



PLANE TALK

Introduction to RC Airplanes

RC Airplane Types - Trainers, Sport
RC Planes, 3D Acrobat RC
Airplanes, Jets & More

RC Airplane Types

- RC airplanes come in a few distinct categories. Each category generally emphasizes certain features or abilities while sacrificing others. Some of the fun in the RC airplane hobby comes from trying these types and discovering which is for you. Finally, tons of fun is the reward for figuring out which type you prefer and focusing on it.

RC Airplane Types

- The first type, because it is commonly a first RC model airplane, is the trainer. The trainer is identified by the wing mounted high on the fuselage and quite a bit of dihedral – the angle between the two wing halves. It is designed to be stable, easy to fly, and simple to build

RC Airplane Types





A few of RCSMP Member's RC Planes

RC Airplane Types

- Often a pilot's second RC model airplane, the sport type, drops the wing to the middle or bottom of the fuselage and emphasizes performance. The airfoil thins out, the wing shrinks, and the fuselage is thinner, all in the name of increased performance and speed. These designs allow for aerobatic maneuvers, including inverted flight, knife edge flight, and snap rolls.

RC Airplane Types

- An example of an RC model airplane that crosses the gap between a trainer and a sport type is this T-28 Trojan RTF.



RC Airplane Types

- Expanding the possibilities in aerobatic maneuvers are 3D acrobats. These r c planes are designed to fly at slower speeds, and to have incredible control surface authority. Often the control surfaces are as big as the flight surfaces! They are also built extremely light and given the strongest motors for mind-boggling performance, unrivaled in the full-scale world.

RC Airplane Types

- An example of a 3D acrobatic RC model airplane is the [SX3 \(Southern Cross 3\)](#)



RC Airplane Types

- Focused on speed and sometimes scale-appearance, jets are a thrilling RC model airplane type. They are often powered by ducted-fans, or even miniature kerosene turbines.

RC Airplane Types

- Examples of turbine powered jets.



Fundamentals of the Sport / Hobby

- You can experience all the joy of flying airplanes without being inside one. Using a few special technologies, you can pilot an RC airplane from the ground. It's cheaper and easier to get into than full-scale piloting. As well, RC model aviation is much safer and offers higher performance. It's a great outdoor hobby where you will enjoy scenery, freedom, and friendship.

Fundamentals of the Sport / Hobby

- The first technology used is the radio control system. As an RC model pilot, you hold a transmitter unit and move two control sticks. By moving these control sticks (which function like two joysticks on a game controller) you will control the airplane's flight

Fundamentals of the Sport / Hobby

- transmitter unit



Fundamentals of the Sport / Hobby

- The transmitter communicates your stick positions, via a radio signal, to the RC model airplane. The RC model airplane contains a receiver, which decodes this transmission and tells the servos to move a position corresponding to what you commanded on the sticks. The servos are a cool piece of technology. They rotate to whatever position they are told to go to, and are very strong and very accurate.

Fundamentals of the Sport / Hobby

■ Receiver



Servos



Fundamentals of the Sport / Hobby

- Flight Pack



Fundamentals of the Sport / Hobby

- How does a servo rotating make your RC model airplane fly? This is where the technology becomes entirely mechanical. A linkage, in the form of a cable or strong rod, connects the servo's rotating shaft and arm to the airframe's flight control surface.

Fundamentals of the Sport / Hobby

- The flight control surface is literally a movable section of wing. By controlling the orientation of the control surface (the servo's job), you can generate the fundamental airframe rotations that all aircraft since the Wright brothers have used for control.

Fundamentals of the Sport / Hobby

- **Roll, pitch, and yaw** are the fundamental airframe rotations. Each is generated and controlled by a specific control surface. **Roll** is generated by the **ailerons**, **pitch** by the **elevator**, and **yaw** by the **rudder**.

Fundamentals of the Sport / Hobby

- It's a complicated process involving a series of interesting technologies, but when you're flying, RC model airplane control is as simple as can be. You move a pair of control sticks with your fingers, and the RC model airplane immediately responds by changing its flight path. Piloting an RC model airplane is a lot like driving a car or playing a video game.

