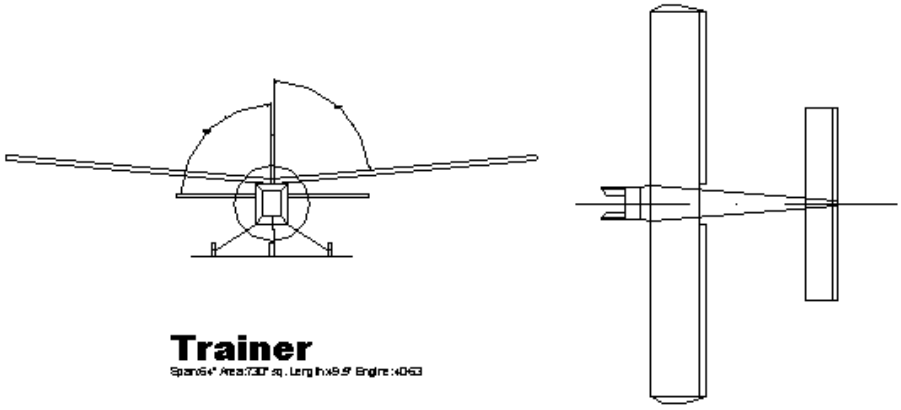
MECOA EZ-4061 Trainer

EZ-4061 is a newly designed, Almost Ready to Fly kit. It is an extremely easy to control trainer with strong construction and excellent aerodynamic performance. This is a great choice for your RC flying.



Specification:

Wing Span: 64 inch, flat bottom airfoil
Wing Area: 735 Sq.inch
Length: 49.5 inch
Engine: 40-63 size, best with 46-61 size 2-stroke engine
Radio: 4-channel radio minimum.
Weight: 5LB

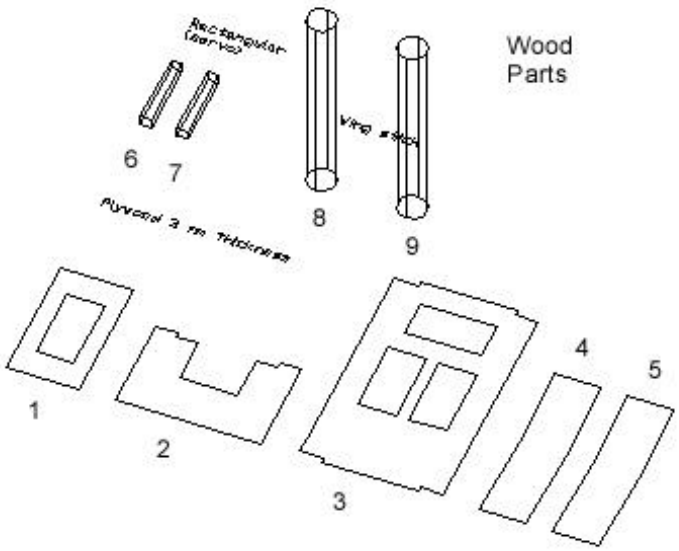
Assembly Instruction

Construction of the major parts of the aircraft has been done at the factory. You, the modeler, will need to do the final assembly and install the engine, fuel system, and radio and flight control systems. The work you must perform is not difficult or time consuming, but it must be done correctly or the model will not function properly.

WARNING: *THIS IS NOT A TOY! Model aircraft are capable of inflicting serious injury and/or property damage. Flying a model aircraft is a skill, which must be learned. If this is your first radio controlled model aircraft, WE STRONGLY RECOMMEND THAT YOU FIND AN EXPERIENCED FLYER TO HELP YOU DURING ASSEMBLY AND THEFIRST FEW FLIGHTS.*

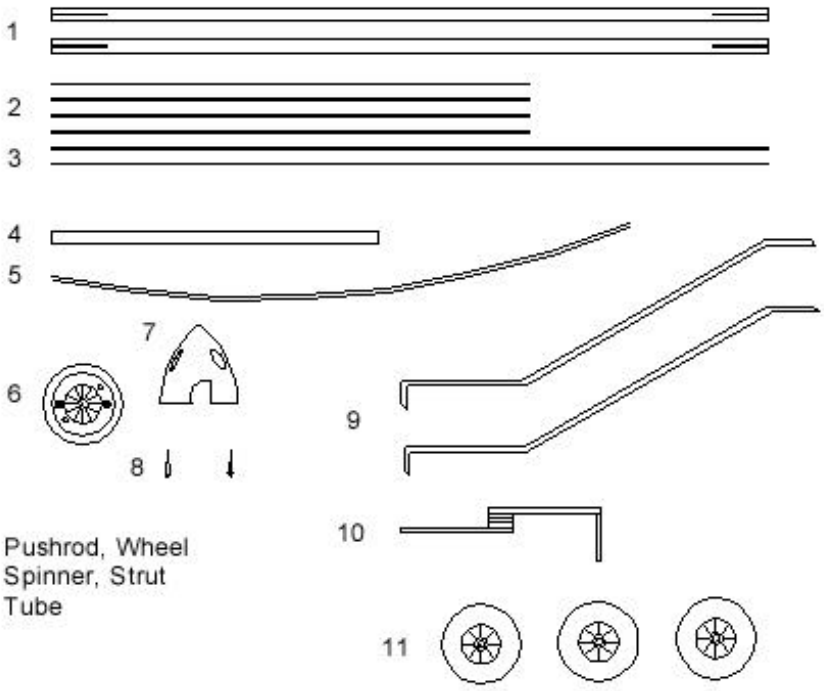
Parts List:

A) Wood Parts Bag:

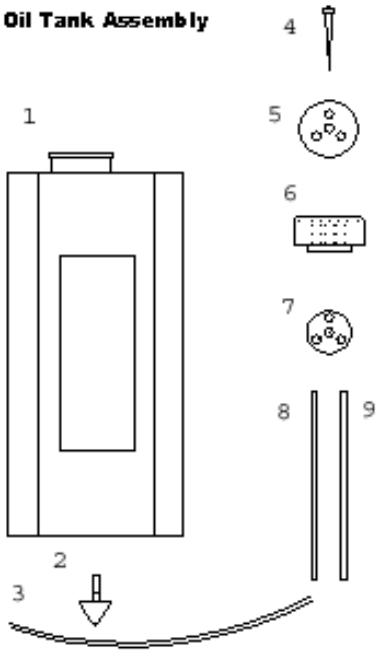


1. Wing servo tray
2. Fuselage servo tray support
3. Fuselage servo tray
4. Wing joiner (cylinder)
5. Wing joiner (cylinder)
6. Wing servo tray support
7. Wing servo tray support
8. Wing joint dowel
9. Wing joint dowel

B) Pushrod Bag:



1. Precut pushrod wood dowel (2pcs)
2. 13” threaded wire pushrod ends (4pcs)
3. Wire throttle and nose-wheel pushrod (2pcs)
4. 3/8” Shrink tube
5. 12” plastic guide tube
6. Spinner back plate
7. Spinner cone
8. Spinner screw
9. Main landing gear strut (2pcs)
10. Nose landing gear strut
11. Wheels (3pcs)



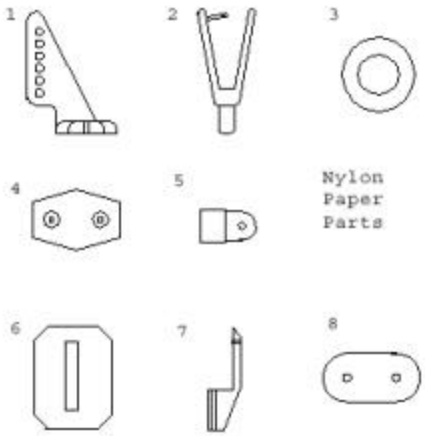
C) Fuel Tank Bag:

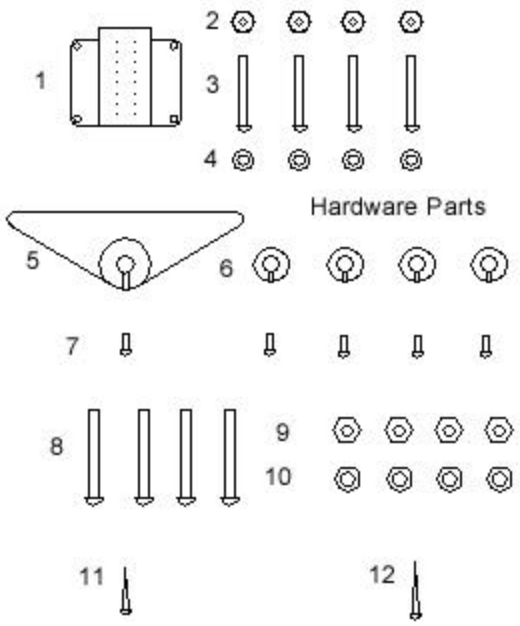
1. Fuel Tank
2. Clunk (weight)
3. 6” rubber tube
4. Cap screw
5. Up stopper
6. Rubber cap
7. Down stopper
8. Steel tube
9. Steel tube

Sub Assembly:
Push two steel tubes through two holes in the rubber cap and stoppers until they stick out same amount of both sides. Connect the clunk with one tube by rubber tube. The clunk should almost but not quite touch the back of the tank when you insert the cap. Gently bend another steel tube so that it will touch the top of tank from the inside. Tighten the cap screw through stoppers.

