HOBBICO®

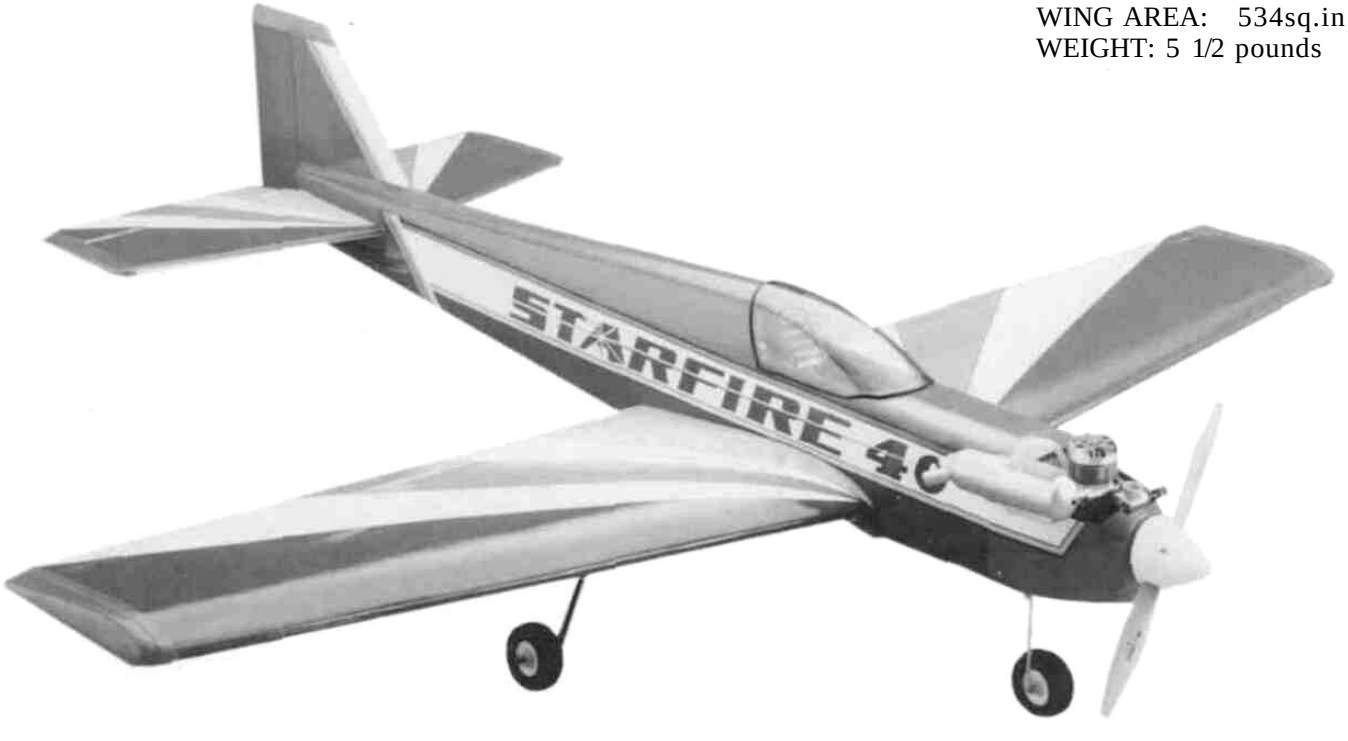
AWARF SERIES
All Wood — Almost Ready To Fly

STARFIRE 40

Almost-ready-to-fly Radio Controlled Model Airplane

- **Superior quality in an Almost-Ready-to-Fly model**
- **80% complete out of the box - No Sanding, Painting, or Finishing required.**
- **Beautiful sporty appearance.**
- **Super acrobatic aircraft for experienced pilots**
- **All wood construction with sheeted wings**
- **Fuel Tank, Spinner, Wheels, Landing Gear, Engine Mount, and Hardware are included.**

WINGSPAN: 55 1/2 in.
LENGTH: 49 3/4 in.
WING AREA: 534sq.in.
WEIGHT: 5 1/2 pounds



RADIO: 4 channel (not included)
ENGINE: .40 Performance 2-cycle (not included)
or .61-.91 4-cycle (not included)
ACCESSORIES: Standard field equipment (not included)

 V1.0

IMPORTANT: BEFORE YOU BEGIN.

Congratulations on your choice of an AWARF 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 Starfire 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 Starfire kit is one of the finest models of its type and will offer you many hours of enjoyment.

BEFORE ASSEMBLY

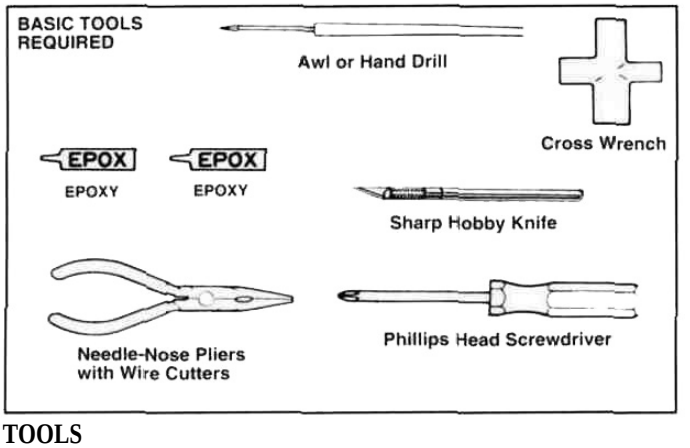
CONSTRUCTION HINTS:

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.
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 or part sizes.

ADDITIONAL ITEMS

The following items are needed for completing the Starfire kit:

Medium Fuel Tubing (12") 1
.40 Sized 2-Cycle Engine.....1
OR
.61 - .70 Sized 4-Cycle Engine.....1
4 - Channel Radio System.....1
Pacer PlastiZap CA Glue.....1
Goldberg #481 Foam Rubber 1
Hobbico (HCAR3950) 30-Minute Epoxy.....1
Silicone Sealer.....1
Dubro 121 E-Z Connects (Optional).....2
Hobbico (HCAR3760)Threadlock..... 1
Dubro 340 in line Fuel Filter.....1
Propeller (Size depends on the engine) 1

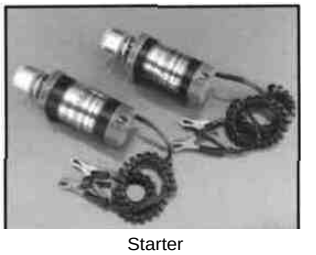


TOOLS
You will need the following basic tools to assemble the kit. Hobby knife. Phillips screwdriver (small and medium), needle nose pliers, drill, drill bits, sanding block, ruler, and string.

