



How To Assemble Your First Ready-To-Fly Trainer

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If you have ever visited an RC Model Airfield, you have seen all types of models. They all look great, well most of them anyway, and definitely must be hard to build. There is no way that you could build one of these without lots of help and several months of difficult work. While the flying looks like fun, everything else is probably just too complicated for the time and interest you now have.

Every new RC model pilot has these thoughts. At one time, they were correct but no longer. Dozens of companies now offer excellent basic trainers that are so nearly complete that they are known as Ready-To-Fly ([RTF](#)) airplanes. (*Ed. Note: Click on any term appearing in blue type for a definition of that term.*)

This short article will take you through all the steps necessary to assemble your first RTF trainer. While the airplane shown here is the 72-inch wing span Alpha 60 by Hangar 9, almost every RTF trainer employs almost the exact same construction steps. No adhesive is required and the only hand tools are a few small screwdrivers and some pliers.



Photo 1



Photo 2

RTF trainers are not built so much as they are assembled. Everything needed to complete the airplane, including the radio, fuel and engine systems, are inside the single box (photo 1) Empty the box and you get photo 2. There are just a few major components.

The fuselage has about all the equipment needed for flight already factory installed. The two wing halves and tail surfaces complete the airframe. All are factory built and covered. The nose landing

wheel, called the nose gear, is already installed and hooked up for ground steering. Steering works off the rudder control.



Photo 2A

The transmitter is included and is factory set for this airplane. The JR brand Quattro transmitter is a four-channel transmitter that controls all the basic flight functions. The right side control stick of this two-stick transmitter controls the elevators (push for “down” and pull backwards for “up”) and the ailerons by moving right and left.

The left side stick controls the engine throttle (forward for more power, back for less) and the rudder, right and left. Both sticks are full-movement controls in that both directions can be moved simultaneously. The throttle stick remains where it is placed while the other flight controls are lightly spring loaded to the center position.

The rear wheels, called the main landing gear, are assembled and just need to be bolted onto the fuselage. What little hardware required to complete the assembly is included as is the charger needed to make the batteries in the transmitter and on-board radio system work. A complete, photo illustrated, instruction booklet is always included with every RTF airplane. Engine and radio system directions are also included.

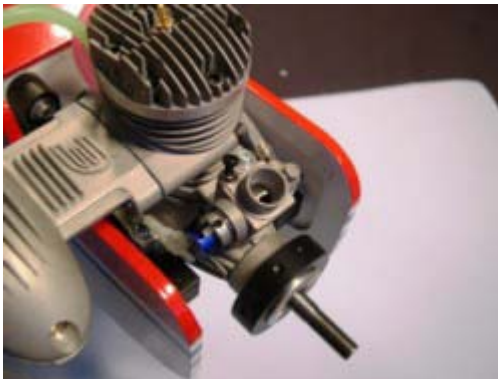


Photo 3



Photo 4

The engine and the entire fuel system is factory installed in the fuselage (photo 3). Only the propeller and spinner must be installed by the pilot and that takes just a few seconds. The complete on-board radio system, shown in photo 4, is also factory installed and fully setup ready to fly.

The on-board battery and the radio receiver that gets the signals from the transmitter are factory installed under the white foam and held in place by the plywood piece shown in photo 4. All connections are already made for the pilot.

So much work is done by the factory that total building time, if you have *never* assembled an RTF model trainer, almost never exceeds one hour. If you have done this before, assembly time is usually 30 minutes. Sport Aviator's record assembly time is 17 minutes for the Hangar 9 Arrow.

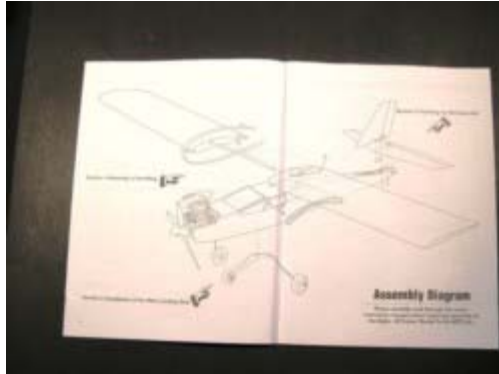


Photo 5

Much of that one-hour assembly time is spent reading the instructions. Just about any question the builder may have is covered in an RTF's photo illustrated guide. There is even a complete "exploded drawing" so the builder knows exactly where every part is supposed to go and how to keep it in place (photo 5).