D) Nylon Parts and Hinges:

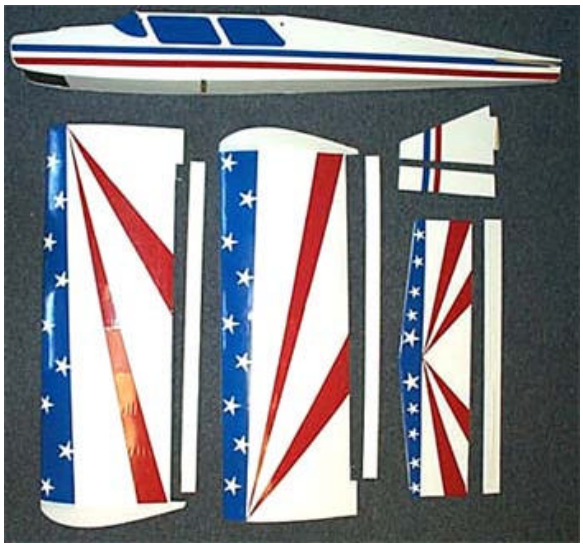
1. Control horn (2pcs)
2. Clevis (4pcs)
3. Nylon wheel collar (3pcs)
4. Control horn back plate (2pcs)
5. Aileron connector (2pcs)
6. Paper Hinges (11pcs)
7. Pushrod holder (2pcs)
8. Landing gear strap (2pcs)





E) Hardware Bag:

1. Nose landing gear mounting bracket
2. Screw nut (4pcs)
3. 3X15mm machine screw (4pcs)
4. washer (4pcs)
5. Nose landing gear steering arm
6. Metal wheel collar (4pcs)
7. 3X6 mm steering arm / wheel collar screw (5pcs)
8. Engine machine screw (4pcs)
9. Nut (4pcs)
10. Washer (4pcs)
11. 2x12mm self tapping screw (8pcs)
12. 2x15mm self tapping screw (4pcs)



F) Main frame parts:

1. Fuselage
2. Square Canopy plate (not shown)
3. Left wing
4. Left aileron
5. Right wing
6. Right aileron
7. Horizontal tail
8. Elevator
9. Vertical Tail
10. Rudder

All is pre-covered with German Oracover.

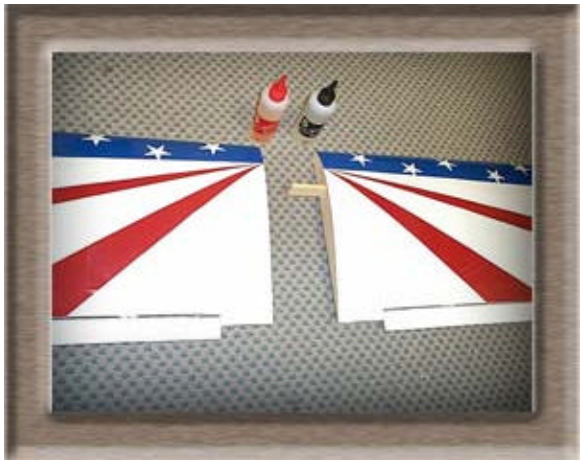
Attaching the control surfaces

Use a hobby knife with a #11 blade to make slits for the hinges in the back of the wings and in the front of the ailerons. IS VERY CAREFUL WHEN DOING THIS. A HOBBY KNIFE IS RAZOR SHARP AND CAN CAUSE SERIOUS INJURY IF IT SLIPS. NEVER TRY TO CUT BY PULLING OR PUSHING THE KNIFE TOWARD ANY PART OF YOUR BODY, INCLUDING YOUR OTHER HAND. Make slots for three hinges in each aileron. Also check to be sure that the aileron control wires (torque rods), which have been factory installed in the wings, fit properly into the predrilled holes in the ailerons.

Mark the center of each hinge and insert them in the front of the ailerons, using the mark to make sure that the hinges only go in one half of their length. DO NOT GLUE THEM YET. Push a straight pin through each hinge on the center mark. Now fit the ailerons by inserting the hinges into the back of the wings and the aileron torque rods into the predrilled holes in the ailerons.

NOTE: Leave about a $^{1}/_{32}$" gap between the wing and the aileron. (The thickness of 5 or 6 sheets of this paper.) When you are happy with the fit, flex each aileron down and drip two or three drops of thin CA on each hinge. CA IS INSTANT GLUE AND WILL GLUE FINGERS AND OTHER BODY PARTS TOGETHER AT LEAST AS READILY AS MODEL PARTS. THIN CA IS <u>VERY</u> THIN AND WILL RUN ALL OVER IF YOU APPLY TOO MUCH. USE IT SPARINGLY AND AVOID SKIN CONTACT WHENEVER POSSIBLE. Turn the wing over and do the same on the bottom of the hinges. Hold each wing with the ailerons down and carefully run some thin CA into the torque rod holes as well. Set the wings aside for 10 minutes or so, there is a special chemical on the hinges, which slows down the CA so that it will penetrate better before it sets. Attach the elevator to the horizontal stabilizer and the

rudder to the vertical stabilizer the same way. Use three hinges in the elevator and two in the rudder. (There are no installed control wires in these parts.)

