HOBBICO®
EXTRA 300™

ALMOST READY-TO-FLY RADIO CONTROLLED MODEL AIRPLANE

- **SUPERIOR QUALITY IN AN ALMOST-READY-TO-FLY MODEL.**
- **SPECIAL COVERING PROCESS YIELDS A STRONG, BRILLANT, AND FUEL-PROOF FINISH.**
- **80% COMPLETE OUT OF THE BOX - NO SANDING, PAINTING, OR FINISHING REQUIRED**
- **WORLD CLASS AEROBATIC CAPABILITIES, JUST LIKE THE REAL EXTRA 300.**
- **BEAUTIFUL SEMI SCALE APPERANCE.**

WINGSPAN: 553/4"
LENGTH: 44 1/2"
WING AREA: 543sq.in.
WEIGHT: 91-95 oz.

RADIO: 4-Channel (Not Included)
ENGINE: .46 Performance 2-Cycle (Not Included)
or 60-70 4-Cycle (Not Included)
ACCESSORIES: Starting Battery w/Clip, Fuel Etc. (Not Included)

IMPORTANT: BEFORE YOU BEGIN.

Congratulations on your choice of an ASAP kit. **BEFORE** you begin assembly, carefully look through the box and thoroughly read the instruction manual. Also check the parts list against the items in the box to be sure you have everything that is on the parts list. Also check the parts list against the items in the box to be sure you have everything that is on the parts list. Although we have taken great pains to simplify the building process, there are no shortcuts to safety. These instructions are your guide to safe and successful flying.

Only after you are thoroughly familiar with the construction process should you proceed with assembly. **Remember! Under no circumstances will a dealer accept a kit back for return if assembly has already begun.**

If the Extra 300 is not quite what you expected, return it to your dealer in **New** and **Unused** condition. However, **we** think you will agree with us that the Extra 300 kit is one of the finest models of its type and will offer you many hours of enjoyment.

BEFORE ASSEMBLY

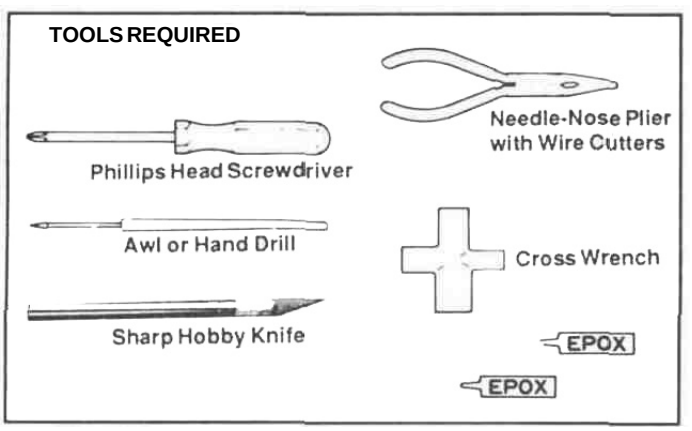
CONSTRUCTION HINTS:

1. Trial fit each part before gluing. Be certain that the parts fit properly.
2. Use PlastiZap or a thin type Cyanoacrylate glue for installing the plastic parts. Do not use too much, as it may run and spoil the appearance. Do not get Cyanoacrylate on the foam parts of the Extra 300. Cyanoacrylate will destroy the foam.
3. It is best to use 30 minute epoxy where required. This allows time to position the parts before the epoxy cures.
4. Before assembly, place your radio system on charge.
5. There is a metric ruler on page 3 to aid in finding the correct screw sizes.

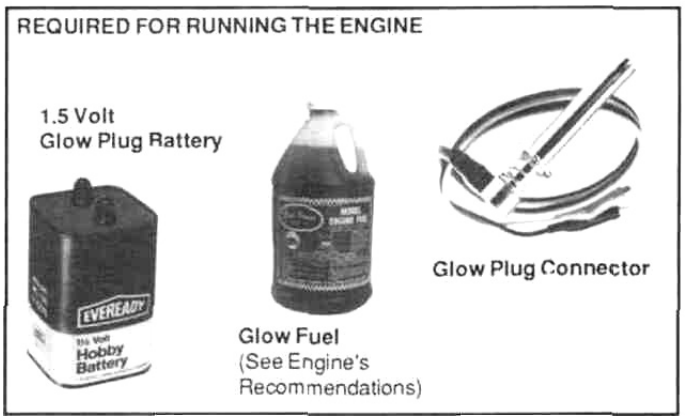
ADDITIONAL ITEMS

The following items are needed for completing the Extra 300 kit:

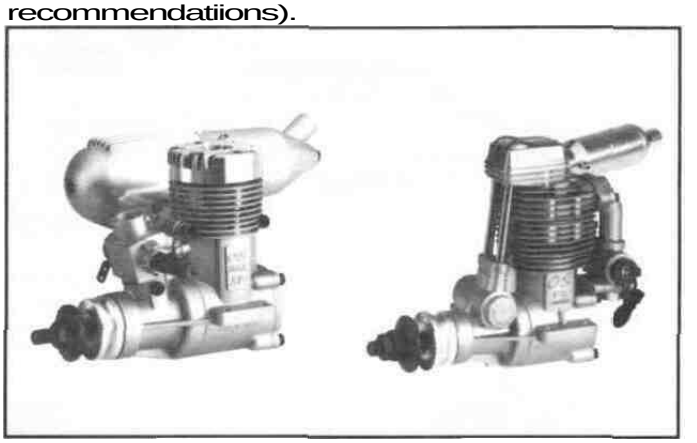
Medium Fuel Tubing (12") 1
.46 Sized 2-Cycle Engine 1
OR
.60 - .70 Sized 4-Cycle Engine 1
4-Channel Radio System 1
Pacer PlastiZap CA Glue 1
Goldberg #481 Foam Rubber 1
Hobbico (HCAR3950) 30-Minute Epoxy 1
Silicone Sealer 1
Dubro 121 E-Z Connects (Optional) 2
Dubro 203 Kwik-Switch Mount (Optional) 1
Hobbico (HCAR3760) Threadlock 1
Dubro In Line Fuel Filter 1



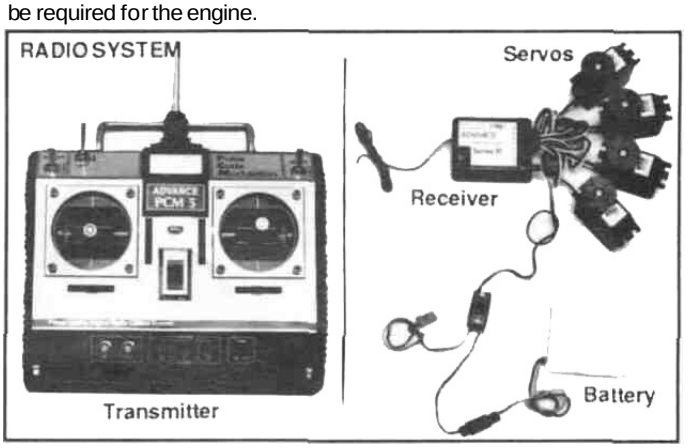
TOOLS-
You will need the following tools to assemble the Extra 300: X-Acto knife, Philips screwdriver (small and medium), needle nose pliers, drill, drill bits, sand paper, ruler, and string.



Most engines require a 1.5V glow plug starting battery, a glow plug clip, and a quality brand fuel (consult the engine manufacturer's recommendations).



A quality brand engine will be needed. We recommend the O.S. .46 SF 2-cycle engine or the O.S. 70 Surpass 4-cycle. A prop and fuel tubing will be required for the engine.

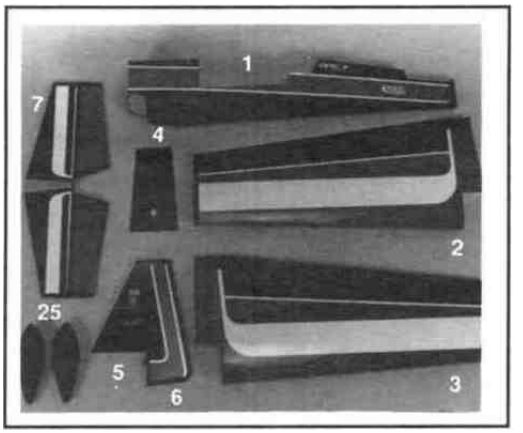


A four-channel radio control sytem with 4 servos is required for the Extra 300. The various components are pictured above.

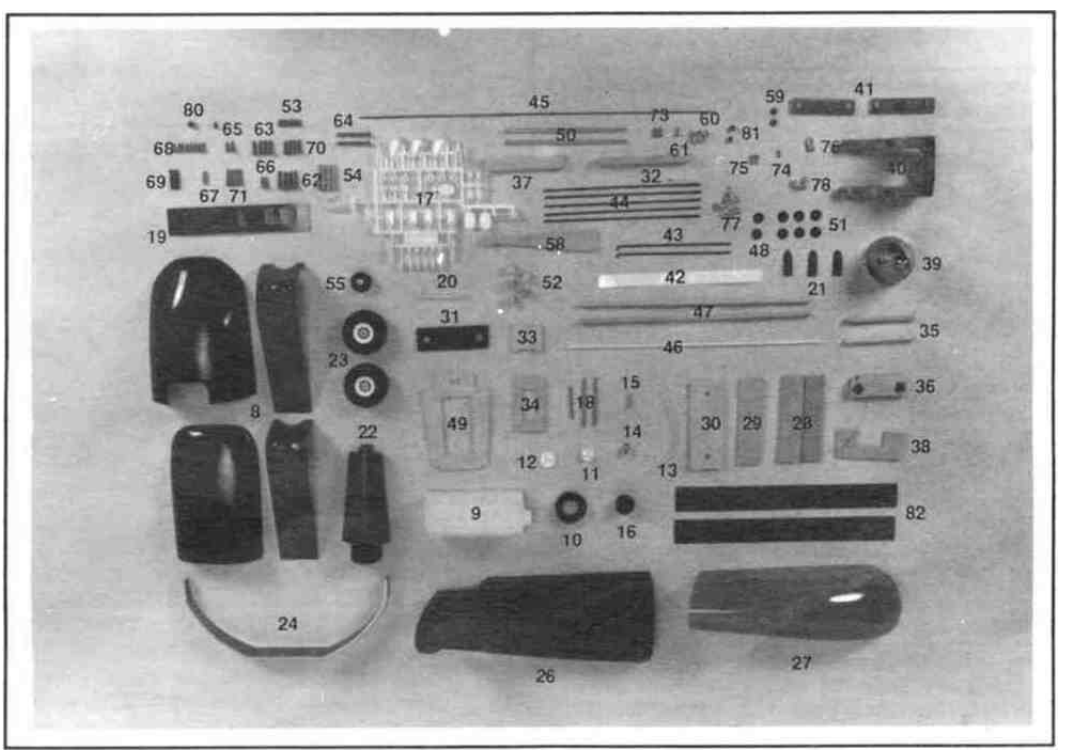
PARTS LIST

Before assembly, match the parts in the exploded view of the Extra 300 with the parts in the kit. Check off each part on the parts list. If any parts are missing or damaged return the kit to your hobby dealer.

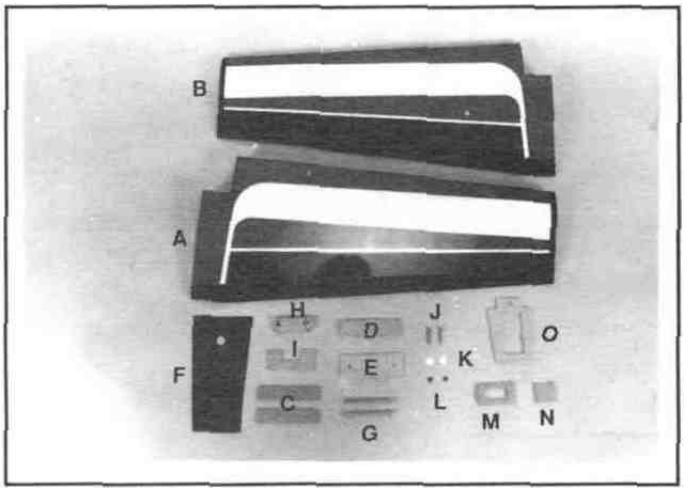
Check to make sure that all the listed parts are included in your kit.



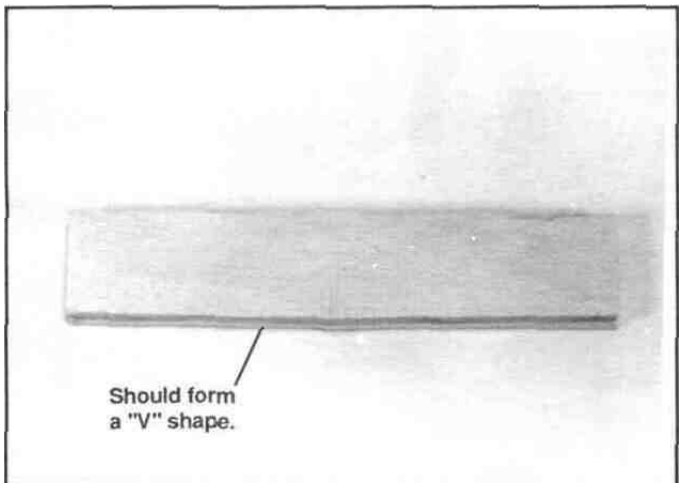
1 Fuselage
2 Right Wing
3 Left Wing
4 Wing Center Cover (Plastic)
5 Vertical Fin
6 Rudder
7 Horizontal Stabilizer
8 Cowl (4 Piece)
9 Fuel Tank
10 NeopreneRing
11 Plastic Disc (Small)
12 Plastic Disc (Large)
13 Silicone Tubing
14 Clunk
15 3x18mm Self-Tapping Screw
16 Rubber Plug
17 Plastic Collar
Aileron Horn
Control Horns
Snap Clevis
Rod Clevis
Back Plates
18 Fuel Pipe
19 Mounting Plates (Angled)
20 Clevis Retaining Tube
21 Push Rod Exits
22 Stab. Root Cover (Plastic)
23 Wheels
24 Main **Gear**
25 Wheel Pants
26 Cock Pit
27 Canopy
28 Main Wing Joiners
29 Rear Wing Joiner
30 Front Wing Joiner
31 Rubber Shock Absorber
32 Cowl Brace
33 Aileron Servo Tray Mount
34 Aileron Servo Tray
35 8mm Dowel Rod
36 Wing Bolt Mounting Block
37 Balsa Tank Support
38 Wing Mounting Brace
39 3x12mm Self Tapping Screw
2 1/4" Spinner
Spinner Back Plate
40 Engine Mount
41 Mounting Plates
42 Shrink Tubing
43 Control Rod (Short-Bent)
44 Control Rods
45 Throttle Control Rod (Long)
46 Throttle Tube
47 Wood Push Rods
48 Plastic Disc (Red)
49 Main Servo Tray
50 Stabilizer Supports
51 Plastic Disc (Blue)
52 CockPit Mounts
53 Brass Sleeve
54 Brass Tube
55 Tail Wheel
56 Tail Gear
57 Tail Gear Mount
58 1/8" Wooden Wedge
59 0-Ring
60 Collars
61 Wheel Collar
62 4 x 40mm Screw
63 4 x 30mm Screw
64 2x15mm Screws
65 3 x 8mm Self-Tapping Screw
66 3 x 8mm Screw
67 3x12mm Self-Tapping Screw
68 3 x 5mm Screw
69 3.5 x 15mm Screw
70 3x12mm Screw
71 4x15mm Screw
72 4 x 20mm Screw
73 4mm Nut
74 2mm Nut
75 3mm Nut
76 4mm Washer
77 3mm Washer
78 2mm Washer
79 Lock Washers
80 4mm Washer
81 4mm Nylon Nut
82 Cowl Stripes (Red)
83 Decal Sheet



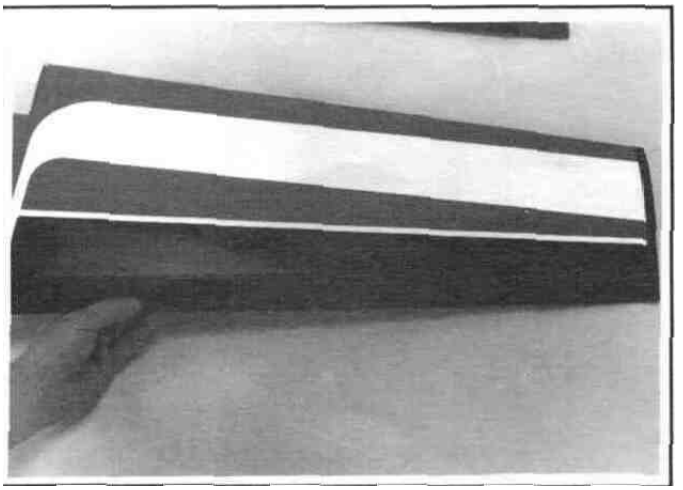
WING ASSEMBLY



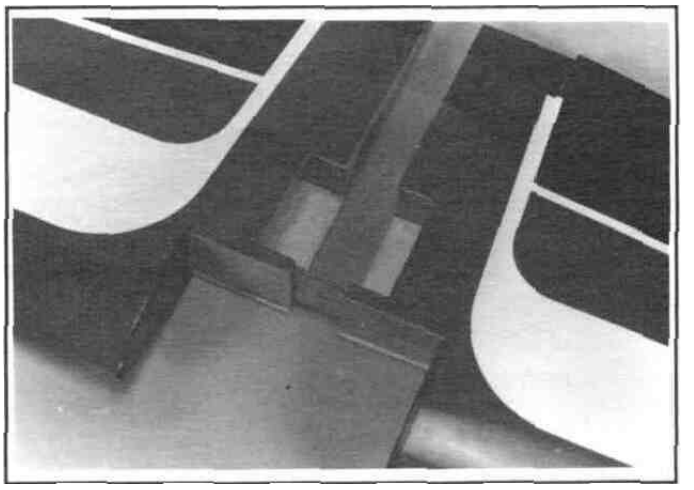
A. Right Wing (Aileron Installed) 1
B. Left Wing (Aileron Installed)..... 1
C. Main Wing Joiner..... 2
D. Rear Wing Joiner..... 1
E. Front Wing Joiner..... 1
F Wing Center Cover (Plastic)..... 1
G. 8mm Dowel Rods 2
H. Wing Bolt Mounting Block..... 1
I. Wing Mounting Brace..... 1
J. 4 x 30mm Bolts 2
K. 4mm Washer 2
L 0-Ring 2
M. Aileron Servo Tray 1
N. Aileron Servo Tray Mount..... 1
O. Main Swvo Tray..... 1



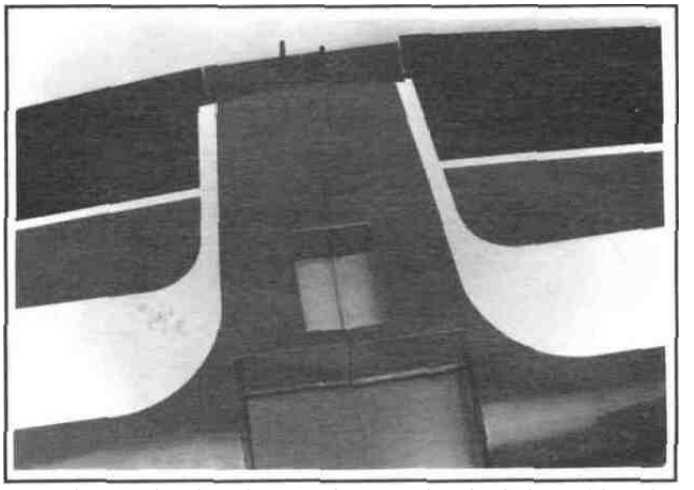
1. Align and epoxy the two main wing joiners together. Hold tight until the glue sets. You'll notice that there is dihedral angle cut into the joiners **so** make sure they are perfectly lined up.



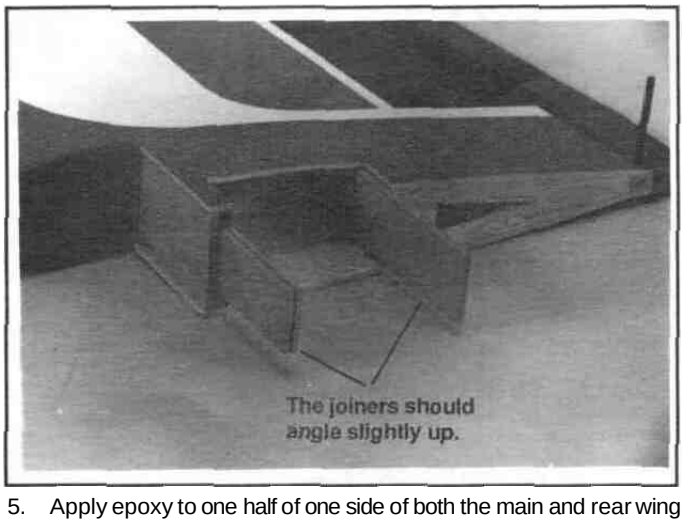
2. Check each wing half for smooth aileron operation. It is a good idea to exercise (move back and forth) the ailerons to insure easy deflection. Trim the end of the aileron if any rubbing is noticed.



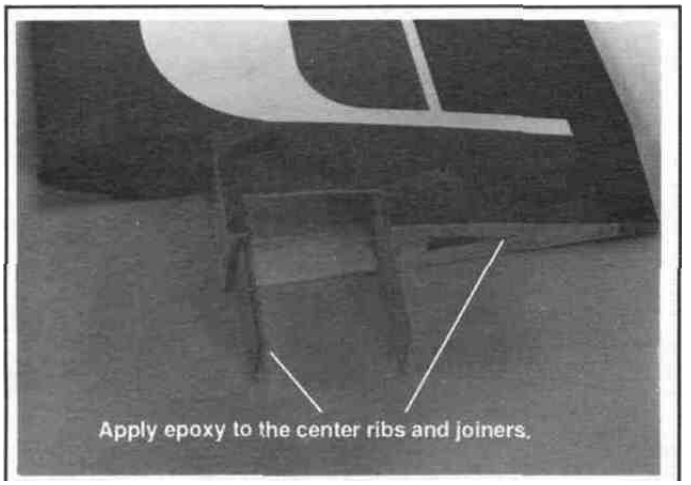
3. Remove the foam covering from the aileron servo mounting area from the top side of the wing. Test fit the main wing joiner and the rear wing joiner in the right and left wing sections. The dihedral angle of the joiners should make the wing tips slightly higher than the center.



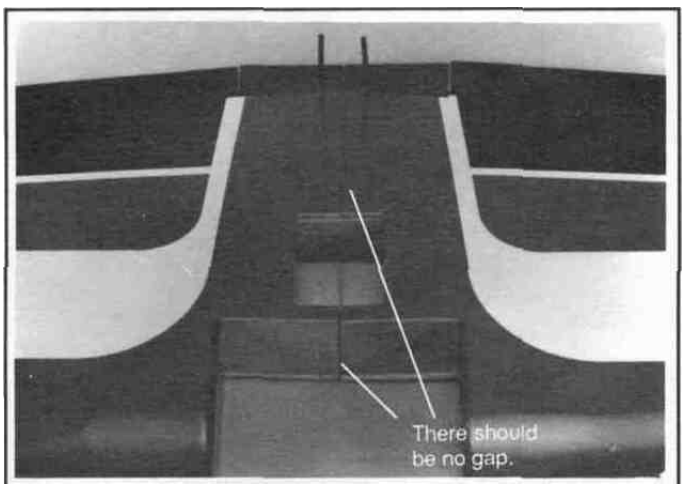
4. Make sure that there is no gap between the wing halves. If there is, sand the wing joiner ends until there is a tight fit.



