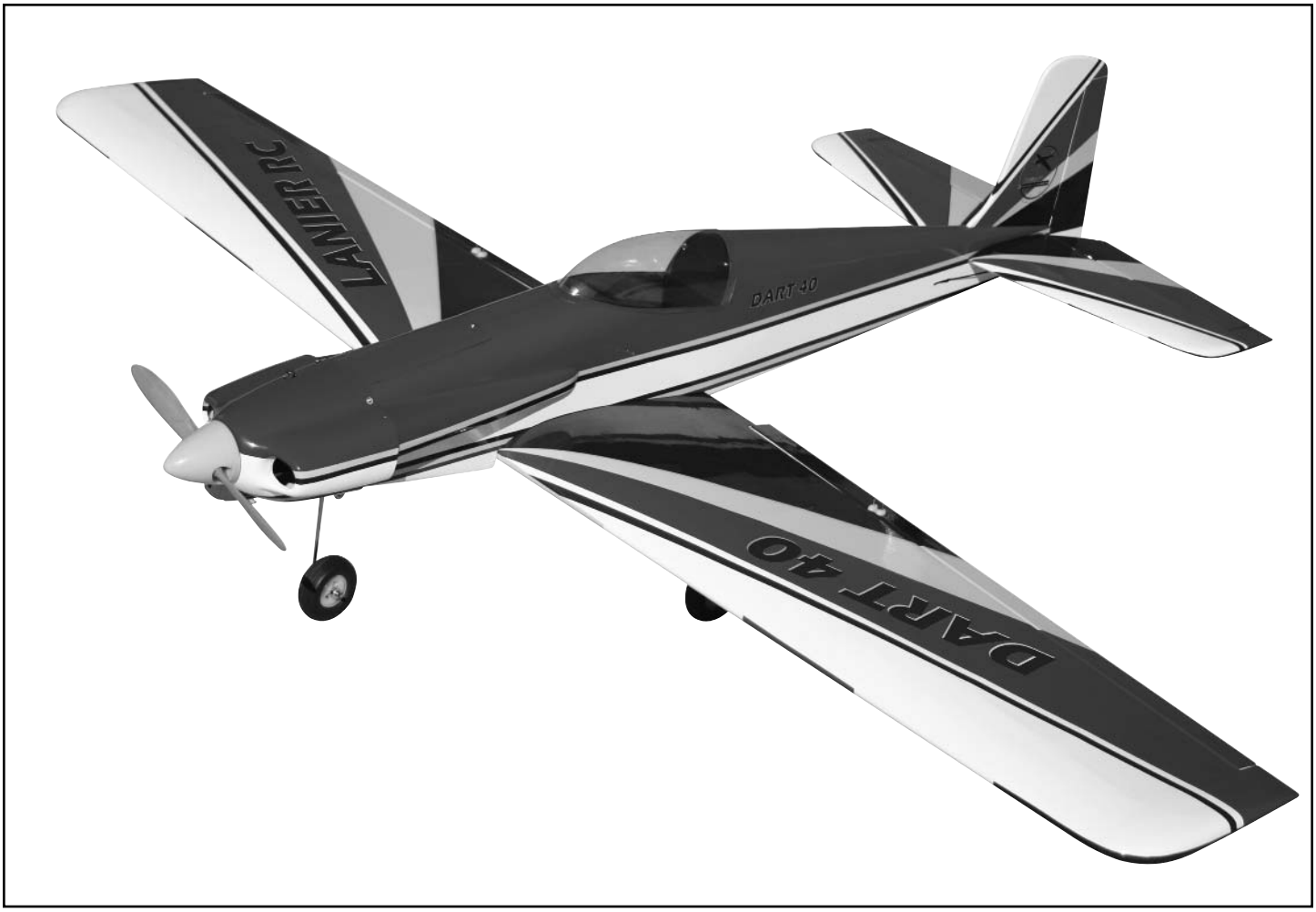
Dart ARF



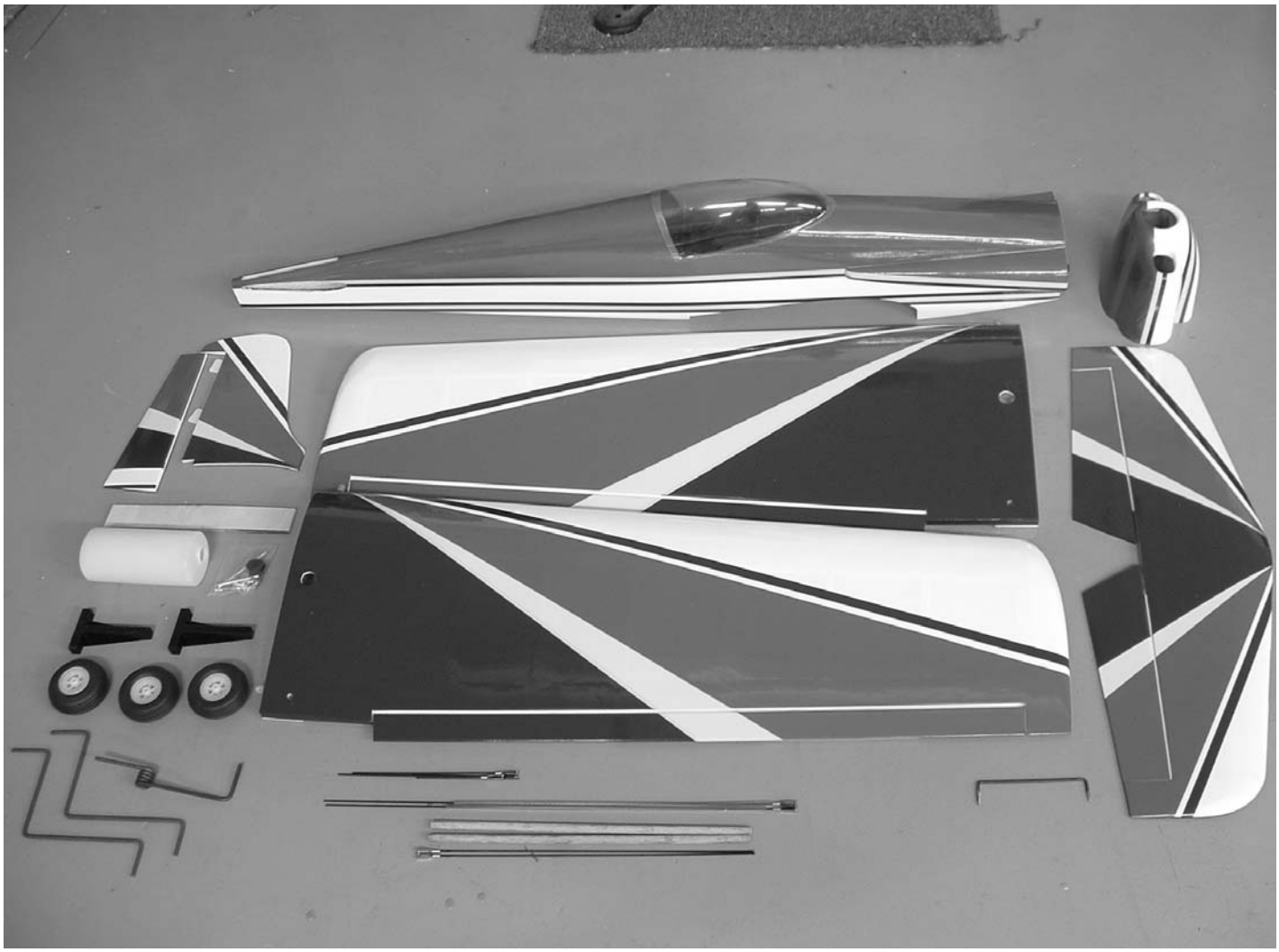
Thank you for purchasing the Lanier R/C Dart. We are sure you will be happy with the quality of the kit and happy with the flying characteristics of the Dart. Because of it's light weight,the Dart will fly exceptionally well on a standard .40 size motor. This makes the Dart a perfect "first time" low wing airplane. The gentle flying characteristics and good aerobatic ability make is a joy to fly.

Lanier R/C, INC. P.O. Box 458 Oakwood, Ga. 30566 PH 770 532 6401

Important Information:

Please inspect the plane before beginning to assemble to make sure you are happy with it. After assembly has begun you cannot return the kit. If you find a problem before beginning to assemble the plane you must contact us, please do not return it to the dealer. Due to temperature changes the plane may develop some wrinkles in the covering that you will need to remove with an iron. Be sure to seal the edges down first so that you do not cause the covering to shrink and leave exposed areas of wood. The model is built light to ensure good flight characteristics. With the power available from the new breed of engines, it is necessary to use throttle management in order not to overstress the airframe. You must maintain good tight control linkage with no slop, good servos with plenty of power, and good servo arms to protect against flutter. Sloppy linkage and over speeding the plane will cause flutter which is not covered in the 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 90 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.

Any action brought forth against the company, based on the breach of the contract of sale to the buyer, or on any alleged warranty there under, must be brought within 1year of the date of such sale, or there after be barred. This one year limitation is imposed by agreement of the parties as permitted by the laws of the state of Georgia.



Wing Assembly

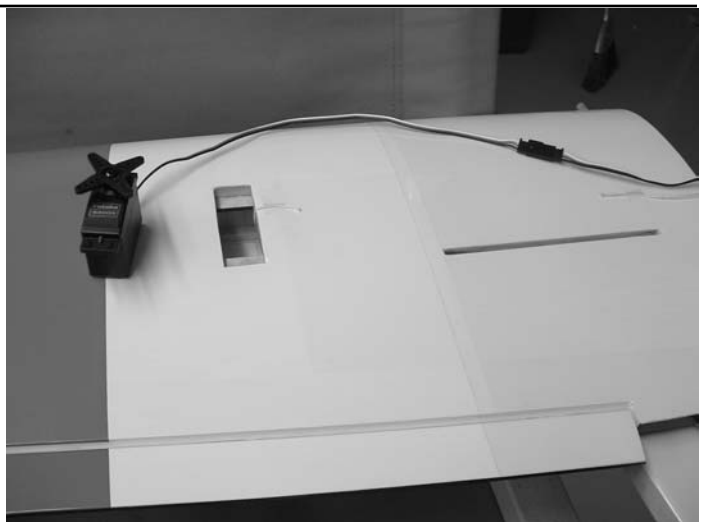
1. ☐ Start with one wing panel. Make sure all the hinges are aligned and the aileron has a 1/32” gap at the wing tip.

