



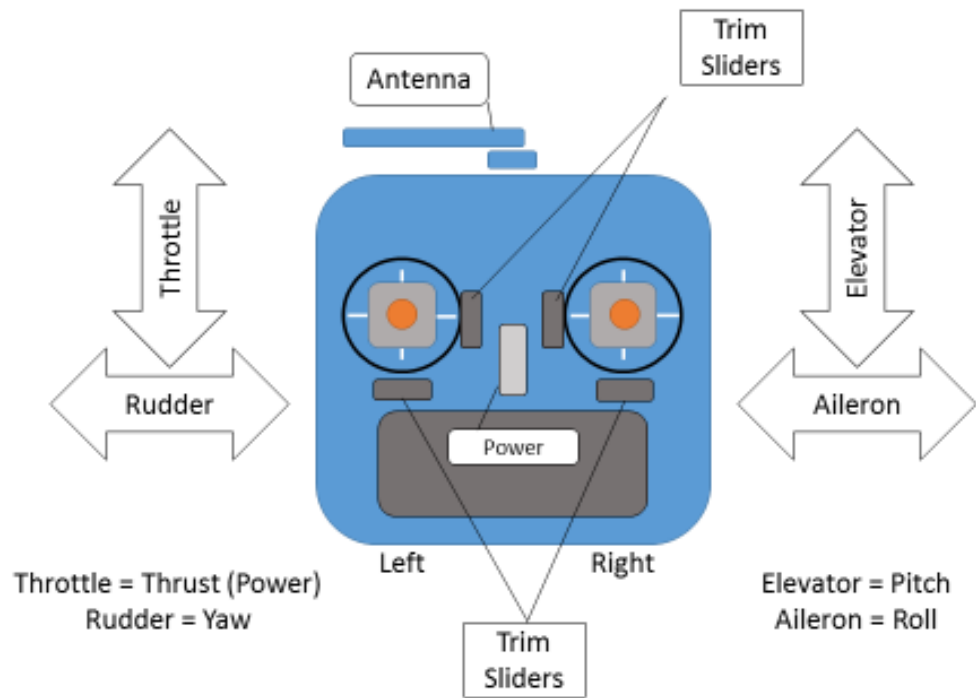
**PSS 4733/6733 Ag. Flight Tech. I**  
**RealFlight® Training Protocols**  
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**How a Flight Transmitter Works**

A flight transmitter emits a radio frequency that is received by the flight system “receiver”, which in turn controls the power and flight control surfaces. Most transmitters broadcast a 2.4Ghz signal although alternative frequencies have been used in the past, and will be employed in the future. Americans fly in Mode 2 where the left stick is rudder and throttle and the right stick is elevator and aileron. Most Europeans fly in Mode 1, with aileron and rudder are swapped.

With a flight simulator, no signal is broadcast. The flight simulator is connected to USB instead. All students must memorize the different simulator features. It is especially important to understand how to make the plane:

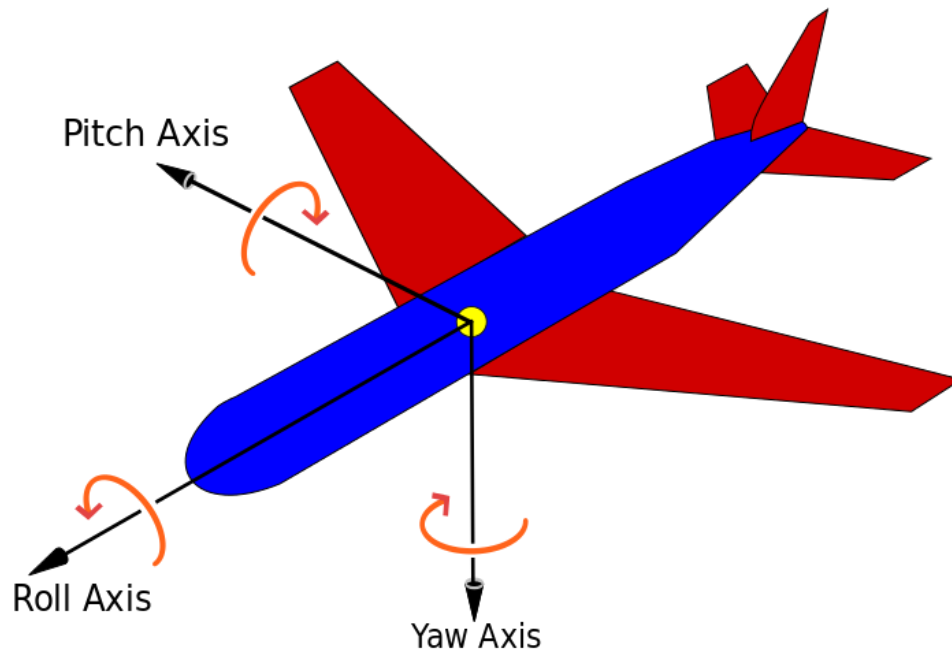
1. Roll (aileron) from side to side,
2. Pitch (elevator) from front to back, and
3. Yaw (rudder) to spin on the vertical axis.



