EXPLORER 40

WARNING! THIS IS NOT A TOY!

THIS IS NOT A BEGINNERS AIRPLANE

This R/C kit and the model you will build from it is not a toy! It is capable of serious bodily harm and property damage. It is your responsibility, and yours alone - to build this kit correctly, properly install all R/C. components and flying gear (engine, tank, radio, pushrods, etc. and to test the model and fly it only with experienced, competent help, using common sense and in accordance with all safety standards as set forth in the Academy of Model Aeronautics Safety Code. It is suggested that you join the AMA and become properly insured before attempting to fly this model. If you are just starting R/C modeling, consult your local hobby dealer or write to the Academy of Model Aeronautics to find an experienced instructor in your area.

Write to : Academy of Model Aeronautics, 5151 Memorial Dr, Muncie, IN 47302

LIMITED WARRANTY

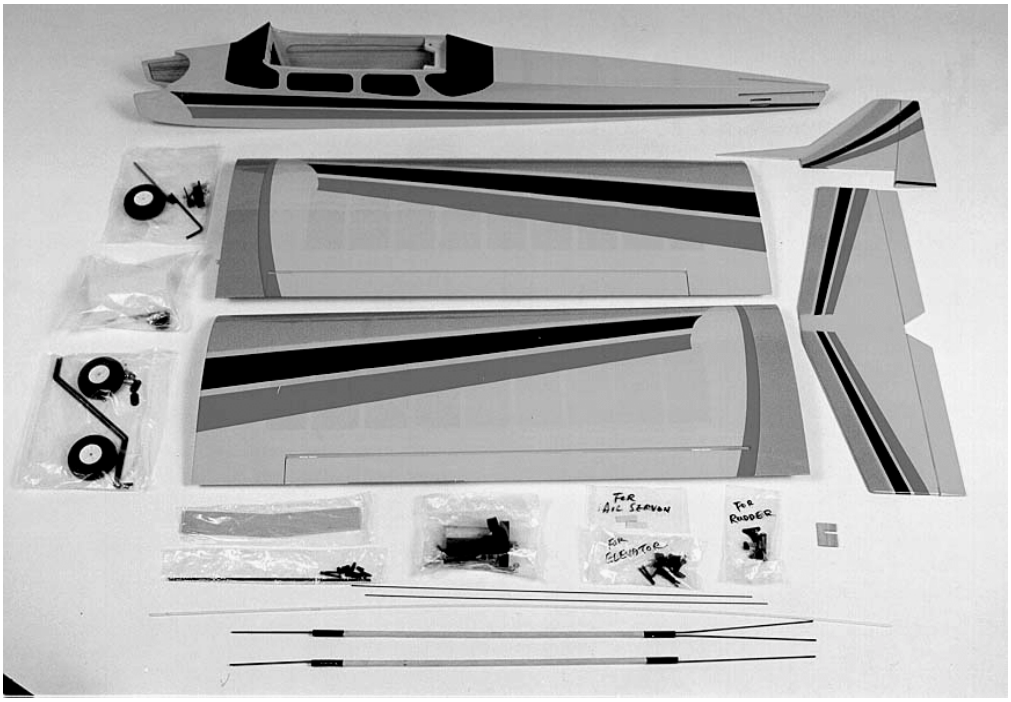
Lanier R/C is proud of the care and attention that goes into the manufacture of parts for its model kits. The company warrants that for a period of 30 days, it will replace, at the buyers request, any parts or material shown to the company's satisfaction to have been defective in workmanship or material at the time of purchase.

No other warranty of any kind, expressed or implied, is made with respect to the merchandise sold by the company. The buyer acknowledges and understands that he is purchasing only a component kit from which the buyer will himself construct a finished flying model airplane. The company is neither the manufacturer of such a flying model airplane, nor a seller of it. The buyer hereby assumes the risk and all liability for personal or property damage or injury arising out of the buyers use of the components or the finished flying model airplane, whenever any such damage or injury shall occur.

LANIER R/C

EXPLORER 40

ASSEMBLY INSTRUCTIONS



Wingspan.....64-1/4”

Wing area.....695-1/2 sq. in.

Weight.....4-1/2 – 5 lbs

Fuselage Length.....49”

Engine Required..... 2 – Stroke .40 to .50
4 – Stroke .52 to .70

Radio ..... 4 - Channel

EXPLORER 40

ASSEMBLY INSTRUCTIONS

INTRODUCTION

If your passion is learning to fly R/C, then the **Explorer 40** is for you. An easy to fly airplane that is bound to have you flying in a short time. The added importance of having ailerons allows the beginner to fly the **Explorer 40** a longer time instead of having to step up to another model. Here is an airplane you will be proud to set down on the flight line and ask that seasoned R/C'er to teach you to fly.

Before assembling the **Explorer 40**, read over the instruction manual and familiarize yourself with what is required. Then when it becomes time to do a particular assembly step you will have a better idea what its all about. We know you will enjoy flying the Explorer 40; giving you many hours of enjoyment.

PARTS NEEDED (NOT INCLUDED)

Four channel radio with four servos

.40 size engine

Suitable propeller

Fuel line (medium size)

Foam cushioning for fuel tank and
Radio receiver

TOOLS AND SUPPLIES NEEDED
(NOT INCLUDED IN KIT)

ADHESIVES

Thin CA (cynoacrylate) glue
Thick CA
CA remover and debonder
30-min Epoxy

TOOLS

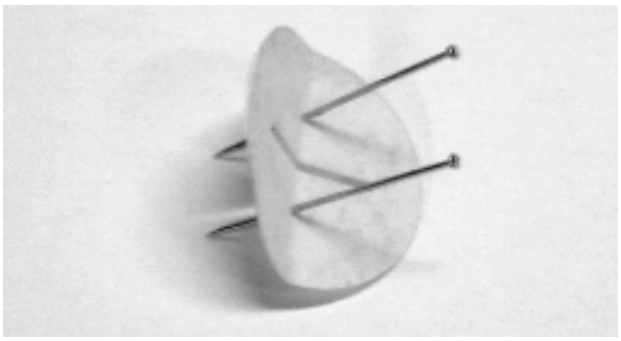
Drill
Drill bit – 1/16",3/32", 3/16", 5/32" 1/4", #33, #43
Medium Phillips Screwdriver
Hobby Knife with #11 blade
Mixing Sticks
Epoxy Brush (es)
Measuring Device (e.g., Tape measure
Combination Square
Paper towels
Wax paper
Rubbing Alcohol
Felt tip pen
Straight pins
Razor Saw
Dremel cut off wheel

ASSEMBING THE WING

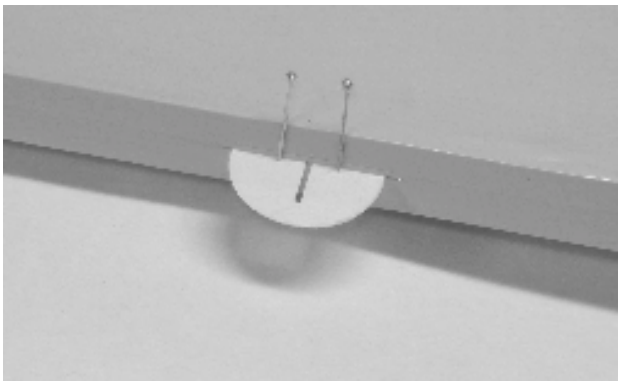
The control surfaces, ailerons, elevator, and rudder, come with the hinges installed, but the hinges are **not glued in place**. It's imperative that you use a high quality thin CA glue to properly adhere the hinges and control surfaces in place.