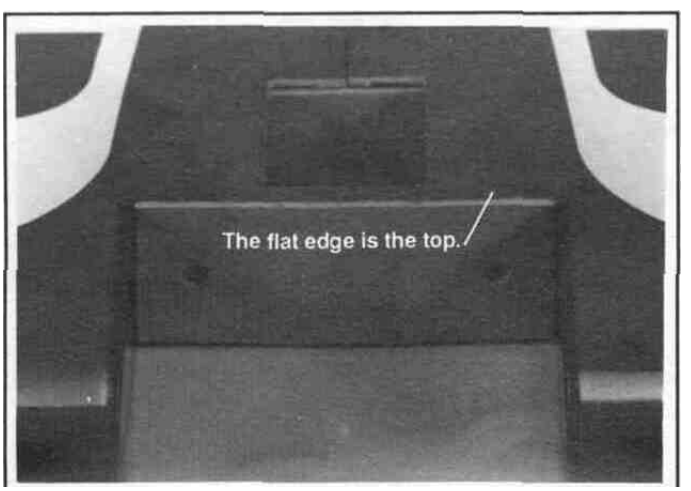
5. Apply epoxy to one half of one side of both the main and rear wing joiners and glue them to one wing half. Make absolutely sure the wing joiner pocket is well coated with epoxy. Make sure the dihedral angle is correct and that the wing halves are slid in all the way. Clean any excess epoxy with paper towel and isopropyi alcohol.



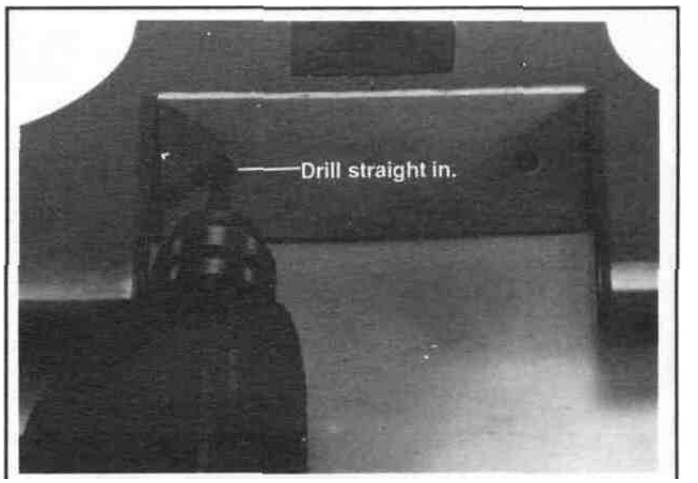
6. After the joiners have cured, apply epoxy where shown. The wing roots, the wing joiners should be evenly and liberally covered with epoxy. The wing joiner pocket should be heavily coated with epoxy.



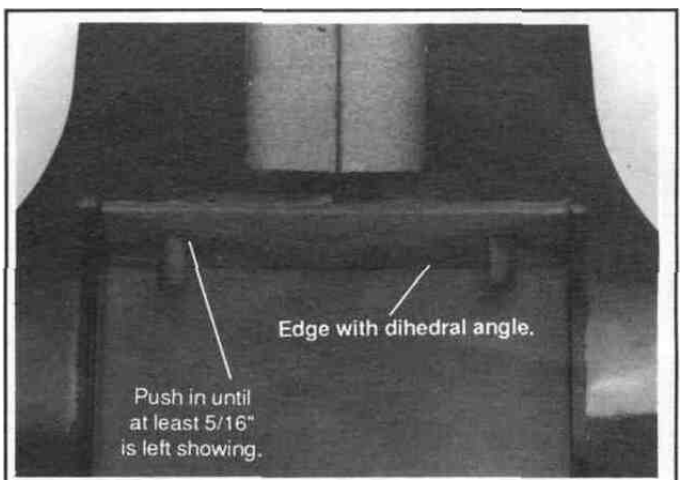
7. Slide the two wing halves together slowly and wipe off any excess glue. With the wing on a flat surface, hold one wing half down so the other end will be elevated. The wing tip should be 1 1/16" off of the surface. Hold the two wing halves firmly together with tape until the epoxy has cured.



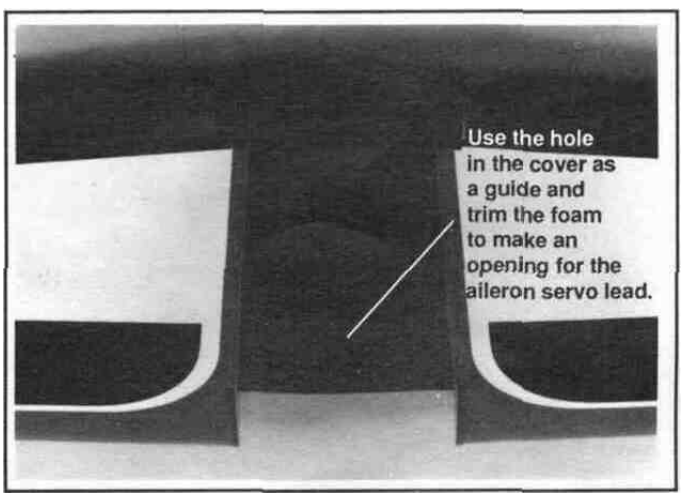
8. Once cured, remove the tape. Position the front joiner as shown. The flat edge of the joiner should line up with the top of the wing. Next, remove and epoxy in that same position. Let cure. **NOTE:** You may have to trim the covering for a tight wood to wood joint. This is very important to the structural integrity of the wing.



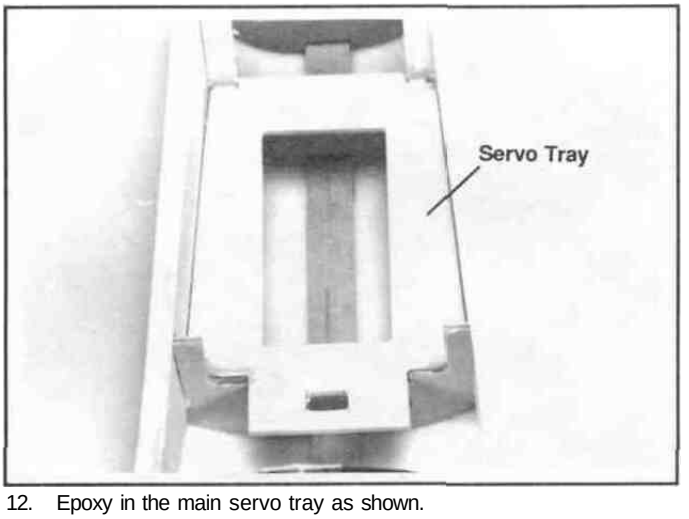
9. Drill two 8mm (5/16") holes into the wing joiners for the dowel rods. Drill through the front joiner and into the rear wing joiner.



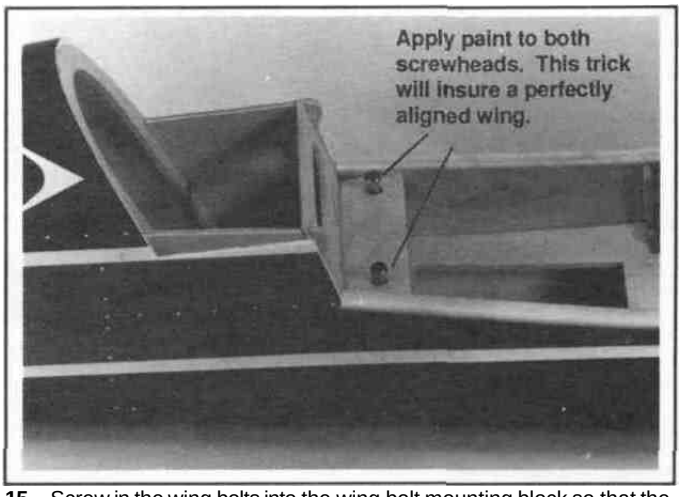
10. Epoxy the two dowel rods into the holes. Make sure they pass all the way through the front joiner plate and are inserted into the rear joiner.



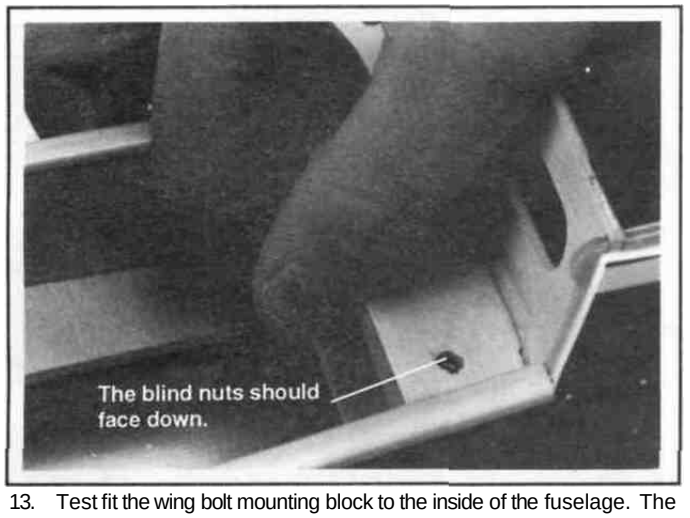
11. Position the wing center cover on the bottom of the wing. Apply Cyanoacrylate glue (PlastiZap) under the edges and hold until it sets.



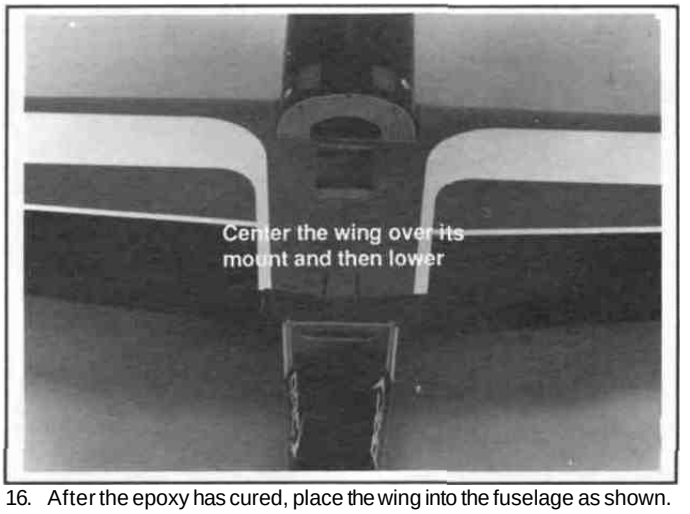
12. Epoxy in the main servo tray as shown.



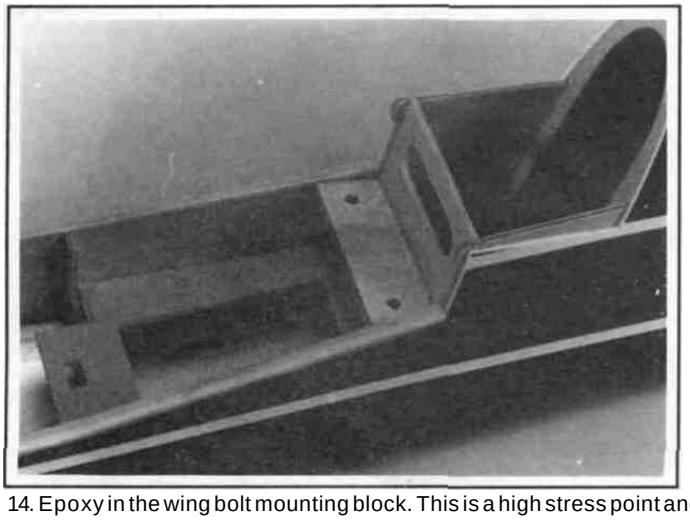
15. Screw in the wing bolts into the wing bolt mounting block so that the **heads are 1/4" above the block. Apply ink or paint to the heads of the two bolts.**



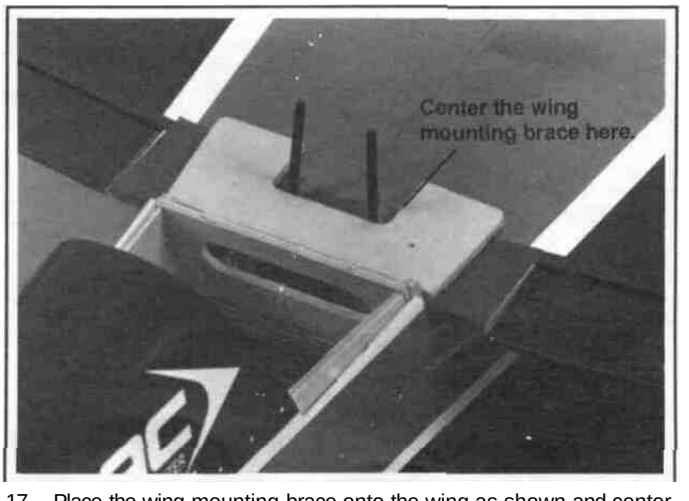
13. Test fit the wing bolt mounting block to the inside of the fuselage. The blind nuts should face down. Make sure that the blind nuts are securly pressed in and then place a drop or two of Cyanoacrylate **to** hold them in. Make sure that no glue gets on the threads



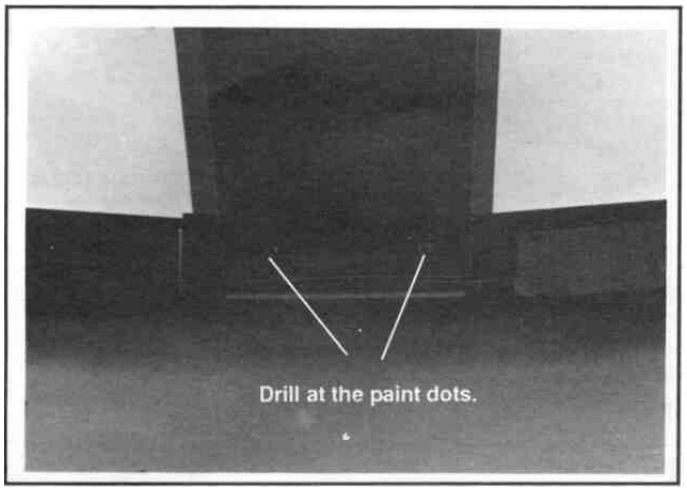
16. After the epoxy has cured, place the wing into the fuselage as shown. Put the front in first by inserting the dowel rods in the holes. Once in place lower the back into position. This will mark where you need to **drill.**



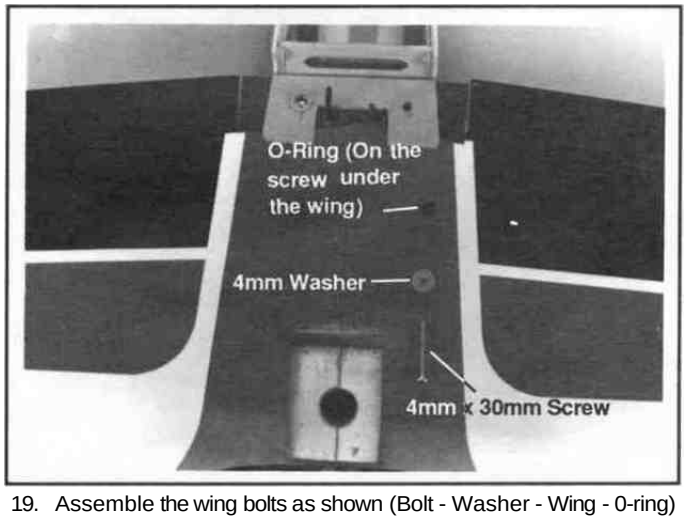
14. Epoxy in the wing bolt mounting block. This is a high stress point and extra care should be taken to ensure a strong joint. Let cure.



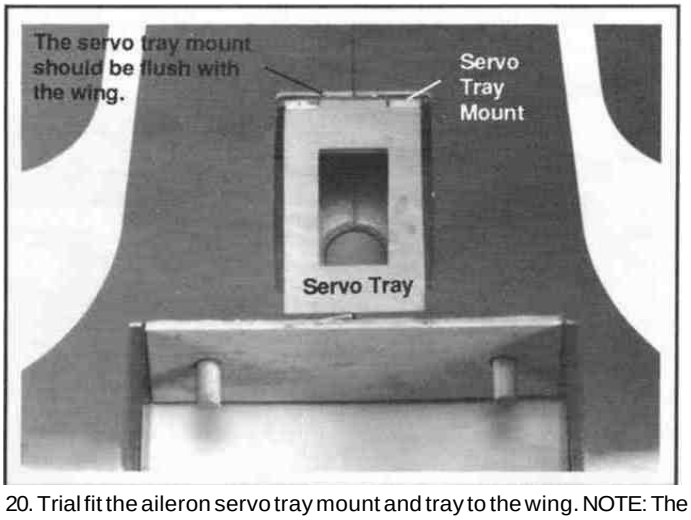
17. Place the wing mounting brace onto the wing as shown and center the wing and brace in the fuselage. **NOTE:** The two indentations on the brace should face up. Trim away any wood to allow the aileron torque rods to move freely. Use PlastiZap to glue this in place.



18. Drill two 4mm holes 90' from the top wing surface for the wing bolts where the paint marks are.

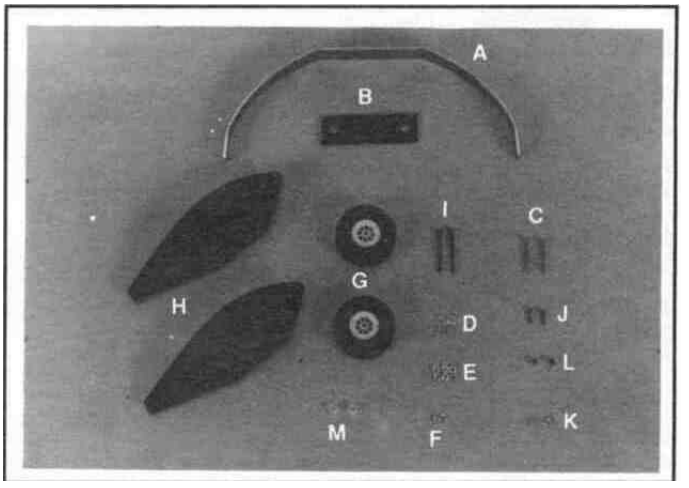


19. Assemble the wing bolts as shown (Bolt - Washer - Wing - 0-ring) and temporarily fasten down the wing. Check for a good fit and then remove.

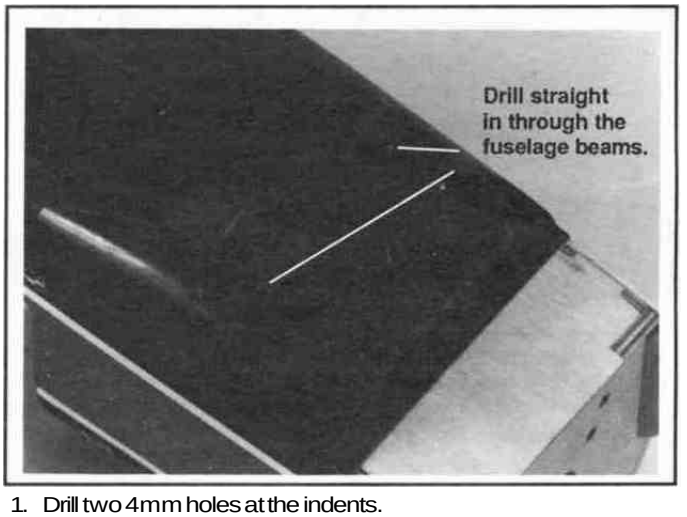


20. Trial fit the aileron servo tray mount and tray to the wing. NOTE: The front edge should be on the wood. You will have to trim away a little covering to insure a good fit. You may also have to trim the bottom of the servo tray mount so it will fit flush inside the wing. Epoxy the aileron servo tray mount into the rear section of the wing servo mount and then epoxy in the tray.

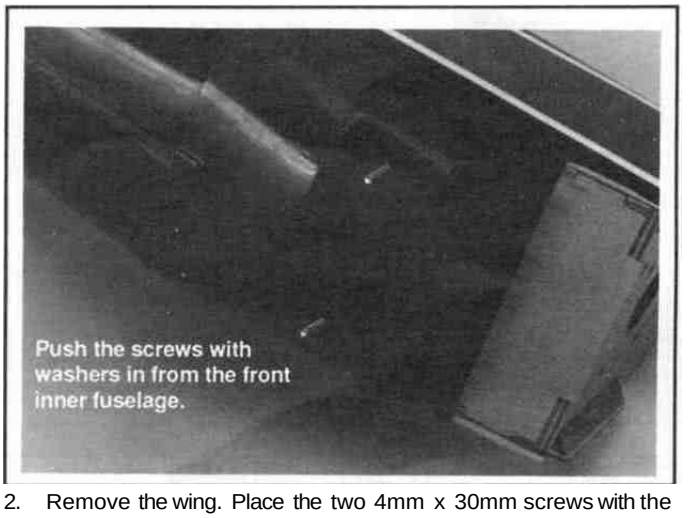
LANDING GEAR INSTALLATION



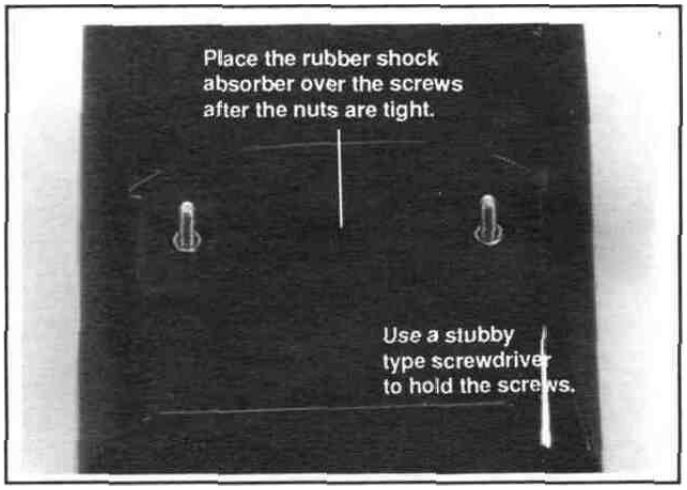
A.	MainGear..... 1	H	Wheel Pants.....2
B.	Rubber Shock Absorber..... 1	I.	4mm x 40mm Screw 2
C	4mm x 30mm Screw 2	J.	3mm x 12mm Screw 2
D.	4mm Washer.....4	K.	3mmWasher.....2
E.	4mm Nut... 6	L	3mm Nut. 2
F.	4mm Nylon Nut..... 2	M.	Plastic Spacer..... 2
G.	Wheel..... 2		



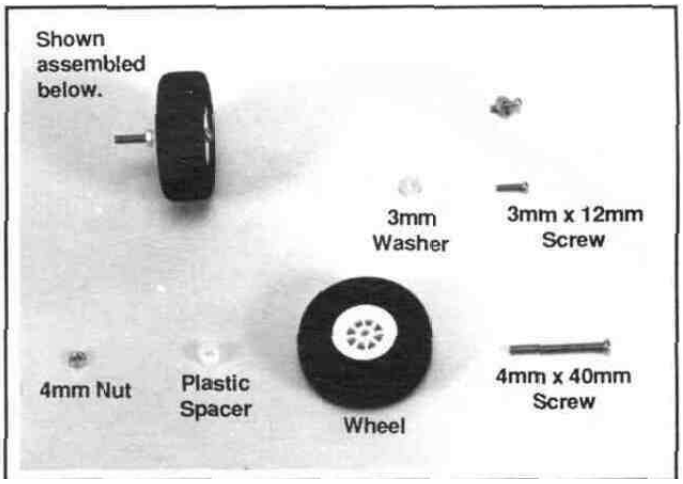
1. Drill two 4mm holes at the indents.



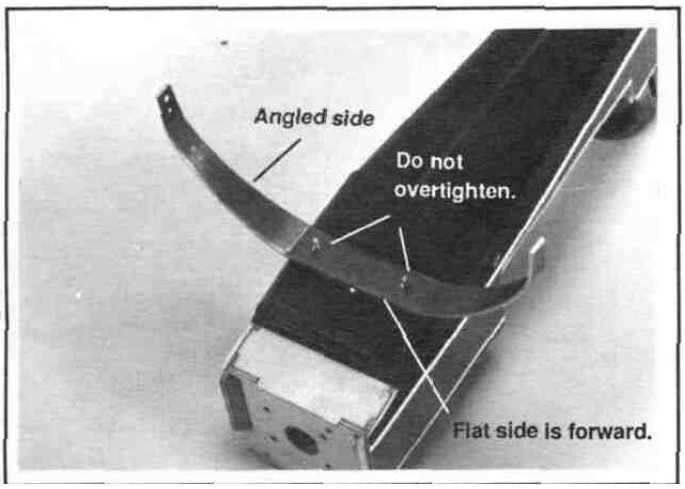
2. Remove the wing. Place the two 4mm x 30mm screws with the 4mm washers into the two landing gear holes that are located inside the front fuselage section.