Assembling the Wing



Photo 6

The wing is usually assembled first. The Alpha 60 uses strong, metal tubing as the main strength for the wing. The technical name is the "Main Spar" but it is usually called the Wing Tube. Slide the wing tube into one half of the wing, and then slide the other wing half onto the tube. Note in photo 6 that there is a short pin near the back of the wing (trailing edge), called the alignment pin. That pin fits into a hole in the other wing half and makes sure your airplane has a straight wing.

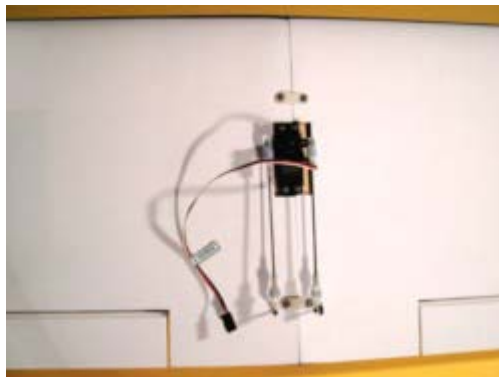


Photo 7

Slide the wing halves together until they touch. The Alpha 60 uses some clear tape to hold the wing together. Just install the tape over the center joint and the wing is almost done. Some other RTF trainers may use screws and a small nylon strap instead of tape as shown in photo 7. Both systems work well and are simple to install.

The last step is to hook the one remaining rod, called a control rod, from the black servo to the one aileron that is not factory hooked up. Photo 6 shows that one of the ailerons, the thin moveable strips at the back of each wing half, is factory connected to the “servo” The servo is the electronic part that translates the receiver’s signal it got from the transmitter into movement on the control surfaces such as the ailerons.

Each control function is managed by a separate servo. The builder just attaches the loose clip to the other aileron horn. That clip is called a “clevis”. It is adjustable by screwing it either inwards or outwards and is used to set all control surfaces in the center, or neutral, position. More on that subject a little later. The wing is now complete.

Assembling the Fuselage



Photo 8



Photo 9

All the fuselage parts also just bolt into place. Photo 8 shows the two tail surfaces. The larger piece is called the “stabilizer” because it stabilizes the lift from the wing and makes the airplane’s pitch controllable. The movable piece at the back of the stabilizer is called the “elevator” and is the moving surface that actually performs the pitch control function. The elevator hooks up to a servo already mounted inside the fuselage.

The smaller surface is known as the “vertical fin” because it sticks straight up from the fuselage. The vertical fin keeps the airplane’s nose pointed in the proper direction. The vertical fin’s moving control surface is called the “rudder” and it too is connected to a servo in the fuselage.



Photo 10



Photo 11

The Alpha's vertical fin has two long threaded rods factory installed in its bottom side. These two threaded rods slide into two holes in the stabilizer as shown in photo 9. Two wing nuts, photo 10, hold the fin firmly onto the stabilizer and are just hand tightened. The completed tail surface is then slid into place on the fuselage as shown in photo 11. All slots are factory cut and fit well.

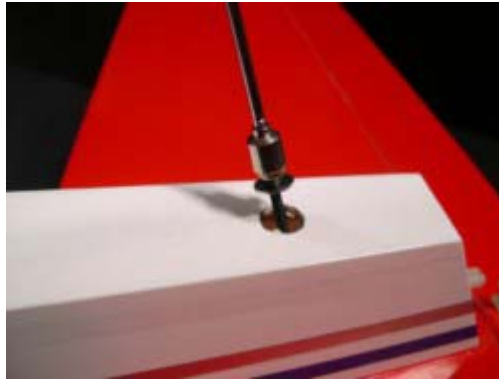


Photo 12

The tail assembly is held in place on the fuselage by two more bolts. These bolts pass through the fuselage and screw into two nuts mounted into the stabilizer bottom. Photo 12 shows how to insert these two bolts into the small fuselage holes designed for this purpose. Once the vertical fin and stabilizer are bolted in place, connect the clevises for the elevator and rudder as you did for the second aileron. The clevises are factory labeled "Elevator" and "Rudder" so hooking them up wrong is impossible.