1. Carefully, remove the wing panels from the protective plastic. Remove the aileron from the wing panel. Note the position of

the hinges. There are four high quality hinges in each panel. Remove each hinge and fold it in the center. Insert a pin in the crease line on either side of the slot.

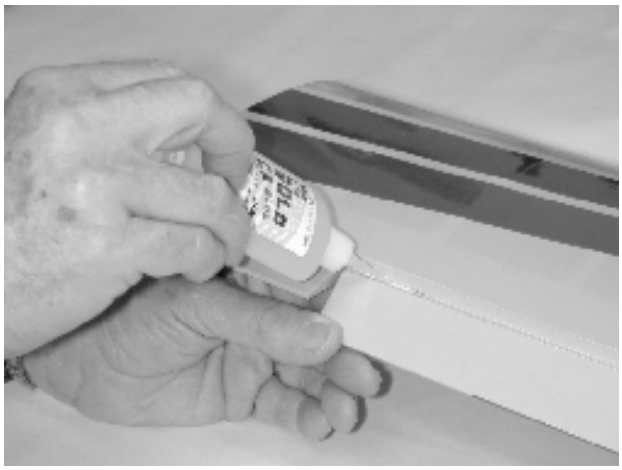


2. Insert the hinges back in the wing with the pins resting up against the trailing edge. Now insert the aileron. The hinge is now centered in the wing panel and aileron.

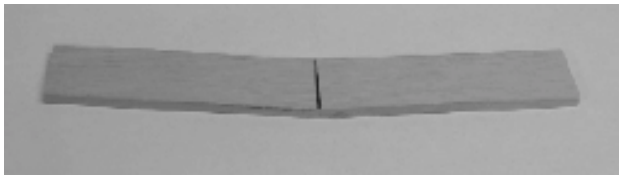


3. Remove the pins and snug the aileron against the wing panel. This will ensure that the hinges are centered.

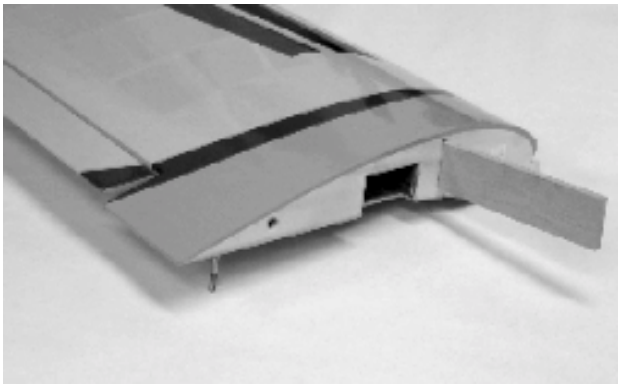
4. Deflect the aileron and apply a couple drops of thin CA at the center of the hinge in the slot. Do not overdo it. Have a paper towel handy to absorb any excess CA. Ideally, when the hinge is glued in place, a 1/32" gap or less will be maintained throughout the length of the aileron. The hinge is made of a special material that allows the CA to wick, or penetrate, and distribute throughout the hinge, securely bonding it in place.



5. Trial fit the wing joiner in the wing to check for proper insertion.

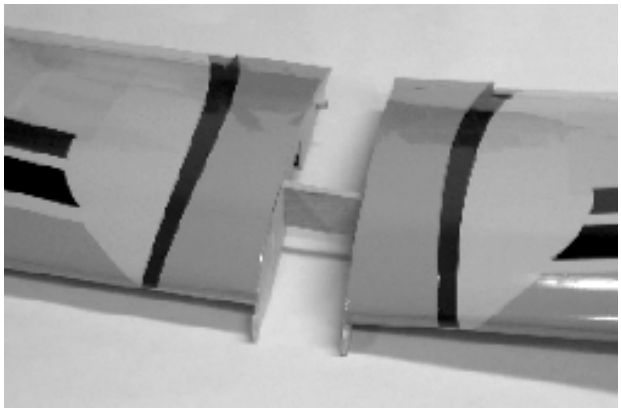


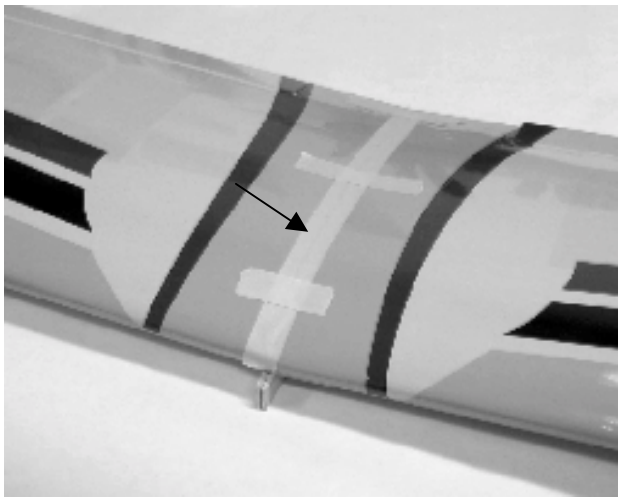
6. Remove the wing joiner and find the center. Draw a line to indicate the center with a felt tip pen.



7. Mix up some 30 min epoxy and apply liberally to wing joiner, and ends of wing. Do not use 5 min epoxy. It will harden before you get things together.

8. Slide the wing panels on the wing joiner aligning the leading and trailing edge. Wipe off excess epoxy with alcohol and a paper towel. Apply masking tape to joint to hold together until cured. Place wax paper under joint to keep it from sticking to the surface underneath.

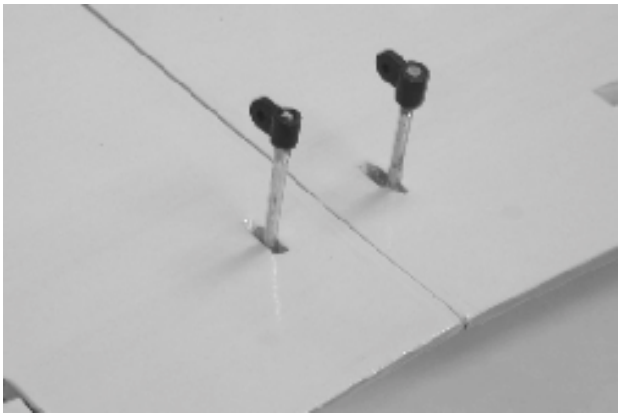


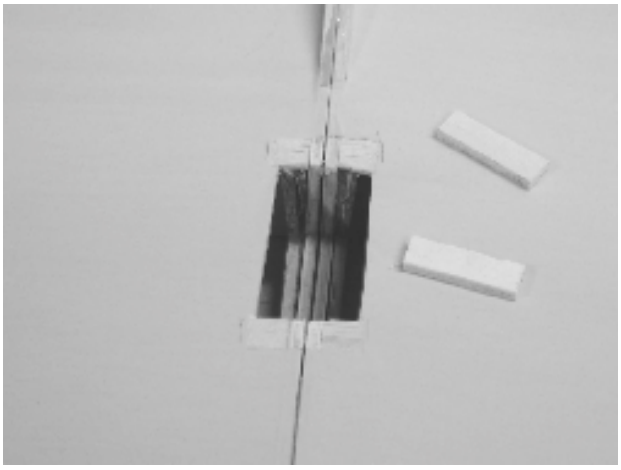


9. Allow to cure over night.

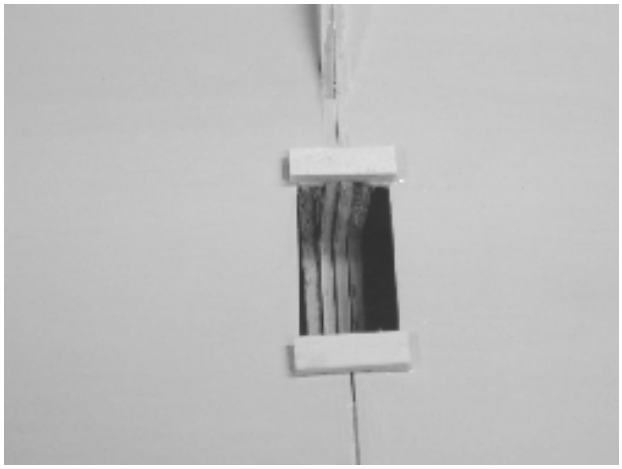
10. Locate the clevis connectors, install them on the aileron horns until about half the thread is showing.