☐ Insert a straight pin in the center of the hinge so the hinges will be one half in the wing and one half in the aileron.

☐ Push the ailerons in place tight against the trailing edge of the wing and remove the pins.

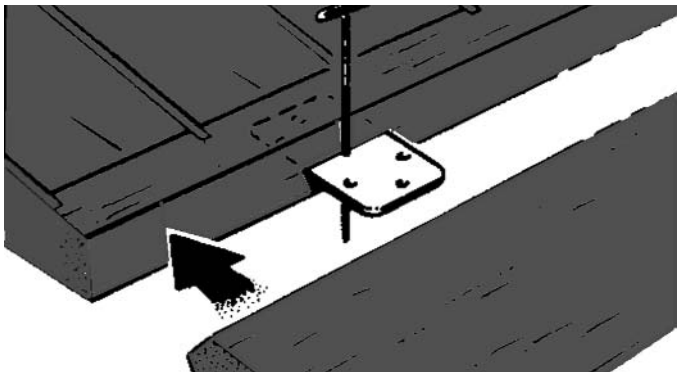
☐ Move the aileron to full deflection in one direction (about 1/2”) and apply one drop of thin CA glue to each hinge. Move the aileron to full deflection in the other direction and apply one drop of thin CA on each hinge on that side.

☐ Give the hinge a minute to dry then apply one more drop to each hinge on each side.

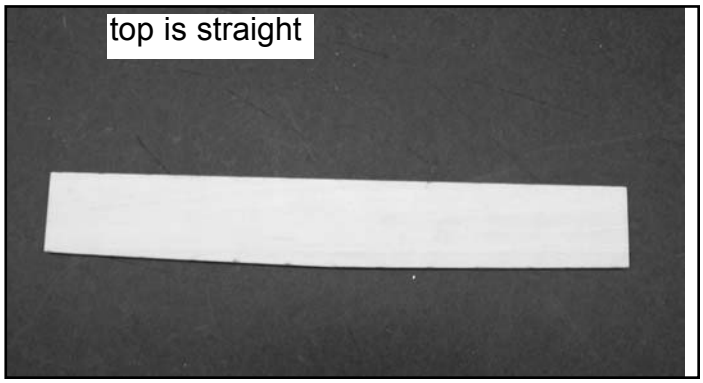


2. ☐ You will need a 6” extension for the aileron servo lead.Use tape on the plug to make sure it does not come apart.

☐ Use the string installed in the wing to pull the servo lead down the wing and out the hole on the top side.



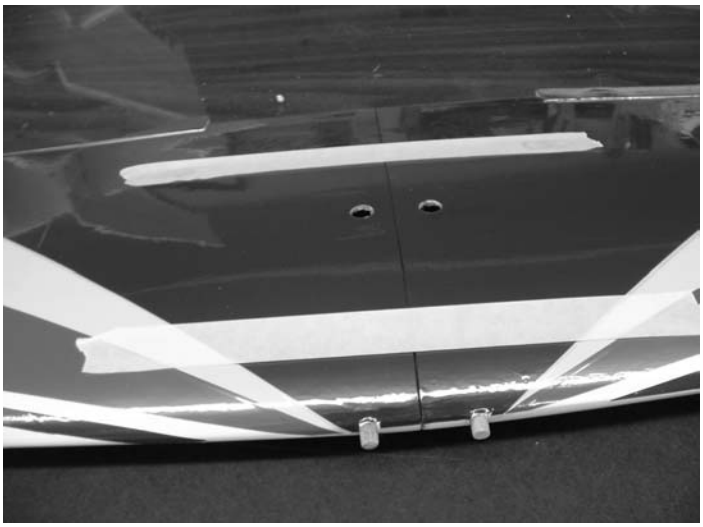
3. ☐ Mount the servo using the hardware supplied with the radio.The output arm should be to the rear.



4. ☐ Locate the dihedral brace. Identify the top side, it is straight, the bottom has a 1 degree angle

☐ Trial fit the dihedral brace in one wing half.

☐ Now slide the other wing panel on the dihedral brace.



5. ☐ When satisfied with fit and alignment, take the wings apart.

☐ Mix 3 oz. of 30 minute epoxy and apply a liberal amount to the root of both wings, both sides and the edges of the dihedral brace, and into the slots of both wings.

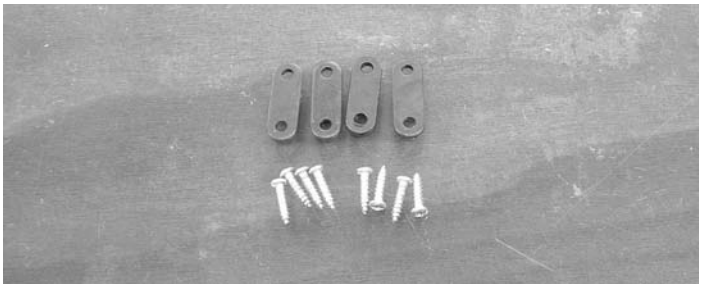
☐ Use a scrape piece of wood to work the epoxy down into the slots in the wings.

6. ☐ Slide the dihedral brace into place.

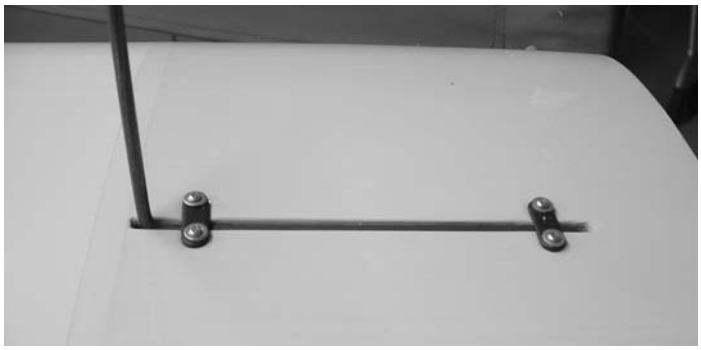
☐ Slide the other wing in place and use masking tape to hold the wing together till the epoxy cures.

☐ Check the trailing edge of the wing and use a pin to make sure it stays in perfect alignment.

☐ Lay the wing down on a flat surface till the epoxy cures, don't stand it on one tip. This will cause the epoxy to run to one end.



7. ☐ When the epoxy is dry, locate the four metal landing gear straps and the eight #2 x 1/2" screws.

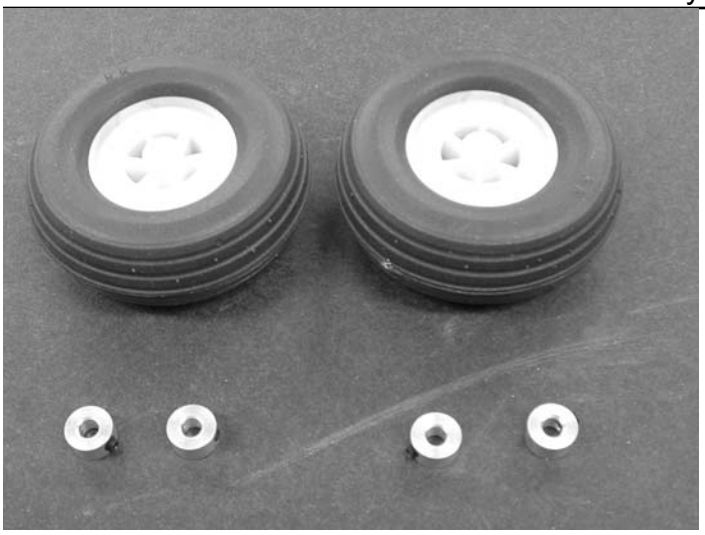


8. ☐ Insert the landing gear wire into the slot in the wing.

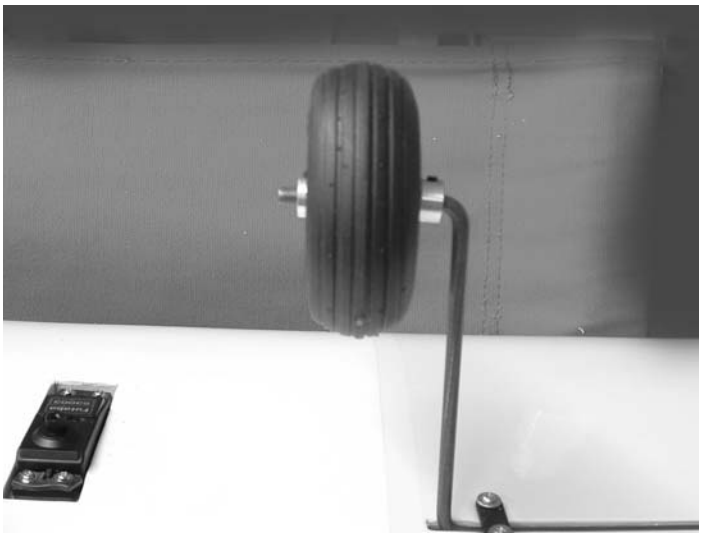
☐ Place one gear strap 1/2" in from the gear leg and the other 1/2" in from the end of the wire.

☐ Drill a 1/16" hole at each location and install the #2 screws.

☐ Repeat for the other wing.



9. ☐ Locate the wheels and four wheel collars.



☐ Install a wheel collar on the inside, then the wheel and the other wheel collar.

☐ Tighten with a 2mm allen wrench.

