**Real Flight 9.5 Online Flight Training Protocol**
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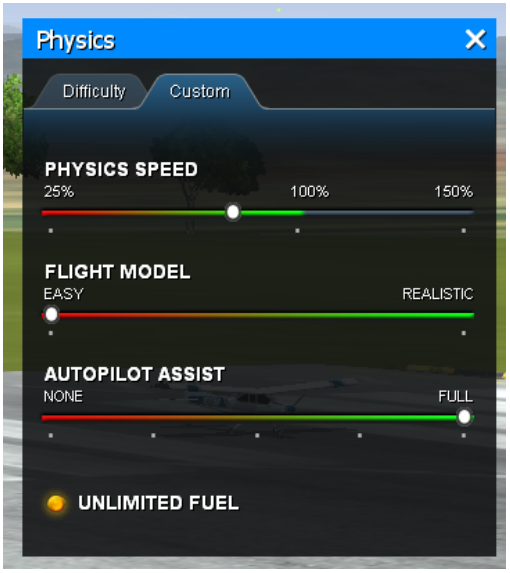
In an online meeting format, have the student 'Share Screen' and display Real Flight launched on the desktop.

Upon RF software installation, student should have completed radio calibration. Will be repeated in Lesson #2.

1) **Lesson #1 – Environment and Aircraft Setup**
   a) Launch Real Flight.
   b) Select *Fly!*
   c) Close all desktop popups inside of Real Flight.
   d) Set up Environments
      i) Environments ➔ Select Airport ➔ Choose: Sierra Nevada: Flight School HD
      ii) View ➔ Scenery ➔ All
      iii) View ➔ Effects ➔ Pilot Nametag
      iv) View ➔ Effects ➔ Sky Grid
      v) View ➔ Camera Type ➔ Fixed Position (F1)
      vi) Gadgets ➔ Radio (2)
         (1) Float the Radio to the bottom left-hand corner leaving 1/2" space above the bottom ribbon.
      vii) Gadgets ➔ Binoculars (3)
         (1) Float the Binoculars to the upper left-hand corner.
   e) Select Aircraft
      i) Aircraft ➔ RealFlight Legacy Aircraft ➔ NexSTAR EP with AFS
         (1) Read about the aircraft
         (2) Discuss AFS and EP
   f) End of Lesson #1.

1) **Lesson #2 – Radio Calibration and Physics**
   a) Calibrate Radio
      i) Simulation ➔ Select Controller
      ii) Verify the type of controller and click Calibrate
      iii) Follow instructions:
         (1) Center sticks and click Next
         (2) Set Channels 01-04 to 50%
         (3) Set Channels 05-10 to 0 or 100%
         (4) Click Finish but DO NOT SHUT OFF THROTTLE.
         (5) Click OK and shut off throttle. Reset aircraft.
   b) Setup Flight Physics
      i) Simulation ➔ Physics
      ii) On Difficulty tab, choose Beginner.
      iii) On Custom Tab, choose
         (1) Physics Speed = 75%
         (2) Flight Model = Easy
         (3) Autopilot Assist = Full
         (4) Verify UNLIMITED FUEL is highlighted.
         (5) Click X to close and save settings.
   c) Adjust wind and turbulence.
      i) Tap the Page Down key to reduce the wind speed to 0.
         (1) If key does not work, ask student to use Environment ➔ Wind ➔ Wind Speed ➔ Decrease
      ii) Tap the Delete key to reduce turbulence to 0.
         (1) If key does not work, ask student to use Environment ➔ Wind ➔ Turbulence ➔ Decrease.
   d) End of Lesson #2.



1) **Lesson #3 – Beginner Fixed-wing Flight**
   a) Introduction
      i) Explain where throttle is on left stick. Have student pull aircraft in front of themselves slowly.
      ii) Explain aircraft 6 degrees of freedom
         (1) Roll (right stick left and right) = Ailerons for banking
         (2) Pitch (right stick forward and backward) = Elevator for tail attitude
         (3) Yaw (left stick left and right) = Rudder for primary steering.
         (4) Reset aircraft
      iii) Explain fixed-wing flight is left-hand dominant with turning on the rudder first before banking. Start flying with only rudder turns until student modulates rudder and throttle simultaneously.
      iv) Explain to student the flight pattern
         (1) Takeoff-180 degree turn left below first grid line and fly to mountain.
         (2) Upon view of three separate groups of trees in the background, turn directly towards self by pointing the aircraft nose in the binoculars to the trainee's nose.
         (3) Hold 50-60% throttle and approach landing area with orange approach barricades.
         (4) When over the approach barricades, cut the throttle completely and float into the runway steering with the rudder only.
            (a) Remind student that if they fly too far away from the runway center, they can pull the aircraft towards them by using their rudder towards their body (pilot's right) OR push the aircraft away by using their rudder away from their body (pilot's left).
            (b) Ask the students to think like a pilot in the cockpit and not to determine left and right in direction of flight.
               (i) Left means pilot's sticks go left.
               (ii) Right means pilot's sticks go right.
      v) Have the student take off and perform a 270 degree turn and fly directly into their face.
         (1) Students can save the plane by pulling out in time.
         (2) Students learn to control the opposite left-right when approaching.
         (3) Students learn to overcome fear of failure.
      vi) Show students Challenges ➔ Balloon Burst.
      vii) To exit challenge, choose Level Select ➔ Back.
      viii) X out of Challenges.
      ix) Return to Flight School HD
   b) End of Lesson #3.