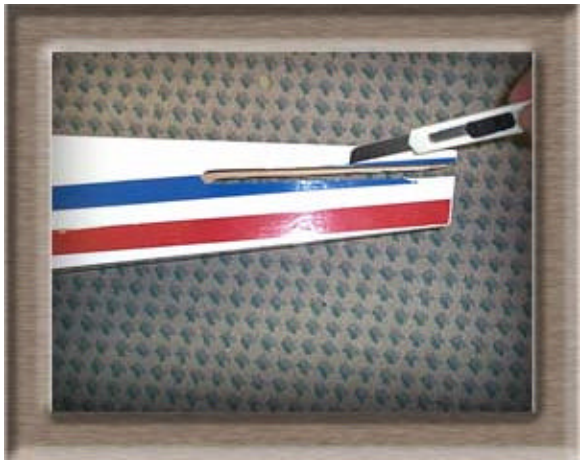


Assembling the wing

Locate the two wing joiners and glue them one on the other together. Be careful to match up the top and bottom edges before you glue them. After the glue has set, sand the edges of the joiner as necessary to fit it into the "pocket" in the center end of each wing. Slide both wings onto the joiner to be sure that the wings come together with no gaps at the center joint. (The "V" shape of the joiner must face up, toward the rounded side of the wings.)

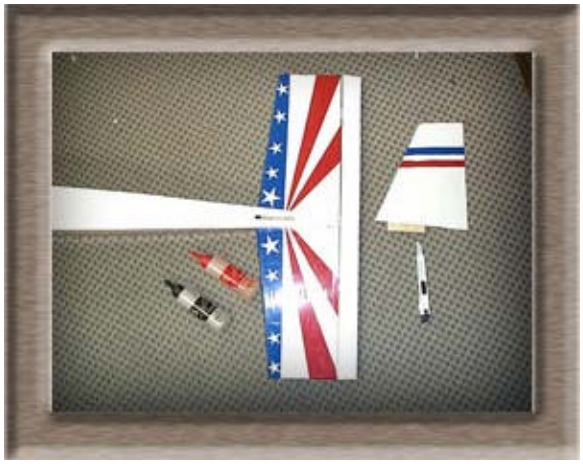
It is important to get a good, strong bond between the dihedral joiner and the pockets. Mix a fairly large batch of 30-minute epoxy and ladle it into the pocket in one wing. Slip the joiner into the pocket and pull it out again to see how well the epoxy is distributed. Keep adding epoxy until all of the surfaces of the pocket and that half of the joiner is covered with epoxy. Then insert the joiner (be sure the "v" faces up) wipe away the epoxy that squeezes out and stand the wing on its tip until the epoxy sets. Slide the second wing onto the joiner and recheck the fit of the center joint. The important point is to get the front and rear edges of the two wings together evenly at the center joint. Minor mismatches along the top and bottom of the center joint are OK. Mix another batch of 30-minute epoxy and ladle it into the pocket in the second wing, checking for complete coverage as you did with the first wing.

When you are happy with the joiner/pocket coverage, wipe off the excess epoxy around the pocket, then mix a batch of 5-minute epoxy and spread a thin coat on the center ends of both wings. Working quickly, slide the wings together, stand the wing on end and wipe off any epoxy which oozes out of the joint, then use your fingers to hold the leading and trailing edges in alignment until the 5 minute epoxy sets. After all the epoxy has set, trim off any remaining glue blobs and apply the wing center tape to cover the joint.



Prepare the fuselage

Feel through the covering on the sides and locate the horizontal stabilizer slots. These are about an inch down from the top and extend 6 inches forward from the rear end. The vertical stabilizer slot in the top of the fuselage starts 3" from the rear end, and is 3 inches long. Cut away the covering from these slots with a hobby knife. The horizontal stabilizer slots must extend all the way to the rear of the fuselage. Use our hobby knife or a saw to cut away the wood, which blocks the opening at the rear.



Mount the tail

With the wing mounted on the fuselage, slide the horizontal stabilizer into its slot and, looking from the rear, check it's alignment with the wing. Sand the edges of the slot as required to correct mis-alignments. Now align the stabilizer with the wing looking from the top, and hold the stab in place with pins. Draw a pencil line along the top and bottom of the stabilizer on both sides where it meets the fuselage.