Tail Assembly

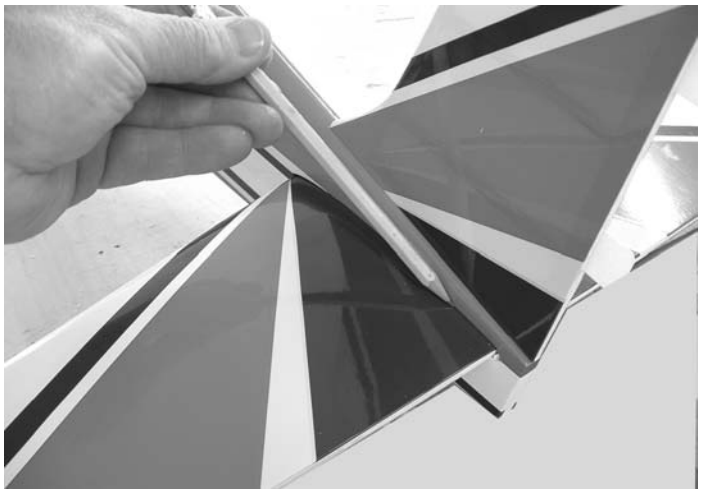
1. ☐ With the wing mounted on the fuselage, slide the stab into the slot in rear of fuselage.

☐ Slide the fin into place in the slot on the top of fuselage.

2. ☐ Measure the stab to make sure it is centered at the rear.Use a yard stick to measure from the rear corner of the stab to the trailing edge of the wing at the fuselage..

☐ Move stab until this measurement is the same on both sides.

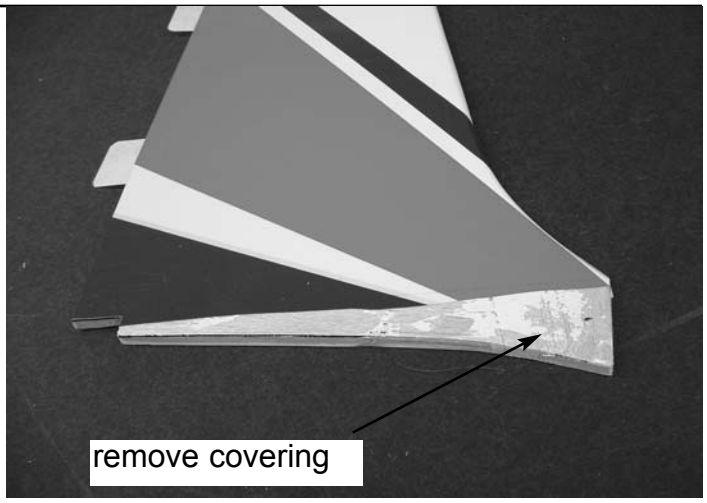
☐ Sight the stab, fin, wing alignment from the rear of the plane. The alignment can be changed slightly by pushing up or down on the stab tip. This is all that should be needed, but if more is needed you can sand the stab saddle till the alignment is perfect.



3. ☐ Do the same with the fin.

☐ When happy with the alignment, use a marking pen and mark a line on the stab, top and bottom and on both sides of the fuselage.

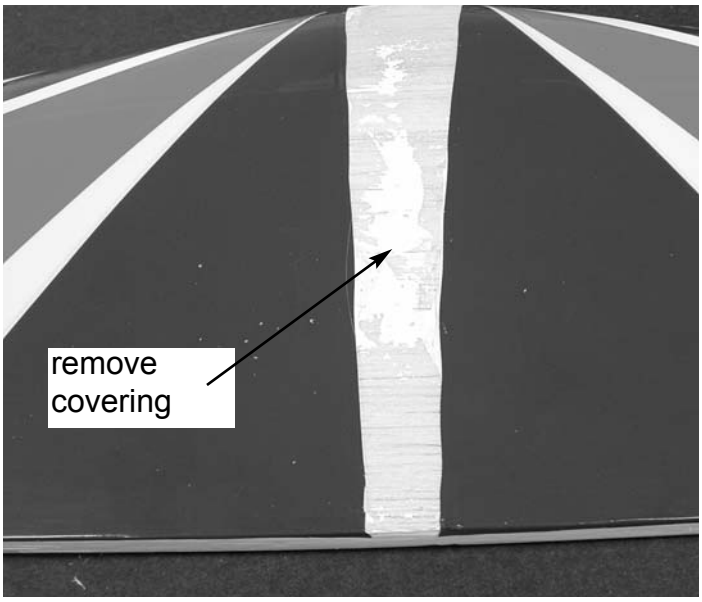
☐ Do the same to both sides of the fin.



4. ☐ Remove stab and fin from fuselage and using a razor blade, remove the covering between the lines you just marked.

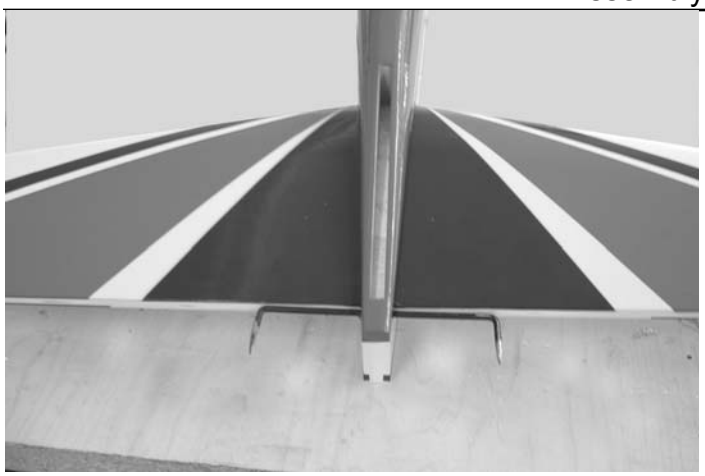
☐ Cut about 1/8” inside your mark so bare wood will not be exposed when glued in place.

Caution: Cut carefully and cut only the covering, don’t cut the balsa underneath as this would weaken the stab and fin.

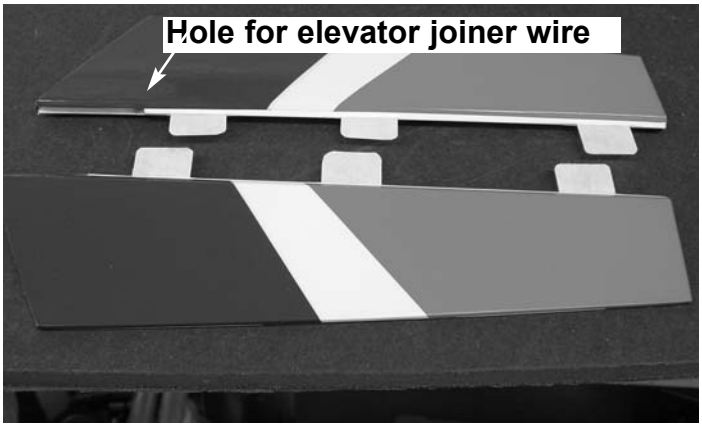


Important:

You must install the elevator joiner wire before installing stab. The elevator wire cannot be installed after the stab is glued in place.



5. ☐ Using 30 minute epoxy, glue the stab and fin in place using the marks made earlier to align. Use masking tape to hold in place if necessary. Check alignment and allow epoxy to cure.



6. ☐ Locate the two elevator halves and insert the CA hinges in the slots.

☐ Use pins in the middle as we did with the ailerons to keep the hinge centered.

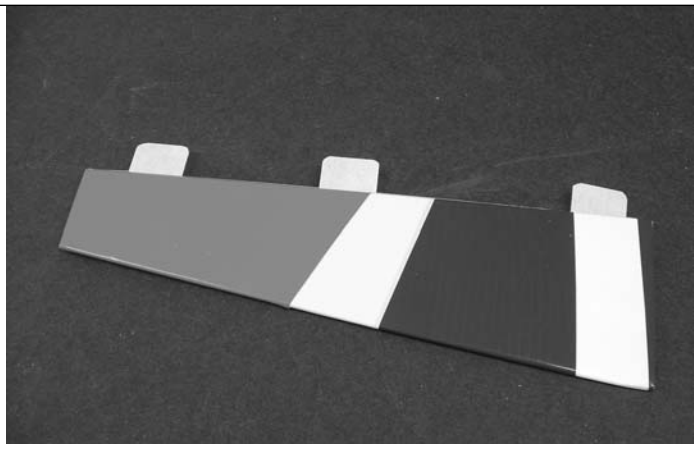
☐ Locate the hole for the elevator joiner wire in each elevator.

☐ Trial fit the elevators in place making sure the hinges go all the way in and the joiner wire fits all the way into the slot.

7. ☐ When satisfied with the fit, put some epoxy in the elevator joiner hole and install the elevators.

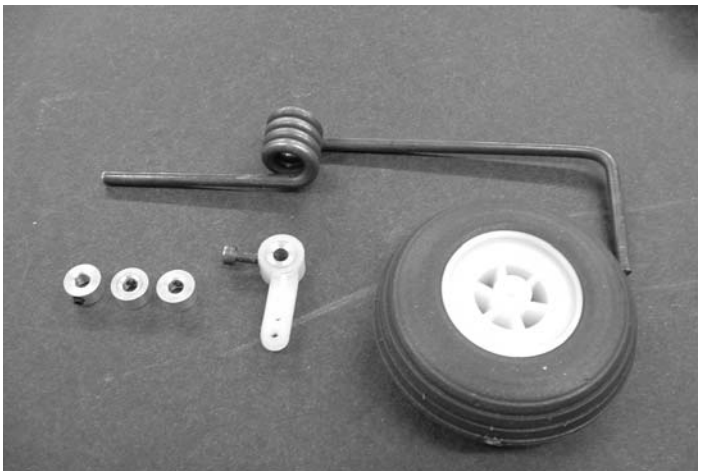
☐ Push the elevators up against the pins, then remove the pins and push the elevators flush against the trailing edge.

☐ Flex the elevator to its full travel in one direction (about 1”) and glue the hinges using thin CA. Flex in the other direction and apply glue on the other side of the hinges.

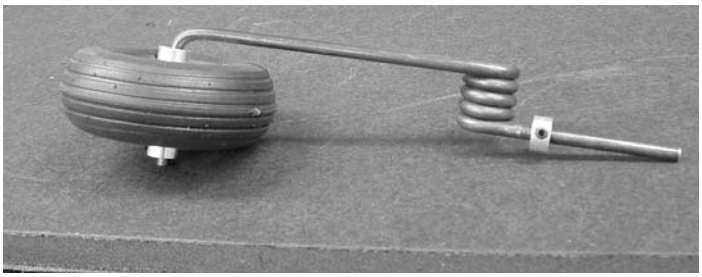


8. ☐ Locate the rudder and hinge it in place using the same method we did on the ailerons and elevators.