11. Trial fit a servo in the wing servo well. Be sure that it fits and the connector has room to come out beside it.

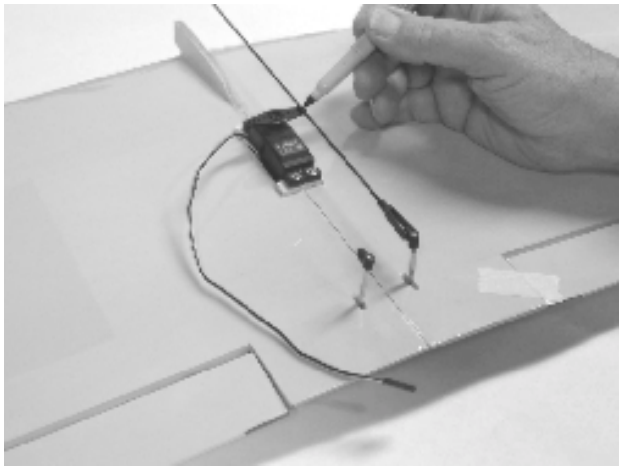




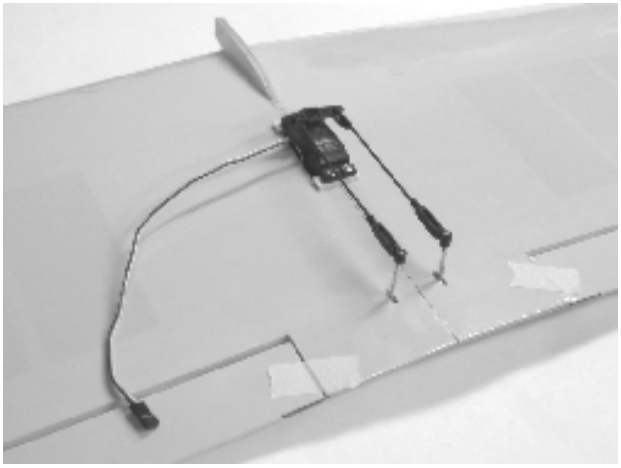
12. Find the two pieces of wood, 1/8" x 5/16" x 1". Lay one flush with the servo well end and draw a line around it. Now remove the covering within the lines. Do the other end as well. Using thick CA, glue the pieces in place, flush with the ends of the servo well. When the servo is mounted, the plywood pieces will add material for the screws to anchor.



13. Locate the two aileron pushrods and screw a clevis on each approx. half of the exposed thread. Attach the clevis on one to the control horn laying the end over the servo output arm. Tape the ailerons in neutral position.



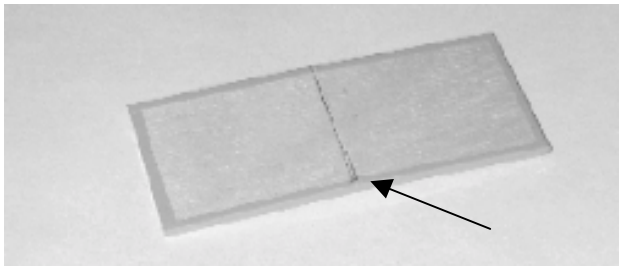
14. Mark the length of the pushrod at the hole in the servo output arm. Once determined, bend the wire 90 degrees. Trim off leaving a ¼" length after the bend.



15. Hook up the clevises on the aileron control horns. Install the pushrods on the servo arm with the black snap-on connectors. Once the servo is power centered, it may be necessary to remove the servo arm and center it on the spline. Adjustment can be made in the clevis on the threaded rod to neutralize the ailerons if necessary.

16. The holes for the wing hold down bolts are pre-drilled however; you must remove the covering over them, top and bottom side. Cut them open with a sharp Exacto knife or better yet, use a micro tip soldering iron to burn them open. This is by far the easiest way with the best results.

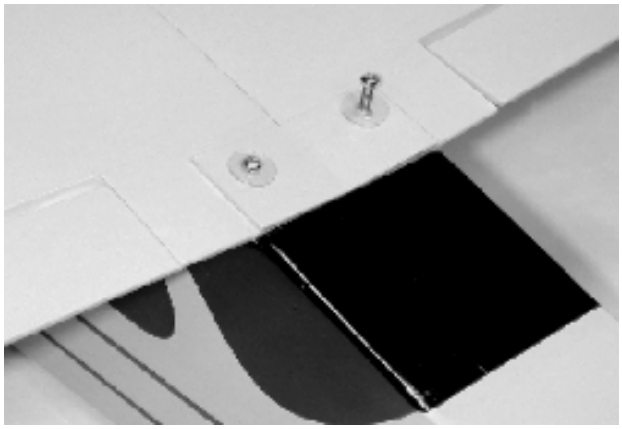
17. Locate the wing hold down plate, turn it over striking a centerline. Partially cut through the plate with a knife or Zona razor saw. Now "crack" it slightly to match the dihedral of the wing.



18. Position the plate on the wing and draw a line around it with a felt tip pen. Using a sharp Exacto knife, carefully remove the covering 3/32" in from the line all the way around.

19. Glue the plate on with thick CA glue. Turn the wing over and match drill the holes through the plate with a 3/16" drill bit. Use the soldering iron micro-tip to clean up the holes on the plate.

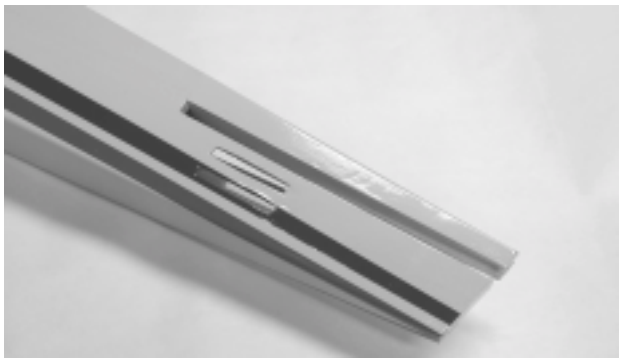
20. Install the wing on the fuselage using the long bolts and plastic washers. Check to see that it fits properly.



21. This completes assembling the wing. Set it aside until needed for final assembly.

ASSEMBLING THE TAIL

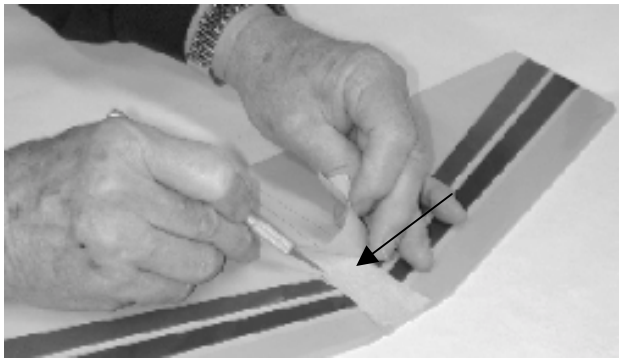
1. Locate the fuselage and clean out the pushrod exit slots on both sides using the micro soldering iron tip. This does a neat job. Do it carefully.