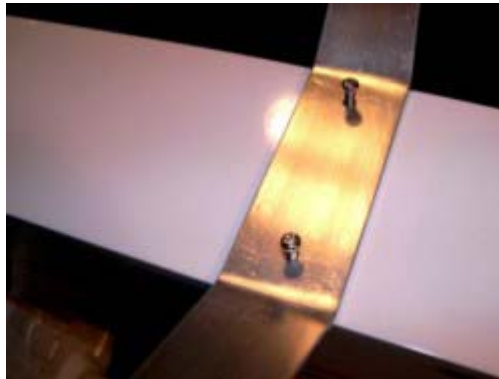


Photo 13

The main landing gear just bolts to the nuts that are factory installed in the fuselage bottom. The wheels were factory mounted to the landing gear. Check photo 2 above. So bolting them in place finishes the entire landing gear installation.



Photo 14

Photo 15

The next assembly step is to install the propeller. The propeller is not factory installed since it might come loose during shipping. If it did, the front spinner piece, called the "Spinner Cone" might hide the loose condition and that could cause a safety problem. So, all RTF airplanes require propeller installation.

Most propellers, factory supplied or purchased separately in a hobby store, have writing on the front (photo 14). The writing has the manufacturer's name and contains the propeller's size. The writing always goes towards the front side.

Install the spinner's flat part, called the "Backplate", onto the engine shaft. Then install the propeller washer and nut. Align the propeller as shown and tighten the nut using adjustable pliers. Do not use regular pliers as they may "round" the nut's corners and usually will not apply enough force to securely tighten the propeller nut. Now just attach the spinner cone using the three small screws supplied.



Photo 16

The final assembly step is to install the two wooden dowels through the factory drilled holes in the fuselage. These dowels are located in the fuselage where the front (leading edge) and rear (trailing edge) of the wing meet the fuselage. This area is called the "Wing Saddle." The rubber bands used to hold the wing in place hook to these two dowels and pass over the wing. Even the rubber bands are included in the box.



Photo 17



Photo 18

The Alpha 60 is now complete. Assembly was quick; you didn't need any special skills and absolutely no electronic knowledge. Building a plastic model airplane is several degrees more difficult than building the average RTF model trainer. If you have ever built one of those plastic models, assembling a RTF RC trainer is simplicity itself.

Before going to the Flying Field

Like all RTF trainers, the Alpha 60 took less than an hour to assemble. But there are a few checks you should perform before leaving for the field. First, use the included charger and charge the transmitter and on-board batteries. The first charge should be for about 20 hours. After the first charge, charge both batteries overnight before leaving for the field. The minimum charge time is 10 hours.

It is important to center all the control surfaces before the first flight. Turn on the transmitter and airborne radio system. Place all the trim levers in the center positions. Check that each control surface, not the throttle yet, is in the center. The elevator should be even with the stabilizer as should the rudder be straight with the vertical fin.



Photo 19



Photo 20

Photo 19 pictures the elevator off center. It is too far in the “down” direction. Carefully detach the clevis and rotate it outwards in this example until the elevator is even with the stabilizer as in photo 20.



Photo 21



Photo 22

Use pliers to protect the control rod as shown in photo 21. Holding the control rod firm while rotating the clevis protects the nylon servo arm inside the fuselage. It is not necessary to install and remove the clevis to check how the adjustment is proceeding. This puts unnecessary wear on it.

Instead just close the clevis all the way until the pin protrudes as in photo 22 and then put only the protruding pin into the control horn’s hole. Remember that the radio must still be turned on. Once the clevis pin fits easily into the control horn hole, the clevis is properly adjusted. Hook it back up to the control rod and slide the keeper back into place.