Nose Gear Mounting



1. ☐ Locate the nose gear, wheel, steering arm and three wheel collars.



2. ☐ Mount the wheel using a wheel collar on each side. Install another wheel collar 3/8” above the coil on the top portion.

3. ☐ Insert the gear into the hole in the bottom of the fuselage and place the steering arm on the wire.

☐ Be sure and place the steering arm far enough away from the firewall so that it does not jam against the firewall when full right rudder is applied.(about 1/4”).

Note: It is a good idea to mark the location of the set screw and remove the nose gear and file a flat spot on the wire where the set screw hits.

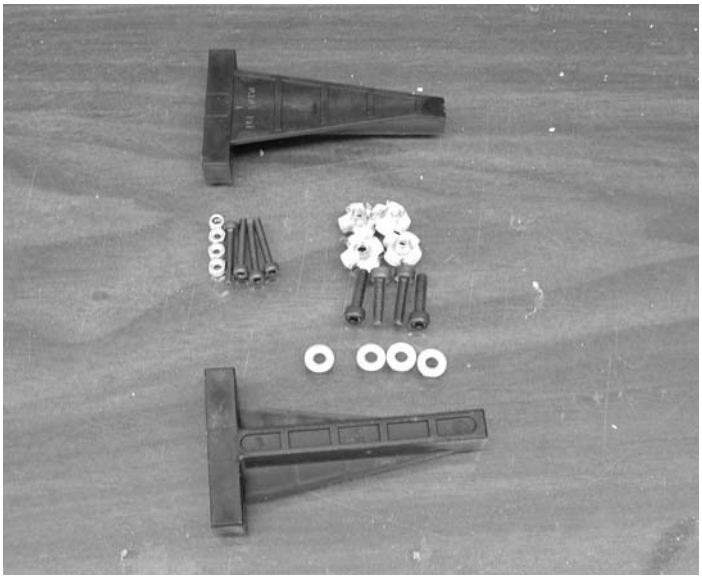
4. ☐ While working on the nose gear go ahead and apply a drop of CA glue to each of the nuts that hold the nose gear block in place.

☐ Locate the 2-56 pushrod and clevis and attach to the steering arm.

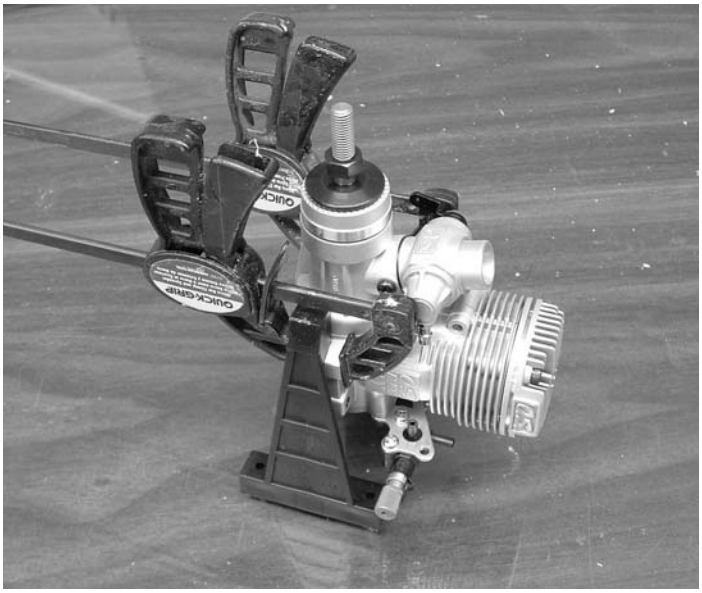
☐ Use a silicone keeper over the clevis.

☐ Insert the 5/32” nylon tube over the pushrod and let it lay in the bottom of the tank compartment.

Engine Mounting



1. ☐ Locate the two nylon motor mounts, four 3mm engine mounting bolts and nylon lock nuts, four 4mm bolts and washers and four blind nuts.



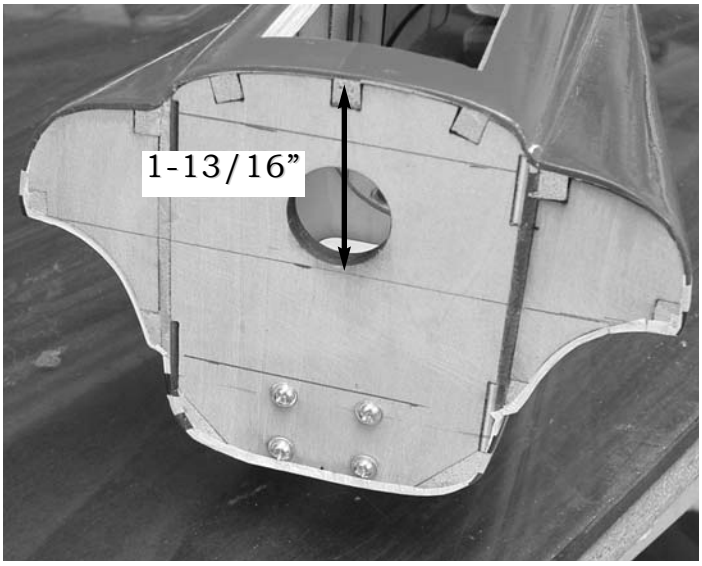
☐ The length of the cowl from the firewall to the back of the spinner is 4.75”. If you use a spinner that is flush on the back such as the Tru-Turn, that will be the distance to the prop hub. If you use a spinner such as the Goldberg which is offset at the rear you will need to add 1/4” to the length.

2. ☐ After you determine which spinner you will use, clamp you motor between the two mounts and set both flat on the table.

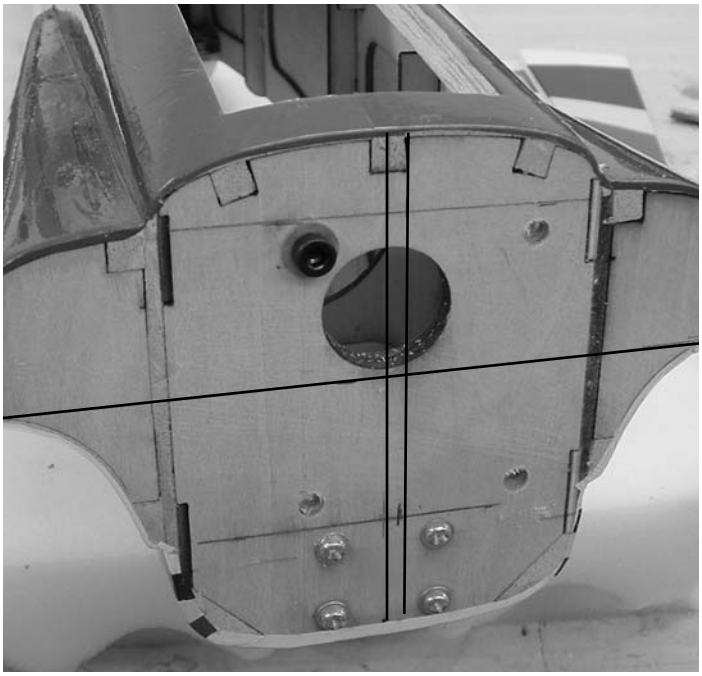
☐ Measure from the table to the front of the prop hub and move the engine until you have the right length.

☐ Mark the location of the holes and drill a 1/8” at the four spots.

☐ Mount the engine using the 3mm bolts and nylon lock nuts.



3. ☐ Measure down from the top of the fuselage 1-13/16” and draw a line across the fuselage.This should be just at the bottom of the cheek cowls.



4. ☐ Draw a line down the center of the firewall.

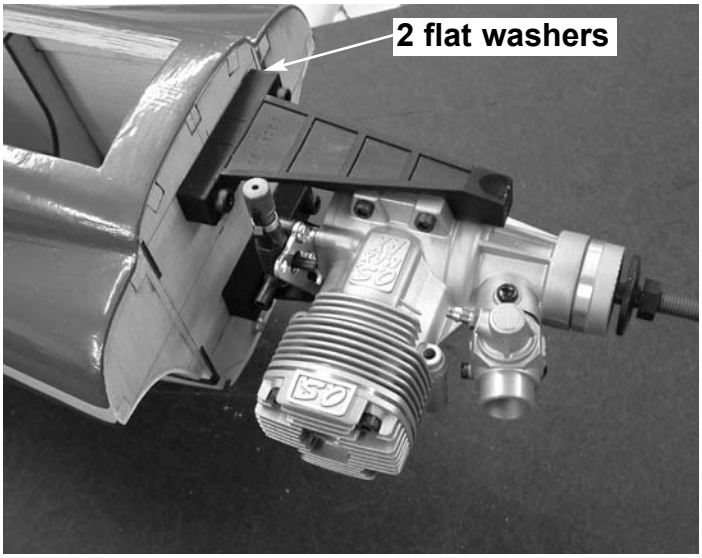
☐ Measure over 1/8” to the left side of the plane and make another line. This will be the offset for right thrust.

☐ Center you motor mounts on these marks and mark the location of the mounting holes.

☐ Before drilling the holes check to make sure your muffler will clear the bottom of the fuselage.

5. ☐ Drill a 13/64” hole at each location. This is the size of the shank on the blind nut, **not the bolt**.

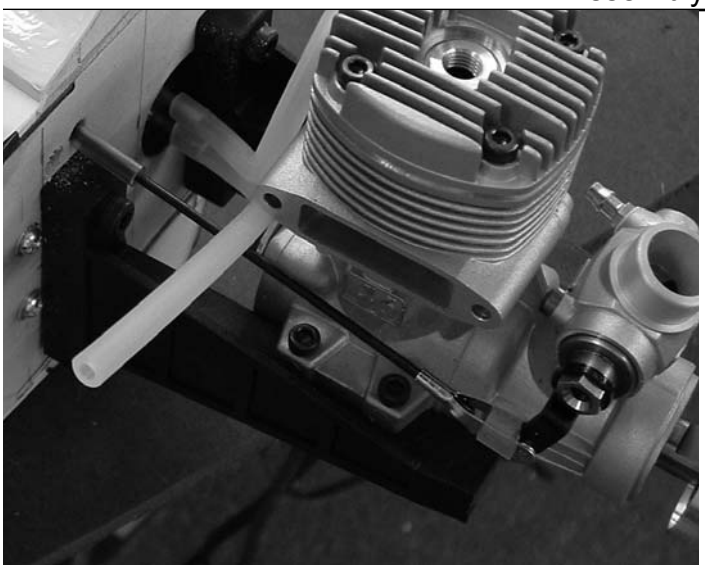
☐ Using one of the bolts and washers, pull each blind nut into place on the back of the firewall.