REQUIRED FOR RUNNING THE ENGINE


Glow Fuel
l See Engine s
Recommendations)

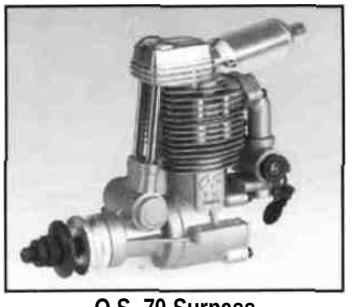

Glow Driver


Starter

12 V 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. .40 SF
2-cycle


O.S. 70 Surpass
4-cycle

A quality brand engine will be needed. We recommend the **O.S.** .40 SF 2-Cycle engine or the O.S. 70 Surpass 4-cycle engine.

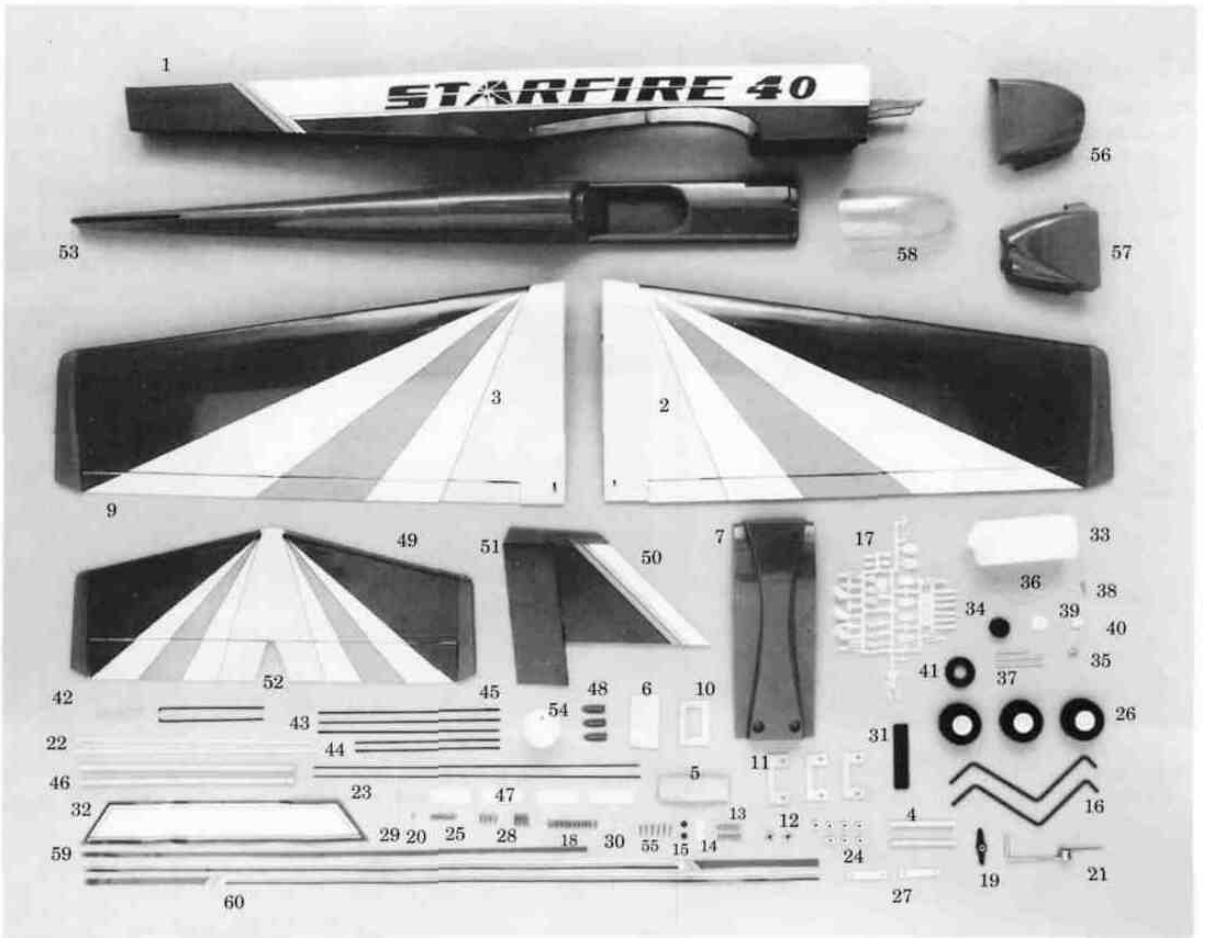
RADIO SYSTEM

A four-channel radio control system with 4 servos is required for the Starfire 40.

PARTS LIST

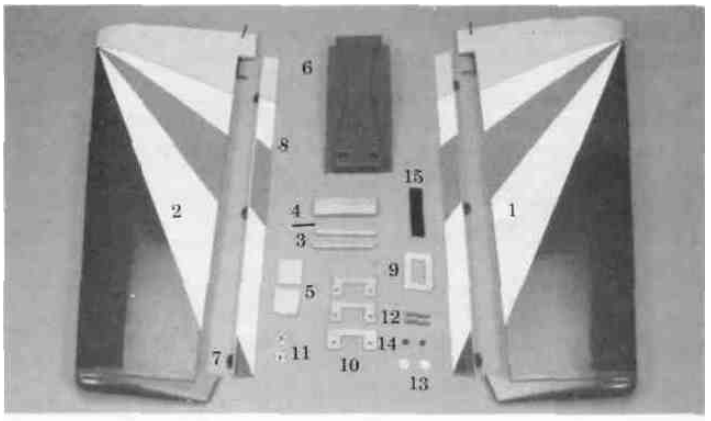
Before assembly, match the parts in the photo on this page with the parts in the kit. Check off each part as they are located. If any parts are missing or damaged, consult your hobby dealer.