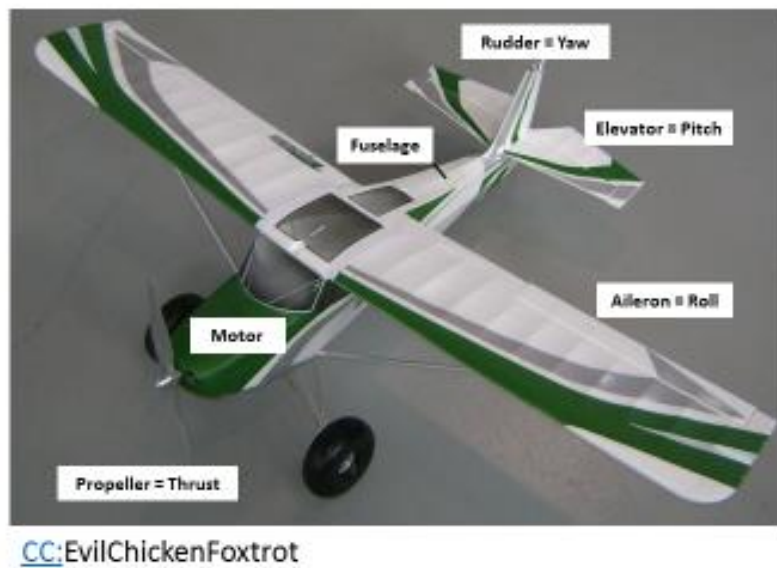
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Radio control transmitter features

## Aircraft Basics



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Fixed-wing surfaces and controls