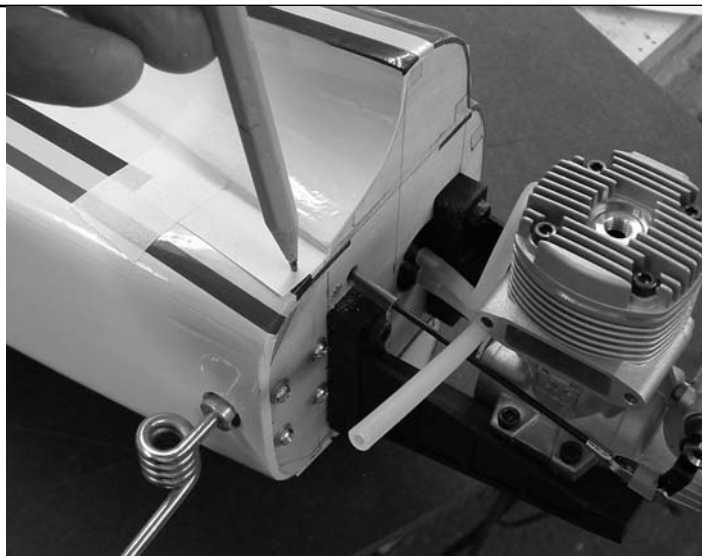


6. ☐ Bolt the engine in place using two flat washer under each mount on the left side.

Be sure and use thread lock on the bolts.

The engine is shown mounted sideways, it can me mounted in any position you desire, upside down or at an angle.





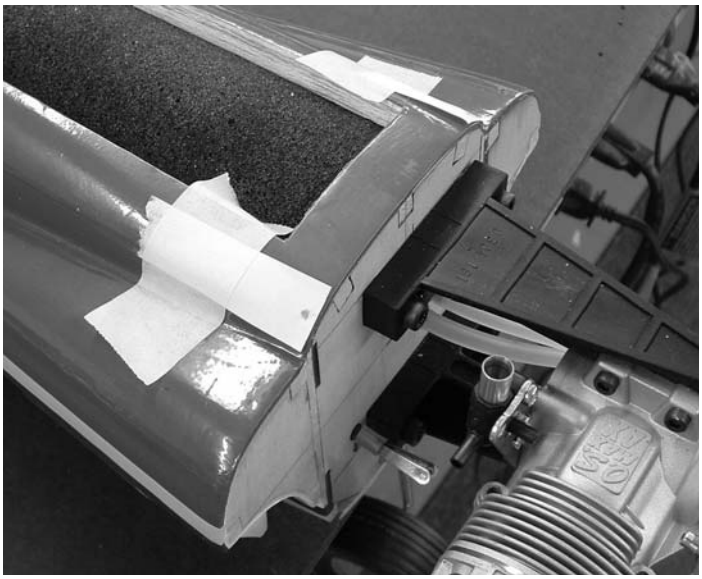
7. ☐ Drill a 5/32” hole in line with your throttle arm and just below the mount.

☐ Attach the 2-56 pushrod and clevis.

☐ Use a silicone keeper on the clevis.

☐ Insert the 5/32” nylon tube through the hole and leave about 1” in front of the firewall..

Cowl Mounting

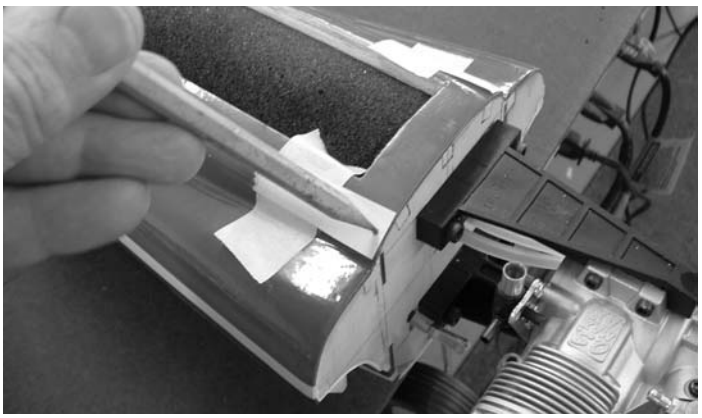


1. ☐ Cut four strips of paper 3/4” wide and 2” long. (Not included)

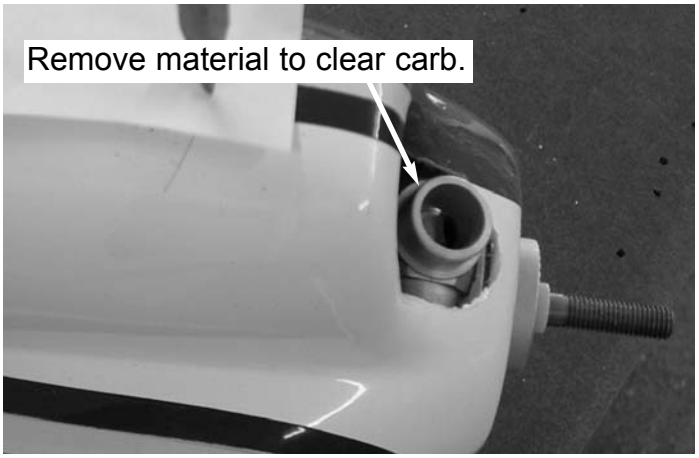
☐ Tape in place about 1” back from the firewall with the front edge flush with the firewall..Two on top, two on the bottom.

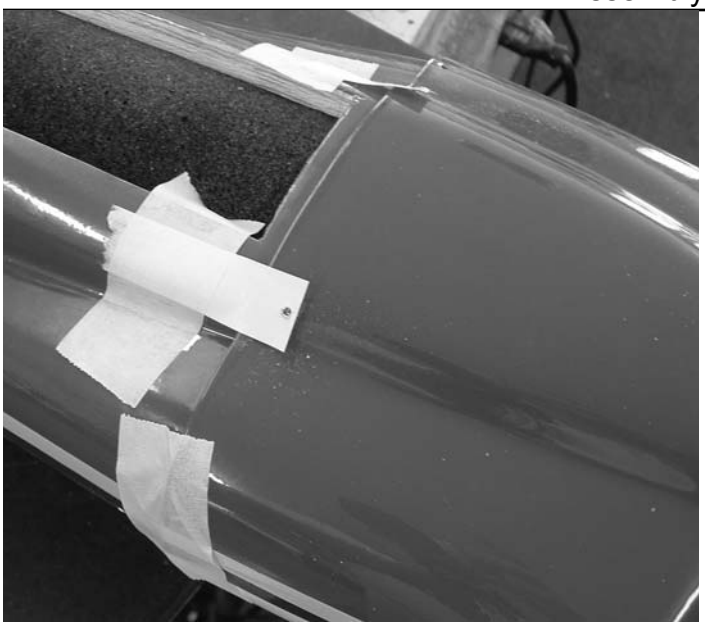
2. ☐ Make sure the location you pick is not over a balsa stringer, we want the screws to go into the hardwood of the firewall.

☐ Use a pencil and mark 1/8” back from the edge of the firewall.



3. ☐ Mark the location of the top holes 1/8” back from the firewall.





4. ☐ Slide the cowl in place allowing the tabs of paper to lay on top of the cowl.

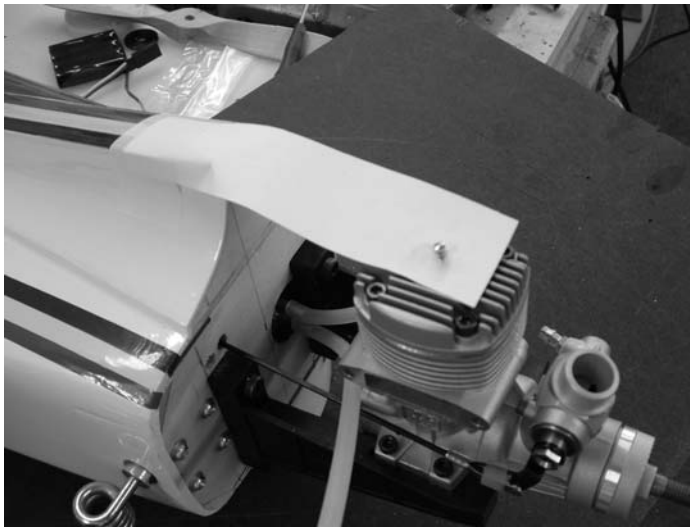
☐ You will probably have to remove some material in the right cheek cowl to clear the carb.

5. ☐ Install the prop and spinner and place a 1/16” shim between the back of the spinner and the cowl.

☐ Tape the cowl in place top, bottom and sides. Pay attention to make sure the cowl is pulled down tight on top and around the cheek cowl and the stripes are aligned.

6. ☐ When satisfied with the fit drill a 1/16” hole through the marks on the paper tabs into the firewall. **Make sure to hold the drill square to the firewall.**

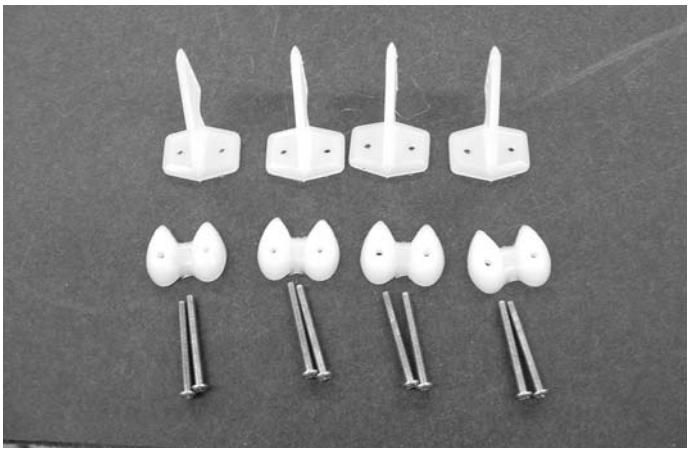
☐ Remove the cowl and open the holes up with a 3/32” drill.