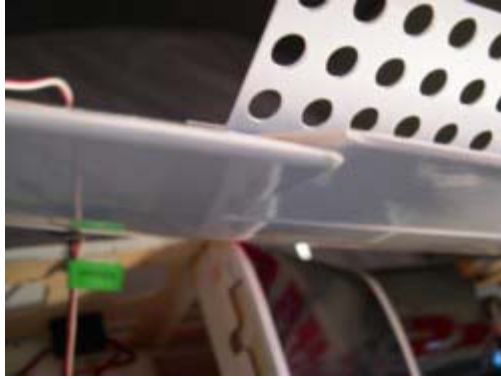


Photo 23

The ailerons should be even with the wing's fixed trailing edge near the wing center. Photo 23 shows a misaligned aileron. Just do the same procedure as was done on the elevator. Make sure to check and adjust, if necessary, the rudder as well.

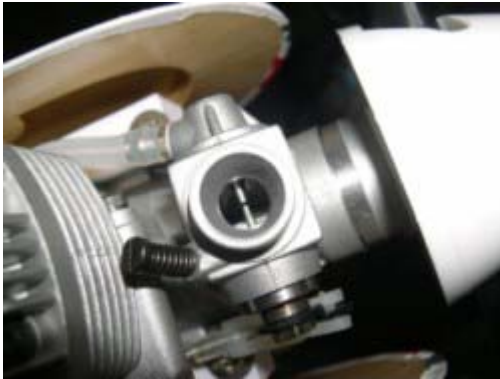


Photo 24



Photo 25

The last control adjustment is to make sure the throttle works as planned. The throttle is usually correctly set on most RTF trainers at the factory. But check anyway to make sure. Push the throttle trim lever all the way to the top of the transmitter. Then move the throttle control stick all the way in the same direction. The carburetor's throttle should look like photo 24.

The throttle servo should not be making noise. If the venturi is not fully open, or the servo is buzzing, readjust the clevis as you did for the control surfaces. Ideally, the throttle should be just fully open and the servo quiet. If the throttle is not fully open, the engine will not run at full power and the high speed fuel mixture may be set too lean.

Move the transmitter throttle level all the way down, but keep the throttle trim lever up. The throttle barrel should now resemble photo 25. This is "high idle" and should be about 3,000 rpm when the engine is run



Photo 26

Fully reducing both the throttle trim lever and control stick should *just barely* close the throttle as in photo 26. This is your engine shutoff.

The final throttle settings must be done at the field with the engine running. Most new engines require 10-20 flights to develop full power and to have a reliable low-idle speed. These initial throttle settings are a good start. The high idle, full up throttle trim, insures the engine will run throughout the entire flight. Your instructor will use it to make the final landing approach, but then will lower the throttle trim all the way to shut off the engine and land. Eventually, your engine will be able to hold a reliable, 2,400-2,500 rpm idle *which you have already set in your transmitter*; just lower the throttle trim lever to half way.



Photo 27

The final check is to make sure the airplane's [Center of Gravity](#) (CG) is set correctly. I have built over 15 RTF trainers and have yet to find one that had a poorly set CG. But the instructions always say to check it and so you should. The Arrow in photo 27 is sitting on a CG machine. But two fingers placed at the CG spot outlined in the instructions work just as well. Check the CG with the fuel tank empty. The nose of the airplane should point downwards about 10 degrees as in the photo.

If it doesn't, you may have to add a little nose weight in the fuel tank area. The instructions will show the best way. But most likely, your RTF trainer will be perfectly balanced by the factory.



Photo 28



Photo 29

That's it. The Alpha 60 is ready to get into the air. Making all the above checks usually takes about 20-30 minutes. But don't be surprised if the more experienced flyers at the club field you have chosen to fly at spend some time checking over your new airplane anyway.

You are special, you are a new member of the model flying corps and everyone wants to make sure your first experiences are as perfect as possible. Remember, each one of those "hot shot" flyers once were brand new pilots just like you. Experienced model flyers worked to make sure their first times were good and they are repaying those favors by working to insure your airplane and flight lessons go just as well as did theirs.

Welcome to the exciting world of Model Aviation. We have all been waiting for you to join us.