HOBBICO®

P-40E WARHAWK

ALMOST READY-TO-FLY RADIO CONTROLLED MODEL AIRPLANE

- **SUPERIOR QUALITY IN AN ALMOST-READY-TO-FLY MODEL.**
- **SPECIAL COVERING PROCESS YIELDS A STRONG, BRILLIANT, AND FUEL-PROOF FINISH.**
- **80% COMPLETE OUT OF THE BOX - NO SANDING, PAINTING, OR FINISHING REQUIRED.**
- **BEAUTIFUL SEMI SCALE APPEARANCE.**
- **SUPER AEROBATIC AIRCRAFT FOR EXPERIENCED PILOTS**
- **WILL EASILY ACCEPT RETRACTABLE LANDING GEAR.**

V1.0

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 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 P-40E 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 P-40E kit is one of the finest models of it's type and will offer you many hours of enjoyment.

BEFORE ASSEMBLY

CONSTRUCTION HINTS-

1 **IMPORTANT! 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 plane Cyanoacrylate will destroy the foam

3 It is best to use 30 minute (or longer) epoxy for assembly This will allow time to position the parts before the epoxy cures

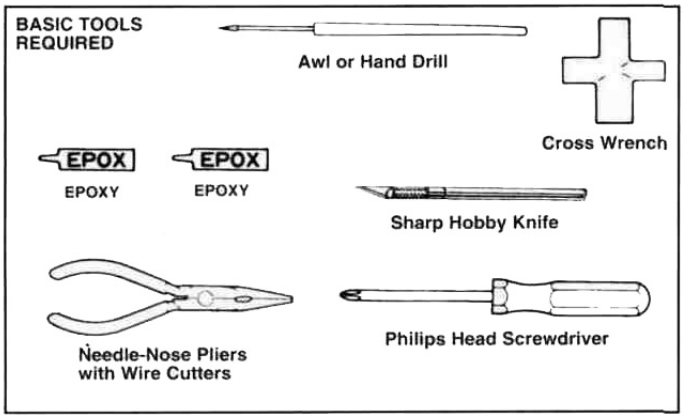
4 Before assembly place your radio system on charge

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 P-40E kit

Medium Fuel Tubing (18")	1
46 Sized 2 Cycle Engine	1
OR	
61 70 Sized 4 Cycle Engine	1
4 to 5 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
Hobbico (HCAR3760) Threadlock	1
Dubro 340 in line Fuel Filter	1
Retractable Gear (HCAA4050) (Optional)	1
Retract Servo (Optional)	1
Dubro 334 Kwik Fill Fuel valve	1
Propeller (Size depends on the engine)	1
HCAP 2150 Exhaust Deflector (4 cycle operation)	1
HCAP 2175 Exhaust Deflector (2 cycle operation)	1



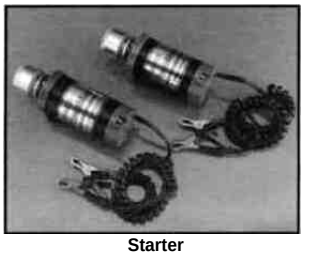
TOOLS

You will need the following basic tools to assemble the P-40E Hobby knife Philips screwdriver (small and medium) needle nose pliers, drill, drill bits sanding block ruler and string

REQUIRED FOR RUNNING THE ENGINE

Glow Fuel
(See Engines Recommendations)

Glow Driver

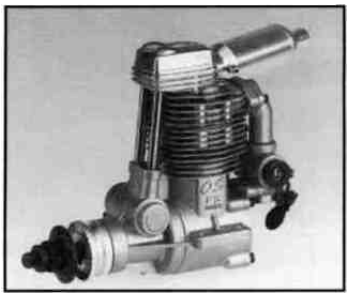


Starter

12V Battery

Standard field equipment is required for running the engine Starter 12V Battery, Hot Shot Glow Plug Driver and compatible glow engine fuel

O.S. .46SF
2-cycle



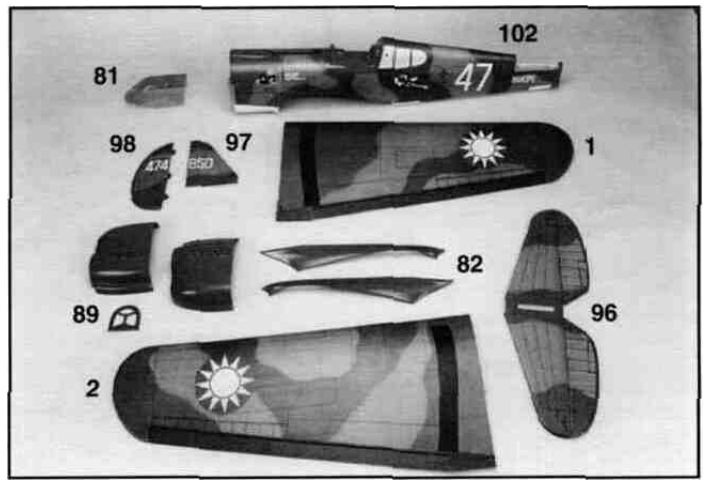
O.S. 70 Surpass
4-cycle

A quality brand engine will be needed We recommend the **0 S 46SF 2** cycle engine or the 0 S 70 Surpass 4 cycle engine

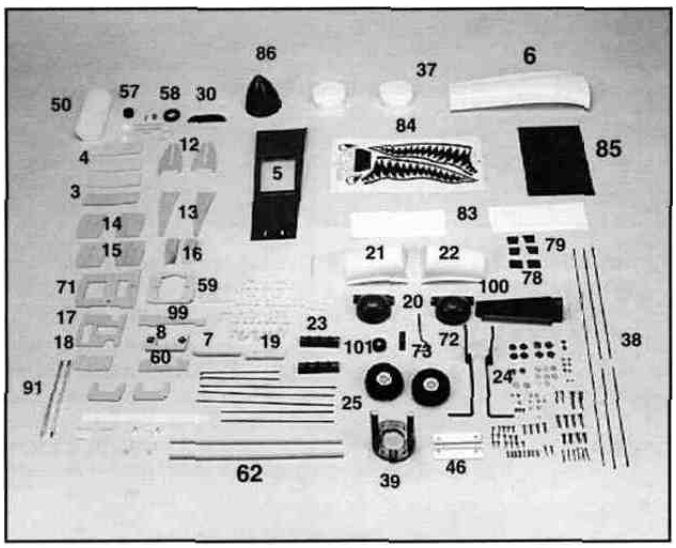
A four-channel radio control system with 4 servos is required for the P-40E If the optional retracts are going to be used a five channel system with a retract servo is needed We recommend that a larger capacity receiver battery (800 mAh or more) be used when using retracts This will allow for more flights before recharging is necessary

PARTS LIST

Before assembly, match the parts in the photos on this page with the parts in the kit. Check off each part as they are located. If any parts are missing or damaged, consult your hobby dealer.

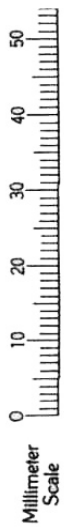


- Right Wing Panel 1
- Left Wing Panel.....1
- Rear Wing Joiner 1
- Front Wing Joiner.....3
- Wing Center Cover (top) 1
- Wing Center Cover (bottom).....1
- 7mm Dowel Rod 1
- Wing Screw Mounting Block 1
- 4 x 30mm Screws 2
- 4mm Washers.....2
- 0-Rings.....2
- Front Center Ribs.....2
- Rear Center Ribs 2
- Gear Mount (A) 2
- Gear Mount (B) 2
- Gear Mount (C).....2
- Aileron Servo Tray 1
- Tray Mount (A) 1
- Tray Mount (B) 1
- Wheel Fairing (Fr).....2
- Wheel Fairing (Rt).....1
- Wheel Fairing (Lt) 1
- Wing Guns 2
- Gear Struts.....2
- Wheels.....2
- Wheel Collar 2
- 3 x 5mm Screws 3
- Gear Mount Straps.....4
- 2.5mm x 10mm S/T Screws.....16
- Front Wing Pad 1
- Bell Crank Mount 2
- Bell Cranks.....2
- 33 Bell Crank Pivots.....2
- 34 3mm Washers 4
- 35 3 x 20mm Screws 2
- 36 3mm Nuts.....2
- 37 Wheel Wells 2
- 38 Control Rods.....4
- 39 Engine Mount.....1
- 40 4 x 20mm Screws 4
- 41 4 x 15mm Screws 4
- 42 3.5 x 15mm Screws 4
- 43 4mm Washers.....4
- 44 Lock Washers 8
- 45 3.5mm Nuts.....4
- 46 Mounting Plates 2
- 47 Blind Nuts.....4
- 48 1 x 450mm Rod.....1
- 49 Throttle Rod Tube 1
- 50 Fuel Tank 1
- 51 Clunk.....1
- 52 Silicone Tubing.....1
- 53 Fuel Pipe .....(2) Long, (1) Short
- 54 Plastic Disc (large) 1
- 55 Plastic Disc (small).....1
- 56 3mm x 18mm S/T Screw.....1
- 57 Rubber Plug.....1
- 58 Neoprene Ring.....1
- 59 Tank Support (A) 1
- 60 Tank Support (B) 1
- 61 Aileron Horn 2
- 62 Wood Push Rods 2
- 63 Control Rods (short-bent) 2
- 64 Control Rods (250mm).....3
- 65 Control Rods (200mm).....2
- 66 Shrink Tubing.....1
- 67 Rod Clevises.....6
- 68 Snap Clevises.....5
- 69 Clevis Retaining Tube.....1
- 70 Push Rod Exits 3
- 71 Main Servo Tray.....1
- 72 Tail Gear.....1
- 73 Metal Strip.....1
- 74 Wheel Collar (small).....1
- 75 Brass Collar 1
- 76 Control Horns.....3
- 77 Back Plates.....3
- 78 Mounting Plates (Rectangle).....2
- 79 Mounting Plates (Angled).....4
- 80 Brass Tubes.....6
- 81 Canopy.....1
- 82 Fillets.....2
- 83 White Decals.....1
- 84 Decal Sheet 1
- 85 Canopy Decals.....1
- 86 Spinner.....1
- 87 Spinner Back Plate 1
- 88 2mm x 20mm Screws 6
- 89 Cowl (3 piece) 1
- 90 2.5 x 12mm S/T Screw.....2
- 91 Stab Supports 2
- 92 Plastic Disc 4
- 93 2 x 15mm Screw 2
- 94 2mm Nuts.....2
- 95 2mm Washers.....2
- 96 Horizontal Stabilizer.....1
- 97 Vertical Fin 1
- 98 Rudder.....1
- 99 1/8" Stab Platform.....1
- 100 Stab. Root Cover 1
- 101 Tail Wheel 1
- 102 Fuselage 1

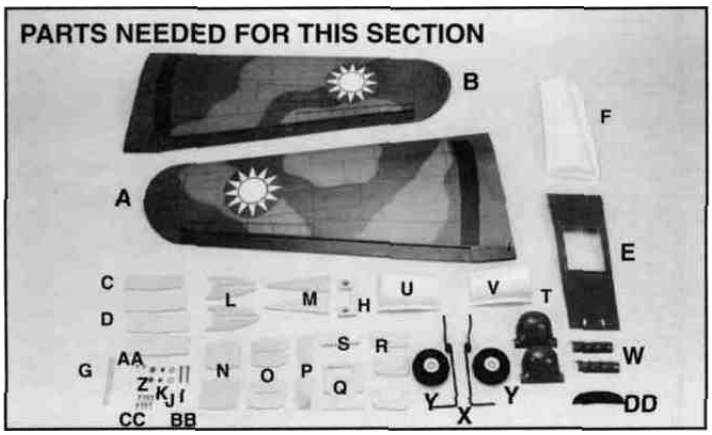


NOTE: Only the major parts are numbered in this photograph.

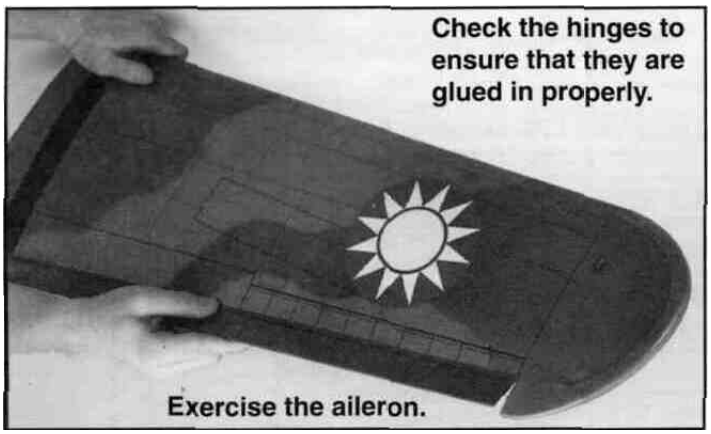
Use this ruler as a guide when selecting parts and screws to ensure that you have the correct part.



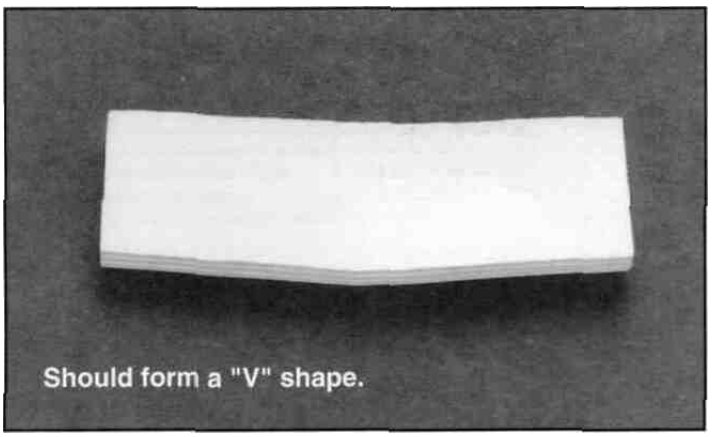
WING ASSEMBLY



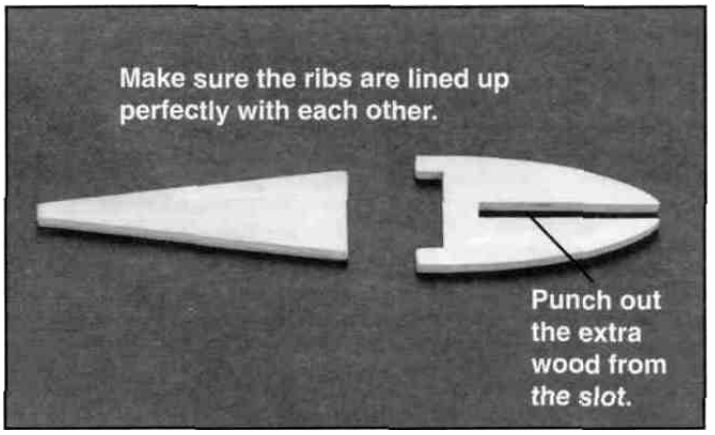
A	Right Wing Panel	1	P	Gear Mount (C)	2
B	Left Wing Panel	1	Q	Aileron Servo Tray	1
C	Rear Wing Joiner	1	R	Tray Mount (A)	1
D	Front Wing Joiner	3	S	Tray Mount (B)	1
E	Wing Center Cover (top)	1	T	Wheel Fairing (Fr)	2
F	Wing Center Cover (bottom)	1	U	Wheel Fairing (Rt)	1
G	7mm Dowel Rod	1	V	Wheel Fairing (Lt)	1
H	Wing Screw Mounting Block	1	W	Wings Guns	2
I	4 x 30mm Screws	2	X	Gear Struts	2
J	4mm Washers	2	Y	Wheels	2
K	0 Rings	2	Z	Wheel Collar	2
L	Front Center Ribs	2	AA	3 x 5mm Screws	2
M	Rear Center Ribs	2	BB	Gear Mount Straps	4
N	Gear Mount (A)	2	CC	2 5 x 10mm S/T Screws	8
0	Gear Mount (B)	2	DD	Front Wing Pad	1



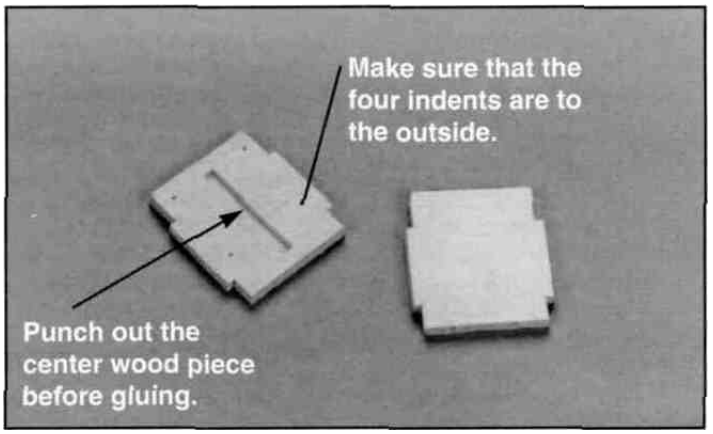
1 Check each wing half for smooth aileron operation It is a good idea to exercise (move back and forth) the ailerons to insure easy deflection Pull lightly on both ailerons to ensure that the hinges are properly glued in If not, re-glue using epoxy



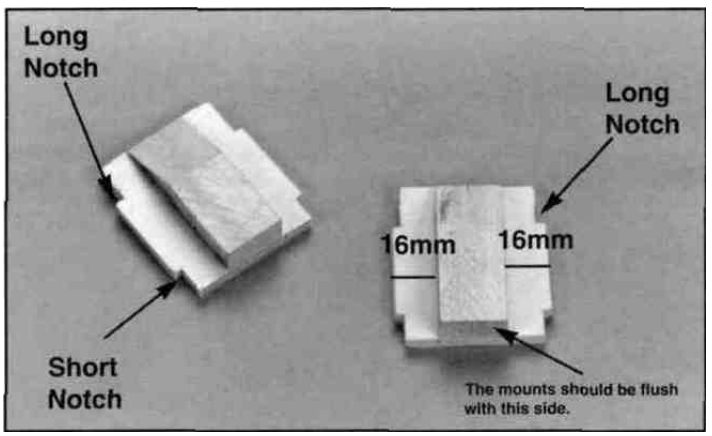
2 Align and epoxy the three main plywood wing joiners together Clamp tight until the glue sets You Il notice that there is a dihedral angle cut into the joiners so make sure they are perfectly lined up and form a "V"



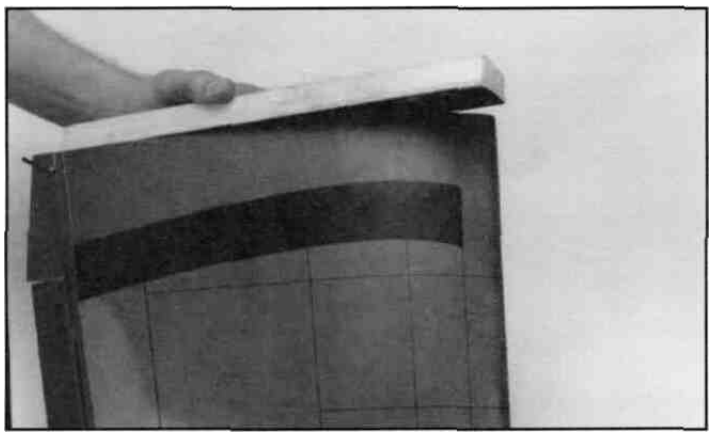
3 Align and epoxy the two front center plywood ribs and the two rear center plywood ribs together as shown.



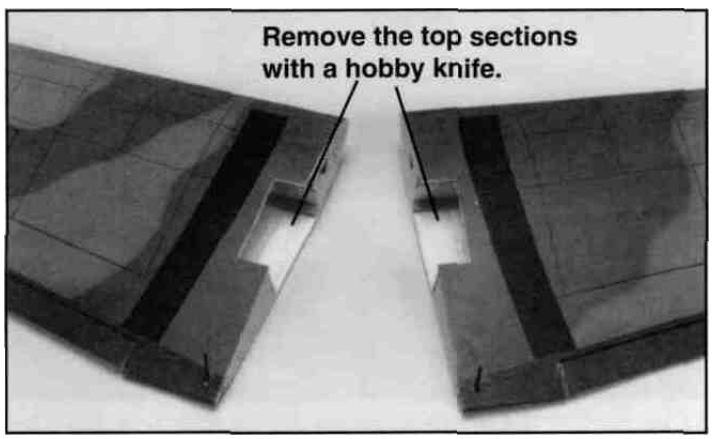
4 Match up the gear mount (A) pieces with the gear mount (B) pieces and epoxy them together Make sure that the bevels on the corners match up perfectly



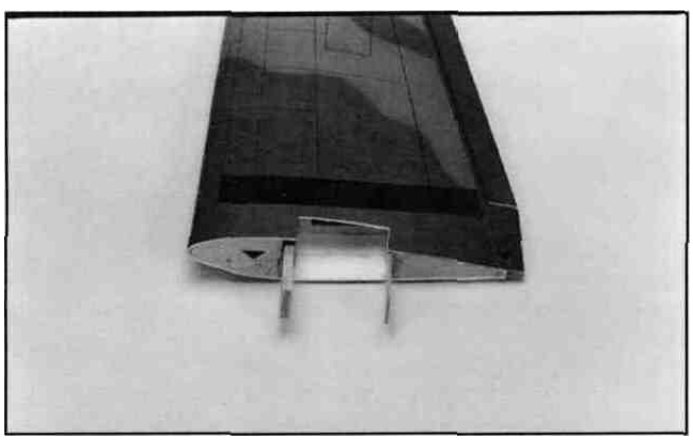
5 Align and epoxy gear mount (C) to the mount assembly side that **does not** have the slot Make sure that mount (C) is centered on the assembly and that the flat side is lined up with the edge with the shorter notches



6 Next, using a sanding block, sand the wing roots of both wing halves to ensure that they are perfectly flat Be careful not to change the dihedral angle of the root

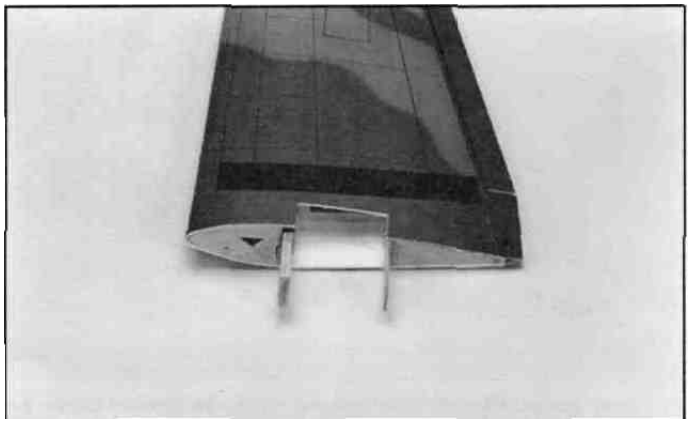


7 Remove the foam covering section from each wing half Only remove the top sections as shown.

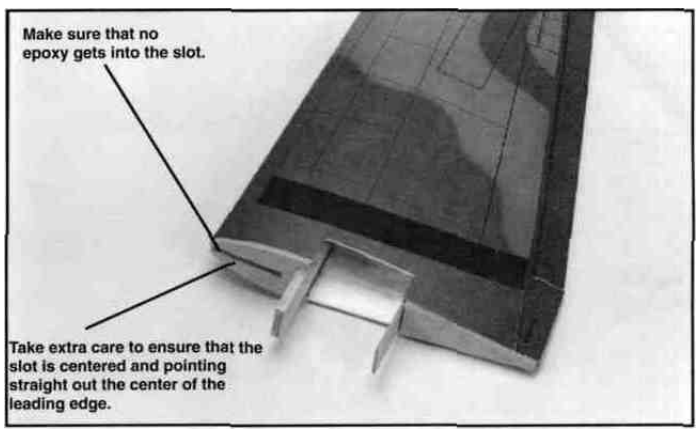


8 On one of the wing panels trial fit the front and rear wing joiners Make sure that both joiners angle up for proper dihedral There may be a slight gap between the wing spars and joiners, but this will be filled with epoxy

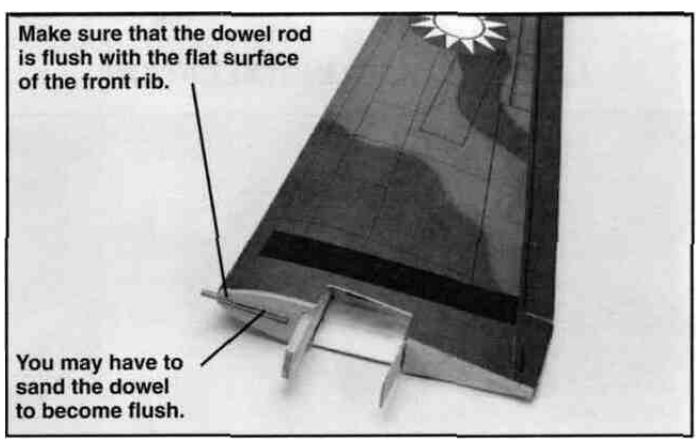
IMPORTANT' The following three steps are critical in the assembly of this kit If they are not done correctly wing failure could result Be sure to use plenty of slow cure (30 min) epoxy



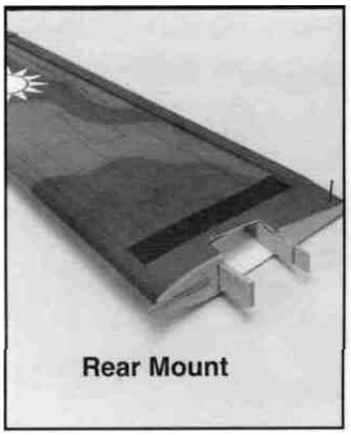
9 Once satisfied with the fit Generously coat the joiners and the wing joiner pocket with 30 minute epoxy and install Next fill any gaps between the joiners and the spars with epoxy for a tight bond It is a good idea to hold the wing so that the leading edge is down This way the epoxy will easily flow into the gaps Let cure before proceeding

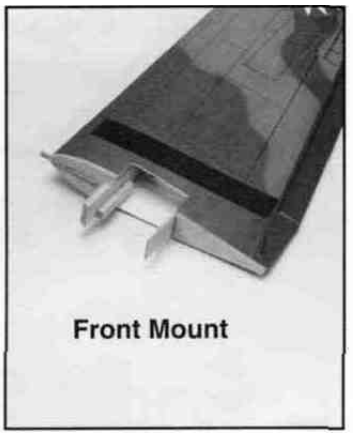


10 Glue the front and the rear center ribs onto the wing root using 30 minute epoxy Make sure that the ribs are centered on the wing root Let cure



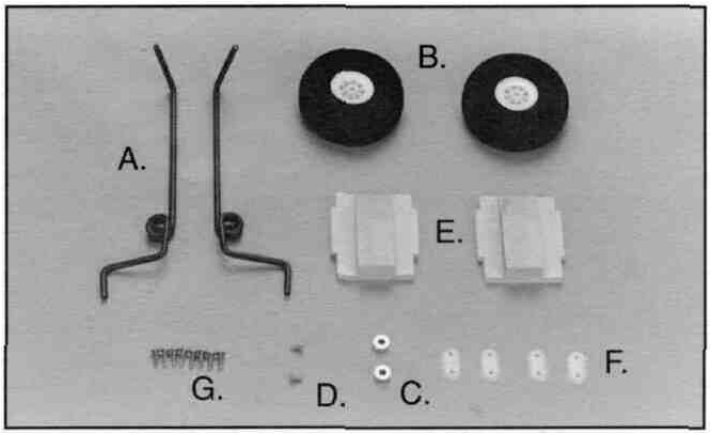
11 Epoxy the 7mm dowel rod into the slot of the front ribs Use plenty of epoxy for a solid fit Let cure





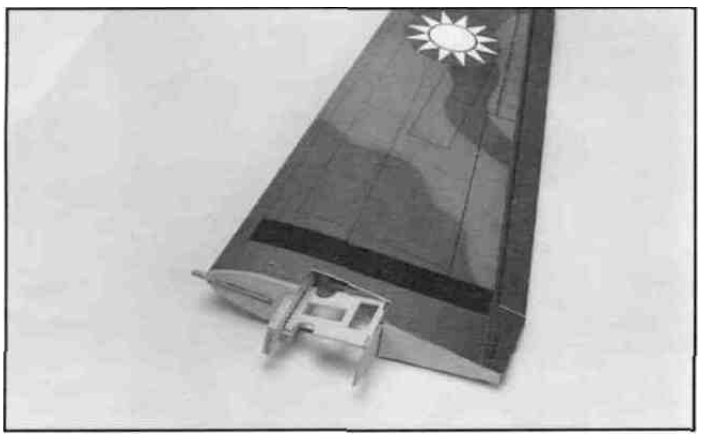
12. Epoxy the tray mounts onto the wing joiners **as shown. Center both** mounts with the bottom edge of the joiners.