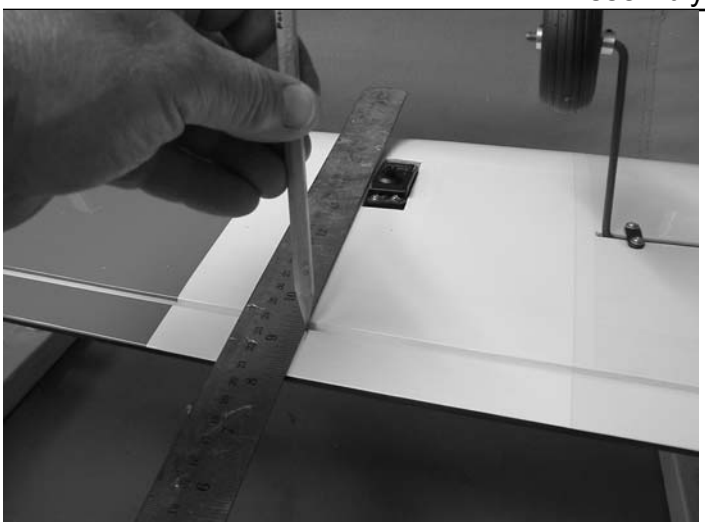
7. ☐ You can use the same method to locate the holes for the glow plug, needle valve and muffler.

8. ☐ After the tank is installed and the pushrod adjusted, mount the cowl using the four 2mm screws and washers

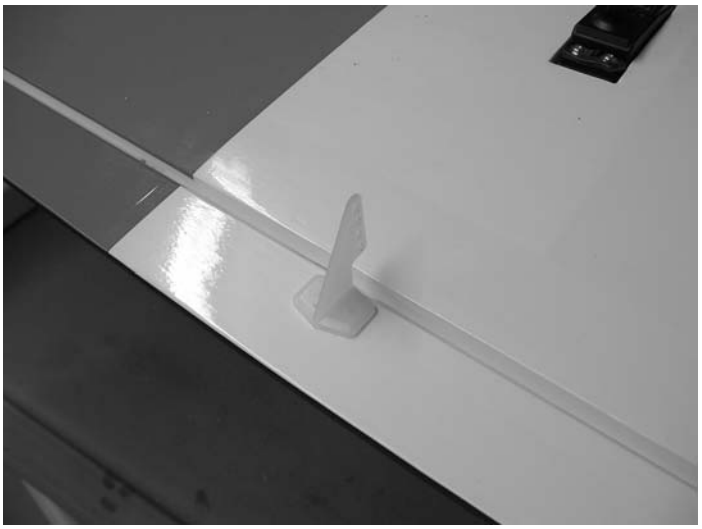
Radio Installation



1. ☐ Locate the control horns, nut plates and #2 screws.



2. ☐ Lay a straight edge along the side of the aileron servo on the outboard side and make a mark on the aileron.

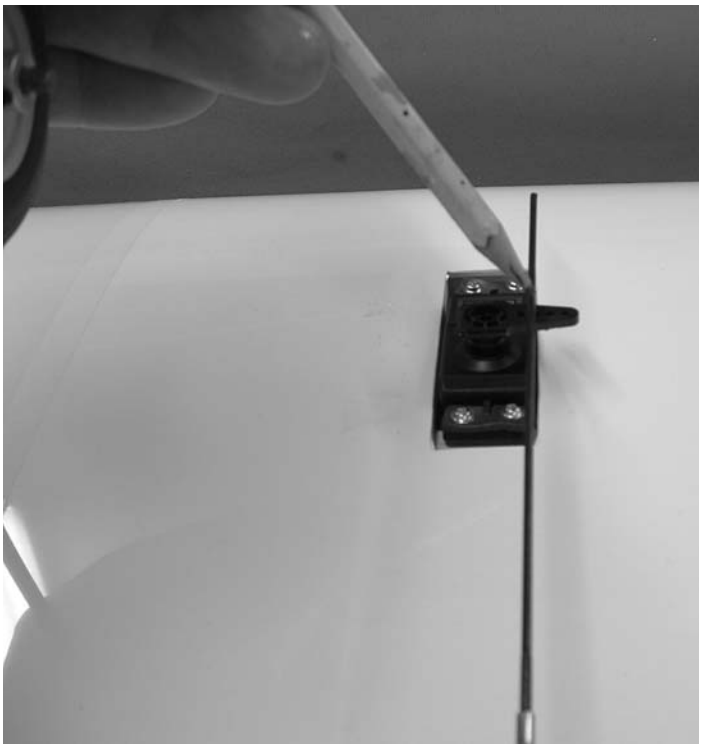


3. ☐ Set the control horn on the aileron at the mark making sure the holes for the clevis are aligned over the hinge line.

☐ Mark the hole location for the screws through the control horn.

☐ Remove the horn and drill a 3/32” hole at the two marks.

4. ☐ Install the control horn with two of the screws into the nylon nut plate on the top surface.



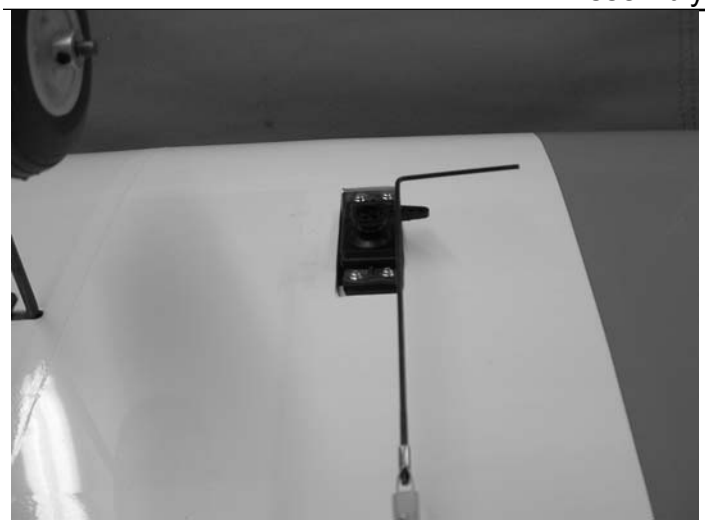
5. ☐ Locate one of the 6” long 2-56 pushrods and clevis.

☐ Install a silicone keeper on the clevis and make sure it is screwed on the wire with about 1/16” extending into the inner part of the clevis.

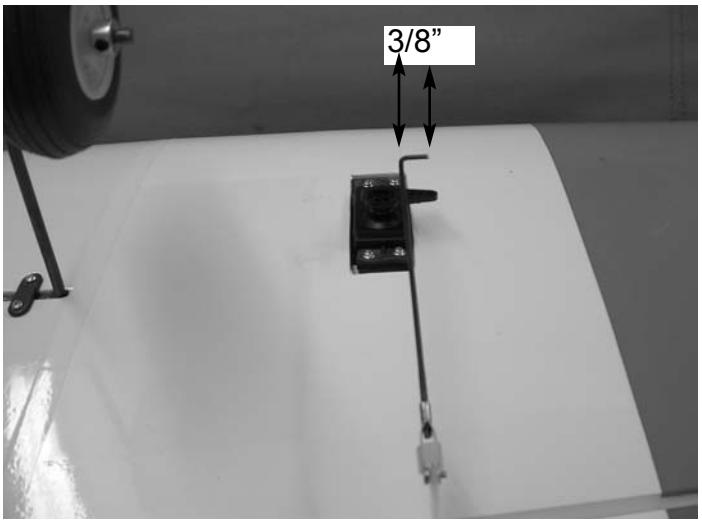
☐ Attach it to the control horn.

6. ☐ Put a servo arm on the servo and center it using your radio.

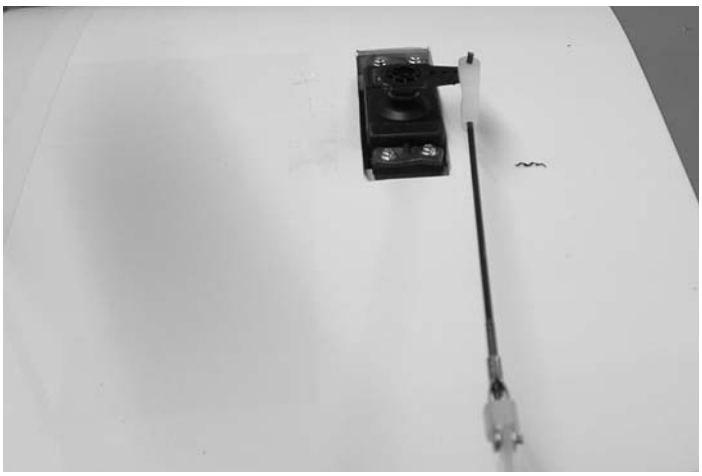
☐ Make sure the aileron is centered and mark the location on the wire where it crosses the servo arm.



7. ☐ Make a 90 degree bend in the wire at the location you marked.



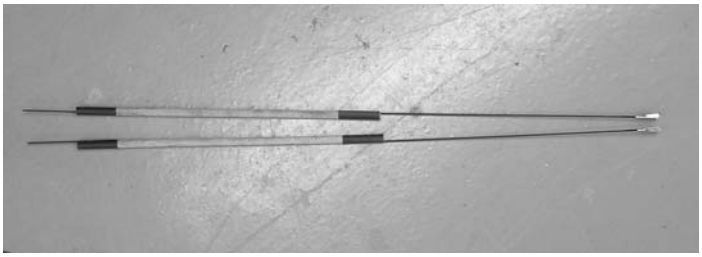
8. ☐ Cut the wire off leaving 3/8”.



