

**Flying Pilgrims R/C Model Club**

**Student Training Manual**

**January 14, 2024**



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**January 13, 2024**

**<https://flyingpilgrims.com/fp/>**

This manual is offered as a service to those who participate in training provided by the Flying Pilgrims R/C Model Club. The manual does not cover every aspect of training, as much of the training is based on discussion between instructor and student(s). The manual contains safety information, but is not a safety manual. The information applies only to the conditions at the Club facility. Those using the manual agree to hold the club and its members harmless. Each person is responsible for their own safety or the safety of those they are responsible for.

This manual is based in large part on manuals shared by other clubs as published on the Academy of Model Aeronautics website.

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## **Introduction**

### **Purpose:**

The purpose of this manual is to provide guidance to students at the Flying Pilgrims R/C Club.

### **Goal**

The goal of this instruction is for students to become proficient in basic flying skills.

### **Safety**

Until being signed off, a student pilot must always fly with the assistance of an instructor or experienced club member.

### **Volunteer Instructors**

Please keep in mind that the instructors are individuals that volunteer their time for the purpose of teaching you to fly. They will, to the best of their abilities, instruct you in the operation of the aircraft.:

As you progress, we encourage you to work with all the instructors. You will get different perspectives and you may feel more comfortable with some instructors, based on your and their personalities.

Once you and an instructor agree you have the confidence and ability to fly safely, he will sign you off as an R/C Pilot.