Now remove the stabilizer from the fuselage and, using a sharp hobby knife, cut the Oracover covering along the lines and peel away the portion between the lines. NOTE: Try to cut only the covering. Cutting into the wood will weaken the structure.

Glue the horizontal stabilizer into its slot with five-minute epoxy. Recheck the alignments frequently until the epoxy sets. After the epoxy has cured, remove the wing from the fuselage.

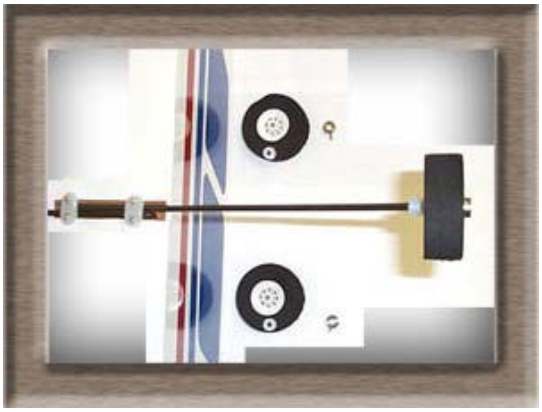
Fit the vertical stabilizer into its slot and rock it from side to side to be sure that the bottom of the vertical stabilizer is touching the top of the horizontal stabilizer. If you can't feel the vertical stabilizer rubbing against the top of the horizontal stabilizer, sand the top of the notched areas on the vertical stabilizer to allow it to protrude deeper into the fuselage until you <u>can</u> feel it rub. Now draw a line on both sides of the vertical stabilizer where it meets the fuselage top. Remove the vertical stabilizer and cut away the covering below the line on both sides.

Puts epoxy on the bottom of the vertical stabilizer and slip it into its slot. While the epoxy is setting, use a triangle or a builder's square to make sure that the vertical stabilizer is aligned 90 degrees to the horizontal stabilizer. After the epoxy sets, use CA to glue the sides of the vertical stabilizer to the top of the fuselage.

Assemble the nose landing gear

Locate Nose landing gear bracket, steering arm, landing gear strut, one steel wheel collar and collar screw. Mount the bracket on the outside of firewall using predrilled holes and four machine screws/ nuts /washers. The straight side or arm faces away from coil.

Mount Landing gear



Locate the two heavy wire main landing gear struts. One end of each strut has a 90-degree bend to fit into the bottom of the fuselage (body of the airplane). Place a nylon wheel collar on the other end of the strut, up against the gentle bend, then put a wheel on next, followed by a steel wheel collar. Leaving a little bit of clearance between the wheel and the outer wheel collar, tighten screw on the steel wheel collar. Install the other main wheel and the nose-landing wheel the same way. The nose landing gear strut has a 90-degree bend at the bottom for the wheel. This one doesn't need a nylon collar on the inside, just install the wheel and the outer collar. Now recheck that all of the wheels will spin freely. If they don't, increase the clearance between the wheel and the outer wheel collar.

Pushrod

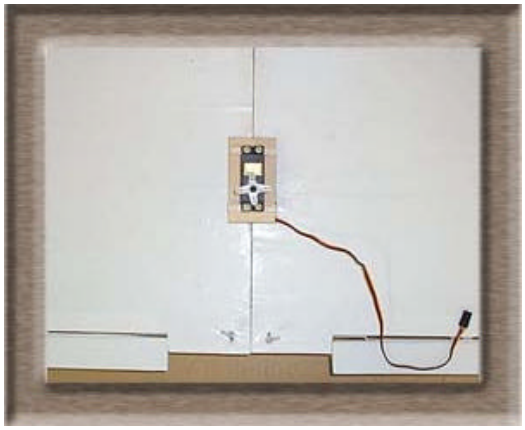
Get out the four 13" metal wires which are threaded on one end, the shrink tubing (comes flattened, it looks like black tape) and the two 17 ¾" hardwood dowels. Cut the shrink tubing into four equal lengths.

Using a wire cutter, cut two of the threaded wires down to 6" long and SAVE THE CUT OFF PIECES. Set the 6" threaded pieces aside; they will be used later for the aileron pushrod. Cut one of the remaining wires down to 7 ¼" long and the last one down to 9" long. (You can discard these last two cut off pieces.) Make an "L" bend 3/16" from the unthreaded end of each threaded piece, and 3/16" from one end of each of the two unthreaded cut off pieces.

Insert the bent end of the threaded wires into the predrilled hole and slot at one end of each dowel, and drip a drop of thin CA into the slot to hold it in place. Now insert the bent end of the unthreaded wires into the hole at the other end of each dowel. Use a knifepoint to open the end of the shrink tubing and slip a piece over each end of the dowels to hold the wires in place. Shrink the tubing tight with a heat gun (or carefully with a match).