2. Find the horizontal stab and remove the elevators. Locate the center of the stab. Using a square on the trailing edge extending the line from front to back.

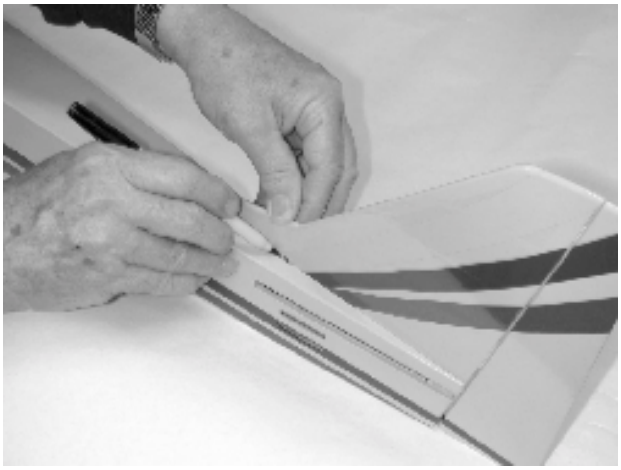
Place the stab in the fuselage slot and sight down through the fin slot. Adjust to centrally locate the centerline in the slot and pin in place. With a felt tip pen draw lines next to the fuselage, sides, top and bottom.

3. Remove the stab from the fuselage. Remove the covering between the lines. Use a straightedge and a new sharp #11 Exacto blade. Cut 1/16" inside of the lines being careful not to cut too deep.



4. Locate the vertical fin/rudder and remove the rudder. Mount it in the slot on the fuselage with the stab in place. Center

the forward tip of the dorsal fin on the fuselage and tape in



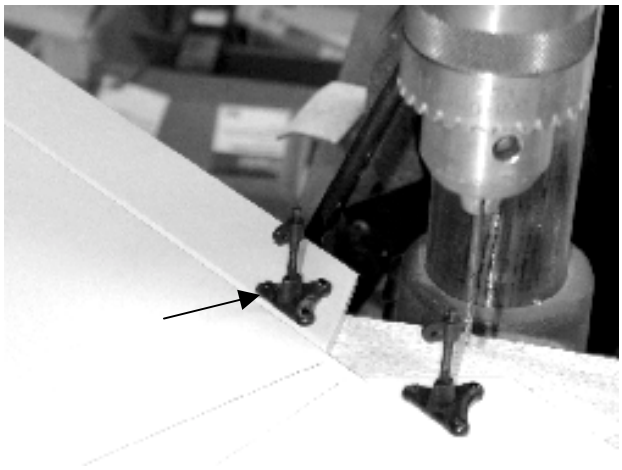
place. Mark around edges, where it meets the fuselage, with a felt tip pen. Remove and cut away covering between the lines as described in step 3.

5. CA the elevator hinges to the stab and rudder hinges to the fin as described in Assembling the Wings, Steps 1,2,3, and 4.

6. Turn the stab assembly over so you are looking at the bottom of the elevators.

Locate two control horns and thread on the clevis connectors. They will thread on much easier if drilled out them with a #43 drill bit. Using thin CA to glue the control horns in position. The hole in the connector should fall on the hinge line when they are located . Also note the straight edge of the control horn faces the hinge line

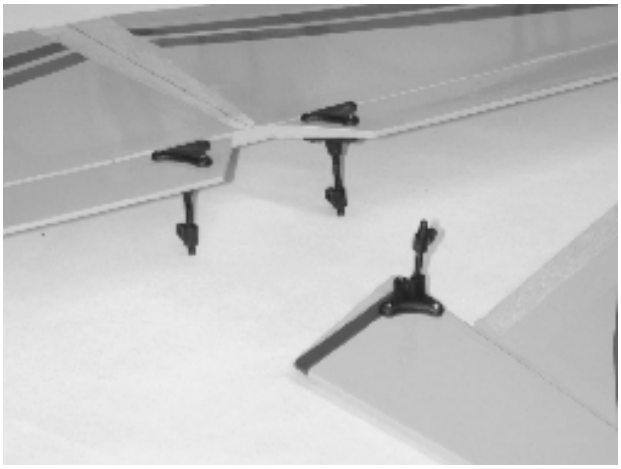
7. Match drill the holes in the control horn drilling through the elevator. Use a drill press or hand drill with a #33 drill bit.

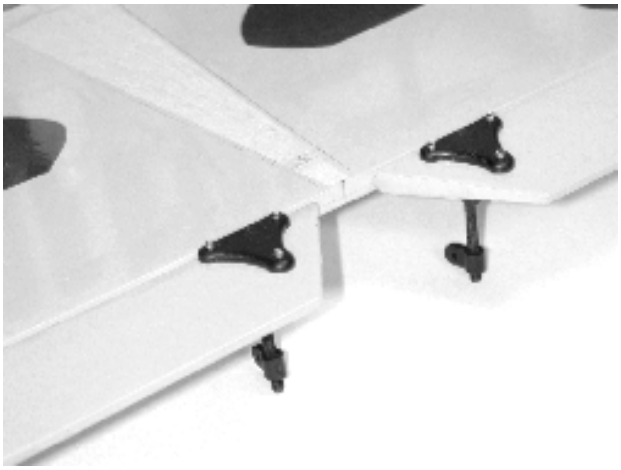


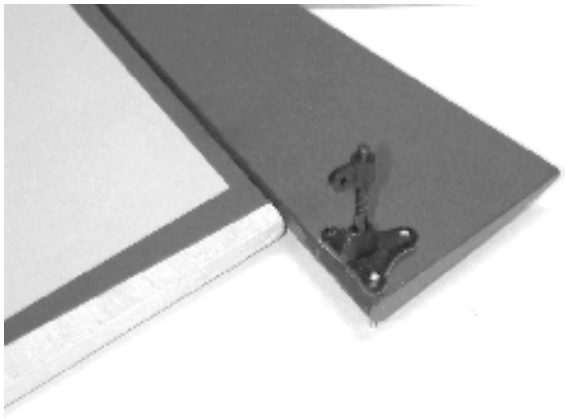
8. Locate six #2 x 5/8” screws and two control horn nut plates. Fasten the control horns in place. Cut off the excess threads flush with the nut plate with a Dremel cut-off wheel.

9. Mount and fasten the rudder control horn in the same manner. Remove 1/4”

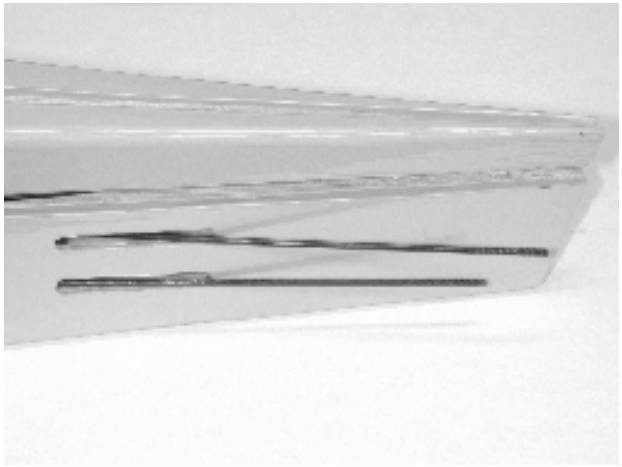
from the threaded end of the horn to clear the elevator control horn.