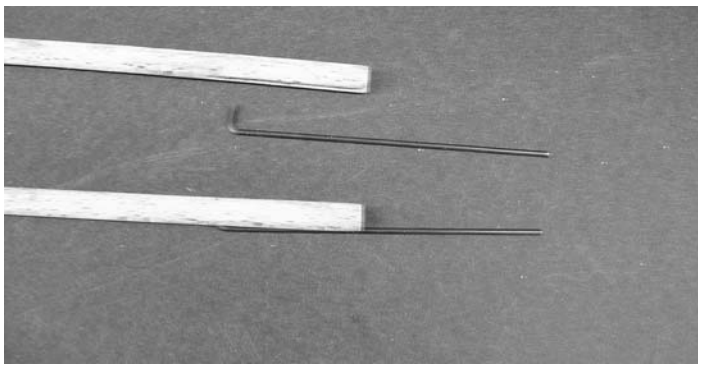
9. ☐ Insert the rod into the servo arm and retain using the nylon swing in keeper.

☐ Repeat for the other aileron.

Push Rod Installation

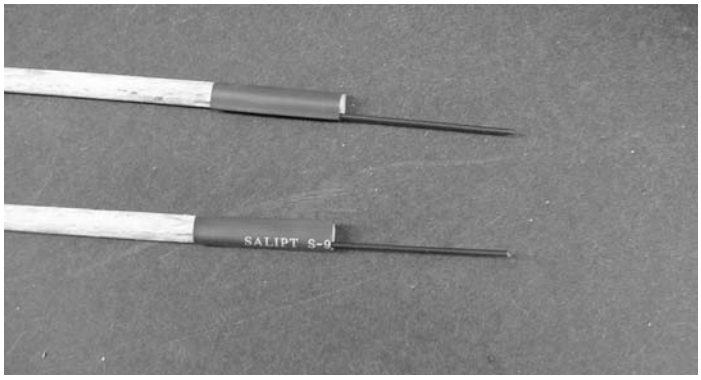


1. ☐ Locate the two wooden dowels, two pieces of 2-56 wire 4” long, two 12” long 2-56 pushrods, two metal clevis, two silicone keepers, and 4 pieces of shrink tubing.



2. ☐ Make a 90 degree bend 1/4” long in the end of both 4” pieces of wire.

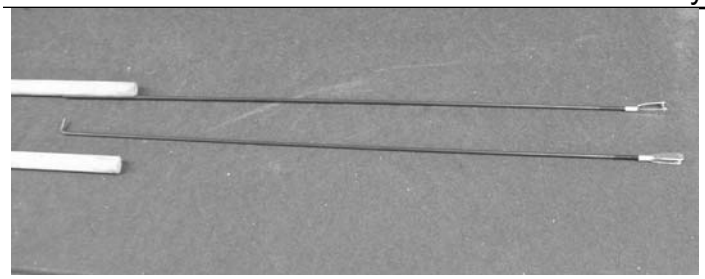
☐ Fit them into the hole in one end of the wooden dowel and into the groove cut in the dowel.



3. ☐ Put some glue on the wire in the slot, either CA or epoxy.

☐ Slide the shrink tubing over the wire flush with the end of the dowel and shrink in place using a heat gun.

You can use a match if you don’t have a heat gun.



4. ☐ Make a 90 degree bend 1/4” long in the end of the 12” pushrods and install them on the other end of the wooden dowel using glue and shrink tubing.

5. ☐ Locate the pushrod exits on each side of the fuselage under the covering and remove the covering.

Hint: A pencil tip soldering iron works really well to remove the covering and seal it at the same time.

6. ☐ Remove the clevis from the pushrods and insert them into the rear of the fuselage and out the holes in the rear.

☐ Use the pushrod to line up the rudder control horn on the right side of the plane.

☐ Make sure the clevis attachment holes are aligned over the hinge line and mark the location of the mounting holes.

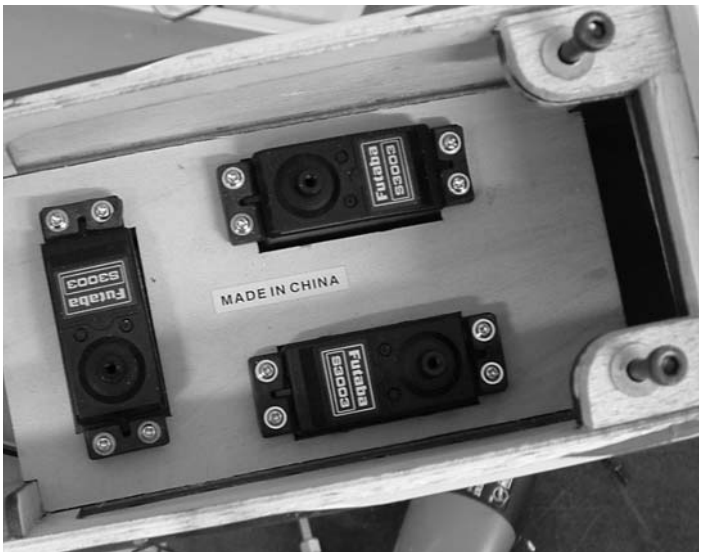
☐ Drill a 3/32” hole at the mark and mount the control horn using the screws and nut plate.

7. ☐ Mount the elevator control horn on the other side of the left side of the fuselage.

☐ Align the clevis holes over the hinge line and as far inboard as possible on the elevator.

☐ Reinstall the clevis on each pushrod with a silicone keeper and attach to the control horns.

Servo Installation

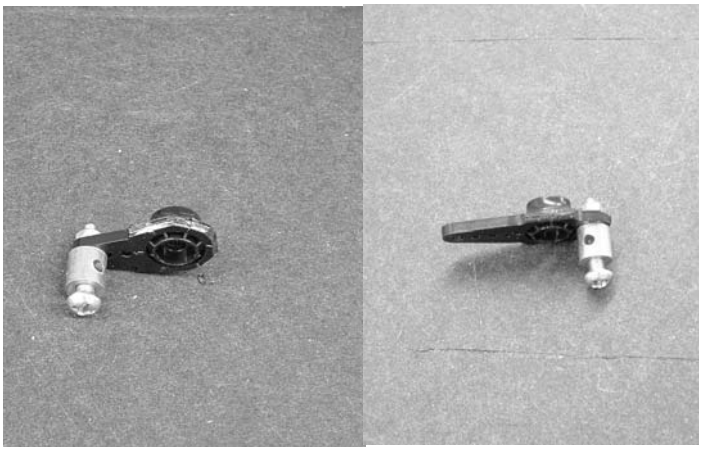


1. ☐ Install three servos in the fuselage using the hardware supplied with the radio.

☐ The rudder servo should have the output arm mounted forward on the left side of the plane.

☐ The elevator servo is mounted on the right side with the output arm to the rear.

☐ The throttle servo is mounted with the output arm to the right side of the plane.



2. ☐ Locate the two adjustable servo connectors and attach one the the throttle servo arm. **A three hole arm (1/2") is about right.**

☐ Attach the other connector to the inner most hole on a double sided four hole (3/4") servo arm for the rudder and nose gear.

3. ☐ Center the rudder servo with the radio and attach the pushrod to the connector.

☐ Make sure the nose gear is straight and tighten the screw.

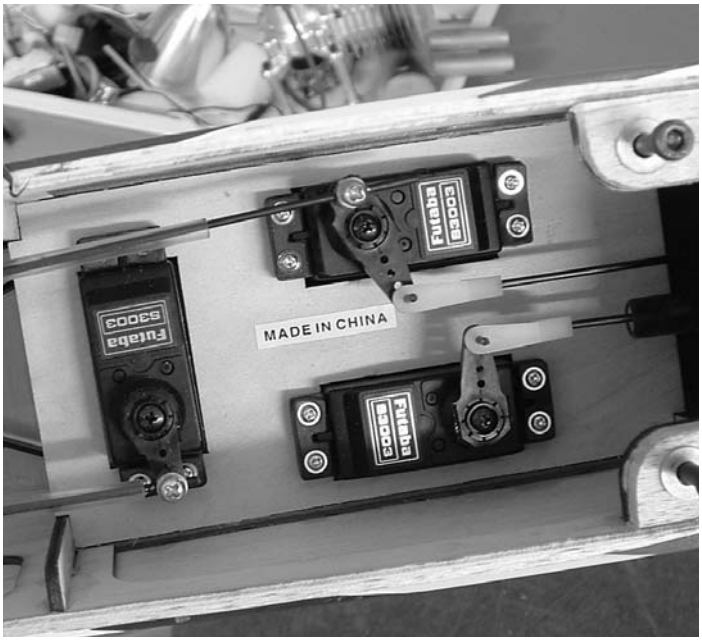
☐ Set the throttle servo to full high motor with the radio.

4. ☐ Attach the pushrod and push the throttle barrel full open. tighten the screw.

☐ The excess pushrod can be cut about 3/8" past the connector.

5. ☐ With the rudder servo centered and the rudder centered, lay the rudder pushrod on the output arm and mark the location where it crosses.

6. ☐ Make a 90 degree bend in the wire and cut off at 3/8”.



7. ☐ Install the pushrod in the outer most hole and retain with the nylon swing in keeper.

☐ Repeat the procedure for the elevator servo. Use a four hole out-put arm for the elevator.

8. ☐ Install the switch in the side of the fuselage on the opposite side from the exhaust.

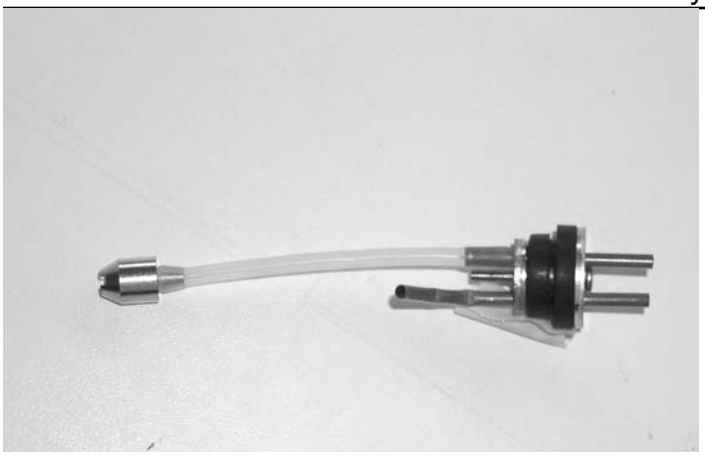
Fuel Tank Installation

1. ☐ Locate the fuel tank and hardware.