Wing Servo

Glue the wing servo tray supports (1 ½" balsa sticks) to the bottom of the wing servo tray along each end. Hold the tray against the bottom of the wing, over the center joint with the front of the tray 3.5" behind the



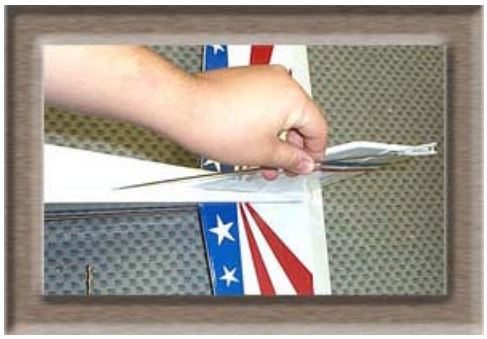
front of the wing, and draw a line around the tray on the surface of the wing. Remove the covering material from within the lines and glue the tray in place. Working through the opening in the tray, use a rotary grinder or hobby knife to cut a hole in the wing surface and the center ribs to clear the servo. Now feed the servo wire between the tray and the wing surface and install the servo with the servo wheel toward the rear, using the directions, which came with the radio.

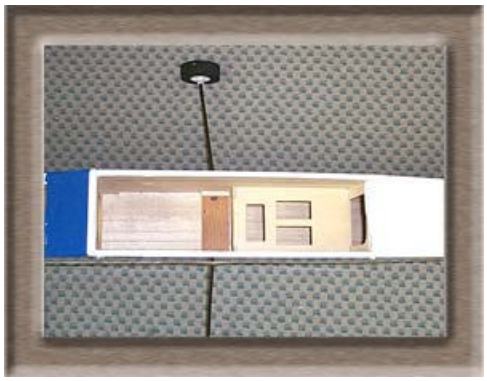
Make sure that the slots for the aileron torque wires in the bottom of the wing are not restricting the aileron travel, then screw the white plastic aileron connectors onto the threaded portion of the torque wires until 1/8" of the wire is exposed above the aileron connector. If you haven't charged your radio batteries yet, do it now, then hook up the receiver battery, aileron extension wire and the aileron servo to the receiver, turn on the transmitter and make sure that the aileron trim control is centered. This will center the servo for the next step. Install the "+" shaped servo arm in place of the wheel which usually comes on the servo. Position the "+" so that one cross arm is parallel to the front of the wing.

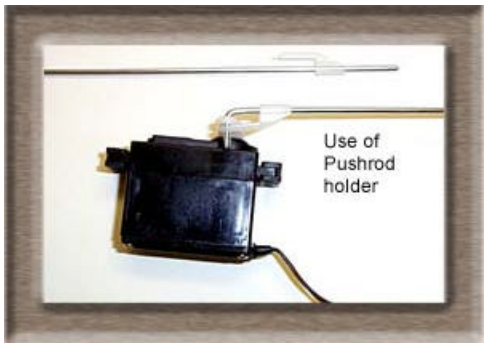
Get out the two 6" threaded metal wires, which you set aside earlier, and two white plastic clevises. Insert the unthreaded end of each wire into the chuck of an electric drill, and use the drill to screw the wire into the Clevis. Stop when 1/8" of the threaded portion of the wire is visible inside the center of the Clevis. Now snap the clevises through the small hole in the front of the aileron connectors on the torque wires.

Holding each aileron with its bottom in line with the bottom of the wing, mark the wire where it falls directly over the outer hole on that side of the servo arm. NOTE: The best way to connect flight critical pushrod to the servo is with a "Z" bend, but this requires special pliers. If you do not have access to a set of Z- bend pliers, you may use "easy connectors" (not included in this kit) but be sure to check them after every flight to be sure they are tight. (When using accessories not included in this kit, follow the directions, which come with the accessory.) Remove the servo arm, install the pushrod in the outer holes and reinstall the arm on the servo.

With the transmitter on, recheck that both ailerons are parallel with the bottom of the wing. Adjust the length of the pushrod by screwing the clevises in or out (or sliding the pushrod through the easy connector) to raise or lower the ailerons as required. Also measure how far the rear edge of each aileron moves (travels) when you move the transmitter stick all the way left or right. It should move ¼" each way. If it doesn't, move the pushrod one hole closer to the center on the servo arm to reduce the travel, or screw the plastic aileron connectors down further on the torque wires to increase the travel. (Recheck the neutral position of the ailerons after you adjust either of these). Your wing is now complete! Turn the transmitter off and disconnect the receiver battery and the aileron servo from the receiver but leave the extension wire plugged into the receiver.







Radio and pushrod

Now, on the left side of the fuselage (with the front facing away from you), cut a slot ¾" long and 1/8" wide, 6 ¾" from the rear and ½" from the top of the fuselage. This is the elevator pushrod exit. Cut the rudder pushrod exit slot in the back end of the fuselage.