10. Before gluing on the stab/elevator and fin/rudder to the fuselage, install the pushrods through the slots in the fuselage. The elevator pushrod is split and must come out the two upper slots on either side. The rudder pushrod exits through the lower slot. Tape the forward ends to the servo tray for now. Here's a tip. Push the elevator pushrod out the back of the fuselage through the stab slot. Spread them apart and carefully slide them back into the fuselage. They will pop right through the slots with ease.



11. Glue on the stab and vertical fin with 30 min. epoxy. Construct a centerline as before. Sight down through the fin slot to center the stab. Pin stab at tail post to keep it from moving. Make sure fin is perpendicular with the stab. Wipe off excess epoxy with a paper towel and alcohol. Allow to cure.

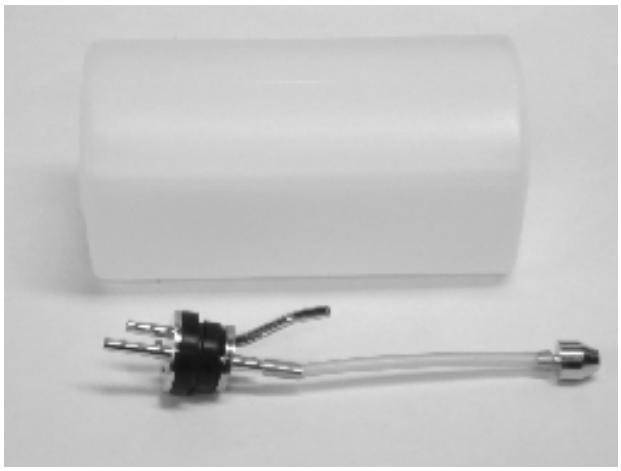
12. Locate three black clevis from the hardware pack. Screw each of them on a pushrod using about half the thread. Now connect each to a control horn connector on the elevators and rudder.

13. Install the servos in the position shown in the photo. The one in the foreground is the elevator servo. Tape the elevators in neutral position. Lay the pushrod wire on the servo output arm and mark it even with the hole. Make a 90 degree bend at that point and trim off leaving a 3/16" leg. Connect it to the arm with a snap-on connector. Now do the rudder servo.

Here is a tip. Remove the servo arm from the servo to snap on the connector. It is much easier to work on it. Power up the servo to center it. Replace the servo arm, making sure the retaining screw is snug, and make any final adjustments at the tail clevis to neutralize the control surface.

ASSEMBLING THE FUEL TANK

1. Locate the fuel tank and the hardware with it. Assemble the parts as shown **in** the photo**.**

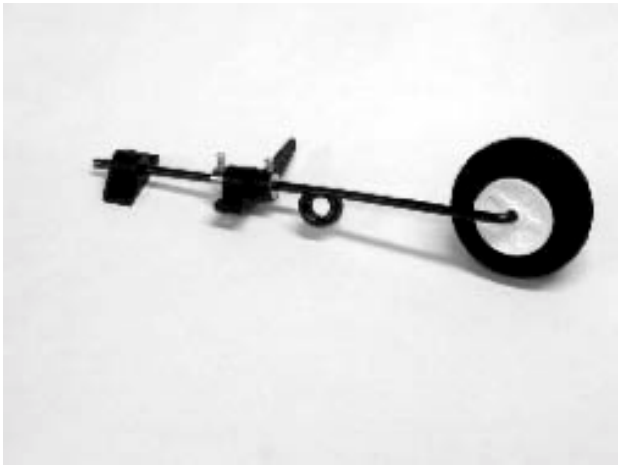


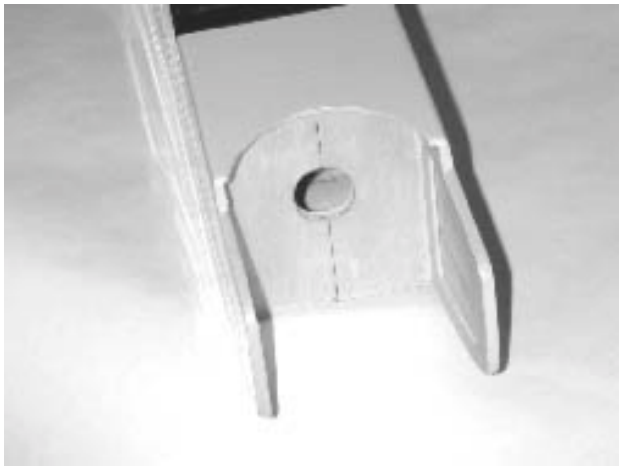
2. Place the straight tube and short bent tube in the holes in the stopper. The bent tube will be the vent and must be oriented toward the top of the tank. Place the large washer on the front and the small washer on the backside. Install the screw but do not tighten. Slip the fuel line on the clunk pushing the other end on the straight piece of tubing. Slide the assembly into the fuel tank pushing the stopper in as far as it will go. Orient the vent line and the carburetor line so that they are horizontal. The nose gear wire must go between these tubes when the tank is installed.

ASSEMBLING THE NOSE GEAR

1. Locate the hardware bag with the nose gear parts. The steering tiller arm must have a wheel collar installed in it. Cut a slot on the side for the setscrew as shown in the photo. **When installing the tiller, the open end should be facing down**.

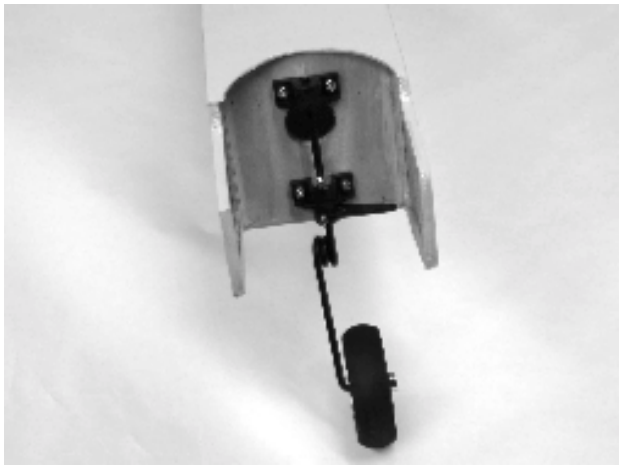
2. Slide the tiller arm on the nose gear. Next, slide the mounting block followed by a wheel collar. Adjust the tiller arm so that it is ½" above the spring and tighten the wheel collar. Now tighten the wheel collar on the topside. Slide on the top-mounting block. Lay the assembly aside.





3. Find the center of the firewall. Using a square, construct a centerline using a felt tip pen.

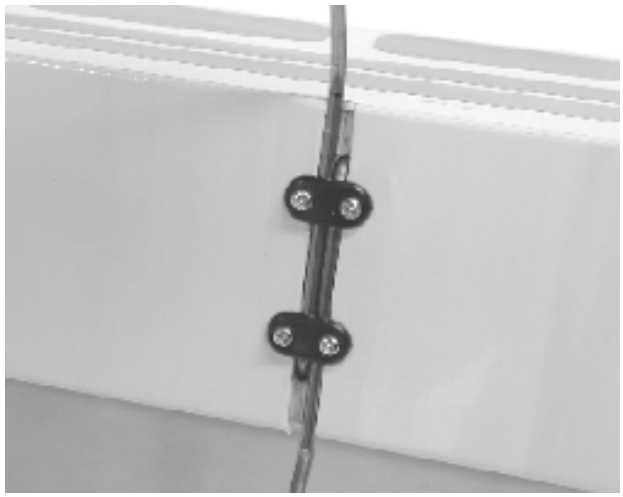
4. Mount the nose gear assy. Place the first mounting block ½" up from the fuselage bottom. Locate the next one just above the fuel tank access hole, both on the center line. Drill a 1/16" pilot hole and secure the mounting blocks with #4 x 7/16" sheet metal screws.