STANDARD LANDING GEAR INSTALLATION

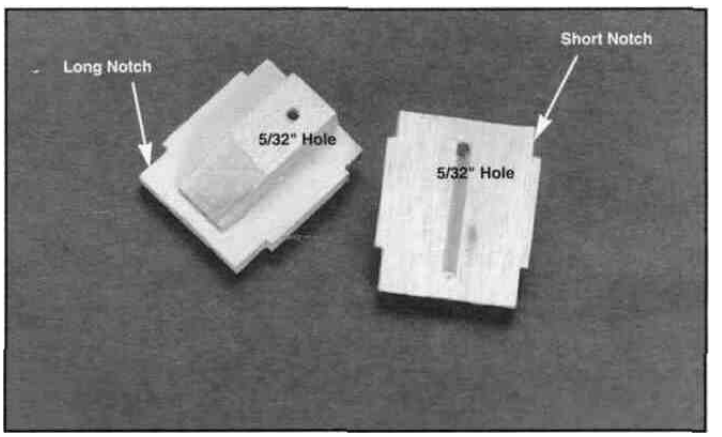


15. Locate the following parts:

A.	Gear Struts	2
B.	Wheels	2
C.	Wheel Collars	2
D.	3 x 5mm Screws .	2
E.	Gear Mount Assemblies	2
F.	Gear Mount Straps (plastic)	4
G.	2.5 x 10mm S/T Screws	8

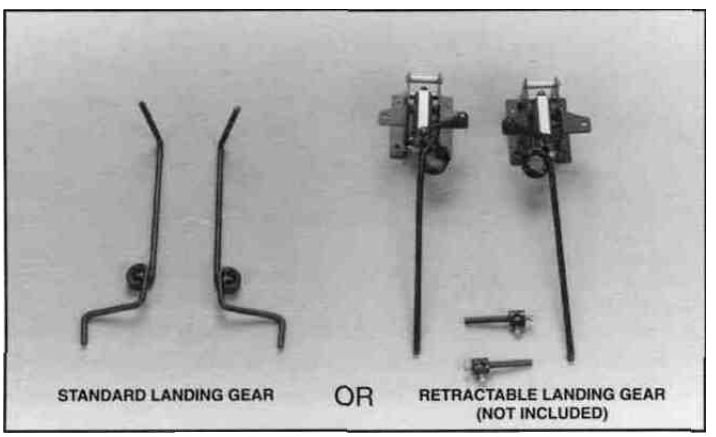


13. Epoxy the servo tray onto the tray mounts.

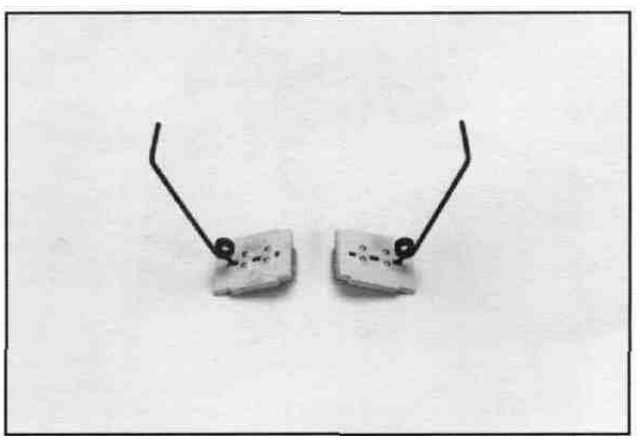


16. Using a 5/32" drill bit, drill the landing gear leg holes in the slot at the end where the mounts (C) are flush. Drill the holes straight and completely through the mounts.

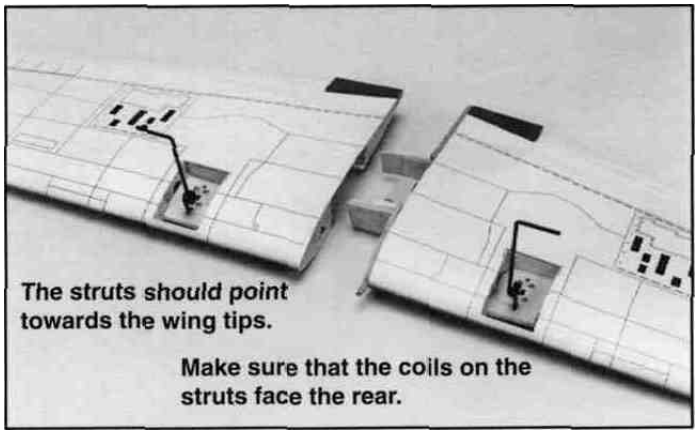
LANDING GEAR INSTALLATION



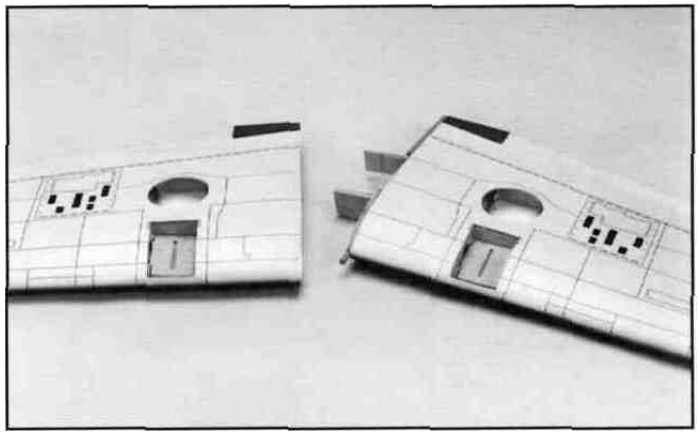
14. If you plan on installing the standard landing gear follow steps 15 through 18. If the retractable gear is going to be used, skip to step 19.



17. Insert the two gear struts into the mounts and secure them using the four gear mount straps and the eight 2.5 x 10mm S/T screws.

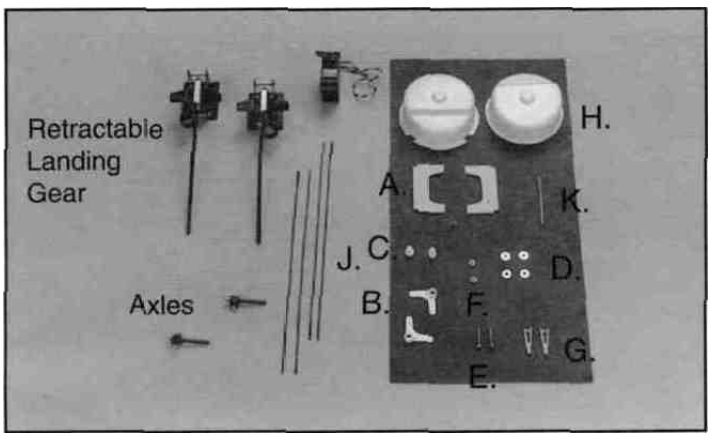


18 Remove the square covering from each wing panel Trial fit the mount assemblies into the wing so that the struts will point towards the wing tips Once satisfied with the fit, remove and epoxy in place.



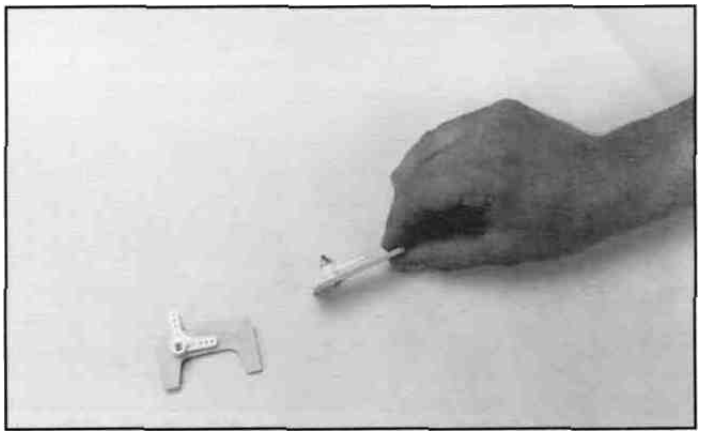
21 Epoxy in place the two landing gear mount assemblies into the wings. Use plenty of epoxy to ensure a strong bond.

RETRACTABLE LANDING GEAR INSTALLATION
(If standard gear was used skip to Step 34.)

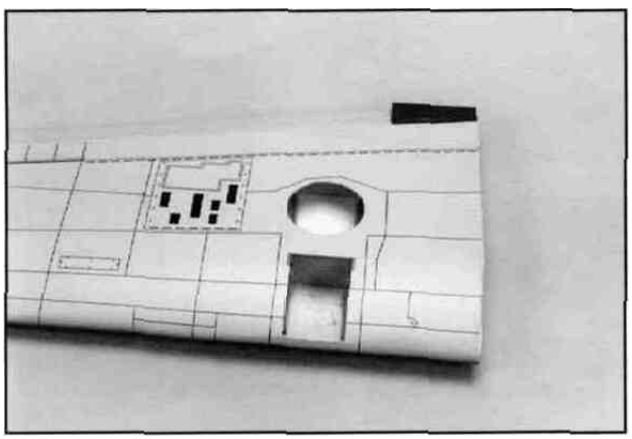


19 A set of 90 rotating retracts are required for this airplane The Hobbico (HCAA4050) retracts were designed for this application You will also need one retract servo that is compatible with your radio system Locate the following parts

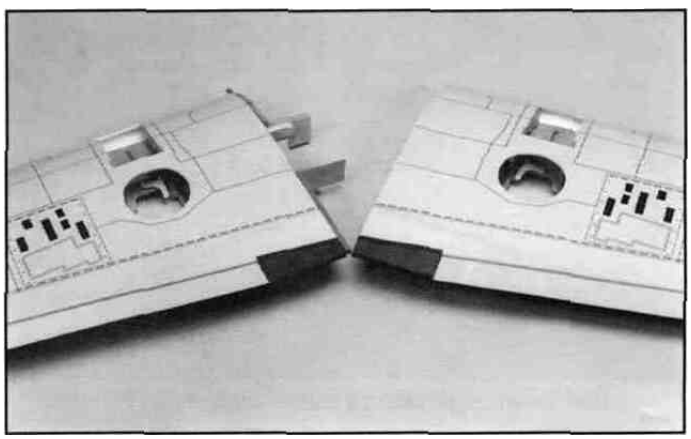
A Bell Crank Mount.....2
B Bell Cranks 2
C Bell Crank Pivots 2
D 3mm Washers.....4
E 3 x 20mm Screws.....2
F 3mm Nuts.. 2
G Rod Clevis 2
H Wheel Wells 2
J. Control Rods 4
K. Clevis Retaining Tubing.....1



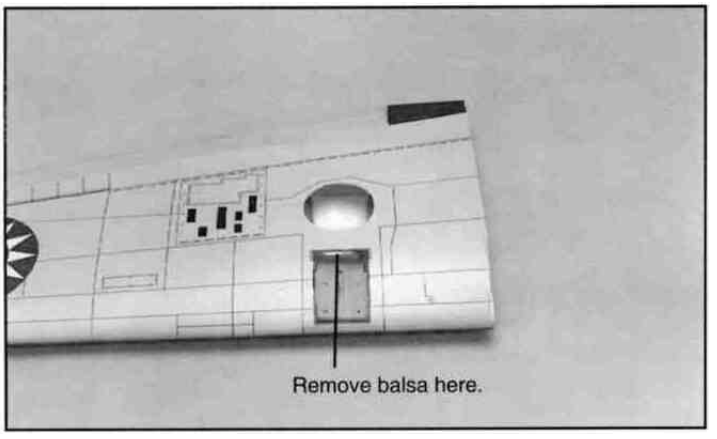
22 Locate the 2 Bell Crank mounts and 2 Bell Cranks Mount the bell cranks to their mounts so they are mirror images of each other Use the two 3 x 20mm screws with the four 3mm washers and the two 3mm nuts. Use thread lock on the screws and nuts.



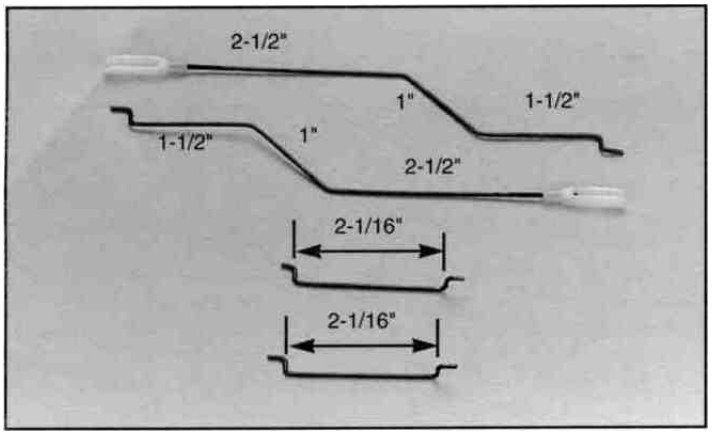
20 Remove the round wheel well covering and the square mount covering from both wing halves as shown Next, remove the tops of the two wing-ribs that are exposed in the wheel well location.



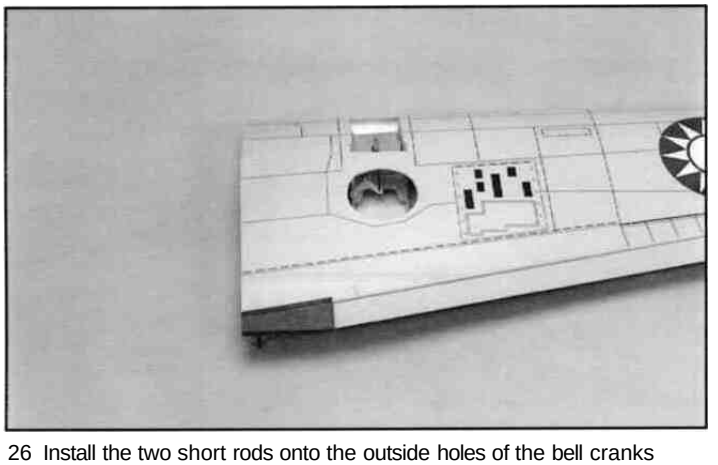
23 Epoxy the Bell Crank mounts into wing panels so that the Bell Cranks are closest to the center wing roots.



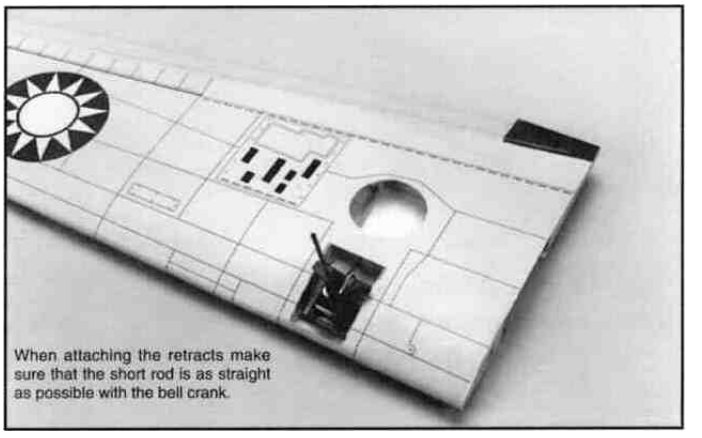
24 Cut out the balsa between the bellcrank mounts and the gear mounts on both panels



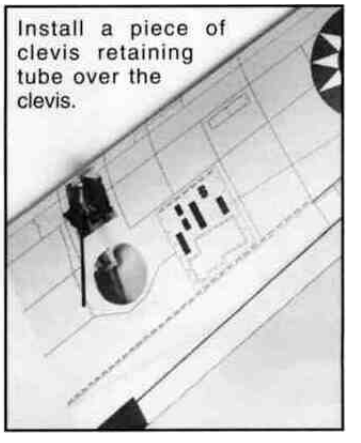
25 Bend and assemble 2 long pushrods with clevises and two short pushrods with Z bends as shown When making Z bends make sure that they are small or they will cause binding of the retracts



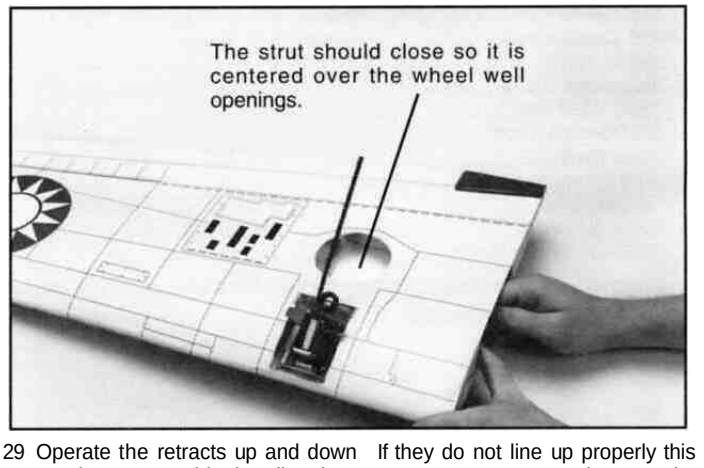
26 Install the two short rods onto the outside holes of the bell cranks



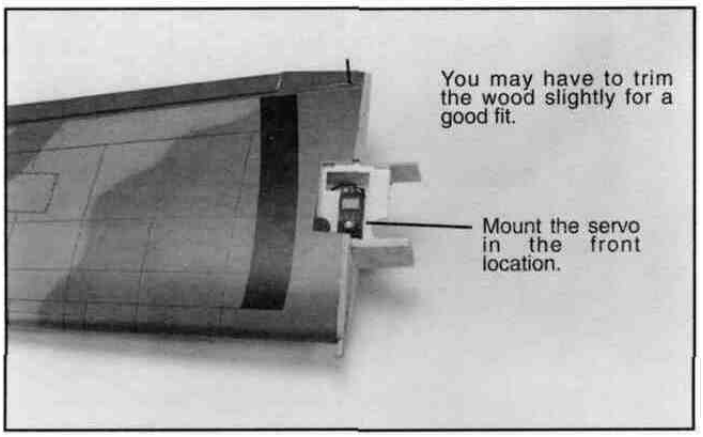
27 Connect the rods to the retracts and then maneuver the retracts into place line up the retracts with the indents in the plywood plate Attach the retracts with four 2 5 x 1 0 S/T screws for each unit



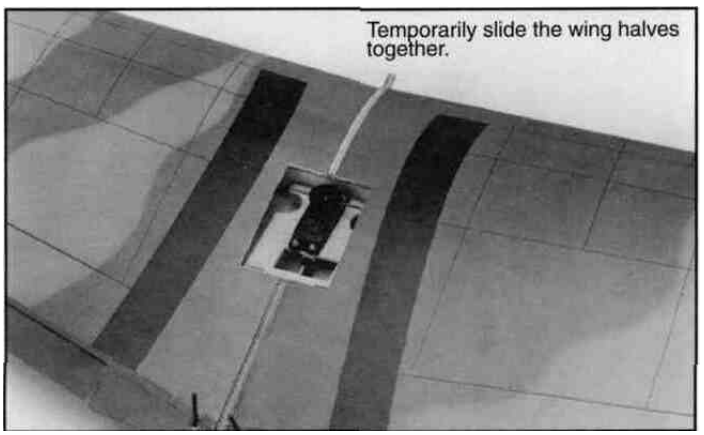
28 Install the longer pushrods to the bellcranks



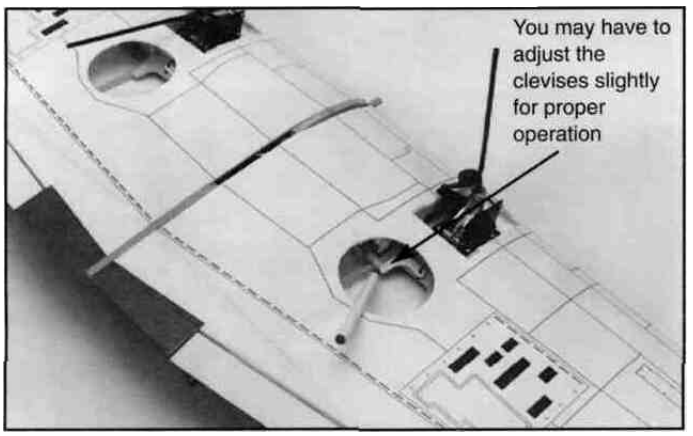
29 Operate the retracts up and down If they do not line up properly this can be corrected by bending the struts You can remove the struts by prying off the E clip at the end of the strut Bend the strut on a rounded surface to prevent sharp angles Reinstall in reverse order



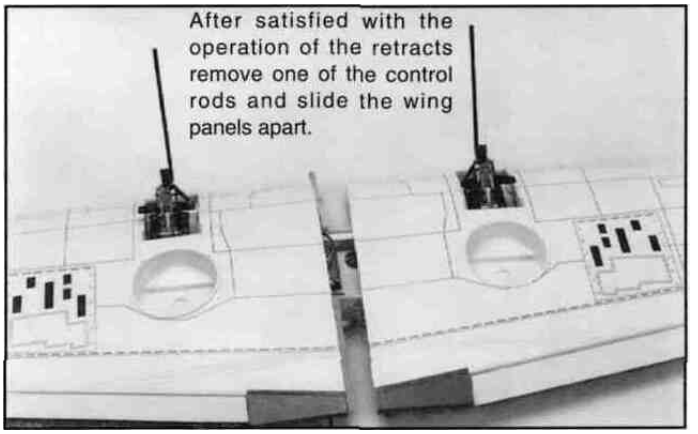
30 A 180 high torque retract servo is required for this application Futaba FP S136G servo is a good example Mount the servo in the space provided in the center of the wing with the screws provided with the radio system



31 Use a round servo wheel with holes 5/16 from center Attach the pushrods to the servo wheel and bell cranks Slide the two wing panels together Keep the pushrods as direct as possible and do not allow them to touch any part of the wing

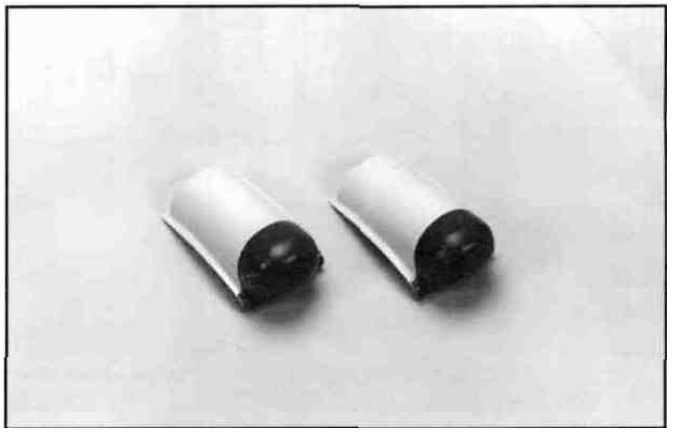


32 Adjust the clevis on the pushrods so both retracts lock in either position Be sure not to over compensate for this or the servo will stall This causes excessive receiver battery usage and can result in loss of radio control Connect the servo to the radio system and check for smooth operation Make sure that both retracts operate perfectly before proceeding

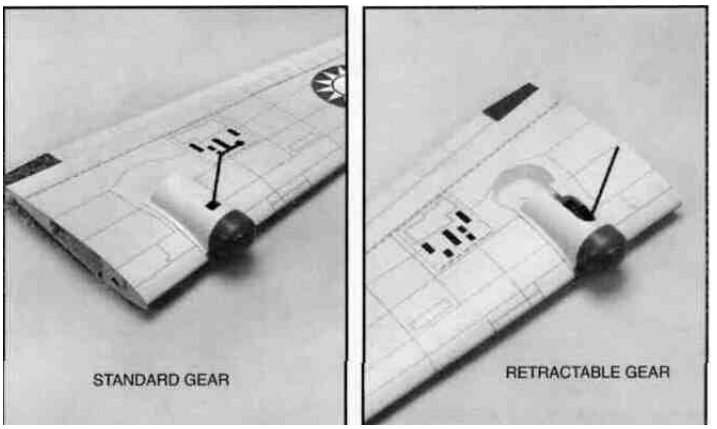


33 Using plastizap CA glue install the two wheel wells into the wing panels You may have to trim the openings slightly for a good fit

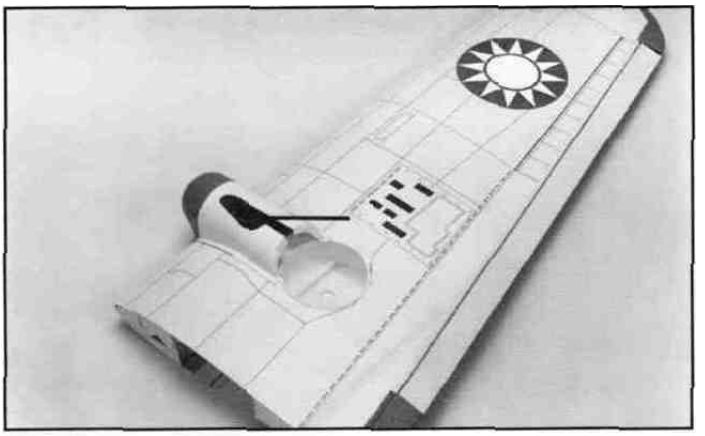
THE REST OF THE STEPS APPLY TO STANDARD AND RETRACTABLE LANDING GEAR VERSIONS OF THE P-40E.