Glue the fuselage servo tray support into the fuselage at the rear of the main landing gear mount block. Then glue the fuselage servo tray to the top of the support and the bulkhead at the rear of the wing saddle opening. The openings in the tray go toward the front. (Trial fit these pieces before you glue them in.)

Install your servos following the directions, which come with the radio. The two rear servos (elevator and rudder) should have the servo wheels toward the front, and the forward servo (throttle) should have the wheel toward the right side of the fuselage. (This is the same side as the muffler.)

Using the faceplate of your radio "on - off" switch as a template, make the necessary holes in the left side of the fuselage and install the switch.

Locate the longer of the two pushrod you assembled earlier. Carefully feed it, threaded end first, from the wing saddle through the elevator pushrod exit hole in the left side of the fuselage. Screw a Clevis onto the threaded end of the pushrod until 1/8" of the threads protrude into the center of the Clevis, then snap a control horn onto the Clevis with the Clevis pin through the outer hole in the horn.

Slip the front end of the pushrod under the right side of the servo wheel on the right (elevator) servo to hold it in place while you position the control horn flat against the top surface of the elevator with the front of the horn at the front edge of the elevator. Mark the control horn mounting hole locations and drill each one through the elevator with a 3/32" bit. Now insert 2 x 15mm sheet metal screws through the control horn and the elevator. Add the control horn nut plate to the bottom of the elevator and screw the machine screws through the nut plate. DO NOT OVERTIGHTEN THESE SCREWS OR THEY WILL CRUSH THE BALSA ELEVATOR.

Install the rudder (shorter) pushrod and control horn the same way. NOTE: The rudder pushrod should cross over the elevator pushrod inside the fuselage and exit through the back end of the fuselage. Replace the servo wheel on the left (rudder) servo with a "+" shaped arm and align the + parallel with the fuselage side. Put the front of the pushrod under the left side of the servo arm on the left servo while you install the rudder control horn.

Plug the servos and switch into your receiver and plug your receiver battery into the switch. Wrap the receiver and the battery completely in foam rubber (not included in this kit) to protect them from engine vibration. Use tape or rubber bands to hold the foam in place.

Turn the transmitter and receiver on and center all of the trim levers (center the throttle stick and trim lever too). Lay the elevator and rudder pushrod over the servo wheel and arm holes which are closest to the fuselage sides and, while holding the elevator and rudder straight, mark the pushrod where they cross the holes.

Make "Z" bends at the marks and cut off the excess length of the pushrod. Remove the servo wheel and arm and insert the ends of the pushrod in the outer holes. (Easy connectors may be used here too, but be sure to check them often.) With the radio on, center the elevator and rudder by screwing the clevises in or out on the threaded end of the pushrod. Adjust the amount of movement (travel) of the elevator and rudder to the amounts shown below, by moving the Clevis to different holes in the control horns. Turn the transmitter and receiver off after this step to save the batteries.

Remove the rudder servo arm and install an easy connector for the nose wheel pushrod (yes, we do recommend them for non-flight- critical applications) in the inner hole of the same arm that the rudder pushrod is connected to. Also install an easy connector in the front (throttle) servo wheel in the hole closest to the fuselage side. NOTE: Reinstall the arm and the wheel and be sure to tighten the mounting screws.

Mount your propeller and the spinner on your engine (but leave the muffler off for now). Slip the engine in position between the engine mount beams so that the back of the spinner is about ½" in front of the end of the fuselage sides. (Sand the beams a little bit if necessary to fit the engine between them.) Mark the position of the engine mounting holes on the beams with a sharp pencil.

Remove the engine and drill 5/32" holes on the marks for the engine mounting bolts. Install an easy connector in the outer hole of the engine's throttle arm, then mount the engine using the four #4-40 x 1" bolts and blind nuts provided.

Drill a 1/8" hole through the firewall for the throttle pushrod alongside the engine mount about ½" below the top right corner of the firewall. (Remember that the right side is the muffler side.) Drill holes through the tank support bulkhead and the bulkhead at the front of the wing saddle so that the pushrod takes a smooth path from the engine's throttle arm to the throttle servo. Slip a plastic pushrod tube through the holes until the inner end is 1" in front of the throttle servo and glue the tube in place. Insert a thin wire pushrod through the easy connector on the engine, through the tube and through the easy connector on the servo wheel. Close the engine's throttle and then tighten the easy connector on the throttle arm, but leave the one on the servo loose.