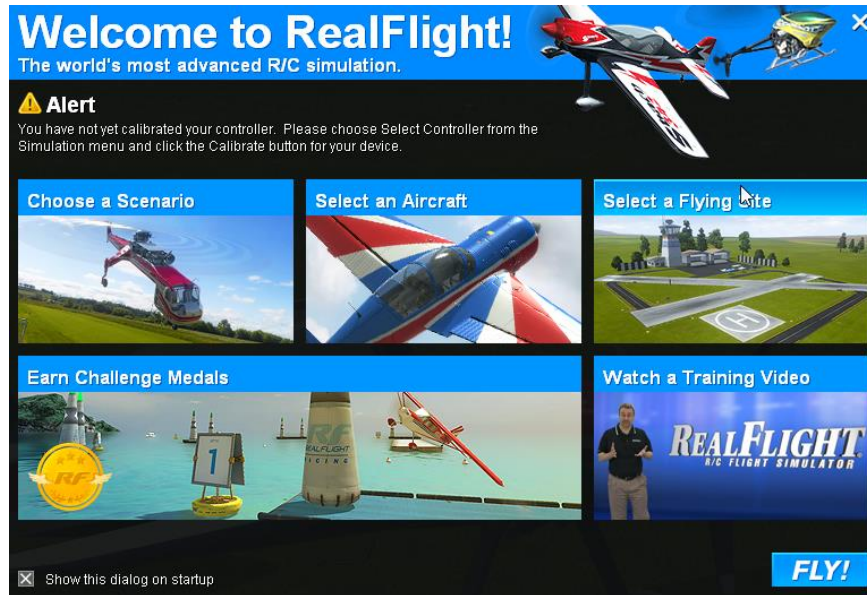
Quadcopter surfaces and controls

### **Real Flight® Simulator Protocols**

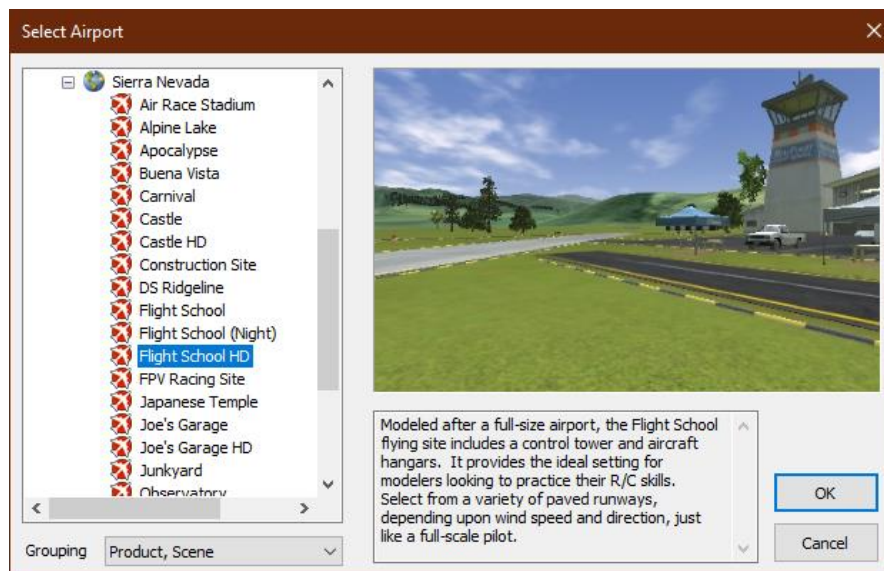
1. Launch RealFlight simulator software
2. In the Launcher, choose Run RealFlight (do not update):



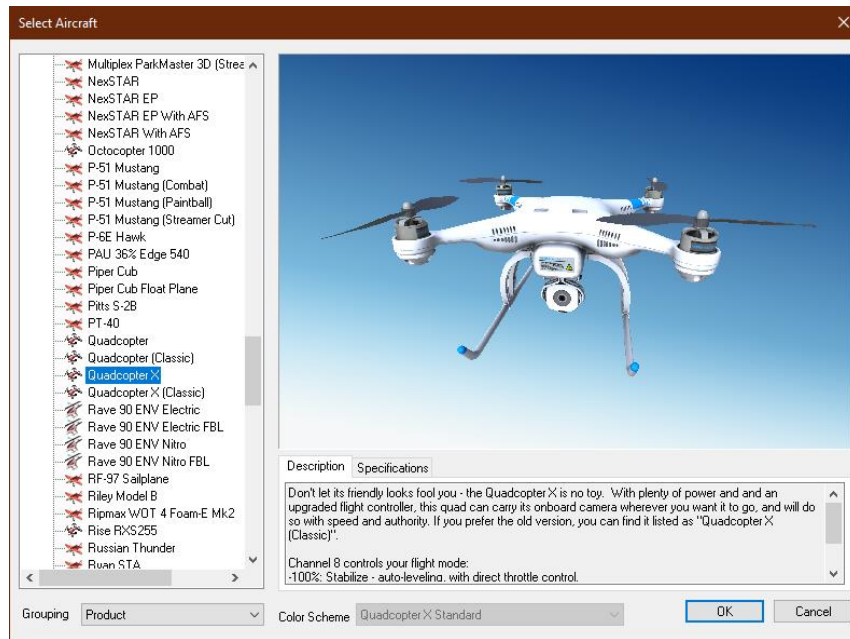
3. When the Welcome window appears, choose Fly!



