

Common Questions and Answers On RC Flight and Flight Instruction

This material is intended to answer some of the most common questions and problems a beginning RC flyer has. We encourage you, as a current or prospective club member, to take advantage of our instruction program, which provides instruction at our field on Tuesday and Thursday evenings from approx 5 pm until dark (weather permitting) from April through October of each flying season.

Is it hard to learn to fly?

Everyone has a different aptitude level for learning RC. This much is certain. RC flying is hard enough to learn that you will not want to try to learn by yourself. Teaching one's self may cost you several airplanes (or at least several crashes) in the process! Fixing airplanes is not nearly as much fun as flying. If you want to learn to fly with the fewest problems, join the club and work with one of our instructors. He'll flight test and trim your plane, take off and land for you, give you pointers, and with the help of a "buddy-box," be ready to take control if you get into trouble in the air. While we can't promise your instructor will never crash, you will have a much better chance of keeping your plane in one piece with an instructor than without one.

How long does it take to learn to fly?

This depends upon the student's aptitude. It also depends on how much time you practice. The more often you practice, the shorter the time it will take to master the skills. You know the saying, "If you don't use it, you lose it!" It truly applies to RC flying. If you only fly once a week, it may take quite a long time. You'll be struggling to remember what was learned in the last session. We have seen people solo (fly by themselves for several consecutive flights) in as little as two weeks of practice (every day for several flights). Others may take the whole flying season to learn to fly. Yet others may take more than one flying season. With a good instructor, even the learning stage is fun and rewarding. So this period should seem to go quite quickly, regardless of how long it takes.

How long can a plane fly?

For fuel-powered models this depends on the size of the engine and the size of the fuel tank, the range of flight time can be from about 10 minutes to well over 20 minutes. One common recommendation for a .40 sized Glow-fuel engine is about a six-ounce fuel tank. This will allow about a 10-12 minute flight.

For Electric-powered models the current capacity of the battery, and the weight of the model will determine flight time, but 8 to 15 minutes is common.

What happens if the engine quits?

Most planes designed for beginners will glide quite well. In the hands of an experienced flier, a plane can be safely landed even if the fuel-powered engine quits or the electric motor stops. Of course the altitude and attitude of the airplane at the time of the power failure has a lot to do with how difficult it is to safely land the airplane. The higher the plane, the more time the flier will have to plan the landing. (Landings without power are called dead-stick landings.)

How far away can the airplane fly?

Modern transmitters typically have a range of at least a mile, which is farther than you will be able to see what you're trying to fly. The rule of thumb is: You have to be able to see it to fly it!

How high can they go?

Planes will easily fly higher than you can see them. Again, if you can't see it, you can't control it! However, newly implemented FAA regulations have established a 400 ft altitude limit in uncontrolled airspace. Instructors will help you to understand any rules related to height and position flying.

Is flying an RC airplane like flying a real (full scale) airplane?

In essence, yes. You'll have the same basic controls a full-scale pilot has in a real airplane. However, full-scale pilots frequently relate that an RC airplane responds much faster than a real airplane. They also say that learning to fly RC can be awkward, since there is no feel for the planes maneuvers. RC flying requires much more hand/eye coordination since you must respond to what you see.

What's the hardest part of flying?

Landing - remember that takeoffs are optional, but landings are mandatory! Your instructor will first teach you how to keep the plane in the air, making simple turns. Then you'll progress to flying figure eight patterns. Once you can keep the plane in the air by yourself without any problems, you'll learn to take-off. Once you have mastered the other phases of flying, you'll learn how to land.

How much wind is too much for flying?

Experienced flyers can fly (sport planes) in winds well over 20 MPH. However, the more wind, the harder (and less enjoyable) it is to fly. Beginners shouldn't fly in winds much over 5 MPH until they have mastered the first steps of learning how to fly.

How does the radio control system work?

As with any kind of radio, a transmitter (hand-held remote control) is used to send signals to the receiver (in the airplane). Rechargeable batteries power both the transmitter and receiver (and also the motor on electric-powered models). The radio system can have several channels. Each channel is used to control one airplane function. Servos (one for each channel) are used to cause the actual motion within the airplane to make control surfaces move.

A good beginner's radio configuration has four or more channels. These channels control ailerons, elevator, rudder, and throttle. Two sticks (like computer game joysticks) on the transmitter give the flier these four controls. With the most common radio setup mode (Mode 2), the right stick is used to control aileron (left/right) and elevator (up/down). The left stick is used to control rudder (left/right) and throttle (idle through full throttle). Like a computer game joystick, the aileron, elevator, and rudder sticks are spring loaded so, when released, these sticks will return to center. The throttle stick stays where you place it, from idle to full throttle.