MOUNTING THE MAIN GEAR

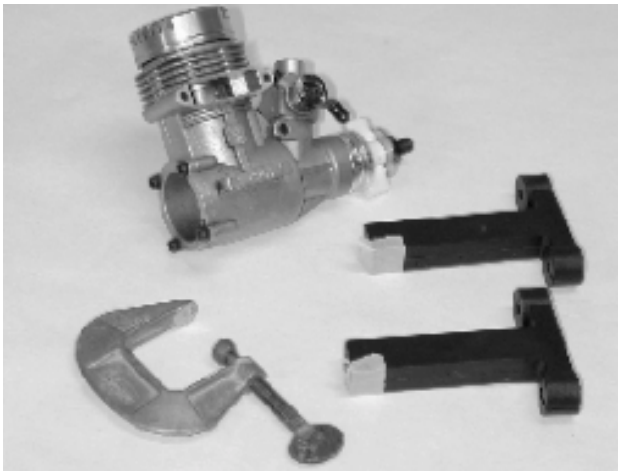
1. Turn the fuselage up side down and locate the main gear mounting holes under the covering. Cut the covering away to expose them.

2. Note the holes are not inline with each other. Ream out the holes with a 5/32" drill bit. Relieve inside edge of holes to accommodate the bend radii in wire. Place the main gear side by side in the holes.



3. Locate the two plastic straps. Mount them as shown with four #4 x 7/16" sheet metal screws. Drill 1/16" pilot holes to start screws.

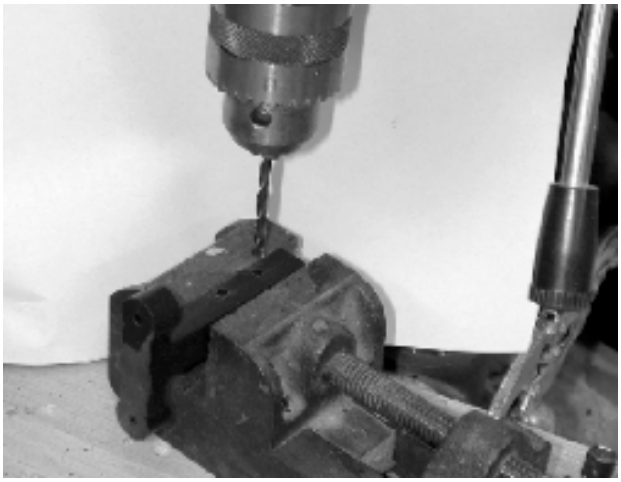
MOUNTING THE ENGINE



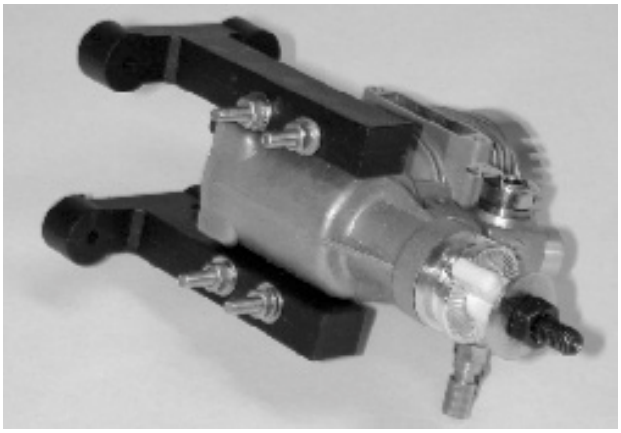
Find the plastic engine mounts mark them ½" from the end of the mount. A small piece of masking tape edge is easy to see. You will need a small "C" clamp to hold the mount to the engine.

1. Clamp the engine to the mount locating the front edge of engine mount on the edge of the tape. Mark the engine mounting holes. Note: the engine mounts are not symmetrical, keep the short leg to the bottom.

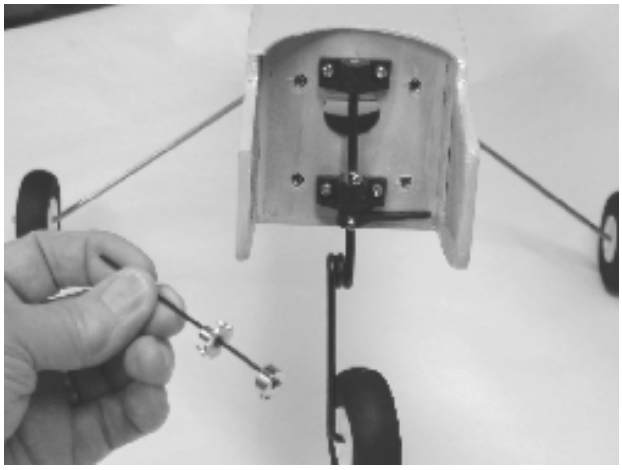
3. Mark both engine mounts. Drill them using a drill press to keep the holes straight. Use a 5/32" drill bit. It you don't have a drill press; use a hand drill as a last resort. We highly recommend using the drill press. If you have a friend that has one, try to use his to keep your frustration level under control.



4. Mount the engine in the mounts using the 1-3/8" machine screws, flat washer, lock washer and nut.



5. Stand the fuselage on end and center the engine on the firewall with the bottom edge of the mount ½" from the fuselage bottom. Now mark the upper left engine mount hole only. Remove the engine and drill a 1/8" pilot hole on the mark. Enlarge it to a ¼" hole.



6. Locate the four blind nuts. Using a piece of wire install a wheel collar on one end. Alternatively, bend a short 90-degree leg on the end. String a blind nut on it with the prongs facing up. Insert the wire into the backside and pull it to the hole. Reach into the forward fuselage cavity and hold the nut in place with your fingers. With the other hand screw the black socket head bolt, with flat washer, into the blind nut and pull it into the hole. Remove the bolt.

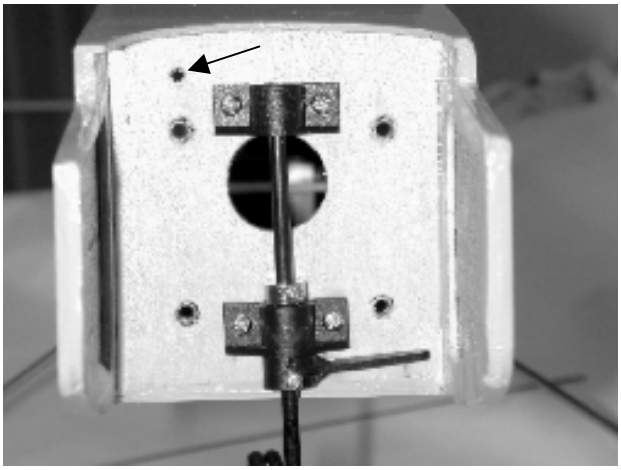
7. Mount the engine with the one bolt and mark the other three holes, drill the fire wall and install the blind nuts as described above. Note: If the balsa reinforcement tri-stock interferes with the blind nut not seating properly, use a long flat blade screwdriver to dig it away for some clearance

THROTTLE PUSHROD

1. Locate the pushrod connector and

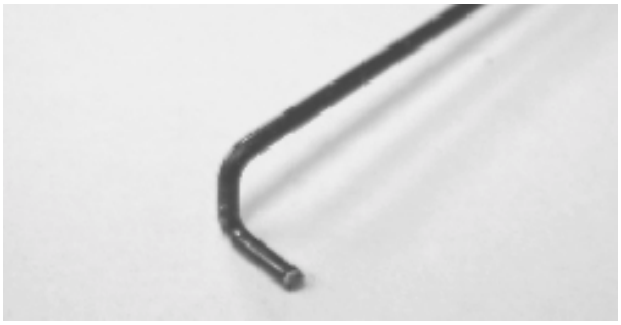
install it on the servo arm. A very small amount of thin CA will hold the nut in place.