Introduction to RC Airplanes: Your First Radio Control Airplane

- Our last article, Fundamentals of the Sport / Hobby, prepared you for the decisions that lay ahead. With the context of RC airplanes in your pocket, let's look at choosing your first airplane.

Introduction to RC Airplanes: Your First Radio Control Airplane

- There are a lot of RC model airplanes to choose from, and a ton of equipment possibilities. All you need to know is what you are looking for, what each option means, and then you can go shopping. Fortunately, there's a market for entry-level RC model airplanes and equipment. After all, every current RC pilot has at one time needed a first RC model airplane.

Your First Radio Control Airplane

- One way to focus your RC model airplane search is to look for RC model airplanes designated as trainers. Trainer is the term used for RC model airplanes that are designed to be simple, durable, easy to fly, and forgiving. You can spot them by their high wing position, abundance of dihedral, and large fuselage.

Your First Radio Control Airplane



PT-40 Trainer

Your First Radio Control Airplane

- Dihedral is the angle between the two wings halves. An RC model airplane with no dihedral has flat wings. An RC model airplane with dihedral has the wing halves sloped upwards away from center. Dihedral induces slight roll stability, so the RC model airplane will want to return to wings-level

Your First Radio Control Airplane

- Once you've started to spot trainers that interest you, it's time to choose between the two types of motors, nitro and electric. Nitro motors are internal combustion engines that burn an alcohol and nitro methane fuel. Electric motors are powered by batteries. They both work very well, so choose between them based on personal attractiveness.

Your First Radio Control Airplane

- As you know from the previous article, RC model airplanes are controlled by their control surfaces. Each control surface requires its own radio channel. You will find radio systems and RC model airplanes rated by the number of channels they use. A 2-channel system of throttle and rudder is the most basic – just enough for basic flight – and will limit the maneuvering that you can do with your RC model plane. A 3-channel system offers good control for casual flight, and a 4-channel system is best for advanced sport and acrobatic flying.

Your First Radio Control Airplane

- RC airplanes are available in Ready to Fly (RTF) versions which only require minutes of preparation to plug the components together, and Almost Ready to Fly (ARF) versions in which the airplane is mostly assembled but may take a few hours of final assembly. Another option would be buying the airplane as a kit and building it yourself. This is a very labor-intensive process, expect to spend thirty to sixty hours building this type of RC model airplane.

Your First Radio Control Airplane



ARF (Almost Ready to Fly Kit)

Your First Radio Control Airplane

- Whatever RC model airplane you choose, it's possible it may crash eventually. If that happens, you will need spare parts. Spare parts availability is important to the success you have in this hobby.
- There's one final tip I can offer to those in the market for an entry-level airplane. You can, in fact, try before you buy. An RC flight simulator, like FMS, has two benefits to you. By spending some time flying FMS Flight Simulator, you get a head start learning to fly and can try many different types of airplanes. Flying a flight simulator with a true RC controller is the best investment of time and money a new pilot can make.

Your First Flight with a Remote Control Airplane

- With the help of the previous article, [Your First Radio Control Airplane](#), and a little work, your remote control airplane is ready to fly. But we have a little more preparation to do before you can send it skyward.