( ) 1 Fuselage.....1
( ) 2 Right Wing.....1
( ) 3 Left Wing.....1
( ) 4 7mm Dowel Rod 2
( ) 5 Wing Joiner 1
( ) 6 Reinforcing Blocks 2
( ) 7 Wing Center Cover.....1
( ) 8 Hinges.....13
( ) 9 Ailerons.....2
( ) 10 Aileron Servo Tray.....1
( ) 11 Wing Mounting Blocks..3
( )12 Blind Nuts.....2
( ) 13 4 x 30mm Wing Screws.2
( ) 14 4mm Washers 2
( ) 15 0-Rings.....2
( ) 16 Main Gear Struts.....2
( ) 17 Plastic Tree.....1
( ) 18 3 x 15mm S/T Screws....8
( ) 19 Bellcrank.....1
( ) 20 3 x 8mm Screw 1
( ) 21 Front Gear Strut.....!
( ) 22 White Tube 2
( ) 23 450mm Rod.....2
( ) 24 Wheel Collars 7
( ) 25 3 x 5mm Screws 7
( ) 26 Wheels 3
( ) 27 Mounting Plates.....2
( ) 28 3 x 15mm Screws 8
( ) 29 Lockwashers.....8
( ) 30 3mm Nuts.....4
( ) 31 Wing Pad 1
( ) 32 Cowl Decal..... 1
( ) 33 Fuel Tank 1
( ) 34 Rubber Cap.....1
( ) 35 Fuel Tank Clunk 1
( ) 36 Fuel Line 1
( ) 37 Fuel Pipes.....3
( ) 38 3 x 18mm S/T Screw 1
( ) 39 Large Disc.....1
( ) 40 Small Disc.....1
( ) 41 Neoprene Ring.....1
( ) 42 Clevis Retaining Tube...l
( ) 43 Bent Rods 2
( ) 44 Short Rods.....2
( ) 45 Long Rods.....3
( ) 46 Wooden Push Rods.....2
( ) 47 Shrink Tubing 4
( ) 48 Push Rod Exits.....3
( ) 49 Horizontal Stabilizer.....!
( ) 50 Vertical Stabilizer 1
( ) 51 Rudder.....1
( ) 52 Elevators.....2
( ) 53 Turtle Deck.....1
( ) 54 Spinner.....1
( ) 55 2 x 20mm Screws 6
( ) 56 Right Cowl.....1
( ) 57 Left Cowl.....1
( ) 58 Canopy.....1
( ) 59 Red Striping Decal..... 1
( ) 60 Side Decal.....2

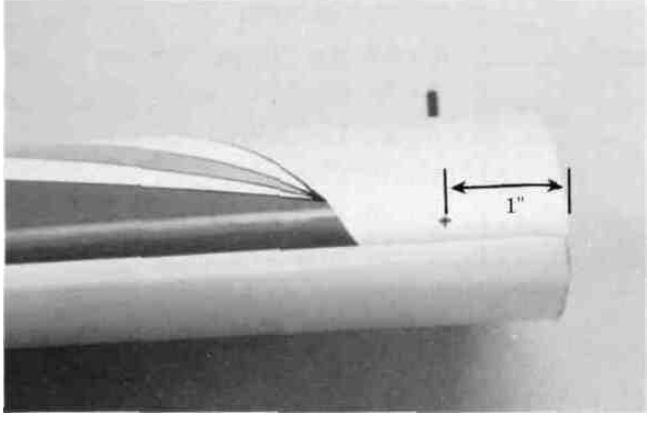


Use this ruler as a guide when selecting parts and screws to ensure that you have the correct part.

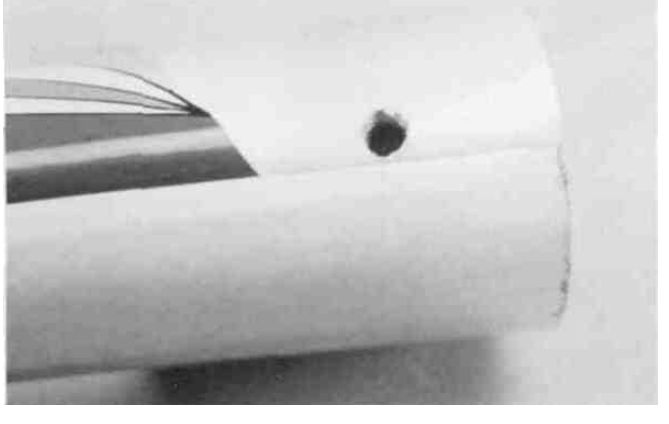
WING ASSEMBLY



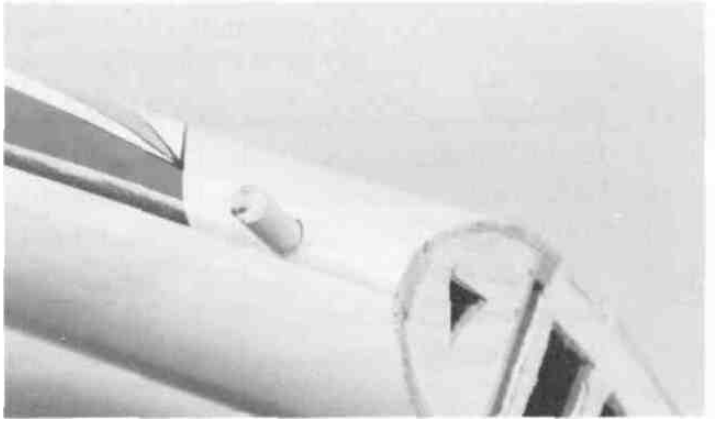
1	Right Wing.....1	9	Aileron Servo Tray 1
2	Left Wing 1	10	Wing Mounting Blocks.....3
3	7mm Dowel Rod.....2	11	Blind Nuts 2
4	Wing Joiner 1	12	4 x 30mm Wing Screws.....2
5	Reinforcing Blocks.....2	13	4mm Washers.....2
6	Wing Center Cover.....1	14	O-Rings 2
7	Hinges.....6	15	Wing Pad 1
8	Ailerons.....2		