2. Locate and drill a 5/32" hole, 9/16" on center and up from the upper engine mount bolt.



3. Cut off a 11" length of white plastic sleeving. Push it through the hole allowing 1/8" to protrude from the firewall surface. Use thin CA to secure it.

4. Find the length of .050 wire, cutoff a 17" piece. On one end form a "L" bend to hook into the throttle arm. Bend a 90 degree leg on the end of the wire. Place leg in vise with the excess wire parallel with the vise jaws, allowing a little more than servo arm thickness between vise surface and bottom surface of wire. Bend wire over, with hammer, toward front of vise. Trim off extending leg to 3/16".



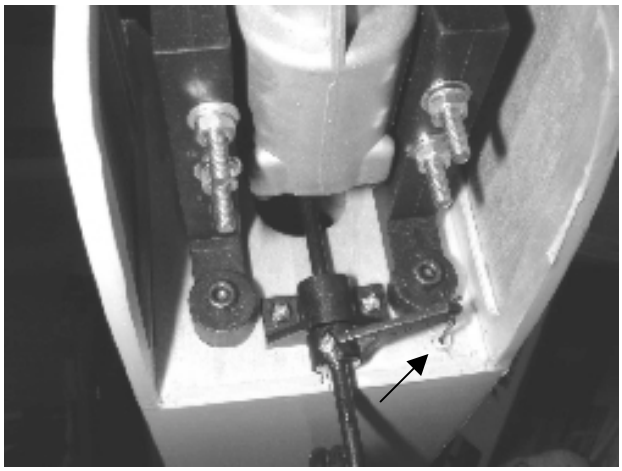
5. Slide the pushrod in the sleeving and through the hole in the connector on the servo arm. Insert the "L" bend into the throttle arm hole and twist until securely in place. Throttle adjustment can be made by powering up the servo, moving the pushrod back and forth by hand, then securing it at the servo arm. Temporarily tighten the set screw on the servo arm connector until ready for final adjustment.

6. The throttle pushrod sleeve must be supported near the servo. Epoxy in the balsa support piece as shown in the photo.

NOSE GEAR PUSHROD

1. The nose gear tiller arm pushrod hook up is very much like the throttle hook up using the same materials. Mount the nose gear assy. Cut off one hole from the tiller arm, using the second hole. Move the tiller arm into the firewall and mark the location for a 5/32" hole.

2. Drill the hole for the sleeving. Now



drill a hole in the second sub-former, inside below the fuel tank as shown. This can done from the front with a long drill or a hole or slot can be made in the former reaching through the wing opening.

3. Cut off a piece of white sleeving 12" long. Cut off a length of .050 wire 14-1/2" long. Follow the same instructions as stated in the throttle pushrod hookup. CA the white sleeving in place.

4. Locate and glue in the sleeving supports near the servos as shown in the photo. Loosen the setscrew in the servo arm connector, power up the servo to center it, adjust the rudder and nose gear to neutral. Tighten the setscrew. Final adjustments can be made in the rudder by turning the clevis in or out.

MOUNTING THE RECEIVER SWITCH

1. Locate the small hole on the left side of the fuselage in the cabin area. Remove the covering over it.

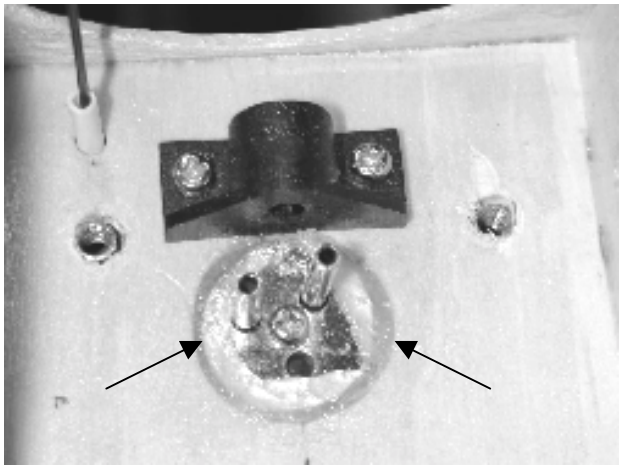
2. Align the switch mounting plate over the hole and match drill the two hole through the fuselage wall.

3. Mount the switch using the two screws that came with it. Note which position of the switch is “on” and “off”. Generally, “on” is in the back position.

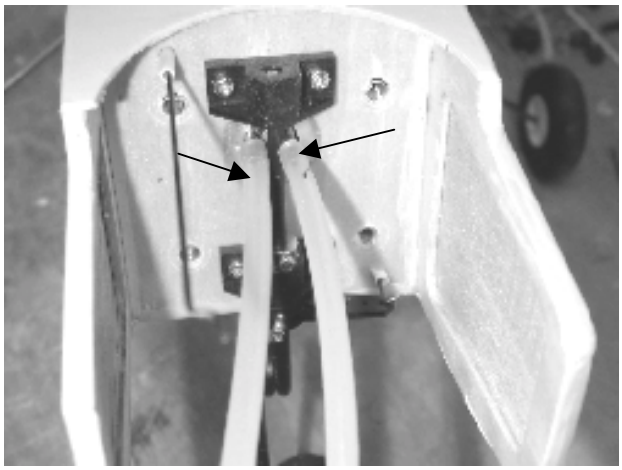
MOUNTING THE FUEL TANK

1. The fuel tank has been assembled so now is the time to mount it. Before doing so, wrap the airborne battery pack with foam and place it next to the firewall between the two formers under the tank. It will need to be there to properly balance the model. Make sure the battery lead is accessible to the radio comartment.

2. Place the fuel tank into position in the fuselage with the outlet on the tank near the top so that the tank rests level. Push it forward into the hole in the firewall. Pack foam around it to support it in place. A piece of Styrofoam wedged behind it will help hold it in place. A spot of white glue will hold the Styrofoam there.

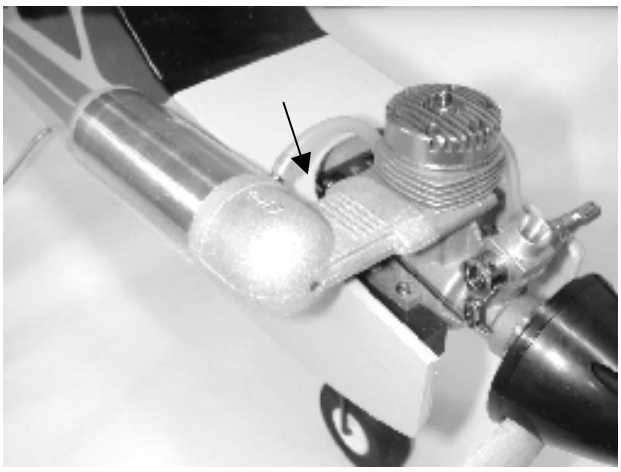


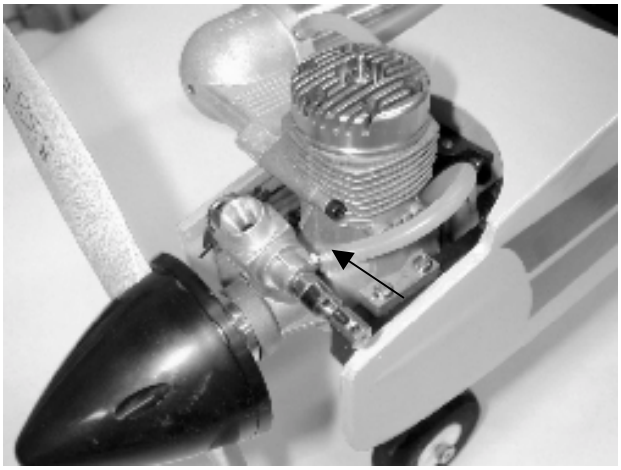
3. Apply a bead of Silicone Sealer around the periphery of the cap sticking through. Allow it to cure over night. This will hold it in place and seal it against fuel coming in.



