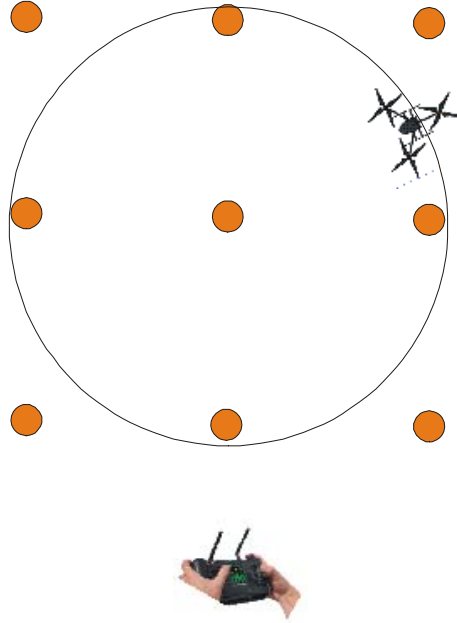


### **Exercise #6:**

Once you become confident flying these positions, try flying a circle. A circle is flown by utilizing both yaw and either pitch or yaw and roll. The following combinations give you circles as follows:

- forward pitch and left yaw gives a forward flying counter clockwise circle
- forward pitch and right yaw gives a forward flying clockwise circle
- right roll and left yaw gives an inward flying counter clockwise circle

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- left roll and right yaw gives an inward flying counter clockwise circle
- right roll and right yaw gives an outward flying clockwise circle
- right left roll and left yaw gives an outward flying counter clockwise circle

The symmetry of the circles is dependant on the consistency of the inputs of yaw and pitch or roll.

When you feel confident flying the training helicopter using all the controls, you should be able to fly it to any desired location and land. Becoming proficient at flying the training helicopter will prepare you to pilot the Draganflyer X6 or X4, and should help reduce mishaps when flying.

You should be able to master all of these maneuvers to be able to use the Draganflyer X6 or X4 to the maximum potential. Even though you may have a DraganflyerX6 or X4 already continued practice with the small indoor helicopter will help make controlling the DraganflyerX6 or X4 more instinctive.

These same exercises are used for training on the Draganflyer X6 and X4. The goal is to fly with precision and smoothly. Remember that flying slowly also allows you to fly smoothly and if an error is made the input to correct it is smaller than it would be if you were flying fast. This way you avoid the yoyo effect which can be created when making fast large inputs.