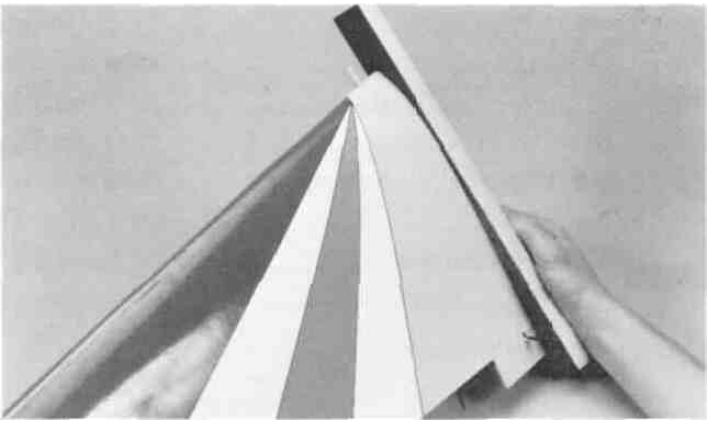
1. On both wing halves, make a mark exactly 1 from the wing root on the leading edge



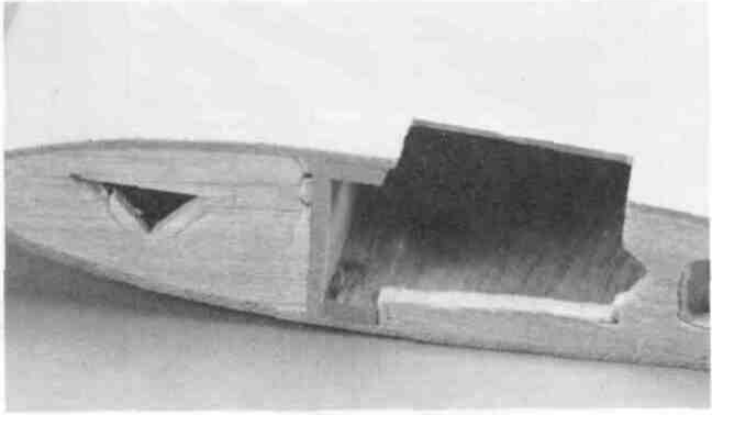
2 Drill a 7mm hole at each mark Make sure that you drill straight in at the center of the mark parallel to the wing root



3 Trial fit the 7mm dowel rods into the holes and butt them up against the front spar They should be positioned straight in and parallel to the wing root Once satisfied with the fit, epoxy them in place using slow cure epoxy.

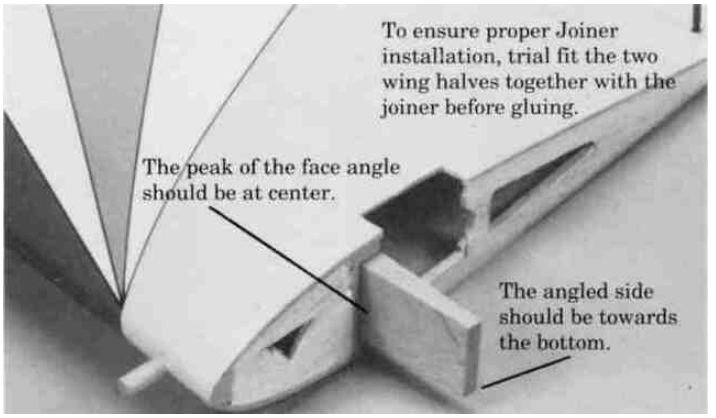


4. Next, using a sanding block sand the wing roots of both wing halves to ensure that they are perfectly flat Be careful not to change the dihedral angle of the root

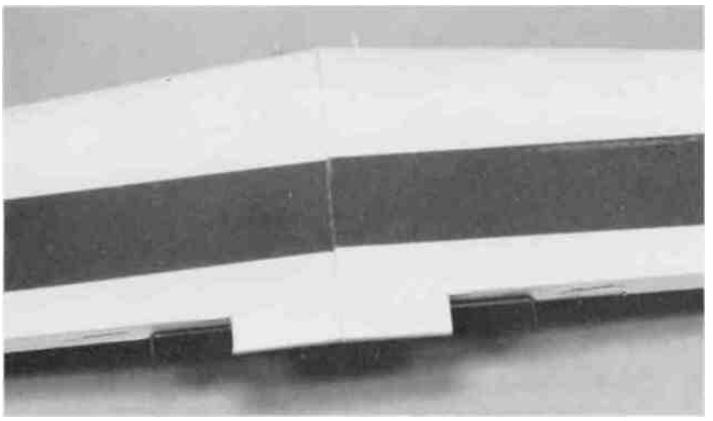


5 Trim each wing half for the aileron servo as shown It's much easier to do this now than after the wing is assembled

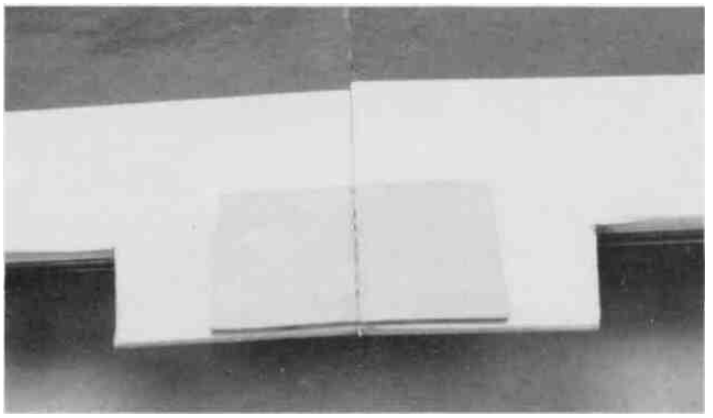
IMPORTANT! The following two steps are critical in the assembly of this kit. If they are not done correctly, wing failure could result Be sure to use plenty of slow cure (30 min) epoxy



