Instructions on how to assemble and fly your first radio controlled airplane.

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You Got the Box Open. Now What?

There was once a time when assembling a flying a model airplane was an experience set aside only for expert modelers. However, with the proliferation of various almost-ready-to-fly (ARF) aircraft, this once exclusive hobby has become open to the masses. Although the construction quality of these ARF is superb, some of the work has been left undone in order to minimize packaging.

This guide was written to help you achieve maximum flight performance and enjoyment from your recent airplane purchase. It is important you take the time to read this guide **prior** to assembling/flying your airplane to reduce the chance of accidental damage. This guide will help you get from the box to the open skies in no time.

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Standard RC Airplane Components

Although your airplane may differ, these are shown for illustrative purposes.

Pictured: Main wing, fuselage, horizontal stabilizer, vertical stabilizer, cockpit, propeller, landing gear, CA glue, accessories, spinner.

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Optional Accessories

(Additional CA, 6-minute epoxy, Felt Tip, Tape Measure, Petroleum Jelly, oil, ruler, paper towels, q-tips.)

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Assembling Your RC Airplane

What makes owning several model airplanes exciting is that every single model is unique in both assembly and flight characteristics. It is for this reason that we cannot outline the assembly procedure for your particular model, but have rather gathered several tips and hints from years of modeling experience. Allowing you to optimally assemble your aircraft while avoiding common mistakes, this can hinder or reduce your overall flight experience.

Please read and apply the assembly tips provided, but do not allow these to supersede the recommended assembly procedure from the manufacturer for the best fit and aircraft performance.

Gluing Tips

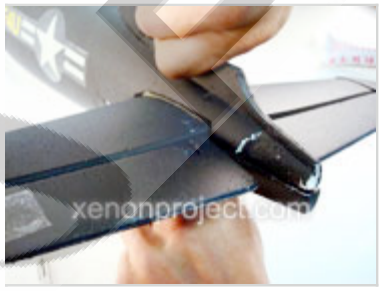
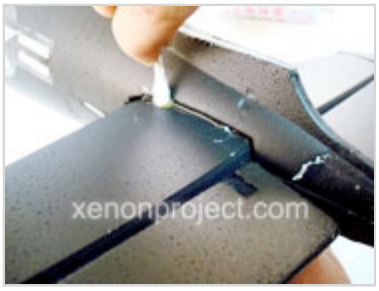
- 1. The most important aspect of assembling/gluing pieces together is to ensure the surface is free of any debris, allowing for a firm bond to occur. To prepare a surface for assembly, take a moist paper towel and carefully wipe down all gluing surfaces. It is only after a surface has been properly prepared that CA should be applied.


Surface preparation.

- 2. Applying CA can be sticky business (pun intended), we recommend using a small hobby brush to apply CA evenly. If a hobby brush is unavailable, a Q-tip can work just as fine with some modification. Simply remove some of the excess cotton. This will allow you to use one of the ends to spread the CA, with some cotton allowing the Q-tip to act as a brush.


Making a q-tip brush.

- 3. Less is generally more, but not when it comes to model airplanes. One common mistake made by modelers is to apply less than an optimal amount of CA. Always apply a liberal amount of CA on both sides of gluing surface areas. You can use a clean q-tip to wipe off any excess glue.

Recommended gluing procedure: Apply, press, and wipe off.

Propeller Tips

- 1. When installing the propeller, make sure to install it the "right" side up. See images below to "visually" distinguish the differences.

You should see an elongated S.

- 2. Make sure to properly secure the propeller on the propeller shaft. Tighten the nut with a wrench; be careful not to over tighten (this may result in "stripping" the nut). Hand tightening is not sufficient, as we have seen many propellers "fly off" during flight.

Do not hand tighten. Use a wrench.

Tail Assembly

- 1. Pre-fit the horizontal stabilizer (elevator) and vertical stabilizer (rudder). Prior to gluing, assemble the elevator/rudder assembly onto the fuselage. Make sure that the angle formed between the vertical and horizontal stabilizer forms a perfect 90 degree angle. Once in place, mark the edges with a felt tip marker. Then using these markings as a guide, glue them in place, using the gluing tips provided.