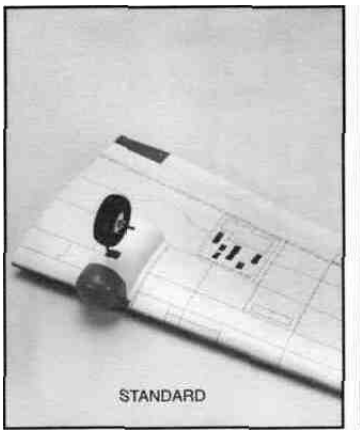
34 Using plastizap CA glue, assemble the front and rear fairings together

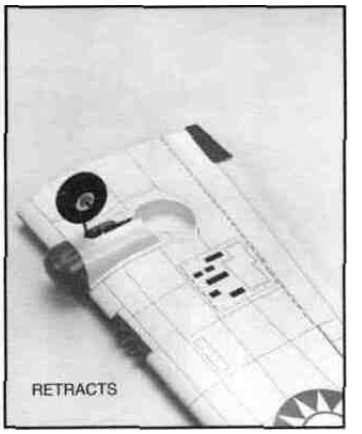


35 Following the lines trim out the rear fairings to allow clearance for the gear struts **NOTE** On a standard gear wing only cut a 10mm hole where the struts protrude Glue in place (using plastizap CA)



36 You may need to trim the fairings more if necessary Exercise the retracts (if used) and trim the fairings if there is any interference.

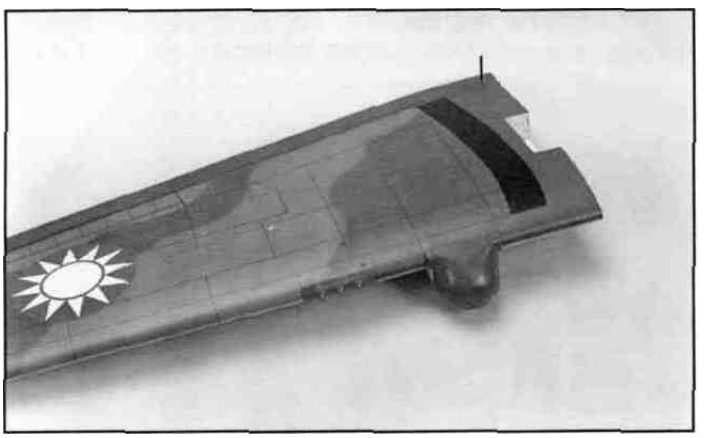




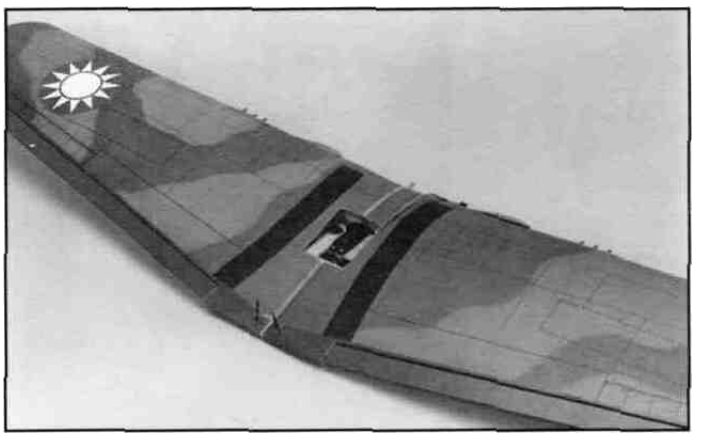
39 Install the wheels **onto the struts and install the wheel collars and** 3x5mm screws

IMPORTANT!

The following five steps are critical for the strength of your wing. Be sure to use plenty of 30 minute epoxy to provide the needed strength

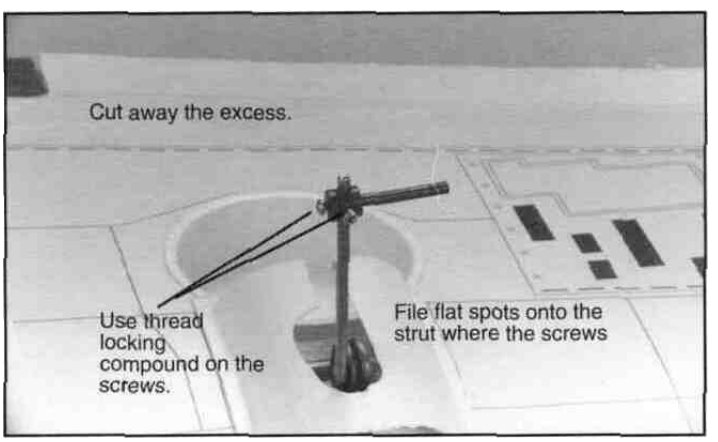


37 Glue (using PlastiZap CA) the triple guns to the wings where shown You may wish to paint the ends black for a more scale-like appearance

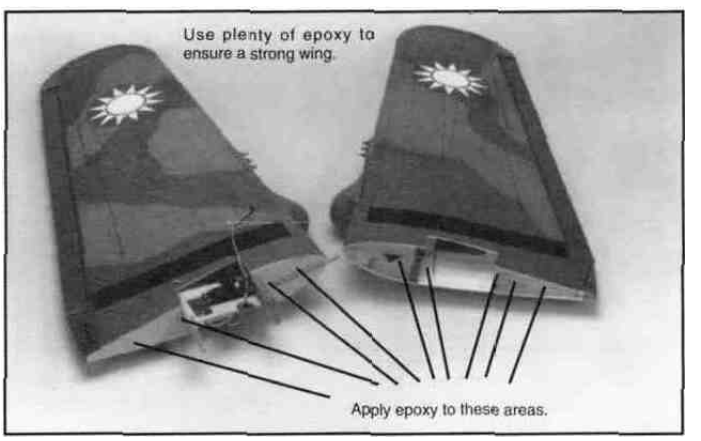


40 Trial fit the wing halves together Check to see if there is any gap between the center ribs If there is sand the ends of the wing joiners slightly until the fit is tight with no gaps.

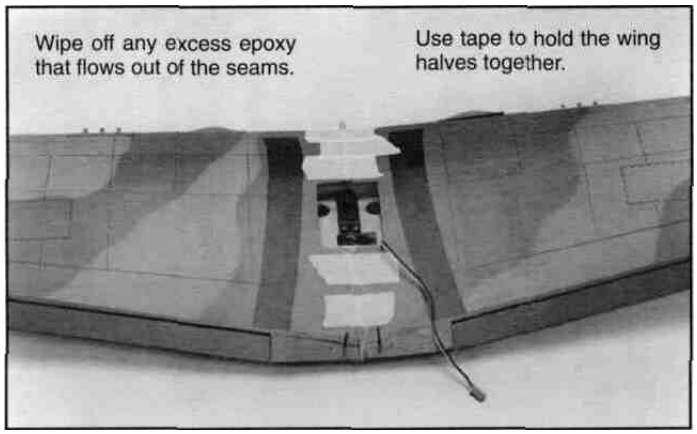
RETRACTS ONLY (If using standard gear skip to step 39.)



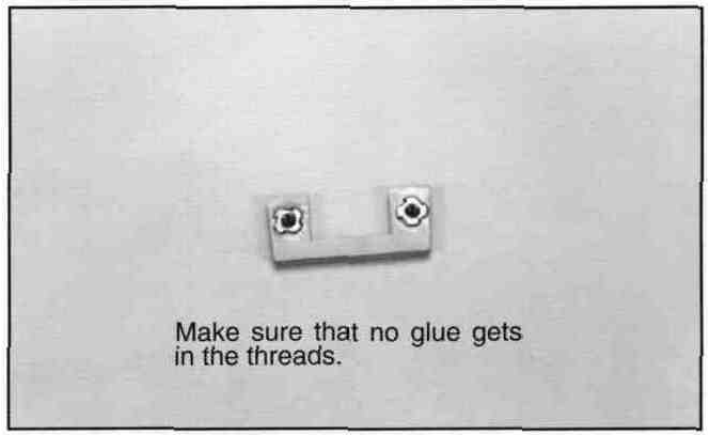
38. Position the axles on the struts so they are centered in the wheel wells Once the mounting location is established, file or grind a flat on each strut where the screws will seat This will prevent the axles from turning on a hard landing Cut the remaining landing gear leg off, leave 1/8" past the axle shaft



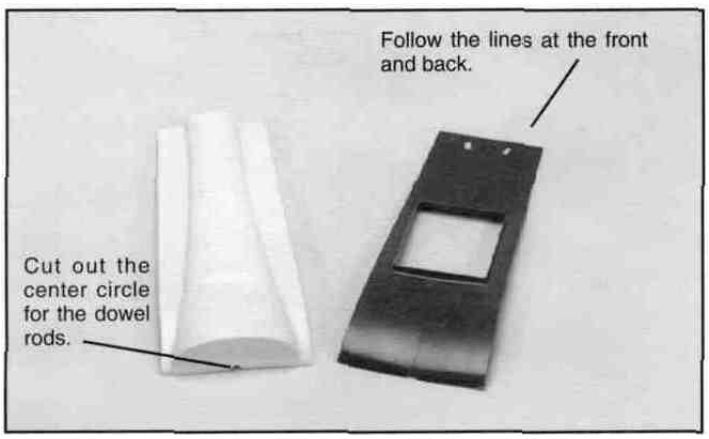
41 Apply 30 minute epoxy to the wing joiners and inside the wing joiner pockets Also coat the center ribs on both wing halves



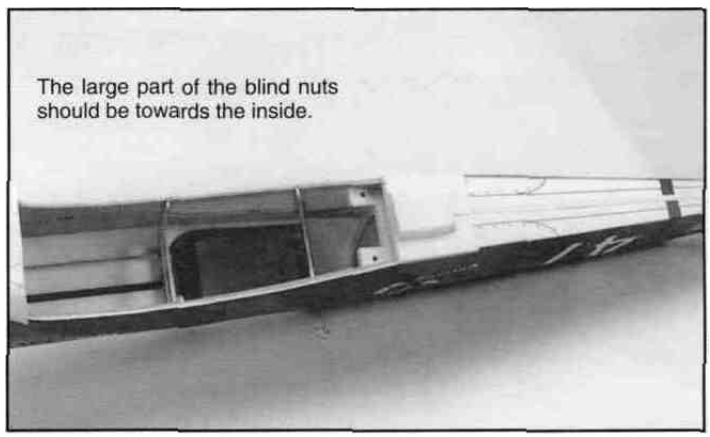
42 Join the wing halves together and hold with tape until the epoxy has cured



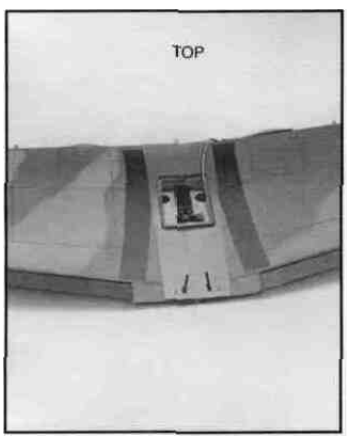
45 Locate the wing screw mounting block Apply a drop or two of epoxy around the blind nuts to secure them to the block



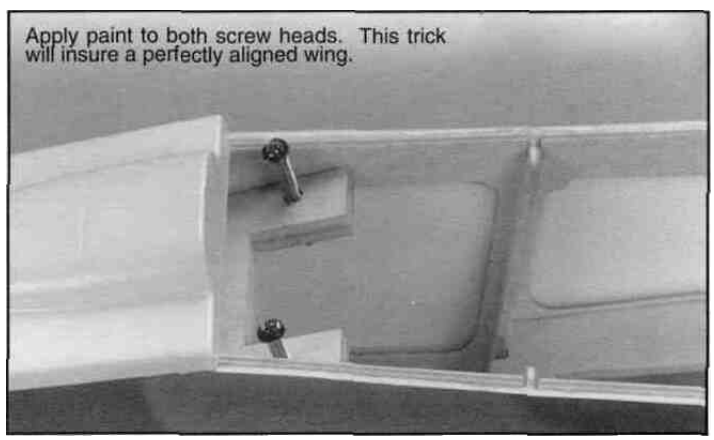
43 Trim the ends of the wing center covers at the lines They are about 1/8" to 1/4" from the ends



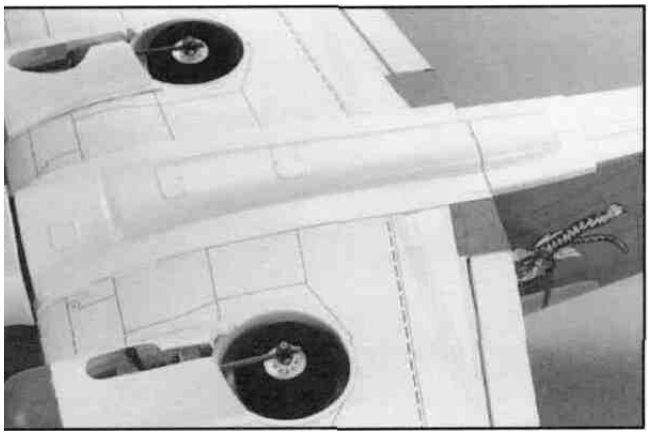
46 Epoxy the mounting block inside the fuselage using plenty of 30 minute epoxy Fill any gaps with epoxy to ensure a strong joint **Set** the fuselage upright until the glue sets



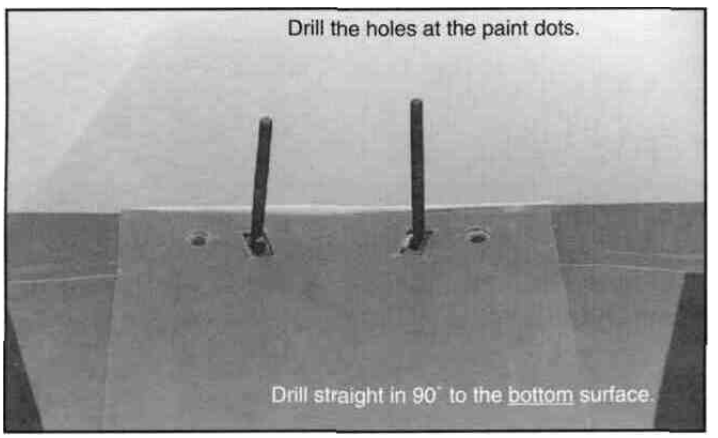
44 Next install the top and the bottom center wing covers using PlastiZap glue On the front of the wing, glue, (using PlastiZap CA), the front wing pad on as shown



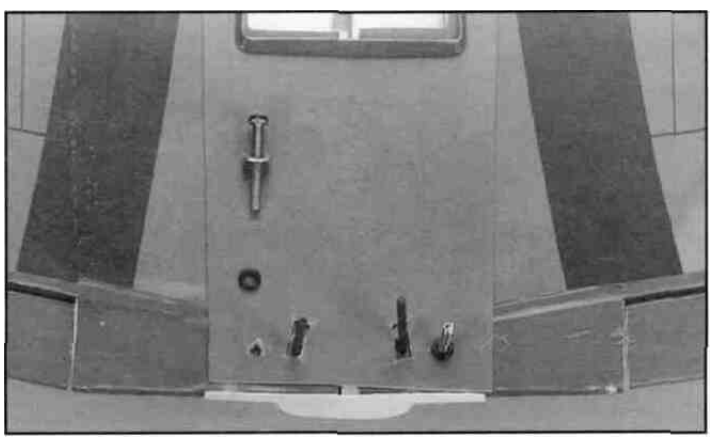
47 Thread the wing screws into the blocks so that the heads are 1/2" above the block Apply ink or paint to the heads of the screws Proceed with the next step immediately before the ink or paint dries



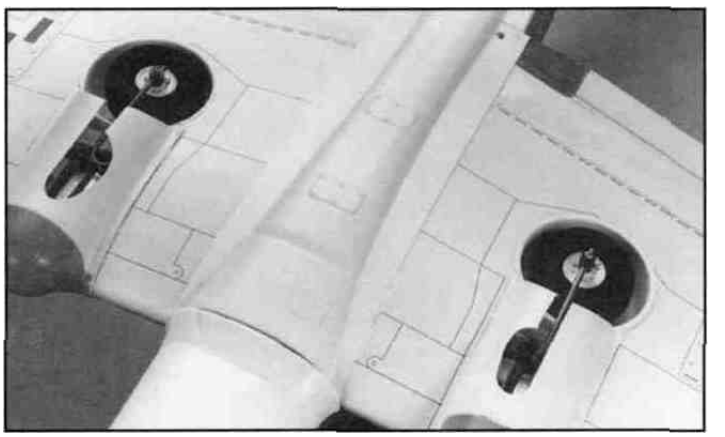
48. Place the wing onto the fuselage as shown. Put the front in first by inserting the dowel rod in the hole. Once in place, center and lower the back into position This will mark where you need to drill.



49. Drill two 3/16" holes 90 from the bottom wing surface for the wing screws where the paint marks are.

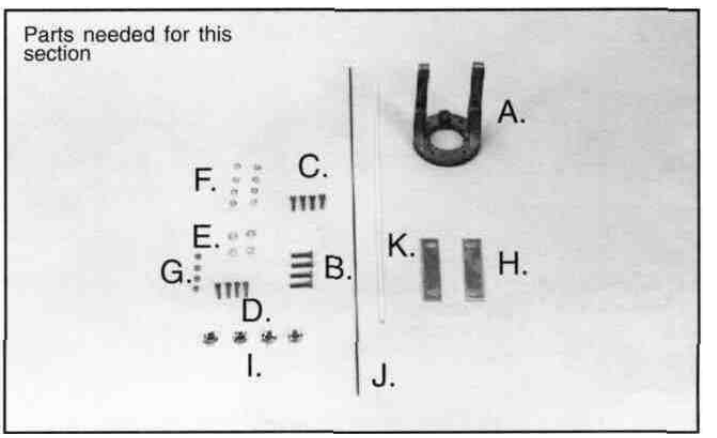


50. Place the two 4mm washers onto the 4 x 30mm screws and push them through the wing from the bottom side. Next, slide the rubber 0-nngs onto the screws



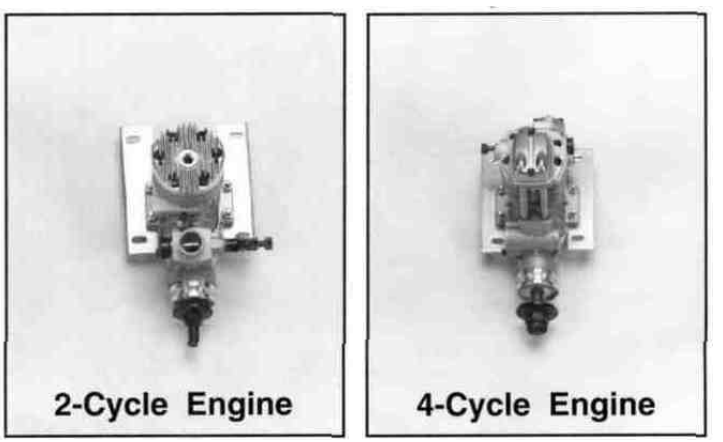
51. Trial fit the wing onto the fuselage. Check for a solid fit then remove.

ENGINE ASSEMBLY



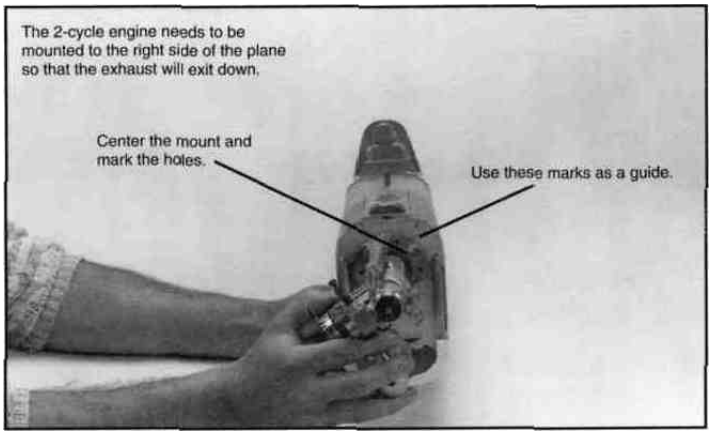
A. Engine Mount 1
B. 4 x 20mm Screws.....4
C. 4 x 15mm Screws.....4
D. 3.5 x 15mm Screws.....4
E. 4mm Washers.. 4
F. Lock Washers.....8
G. 3.5mm Nuts 4
H. Mounting Plates.....2
I. Blind Nuts..... 4
J. 1 x 450mm Rod.....1
K. Throttle Rod Tube.....1

ENGINE INSTALLATION



If you plan on installing a 2-cycle engine follow steps 1-13. If you are going to install a 4-cycle engine, skip to step 14.

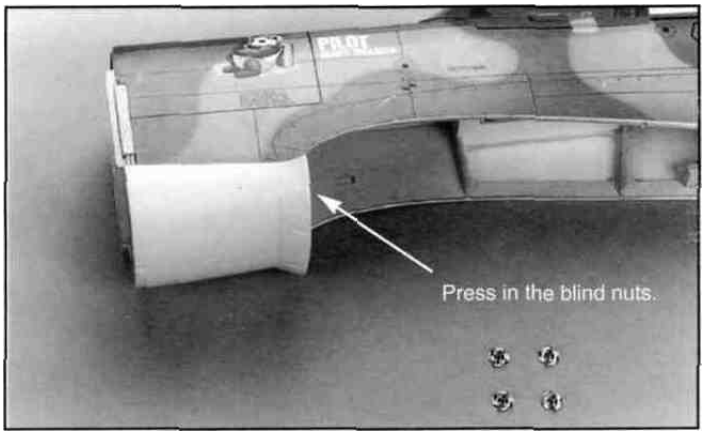
2-CYCLE INFORMATION



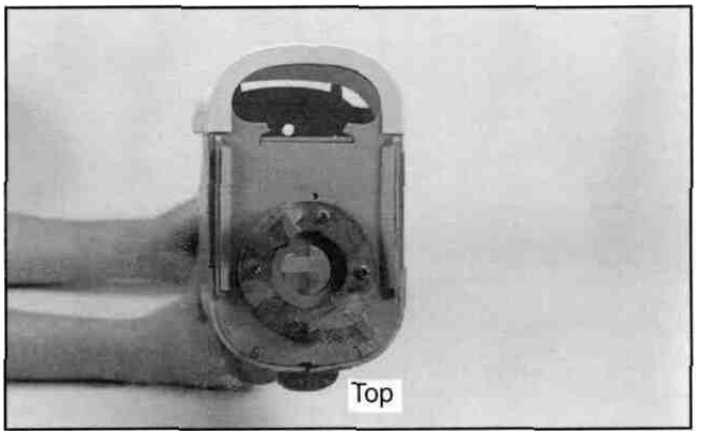
1 Place the engine mount up to the firewall Center it inside the circle so that the top points to the right side For easier mount positioning, hold the engine onto the mount and position the mount so the muffler will exit at the lower center of the fuselage Mark the holes for drilling

Drill straight in at the marks

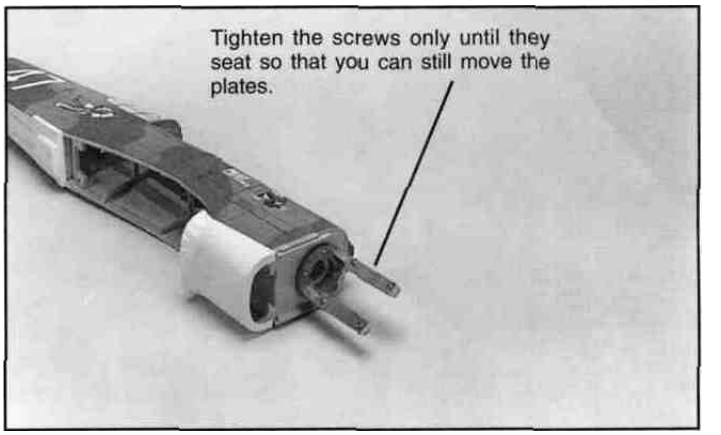
2 Drill four 5/16" holes at the marks



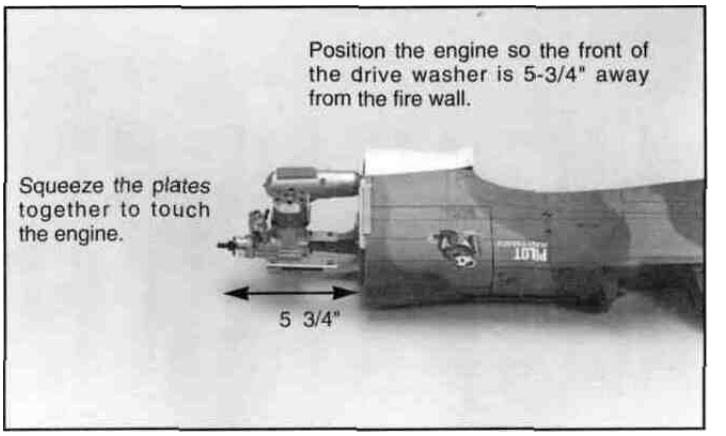
3 Install the blind nuts from inside the fuselage