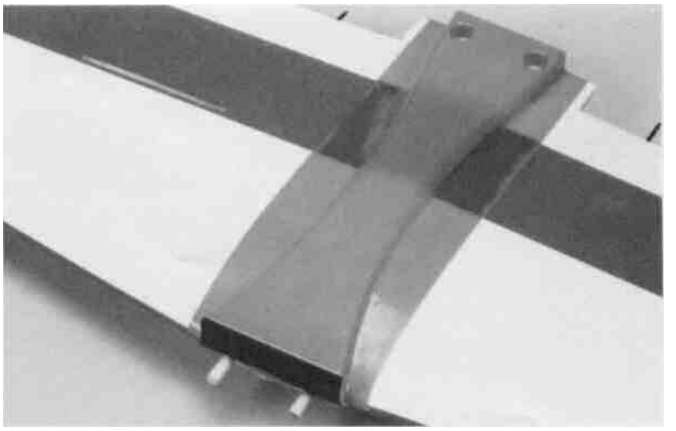
6 Check the **wing** joiner to find the angled sides Place the joiner on a flat surface and rock until you have identified the **two angled sides** The angled face side should point forward and the angled narrow side should face down for proper dihedral Using one of the wing panels trial fit the wing joiner and check for proper alignment Position the joiner so it will be centered when the two wing halves are joined together Once satisfied with the fit, glue the joiner in place using slow cure epoxy Let cure



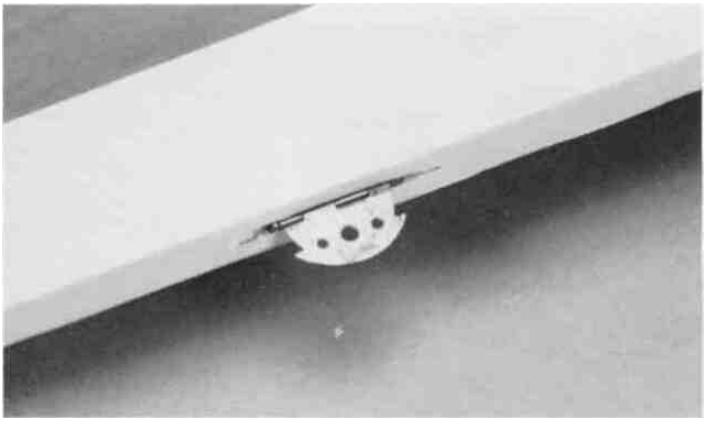
7 Trial fit the two halves together and line up the leading and trailing edges Check for a good gap-free fit Sand if needed Once satisfied, glue the two wing halves together using slow cure epoxy You can tape the wing halves together to hold them tight while the glue cures



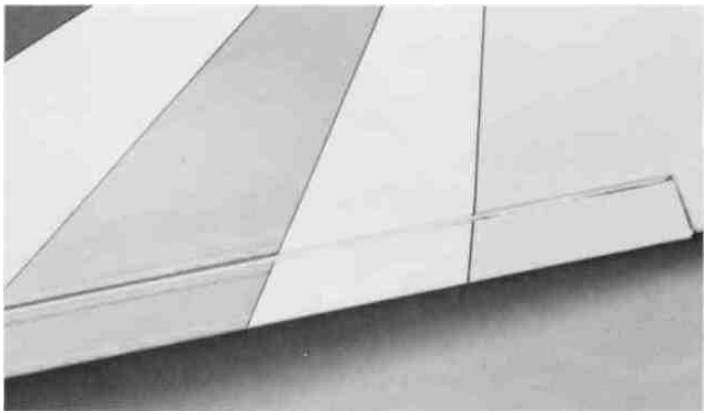
8 Line up the reinforcement blocks as shown so that the sides angle **in** Remove the wing covering underneath the blocks Next, glue the blocks to the wing using epoxy



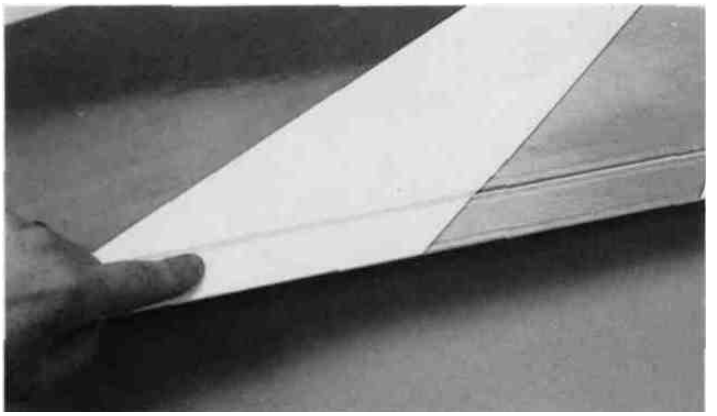
9 Install the wing center cover using Plastizap CA Glue Wipe off any excess glue immediately Next on the **front** of the cover glue the wing pad on as shown using Plaslizap CA Glue



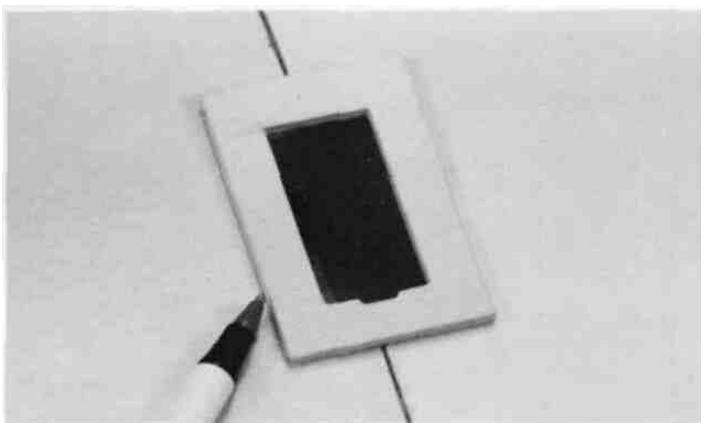
10 Install the six aileron hinges into the slots at the trailing edge of the wing using epoxy Only a small amount of glue is needed here Use too much and it will seep into the hinge causing it to lock up You may wish to apply a small amount of vasiline to the hinge joint to protect it against epoxy If any glue does set up into the joint, remove it immediately using a soft cloth and rubbing alcohol.