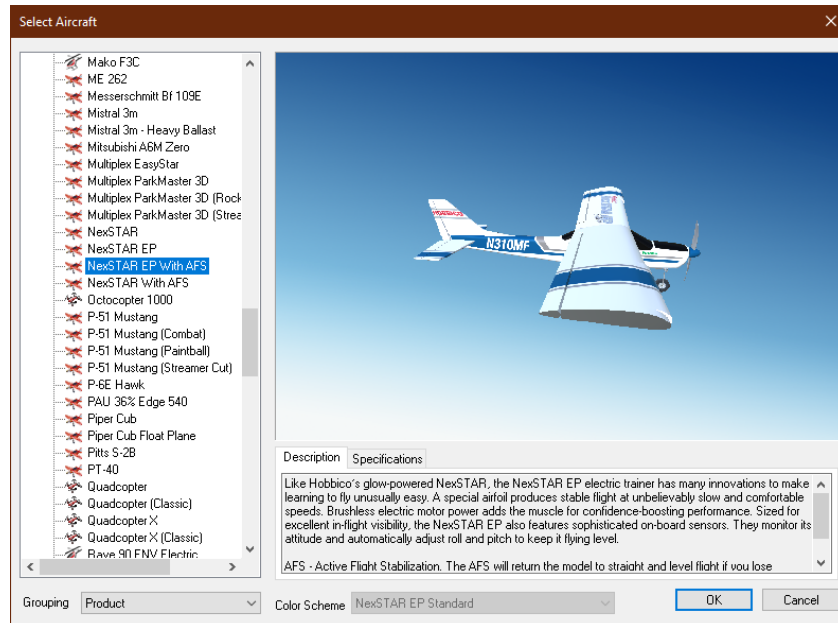
4. Pull the left stick (throttle) back and verify it is shut off.
5. Choose the Environment. In the file text menu, choose Environment → Select Airport.
6. Expand the Sierra Nevada menu and choose Flight School HD. Click OK.



7. Choose the training aircraft. In the file text menu, choose Aircraft → Select Aircraft.
  - a. For this course, two aircraft are used:
    - i. Roto-copter = Quadcopter X (do not choose Classic)



ii. Fixed-wing = NexSTAR EP With AFS



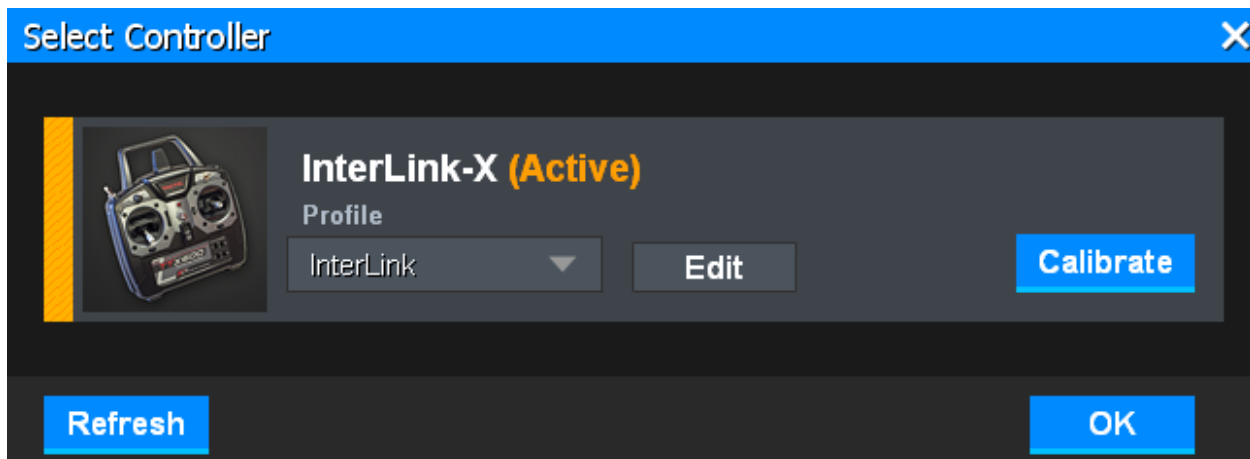
iii. Choose the NexSTAR EP with AFS and click OK.