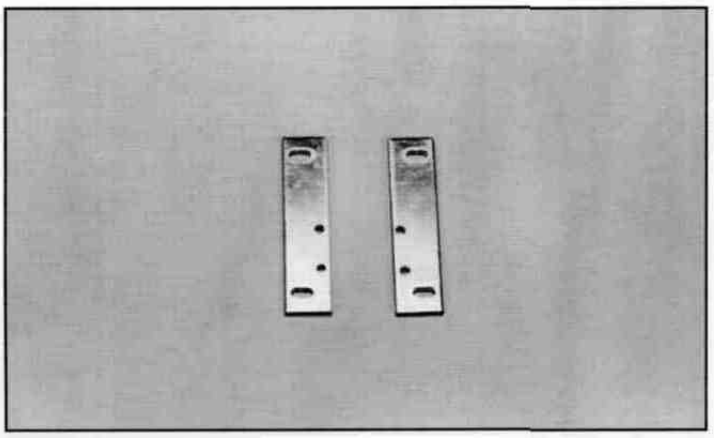
4 Install the mount using the longer 4 x 20mm screws and 4 lock washers Use thread locking compound on all four screws



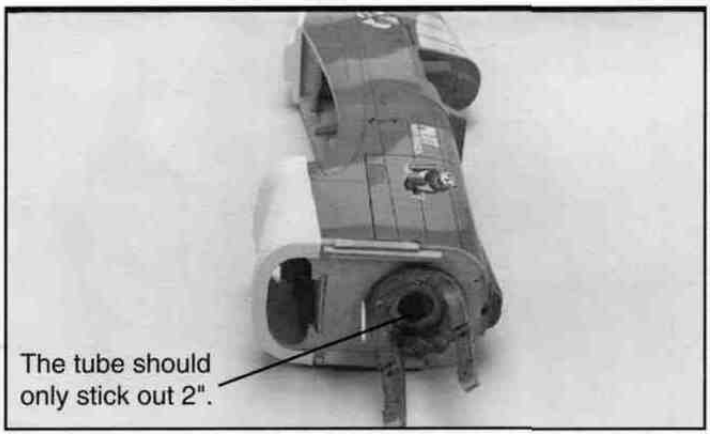
5 Temporarily install the two mounting plates onto the mount



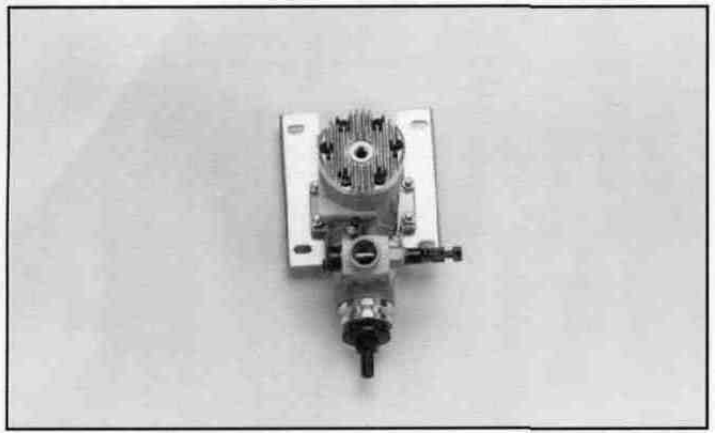
6 Set the engine on the mounting plates so that the center line of the engine is in line with the center of the engine mount Next mark the mounting holes of the engine on the plates



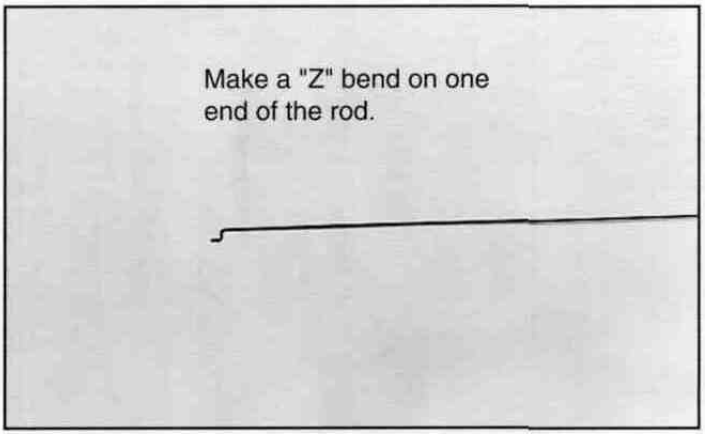
7 Remove the plates and drill four 1/8" holes at the marks



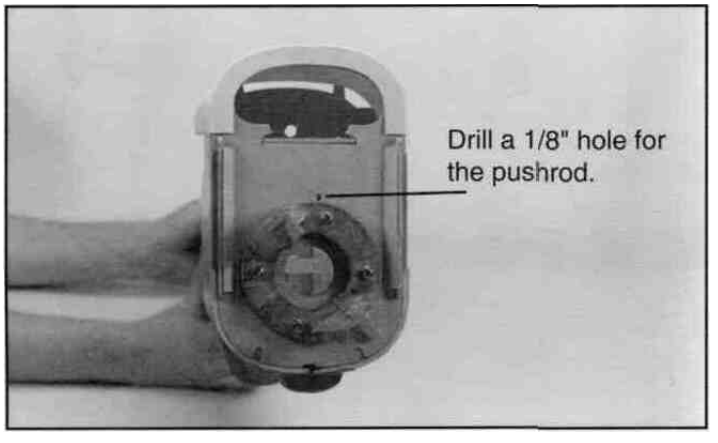
10. Epoxy the white throttle rod tube into the fuselage so that it only sticks out 2"



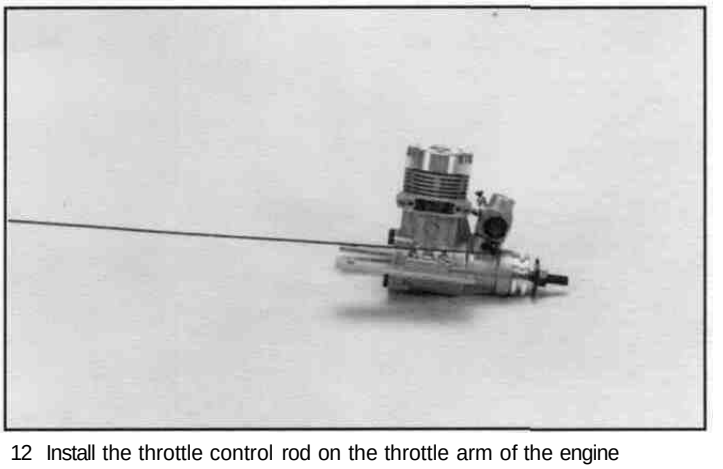
8 Mount the engine to the mounting plates using four 3 5 x 15mm screws four lock washers and four 3 5mm nuts as shown **NOTE.** Use thread locking compound on the screws and nuts to prevent them from coming loose with vibration.



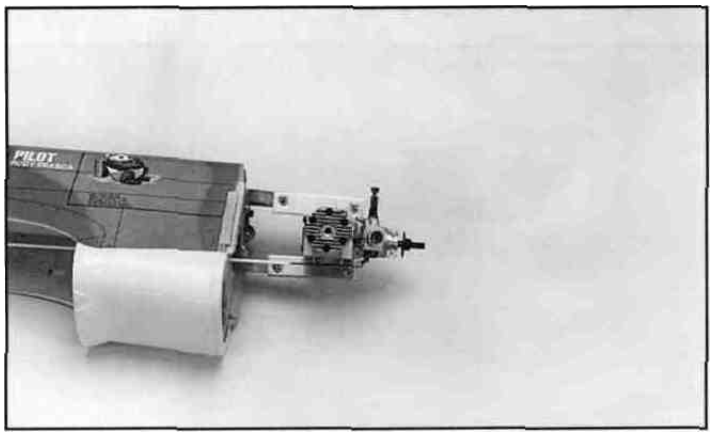
11 Make a Z bend in the 1mm x 450mm (the longest rod) throttle control rod as shown



9 Place the engine on the engine mount and mark on the fire wall where the throttle pushrod will come through Drill a 1/8 hole at the mark.



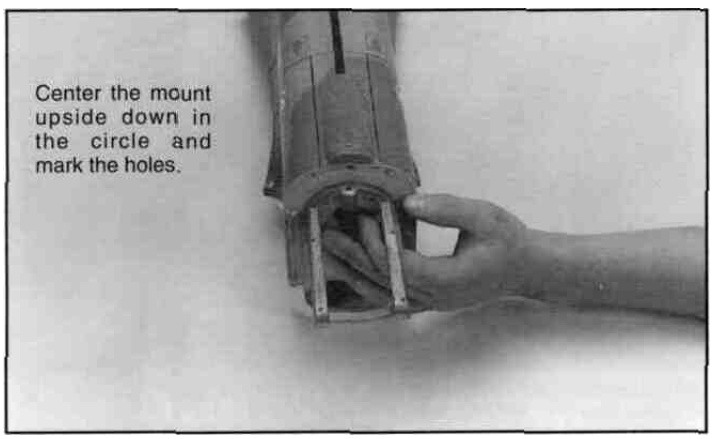
12 Install the throttle control rod on the throttle arm of the engine



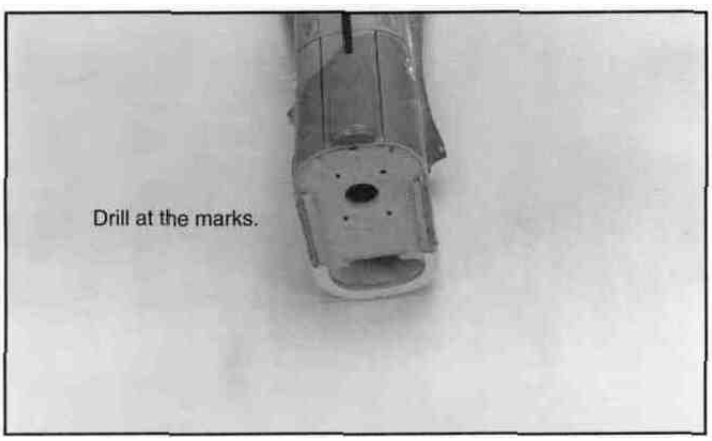
13 As you install the engine and mounting plates on the engine mount, slide the throttle control rod into the throttle control tube Install the four 4 x 15mm screws and four washers to hold the engine and mounting plates to the engine mount **NOTE: Use thread locking compound on these screws.**

4-CYCLE INSTALLATION

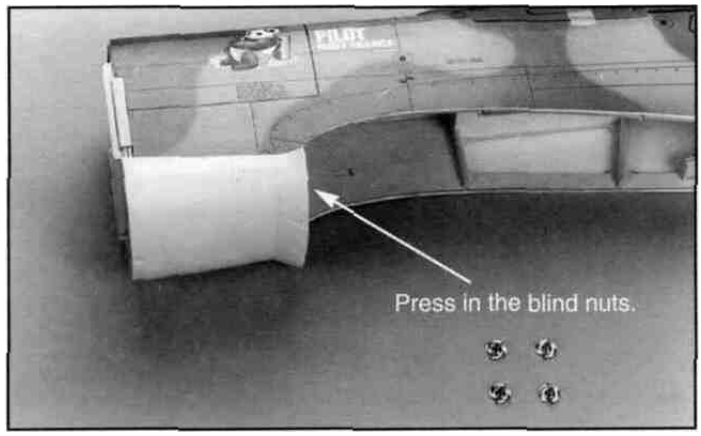
If you installed a 2-cycle engine, skip to page 17, Fuel Tank Assembly



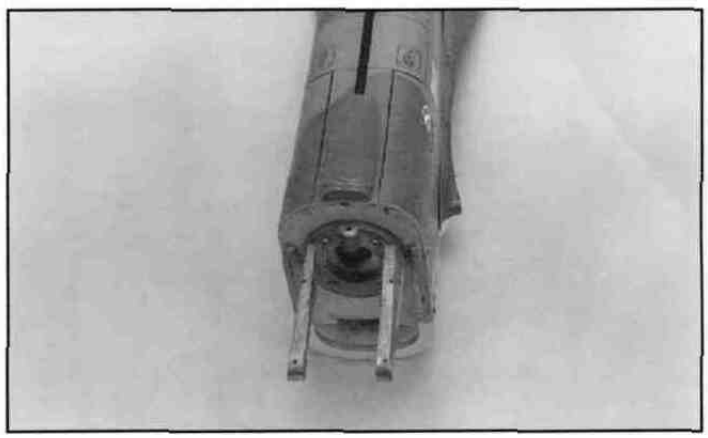
14 Place the engine mount up against the fire wall Center it inside the circle so that it is positioned upside down Mark the holes with a hobby knife or awl.



15. Drill four 5/16" holes at marks.

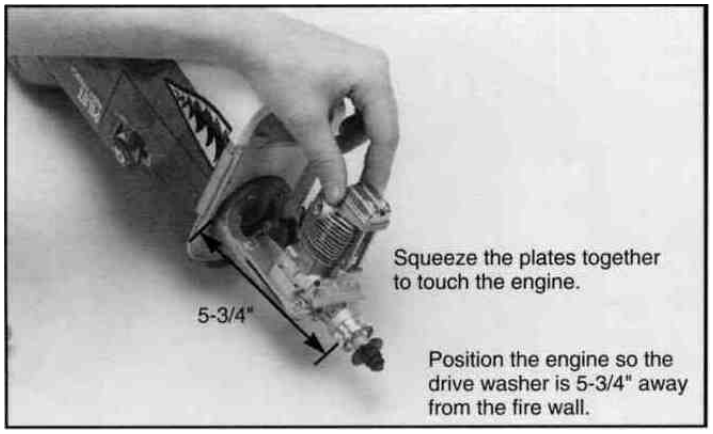


16. Install the blind nuts from the inside of the fuselage.

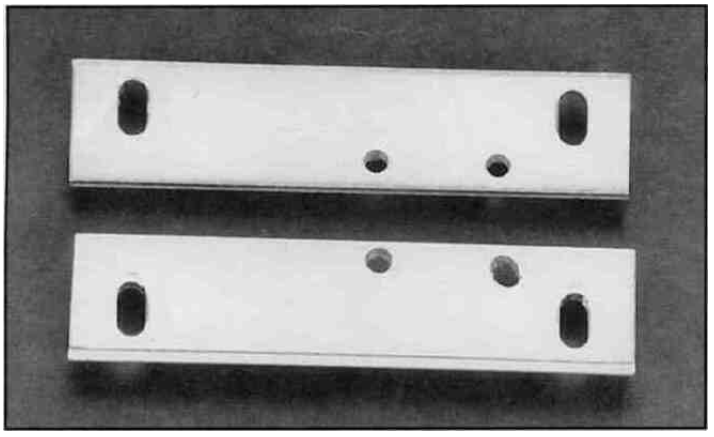


17 Install the mount using the longer 4 x 20mm screws and 4 lock washers. Use thread locking compound on all four screws.

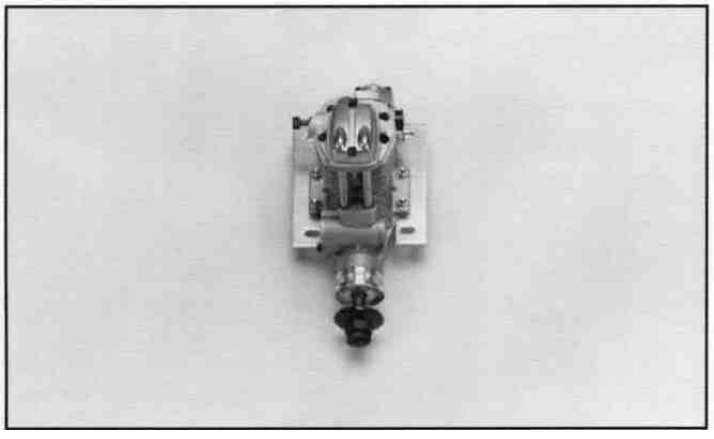
18. Temporarily install the two mounting plates onto the mount.



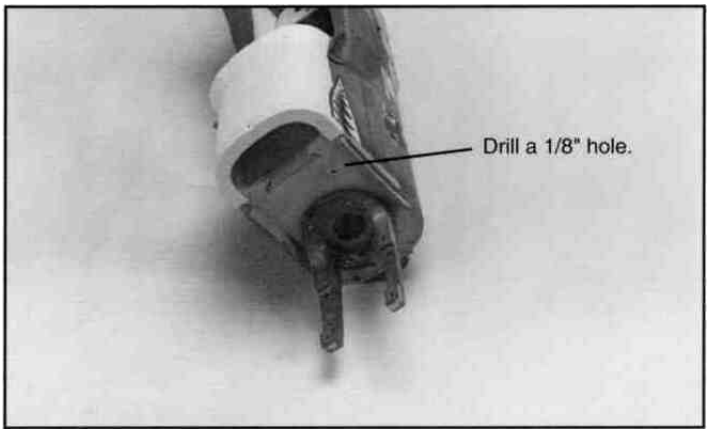
19 Set the engine on the mounting plates so that the center line of the engine is in line with the center of the engine mount Next, mark the mounting holes of the engine on the plates.



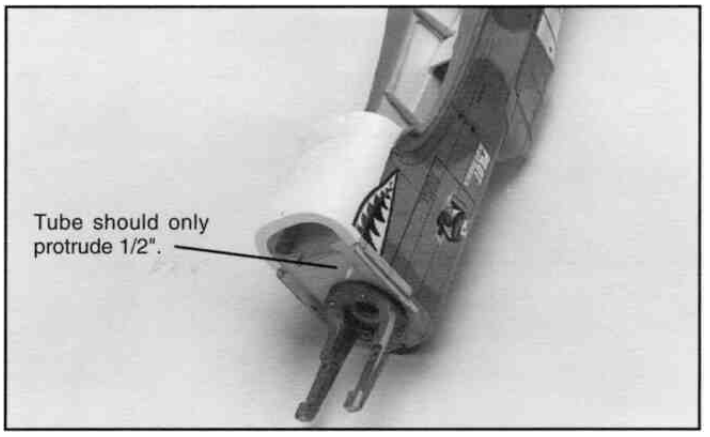
20 Remove the plates and drill four 1/8" holes at the marks



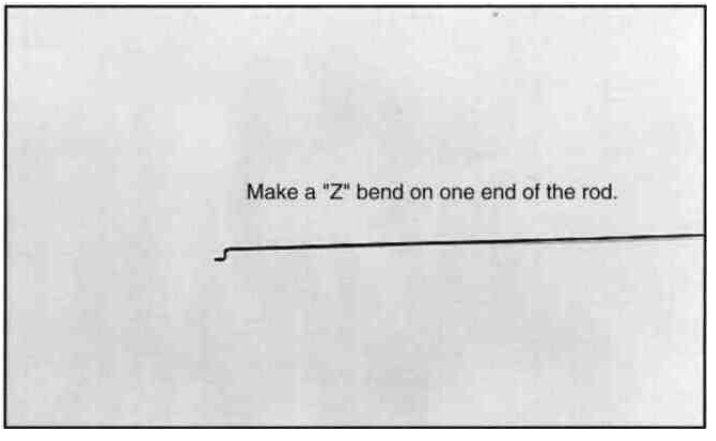
21 Mount the engine to the mounting plates using four 3 5mm x 15mm screws four lock washers and four 3 5mm nuts as shown **NOTE:** Use the thread locking compound on the screws and nuts to prevent them coming loose with vibration



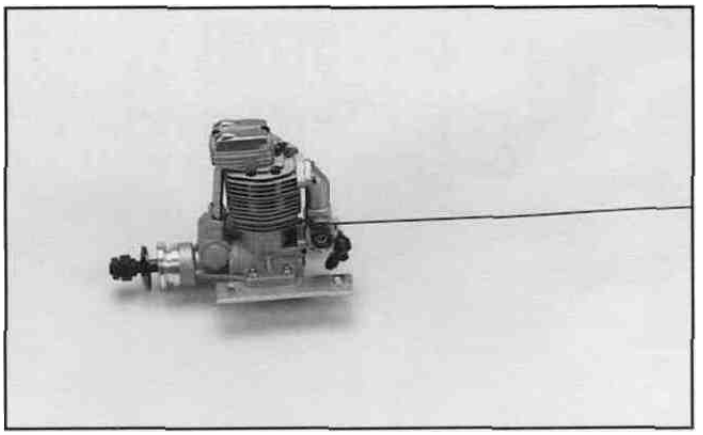
22 Place the engine on the engine mount and mark on the fire wall where the throttle pushrod will come through Drill a 1/8" hole at the mark.



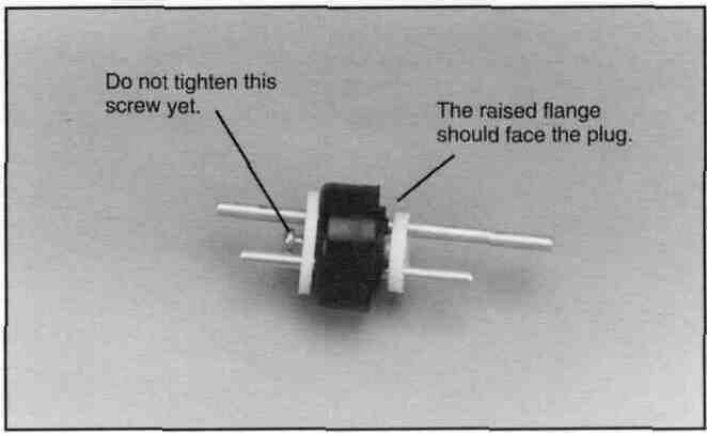
22 Epoxy the white throttle rod tube into the fuselage so it only sticks out 1/2".



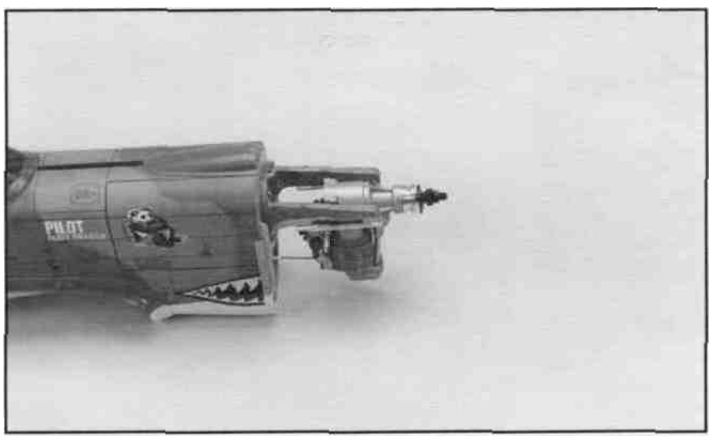
24 Make a "Z" bend in the 1mm x 450mm (the longest rod) throttle control rod as shown



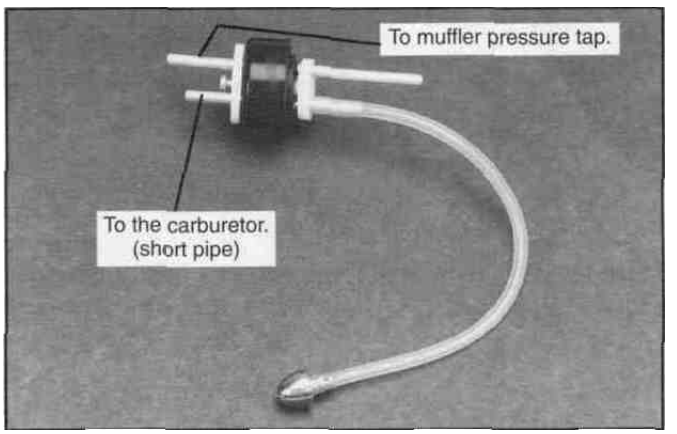
25. Install the throttle control rod on the throttle arm of the engine.