Within the airplane, servos respond to signals from the radio's receiver whenever either of the transmitter sticks is moved. The servos change position according to the position of the transmitter sticks and cause the control surfaces of the airplane to move in sync with stick movements (through mechanical linkages). For electric planes, the Electronic Speed Control (ESC) converts the throttle stick position to the appropriate motor rpm.

Radio Terminology

Stabilization — Many present-day electric-powered trainers have computer stabilization receivers that feature Beginner, Intermediate, and Expert modes. While beginner modes will allow a trainee to think he is controlling the plane, the software is making many small corrections and the stick movements made by the student are very sluggish. If you are ever going to really learn to fly, you cannot rely on the extreme control augmentation provided by Beginner mode.

If your radio system has these features, Beginner mode should be used only initially to instill confidence before moving on to Intermediate mode. In Intermediate mode the extremes of roll and pitch are limited, but control feel and responsiveness are preserved, creating a more realistic training operating mode. Once you become proficient in Intermediate mode, it is recommended you extend your training to Expert mode to allow basic roll and loop maneuvers as well as stall and spin recovery (these maneuvers *cannot* be performed in Intermediate mode).

Trim controls - It is not possible to perfectly set each servo and control surface. Say for example, the plane tends to climb with hands-off the control stick. The elevator trim control will give the flyer the ability to trim in some down elevator without affecting the joystick for the elevator. In essence, trim controls allow the flyer to set the radio so that the plane will fly straight and level with hands off the radio. All radios come with trim controls for each of the four basic channels.

Setting correct trim is another reason that beginners should seek help. It is highly unlikely that a new airplane will fly straight and level hands off without any trim adjustments. A plane that is not trimmed properly can be very difficult to fly (even for an experienced flier). For a beginner, it will be impossible to fly. During your new plane's first flight, the instructor will trim your airplane, causing the centered or neutral position of each channel to be correctly positioned for ease of flight.

Trainer aircraft with stabilization systems may require special procedures for flight trimming. Be sure to read the instructions that come with your aircraft in order to properly trim it for straight and level flight.

Servo reversing - It is sometimes inconvenient (if not impossible) to mount the servos in a way to properly direct the control surface. In some cases, the servo will operate in the wrong direction (left aileron acts as the right aileron, for example). A radio transmitter servo reversing feature allows you to correct this backward control movement. A servo reversing switch (in the transmitter), for that servo, can be used to change the direction of servo movement. Servo reversing is a standard feature on almost all radios sold today.

Dual rates - Though not included on every radio, this feature allows you to change the responsiveness of your airplane's control surfaces (usually this feature only applies to ailerons and elevator). On high rates, your servos will move full travel and the plane will be quite responsive. On low rates, your servos may only move about 40-60 percent of their total travels. This is a nice feature for beginners, since you can reduce the responsiveness of your airplane, making it easier to fly. Most pilots find that low rates are useful for takeoff and landing, and use high rates for more aggressive aerobatics.

Mixing - Some transmitters have a feature that allows you to have one control automatically invoke another. For example, as you give left aileron, the radio can be adjusted to automatically give some rudder correction (to make for a smoother coordinated turn). While this is a nice feature for experienced flyers, it doesn't help beginners learn to fly. Don't go out of your way to find a radio with this feature for your first radio.

Trainer system - This transmitter feature allows the transmitter to be buddy-boxed to another transmitter, which is the safest method of flight instruction. We devote an entire discussion later in this document. Please refer to this information. For now, just remember a beginner should not buy a radio without the trainer system provision!

What makes a good trainer plane?

There is a lot of controversy related to what truly makes a good trainer. As you talk to people at the field and read ads & articles in model magazines, everyone seems to have a different idea as to what makes the best trainer. Of course, the companies trying to sell trainers will always slant their sales information in a way that sounds right for everyone. Let's take a look at some of the important attributes for trainer type airplanes.

Wing location - The most popular trainers are of high wing design. This is true for full scale aircraft as well. The high wing gives the most stability for flying. Since the major portion of the airplane's weight is below the wing, high wing airplanes have excellent self-correcting characteristics.

Shoulder wing and low wing aircraft tend to be more aerobatic, and are not suitable for training. Yes, this means that the really cool P-51 Mustang model probably isn't going to be the best thing to learn to fly on, despite what the manufacturer may say.