## **Calibrate the Transmitter**

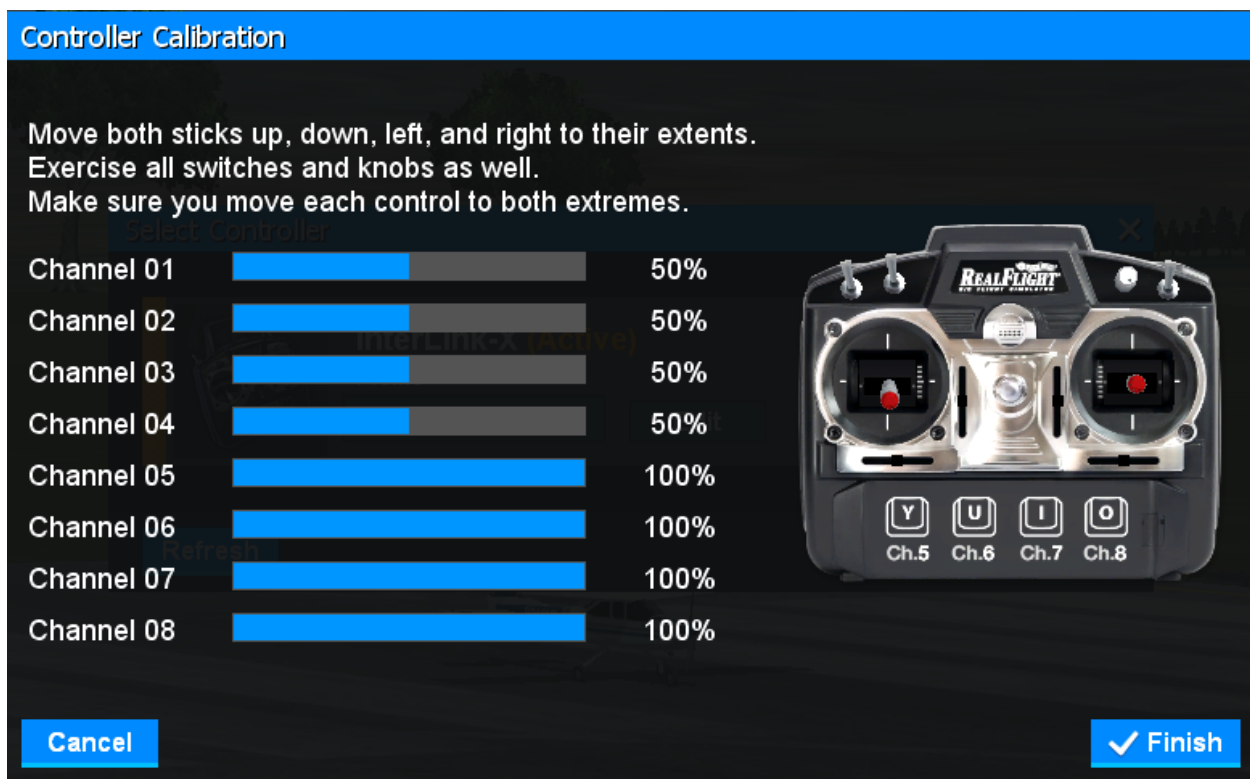
From time to time, the transmitter requires re-calibration. Assume that calibration is needed upon each use of the device.

1. In the file text menu, choose Simulation → Select Controller.





2. Click Calibrate. Follow the instructions and center the sticks. Click Next.
3. Roll, pitch, and yaw each of the sticks, including throttle.
4. Set channels 01-04 to 50%. Set Channels 05-08 to 100%



5. When finished, click Finish and click OK to return to the main flight menu.
  - a. If an active Finish button does not appear, the calibration is incorrect. Cancel and start again.
6. Set the throttle at 0% and press Reset (red button on left with circular arrow).

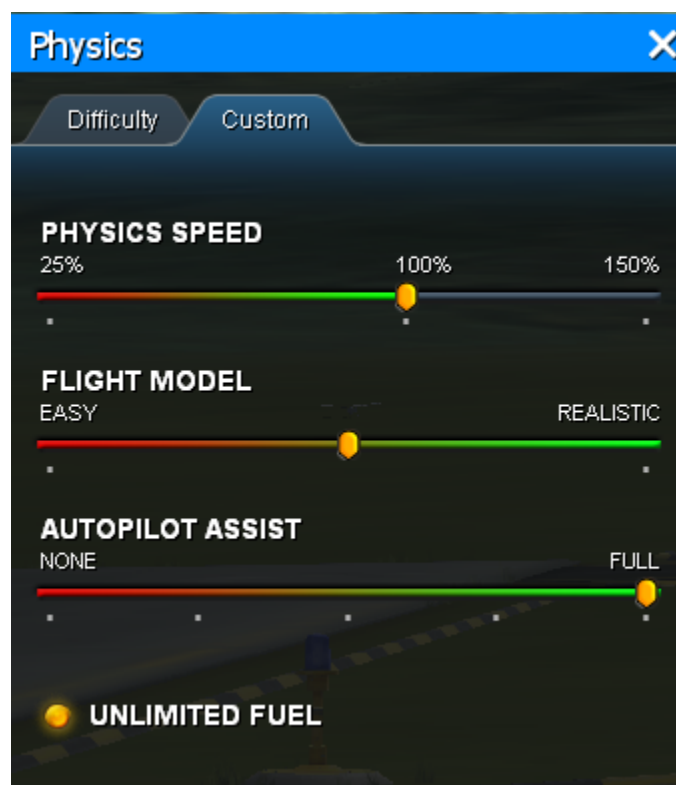
## Setup the Physics

Automatic wind and turbulence settings are turned on by default. You can view the current wind speed and turbulence settings in the lower right-hand corner of the screen using keyboard buttons.