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 flange 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

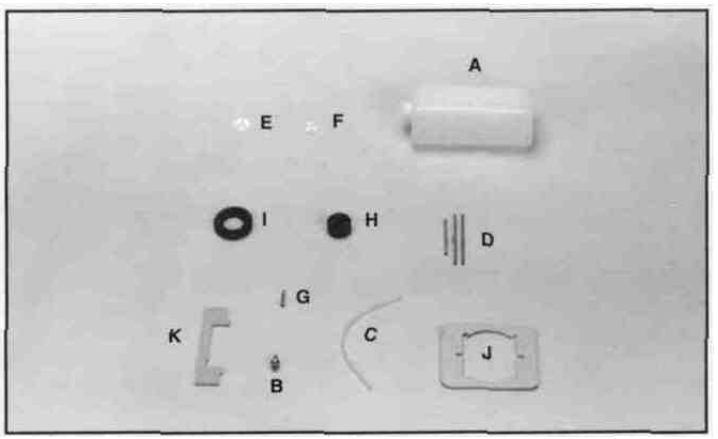


26 As you install the engine and mounting plates on the engine mount, slide the throttle control rod into the throttle control tube Install the four 4 x 15mm screws and four washers to hold the engine and mounting plates to the engine mount **NOTE: Use thread locking compound on these screws.**

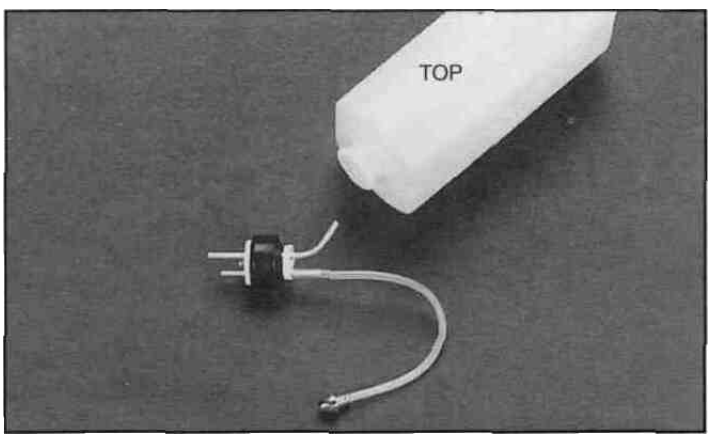


2 Attach the silicone tubing to the short fuel pipe and attach the clunk to the other end.

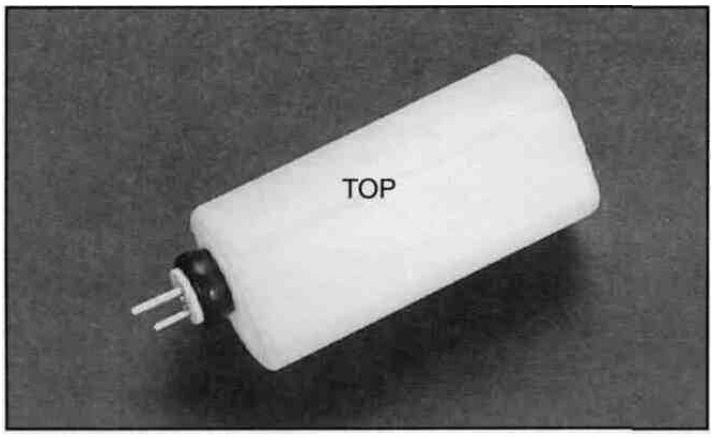
FUEL TANK ASSEMBLY



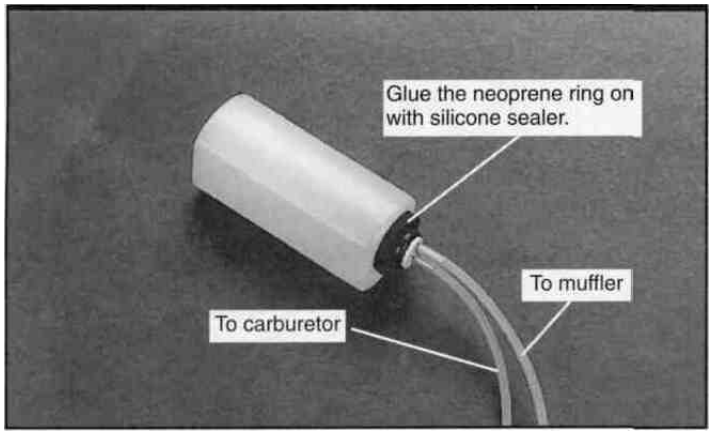
A. Fuel Tank.....1
B Clunk 1
C Silicone Tubing 1
D Fuel Pipe (2) Long, (1) Short
E Plastic Disc (large) 1
F. Plastic Disc (small) 1
G 3mm x18mm S/T Screw 1
H Rubber Plug 1
I Neoprene Ring 1
J. Tank Support (A).....1
K. Tank Support (B).....1



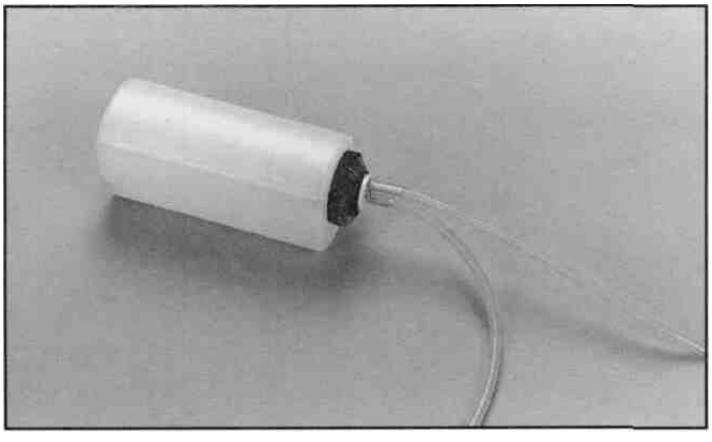
3. Carefully bend up the other fuel pipe so it will just touch the inside top of the fuel tank.



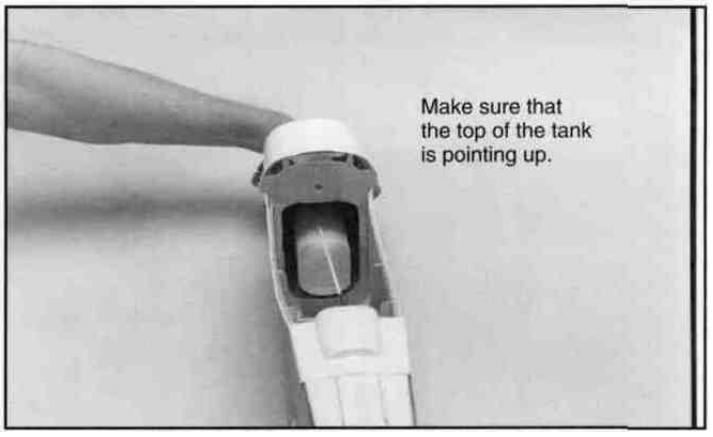
4 Attach the complete fuel tank cap to the tank Make sure that the bent pipe is pointing to the top Slide the cap on until the lip on the fuel tank is in the groove of the cap Then tighten the screw Check to make sure the clunk is free to swing at the bottom of the tank This is where the term "clunk"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



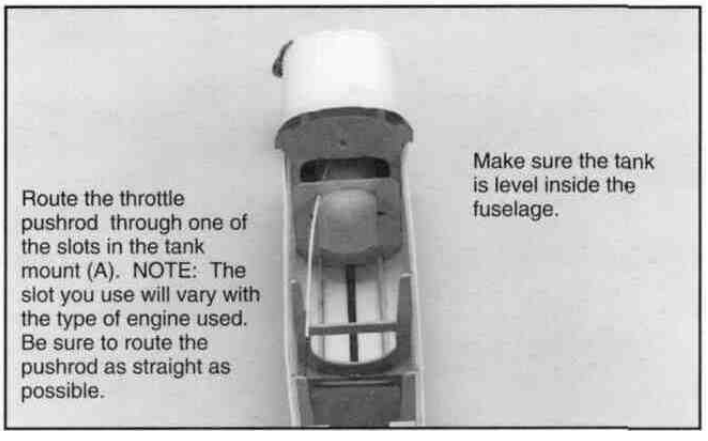
5 Glue the neoprene ring to the tank with silicone sealer Attach two pieces of fuel tubing (7 long) to each of the pipes One is for the carburetor the other is for the pressure tap on the muffler



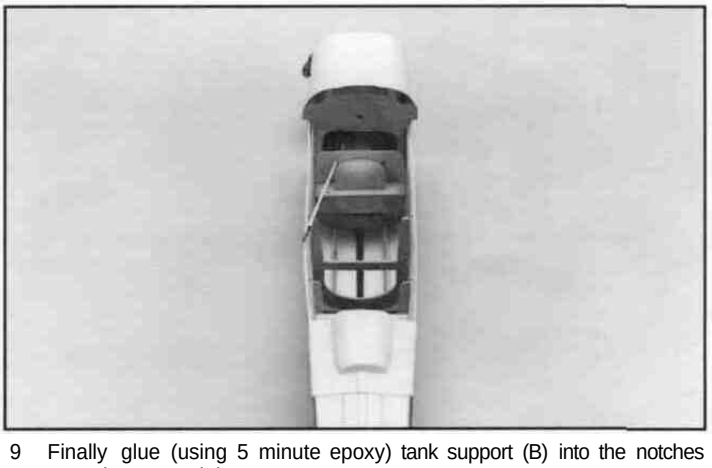
6 Put a bead of silicone sealer on the neoprene ring



7 Install the fuel tank from the inside of the fuselage Route the fuel tubing through the hole and push the tank cap through until tight

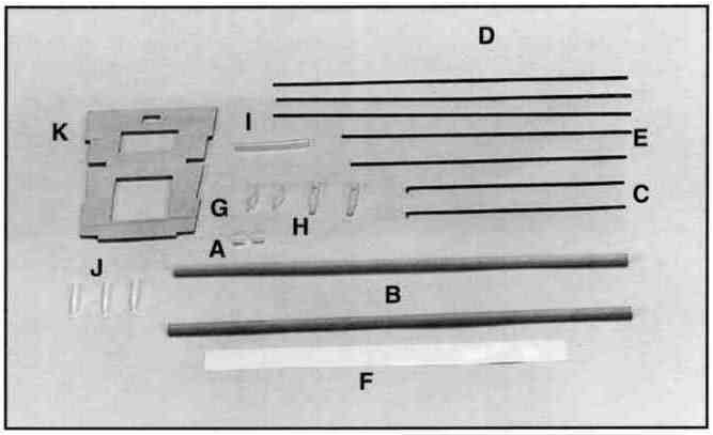


8 Next, epoxy tank support (A) to the inside fuselage former

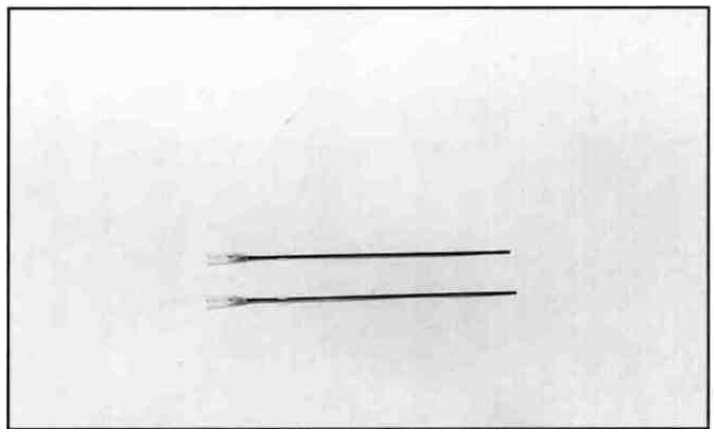


9 Finally glue (using 5 minute epoxy) tank support (B) into the notches on tank support (A)

RADIO INSTALLATION

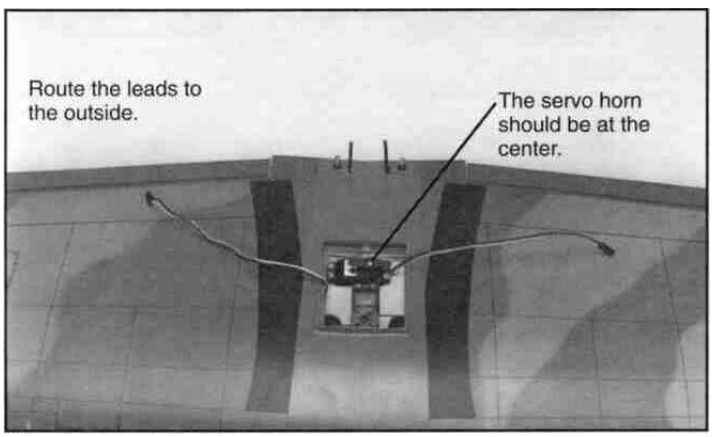


A. Aileron Horn 2
B Wood Push Rods..... 2
C Control Rods (short-bent)... ..2
D. Control Rods (250mm) 3
E. Control Rods (200mm) 2
F. Shrink Tubing 1
G Rod Clevises 2
H Snap Clevises.....2
I Clevis Retaining Tube.....1
J Push Rod Exits 3
K. Main Servo Tray 1

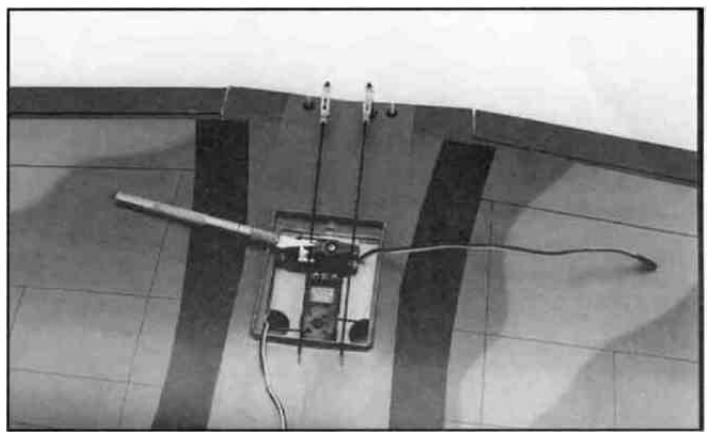


3. Screw two snap clevises half way up the threads on the 200mm control rods Next, cut two pieces of the clevis retaining tubing (3/16") and slide them onto the rods.

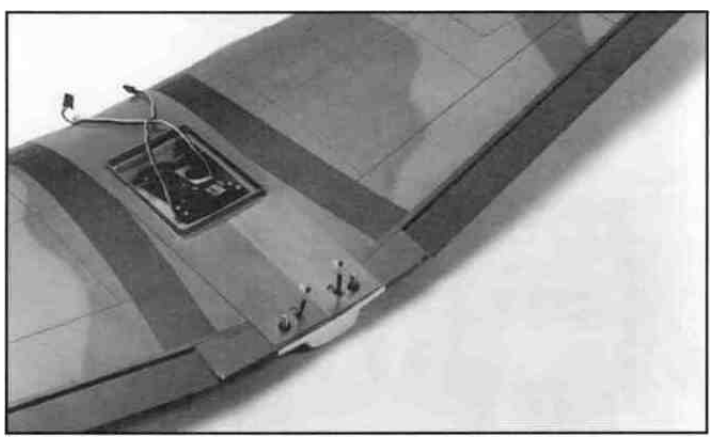
WING



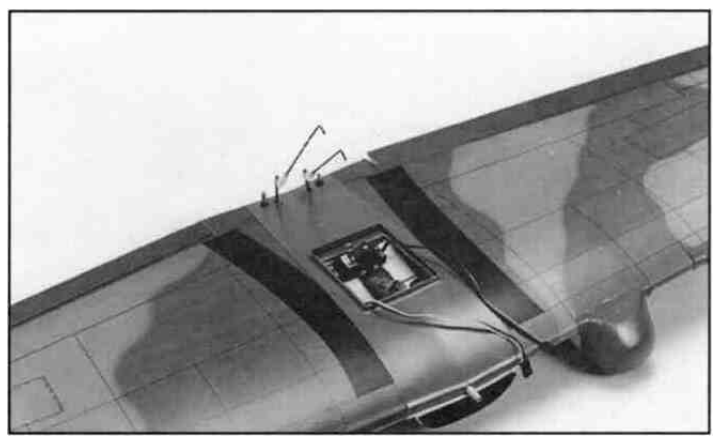
1. Check the fit of your aileron servo in the aileron servo tray You may have to trim away some of the servo tray for a good fit Install the grommets onto the servo and mount using the screws provided with the radio system.



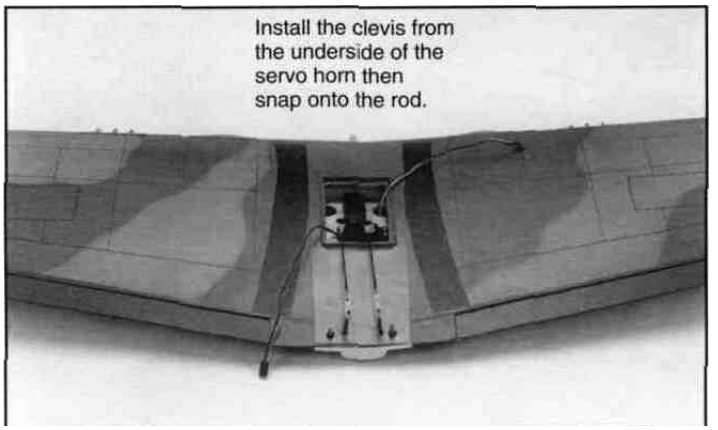
4 Attach the clevises to the aileron horns and slide on the retaining tubes After checking the neutral position of the aileron servo and ailerons, put a mark on the push rods where the servo arm holes line up Be sure the ailerons are in neutral position



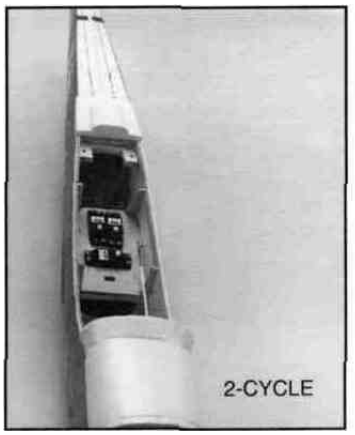
2. Screw the aileron horns onto the aileron control arms. Make sure you use the two horns with the larger holes.

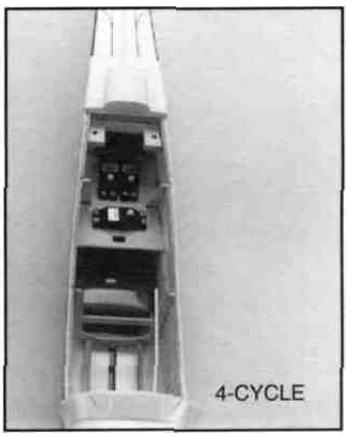


5. At the mark, bend each push rod at a right angle. Next, cut the push rods 6mm from the bend.



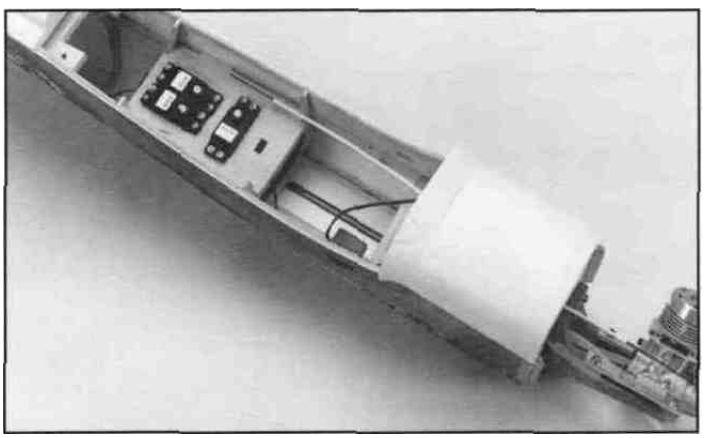
6 Attach the rods to the servo arm using the rod clevis





9 Install three servos into the tray using the grommets and screws Be sure that the servos are positioned correctly **NOTE-** Make sure that the servo wires all run forward so they are easily accessible

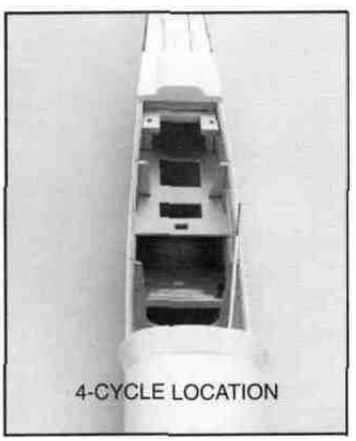
7 Connect the aileron servo to the receiver and check the movement of the ailerons Make sure that both ailerons are neutral when the servo is neutral Adjust the clevises as needed



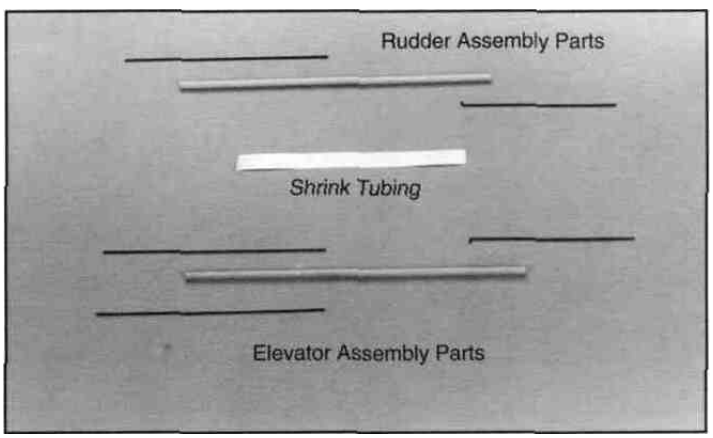
10 Next install the switch into the fuselage side at the cutout You will have to drill the two mounting holes depending on your switch For a 'cleaner look you may choose to install the switch onto the radio tray and use external switch linkage The Dubro #203 Kwik switch mount works well

FUSELAGE

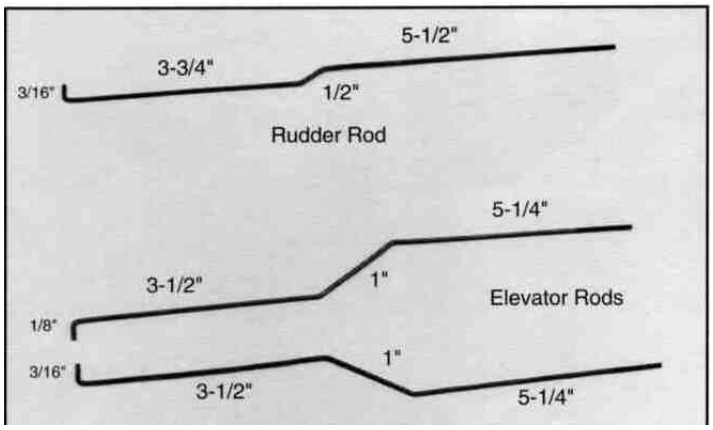
For proper weight distribution, two different radio tray mounting locations are provided



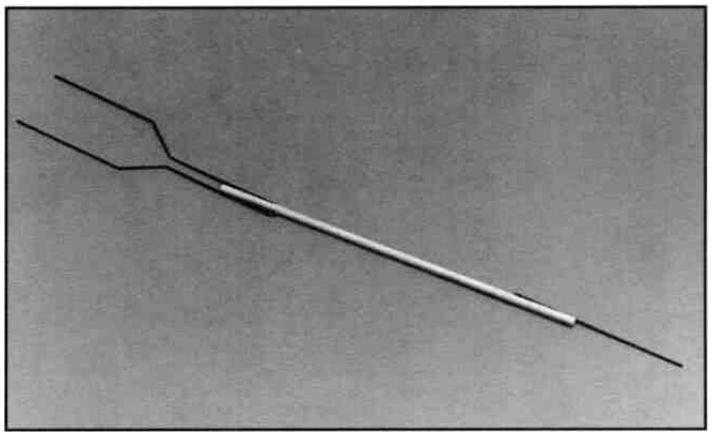
8 If you installed a 2-Cycle engine use the forward most mounting location If a 4-cycle engine is used mount the servo tray in the rear position After the proper location is determined epoxy the servo tray in place



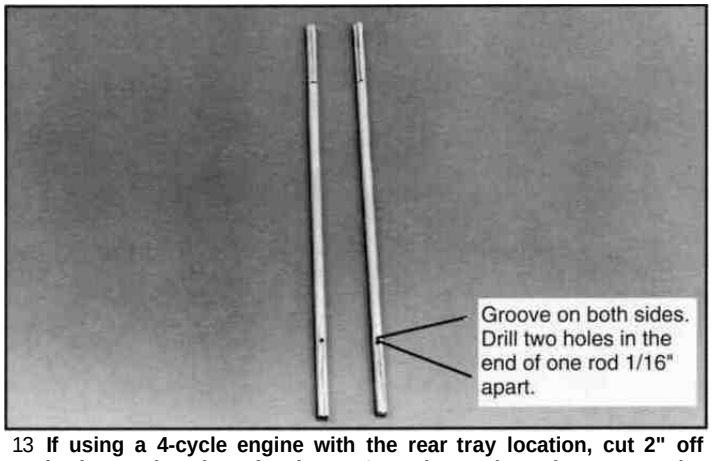
11 Assemble the rudder and elevator control rods using the parts above



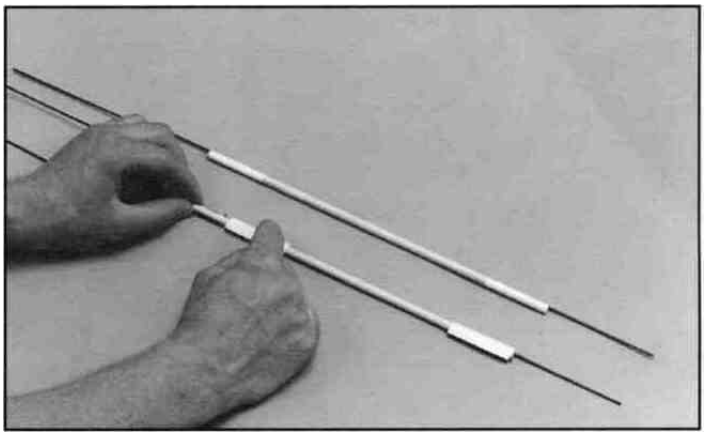
12 Bend two of the long rods as shown for the elevator and one **for the** rudder NOTE the pre bent rods will be used later in step 15



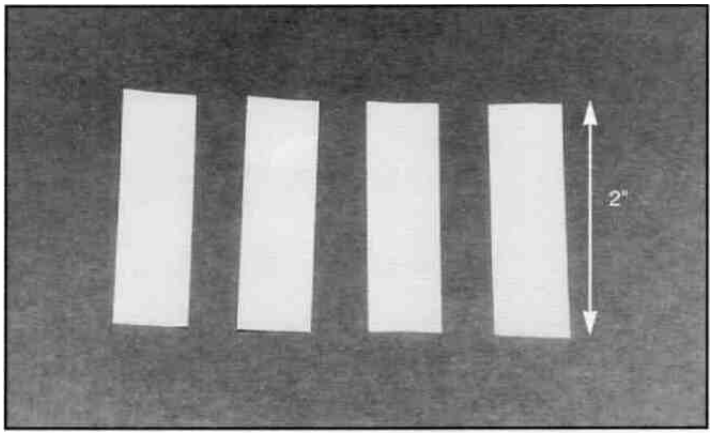
15 Assemble the elevator push rod as shown Place the two elevator rods into the double grooved end of one of the rods Next place one of the short (pre-bent) rods into the other end