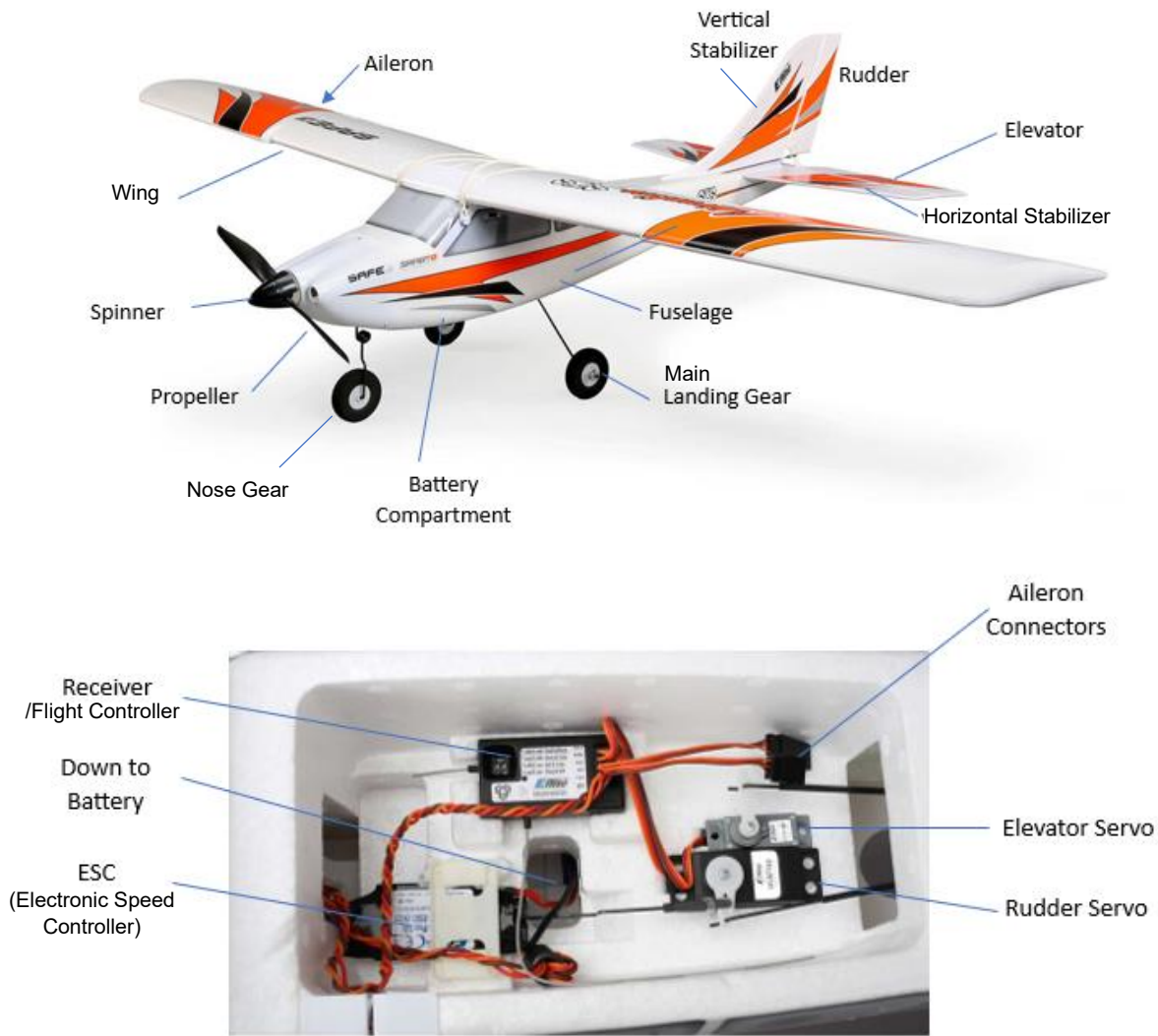
### **Club Equipment**

Flying Pilgrims provides trainer airplanes for students to learn with. A “Buddy Box” will be used during your training sessions. It is the safest way to learn how to fly R/C.

**Figure 1**

**Flying Pilgrims Flight Training Equipment**

The Flying Pilgrims flight training program uses E-Flite Apprentice RC Airplanes for training.



## Training Session Norms

1. Setup
  - a. Airplanes may be assembled on tables in the shelters. After assembly, all flight gear and airplanes shall be placed in the pit area.
  - b. Check the airplane. If something is wrong with the airplane on the ground, it will not get better in the air.
  - c. If in doubt do not fly the set-up. If you doubt the power output in the model or have a questionable battery/motor do not fly it. It is better to not fly and save the model than to push a bad set up and lose it all. The most important decision a pilot has is whether to fly.
2. Startup
  - a. Before connecting a battery to power an airplane
    - i. Make sure that the throttle cut on the transmitter is in the correct position (engaged).
    - ii. Make sure that the throttle is in the lowest position.
    - iii. Always turn on the transmitter first and then power the airplane/receiver second.
    - iv. Stay clear of the propeller.
    - v. Make sure the propeller faces away from people.
  - b. Do not connect the battery(ies) to the plane under the shelter. Do not connect the battery(ies) until you are ready to fly.
  - c. Never start an unrestrained aircraft; get assistance, use an anchor, or use a starting stand.
3. Taking off
  - a. Always announce your plans to take-off by shouting "taking-off." Get confirmation from the other pilots.
  - b. Always take-off into the wind.
  - c. Never force a take-off.
  - d. Never take off directly from the taxi way by the pilot station line.
  - e. Smoothly apply power. Reach full power in about 2 seconds, no more, no less. Maintain control over direction of the airplane.
  - f. After taking off, maintain the wings level, and fly to the end of the runway and keep climbing,
  - g. Turn into the crosswind leg, as you reach the desired altitude reduce power to half throttle.

#### 4. Flying

- a. The pilot must keep his or her full attention on the operation of his plane while flying and at no time do anything that would be a distraction such as using a cell phone or watching a child. When flying the pilot must always stay on the flight line station. Personnel who are not piloting an aircraft should refrain from disturbing or distracting those who are.
- b. Announce your intentions loud and clear: “taking off,” “landing,” “touch and go,” “low pass,” “on the field,” “clear,” “dead stick,” component or radio failure, etc.
- c. When any problems occur during a flight the pilot shall alert fellow pilots and spectators.
- d. To retrieve a model on the field, give a warning to any pilot who is flying. i.e., “On the field.”
- e. Flight patterns will be enforced when more than one plane is in the air.
  - i. Takeoffs are to be executed into the most windward direction,
  - ii. followed by a turn to the north and away from the flight line /pit area/and spectators.
- f. Do not fly too far away because it is easy to become disorientated.
- g. Know what your batteries can do and time flights (this can save a model). Track how long a set amount of MAH's will fly your plane. This can save you from overstressing your battery and from losing an airframe from lack of control.
- h. Most trainer aircraft will recover from unusual attitudes (mistakes) by killing the power and releasing the controls. Wait and pull up-elevator (depending on altitude). Be ready to level out and apply power.
- i. Always maintain contact with the control sticks. Either pinching between your fingers or with thumbs on top. All movements should be smooth and gradual. Do not slam the sticks as over correction will occur. Do not let the sticks slip from your fingers, it takes time to find the stick and recover.