- Press the Page Down keyboard option to lower the Wind Speed to 0 mph.
- Press the Delete keyboard option to lower the turbulence to 0 mph.

Physics in the flight control system allows users to reduce piloting stress. There are multiple Physics settings, but early learners need to reduce advanced settings to maximum stabilization mode in order to enjoy early flight.

1. In the file text menu, choose Simulation → Physics. Choose the Custom tab.
  - a. Set the physics speed to 100%.
  - b. Make the Flight Model 50% (middle range).
  - c. Make the Autopilot Assist Full
  - d. Set the Fuel to Unlimited. Click the X to close the menu.

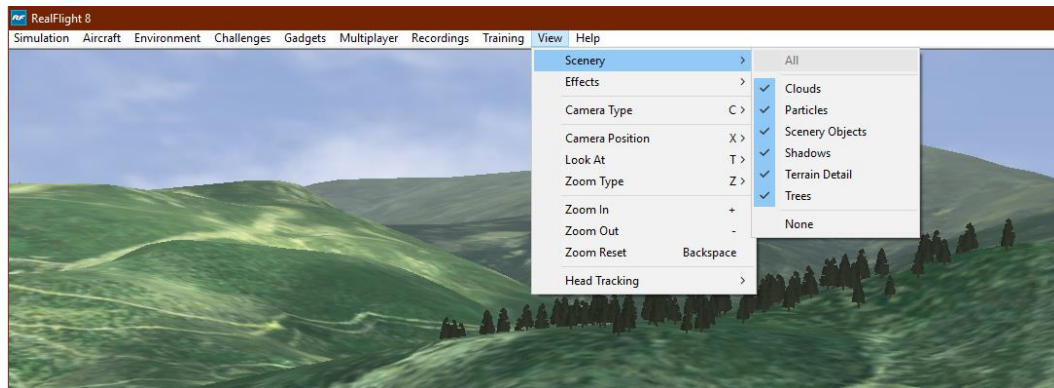


2. The plane is ready to fly in beginner mode. Use this mode only to help navigate Roll, Pitch, and Yaw sticks. Once learned, a pilot should return to the Physics menu and use the Realistic setting.
3. In the main menu, follow instructions for basic flight.