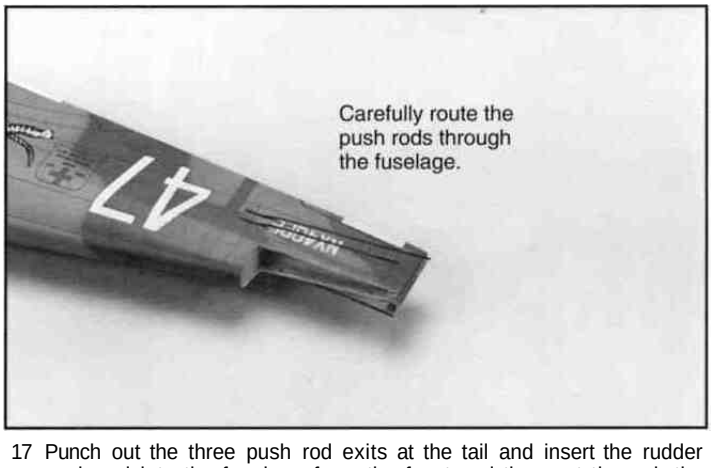
13 **If using a 4-cycle engine with the rear tray location, cut 2" off both wood rods. If using a 2-cycle engine, do not cut the wooden rods** Drill a 1/16" hole 2" from the ends (2 holes 1/16 apart on one end of one rod) of both wood push rods With a hobby knife, carefully cut straight grooves from 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



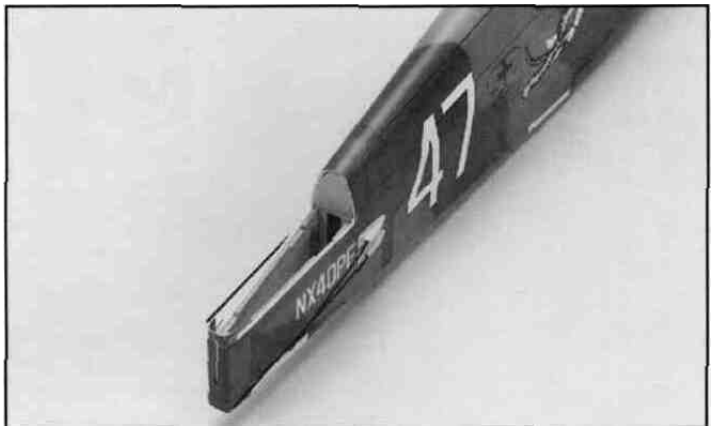
16 Next do the same with the rudder push rod Make sure that each rod fits in a groove Now slide the four pieces of shrink tubing over the ends of the wooden rods and shrink them with a heat gun or lighter To ensure durability place a drop or two of Cyanoacrylate glue at the edges of the shrink tubing



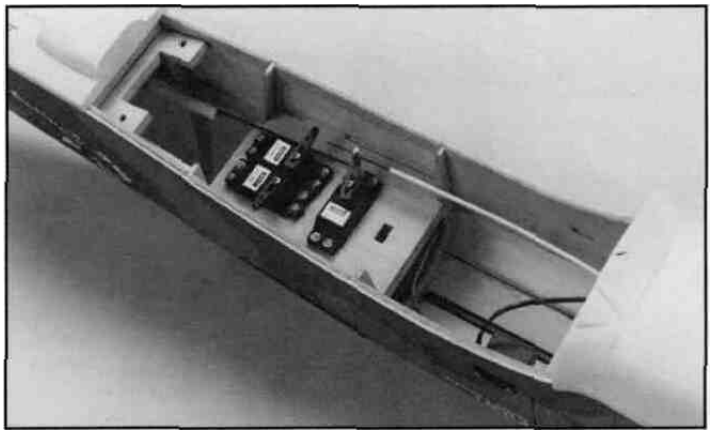
14 Cut four equal pieces of the white shrink tubing (about 2" long each)



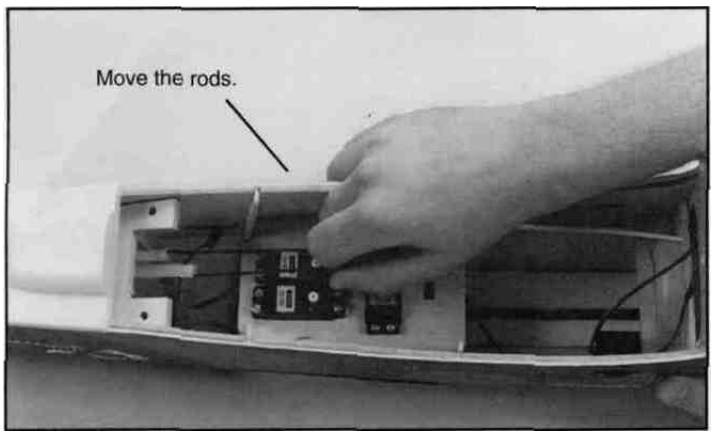
17 Punch out the three push rod exits at the tail and insert the rudder push rod into the fuselage from the front and then out through the bottom exit on the right side Do the same with the elevator push rod, but put those through the top two holes It may be necessary to bend the rods slightly to fit



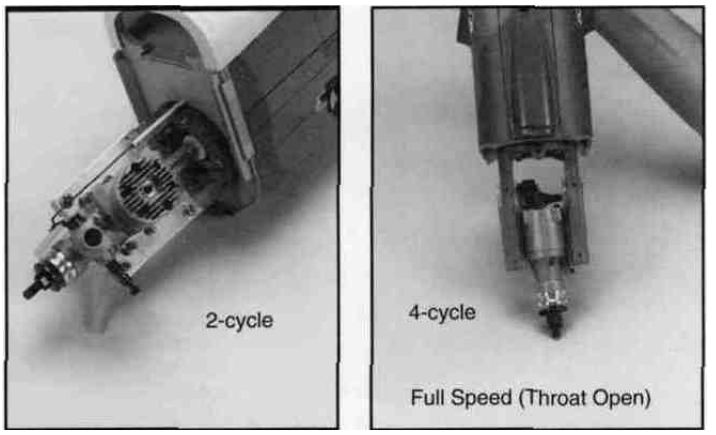
18. Using PlastiZap, glue the three plastic push rod exits to the fuselage.



21. Slide the throttle push rod through the hole in the easy connector (Dubro #121 E-Z Connectors work well) Install the connector to the throttle arm With the throttle in low position, pull back the push rod and tighten the screw on the connector

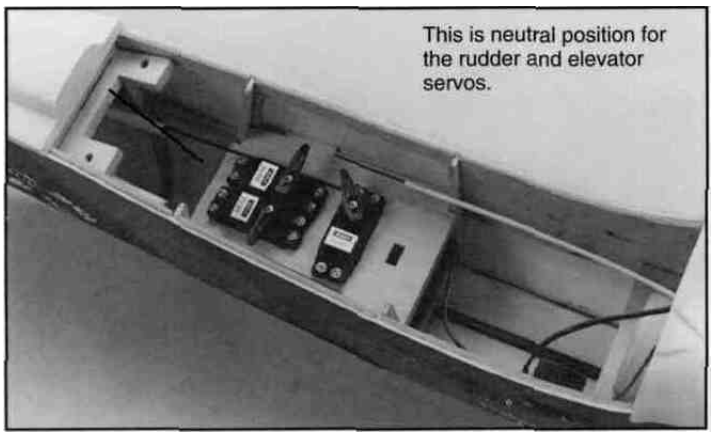


19 Check to make sure that the rods will easily move in and out with little resistance. You may have to bend the rods slightly for a perfect fit.

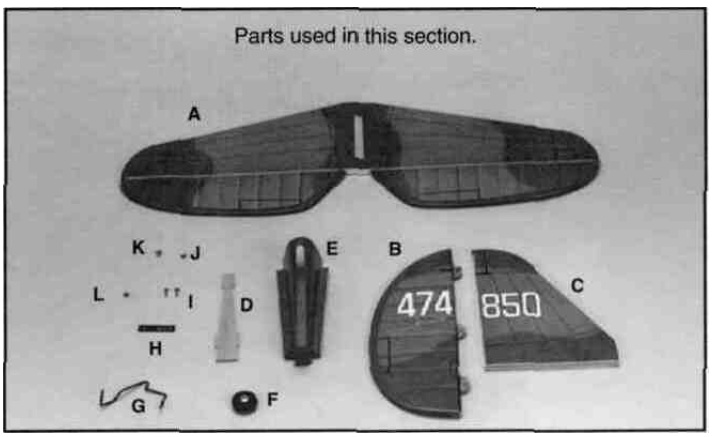


22 Check for proper radio operation of the throttle Make sure that the carburetor will move from low to high completely.

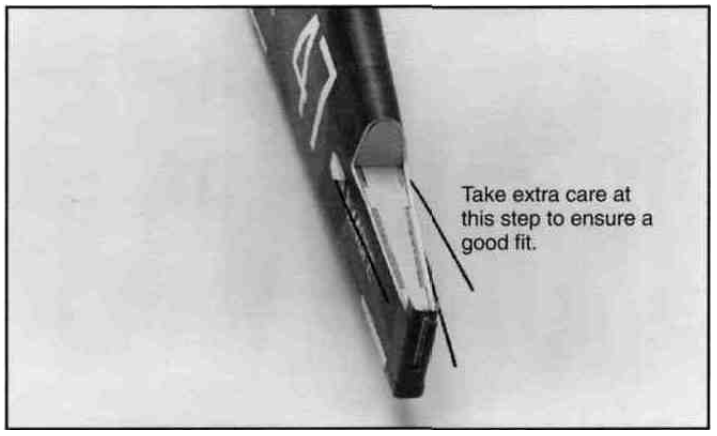
TAIL ASSEMBLY



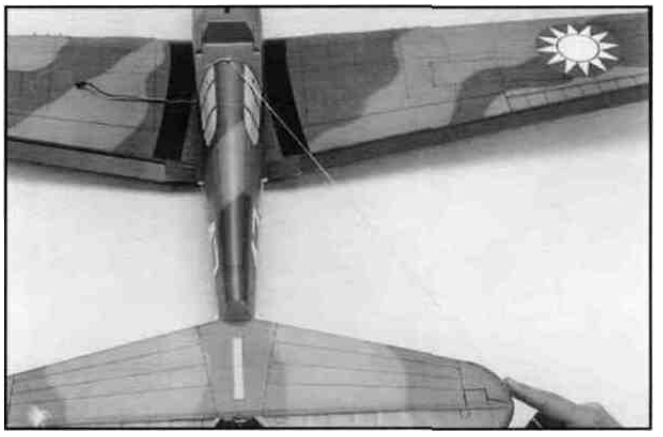
20 Connect the servos and battery to the receiver and center all radio controls (including the throttle stick) and reposition the servo horns so they are in line with the servos as shown After they are centered, pull the throttle stick back down (low throttle) Use the straight servo horns that are included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



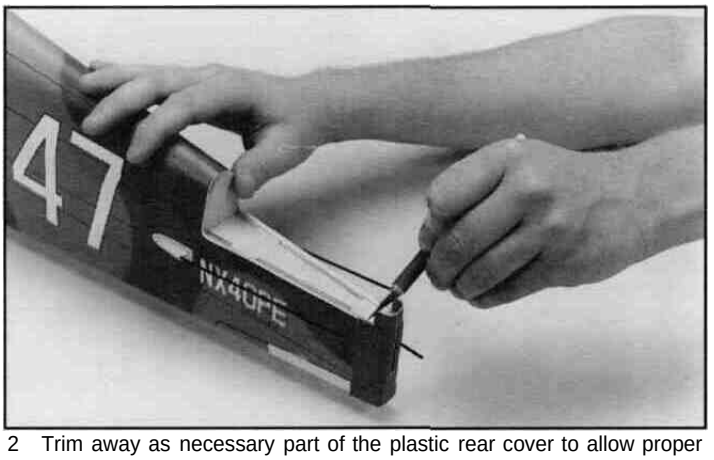
A. Horizontal Stabilizer.....1
B. Vertical Fin 1
C. Rudder 1
D. 1/8" Stab Platform 1
E. Stab Root Cover (Plastic) 1
F. Tail Wheel.....1
G. Tail Gear 1
H. Metal Strip 1
I. 2 5 x 10mm S/T Screw.....2
J. 3 x 5mm Screw.....1
K. Wheel Collar.....1
L Brass Collar.....1



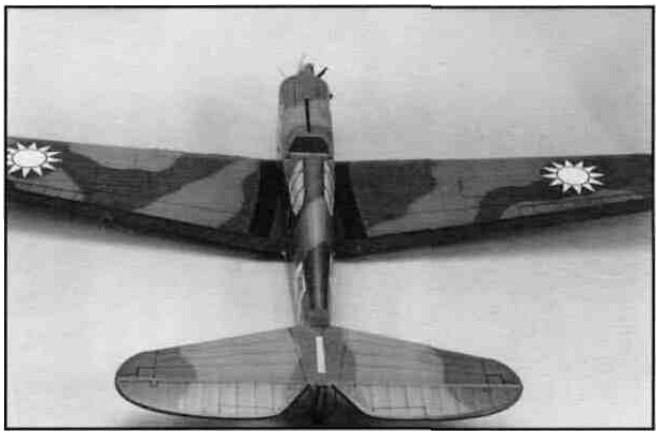
1 Test fit the 1/8 stab platform into the tail end of the fuselage **NOTE* It may be necessary to trim away some wood or glue to make the stab platform fit flush** If there is a good fit epoxy it in place making sure that it is even with the fuselage sides



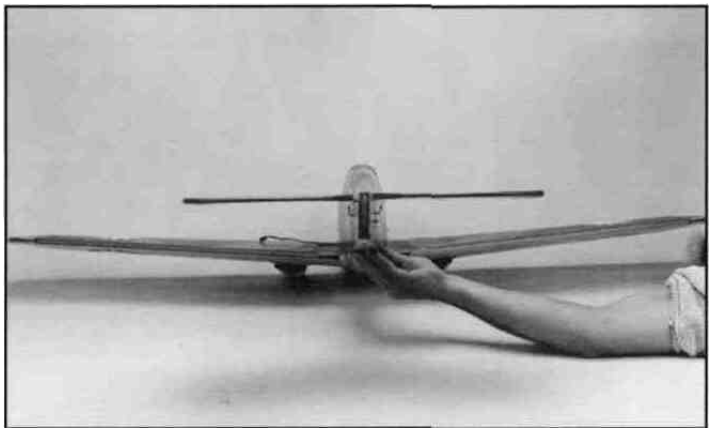
4 Next take a piece of string and attach it with a pin to the top center of the fuselage Make sure that the stabilizer is centered and stretch the string to the corner of the elevator Adjust the positioning of the stabilizer so that both corners are the same length when moving the string from side to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



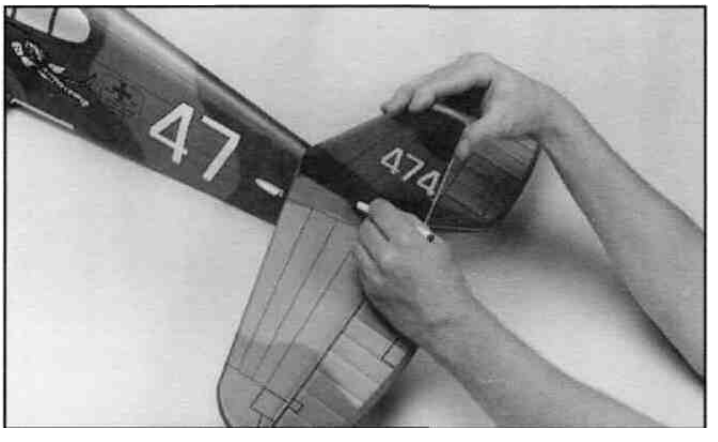
2 Trim away as necessary part of the plastic rear cover to allow proper fit of the horizontal stabilizer



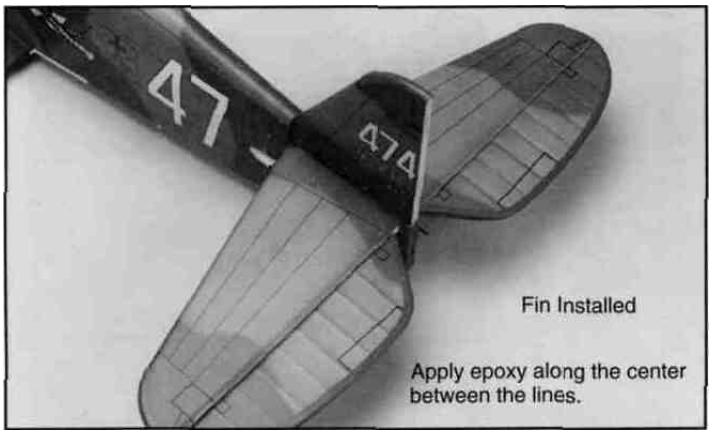
5 Next remove the stabilizer and apply slow cure epoxy to the stab platform Reinstall the stabilizer and re center as shown in step 4



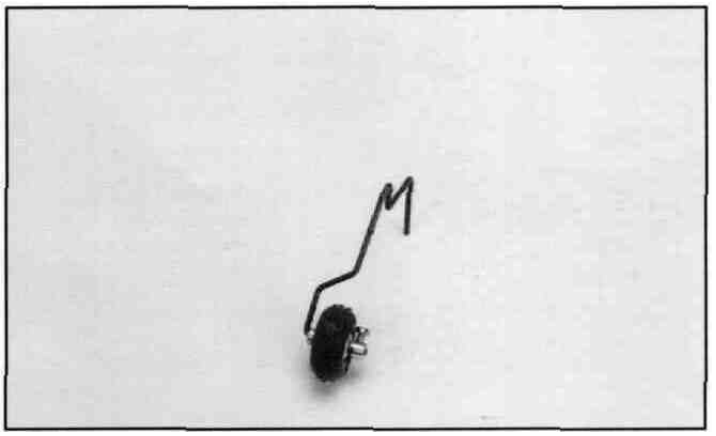
3 Bolt the main wing in place Next place the horizontal stabilizer onto the tail Hold it on and visually see if the wing and stabilizer are parallel If not sand the higher side of the stabilizer mount until the stabilizer is parallel **It is critical for proper performance that the two surfaces are parallel Take extra time to ensure a correct fit.**



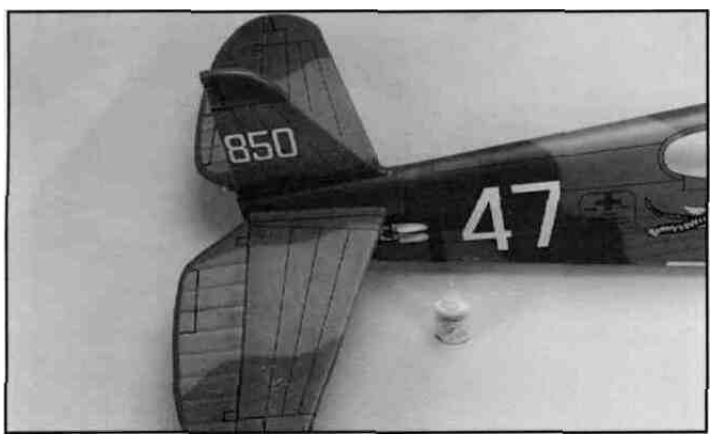
6 Once the horizontal stabilizer epoxy has cured trial fit the vertical fin (without the rudder) on top of the horizontal stabilizer so that the back edge is even with the rear of the fuselage Draw a line on both sides of the fin as shown



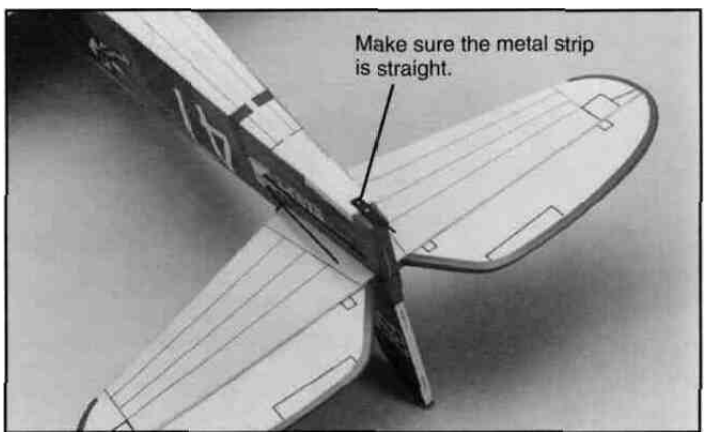
7 Next, apply epoxy to the top of the horizontal stabilizer and reposition the fin between the lines Make sure that the fin is still 90 to the stabilizer. Do the next step before the glue sets.



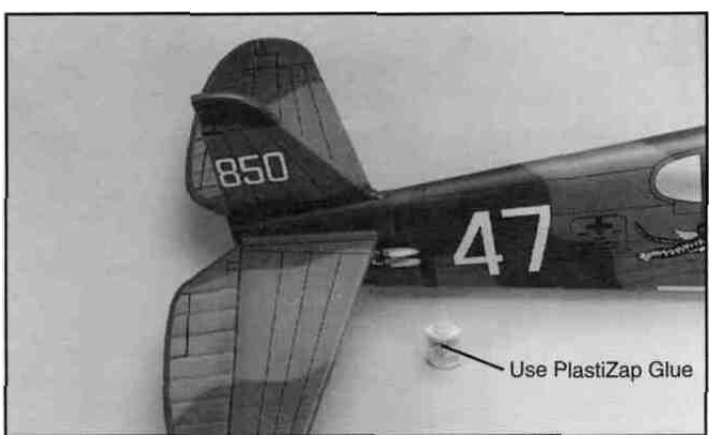
10 Assemble the tail wheel section shown Slide on a brass collar the tail wheel and install the wheel collar with a 3 x 5mm screw Use thread locking compound on the screw



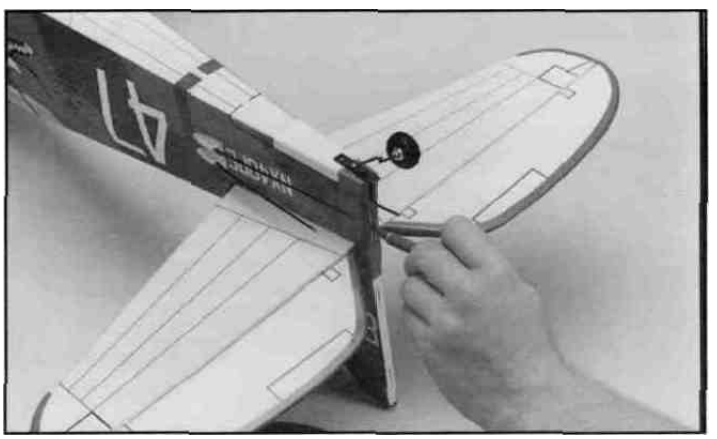
8 While the epoxy is still soft position the plastic stabilizer root cover over the fin Double check the positioning of the fin after doing this Use a 90° triangle to ensure that the fin is perpendicular to the stabilizer



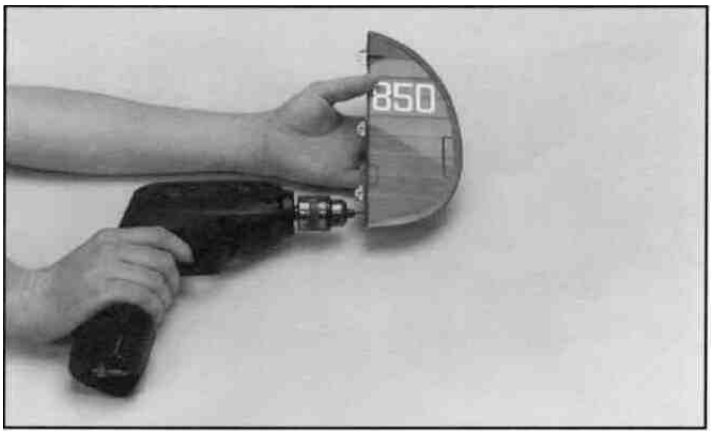
11 Insert a 2 5 x 10mm self-tapping screw through the middle hole of the metal strip and attach to the under side of the tail section so that the screw is positioned 11/16" from the end of the fuselage and the smallest hole is facing the rear Once in position, install a second 2 5 x 10mm screw into the front hole of the metal strip



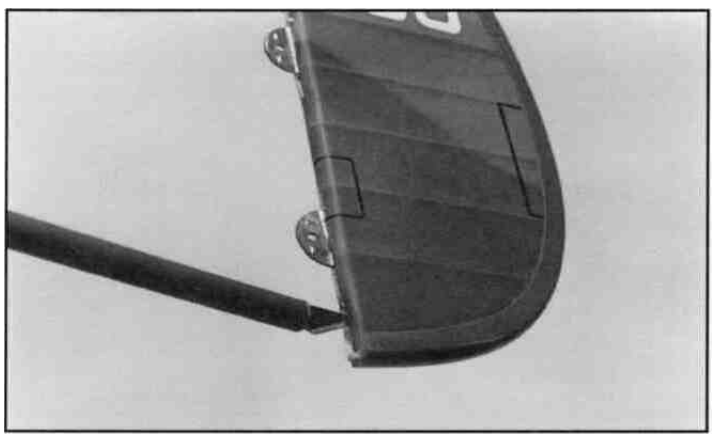
9 When satisfied with the positioning apply Cyanoacrylate glue to the underside edge of the stabilizer cover and install in place



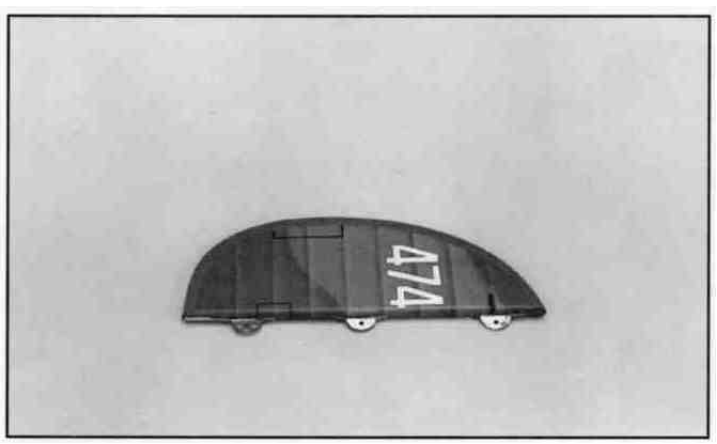
12 Install the tail wheel assembly through the metal strip Next trial fit the rudder onto the vertical fin Notice where the bottom hinge meets the fuselage and make a slot in the tail where the rudder hinge needs to be with a hobby knife



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



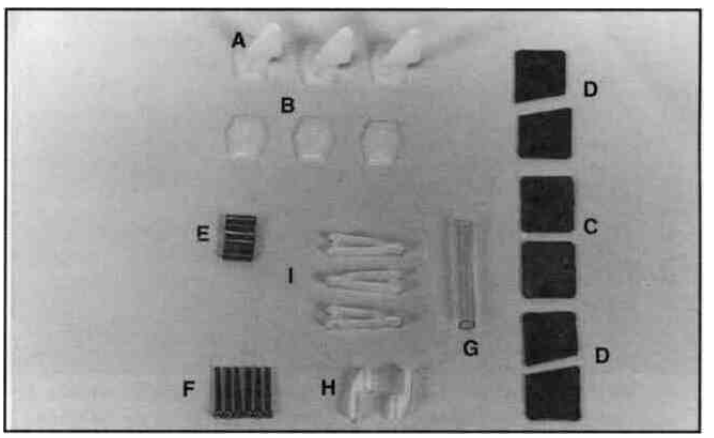
14 Notch a small groove (1/8" deep) from the hole down to the bottom for the tail control arm.