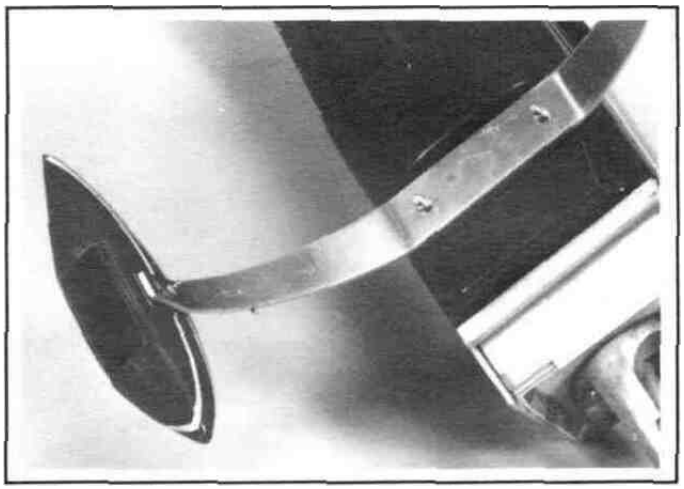
3. Thread two 4mm nuts onto the two screws and tighten Next place the rubber shock absorber over the screws.



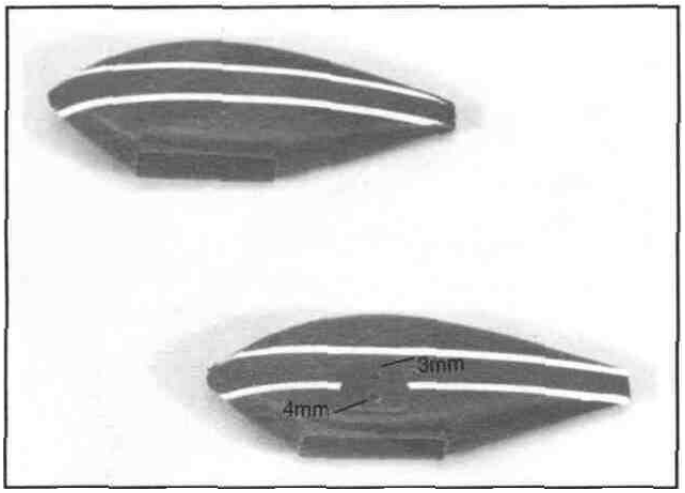
6. Arrange the above parts as shown and then assemble together. Do this twice. Place threadlock on the threads when installing the nuts



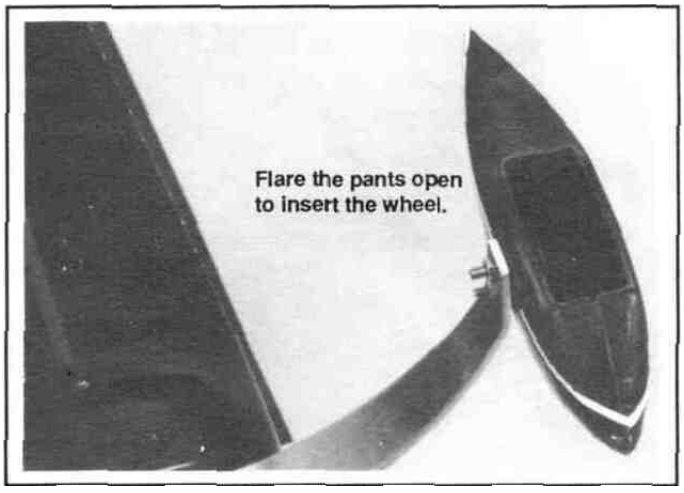
4. Now place the main gear over the screws and secure it with two 4mm nylon nuts NOTE: tighten the nuts all the way and then loosen them both one turn. This will give the gear the correct shock absorbing qualities.



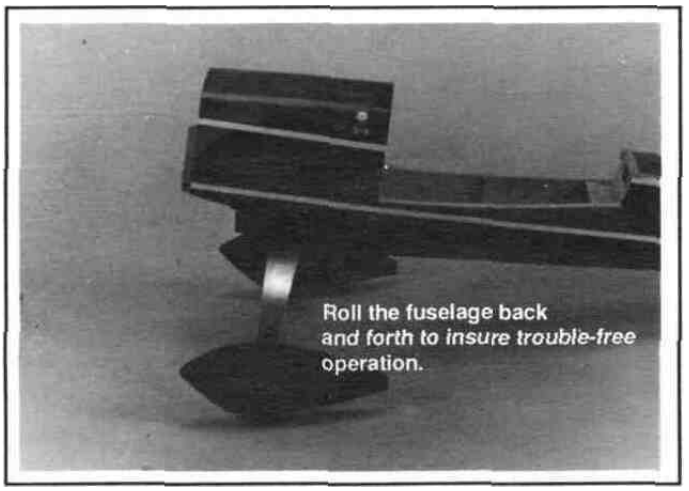
7. Place the 3mm screw/washer into the top hole of the wheel pants from the inside And then attach it to the top hole of the main gear using a 3mm nut with threadlock.



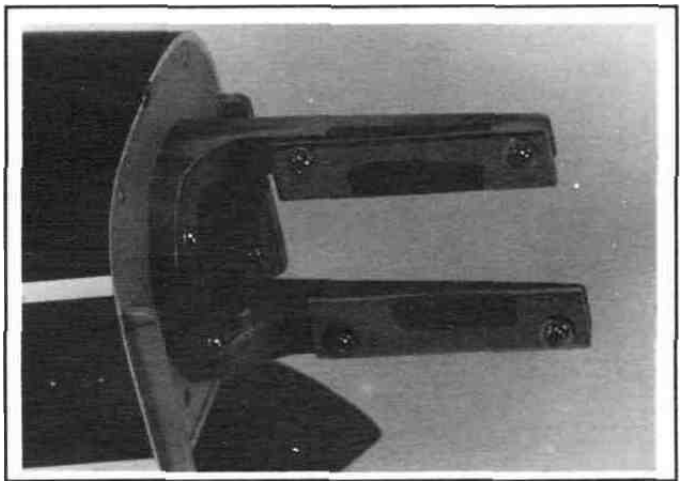
5. Next, take the two wheel pants and drill two holes in each one The first hole should be at the indent (4mm in diameter) The second should be 3/8" above the first and smaller (3mm diameter) Apply the wheel pant's decal stripes to both sides of the two wheel pants.



8. Flare open the pants and insert the wheel assembly Install the 4mm nut with threadlock and tighten, holding the inside nut with needle nose pliers.



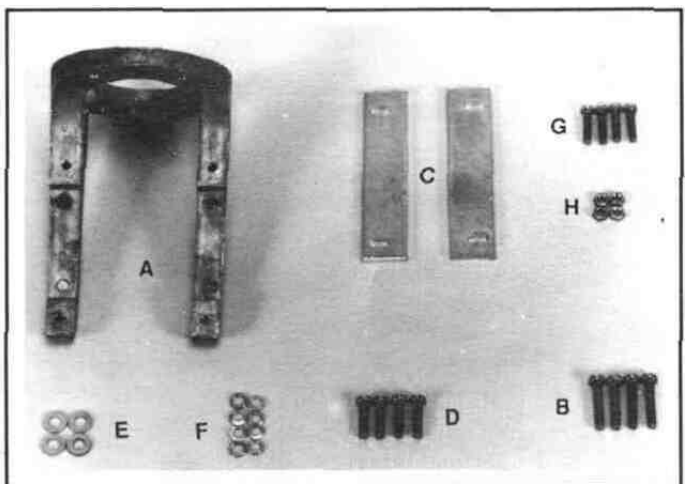
9. Make sure that both wheels rotate freely. If they do not, trim away the plastic as needed. Or if need be, loosen the nuts and reposition the wheel.



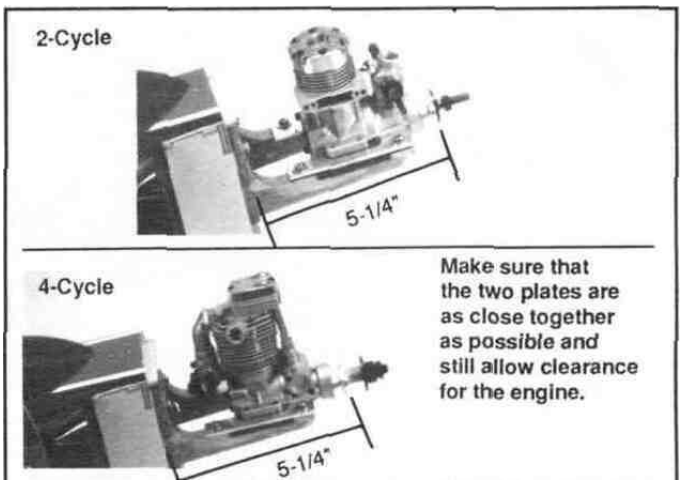
2. Install the two mounting plates onto the engine mount. Next, paint a strip on each plate using four 4mm x 15mm screws and washers and proceed with the following step before the paint dries.

ENGINE INSTALLATION

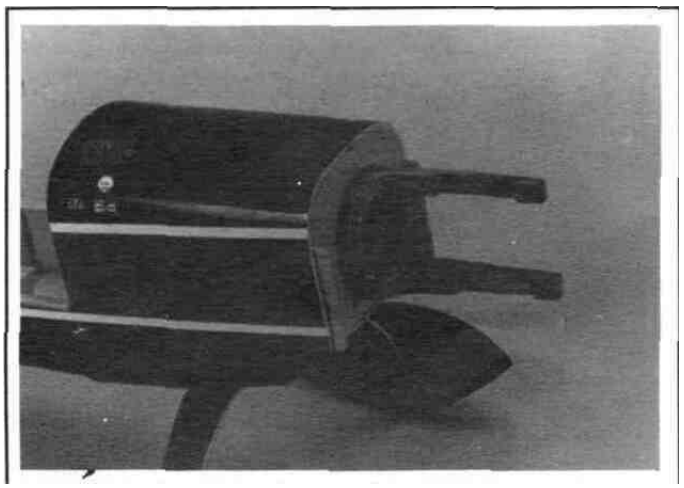
FOLLOW THE SAME PROCEDURE FOR EITHER 2-CYCLE OR 4-CYCLE INSTALLATION.



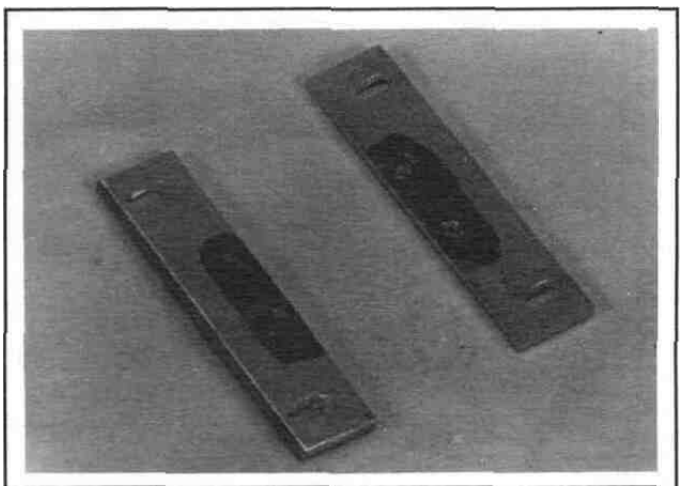
A. Engine Mount 1
B. 4mm x 20mm Screws 4
C. Mounting Plates 2
D. 4mm x 15mm Screws 4
E. 4mm Washers 4
F. Lock Washers 8
G. 3.5mm Screw 4
H. 3.5mm Nuts 4



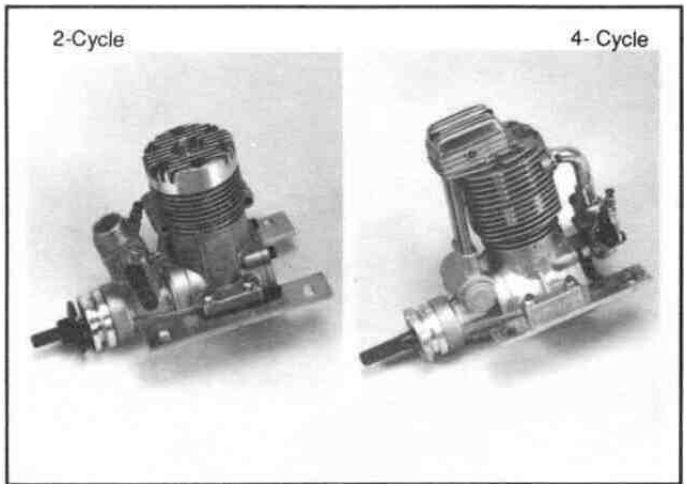
3. Before touching the plates, align the engine so it is pointing straight forward. Center the engine with the plates and carefully touch the engine into position. Now carefully remove the engine and there will be the guides for drilling the mounting holes.



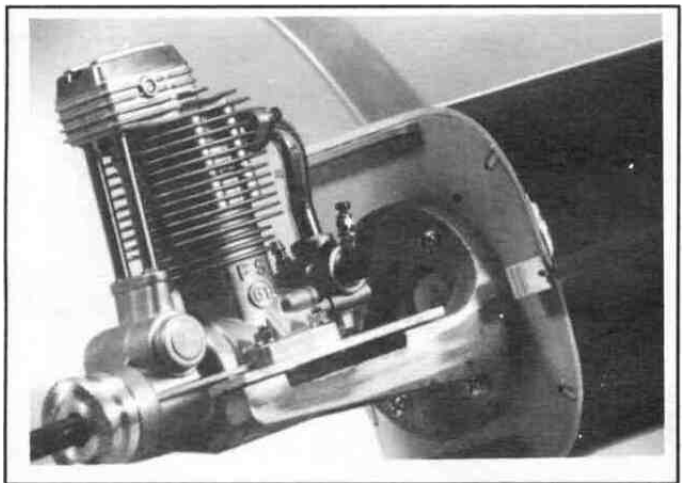
1. Install the engine mount to the fuselage using four 4mm x 20mm screws and four lock washers. Note the direction the mount **is** installed for proper engine positioning. Also use threadlock on the screw threads.



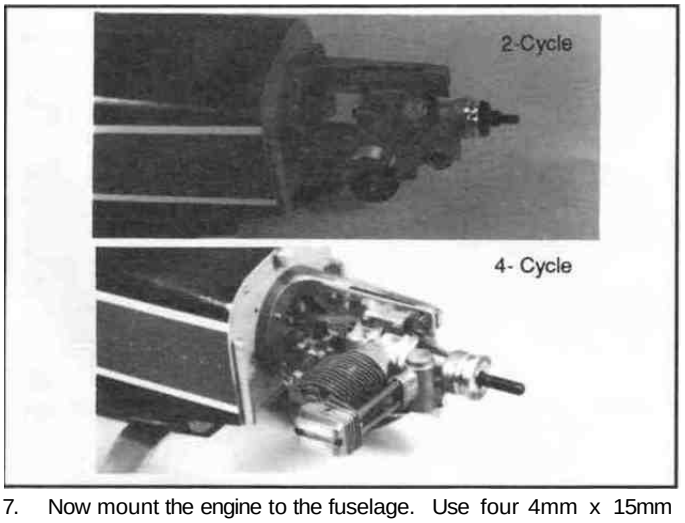
4. Drill two 4mm holes in each mounting plate at the marks.



5. Mount the plates to the engine using the 3.5mm screws up from the bottom as shown. Next apply screw locking compound to the screw threads and tighten on the 3.5mm nuts with lock washers. Do this to both sides.

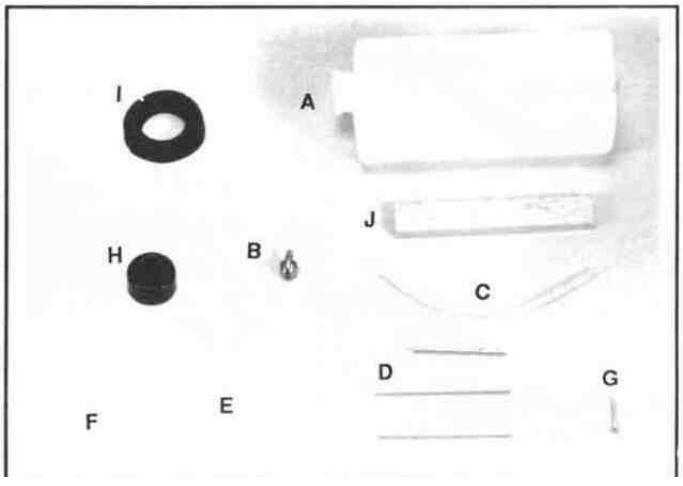


6. When mounting a four cycle engine, the existing throttle control rod hole (for 2-cycle engines) will not work. Position the engine to the mount and drill a 1/8" hole into the firewall so it will line up with the throttle arm on the engine.

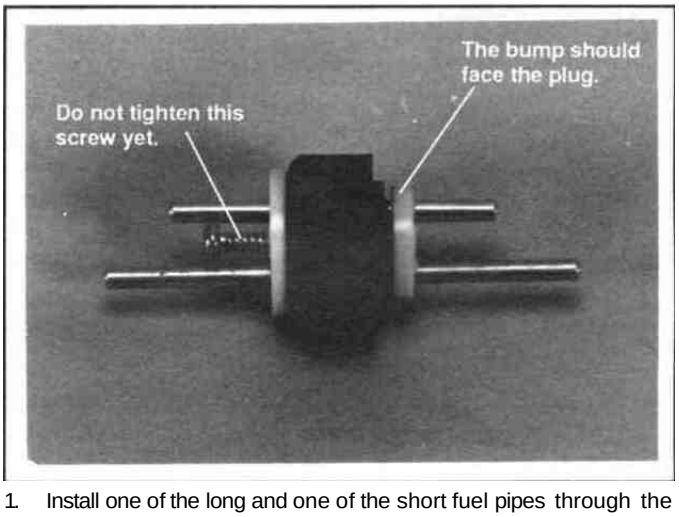


7. Now mount the engine to the fuselage. Use four 4mm x 15mm screws with the four4mm washers. Be sure to use threadlock on the **screws.**

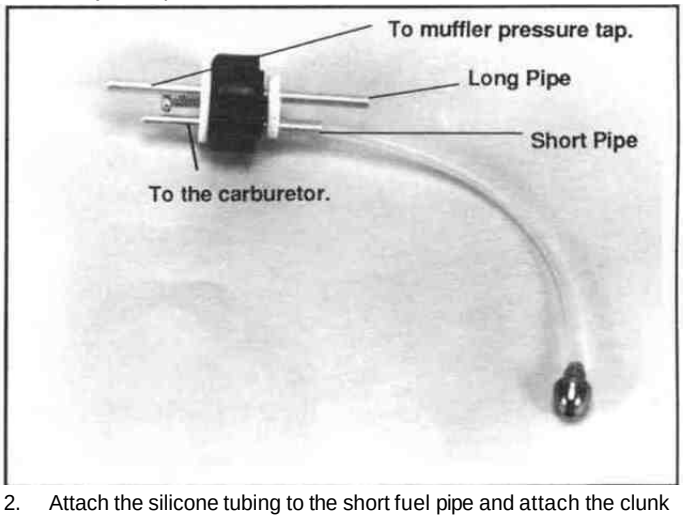
ENGINE INSTALLATION



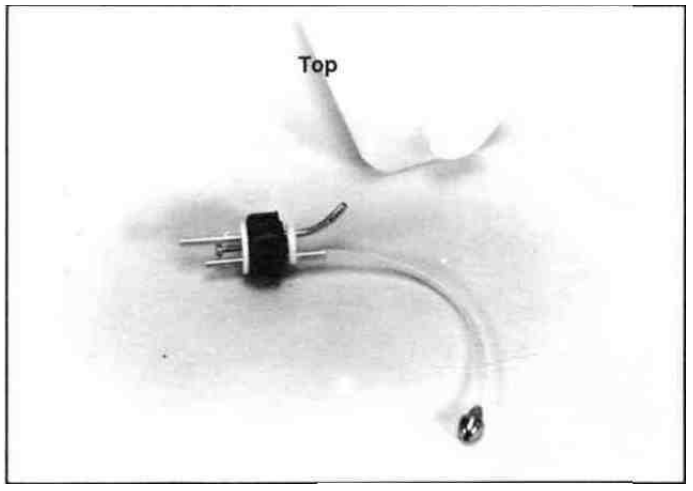
A.	Fuel Tank	1
B.	Clunk	1
C.	Silicone Tubing	1
D.	Fuel Pipe	(2) Long (1) Short
E.	Plastic Disc(Large)	1
F.	Plastic Disc(Small	1
G.	3mm x 18mm Self-Tapping Screw	1
H.	Rubber Plug	1
I.	Neoprene Ring	1
J.	Balsa Tank Support	1



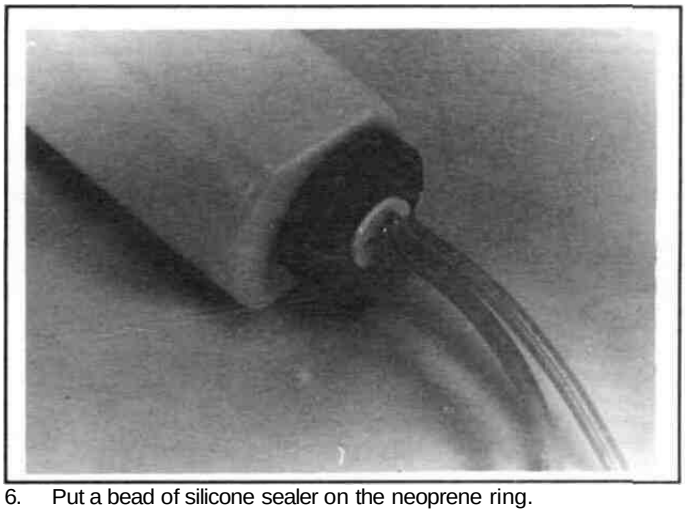
1. Install one of the long and one of the short fuel pipes through the rubber plug. Center the pipes in the cap. Place the two plastic discs onto each side. The large one should be on the outside. The bump on the small one should face the rubber cap Put the 3mm x 18mm self-tapping screw in the center hole from the large end and tighten it only a couple of turns into the small disc



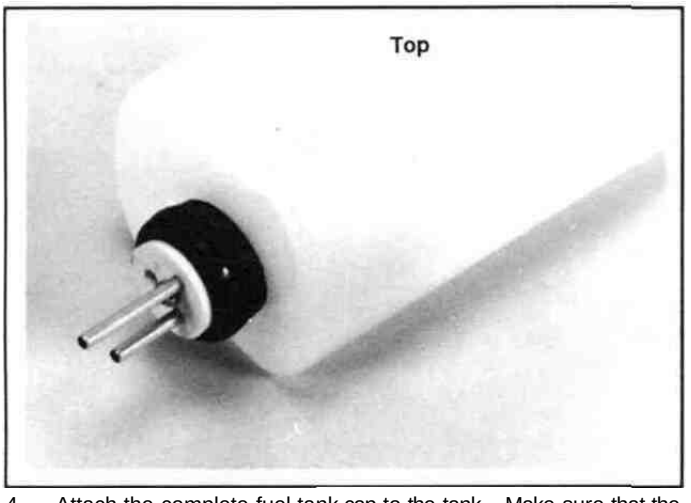
2. Attach the silicone tubing to the short fuel pipe and attach the clunk to the other end



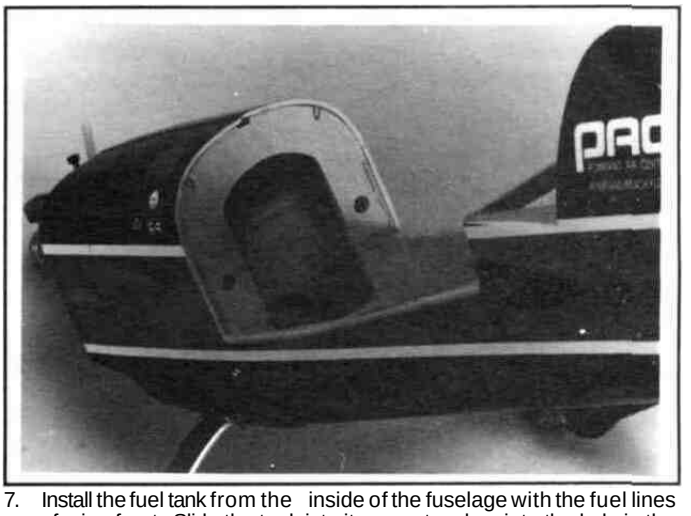
3. Carefully bend up the other fuel pipe so it will just touch the inside top of the fuel tank.