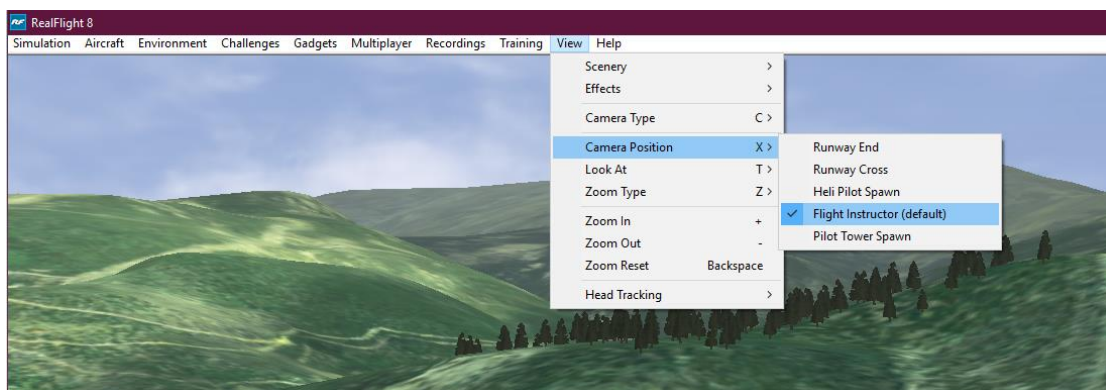


## Scenery and View

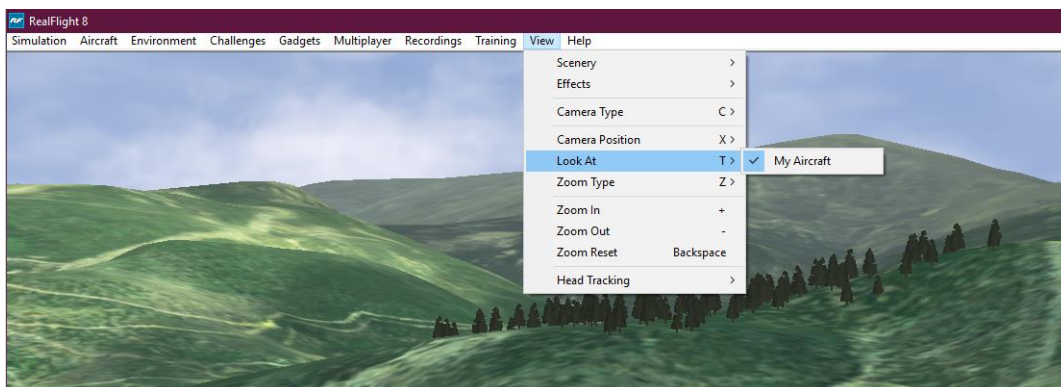
1. Verify that all scenery is turned on. In the file text menu, choose View → Scenery → All.



2. Verify the camera viewpoint is in instructor's mode. In the file text menu, choose View → Camera Position → Flight Instructor (default).



3. Press the F1 key to verify the camera type is “Fixed”, or choose View → Camera Type → Fixed.
4. Choose View → Effects → Grid to turn on a background grid.
5. If the aircraft is not visible, choose to force the Look At view to “My Aircraft”.

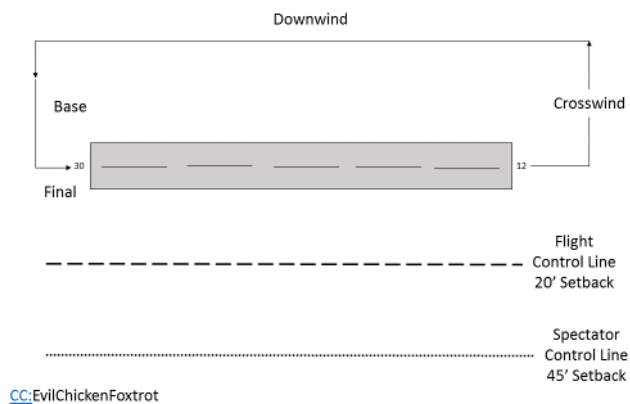


This completes the basic setup of the flight simulator.

## Required Flight Patterns on Simulator:

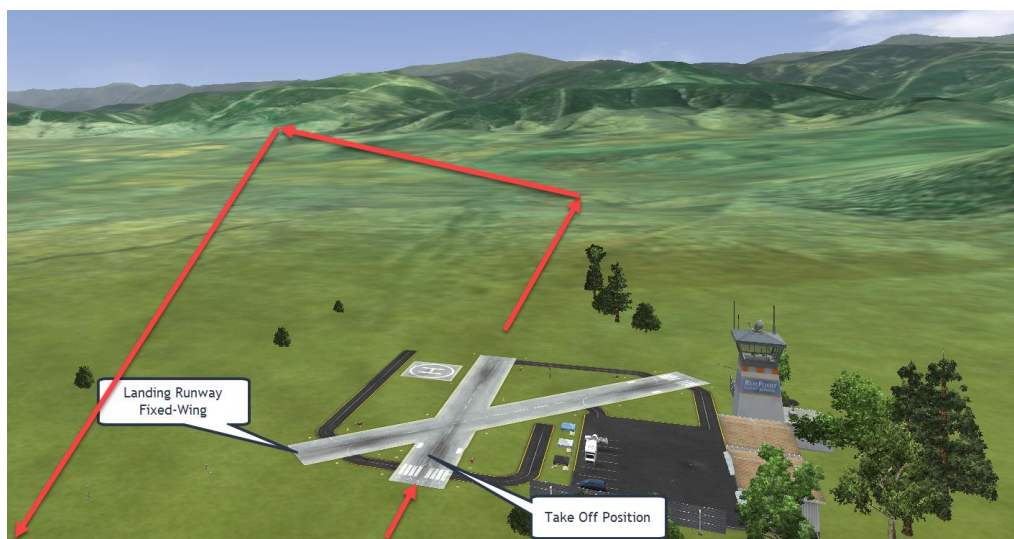
- a. NexStar EP with AFS (trees visible) –
  - i. Flight pattern = oval tracking to left, landing to right with 90% accuracy.
- b. Quad-copter – Physics = Realistic
  - i. Flight pattern = taxi out to center and perform 360 ° 15 foot right and left with tail in and nose in (see graphic below) with 80% accuracy
  - ii. Flight pattern = free flight with grassy landing
  - iii. Flight pattern = lateral figure 8s

The following is a classic flight training pattern.