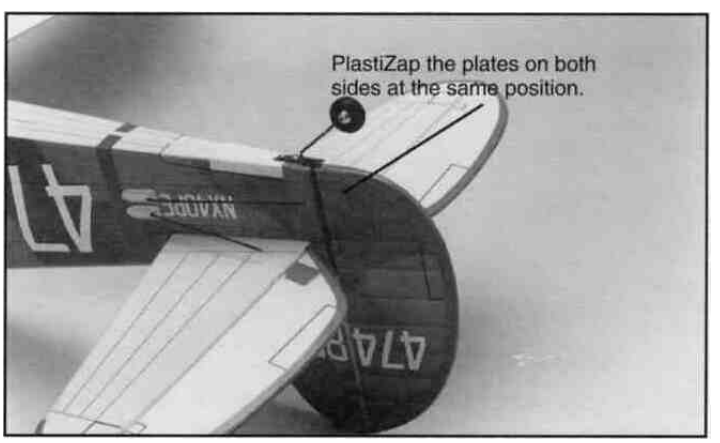
15. Place a small amount of epoxy on the hinges, in the groove, and on the end of the tail control arm. It is a good idea to place some petroleum jelly onto the hinge center joint (point of movement) to keep out any epoxy.

16. Carefully position 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.

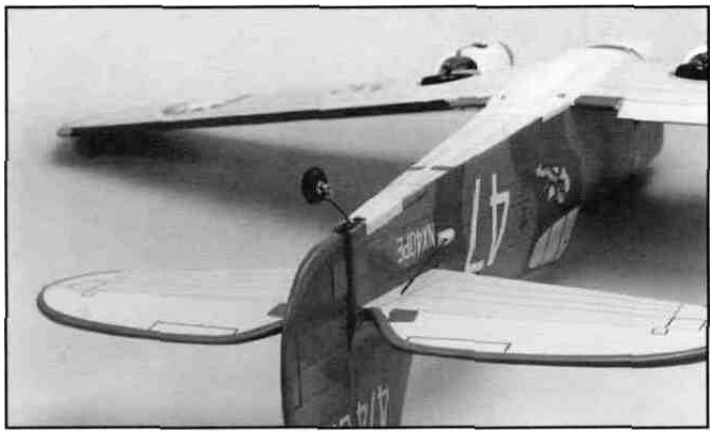
ELEVATOR/RUDDER CONTROL ROD INSTALLATION



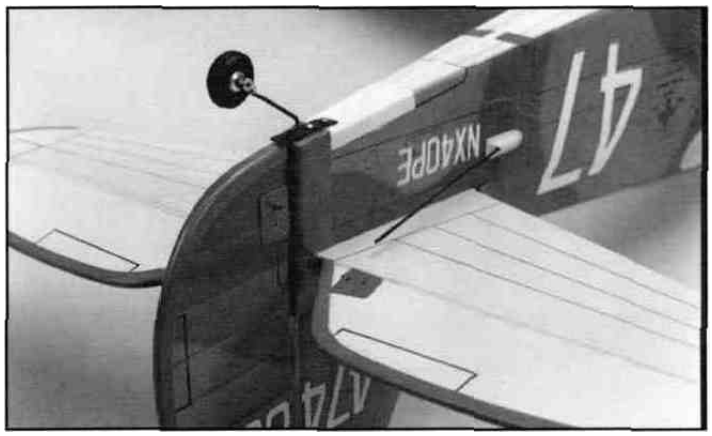
A. Control Horns 3
B. Back Plates..... 3
C. Mounting Plates (Rectangle) .2
D. Mounting Plates (Angled) 4
E. Brass Tubes.....6
F. 2mm x 20mm Screws.....6
G. Clevis Retainer Tube 1
H. Rod Clevis.....2
I. Snap Clevis 3



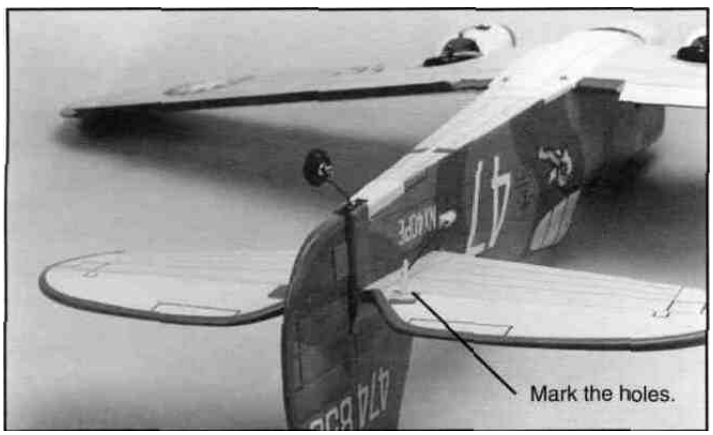
1. Glue (using PlastiZap) the rectangular mounting plates to the rudder so that they are centered, one on each side, over the tail control arm that is "inside" the rudder



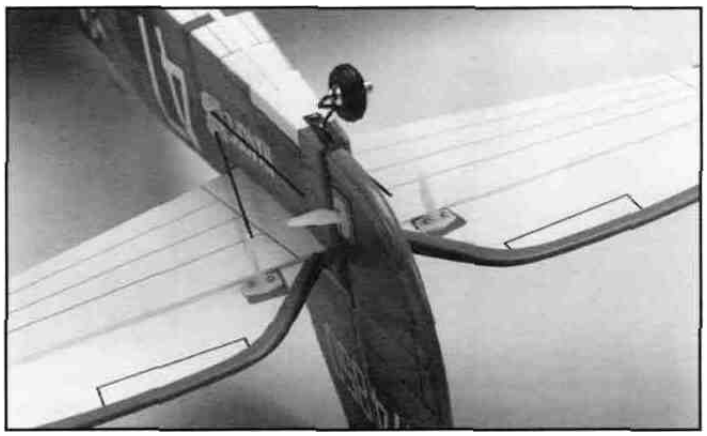
2 Using PlastiZap again glue the angled mounting plates, one on each side, on the two elevator halves as shown



5 Install the small, brass tubes into the six holes

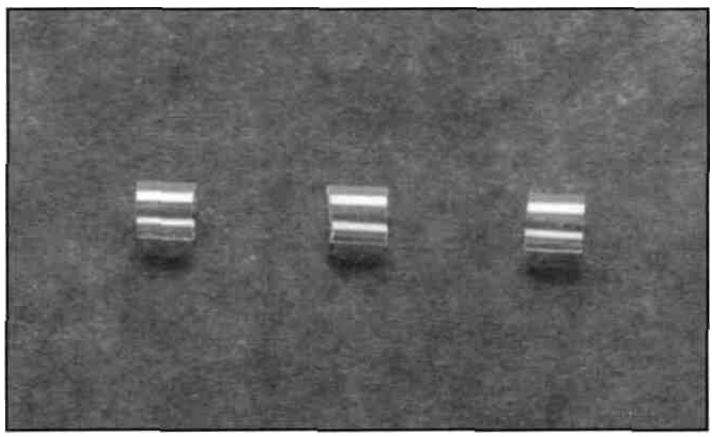


3 Using the control horn as a guide center and mark two holes for drilling on all three mounting plates The horns will then be mounted - two underneath the elevator and one on the right side of the rudder (as viewed upright from the rear)

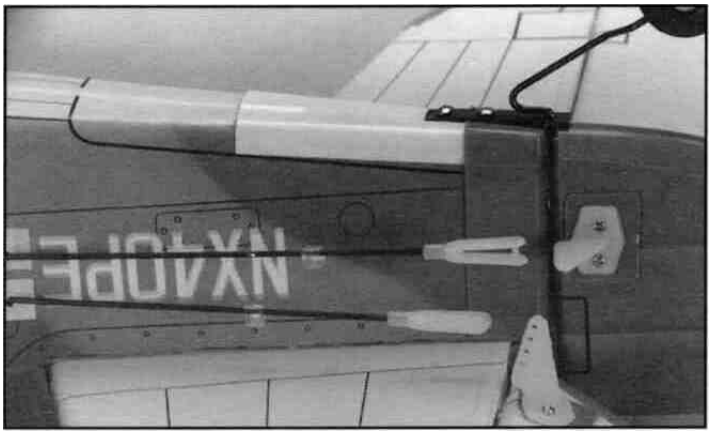


6 Mount the control horns to the surfaces with the 2 x 20mm screws Pass the screws through the horn through the tubes, and finally thread them into the back plates.

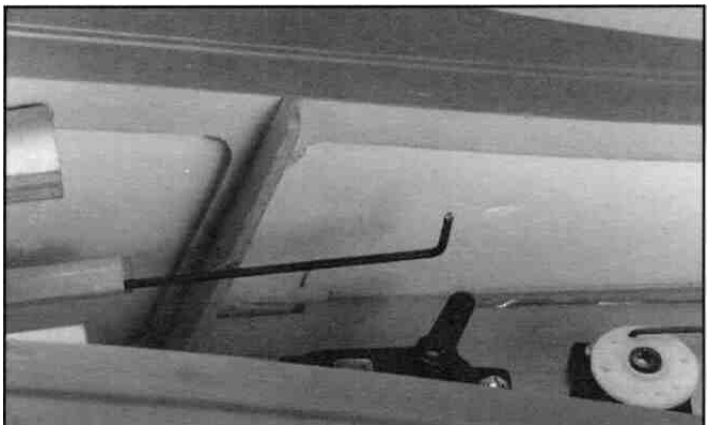
4 Drill six 3/32" holes for the three horns Make sure that you drill straight through to the other side



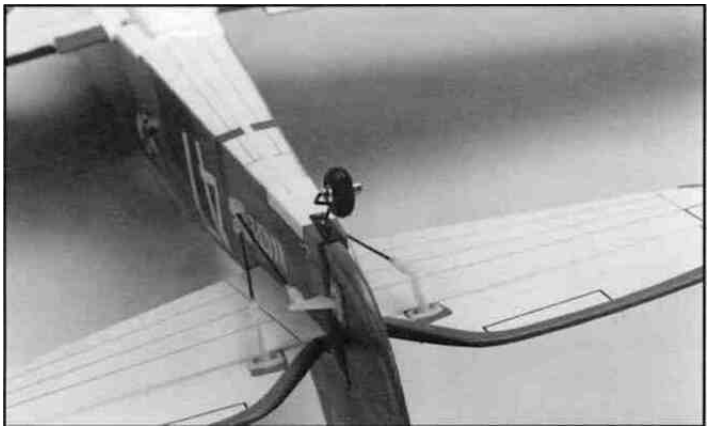
7 Cut the clevis retaining tube so that you have three 3/16" tubes



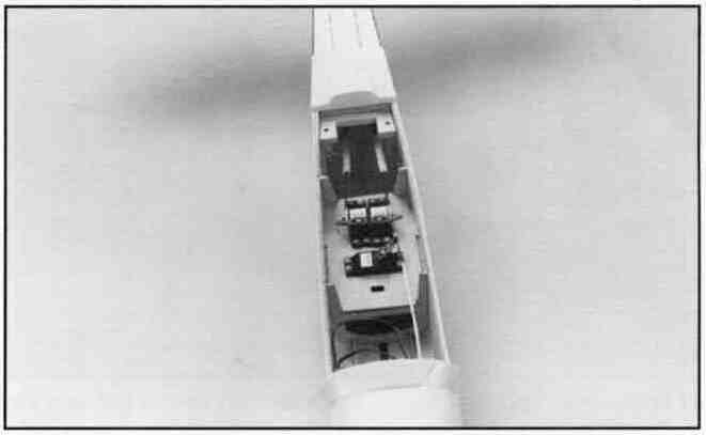
8 Slide on one of the retaining tubes onto each rod Screw on the plastic snap clevises to the three push rods coming out of the fuselage Screw them on half way up the threads



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

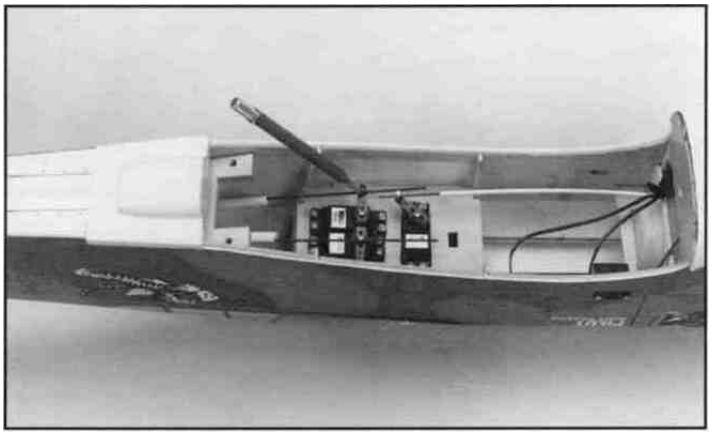


9 Attach the respective control rods to each horn Use the middle hole of the horn Turn on the radio system and adjust the clevises for centered control surfaces Make sure that both elevator surfaces are the same Slide up the retaining tubes to lock the clevises

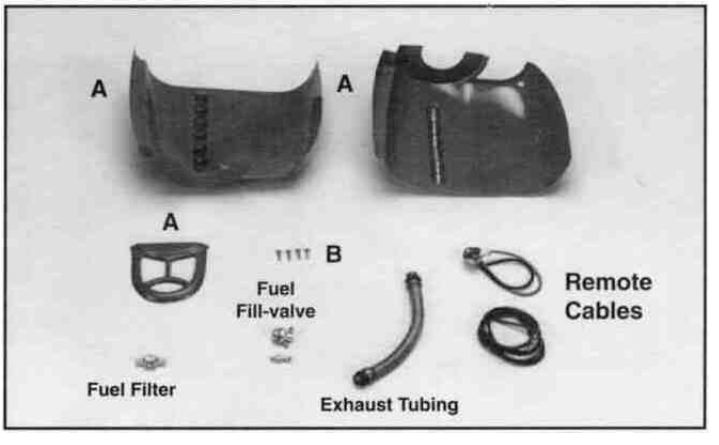


12 Attach the rods to the servos using the rod clevises as shown in the above picture You may need to enlarge the holes in the horns slightly for a good fit.

COWL INSTALLATION

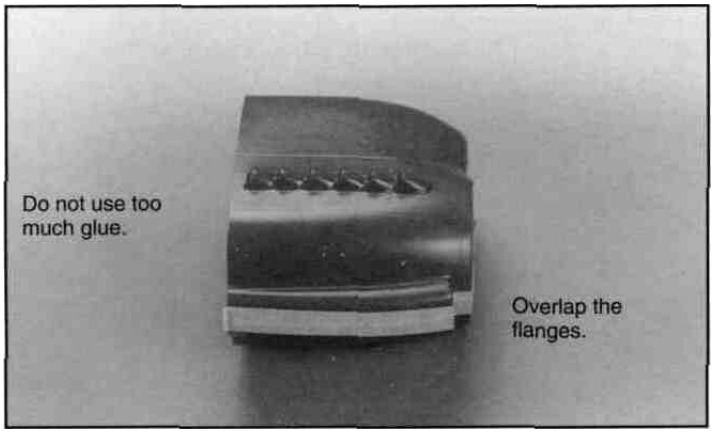


10 Align the rods over the servo horns and make a mark where they intersect Make sure that the control surfaces are in neutral (center position) before marking.

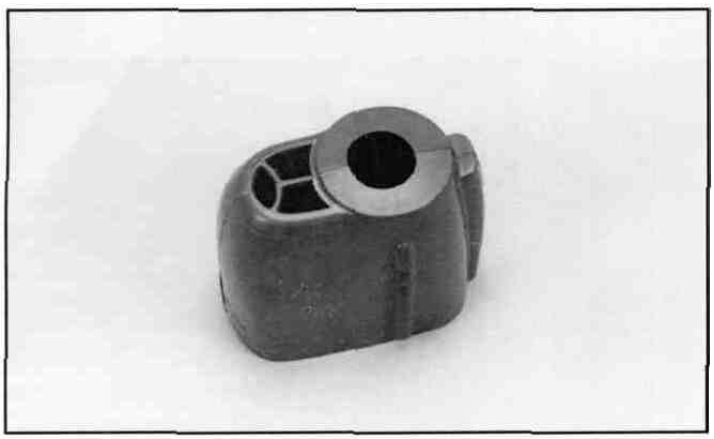


A Cowl (3 piece) 1
B. 2 5 x 10mm S/T Screw 4
OTHER ITEMS RECOMMENDED. (not included with the kit)

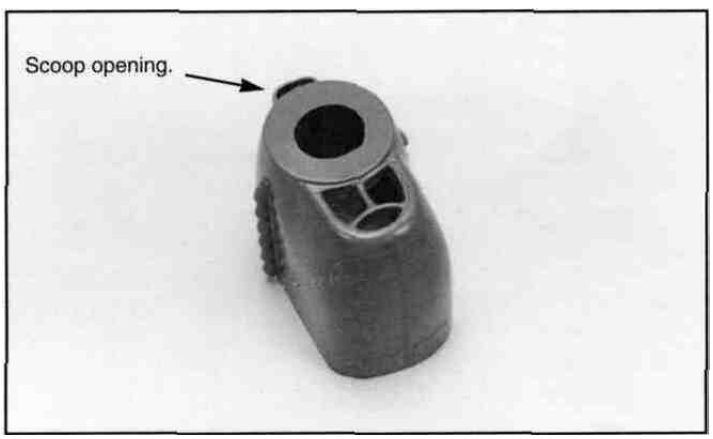
1. Fuel Filter
2. External Fuel-Fill Valve
3 Exhaust Tubing
4 Remote Glow Plug Cable for 4-cycles



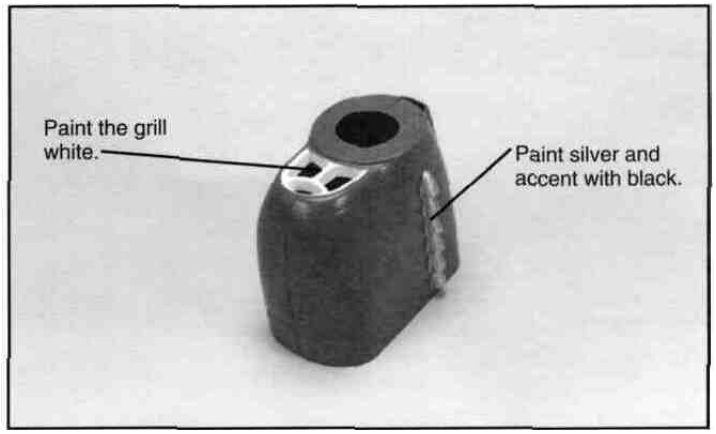
1. Lightly sand the flanges on the left and right cowl edges This will allow the glue to adhere better to the plastic Next hold or tape the right side over the flange of the left side and glue together along the inside seam with PlastiZap CA glue Let this cure



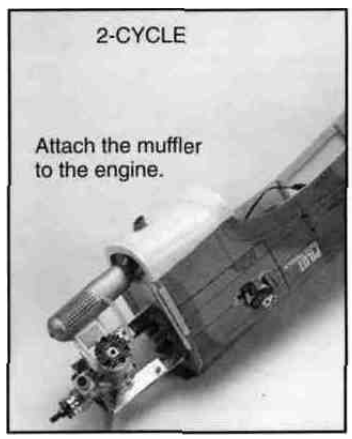
2 Next, using Plastizap CA glue, attach the front air inlet grill from the inside

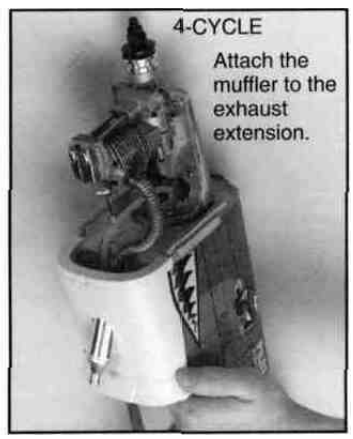


3. Carefully cut out the top scoop opening with a hobby knife Use a small round file to make the opening neat Also, use the file on the remaining openings allowing a smoother inlet for cooling air.



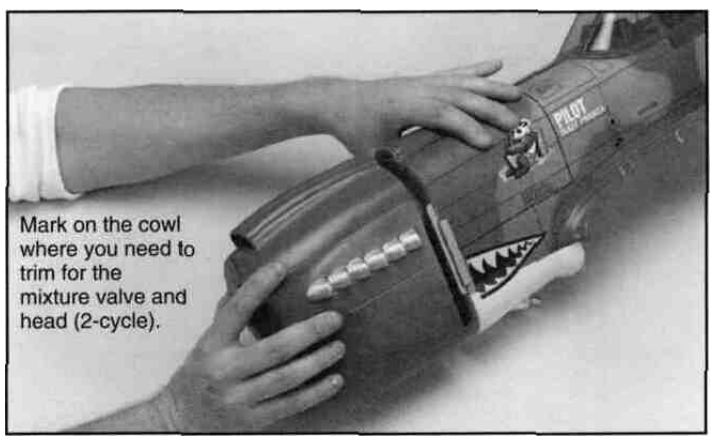
4 At this time you may wish to paint the molded exhaust headers on the outside of the cowl You may also wish to paint the front air inlet grill





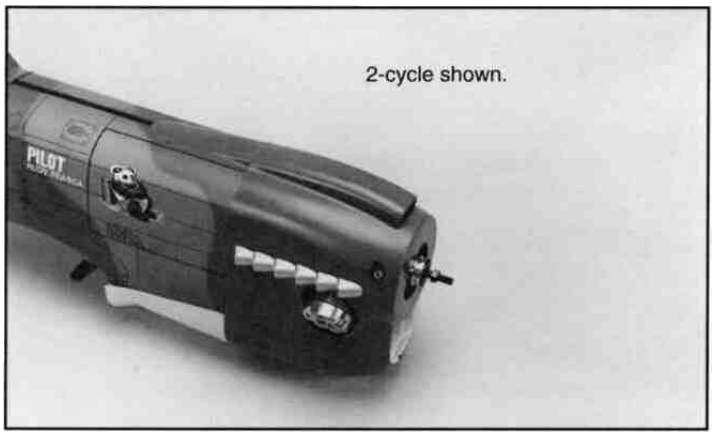
5. Attach the exhaust tubing to the engine and route it through the lower fuselage as shown You will have to cut the fuselage where the exhaust will exit. Attach the pressure line onto the muffler.