1) **Lesson #4 – More Advanced Fixed-Wing Maneuvers**
   a) Have student demonstrate progress in takeoff and landing.
   b) Ask student to demonstrate takeoff and landing with no rudder.
      i) Explain "wing stall".
   c) Put aircraft in Chase mode and fly same takeoff and landing routine.
      i) View ➔ Camera Type ➔ Chase
      ii) Gadgets ➔ Heads Up Display (9)
   d) Explain the level bars and the altitude meter.
      i) Have the student take off and fly to 200', and remain steady.
      ii) Make the 180 degree turn.
      iii) Cross the gravel road and turn 180 degrees towards the runway.
      iv) Reduce altitude slowly towards approaching.
      v) Land and steer.
         (1) Explain to student that the maneuver was no different than if having flown in fixed position.
   e) Return to Fixed Position camera type.
      i) View ➔ Camera Type ➔ Fixed Position.
   f) Turn on Trails for maneuvers
      i) View ➔ Effects ➔ Trails.
   g) Instruct student to take off and fly in open mountain region after turning 180 degrees at end of runway.
      i) Conduct figure-8 flight pattern on a single level, if possible.
      ii) Engage the ailerons to create banking after turning on the rudder first.
   h) Ask the student which direction is more difficult: Left-hand turns or Right-hand turns.
      i) Most students will claim right-hand turns are more difficult.
   i) Have student practice free-flight and continue with Challenges.

1) **Lesson #5 – Aerobatic Flight**
   a) Have the student load the Timber X airplane.
      i) Aircraft ➔ Select Aircraft ➔ RealFlight 9 Aircraft ➔ Eflite Timber X 1.2m.
      ii) Gadgets ➔ Flight Modes (0).
         (1) Float the Flight Modes window to the bottom right-hand corner.
      iii) Simulation ➔ Physics
         (1) On the Difficulty tab, choose Realistic.
         (2) On the Custom tab, choose Unlimited fuel with 100% speed, Realistic setting and Autopilot Assist = None.
         (3) X out of Physics window.
      iv) Visit Wiki RC aerobatics for theory on flight:
         (1) https://en.wikipedia.org/wiki/Radio-controlled_aerobatics
      v) Visit Hooked on RC Airplanes to watch videos of different maneuvers:
         (1) https://www.hooked-on-rc-airplanes.com/aerobatic-maneuvers.html
      vi) Attempt inverted flight by pitching up to the sky for stabilization.
      vii) Attempt large, slow loop.
      viii) Attempt barrel roll.
   b) End of Lesson #4.

1) **Lesson #6 – Tricopter**
   a) A tricopter uses both right-hand and left-hand dominance traits.
   b) Load the Tricopter 900
      i) Choose Aircraft ➔ Select Aircraft ➔ RealFlight 9 Aircraft ➔ Tricopter 900 (do not use manual modes).
      ii) Select Loiter mode.
   c) Ask student to do a 5' throttle test and determine at what % the throttle engages flight (Answer: 50% + 1%).
      i) Bounce the aircraft up and down to determine range of throttle motion.
      ii) Land aircraft and reset.
      iii) Turn wind up to 7 mph (Page Up key).
   d) Ask student to climb 10' and hold steady.
      i) Switch to Altitude Hold mode. Explain why aircraft is moving.
      ii) Switch back to Loiter mode and realign with RF 09 runway sign and tree.
      iii) Switch to Stabilize mode. Switch to Loiter and realign with RF 09 runway sign and tree.
         (1) Loiter: maintains current location, heading, and altitude.
         (2) Altitude Hold: maintains altitude only.
         (3) Stabilize: maintains roll and pitch but not altitude or horizontal alignment.
   e) Ask the student to fly the tricopter using pitch controls, rudder turns, and very little banking.
   f) If in chase mode, the aircraft is being flown in a balanced and well-controlled manner if the viewpoint remains nearly behind the aircraft (pilot does not veer out to either side of the aircraft).
   g) Ask the student which direction is more difficult: Left-hand turns or Right-hand turns.
      i) Most students will claim left-hand turns are more difficult.
   h) Have student practice free-flight and continue with Challenges.

1) **Lesson #7 – Roto-copter (Quadcopter X)**
   a) The goal of rotocopter flight is to move students from left-hand dominant maneuvers to right-hand dominant.
   b) Load Quadcopter X
      i) Choose Aircraft ➔ Select Aircraft ➔ RealFlight 9 Aircraft ➔ Quadcopter X.
      ii) Choose Simulation ➔ Physics. Choose Realistic on the Difficulty tab (Quadcopter in beginner mode will not yaw).
   c) 10 basic maneuvers (in Loiter mode only):
      i) 5' throttle test (same as tricopter)
         (1) Anytime a pilot is new to an aircraft, they must determine at what point (%) the throttle engages in flight.
         (2) The Quadcopter X engages in flight at 50% + 1%.
      ii) Airworthiness Test: it is not possible to test aircraft worthiness on the ground.
         (1) Up and Out 50'
            (a) Engage in lift off and fly diagonally up and out 50' each
         (2) Roll, Pitch Yaw
            (a)
      iii) Square 8 nose in cardinal direction
         (1) Nose Out
         (2) Nose In
      iv) Square 8 nose in direction of travel
         (1) Forward
      v) Smooth figure-8
         (1) Forward
      vi) Maximum Line of Sight Recovery: a skill to return an aircraft that has lost homing potential.
         (1) In Loiter mode
         (2) In Altitude Hold mode
      vii) Free Flight