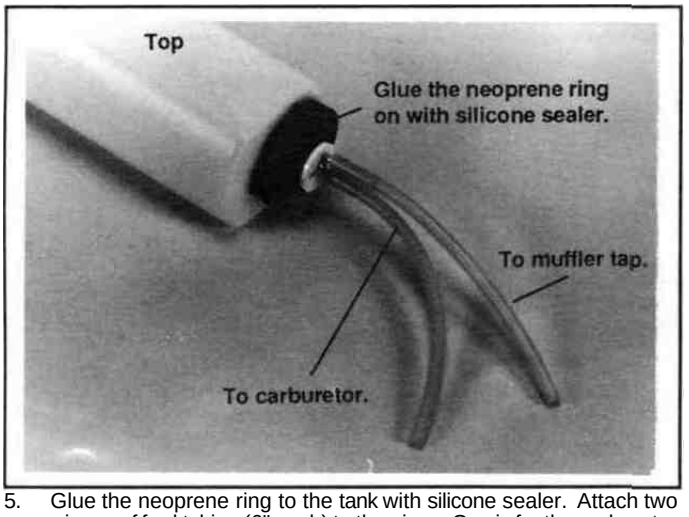
6. Put a bead of silicone sealer on the neoprene ring.



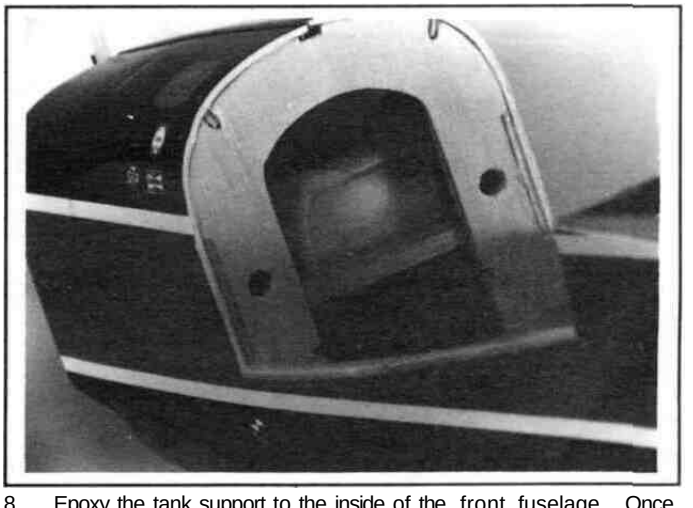
4. Attach the complete fuel tank cap to the tank. Make sure that the bent pipe is pointing to the top. Slide the cap on until the lip on the fuel tank is in the groove of the cap. Then tighten the screw. Check to make sure the clunk is free to swing at the bottom of the tank. This is where the term "clunk" comes from.



7. Install the fuel tank from the inside of the fuselage with the fuel lines facing front. Slide the tank into its mount and up into the hole in the front of the fuselage. Make sure that the fuel tubing is through the **hole.**

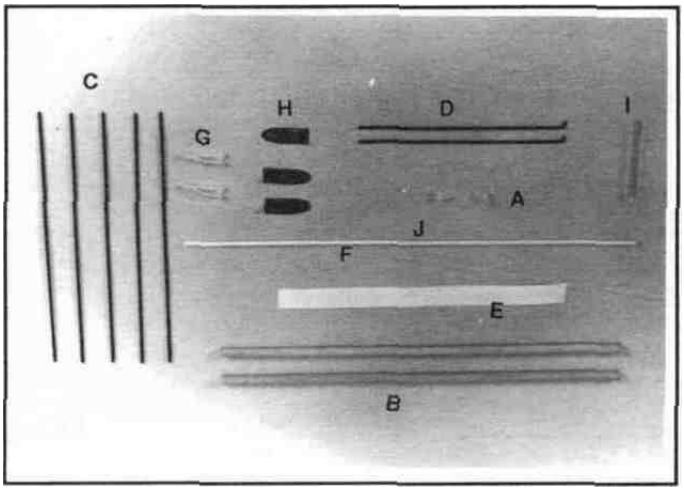


5. Glue the neoprene ring to the tank with silicone sealer. Attach two pieces of fuel tubing (6" each) to the pipes. One is for the carburetor the other is for the pressure tap on the muffler.

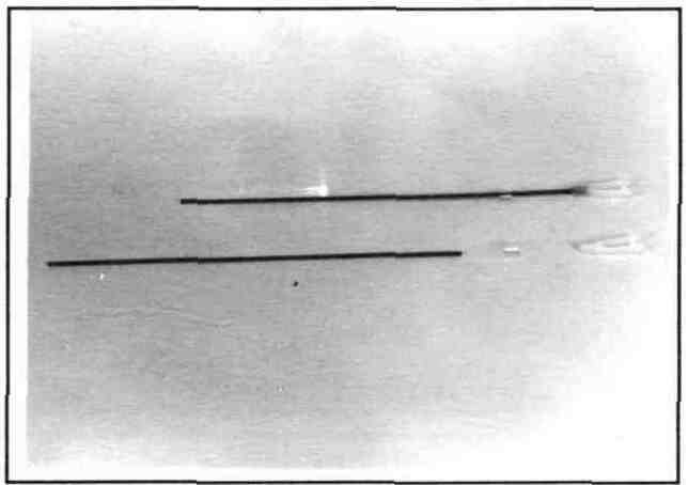


8. Epoxy the tank support to the inside of the front fuselage. Once dry apply a bead of silicone sealer where the support and the tank touch.

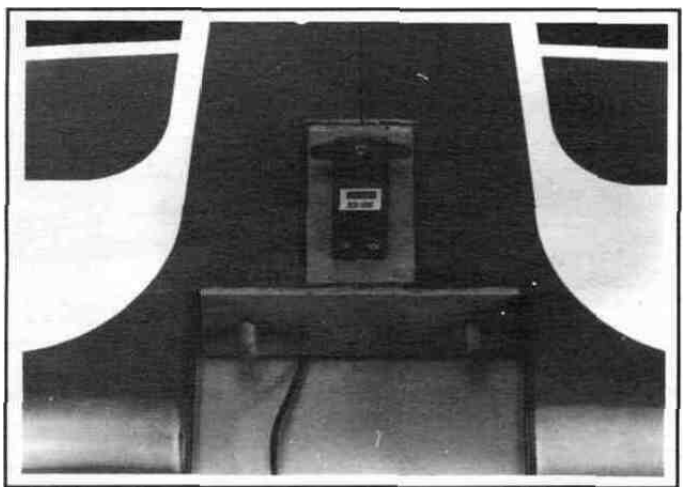
RADIO INSTALLATION



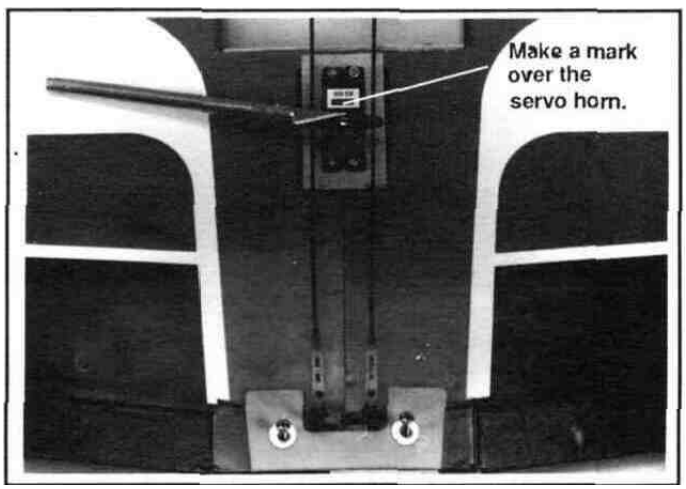
A.	Aileron Horn..... 2	F.	Throttle Control Rod (Long)..... 1
B.	Wood Push Rods..... 2	G.	Snap Clevis..... 2
C.	Control Rods..... 5	H.	Push Rod Exits 3
D.	Control Rod (Short-Bent)..... 2	i.	Clevis Retaining Tubing 1
E.	Shrink Tubing..... 1	J.	Throttle Tube..... 1



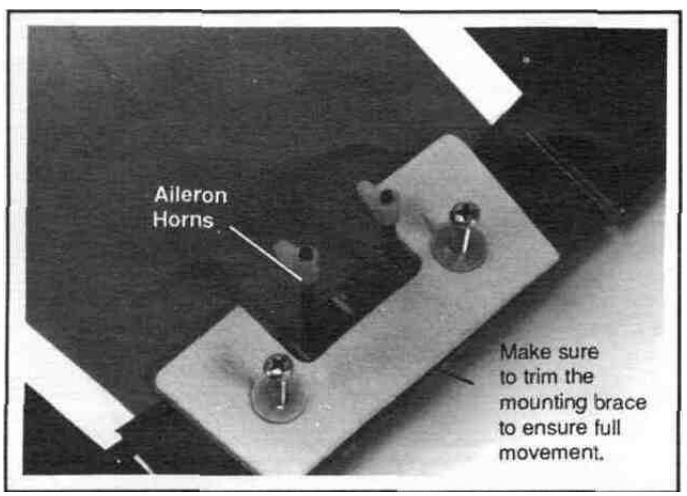
3. Screw two snap clevises half way up the threads on the aileron control rods. Next, cut two pieces of the clevis retaining tubing (3/16") and slide them onto the rods.



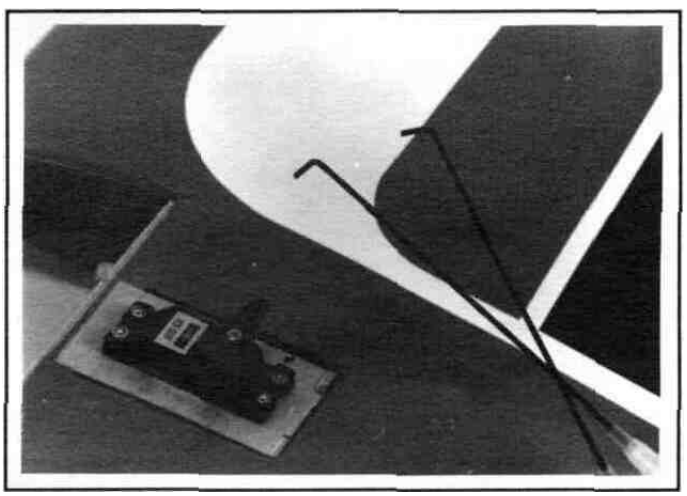
1. Check the fit of your aileron servo in the aileron servo tray. You may have to trim away some of the servo tray for a good fit. Install the rubber grommets onto the servo case flange. Route the servo lead through the hole in the bottom of the wing and fasten it to the aileron servo mount using the screws provided with the radio system.



4. Attach the clevises to the aileron horns and slide on the retaining tubes. After checking the neutral position of the aileron servo and ailerons, put a mark on the push rods where the servo arm holes line up. Be sure the aileron is in the neutral position.

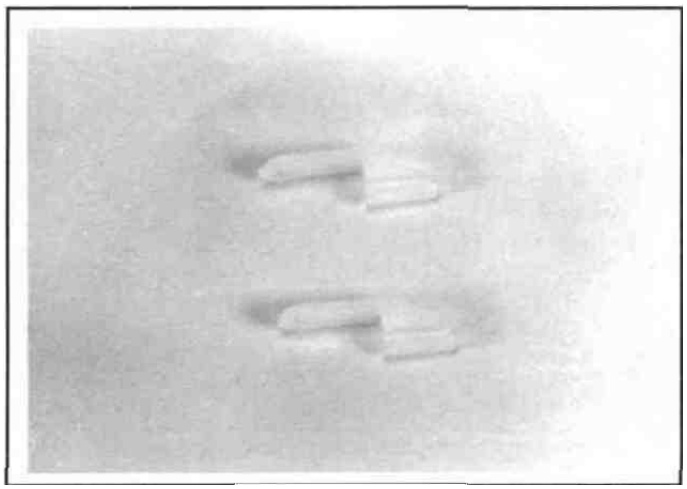


2. Screw the aileron horns onto the aileron control arms. Trim the wing mounting brace as needed for full aileron movement. Make sure you **use** the two horns with the larger holes.



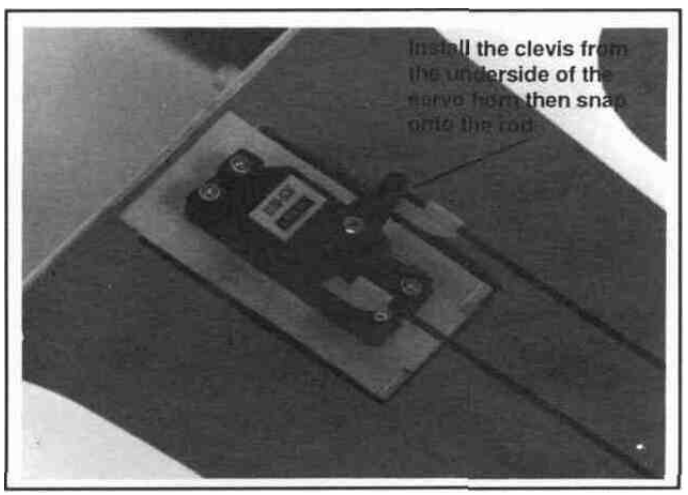
5. At the mark, bend each push rod at a right angle. Next, cut the push rods 6mm from the bend.

RADIO INSTALLATION

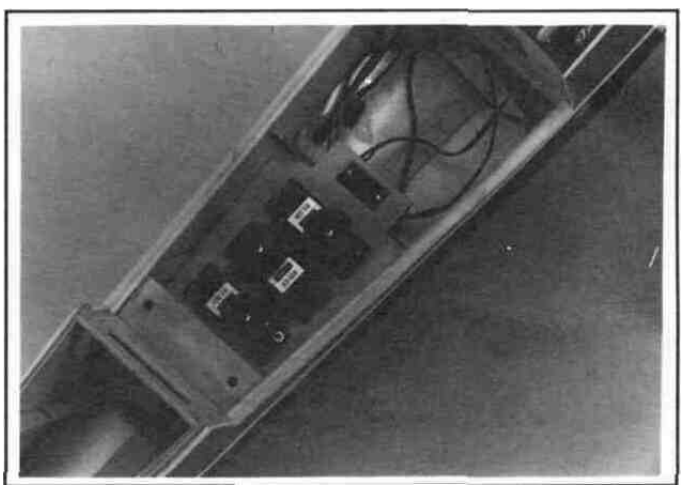


6. Locate two rod clevises from the plastic parts tree.

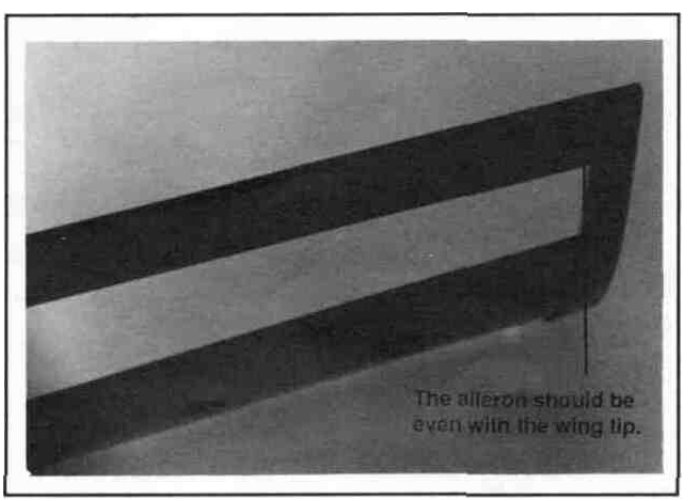
9. Trial fit the servos into the fuselage servo tray, and trim the tray as needed for a good fit.



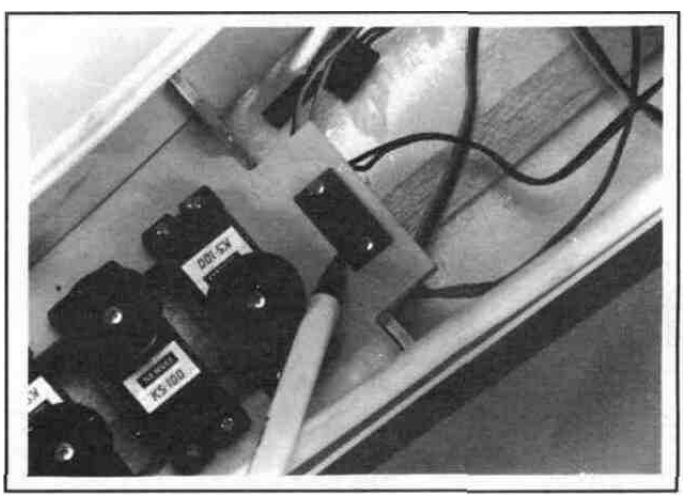
7. Attach the rods to the servo arm using the rod clevis. **NOTE:** You may have to use a different style servo horn for more throw as shown.



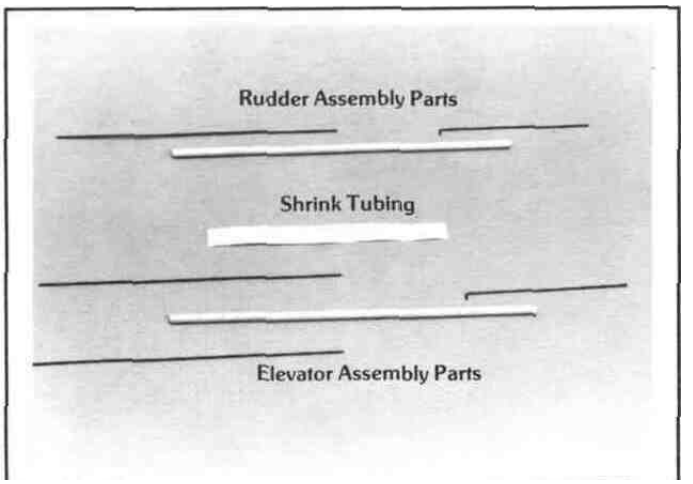
10. Install the three remaining servos (1/4" apart) into the tray using grommet eyelets and screws. Be sure that the servos are positioned correctly. Next, mount the radio switch. **NOTE:** Make sure that the servo wires all run forward so they are easily accessible.



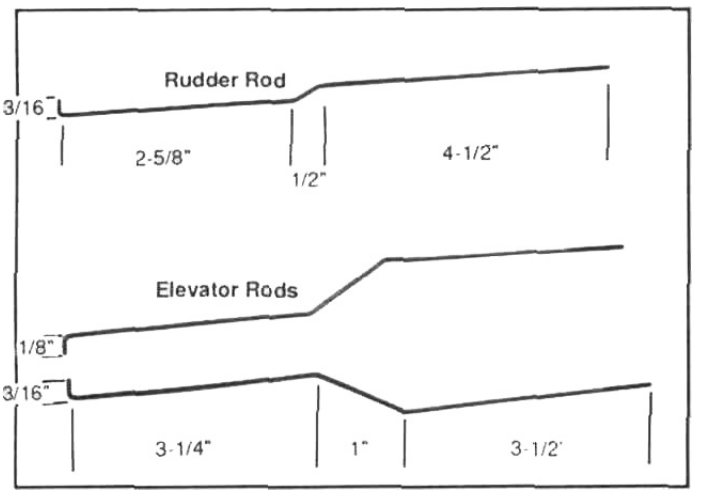
8. Connect the aileron servo to the receiver and check the movement of the ailerons. Make sure that both ailerons are neutral when the servo is neutral. Adjust the clevises as needed.



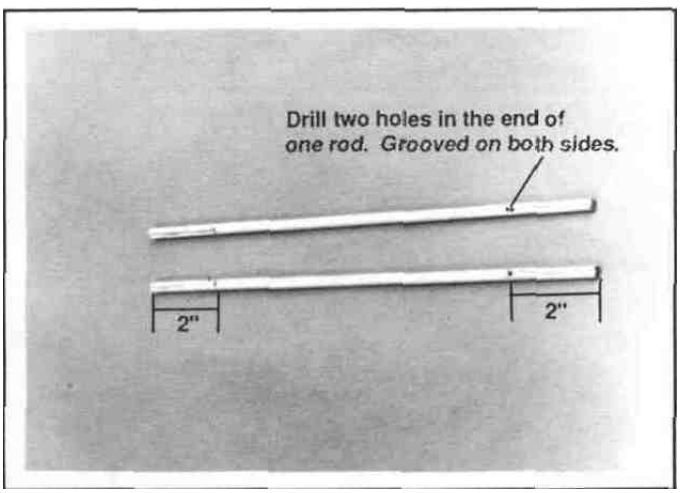
11. We suggest installing an external switch mount so that the radio system can easily be turned on and off from the outside without taking the wing off. (The Dubro #203 Kwik-Switch Mount works well.)



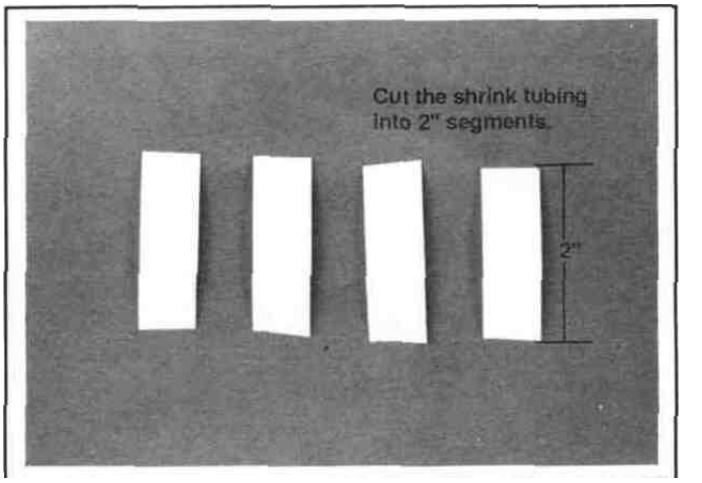
12. Assemble the rudder and elevator control rods using the parts **above.**



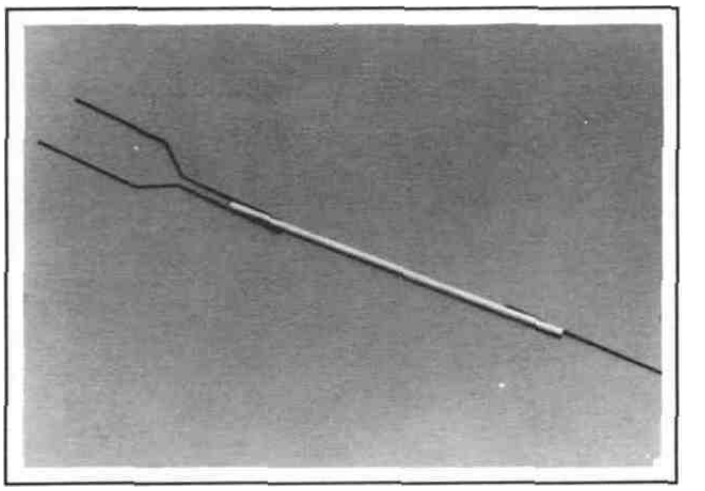
13. Bend two of the long rods as shown for the elevator and one of the rods for the rudder.