#### 5. Landing

- a. Remember, unless you are “dead stick” (without power), you do not have to land. If the position of the airplane, or speed, are not right, go around. It is much easier, and safer, to do it over rather than try to salvage a bad approach.
- b. While landing, fly the plane all way through, until it stops. Upon touch down, steer the plane.
- c. If a landing is aborted, increase the throttle to full power, keep the wings level, do not turn, until reaching the end of the runway, then proceed as normal.

#### 6. Taxing

- a. Upon landing, promptly taxi off the runway, using one of the taxi ways.

- b. Stop the plane at the fence, and engage the throttle cut on the transmitter.
  - c. If the plane is equipped with a power switch, move the switch to the off position.
  - d. Move the plane away from the pilot station to the pit area.
7. Lithium Polymer (LiPo) Batteries
- a. LIPO batteries are an efficient source of power if used and treated properly.
  - b. If abused or mistreated, they can be dangerous.
  - c. Charging systems, and these chargers need to be set up correctly for safe operation.
  - d. The batteries are no more or less dangerous than the person using them. Obtain, read, and understand the instructions for use.

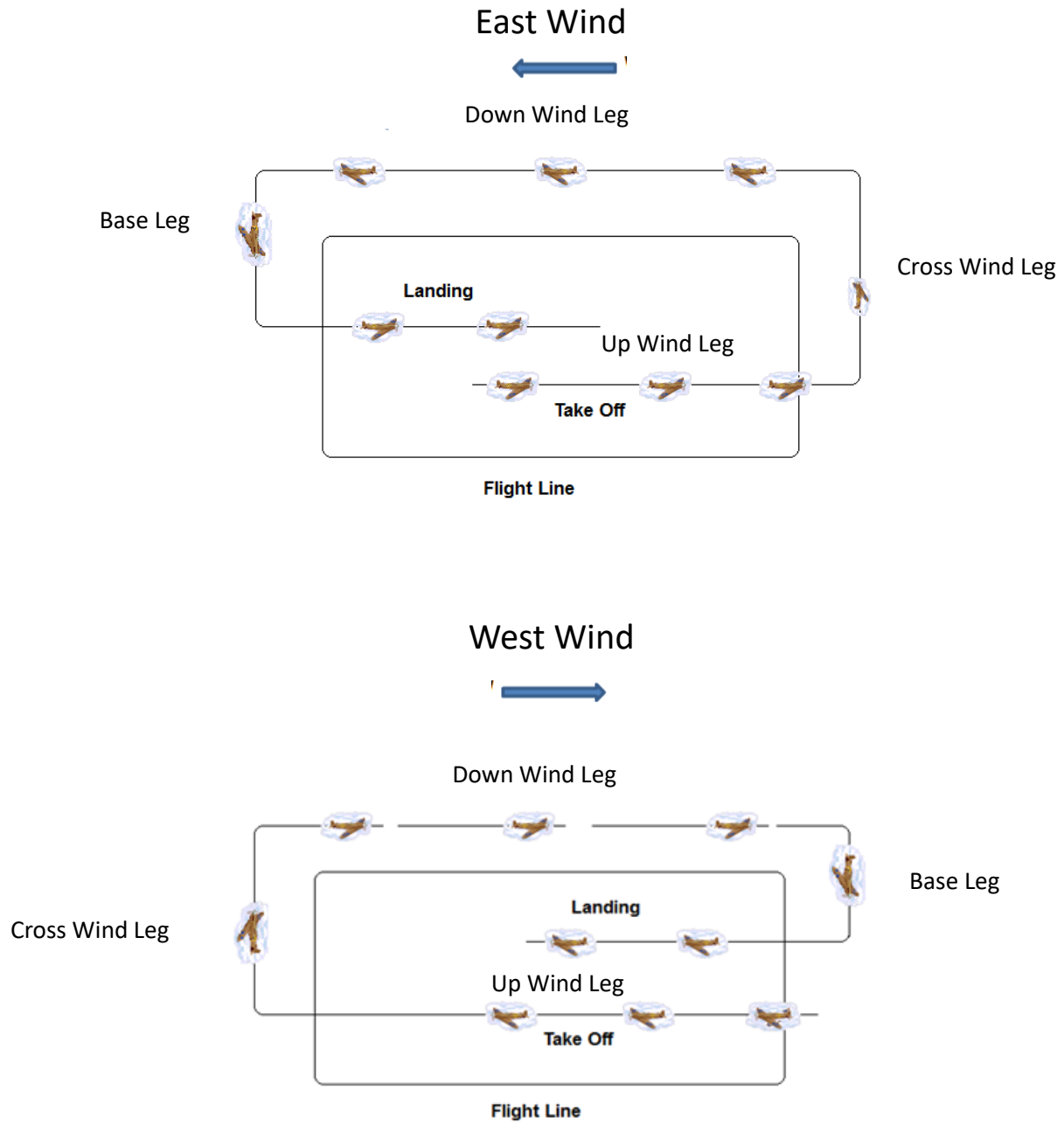
Figure 2 presents an overhead view of the training area. All flying should be performed north of the runway centerline.