Fixed-wing flight pattern at an airfield

However, RealFlight technology uses a different flight pattern for fixed-wing flight:



Fixed-wing flight pattern in RealFlight

## Quad-Copter Flight Training

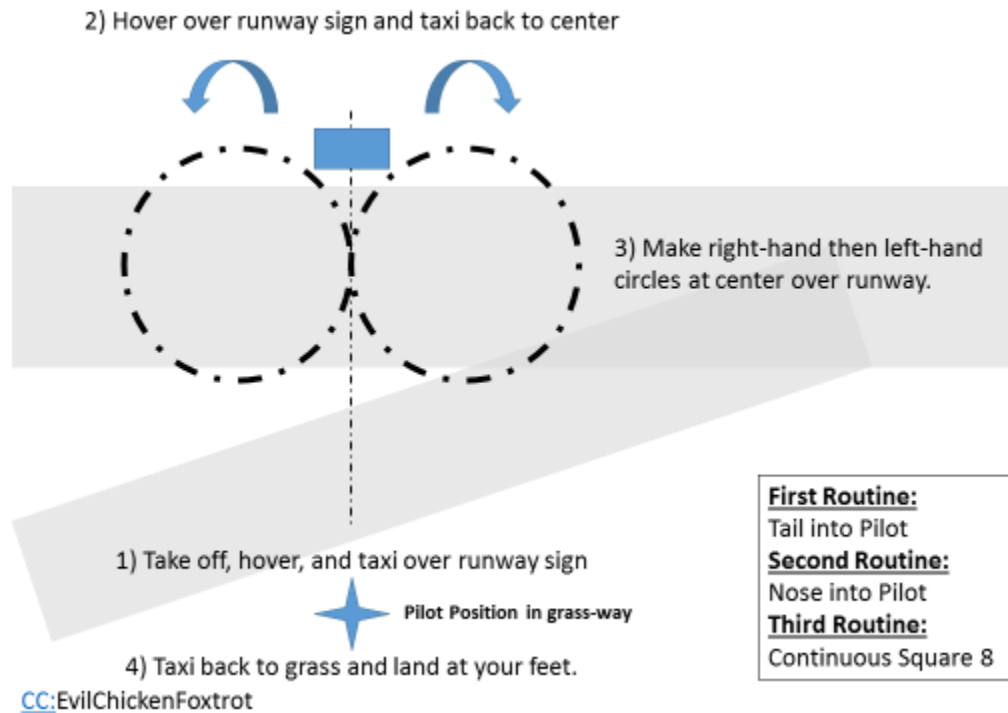
### Set Up Aircraft

1. Remain at the Sierra Nevada → Flight School HD airport.
2. Choose Quad-copter X as the aircraft. In the file text menu, choose Aircraft → Select Aircraft → Quadcopter X.
3. Set Physics to Realistic. In the file text menu, choose Simulator → Physics → Realistic.

### Settings on Flight Stabilization

1. Loiter = Channel 8 away from pilot
2. Alt Hold = Channel 8 in medium position
3. Stabilize (all manual with no stabilization) = Channel 8 towards pilot

In Loiter mode, all students must be able to fly the following pattern.



Quadcopter simulator flight training patterns

### **Maximum Line-of-Sight Recovery**

All students must demonstrate proficiency in MLSR procedures.

1. Launch quadcopter and elevate to 50 feet. Fly straight out until the orientation of the aircraft is no longer visible.
2. Stop the aircraft. Spin the aircraft.
3. Use the right stick (pitch) and draw the aircraft towards the pilot.
4. Use the left stick (rudder) to fly in the direction of travel the aircraft is going until the return is directly at the pilot.
5. Bring the aircraft back to the pilot and land. Repeat several times.