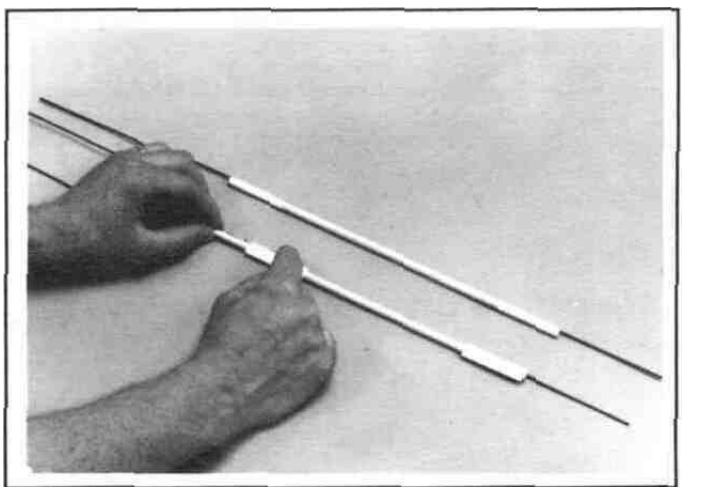
14. Drill a 1/16" hole 2" from the ends (2 holes 1/16" apart on one end of one rod) of both wood push rods. With a hobby knife, carefully cut straight grooves from the holes to the ends. Only cut a groove on one side of each end. except for one end of one rod (the one with two holes). For this one end, make a groove on both sides.



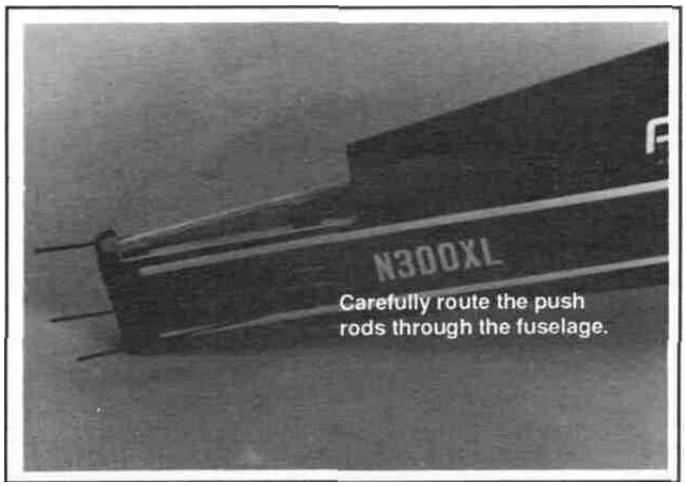
15. Cut four equal pieces of the white shrink tubing (about 2" each)



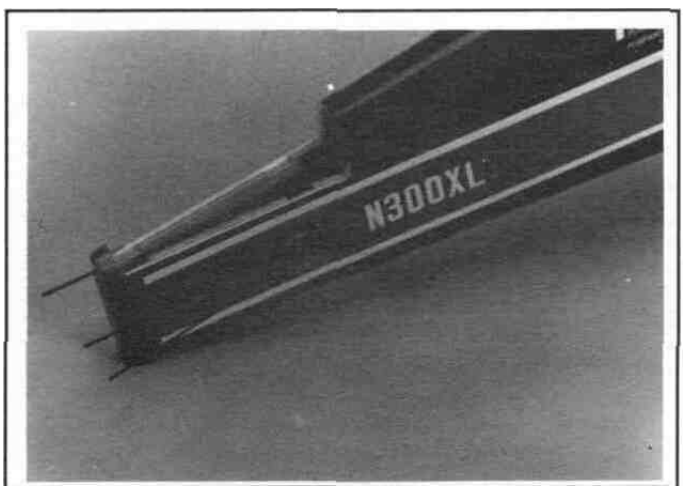
16. Assemble the elevator push rod as shown. Place the two elevator rods into the double grooved end of one of the rods. Next, place one **of** the short (pre-bent) rods into the other end.



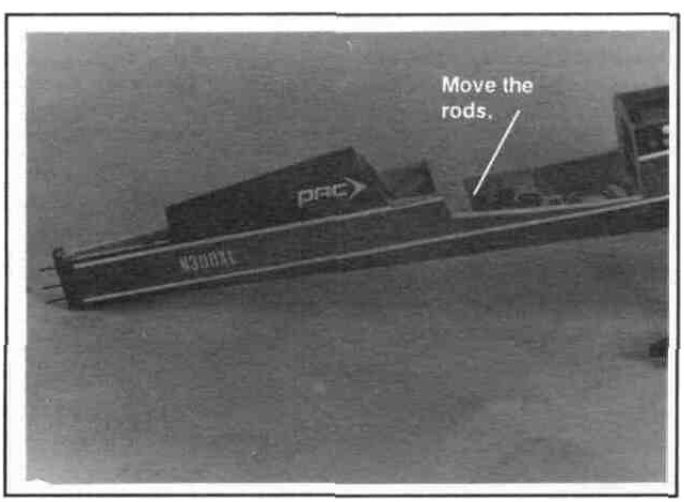
17. Next, do the same with the other rudder rod. Make sure that each rod fits in a groove. Now slide the four pieces of shrink tubing over the ends of the wooden rods and shrink them with a heat gun or lighter. To ensure durability, place a drop or two of Cyanoacrylate glue to the edges.



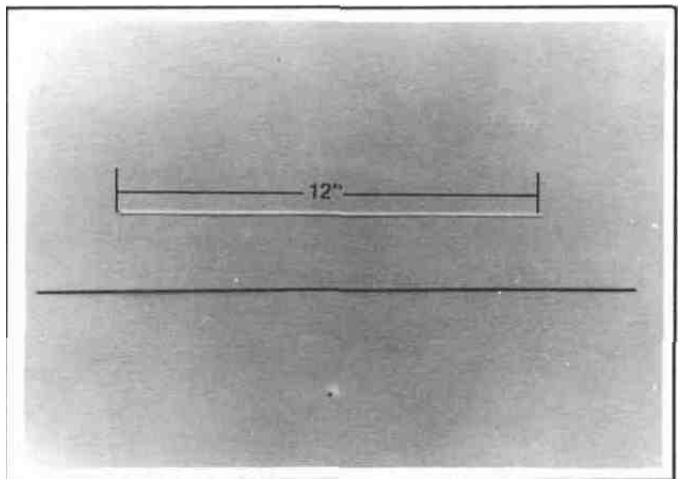
18. Punch out the three rod exits at the tail and insert the rudder pu sh rod into the fuselage from the front and then through the bottom exit on the right side. Do the same with the elevator rod, but put those through the top two holes. It may be necessary to bend the rods slightly to fit.



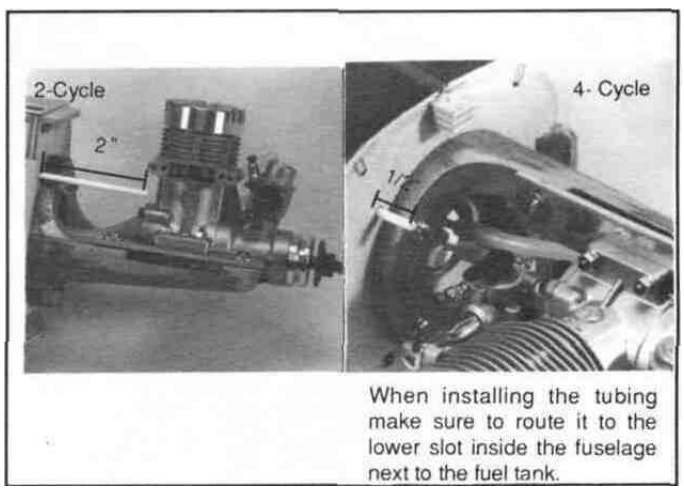
19 Using PlasiZap, glue the three plastic push rod exits to the fuselage.



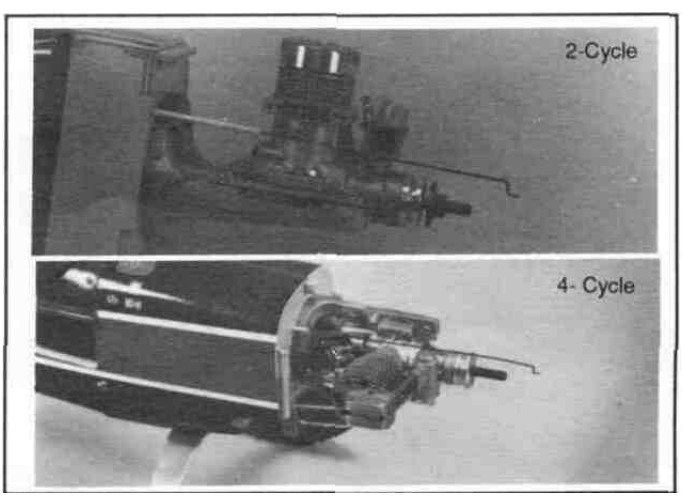
20 Check to make sure that the rods will easily move in and out with little resistance. You may have to bend the rods slightly for a perfect fit (we will connect the rods to the servos after the tail assembly).



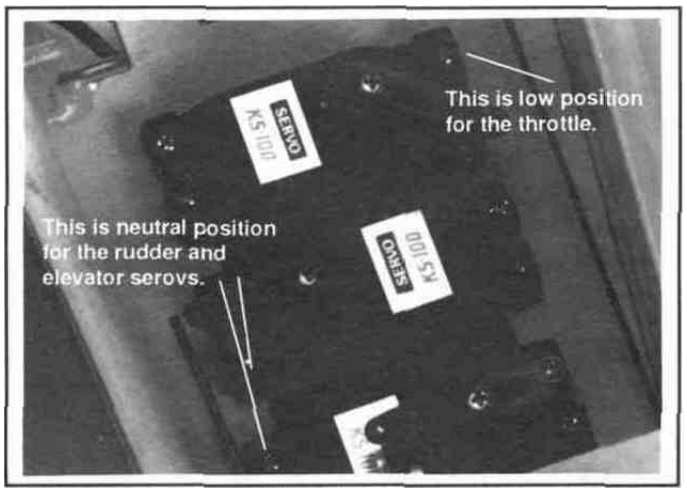
21. Use the throttle control rod and the white throttle tube for the engine linkage. Lightly sand the plastic tube so the epoxy will adhere to it. Cut the plastic tube so it is only 12" long.



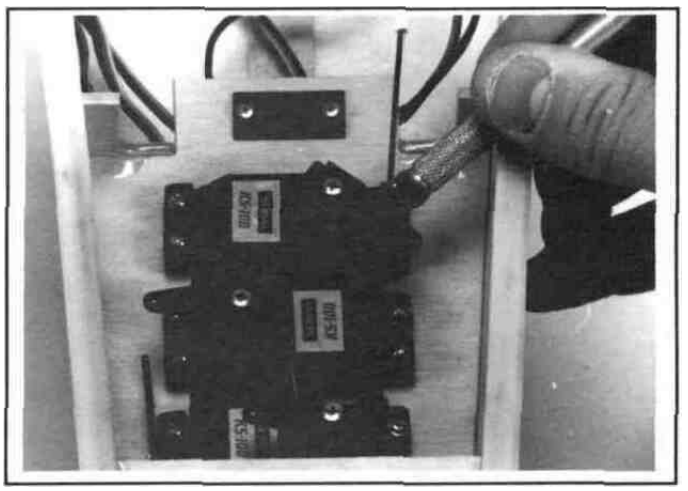
22. Install the plastic tubing through the hole in the firewall to the servo tray Epoxy the tube where it goes in If using a four cycle engine, install the tube into the drilled hole from Page 10.



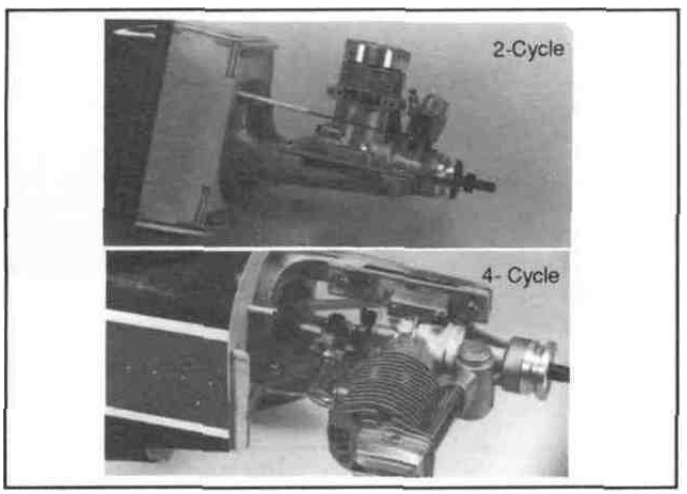
23. Make a "Z" bend on one end of the throttle control rod and insert the opposite end into the tube.



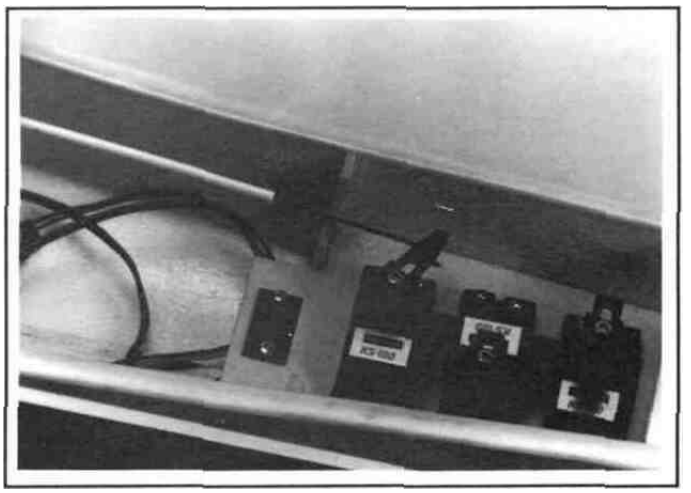
24. Connect the servos to the receiver and battery and center all radio controls (including the throttle stick and move the servo horns so they are in line with the servo as shown. After they are centered, pull the throttle stick back down (low throttle). Install the straight servo horns that are included with your radio system.



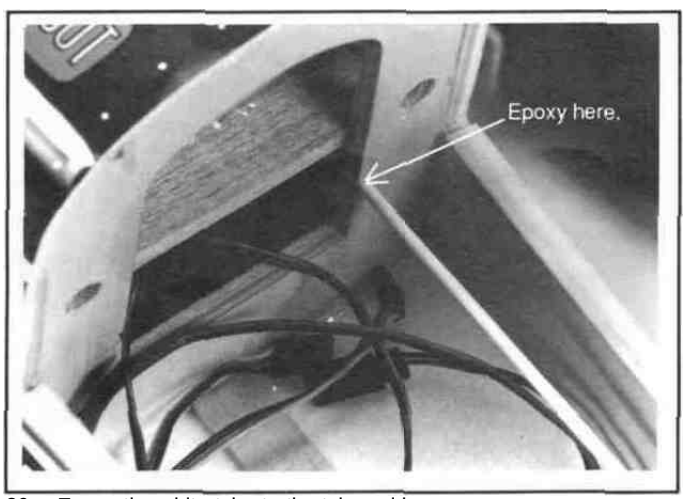
27. From the inside, pull back the throttle control rod so the carburetor is closed. Now, mark the rod where it crosses the throttle servo horn **(in low posistion).**



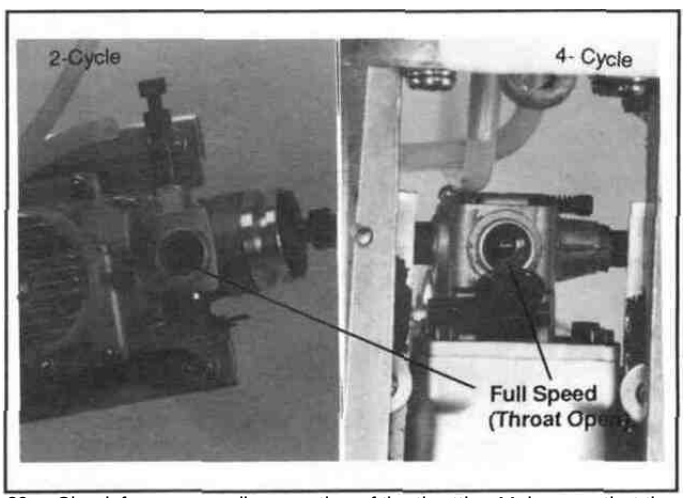
25. Connect the "Z" bend to the engine throttle arm. It may be necessary to remove the arm from the engine for easier installation.



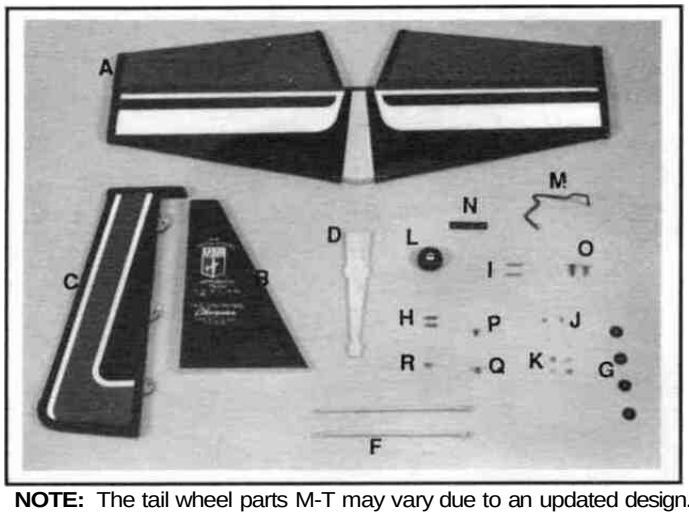
28. Next, at the marked point, make another "Z" bend, cutoff the excess and attach it to the servo arm. For easy adjustments, an easy connect can be used here. (Dubro#121 E-Z Connectors work well.)



26. Epoxy the white tube to the tube guide.

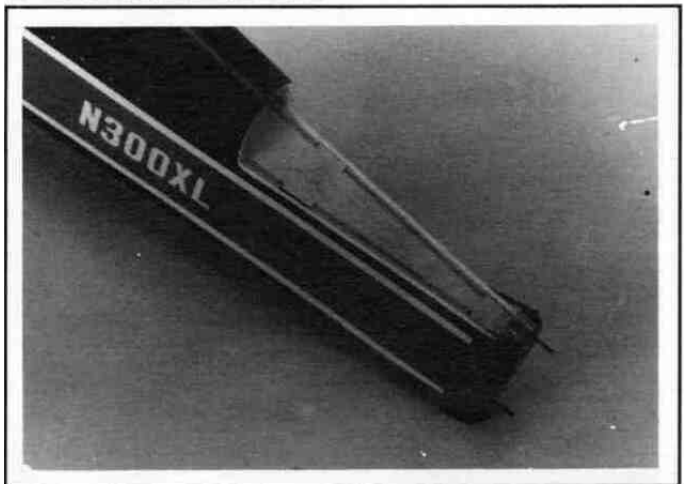


29. Check for proper radio operation of the throttle. Make sure that the carburetor will move from low to high completely.

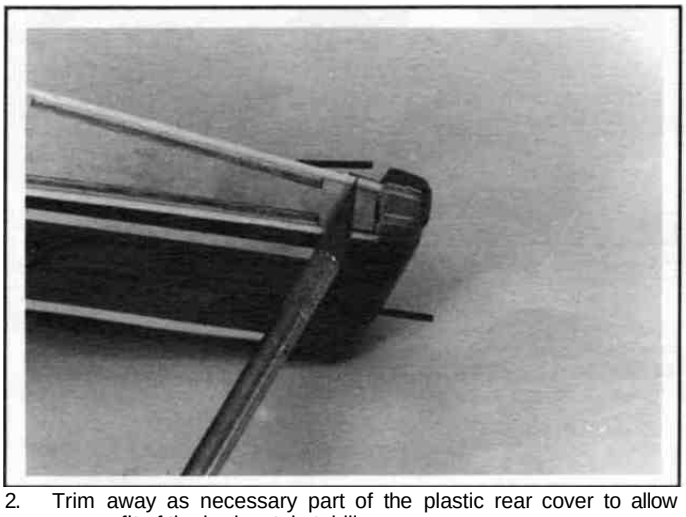


NOTE: The tail wheel parts M-T may vary due to an updated design. See page 18, Step 10.

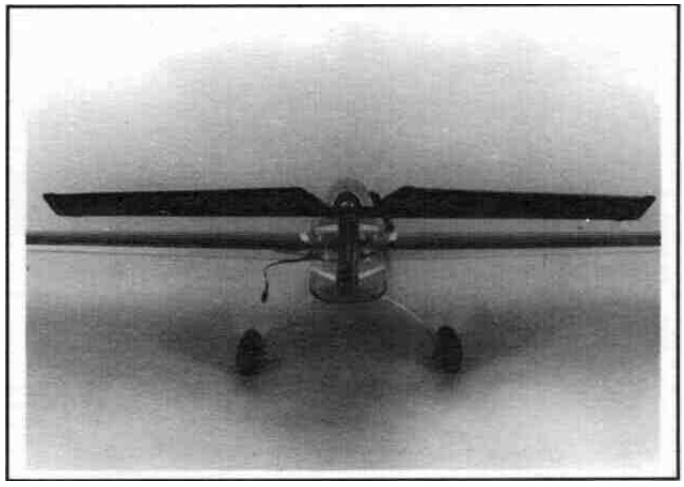
A. Horizontal Stabilizer..... 1
B. Vertical Fin..... 1
C. Rudder..... 1
D. 1/8-Wooden Wedge..... 1
E. Stab. Root Cover (Plastic) 1
F. Stab. Supports.....2
G. Plastic Disc 4
H. BrassSleeve 2
I. 2mm x 15mm Screw 2
J. 2mm Nut..... 2
K. 2mm Washer 4
L. Tail Wheel..... 1
M. Tail Gear..... 1
N. MetalStrip.....1
0. 3mmx12mmSelf-TappingScrew 2
P. 3mm x 5mm Screw 1
Q. Wheel Collar 1
R. BrassCollar 1



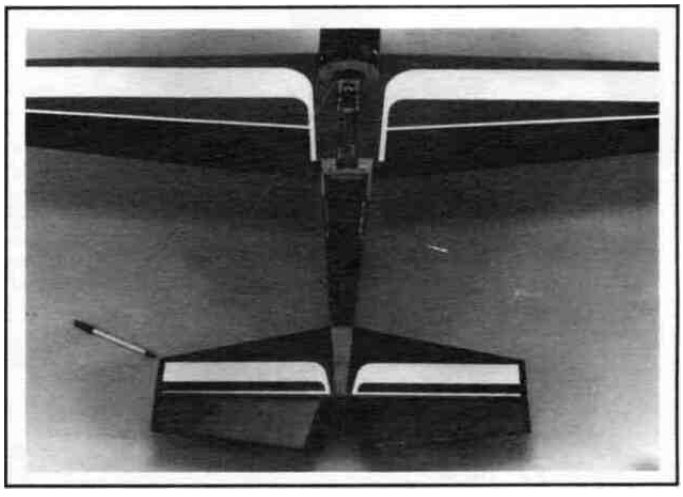
1. Test fit the 1/8" wooden wedge into the tail end of the fuselage. If there is a good fit, epoxy it in place making sure that it is even with the fuselage sides. **NOTE:** It may be necessary to trim away some wood or glue to make the wedge fit flush.



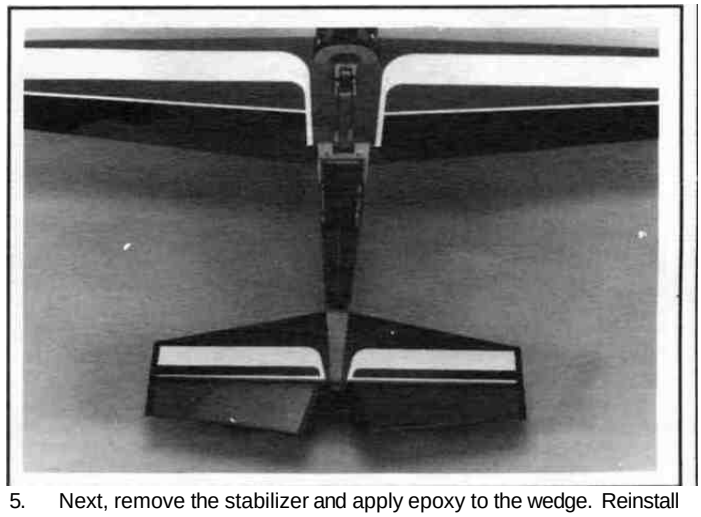
2. Trim away as necessary part of the plastic rear cover to allow proper fit of the horizontal stabilizer.