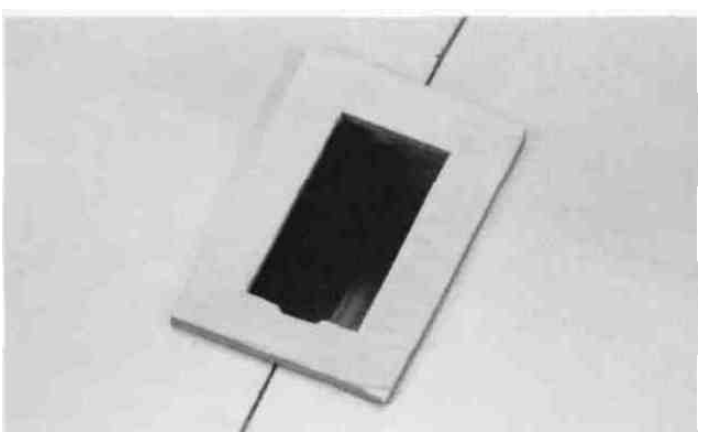
11 Apply epoxy to the contiol rods and in the control rod slots of the ailerons Next put a small amount of epoxy onto the the hinges and install both ailerons



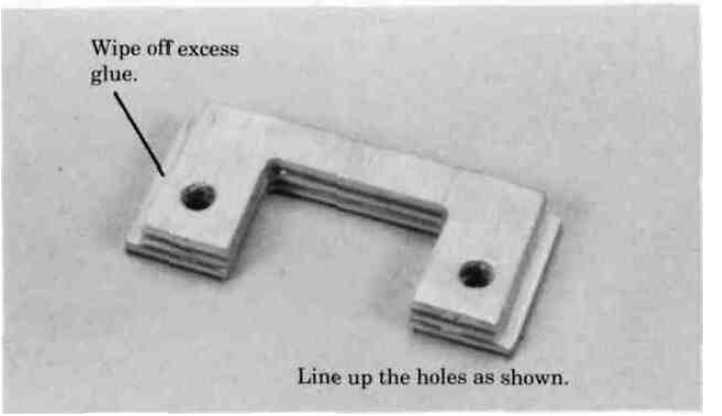
12. Check the ailerons for smooth operation. By exercising the ailerons after the glue is cured, you can loosen any of the stiffness that might have been created by glue seeping into the hinges.



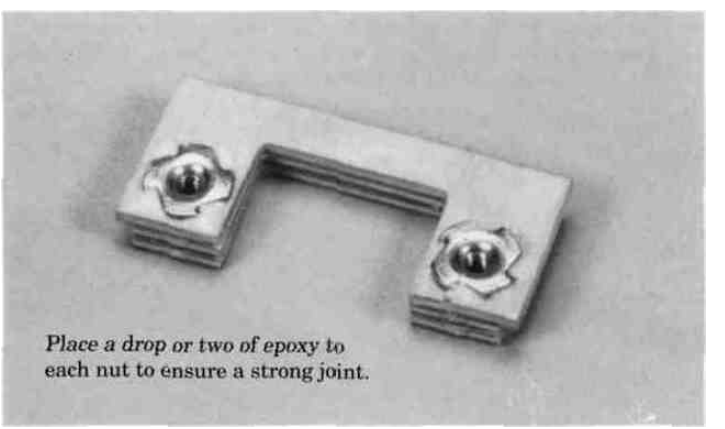
13. Align the aileron servo tray on the wing and trace around it using a ball point pen. Remove the covering material that was outlined underneath the tray.



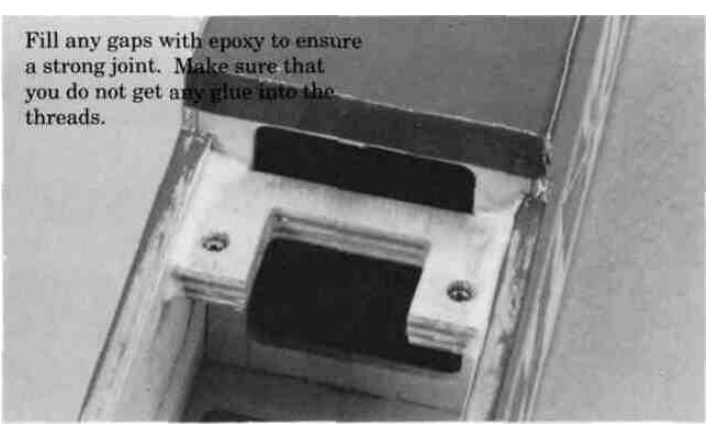
14. Glue the tray to the wing using slow cure epoxy.



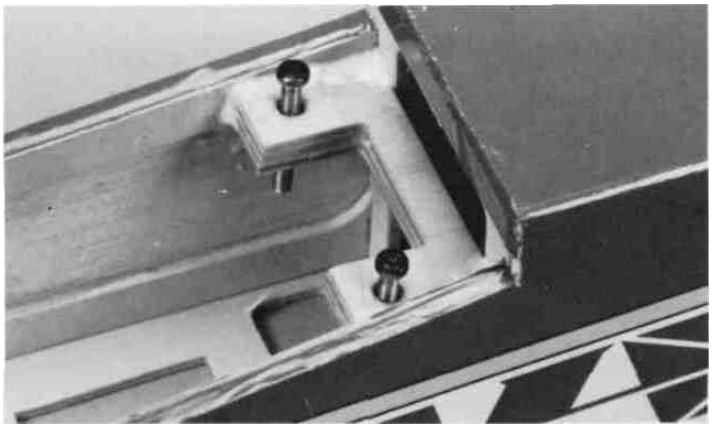
15. Glue the three wing mounting blocks together using slow cure epoxy. Center the three blocks together by lining up the holes. The larger block should be at the bottom.



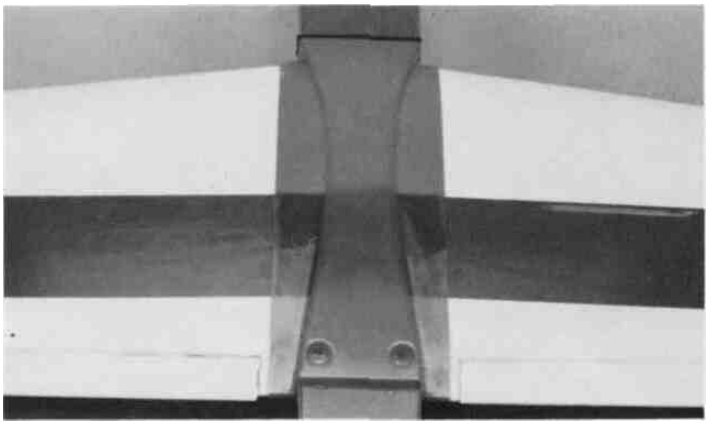
16. Install the blind nuts to the larger side of the mounting **block.** These can easily be pressed in with a pair of pliers.