Wing airfoil - Generally speaking, planes with flat bottom wings are easiest to fly as they generate more lift and allow the aircraft to fly more slowly. However, on windy days, difficulty of flying increases due to the fact that they do not penetrate the wind as well. You will also notice a great deal of ballooning (the tendency for a plane to gain altitude when speed is increased) with flat bottom wings. Also, planes with flat bottom wings tend to have limited aerobatic capabilities.

Planes with semi-symmetrical wings, while they sacrifice some in the way of self-correcting characteristics, remain amazingly stable. With them you gain in wind penetration characteristics, reduce the tendency for ballooning, and increase your potential for aerobatics once you have learned the basics of flight.

Planes with fully symmetrical wings tend to be much more aerobatic. In the hands of an experienced pilot, can perform almost every maneuver in the book! You can look forward to transitioning to more high performance aircraft like this after you solo.

Dihedral - Dihedral is the upward angle of an aircraft's wings. The amount of dihedral has a great deal to do with the plane's stability and self-correcting characteristics. Generally speaking, the more the dihedral, the greater tendency the plane will have to self-correct a roll. However, on windier days, excess dihedral will keep the plane from penetrating the wind nicely. It is difficult to fly planes with excess dihedral directly into the wind. The plane will have the constant tendency to turn in the direction the wind is blowing (with the wind).

Weight versus rugged design - Of course your first airplane will have to take quite a bit of abuse. Especially when you start landing on your own, you'll need a plane that can withstand the bumps and bruises associated with your first few attempts. Avoid heavy weight airplanes that claim to be indestructible as they sacrifice good flying characteristics to be able to make this claim.

If you purchase a ready-built airplane, look for foam or balsa construction to in order to keep the weight down. Remember that lighter models almost always fly better!

Plane and engine size – In glow-fuel powered models, 40 size (0.40 cubic inch displacement glow engine) trainers offer the best compromise in stable flight and economy, but today electric power has become the norm for many flyers.

Electric-powered RTF's (Ready To Fly) models come with motor, speed control and also with a dedicated radio and servos. BNF (Bind N Fly) can be purchased with a radio receiver and servos only for those flyers who already have a transmitter. Or some models may be purchased in semi-kit form where you can use a motor, speed control, radio, and servos of your choice.

What is the trainer system?

Imagine you've just built or purchased your airplane and you bring it out to the field for the first time. You get together with an instructor and he test flies your airplane and trims it out. Now it is going to be your turn. Your instructor takes off again and gets the plane up to a safe altitude and hands you the transmitter. If you are like most beginners, you'll have the plane on its back almost immediately (most beginners have a tendency to over-control the plane). Your instructor quickly grabs the transmitter back from you and rights the plane. Then he gives you back the transmitter. You get about three more seconds of practice before he has to grab the transmitter again.

This passing back and forth of the transmitter is very cumbersome, error prone, and downright scary. In the beginning, when you are just trying to keep the plane in the air, passing the transmitter will suffice. But as you get better, and you begin to do maneuvers closer to the ground (like take-offs and landings), you'll want a more fail-safe method of instructor control.

Sometimes called a “buddy box”, the trainer system allows you to connect a slave transmitter with the master transmitter either wirelessly, or with a cable. Once set up properly, the instructor will take the master transmitter and give you the slave transmitter. He'll get the plane in the air and when ready, he'll simply press a button and you'll have control. If you get into trouble, he releases the button and he has control again. No more passing the transmitter back and forth. The trainer system will dramatically improve your odds of learning how to fly without crashing even once (especially as you begin taking off and landing).

Our instructors have a limited number of buddy-box setups for instruction use with the most common brands of radio gear. These may require re-trimming as they are moved from student to student, and there is no guarantee a box will be available for your brand of equipment. You can buy your own slave transmitters and a trainer cord (if required) that work with your radio, and this will ensure you are ready for flight assistance whenever an instructor is available.

Preflight inspections

We urge beginners to have their planes checked for air-worthiness before they are flown for the first time. Instructors will check for problems that need to be corrected. Common mistakes that must be corrected before the plane can be flown include having servos activate control surfaces in the incorrect directions (easily fixed by using servo reversing), improper assembly, incorrectly secured control surface hinges, and improper center of gravity point. Keep in mind that these are but a few of the many things that can cause an airplane to crash, and an instructor will be on the lookout for these and many more.

Revised 1/2021 to acknowledge the prevalence of electric-powered models — RWB/CBB