**Figure 2**  
**Flying Pilgrims R/C Club – Flying Area Layout**





**Figure 3 - Flight Patterns**



## **How Airplanes Fly**

This material is covered in the following references:

<https://www.explainthatstuff.com/howplaneswork.html>

<https://aerocorner.com/blog/how-airplanes-fly/>

<https://www.instructables.com/Basics-of-RC-Plane-Flying/>

<https://www.rc-airplane-world.com/flying-model-airplanes.html>

## **Cross Wind Landing Techniques**

This material is covered in the following references:

<https://www.century-of-flight.net/mastering-the-crosswind-landing/>

<https://pilotinstitute.com/crosswind-landings/>

<https://youtu.be/92K8s-vppDI>

## **Four Left Turning Tendencies**

This material is covered in the following references:

<https://youtu.be/SxtHyhoBHjk>

<https://pilotinstitute.com/left-turning-tendencies-in-airplanes-explained/>

## Solo Flight

**Note:** The purpose of the solo flight is to be signed off. The goal is to demonstrate that the new pilot can prepare the plane, take off, fly, land, and recover the plane in a safe manner.

### **Task #1:** Ground support equipment, and taxi

- Demonstrate knowledge of Throttle Cut, Dual Rate, and Flight Mode switches.
- Perform aircraft preparation and inspection.
- Perform radio checks.
- Perform taxi course.

### **Task #2:** Takeoff.

- Execute proper upwind takeoff with runway alignment.
- Initiate takeoff throttle setting.
- Maintain runway ground steering during takeoff acceleration.
- Execute takeoff rotation at proper speed.
- Execute proper climb speed, and pitch angle.
- Perform a takeoff abort if required.

### **Task #3:** Maneuvers.

- Perform level rectangular patterns (left and right).
- Apply crosswind technique to maintain proper ground tracking during planning maneuvers.

### **Task #7:** Landing pattern.

- Execute landing patterns.
- Taxi back (if needed) and takeoff (two more times)

### **Task #9:** Full-stop landing.

- Execute full-stop landing
- Taxi back to taxi-way with turn off, stopping before the fence.
- Engage throttle cut
- Switch airplane power to off position
- Carry the airplane back to a starting stand, with propeller facing away from self, and other people.
- Remove battery from airplane
- Turn off transmitter.