COWL INSTALLATION

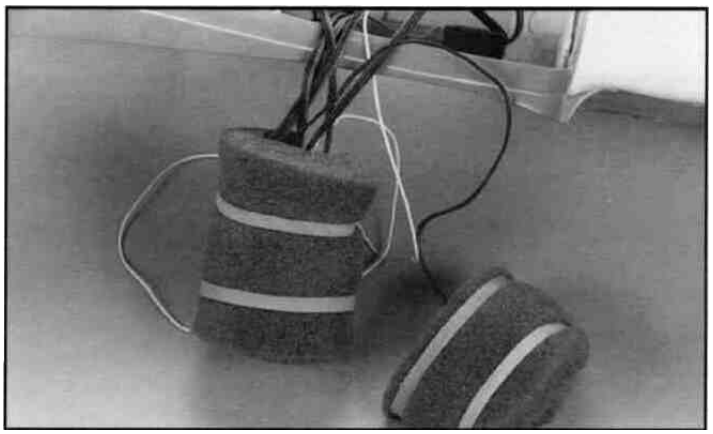


6 Trial fit the cowl over the engine.

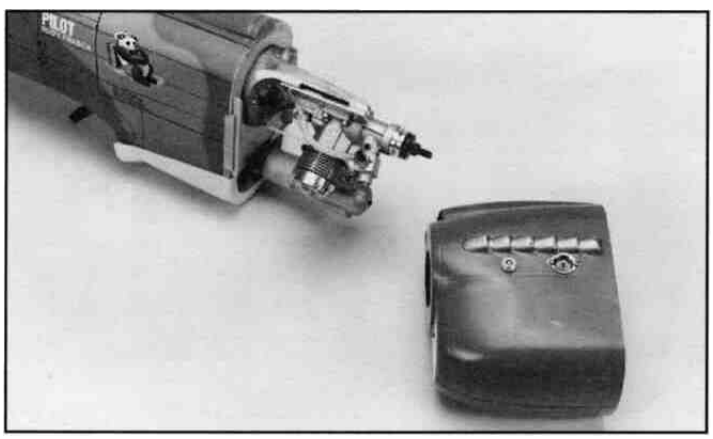
RECEIVER AND BATTERY INSTALLATION



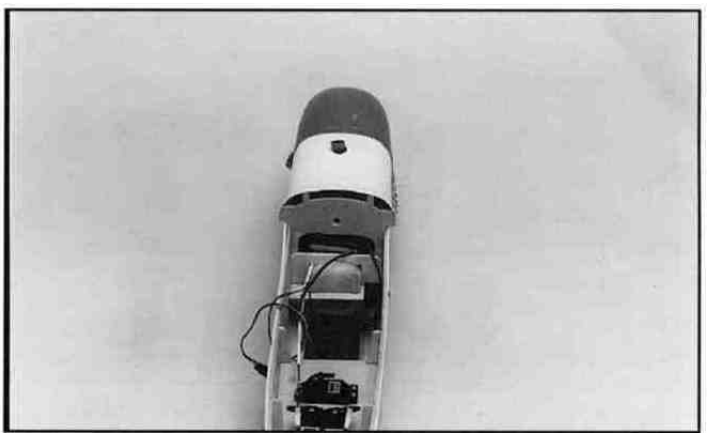
7 Drill and trim the necessary holes for the mixture screw, choke (4-cycle) and engine head (2-cycle) You will need to attach an extension to the mixture needle



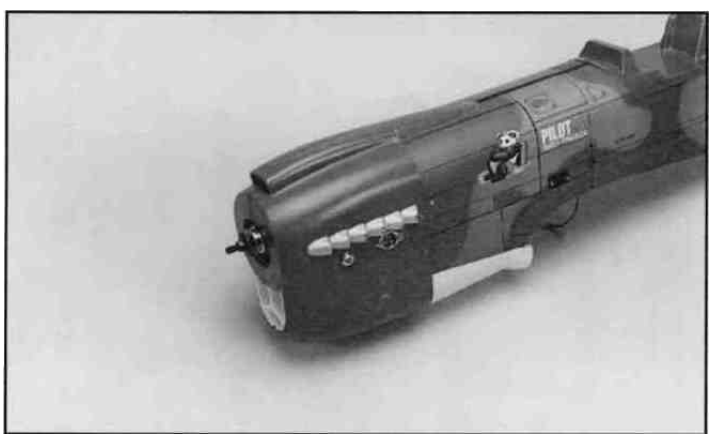
1 Hook up the servos and wrap the receiver and battery in natural foam rubber to protect it from vibration (Goldberg #481 Foam Rubber 1/4" works well) For added convenience in transportation and assembly, we recommend using extension leads for the aileron and retract servos



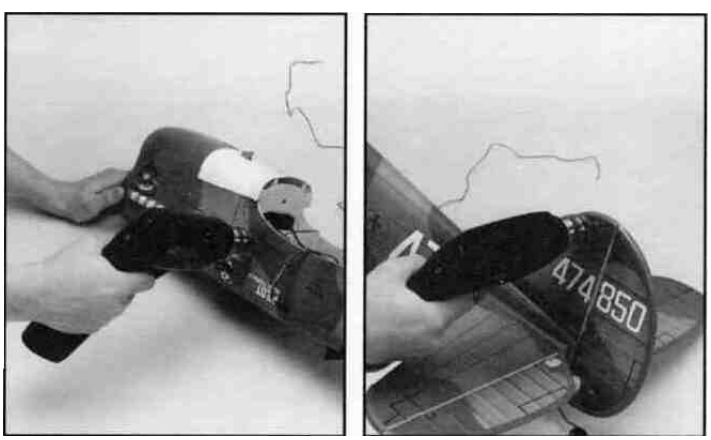
8 Install the fuel-fill valve fuel filter and remote glow plug adapter (4-cycle only) You can attach the valve and the remote adapter where ever you feel is most convenient



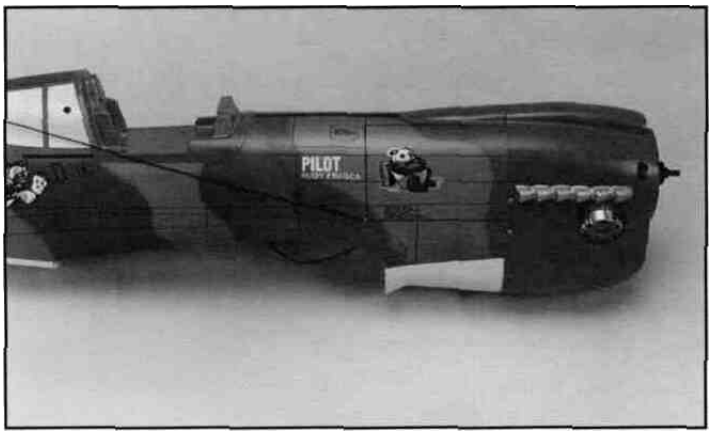
2 Install the battery into the cavity under the fuel tank Install the receiver to the top of the fuselage using double sided tape You may wish to install two screw eyes and hold the receiver in with a rubber band This will allow easier installation and removal of the receiver



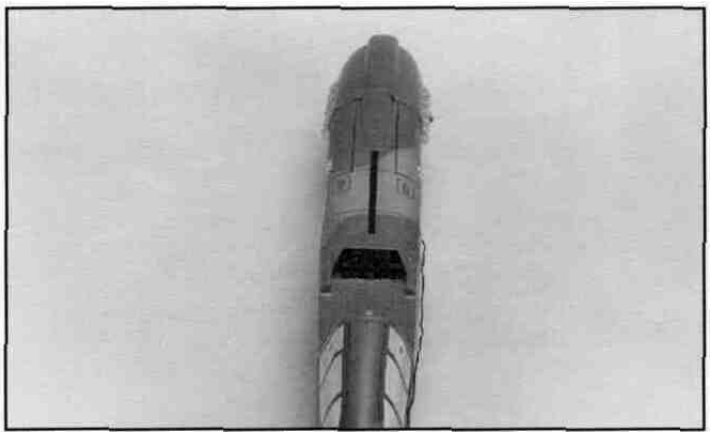
9 Position the cowl in place and drill two 2mm holes 1-1/2' apart on each side and install the 2 5 x 10 S/T screws to secure the cowl in place



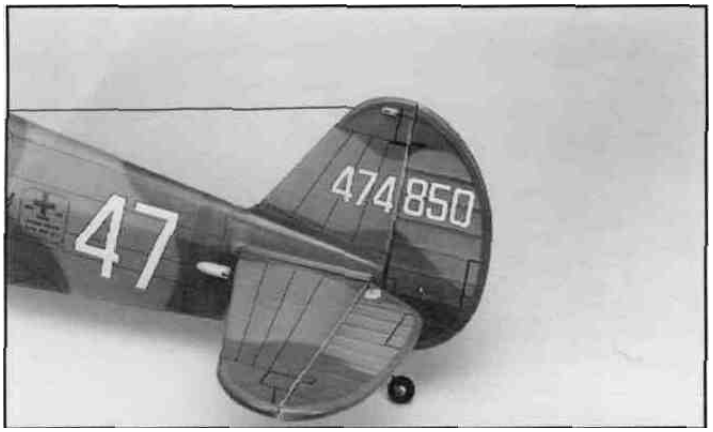
3 To route the Receiver antenna out of the fuselage drill a 1/16 hole into the fuselage at the point shown Also drill a 1/16" hole at the top of the vertical fin



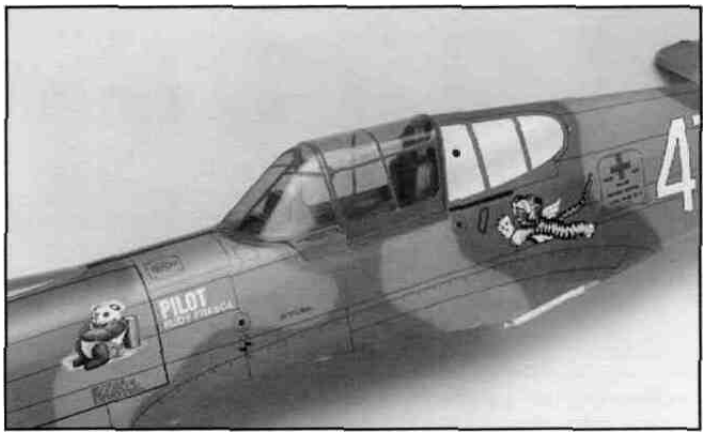
4. Route the antenna wire out through the hole in the fuselage and up through the hole in the tail.



1. Cut out the instrument panel decal and apply to the cockpit.

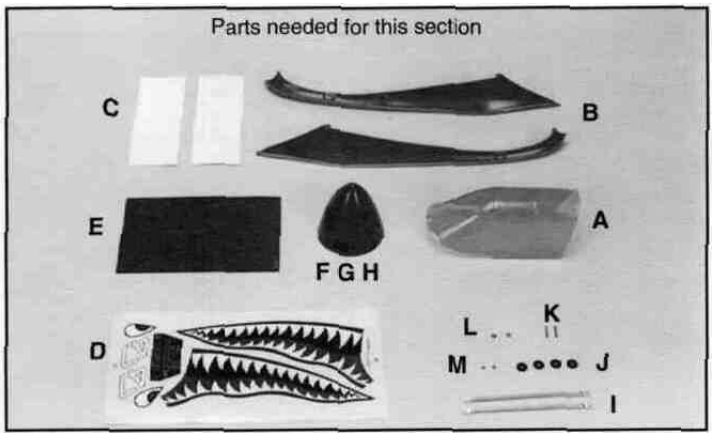


5. Use the plastic antenna retainer and secure the wire to the tail.

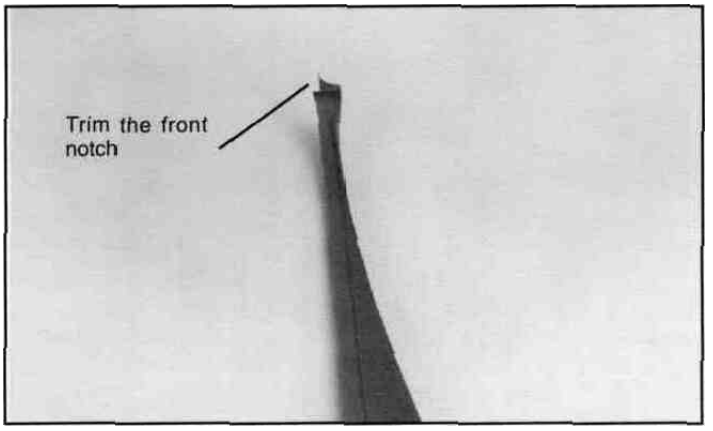


2. Using PlastiZap, glue the canopy onto the fuselage. Next, apply the green canopy decals as shown.

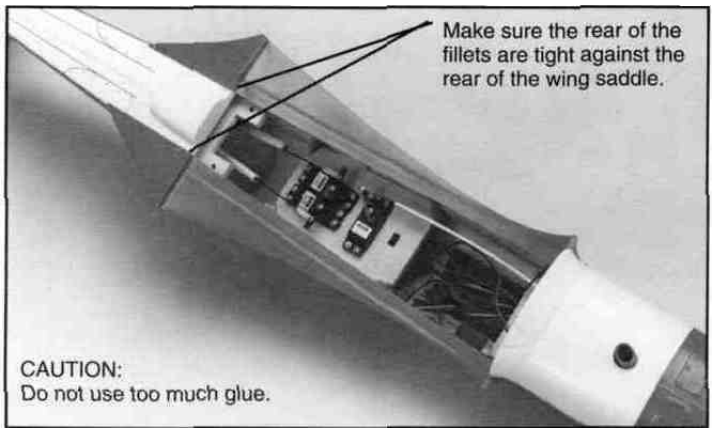
FINAL DETAILS



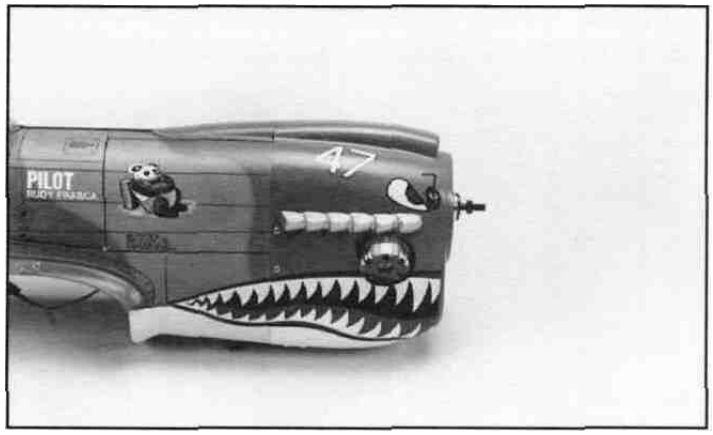
A. Canopy 1
B. Fillets 2
C. White Decals.....2
D. Decal Sheet.. 1
E. Canopy Decals 1
F. Spinner 1
G. Spinner Back Plate.....1
H. 2.5 x 12mm S/T Screw.....2
I. Stab Supports.....2
J. Plastic Disc. 4
K. 2 x 15mm Screw.....2
L. 2mm Nuts.....2
M. 2mm Washers.....2



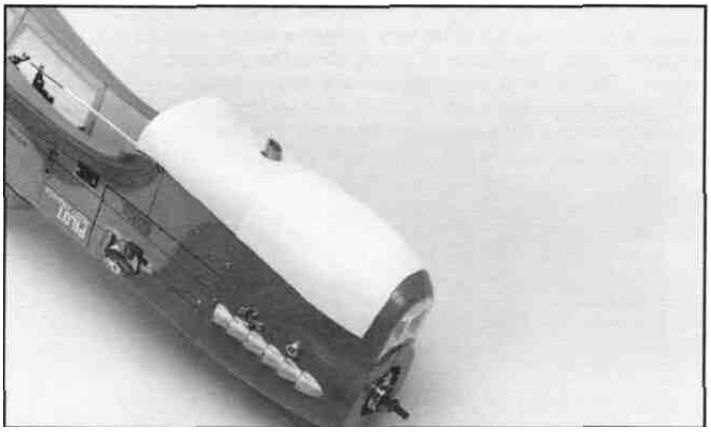
3. Trim out the front notch on the two wing fillets.



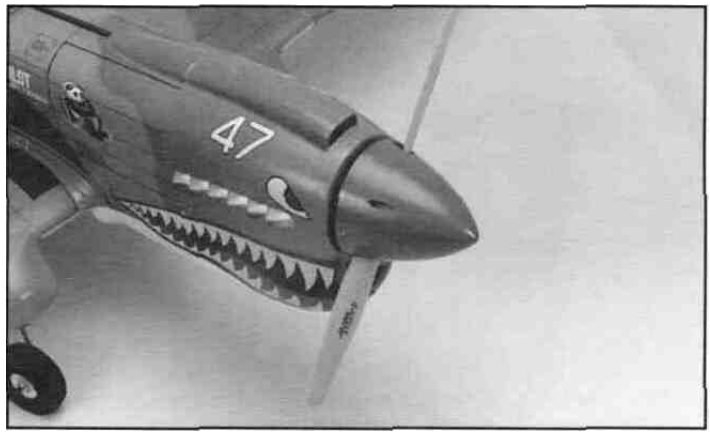
4 Install the fillets to the fuselage using PlastiZap CA glue Start by gluing the back in place and work your way forward



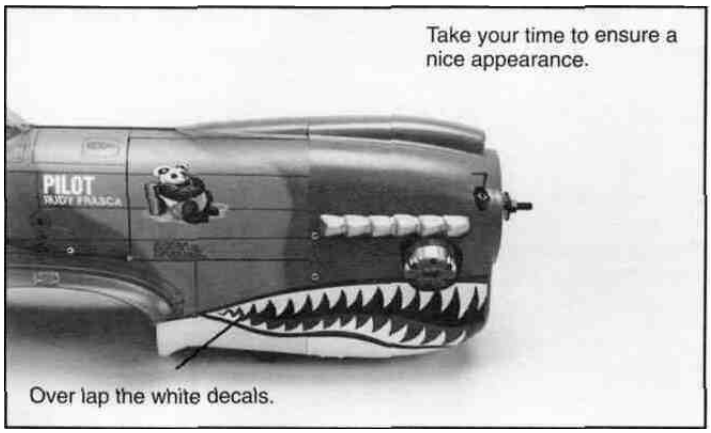
7 Trim out and apply the two eyes and numbers to the sides



5 Apply the white decals to the underside of front cowl The decals are flexible so carefully pull them around and over the different bumps and curves as shown Trim to fit

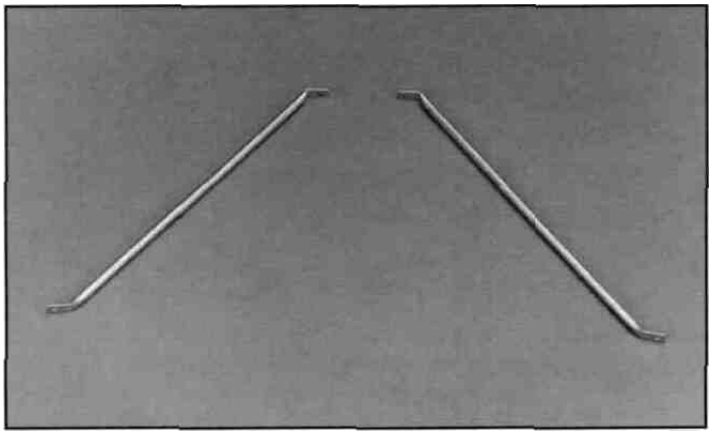


8 Install the spinner back plate prop prop washer prop nut and spinner with the 2 5 x 12 S/T screws Attach the wing to the fuselage

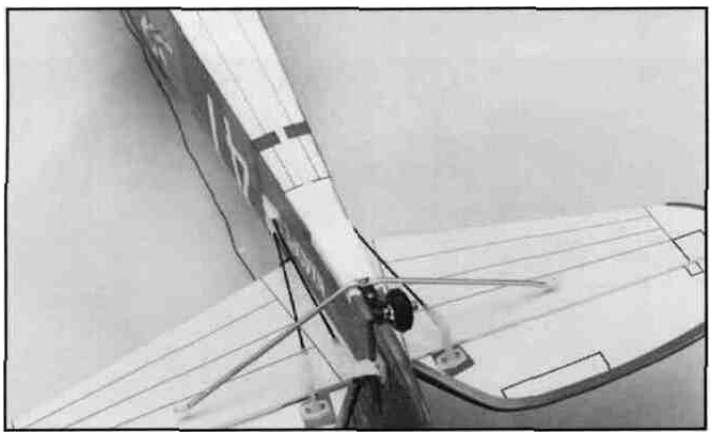


6 Trim out and apply the teeth decals to the cowl sides Carefully stretch the decals into place

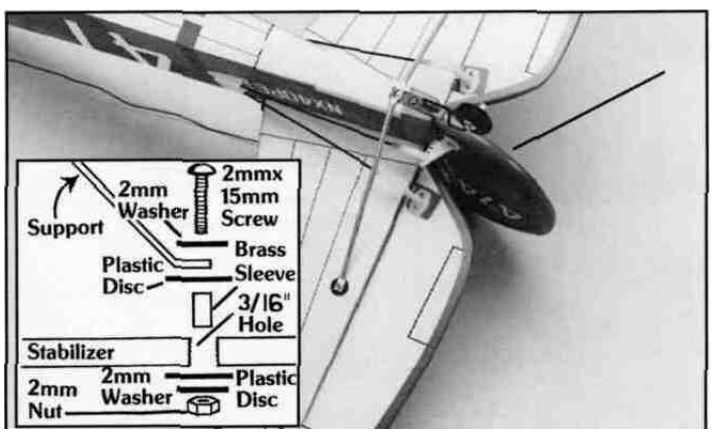
OPTIONAL: If you feel that the horizontal stabilizer needs more support, you can add the stabilizer supports as shown below.



1 Take the supports and bend the ends as shown above



2 Attach the two supports onto the fuselage with a 2. 5mm x 12mm self-tapping screw Make sure that the metal strip is straight



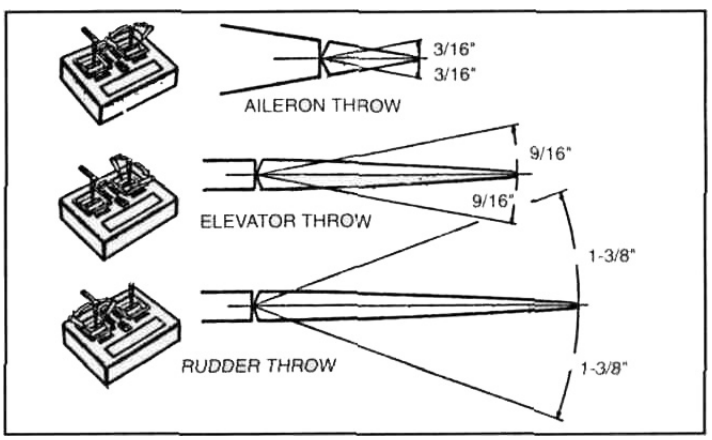
3 Position the supports straight out (90) to the fuselage Mark where the supports touch the horizontal stabilizer drill a 3/16 hole on each side at the marks Finally, attach the supports as shown in the drawing above

CENTER OF GRAVITY

Balance the plane upside down using the CG 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 an 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 sluggishy to respond to your control inputs If the plane is tail heavy it will be very sensitive to the elevator and possibly uncontrollable The center of gravity should be checked with the fuel tank empty The range in which the airplane should balance is marked with a dot on the side of the fuselage With standard radio equipment the plane should balance at this point If it does not balance within this range, **add** weight to the nose or tail as you need to obtain the proper balance

RECOMMENDED SURFACE 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	1-3/8"	2-3/4"

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

PRE-FLIGHT CHECK

1. Check to make sure all nuts, bolts, and screws are still securely fastened
2 Check all control surfaces to be sure that they are all properly attached
3 Check the range of the radio system as the manufacturer recommends
4 Check that all controls move smoothly and in the proper directions
5 Check the level of charge in the transmitter and receiver batteries.
6 Check that the flying area being used is free of obstacles
7 Check the frequencies currently in use at the field and in your area Make sure no one else is on your frequency before turning on your transmitter
8. Check the level of the fuel tank to be sure it is full.
9. Double check the radio operation.

FLIGHT SAFETY

- **(This plane is designed for experienced fliers only.)** NOTE If you are a beginner we suggest that you start off with a trainer aircraft (like the Hobbico Flightstar 40) and become proficient with it before attempting to fly the Hobbico P-40E Warhawk
- 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 obtained from your local area hobby shop and/or by writing to Academy of Model Aviation, 1810 Samuel Morse Drive, Reston, VA 22090.
- Fly in an open field without any obstructions
- Fly the model conservatively until you get to know the flight characteristics of the plane
- When adjusting the needle valve just prior to flight, hold the plane at a 45 nose up attitude with the throttle open Adjust the needle valve for the top performance as the manufacturer's instructions suggest

TAKE OFF

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 One 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

As you are ready for take-off, simply point the nose into the wind and slowly advance the throttle up to full 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 stable without 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 for straight flight 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 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" 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 feet away 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 the 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 It will still seem very fast and will use the complete runway to slow down.

AFTER -FLIGHT MAINTENANCE

- Check and double check that the transmitter and receiver switches are switched to the off positions
- Remove all excess fuel from the fuel tank as this fuel can become jelly-like and cause clogging of the fuel lines as well as clogging the engine's carburetor valves
- Remove fresh fuel from the surface of the plane immediately **as** different brand can cause clouding of the surface
- Wipe off the excess oil that will collect on the wing and fuselage Use a light-duty cleanser to help cut through the oil
- Always use after-run oil in the engine to prevent corrosion
- Replace any bent, marred or dinged props as they can fly apart at any time when the engine is turning
- Completely check the airplane 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 P-40E

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 electric 12V starter, try to position the prop parellel to the wing at the beginning of the compression stroke.

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 Proper break-in and maintenance will help ensure dependable trouble-free operation and longer life of the engine.

1 Use a filter on the carburetor line
2 Fill the fuel tank When the tank is full, the fuel will come out the muffler
3 Follow you manufacturer's instructions according to needle valve settings
4. Turn the radio system 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 Watch the fuel line If no fuel is reaching the carburetor, recheck the fuel line plumbing
5 Reduce the throttle to 1/4 or 1/2 throttle for starting
6. 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.
7. Attach the glow plug clip at this time
8 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
9 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 manufacturer's recommendations for engine break-in procedures and valve settings
10 As a guideline, always run a new engine slightly rich This will allow the engine extra break-in time and will help ensure future dependability
11 If you continue to have problems with the performance of starting of your engine, refer to the 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 or glo-starter and check to make sure the battery can glow the plug red hot prior 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 try again.**
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 well.	**Loose plug or bad plug.**	**Replace the plug and/or tighten the old plug.**

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 that the transmitter and receiver batteries are fully charged.
2. Glow plug clip and fully charged 1 1/2 volt battery (Hot-Shot glo-starter)
3. Fuel and fuel pump or fuel bulb.
4. Extra props and prop wrench.
5. Screw drivers, knife, pliers, and wrenches.
6. Epoxy and something to mix it on.
7. Paper Towels
8. Cleaner to remove residue on the plane (glass cleaner works great).
9. Extra glow plugs
10. 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 SNAP CLEVIS CLOSER to the surface or move the ROD CLEVIS away from the center of the servo arm To DECREASE the amount of movement, move the SNAP CLEVIS AWAY from the surface **or** move the ROD CLEVIS closer to the center of the servo arm.

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 instructions 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. Never cut the receiver antenna. This will affect the sensitivity of the receiver and result in a loss of range.
2. Carefully wrap the receiver in foam and a plastic bag like the receiv< battery
3. Make sure that all the servos are plugged tightly 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 But the flying surface being moved is at its limit. This can damage the servo and drain the battery which may cause loss of control of the plane and crash. If this happens, move the control rod in closer to the center of the servo to reduce the chance of binding Make sure to double check the servo throws afterwards. Recenter if necessary.

HOBBICO® AIRPLANE KITS

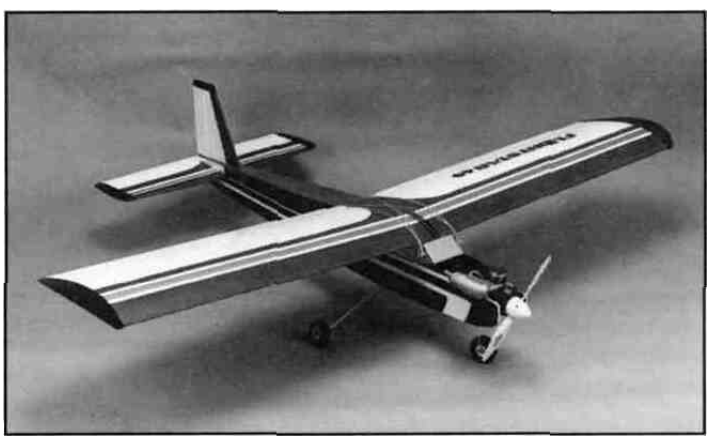
HCAA2600 - Extra 300

HCAA2530 - Cherekee 25

HCAA2570 - Super Chipmunk 40
HCAA2510 - Super Chipmunk 25

HCAA2590 - Cessna 182

HCAA2580 - Telestar 40
HCAA2520 - Telestar 25



HCAA2050 - AWARF Flightstar 40