2. ☐ Assemble the cap with large washer in front and small washer in the rear.

☐ Bend the long tube at a 45 degree angle so it will reach the top of the tank.

☐ The fuel pickup is straight with about 1/2” on each side of the cap.

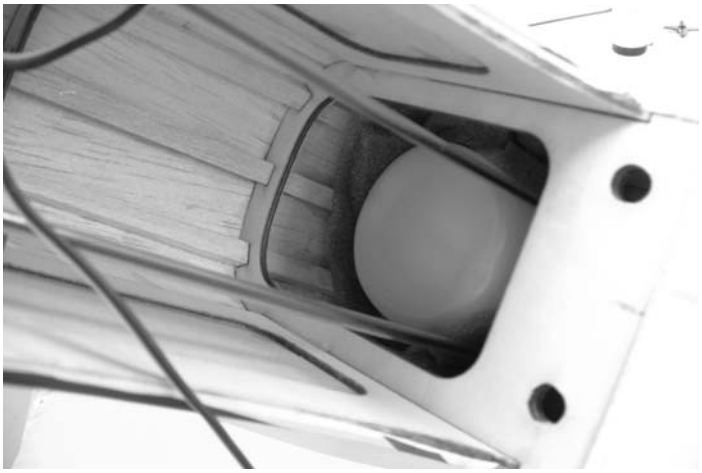


3. ☐ Install the silicone fuel tubing on the fuel pickup line with the clunk on the other end.

☐ Adjust the length of the tube so the clunk will be 1/4” off the bottom of the tank when the tank is held vertical.

☐ The vent tube should go to the top of the tank.

☐ When properly aligned tighten the screw in the cap to secure it in the tank.



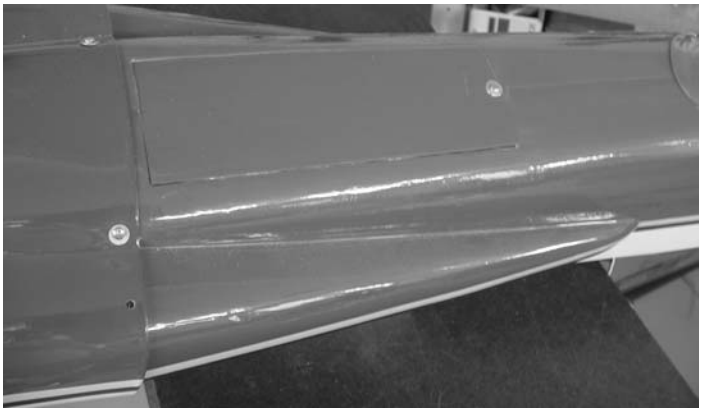
4. ☐ Slide the tank into the fuse through the wing opening.

☐ The tank will sit on the pushrod tubes from the throttle and nose gear.

☐ Use foam rubber(not supplied) to cushion the tank.

☐ Access the front of the tank through the hatch on top and guide the cap assembly into the hole in the firewall.

☐ Attach fuel line (not supplied)from the vent line to the muffler pressure tap and from the fuel pick up line to the carb.



5. ☐ Install hatch using a #2 screw into the block in the rear of the hatch.

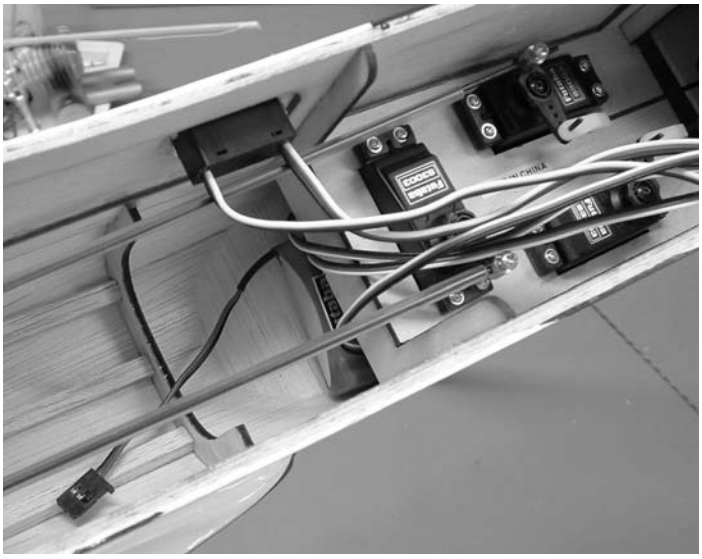
Canopy Installation

1. ☐ Trim canopy to fit, cut over-size and trim down slowly till you have about 1/4” over-lap.

☐ Glue in place using canopy glue.

☐ Use clear vinyl tape or colored tape to out line the canopy and make sure it does not come off.

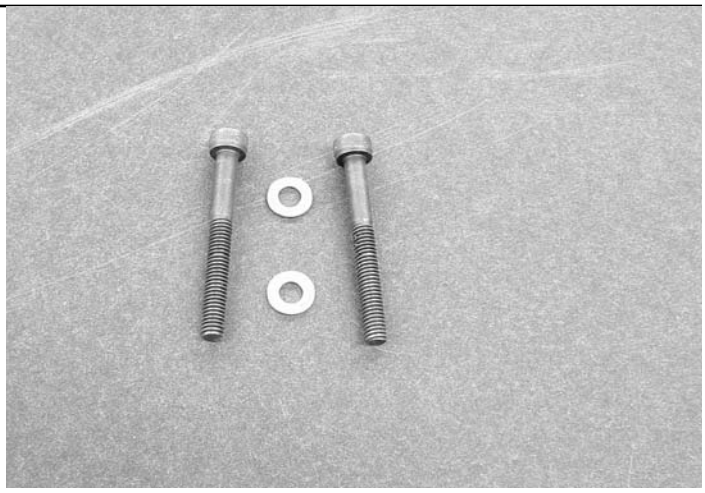
Battery & Receiver Installation



1. ☐ The battery can be placed under the servo tray for balance if necessary. It can also be placed all the way forward under the tank if needed for balance.

2. ☐ The receiver can be place in the opening between the servo tray and the bulkhead at the leading edge of the wing.

Be sure to wrap the receiver in at least 1/2" of foam rubber.



☐ Locate the 4mm x 35mm bolts and flat washers.

☐ Bolt the wing in place into the pre-installed blind nuts in the fuselage.

Control Throws

Low Rate

Elevator 1/2" up and down
Aileron 3/8" up and down
Rudder 3/4" each way

High Rate

Elevator 1" up and down
Aileron 1/2" up and down
Rudder 1-1/2" each way

Center of Gravity

3-1/4 to 3-3/4" behind leading edge of the wing next to the fuselage

Parts List

Airframe components

1. Fuselage	1
2. Wings	2
3. Aileron	2
4. Stab	1
5. Fin	1
6. Rudder	1
7. Elevators	2
8. Fuel hatch	1
9. Clear Canopy	1
10. Main Landing gear	2
11. Nose gear	1
12. Cowl	1

Wing Hardware

1.Dihedral brace	
2.	2
3. Control horns	2
4. Control horn plates	2
5. Control horn screws #2x3/4”	4
6. 2-56 clevises	2
7. Nylon swing in keepers	2
8. Silicone clevis keepers	2
9 .2-56x 6” pushrod	2
10.Wing bolts 4mm x35mm	2

Elevator, Rudder Hardware

1. Control horns	2
2. Control horn plates	2
3. Control horn screws (Elevator)#2x3/4”	4
4. 2-56x12” control rods with clevis	2
5. Unthreaded pushrods 4” long	2
6.Elevator joiner wire	
7. Nylon swing in keepers	4
8 Silicone Clevis keepers	2
9. 3\8” wooden dowels	2
10. Shrink tubing	4
11. Adjustable pushrod connector	1

Landing Gear Hardware

1. Main gear mounting straps	4
2. #2 screws for straps	8
3. 2-1/2” wheels	3
4. 3/16” wheel collars	7
5. Nose gear steering arm	1
5 2-56 x 15” with clevis.	1
6. 5\32 nylon tube	1

Cowl Mounting Hardware

1. #2 x 1/2 screws	4

Motor Mounting Hardware

1. Nylon motor mounts	2
2. 3mm x 20mm bolts	4
3. 3mm aircraft lock nuts	4
4. 4mm x 25mm bolts	4
5. 4mm blind nuts	4
6. flat washers	4

Misc. Hardware

Fuel tank 10.8 oz 320cc	1
Decal Sheet	1
Instruction Booklet	1

Adhesives

1. Thin CA (cyanoacrylate) glue
2. Medium CA. Glue
3. CA remover/debonder
4. 5-Minute Zap Z-Epoxy
5. 30-Minute Zap Z-Epoxy
6. Zap Z-42 Thread lock
7. Zap Canopy glue.

Throttle Hardware

1. Adjustable pushrod connector	1
2. 18” 2-56 pushrod	1
3. 2-56 clevis	1
4. 5/32” nylon tube	1
5. Silicon clevis keeper	1

Equipment Required

1. Four channel radio or better	
2. Servos- 46in.oz. or better	5
3. 650mah battery pack or larger	
4. Y-connectors	1
5. 6” extensions (Aileron)	2

8. Switch harness (your radio)
9. Motor .40 to .46
10. Prop and 2-1/4”” Spinner for your motor.
11. Fuel line (for gas or glow)
12. Pilot figure (optional)

Tools need to complete the Dart ARF

1. Drill and assorted bits
2. Hobby Knife with #11 blade
3. Masking Tape
4. T-pins or straight pins
5. Felt tipped pen/pencil
6. Rubbing alcohol
7. Paper towels
8. Phillips screwdriver
9. Allen wrenches
10. Metric tap 6mm.
11. Pliers (needle nose)
12. Mixing sticks
13. 36” yard stick or tape measure
14. Scissors
15. Moto tool with sanding drum.