- END -

## ATTACHMENTS

## Attachment One – Pre and Post Flight Checklist

### Pre-Flight Checklist

Internal (prior to attaching wing):

- Check Servo Mount, Screws (if applicable), Servos, Servo Arms, for security and integrity.
- Check Push rods for security and Integrity.
- Check Receiver, ESC, and Battery for connections, security, and integrity.
- Check for loose items that could cause interference and fouling of the servos and control rods.
- Make sure battery lead is pushed down into battery bay

Wing (prior to attaching)

- Check wing for breaks, warps, cracks, and general integrity.
- Check aileron pushrods, linkages, hinges, and clevises (if equipped) for security and integrity.

Engine Area

- Check motor mount, motor, prop nut and/or spinner for security and integrity.
- Check prop. Replace if necessary.
- Check Cowl (if equipped) for security and integrity.

Tail Section

- Check vertical fin, rudder, hinges, control horns, and clevises for security and integrity.
- Check Tail wheel (if equipped) for alignment, security, and integrity.
- Check Horizontal Stabilizer, elevator, hinges, control horns, and clevises for security and integrity.

Landing Gear

- Ensure wheels are secure and roll freely.
- Ensure nose wheel is straight.

Flight Control Check

- Check that all flight control surfaces move in the correct and proper direction as input from the control sticks on the transmitter.
- Check transmitter for proper settings of switches and trim settings.
- If transmitter is equipped, check for proper model.
- Check proper trim of flight controls when sticks are in the neutral position.
- Shout out “taking off” and wait for other pilots to respond.

- Disengage throttle cut.
  - Taxi to centerline of runway and takeoff.
- 

### **Post-Flight Checklist**

- Engage throttle cut.
- Turn off switch (if there is one) on airplane
- Carry airplane to restraining table
- Remove battery
- Turn off transmitter
- Check battery voltage level
- Bring battery to charging station.

## Attachment Two – Tasks & Activities to Undertake During Training

Note: This is a suggested list of training exercises. The student and instructor may choose additional activities. These may not all be addressed before being signed off.

<b>Field Walkthrough</b> Become familiar with how the field is arranged and procedures for basic model operation. <ul style="list-style-type: none"><li>• Opening the gate (combo and proper opening and closing)</li><li>• Field equipment and areas: portable toilet, fire extinguisher, pit area (no fly area), pilot boxes, helicopter hover area, engine run-up areas, frequency board, sign in stand (with emergency contact data)</li></ul>
<b>Aircraft Assembly</b> Ask the instructor to provide tips on how to assemble the club aircraft and battery installation.
<b>Ground School –</b> Instructor simulates flight of plane (without power) based on student control of transmitter.
<b>Left (Right) Hand Racetrack Pattern:</b> Prior to flight, the instructor will review stick movement effect on aircraft flight with the student. The instructor will then show the student the stick movements necessary for making a left (right) turn. The instructor will get the aircraft airborne and verify trim. The instructor will demonstrate flying a left (right) hand racetrack pattern. He/she will then supervise the student in making constant altitude left (right) hand turns while flying a racetrack pattern.
<b>Climbing and Descending.</b> Practice making altitude changes while flying a pattern.
<b>Practice Trimming the Airplane in Flight</b> Practice adjusting the transmitter controls to correct flight of the airplane.
<b>Figure Eight Pattern:</b> Practice making left hand and right hand turns while flying a figure eight pattern. Maintain a constant elevation.
<b>Stalls and Slow Flight:</b> Practice slow flight, stalling, and stall recovery.
<b>High Landing Approach:</b> Practice lining up for landing from an altitude of no less than 25 feet.
<b>Left (Right) Landing Approach:</b> Practice making rectangular approach pattern to left-to-right full stop landings.
<b>Taxi and Take Off:</b> Practice performing takeoffs.
<b>Touch and Go's:</b> Practice making touch and go's.
<b>Dead Stick Landing</b> Practice Landing a plane that has lost power.