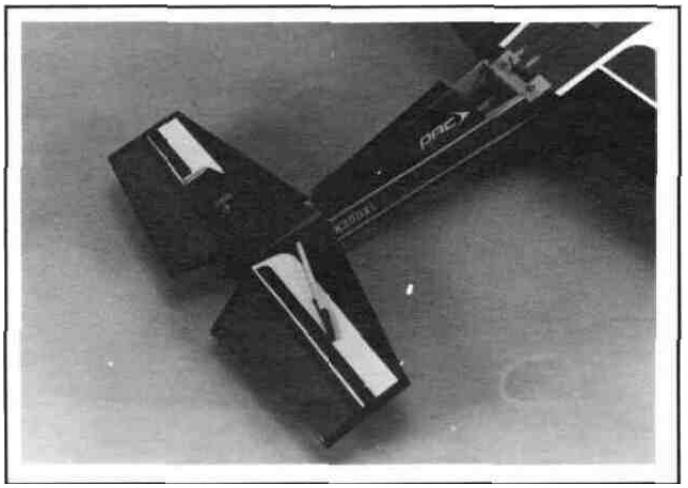
3. Install the main wing. Next place the horizontal stabilizer onto the tail. Hold it on and visually see if the wing and stabilizer are parallel. If not, sand the higher side of the stabilizer mount until! the stabilizer is parallel.



4. Next take a piece of string and attach it with a pin to the top center of the fuselage. Make sure that the stabilizer is centered and stretch the string to the corner of the elevator. Adjust the positioning of the stabilizer so that both corners **are** the same length when moving the string from side to side.

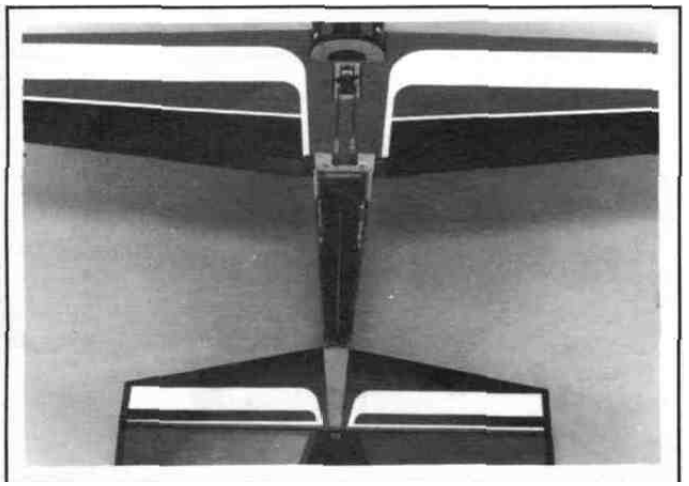


5. Next, remove the stabilizer and apply epoxy to the wedge. Reinstall the stabilizer and re-center like before.

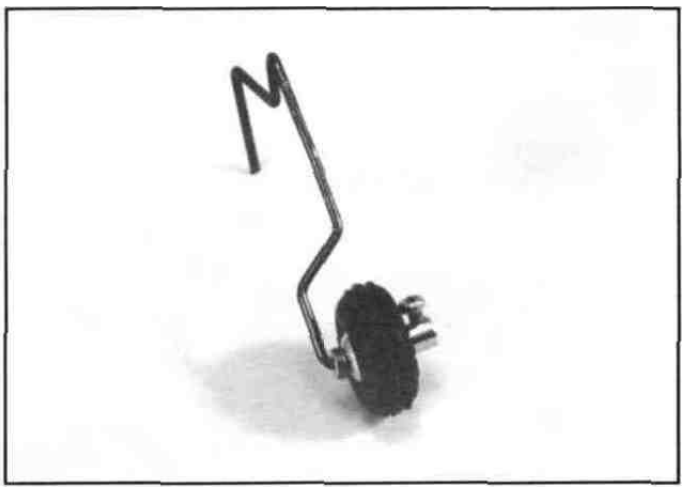


6. Once the horizontal stabilizer epoxy has cured, trial fit the vertical fin (without the rudder) on top of the horizontal stabilizer and the back edge is even with the rear of the fuselage. Draw a line on both sides of the fin as shown

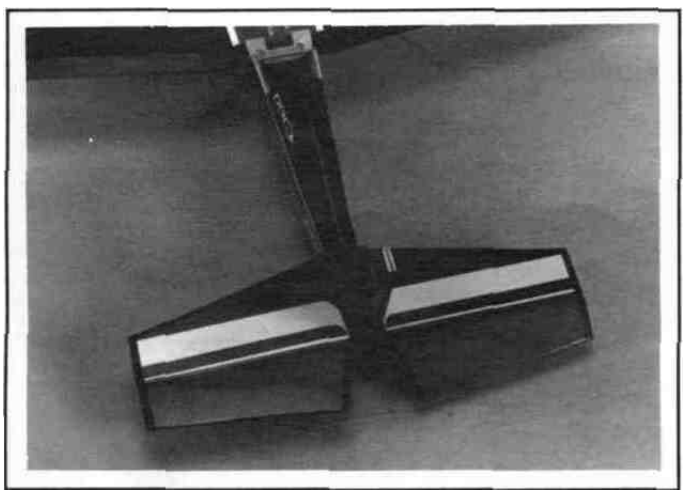
9. When satisfied with the fairing positioning, apply cyanoacrylate glue **to** the underside edge of the stabilizer cover and install in place



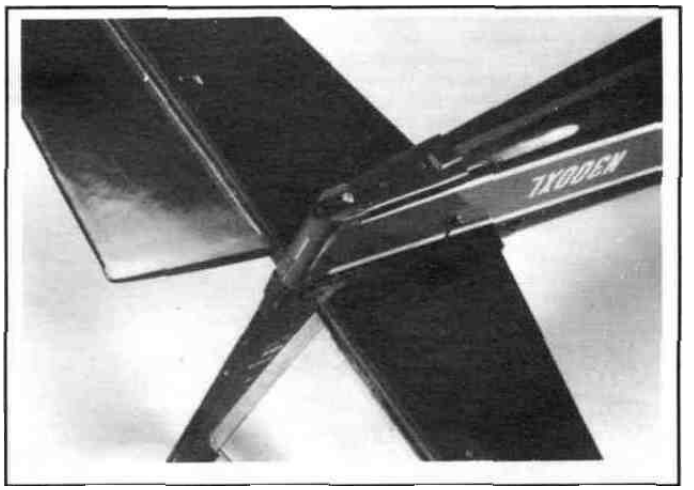
7 Next, apply epoxy to the top of the horizontal stabilizer and re position the fin between the lines Make sure that the fin is still 90" to the stabilizer Do the next step before the glue sets



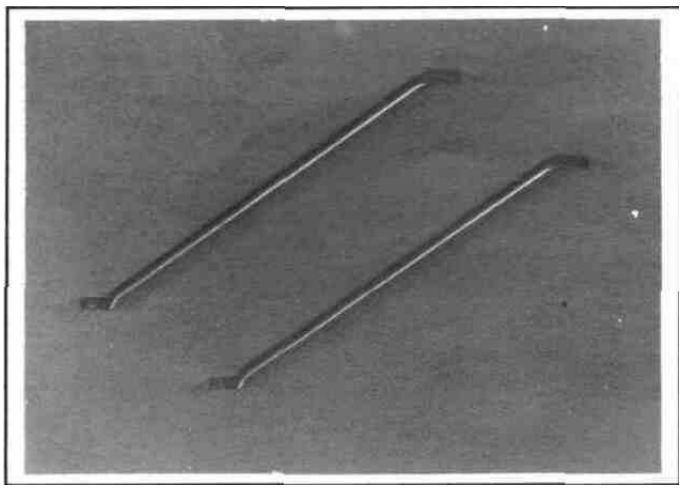
10. Assemble the tail wheel section shown Slide on a brass collar, the tail wheel, and install the wheel collar with a 3x5mm screw.



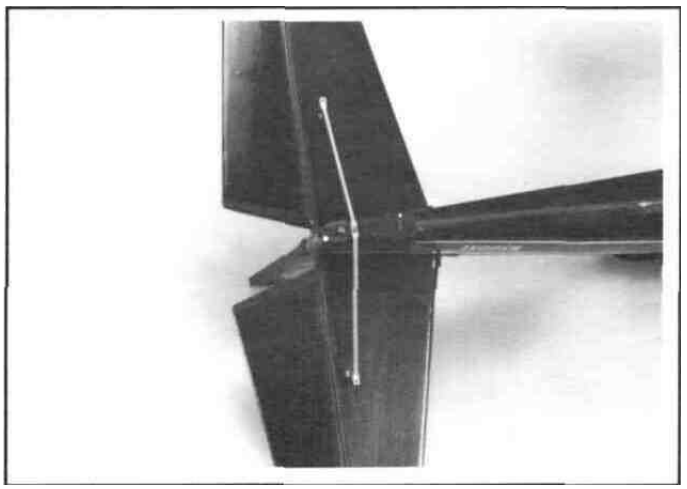
8. While the epoxy is still wet, position the plastic stabilizer fairing cover over the fin Double check the positioning of the fin after doing this. Allow epoxy to set.



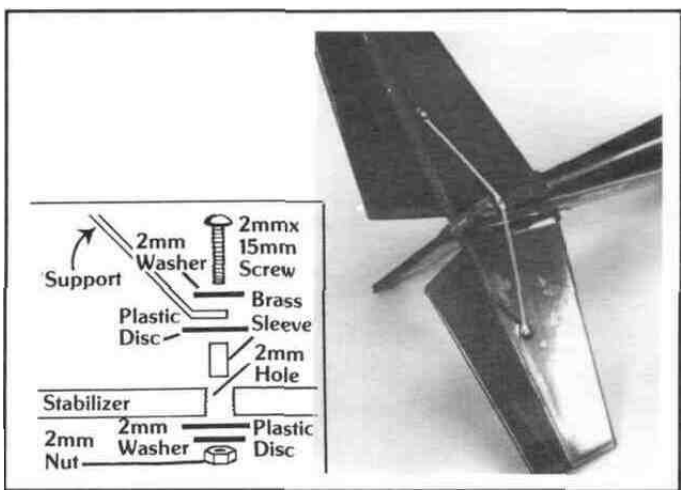
11 Inserta 3mmx12mm self tapping screw through the middle hole of the metal strip and attach to the under side of the tail section so that the screw is positioned 1/2" from the end of the fuselage.



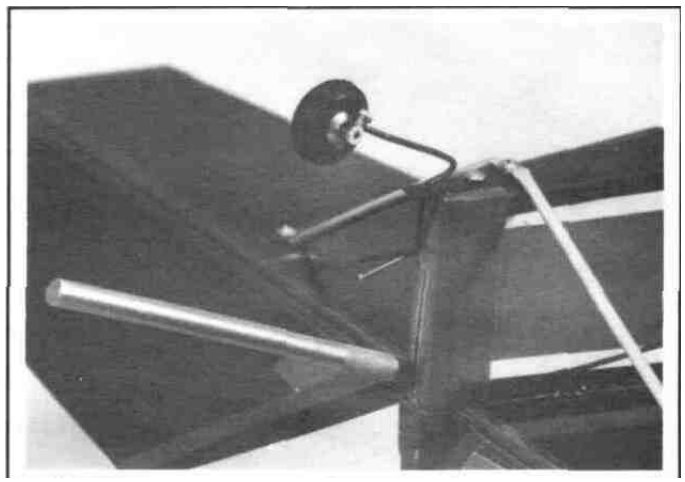
12. Now take the supports and bend the ends as shown above.



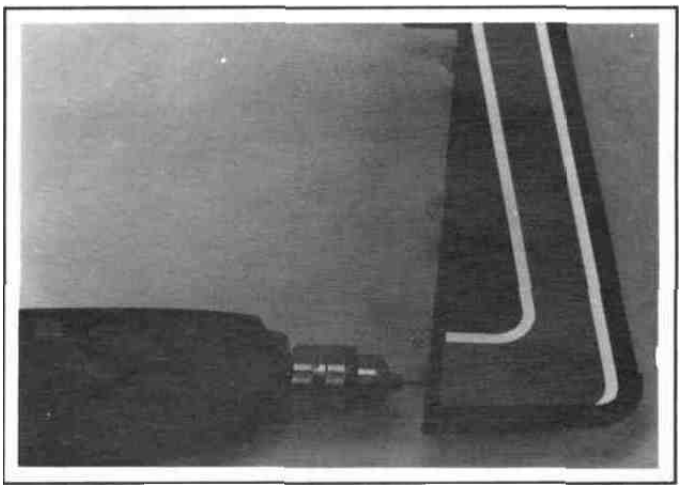
13. Attach the two supports onto the fuselage with a 3mm x 12mm self-tapping screw. Make sure that the metal strip is straight.



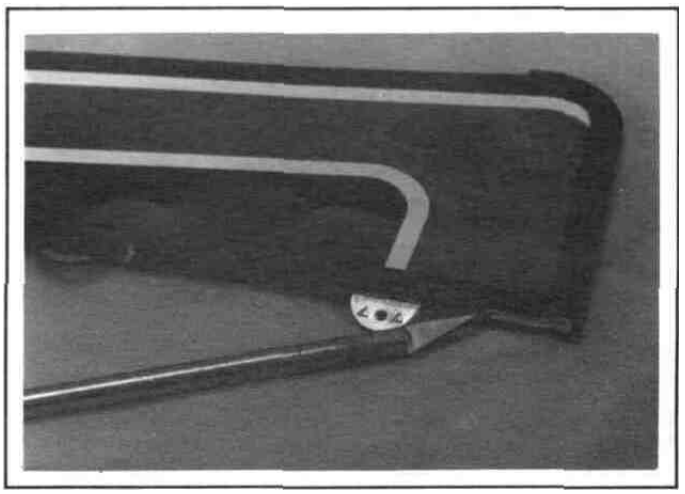
14. Position the supports straightout (90') to the fuselage. Mark where the supports touch the horizontal stabilizer, drill a 2mm hole on each side at the marks. Next, cut 1/8" off of two brass sleeves. Finally, attach the supports as shown in the drawing above.



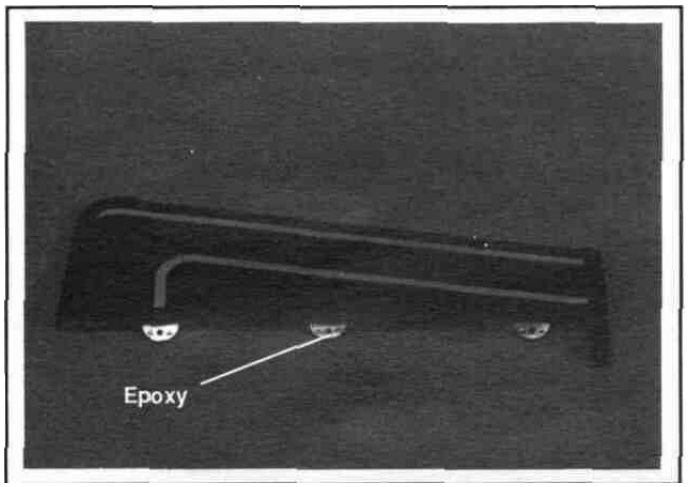
15. Install the tail wheel assembly through the metal strip. Next, trail fit the rudder onto the vertical fin. Notice where the bottom hinge meets the fuselage and make a slot in the tail where the rudder hinge needs to be with an X-Acto knife.



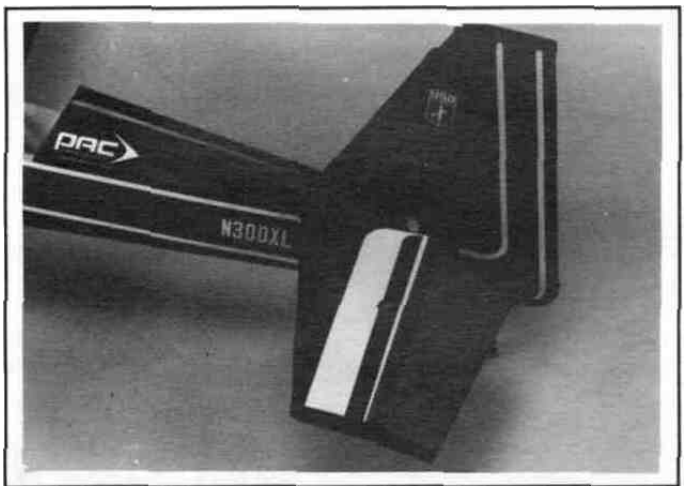
16. Next, drill a 2mm hole about 1" deep at 7/8" from the bottom of the rudder. The hole should be straight in from the front edge.



17. Notch a small groove (1/8" deep) from the hole down to the bottom for the tail control arm.

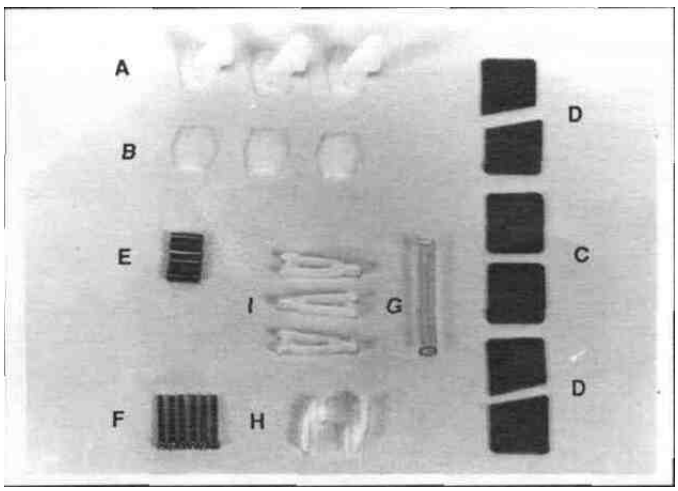


18. Place a small amount of epoxy on the hinges, in the groove, and on the end of the tail control arm. (It is a good idea to place some petroleum jelly onto the hinge center joint (point of movement) to keep out any epoxy.

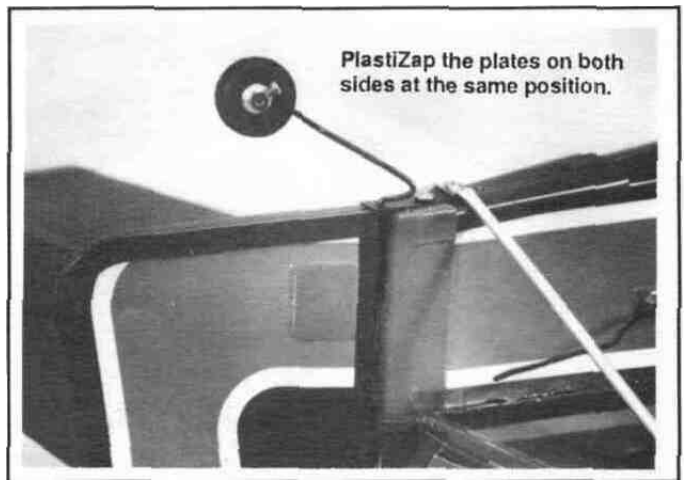


19. Carefully postion the tail control rod into the hole and the groove. Wipe off any excess epoxy and then insert the hinges into the slots. Wipe off any excess epoxy from the hinges and check for free operation. Let cure.

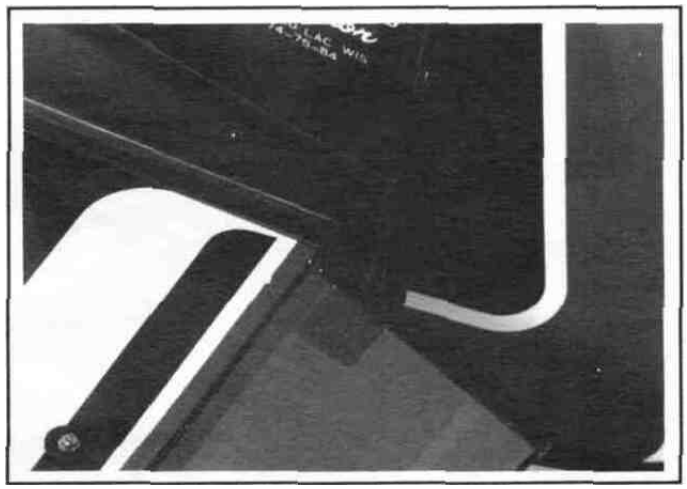
ELEVATOR/RUDDER CONTROL ROD INSTALLATION



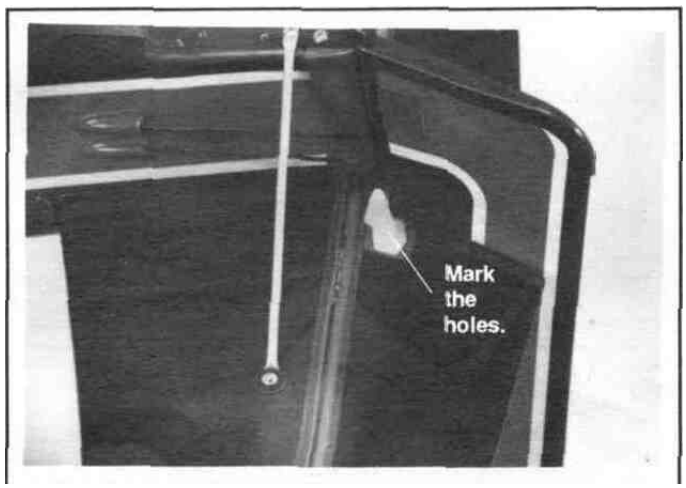
A.	Control Horns	3
B.	Back Plates	3
C.	Mounting Plates (Rectangled)	2
D.	Mounting Plates (Angled)	4
E.	Brass Tubes	6
F.	2mm x 20mm Screws	6
G.	Clevis Retainer Tube	1
H.	Rod Clevis	2
I.	Snap Clevis	3



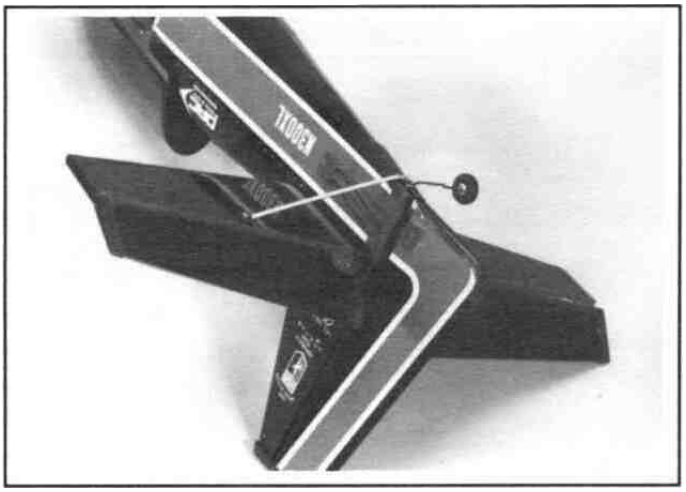
1. Glue (using PlastiZap) the rectangular mounting plates to the rudder so that they are centered, one on each side, over the tail control arm that is "inside" the rudder.



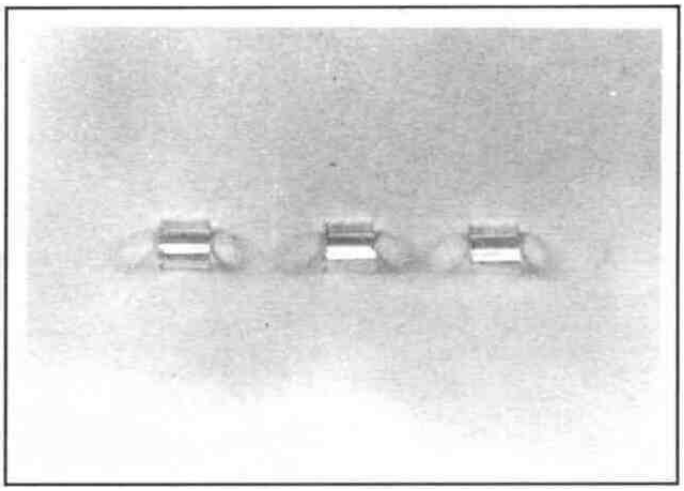
2. Using PlastiZap again, glue the angled mounting plates, one on each side, on the two elevator halves as shown.