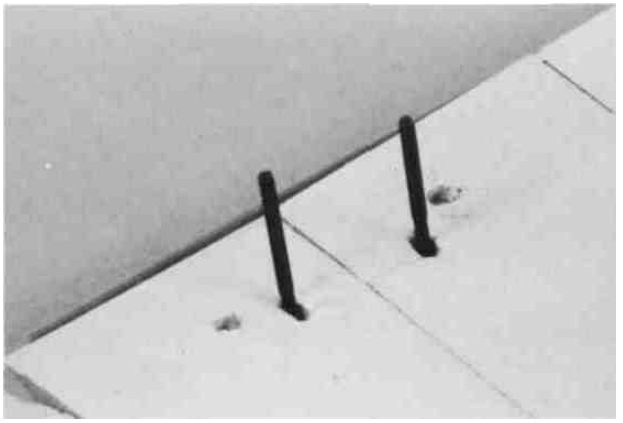
17. Epoxy the mounting block inside the fuselage. It is critical that this joint is solid. Use plenty of epoxy. Let cure.



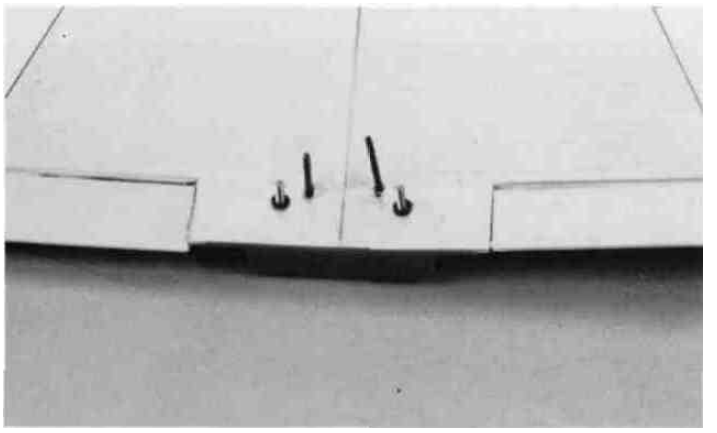
18. Thread the wing screws into the blocks so that the heads are 3/8" above the block. Apply ink or paint to the heads of the screws. Proceed with the next step immediately before the ink or paint dries.



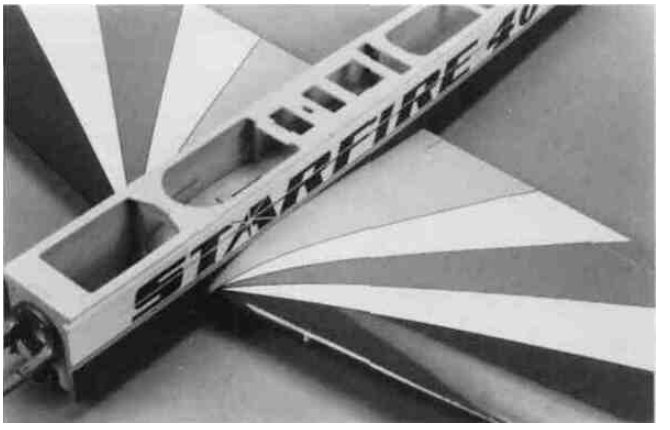
19. Place the wing onto the fuselage as shown. Put the front in first by inserting the dowel rods in the holes. It may be necessary to round the tips of the dowel rods and bevel the holes in order to allow easier installation. Once in place, center and lower the back onto the screw heads. This will mark where you need to drill.



20. Drill two 3/16" holes 90° from the **bottom** wing surface using the paint marks as a guide.

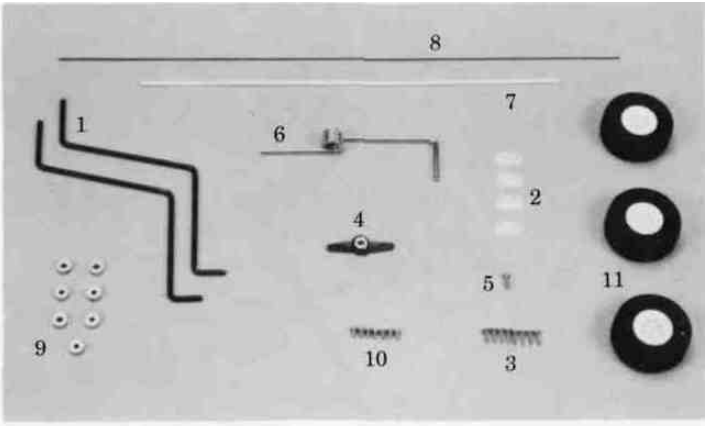


21. Place the two 4mm washers onto the 4 x 30mm screws and push them through the wing from the bottom side. Next, slide the rubber 0-rings onto the screws.