Drill another 1/8" hole through the firewall for the nose` wheel steering pushrod just above the fuselage bottom about 5/8" from the bottom left corner of the firewall. (The left side is the side away from the muffler.) Drill holes through the tank support bulkhead and the bulkhead at the front of the wing saddle so that the pushrod takes a smooth path from the nose wheel steering arm to the rudder servo. Slip a plastic pushrod tube through the holes until the inner end is 1" in front of the rudder servo and glue it in place. Trim the outer ends of the tube flush with the firewall. Make an "L" bend ½" from one end of the remaining thin wire pushrod and then insert the other end of the pushrod through the tube and through the Easy Connector on the rudder servo arm. The "L" should point downward just in front of the firewall and will connect the pushrod to the steering arm.

Place the receiver battery on the floor of the fuel tank area, then put the fuel tank in position. The neck of the fuel tank must protrude through the hole on the firewall. Add some foam rubber above the tank, hold the hatch cover in place and drill a 1/16" hole near each corner. Use four 3 x 12mm sheet metal screws to attach the hatch cover. Glue a piece of scrap wood across the opening in the bulkhead at the rear of the

tank to keep the tank from sliding backward. Put some foam rubber between the wood and the tank to prevent engine vibration from causing bubbles in the fuel.

The receiver goes on the floor of the fuselage between the fuel tank and the servos. Use a piece of scrap wood, placed across the top of the receiver and glued to the fuselage sides to hold the receiver in place. The simplest way to route the receiver antenna is to drill a 1/16" hole through the bottom of the fuselage in front of the main landing gear, run the antenna outside, along the bottom of the fuselage, to the tail and tape it at the rear. DO NOT CUT OFF ANY OF THE ANTENNA. Just let the extra length hang loose.

Mount the wing to the fuselage

Get out the fuselage and locate the two 4 ¾" hardwood dowels. These dowels go through the fuselage and anchor the rubber bands, which hold the wing on. Find the precut holes in the fuselage sides just behind and about ½" below the front and rear of the wing saddle. Cut the covering away from these holes and push the dowels all the way through. The dowels should stick out an equal amount on each side of the fuselage. When you are happy with the fit, glue the dowels in place with CA.

Many modelers prefer to pad the wing saddle with 1/8" foam tape, but it is not required (and the tape is not included in this kit). If you wish to use foam tape, apply it now. Fit the wing onto the wing saddle and hold it on with four or five #64 rubber bands (not included in this kit) on each side. (Be careful that the aileron servo wire doesn't hang out.)

Final Assembly

Turn the transmitter and receiver on and pull the throttle stick and the throttle trim lever all the way down. Hold the engine throttle arm all the way toward the rear while you tighten the easy connector on the throttle servo wheel. If the engine throttle doesn't open most or all of the way when you push the transmitter's throttle stick and throttle trim all the way up, you will need to change to a "+" servo arm on the throttle servo in order to get more travel. Setting up the throttle properly is sometimes difficult, so get an experienced modeler to help you if at all possible.

Center the nose wheel and then tighten the nose wheel easy connector on the rudder servo arm. If the nose wheel steering arm hits the firewall before the nose wheel reaches full deflection loosen the steering arm set screw and turn the steering arm away from the firewall a little bit, then retighten the set screw and re-center the nose wheel.

The main gear mount has been covered over at the factory. Locate the wide "slot" across the bottom of the fuselage below the wing saddle and cut away the material, which covers it. Install the main landing gear by inserting the wire struts into the holes in the main gear mount, hold a landing gear strap over the struts near each fuselage side, mark and drill (1/16") the mounting holes and then install the straps using the remaining 3 x 12mm sheet metal screws.

Mount the muffler onto your engine. Cut and install a piece of fuel line from the left tube in the front of the fuel tank to the nipple on the left side of your engine's carburetor and a second piece from the right tube of the fuel tank to the nipple in your engine's muffler.
Now BALANCE THE AIRPLANE. This is very important! In order to function correctly, the airplane must balance 3 ½" to 3 ¾" behind the leading edge of the wing. Perform this test with the airplane ready to fly, but with the fuel tank empty. Place your fingertips on the bottom of both wings, alongside of the fuselage, 3 ¾" behind the leading (front) edge of the wing, and hold the airplane off the ground. The airplane must balance level or slightly nose down when held this way. If it doesn't, add stick- on lead weights (not included in this kit) to the nose or tail until it does.

You are ready for flying

The EZ-4063 is one of the best flying trainer aircraft available. If you have built it correctly, it will fly gently, but with full control. It will not, however, fly itself or correct your mistakes for you. To do those things, you will need an experienced RC flyer as an instructor, preferably with a "buddy box" and a trainer cord. PLEASE, for you own safety, that of your onlookers and of any property within half a mile or so, DO NOT ATTEMPT TO TEACH YOURSELF TO FLY THIS, OR ANY OTHER RC AIRCRAFT.

MECOA - Model Engine Company Of America