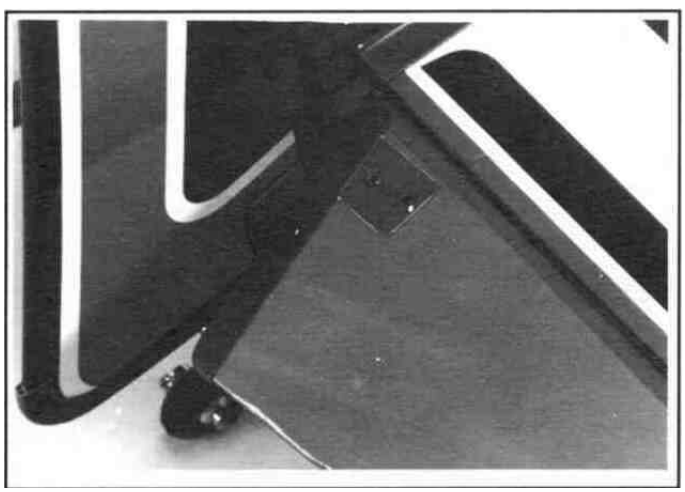
3. Using the control horn as a guide, center and mark two holes for drilling on all three mounting plates. The horns will then be mounted - two underneath the elevator and one on the right side of the rudder (as viewed from the rear).



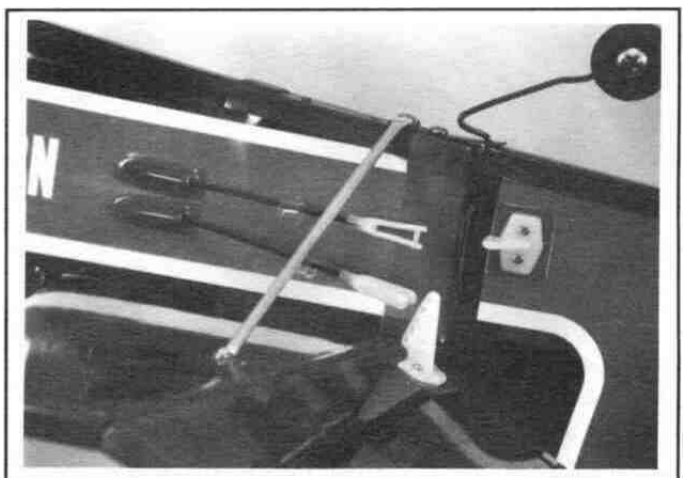
4 Drill six 3mm holes for the three horns Make sure that you drill straight through to the other side



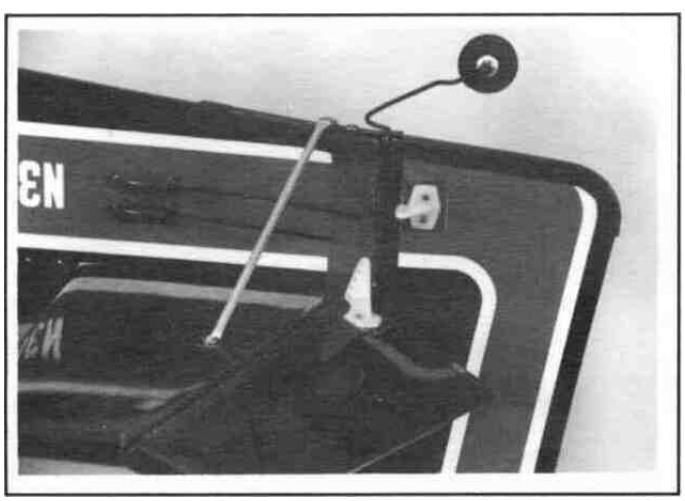
7 Cut the clevis retaining tube so that you have three 3/16" tubes



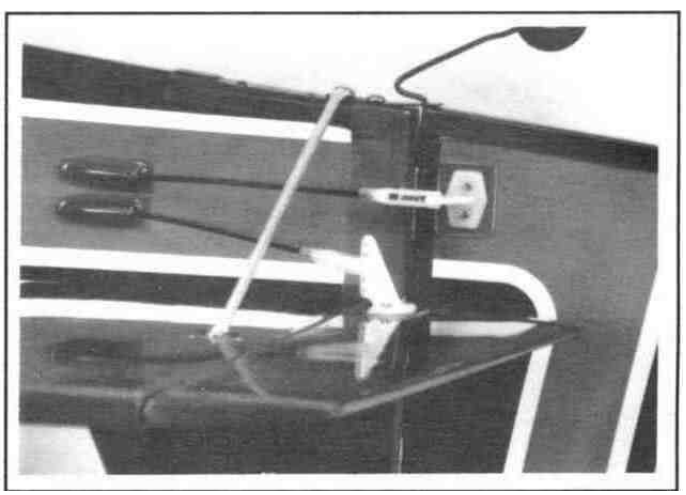
5 Install the six brass tubes into the holes



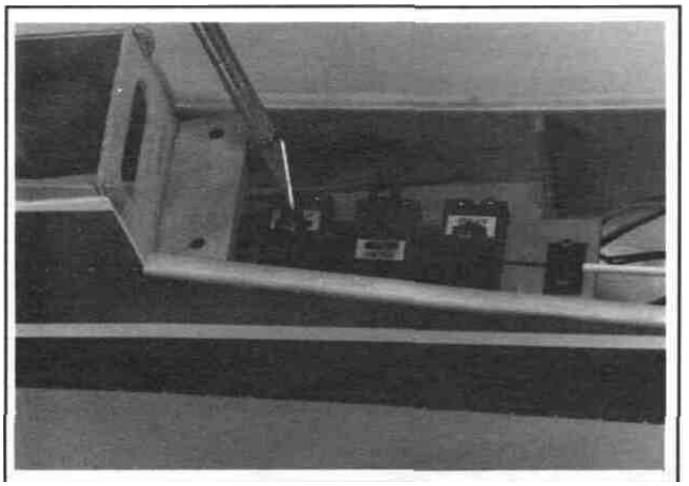
8 Slide on one of the retaining tubes onto each rod Screw on the plastic snap clevises to the three push rods coming out of the fuselage Screw them on half way up the threads



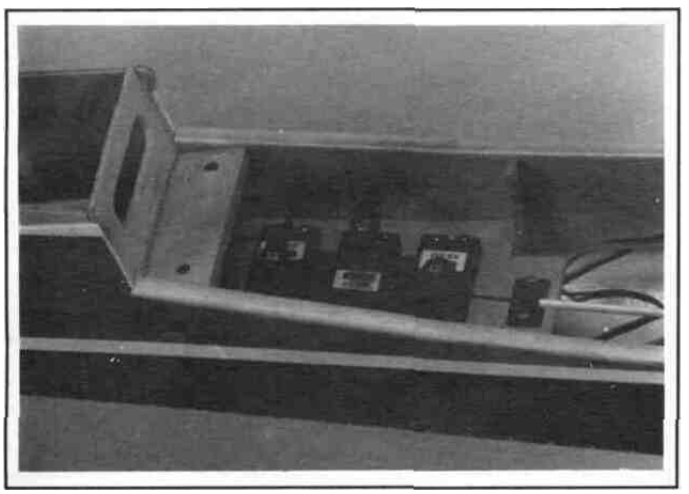
6 Mount the control horns to the surfaces with the 2mm x 20mm screws Pass the screws through the horn, through the tubes and finally thread them into the back plates



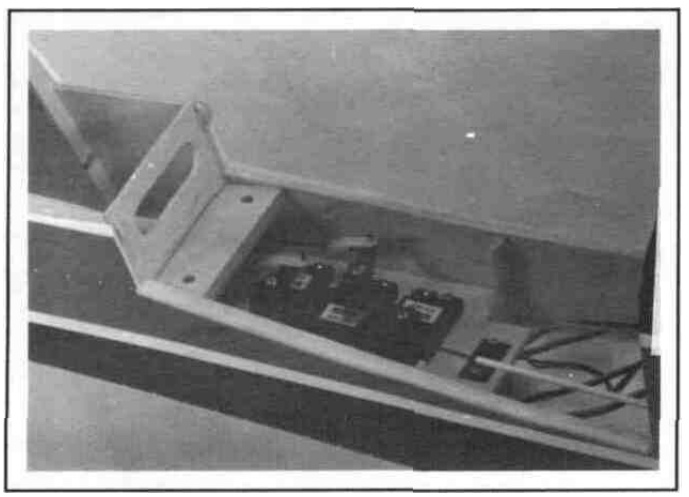
9 Attach the respective control rods to each horn Use the middle hole of the horn Turn on the radio system and adjust the clevises for centered control surfaces Slide up the retaining tubes to lock the clevises.



10 Align the rods over the servo horns and make a mark where they intersect Make sure that the control surfaces are in neutral (center position) before marking.

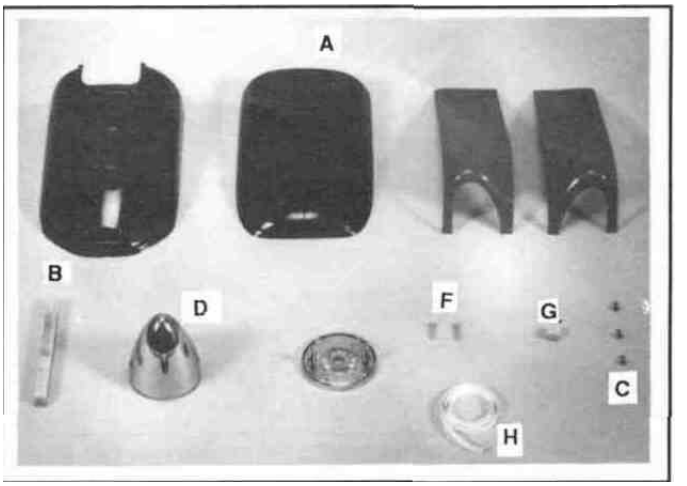


11. Next, make a 90' bend upwards at the mark and cut-off the excess so that there is only 6mm of rod after the bend.

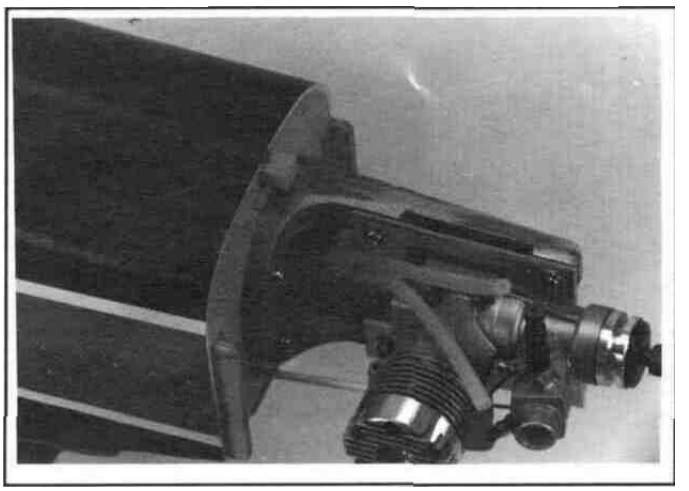


12 Attach the rods to the servos using the rod clevises as shown in the above drawing You may need to enlarge the holes in the horns slightly for a good fit.

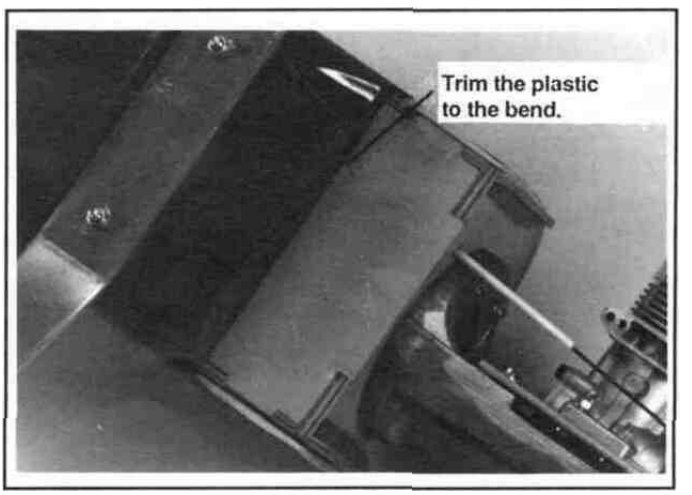
COWL AND PROP INSTALLATION



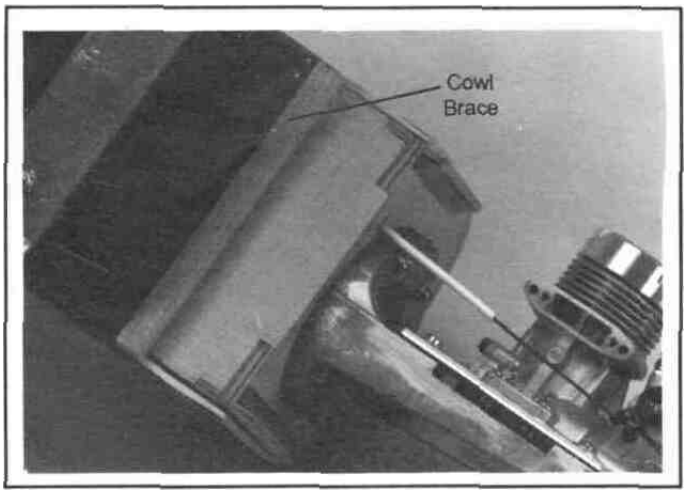
A. Cowl (4 piece)... 1
B. Cowl Brace 1
C. 3mm x 10mm Self-Tapping Screw 3
D. Spinner 1
E. Spinner Back Plate 1
F. 3mm x 12mm Self-Tapping Screw 2
G. Mounting Block 1
H. White Striping Tape 1/4" 1



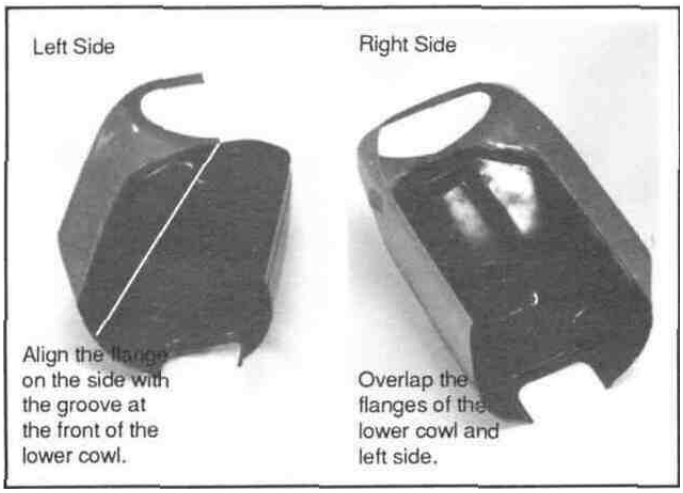
1. Epoxy the small mounting brace to the top of the firewall Fill any gap with epoxy, allow to cure.



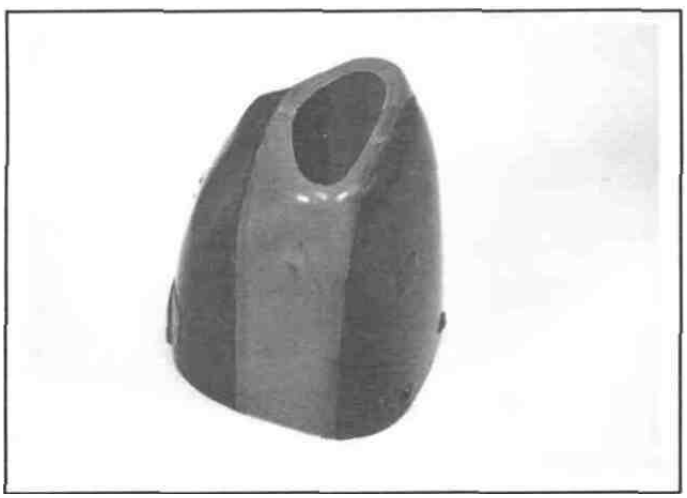
2. Trim away some of the plastic from under the front of the fuselage where shown.



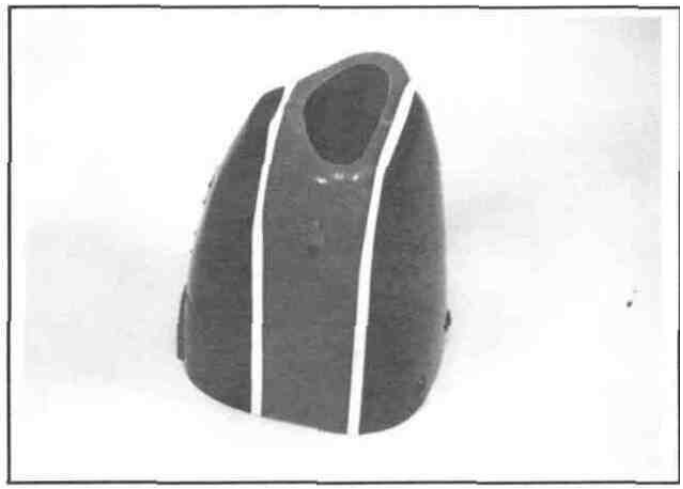
3. Epoxy the cowl brace onto the front of the fuselage. Make sure that the beveled ends angle down in line with the fuselage. Attach the muffler to the engine if using a two cycle. Remove, if necessary, the muffler/pipe if using a four cycle engine.



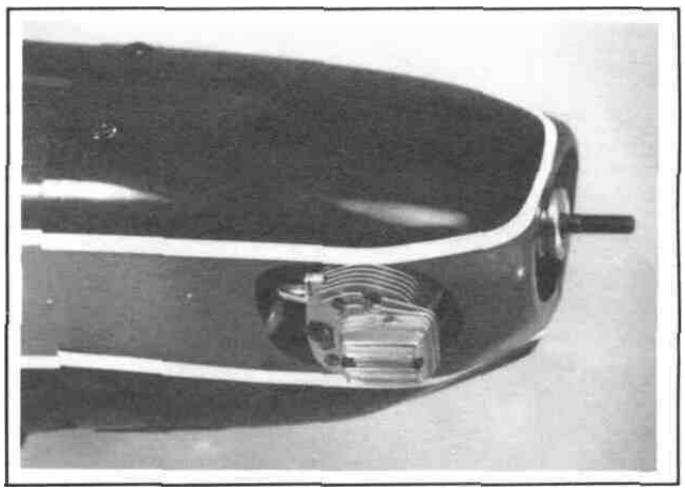
4. Lightly sand the flanges on the upper and lower cowl edges. This will allow the glue to adhere better to the plastic. Next, hold or tape the left side over the flange of the lower cowl and glue together along the inside seam with CA glue. Finally, install the right side in the same manner and glue.



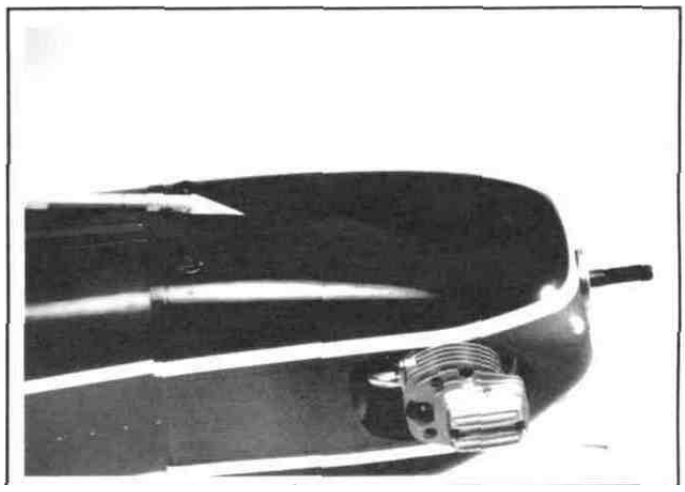
5. Trail fit the upper cowl in place from the inside. Check for a good fit. You may have to trim the upper cowl flanges slightly for a perfect fit. Once satisfied, place a light bead of CA glue along the length of the flange and hold in place until the glue cures.



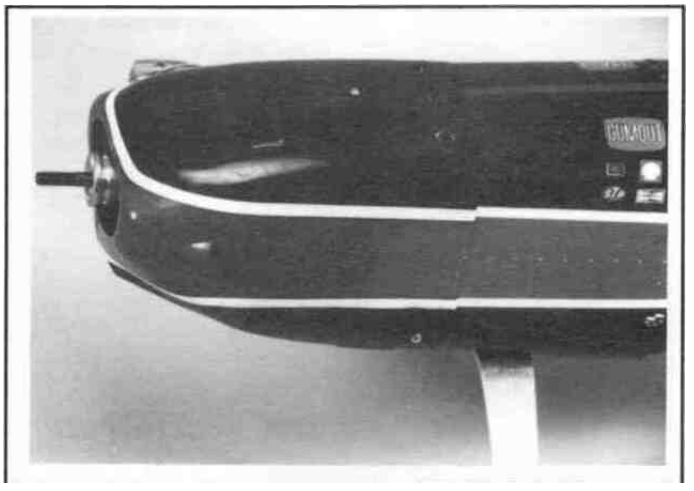
6. Apply the 1/4" white striping tape to the seams on the outside of the cowl.



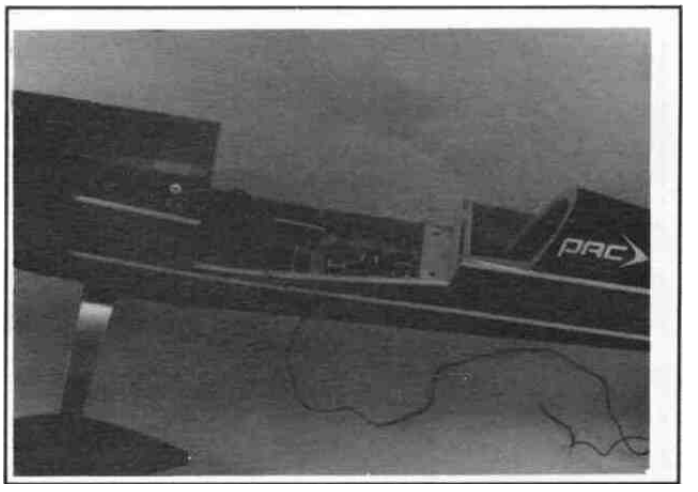
7. Trail fit and trim the cowl as needed so that the engine muffler will exit with at least 1/8 - 3/16" clearance. Now, carefully cut two holes in the cowl, one hole on the side to the cylinder head. Now cut one where the needle valve is located for easy accessibility. For four cycle engines, cut another hole for the choke linkage.



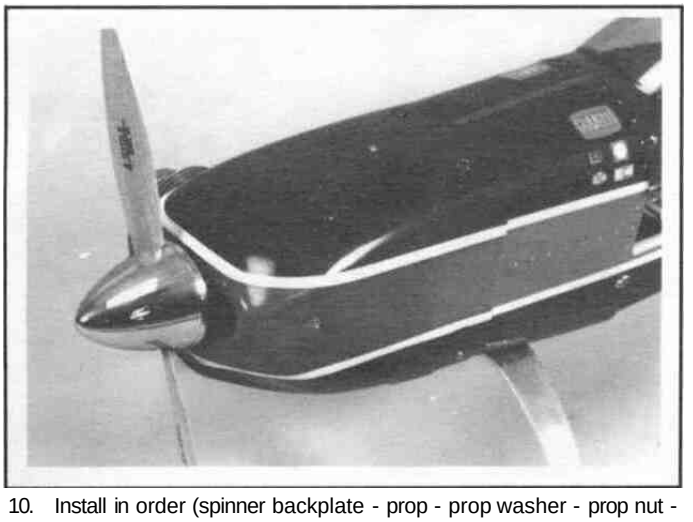
8. Slide the cowl onto the fuselage and make 3 marks (1 on top, and 1 on each side) where the mounting block and cowl brace are located.