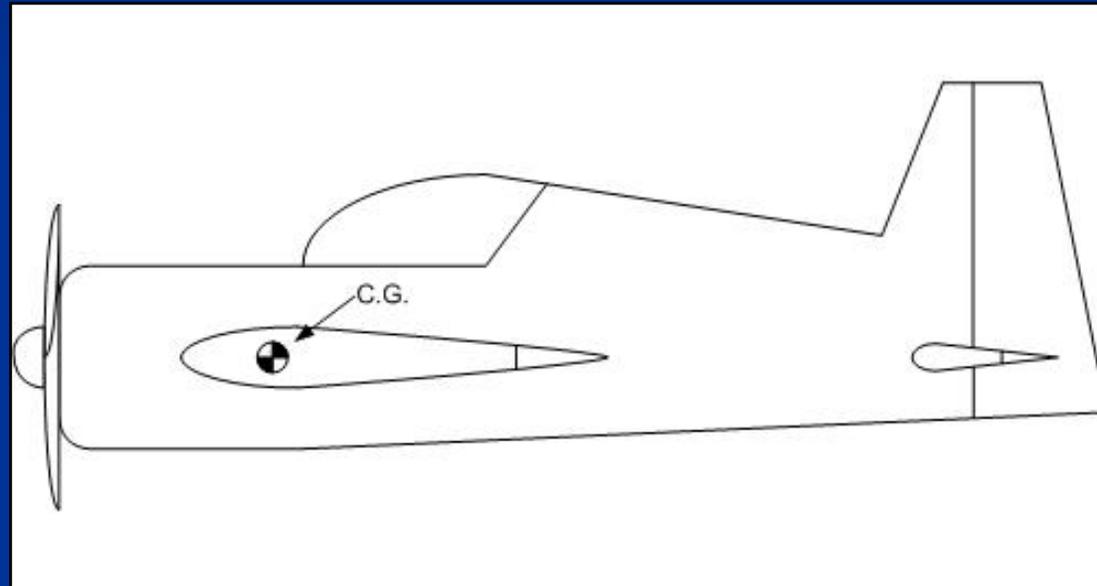


Hobbico Nexstar

Your First Flight with a Remote Control Airplane

- Your remote control airplane's center of gravity (CG) is a vital setting. You determine where it is by balancing the remote control airplane – fully assembled, fueled, and ready to fly – at two points on the bottom of the wing. You are trying to find out where, front to back, the remote control airplane balances, so keeping both fingers (or sticks, whichever you use) at the same front-to-back location on opposite wing halves is very important. Once you've found that point, mark it somehow.

Your First Flight with a Remote Control Airplane



Center of Gravity (CG)

Your First Flight with a Remote Control Airplane

- Now you know where your remote control plane's CG is. The correct CG position depends on the remote control airplane, so check the manual. It should give you a range of acceptable CG locations. The CG for a typical trainer remote control plane is about one third of the width of a wing back from its leading edge. If your CG isn't in that range, you need to make some changes. You can move RC model equipment or the batteries around internally or add lead weight. Lead should be placed at the very front or very back of the remote control plane, where it has the most effect. Attempting to fly with a CG outside the range is a recipe for disaster.

Your First Flight with a Remote Control Airplane

- The next check is to ensure the remote control airplane won't fall apart or stop working once it takes off. You should give a firm pull on all sections of the remote control airplane to ensure the wind won't pull them off or break them. Concentrate on the wing, ailerons, vertical fin, rudder, horizontal fin/stabilizer, elevator, landing gear, and motor.

Your First Flight with a Remote Control Airplane

- We're getting closer. Next, use your transmitter to confirm that all control surfaces (and throttle!) move in the right direction with the sticks. Pull back on the elevator stick, and the elevator should rise. Push the rudder stick right, and the rudder should move right (when looking at the plane from behind). Push the aileron stick right, and the right aileron should rise and left aileron should fall. Full throttle should fully open the carburetor or run the electric motor at full speed, and idle throttle should almost fully close it; it should fully close when throttle trim is brought all the way down or in the case of an electric motor the prop should slow to a halt.

Your First Flight with a Remote Control Airplane

- Now the remote control plane is ready, but it is important to understand that it is possible to crash. Even if a crash occurs you don't need to worry. The key question here is, how well will your remote control plane survive a crash, and are the spare parts you may need available? Some planes, like trainers, are very durable and designed to survive crashes.

Your First Flight with a Remote Control Airplane

- Others, mostly sport planes, can suffer major damage and require hours of repair. If your remote control plane is the former durable type, then visit a large open tree-free field and start learning to fly.
- For the other types of remote control plane, finding local experienced pilots to test fly your remote control plane and take over when you get in trouble is absolutely necessary. **Find and join the local flying club**, and your flying experience should be highly successful.

- With the first flight under your belt, the remote control airplane becomes secondary. It's now about improving your piloting skills and having fun. Protect your remote control airplane, diligently practice your landings, and enjoy the sky.
- **Join the AMA (Academy of Model Aeronautics)**
- **Join the RCSMP (Radio Control Society of Marine Park)**