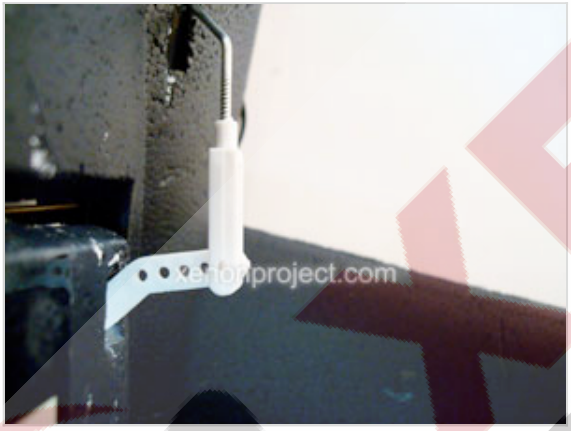
Use a felt-tip marker to guide you. Check the angle between the vertical and horizontal stabilizer: should be 90 degrees.

Servo/Linkage Assembly

- 1. Make sure the servos are properly mounted. If properly mounted, make sure they are properly connected to the on-board receiver. As a loose connection may result in no transmitter response.

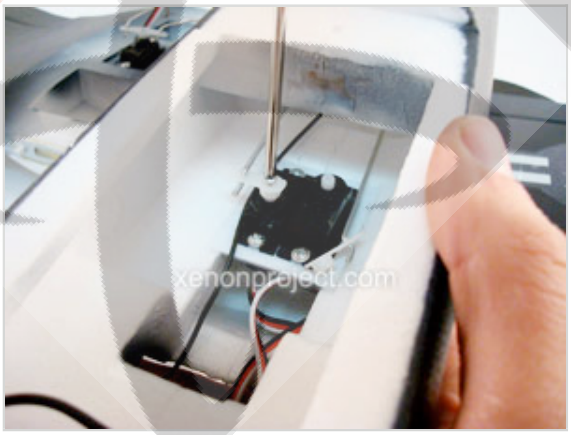
Make sure the servos are properly mounted and properly connected.

- 2. Then proceed to unscrew the servo arm from the on-board servos. Attach the throw rods directly onto the throw surfaces, and then mechanically adjust the surfaces until they are perfectly aligned with their respective surfaces.



Align the control surfaces.

- 3. Then re-attach the servo arms onto the on-board servos.



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Balancing RC Airplanes

We must make to correctly balance RC Airplanes, because an airplanes center of gravity is one of the most important aspects of safe flying, because even a slight variation in the CG can result in an uncontrollable aircraft. A badly balanced RC airplane will be hard to control (especially true for tail heavy models) and may result in damage due to a premature crash.

Every RC airplane has a correct CG, this is a special point at which the airplane model is perfectly balanced fore-aft correctly. On most airplanes, this sweet spot is normally located about 1/3 from the leading (front) edge of the wing. However, you should always check with the individual manufacturers specifications.

Balancing Your RC Airplane's Fore/Aft

- 1. The first thing you need to do is identify the correct center of gravity (CG). Generally, the CG is about 1/3 the way back from the leading (front) edge of the wing.

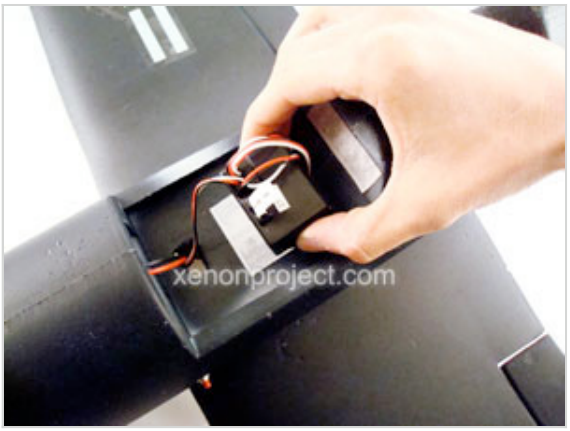
- 2. Check to verify the position of the CG, by placing the tips of your finger under each wing in line with the CG. A good place to start is a couple of inches from the inside of the end of the wings. Then gently lift the airplane up so it clears the surface and it hangs freely.

Use the tip of your fingertips to balance the plane.

- 3. A correctly balanced airplane will be either level, or with the nose pointing slightly downwards. If the tail points downwards, (the model is tail heavy) or nose, the balance will need to be adjusted toward the correct CG. The first thing to try is to move the RC equipment located in the fuselage either forward (airplane is tail heavy) or backward (airplane is tail heavy) without adding extra weights since the lighter an airplane is the better it will perform. The battery pack is a great place to start as is the heaviest and will have the greatest effect. Make sure to carefully reposition and check the balance of the airplane every time you move something. Once balanced, mark the location with a felt tip marker and affix the battery etc. with Velcro, as it can be easily removed to charge.