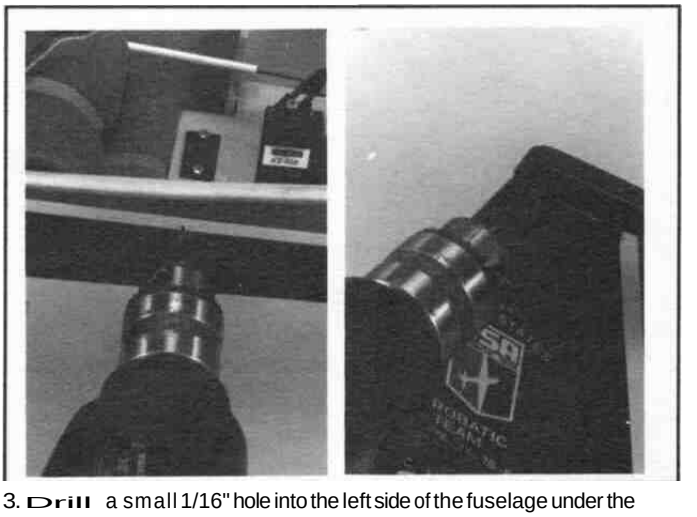
9. Reposition the cowl and drill a 2mm hole at each point and attach the cowl using three 3mm x 8mm self-tapping screws. If using a 4-Cycle engine, install the muffler/pipe at this time.



2. Install the battery first into the front of the fuselage as shown and then install the receiver on **top.**

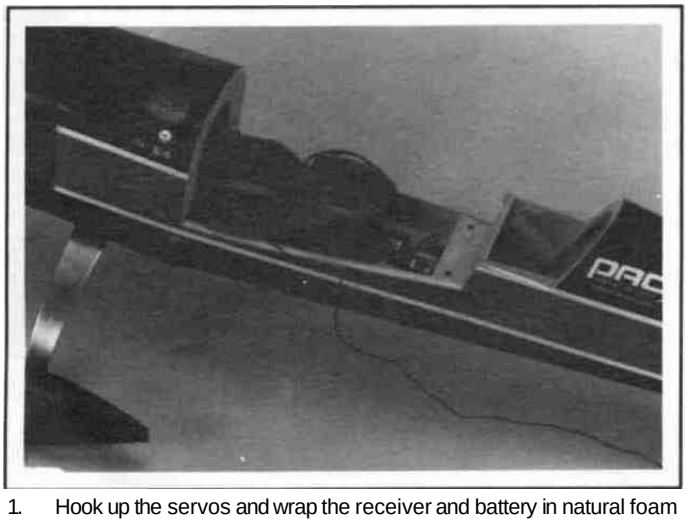


10. Install in order (spinner backplate - prop - prop washer - prop nut - spinner cone - two 3mm x 12mm self tapping screws) onto the engine crankshaft.

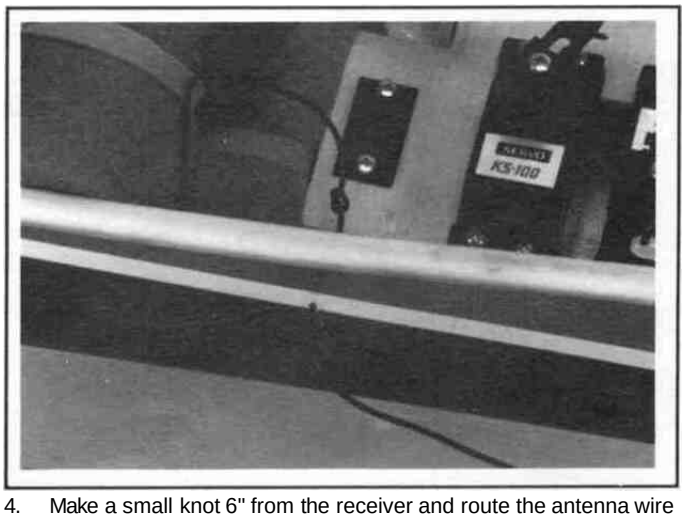


3. Drill a small 1/16" hole into the left side of the fuselage under the wing and drill a hole at the top of the vertical fin.

RECEIVER AND BATTERY INSTALLATION

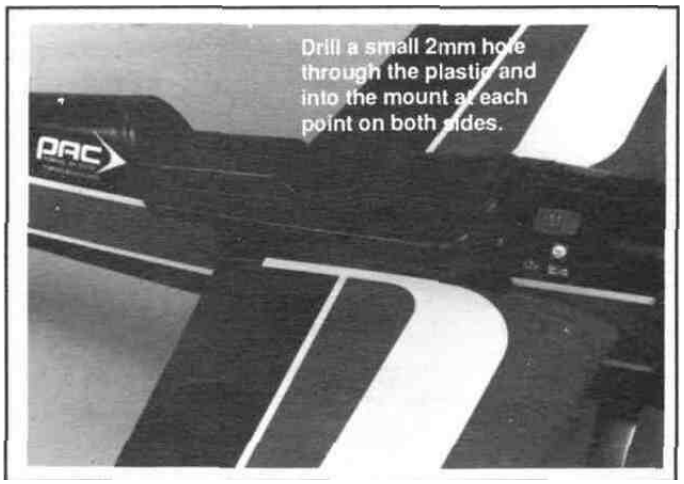


1. Hook up the servos and wrap the receiver and battery in natural foam rubber to protect it from vibration (Goldberg #481 Foam Rubber 1/4" works well). Use the aileron extension for your particular radio installation.



4. Make a small knot 6" from the receiver and route the antenna wire out through this hole and up through the hole in the tail.

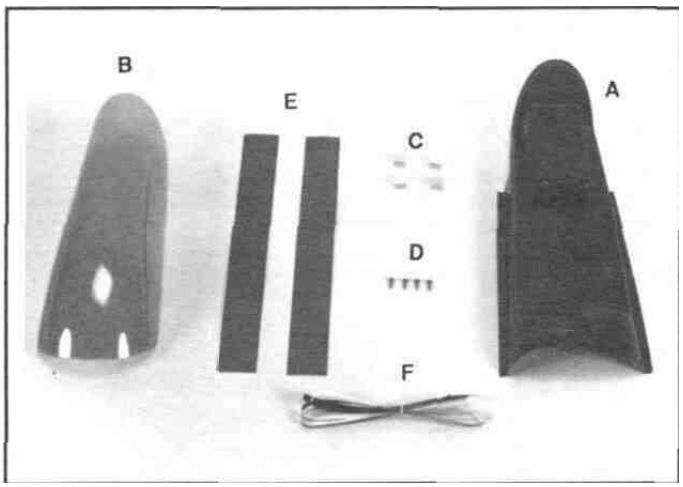
5. Use the antenna retainer and secure the wire to the tail.



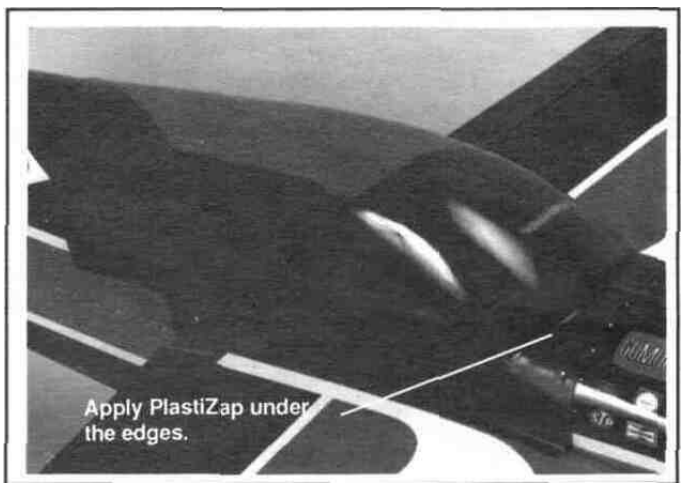
2. Once the epoxy has completely cured, position the cockpit on the fuselage. Make 4 small holes where the cockpit mounts are located. Attach with the 4 small self-tapping screws. Do not glue the cockpit. Apply the instrument decal to the front of the cockpit.

included in Fuse Kit

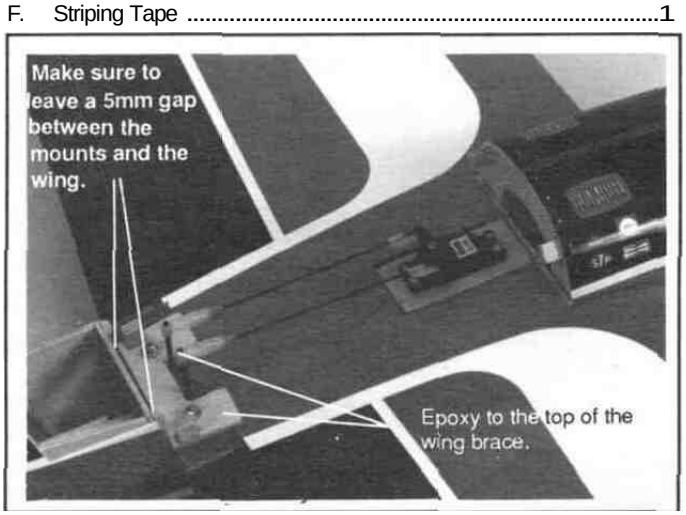
COCKPIT/CANOPY ASSEMBLY



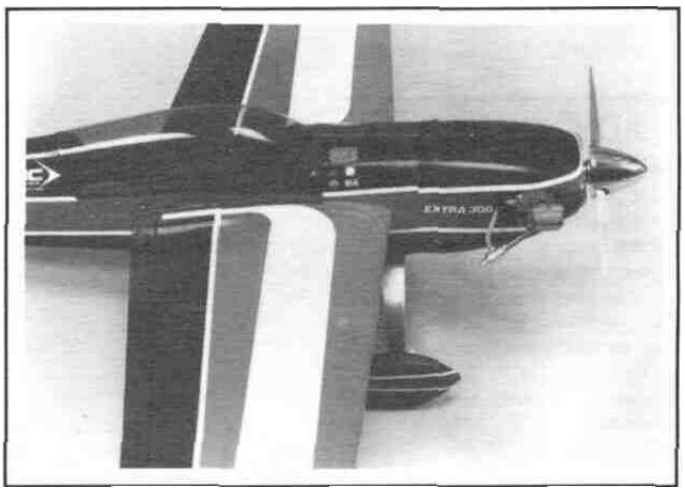
A. Cockpit 1
B. Canopy 1
C. Cockpit Mounts 4
D. 3 x 8mm Self-Tapping Screws 4
E. Decals 2
F. Striping Tape 1



3. Trial fit the canopy to the cockpit. If necessary, trim for a perfect fit. Apply a thin bead of Cyanoacrylate glue to the cockpit and attach and hold the canopy until secure. Now apply the black striping tape to the edge **of** the seam.



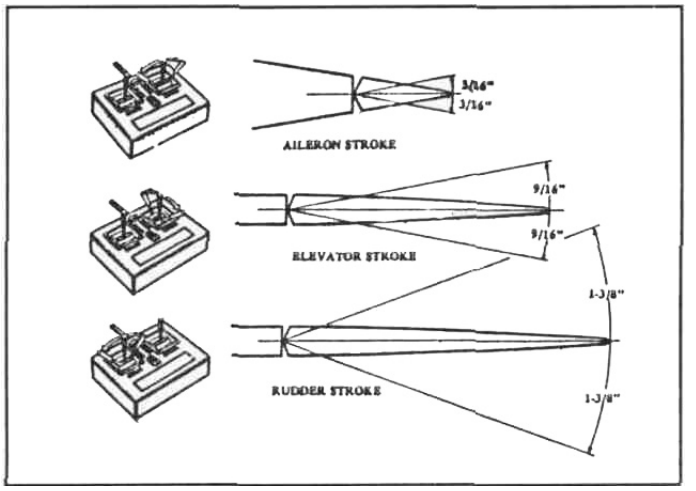
1. Connect the aileron servo lead to the receiver and install the wing. Epoxy the four cockpit mounts to the fuselage as shown. Be careful when gluing the rear mounts to only glue them to the wing mounting brace.



4. Apply the red sthpes to the side of the cockpit and trim as shown. Apply the "Extra 300" decals to the cowl sides.

C.G. 3/8" – 1/2" aft of fuse bulkhead

SERVO THROWS



The amount of throw that the control surfaces have is critical if you want a properly responsive plane Measure the throws as shown above They should be.

	Each way	Total
Ailerons	3/16"	3/8"
Elevator	9/16"	1 1/8"
Rudder	13/8"	23/4"

If not, move the clevis to a different hole or use a larger servo horn.

TRANSPORTING CHECKLIST

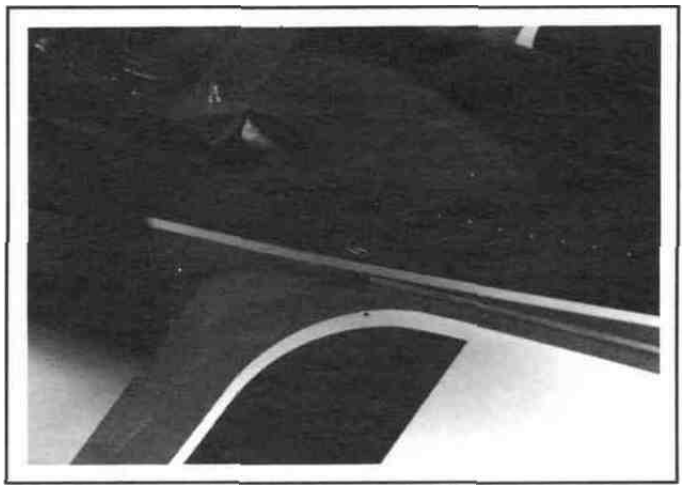
Before leaving for the flying field go through the checklist. This will help prevent you from forgetting to take things with you.

1. Make sure radio batteries are all charged.
2. Make sure the transmitter and receiver are on the same frequency
3. Glow plug clip and fully charged 1 1/2 volt battery.
4. Fuel and fuel pump or fuel bulb
5. Extra props and prop wrench
6 Screw drivers, knife, pliers, and wrenches.
7 Epoxy and something to mix it on.
8. Paper towels
9. Cleaner to remove residue on the plane.
10. Extra glow plugs
11. Electric starter or chicken stick.

RADIO CHECK

Always check the operation of your radio before you fly to see that the control surfaces move in the proper directions and that they move the proper amount If the direction of rotation needs to be reversed to correct for reversed controls, simply change the side of the servo arm to which the push rod is attached or flip the proper servo reversing switch on your transmitter To INCREASE the amount of movement that the surface will have, move the CLEVIS CLOSER to the surface or move the (ROD CLEVIS OR E Z CONNECTOR) away from the center of the servo arm To DECREASE the amount of movement, move the CLEVIS AWAY from the surface or move the (ROD CLEVIS OR E Z CONNECTOR) closer to the center of the servo arm

CENTER OF GRAVITY



Balance the plane using the mark on the side of the fuselage. It should balance at this point See below.

The center of gravity is a very important aspect of setting up the airplane properly It will control a large part of what type of flying characteristics your plane will have, if it is nose heavy the airplane will try to dive, and the elevator will be sluggish to respond to your control inputs If the plane is tail heavy the airplane will be very sensitive to the elevator and possibly uncontrollable The center of gravity should be checked with the fuel tank empty in the plane to be accurate The range in which the airplane should balance is marked with a black dot on the side of the fuselage With standard radio equipment, the plane should balance within this range If it does not balance within this range, feel free to add weight to the nose or tail as you need to obtain proper C G.

IMPORTANT SAFETY MEASURES

Receiver Battery

1. Always make sure the receiver battery pack is fully charged before flying
2. Wrap the receiver battery in 1/2" soft foam rubber to protect it from engine vibration and shock A rubber band may be used to hold the foam around the battery pack It is also suggested to place the battery pack in a plastic bag to protect it from fuel
3. If using NiCd batteries, follow the instruction that came with your radio for charging and care of the batteries
4. Before the first flight of the day, check all the wires on the battery pack and switch for corrosion or broken wires
5. Do a pre-flight check of your radio system each flying session

Receiver

1. Do not cut the receiver antenna. This may affect the sensitivity of the receiver
2. Carefully wrap the receiver in foam and a plastic bag like the receiver battery
3. Make sure that all the servos are plugged into the correct receiver terminal

Servos

1. Make sure that all the control surfaces move smoothly without binding When installing the push rods the servo must be able **to** move through its complete range of rotation
2. If the servo buzzes when the transmitter stick is moved to its limit, the servo still has some movement left This can damage the servo and drain the battery which may cause loss of control of the plane and crash

STARTING ENGINE

Engine Maintenance

Always check the engine mounting bolts, muffler, glow plug, propeller and spinner, etc .before attempting to start the engine Check for loose bolts, nuts or screws which may come off when the engine is running and cause serious damage Always check the area in which you will be flying or just running the engine Check for possible hazards, such as loose rags, rocks, tools, etc , lying on the ground which may get caught in the prop

If you intend on starting the engine by hand flipping the prop, always use a chicken stick, and be sure to check the position of the prop It is most comfortable when it is at the 2 o clock position when starting the compression stroke When you are using an electnc12V starter, try to position the prop parallel to the wing

Engine Break-In and Starting

Most manufacturers recommend that the engine be broken in on a test stand We also recommend that this be done according to manufacturer's instructions If a test stand is unavailable the engine may be broken in on the airplane Breaking in the engine allows the parts to "seat" to each other

1 Use a filter on the caburetor line
2 Remove the carburetor fuel line and the muffler pressure line from the muffler
3 Fill the fuel tank through the carburetor fuel line, when the tank is full the fuel will come out the pressure line
4 Reconnect the tubing
5 Follow your manufacturer's instructions according to needle valve settings
6. Turn the radio on and open the throttle to full open Place your finger over the air intake on the carburetor while turning the prop counter clockwise a few times Notice the fuel line If no fuel is reaching the carburetor, recheck the fuel line plumbing
7 Reduce the throttle to 1/4 or 1/2 throttle for starting
8 Using a starting stick (chicken stick) and holding the fuselage firmly quickly flip the prop in the counter clockwise direction Do not attach the glow plug clip in this step This will prevent the engine from being flooded and will make starting much easier Do not use bare hands/ fingers for starting, as the kick back from a model engine can be strong enough to cause severe injury
9 Attach the glow plug clip at this time
10 With quick flipping movements, flip the prop in the counter-clockwise direction If the engine does not try to start in the first few tries, double check your procedure and keep trying
11. Once the engine has started, listen carefully to the sound of the engine The sound of the engine will tell you how the engine is running, if you know what to listen for A lower tone, popping sound is the sound of a rich running engine As you turn the needle valve in, the popping sounds should decrease and the pitch of the engine should rise The optimum needle valve setting will depend on your engine and current weather conditions Again check with the manufacturers recommendations for engine break in procedures and valve settings
12 If you continue to have problems with the performance or starting of your engine, refer to engine trouble shooting guide as shown below

ENGINE TROUBLESHOOTING GUIDE

SYMPTOM	POSSIBLE CAUSE	SOLUTION
The engine does not start.	Glow plug battery is making poor contact.	Check to see if the battery is wired correctly and to see if the clip is making good contact with the plug
	Battery is dead or has a very low voltage	Replace or recharge the battery and check to make sure the battery can glow the plug red hot pnor to starting
	Bad glow plug (burned out or deteriorated filament)	Replace the glow plug
	Improper air/fuel mixture intake	Prime the engine through the carburetor air intake
	Engine is flooded with fuel.	Close the needle valve completely and try to start the engine It should start and then quickly stop Reset the needle valve and continue starting
The propeller is difficult to rotate	Engine may be flooded.	Remove the glow plug and rotate the engine until only a mist of fuel remains in the cylinder Replace the plug and continue
The engine fires but does not start.	Fuel is not reaching the carburetor.	Check the level of fuel in the tank Recheck fuel Open the needle valve a half turn or so and continue
	Improper break in procedures	Check the break in procedure and repeat
The engine starts but does not sound or run good	Loose plug or bad plug	Replace the plug and/or tighten the old plug

Pre-Flight Check

1. Clean the dust dirt, and oil off of the surface of the airplane
2. Check to make sure all nuts, bolts, and screws are securley fastened
3. Check all control surfaces to see if they are properly attached.
4. Check the range of the radio system as the manufacturer recommends
5. Check that all controls move smoothly and in the proper directions.
6. Check the level of charge in the transmitter and receiver batteries
7. Check that the area being used is free of obstacles and debris
8. Check the frequencies currently in use at the field and in your area
9. Check the level of the fuel tank to be sure it is full
10. Double check the radio operation

Flight Safety

- If this airplane happens to be your first radio controlled airplane, we strongly suggest that you ask a skilled pilot or instructor to help you learn how to fly You should also suggest to him to take the maiden **flight** to see what problems (if any) that need to be worked out There will be enough to worry about on your first solo flight without having to worry about whether or not it is properly set up
- Fly in an open field without any obstructions For example, trees, power lines, buildings, crowds of people, etc , are obstacles that the plane may hit and cause damage
- If you are a novice pilot, local area clubs have been formed and are very willing to help you with any questions you may have Many of the clubs even have club trainer airplanes that they will actually teach you to fly with This helps prevent disappointing crashes on your first flights Addresses of local area clubs can be located from your local area hobby shop and/or by writing to Academy of Model Aviation, 1810 Samuel Morse Drive, Reston, VA 22090
- Fly the model at reduced throttle until you get to know the flight characteristics
- When adjusting the needle valve JU st prior to flight, hold the plane at a 45" nose up altitude, full open throttle and adjust the throttle for top performance **as** the manufacturer's instructions suggest.

Take-Off

The airplane may be taxied around on a smooth/open section of pavement without the wing and the engine has been adjusted and the radio has been properly checked Become familiar with controlling the plane on the ground with the rudder, in the air you will find that most of the time you will be using a combination of elevator and ailerons to turn the plane because they are more effective in the air On the ground, the rudder is more effective A transition will need to be made once the plane leaves the ground That transition, from using the rudder on the ground to using the ailerons once it leaves the ground, will take a little practice Once good rule of thumb is to always take off directly into the wind (if there is any) This will prevent the wind from trying to blow the model from side-to side and will not take **as** much runway as if you were trying to take off downwind

One you feel comfortable with the way it handles on the ground, it comes time for you to concentrate very much on the airplane's movements As you are ready for take off, simply point the nose into the wind and slowly advance the throttle up to full throttle At this point the plane will be going very fast and will be very sensitive to your rudder inputs Use smooth inputs to correct the plane from wandering off of the runway Once the plane is at take off speed, slowly pull back on the elevator stick This will cause the plane to leave the ground At this point, notice whether the plane tends to turn. climb or dive, and make the necessary opposite control inputs to keep the plane on a gentle climb in the desired direction.

Flight

Once the plane has reached a safe altitude, reduce the throttle to about half power If the airplane is properly set up (i. e. correct C G .trims all centered, engine properly set), the plane should be very stablewithout any wandering tendencies. If the plane does tend to go more in one direction than another, use your trim levers on your transmitter to correct this Do not look at the transmitter while adjusting trims Then while the plane is flying straight, adjust the elevator trim to correct abnormal climbing or diving If the trims will not overcome a turn or a climbing **tendency,** land the model immediately and check for improper setup

Landing

There is an old saying that states, "You do not have to take off .. But you do have to land " Therefore, be ready to land at all times during your flight The engine may not stay running through a complete tank of fuel for one reason or another It is suggested to time the "run time" of a complete tank before flight That way you know approximately what to expect and when you need to land before the fuel runs out

Set up your landing approach downwind at 100 200 feet up and 500 800 feetaway depending on the height of the plane and the strength of the wind Approach into the wind and slowly reduce the throttle to the closed position Concentrate on the glide path of the plane, taking notice of whether the plane will reach the beginning of the runway or if it will overshoot the runway completely With smooth, deliberate inputs, use your engine power and your elevator to adjust the glide path so the plane will touch down smoothly on the beginning of the runway at its slowest speed Itwill still seem very fast and will use the complete runway to slow down.

After-Flight Maintenance

- Remove all excess fuel from the fuel tank as this fuel can become jelly like and cau se clogging of the fuel lines as well as clogging the engine's carburetor valves
- Always use after run oil in the engine to prevent corrosion
- Check and double check that the transmitter and receiver switches **are** switched to the off positions
- Wipe off the excess oil that will collect on the wing and fuselage **Use a** light duty cleanser to help cut through the oil
- Remove fresh fuel from the surface of the plane immediately **as** different brands can cause clouding of the surface
- Replace any bent, marred, or dinged props as they can fly apart at any time when the engine is turning
- Completely check the alplane for damage to the wings, landing gear, covering and repair as needed before your next flight.

Repair

If damage should occur, wipe the broken area clean with a clean rag to remove all debris Use epoxy glue to repair Do not use Cyanoacrylate adhesive near any foam parts as it will deteriorate the foam

Fully Assembled Extra 300