4. Cut off two pieces of medium fuel line (not supplies) approx. 6” each. Connect them to the vent and carburetor lines on the tank.

5. Mount the engine with the socket head cap screws supplied and connect the lines to the carburetor and muffler tap.





INSTALLING THE RECEIVER

1. Wrap the receiver with foam to protect it in case you have a bad crash. Use some Velcro (not supplied) to hold it in place on the bottom of the fuselage in the radio compartment.

2. Route the antenna through the side of the fuselage and back to the top of the fin.

3. A short extension plugged into the aileron channel will help in connecting the aileron servo when installing the wing on the fuselage.

4. Power up the radio to make sure all servos are working.

Final hookups and checks

1. Take the servo arms off the servos, turn on the transmitter and center all the trims. Reinstall all the servo arms and secure them with the screws.

2. Double-check all the servos and make sure the servo arms are secure and all the clevises have a retainer.

4. Adjust the pushrod hookups and set up your radio to provide the control surface movements as follows. Use a ruler to measure them.

AILRONS PLUS/MINUS 1/4”
ELEVATORS PLUS/MINUS 3/8”
RUDDER PLUE/MINUS 1”
(measure rudder at widest point)

The balance point and control surface throws listed in this manual are the ones at which the Explorer flies best. Set up your aircraft to those specifications. If, after a few flights you would like to adjust the throws or C.G. to suit your tastes that is fine.

Too much control surface throw can make your model difficult to control or force it into a stall, so remember... more is not better.

PREFLIGHT

Identify your model

Regardless if you fly at an AMA sanctioned R/C club site or if you fly somewhere on your own, you should always have your name, address, telephone number and AMA number on or inside your model. It is required at all AMA R/C club flying sites and AMA sanctioned flying events.

Charge the batteries

Follow the battery charging procedures in the radio instruction manual. Always charge your transmitter and receiver batteries the night before you go flying and at other times as recommended by the radio manufacturer.

Balance the propeller

Carefully balance your propeller before you fly. An unbalanced prop is the single most significant cause of vibration that can damage your model. Not only will engine mounting screws and bolts loosen, possibly with disastrous effect, but vibration may also damage your radio receiver and battery. Vibration can also cause the fuel to foam, which will cause the engine to run hot or quit.

Ground check your model

If you are not thoroughly familiar with the operation of R/C models, ask an experienced modeler to inspect your radio installation and control surface set-up. Follow the engine manufacturer's instructions to break-in your engine. After you run the engine on your model, inspect your model closely to make sure all screws remain tight and your pushrods and

Range check your radio

Ground check the range of your radio before the first flight of the day. With the transmitter antenna collapsed and the receiver and transmitter on, you should be able to walk at least 100 feet away from the model and still have control. Have an assistant stand by your model and, while you work the controls, tell you what the control surfaces are doing. Repeat this test with the engine running at various speeds with an assistant holding the model, using hand signals to show you what is happening. If the control surfaces do not respond correctly, do not fly! Find and correct the problem first. Look for loose servo connections or broken wires, corroded wires on old servo connectors, poor solder joints in your battery pack or a

defective cell in your battery pack, or a damaged receiver crystal from a previous crash.

ENGINE SAFETY PRECAUTIONS
NOTE: Failure to follow these Safety precautions may result in severe injury to yourself and others.

Store model fuel in a safe place away from high heat, sparks or flames. Do not smoke near the engine or fuel as it is very flammable. Engine exhaust gives off a great deal of deadly carbon monoxide so do not run the engine in a closed room or garage.

Get help from an experienced pilot when you are learning to operate engines.

Do not run the engine near loose gravel or sand; the propeller may throw loose material in your face or eyes.

When you start and run the engine, keep your face and body as well as all spectators away from the plane of rotation of the propeller.

Always be aware and very conscious of hand movements and be deliberate in your reach for the needle valve, glow plug clip, or other items near a spinning propeller.

Keep loose clothing, shirt sleeves, ties, scarfs, long hair or loose objects away from the prop. Be conscious of pencils, screwdrivers or other objects that may fall out of your shirt or jacket pockets.

Use a chicken stick or electric starter and follow the instructions to start your engine.

Make certain the glow plug clip or connector is secure so that it will not pop off or get into the running propeller.

Ask an assistant to hold the model from the rear while you start the engines and operate the controls.

Make all engine adjustments from behind the rotating propeller.

The engine gets hot! Do not touch the engine during or immediately after you operate it. Make sure fuel lines are in good condition so fuel will not leak onto a hot engine and cause a fire.

To stop the engine, close the carburetor barrel (rotor) or pinch the fuel line to discontinue the fuel flow. Do not use your hands, fingers or any body part to stop the engine. Never throw anything into the prop of a running engine.

GETTING YOUR MODEL READY TO FLY

Balance your model

NOTE: This section is **VERY** important and must **NOT** be omitted! A model that is not properly balanced will be unstable and possibly unflyable.

1. Accurately mark the balance point on the top of the wing on both sides of the fuselage with the wing mounted. The balance point is 3” in from the leading

edge of the wing. This is the balance point at which your model should be balanced for your first flights. Later, you may experiment by shifting the balance up to 3/8" forward or back to change the flying characteristics. If you move the balance point forward it may improve the smoothness and tracking, but your Explorer may then require more speed for takeoff and become more difficult to slow and flare for landing. If you move the balance aft it may make your Explorer more agile with a lighter feel and allow you to perform more aerobatic maneuvers. In any case, please start at the location we recommend and do not at any time balance your model outside the recommended range.

2. All components should be in the model and it should be ready to fly when balancing the model, however the fuel tank should be empty.

3. With the wing attached to the fuselage and an empty fuel tank, lift the model at the balance point If the tail drops, the model is tail heavy and you must relocate your battery pack or other components forward or add weight to the nose. If the nose drops, it is nose heavy and you must relocate your battery pack or other components aft or add weight to the tail. In order to save weight, relocate your battery pack and/or receiver or other components before you add additional weight to arrive at the correct C.G. Later if the balance proves to be OK, you can open the fuse bottom and glue these in **permanently**

Note: The amount of weight required will depend on the engine, density of the wood provided and how heavily or lightly the tail was built.

GO OUT AND FLY

Now that you have everything in order, it's time to go out and fly. Have a ball! But always stay in control and fly in a safe manner. **GOOD LUCK AND ENJOY YOUR EXPLORER 40!**

We hope you have enjoyed assembling your Explorer 40. Lanier R/C has a number of other outstanding 40 size airplanes. As your next project may we suggest our Citabria. A scale, high wing, easy to fly model and a great step up in flight characteristics. It is pre-covered, all wood construction with pre-painted fiberglass cowl and wheel pants. All you have to do is assemble the parts, and apply the included graphics. A great looking airplane you will enjoy. Try one!

Notes:

EXPLORER 40

ASSEMBLY INSTRUCTIONS