  If you cannot get the correct CG with repositioning, you may have to add some weight (we don't recommend removing anything, as

it may reduce the structural integrity of the plane) to either the nose of tail of the plane (this will have the greatest effect). Remember to add only enough to balance the plane correctly on your fingertips.



Move onboard components forward/backwards in order to achieve optimal center of gravity.

Balancing the Roll of Your RC Airplane

Often overlooked, this balancing act in many ways is not particularly important. (Unless something is *seriously* wrong, the plane won't spiral out of control just because one wing is slightly heavier than the other.) But an airplane with one heavier side than the other will have slight tendency to naturally to roll to the heavier side.

- 1. To balance your airplane roll, simply loop some thread around the propeller shaft and the fuselage, then rope some thread around the rear of the fuselage (as close to the tail as you can get).
- 2. Lift up the airplane by the ends of the thread and see if tends to roll to one side. If it does, you will need to shift some of the components opposite of the heavy wing. If this does not work, you can add some tape some weight to the higher (lighter) side. Only add enough to make the plane level (when viewed from the front).

A correctly balanced plane will always be safer and easier to fly, and won't need as much trimming at the transmitter.

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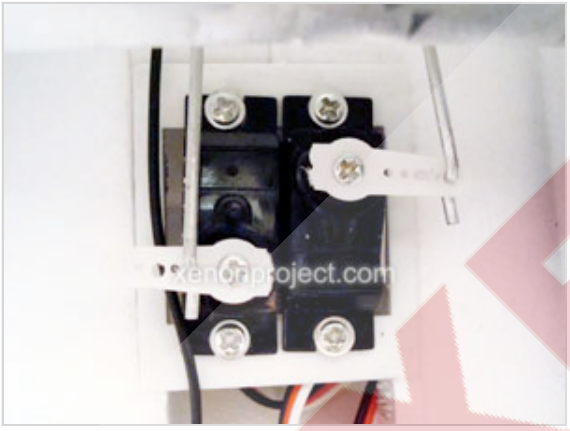
Control Throw

The amount of control throw should be adjusted to suit the individual flyer's flight style. A greater amount of throw will result in greater control responsiveness, with a smaller amount of throw resulting in decreased responsiveness. It is highly recommended that control throw is reduced for the initial flight, as this will allow a pilot to acclimate to the individual flight characteristics of their airplane model. Once, the pilot feels proficient at controlling his aircraft, the amount of throw can be increased. The amount of control throw should be adjusted as close to neutral as possible using "mechanical" means instead of electronically using the transmitter trim functions. By using a combination of the mechanical methods outlined below, the control throw can be adjusted to achieve the recommended / preferred throw.

- 1. To minimize the amount of control throw, the clevis should be moves towards the outermost hole. Moving toward the "inside" of the control horn will maximize the surface throw.

Moving the clevis toward the innermost hole will maximize throw, while moving it toward the outermost hole will minimize throw. Left: More throw. Right: Less throw.

- 2. To maximize the control effect, move the pushrod at the servo arm away from the center. While moving it closer to the center will minimize the control.



The servo on the left has less throw than the servo on the right.

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Flying Your RC Airplane for the First Time

- **Step 1. Charge It.**
  In order to fly your airplane you will need to charge the on-board battery prior to use.

  Insert Image of Charging battery (with car battery/wall charger)

  The first step in charging your battery pack is to plug in the charger (we recommend you plug the charger in first, as most charging cables usually have exposed connectors which may be short circuited against any metal objects). Now connect the battery to the charger. **Please Note:** If you have just finished using your Li-Po battery, make sure it is not hot. If it is, you will need to wait for it to cool down before attempting to charge it.

  Once the charging process has started, the charger will take care of everything. After 3-5 hours (depending on your specific battery pack and charger), you can unplug the battery and use it again.

  In order to prevent accidents while charging, you can either use a balancer, which fights cell imbalance or be sure to place the

battery somewhere nonflammable. **SAFETY PRECAUTIONS:** Do not attempt to charge a lithium battery if it is "puffed" up or damaged. Only use chargers designed to work with Li-Po batteries.

Step 2. Install radio system batteries.

Install the batteries into both the transmitter and the RC vehicle. Be sure to use only high quality batteries.
CAUTION: Weak or dead batteries could cause you to lose control of your RC vehicle and cause permanent damage, which is not covered under warranty.

Step 3. Turn on both the transmitter and receiver.

Always turn on the controller [First] and receiver [Second]. Once the transmitter is turned on, turn on the receiver on the RC vehicle.
CAUTION: This hard and fast rule will help prevent damage caused to your RC which is not covered under warranty. Doing so will prevent your RC from operating wildly due to stray signals from another transmission source.

Step 4. Check operation of the radio system and servos.

This step serves two main purposes. First, this procedure will help ensure our customers receive a defect free product. Secondly, this procedure will enable our customer to become better acquainted with the various channels and functions on their RC airplane.

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IMPORTANT NOTE: Our manufacturers implement stringent quality control measures in order to eliminate defects; although rare, defects do occur. By verifying the operation of the servos and remote, it allows us to identify and replace any defective items before any damage can arise from use of a defective item. As such, any defective items (i.e. faulty servos etc.) will be replaced. However, any damage (crashed or broken parts) arising from defective items is not covered under warranty and is the sole responsibility of the owner because normal operating procedure requires users to verify the proper operation of these items, prior to operation.
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RC airplanes are controlled by a radio signal sent by the transmitter. Depending on the particular helicopter model, the transmitter will control 2, 3, 4, 6 or more on–board helicopter functions.

In order to provide a comprehensive view of helicopter capabilities and functions, we have attached a diagram of a 6 channel transmitter. Although your helicopter model may not contain all the features channel options in the diagram, the diagram serves as a good reference for 2, 3 and 4 channel helicopter transmitters.

Transmitter Functions

NOTE: Do not be alarmed if one/more of the control is reversed. The controls can be adjusted by switching the servo switch located on the bottom of the transmitter.

Function Tested: Throttle [Left Stick (↑ ↓)], Throttle Trim [Up/Down Trim on the left]

None	Some	Full Throttle
		
		

PLEASE NOTE: Make sure to hold the airplane firmly as you test the throttle.

Procedure: The throttles control the RPMs of the propeller. In order to verify the proper operation of the throttle, move the throttle trim to its lowest setting (all the way down). While holding the airplane in your hand, very slowly, apply the throttle (↑). As power is applied to the propeller, the airplane will begin to pull forward. However, make sure to maintain control of the airplane while testing the throttle function. Now, decrease the throttle (↓). Slowly increase the trim (↑). As you move the trim up, the propeller should increase in speed. Now return the throttle trim to its lowest setting. In doing this "power up" you will know that when the aircraft is airborne it will pull itself through the air.

Function Tested: Rudder [Left Stick (↔)], Rudder Trim [Left/Right Trim on the left]

Bottom-Right **Bottom-Left**

Procedure: Yaw is controlled by the rudder, attached to the vertical fin attached at the rear of the aircraft (sometimes the entire fin is movable). When the rudder is moved, the vertical surface will move left/right. Move the stick to the left causing the rudder to the move left, then move the stick right to move the rudder to the right. Slowly slide the trim left/right until the rudder is perfectly aligned with the vertical stabilizer.

We will now test the functions associated with the right stick.

▸ **Function Tested: Elevator [Right Stick (↑ ↓)], Elevator Trim [Up/Down Trim]**

Down **Up**

Procedure: The airplane pitch (angle of attack) is controlled by the airplane's horizontal stabilizer located in the rear. By moving the elevator controlled backwards the pilot moves the elevator up and the downward force of the horizontal tail is increased. And the opposite occurs when the pilot moves the elevator forward. Move the stick (↑), then (↓); while the stick is moved, the elevator will up/down. Then adjust the elevator trim by moving it up/down until the elevator perfectly aligned with the horizontal stabilizer.

▸ **Function Tested: Aileron [Right Stick (↔)], Aileron Trim [Left/Right Trim on the right]**

Right **Left**

Procedure: "Rolling" movement, is controlled by the moveable portions of the trailing (rear) edge of the wings called "ailerons". Unlike other control surfaces on an airplane, the ailerons move inversely (as one side goes up, the other goes down). This difference, will result in a left/right rolling movement. To verify proper aileron operation, apply the aileron to the left (←). You will notice that the angle of the ailerons has changed. Now move the aileron to the right (→). Once again, the angle has again changed. While maintaining control on the throttle, return the ailerons to the center position. Slowly adjust the aileron trim left/right until both are perfectly aligned.

Step 5. Test and Pull.
Make sure all the flight surfaces, wings, propeller, linkages and wheel are firm, secure and in good condition (touch and pull) replace any items that you would consider questionable. And failure of any of these components in preflight or actual flight would mean the loss or termination of your aircraft.

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