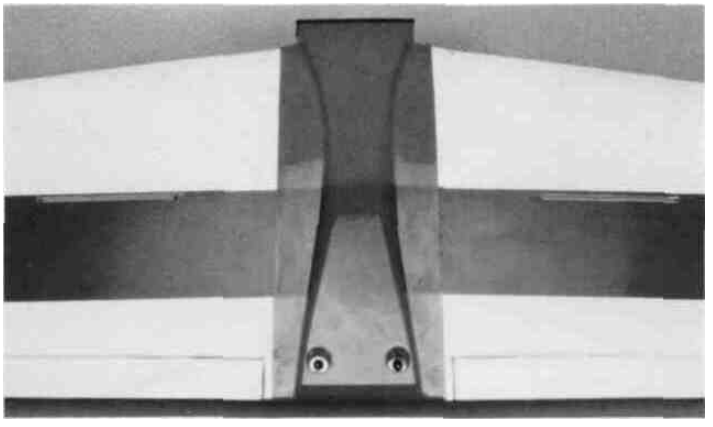


22. Trial fit the wing onto the fuselage. Check for a solid fit then remove.

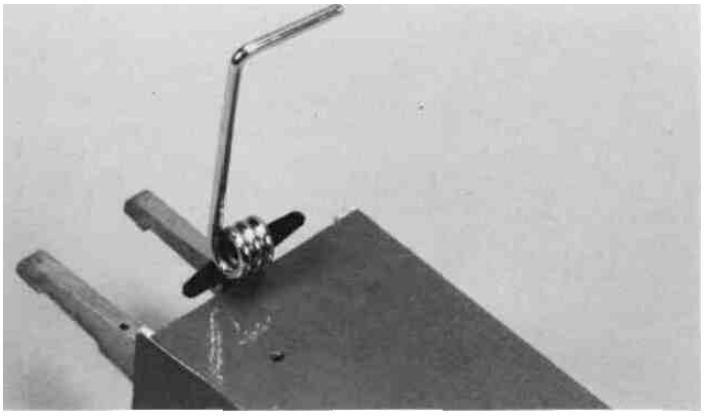
LANDING GEAR INSTALLATION



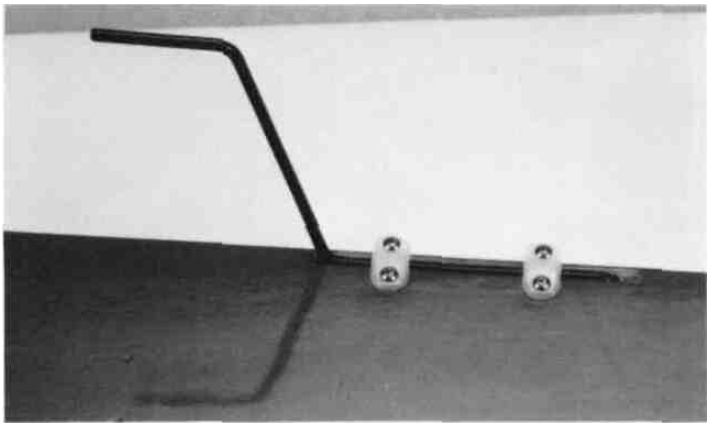
1	Main Gear Struts.....2	7	White Tube.....1
2	Retaining Straps.....4	8	450mm Rod 1
3	3 x 15mm S/T Screws.....8	9	Wheel Collars 7
4	Bellcrank 1	10	3 x 5mm Screws 7
5	3 x 8mm Screw.....1	11	Wheels 3
6	Front Gear Strut.....1		



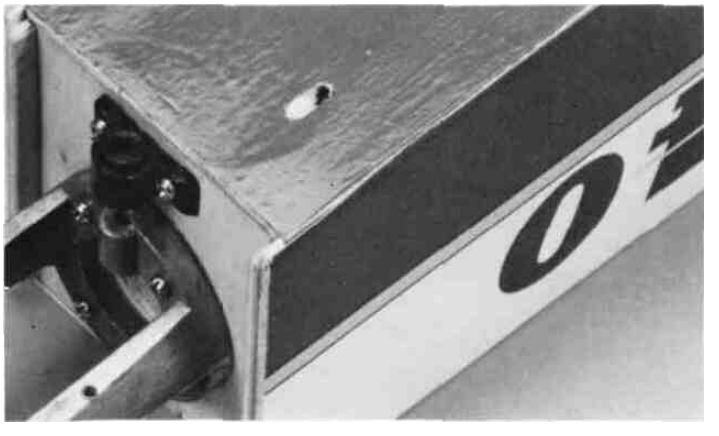
1. Feel along the front edge of the blue stripe until you find the two slots under the covering, trim out the covering over the slots.



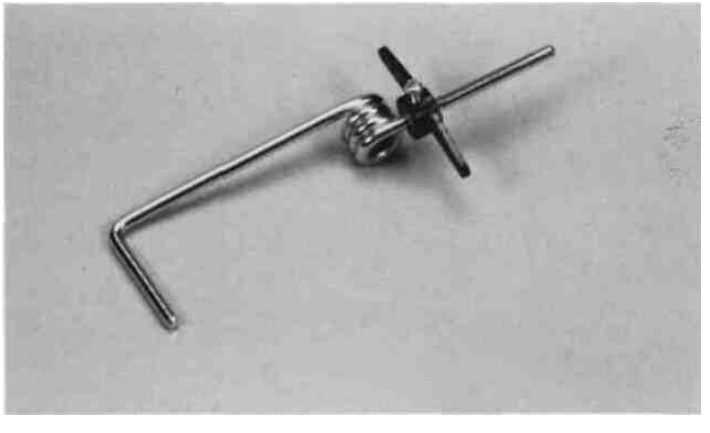
4. Temporarily install the strut and mark the bottom of the fuselage for the installation of the control rod Mark the hole about 1" from the firewall and 7/8 from the left bide of the fuselage.



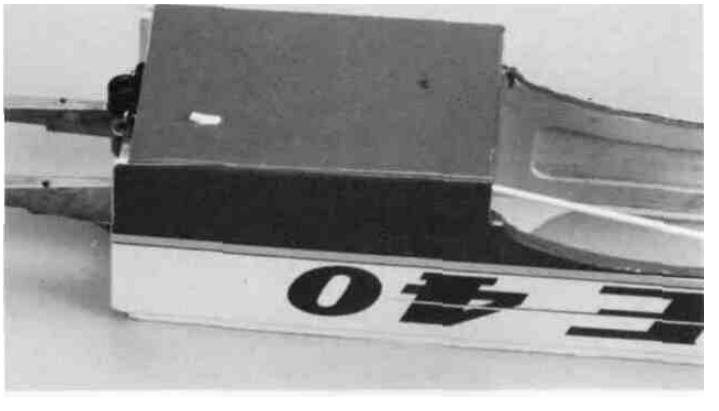
2. Install the two main gear struts into the wing and attach using the plastic retaining straps and 3 x 10mm self-tapping screws. You may with to drill eight 1/16" holes to prevent the wood from splitting when installing the screws.



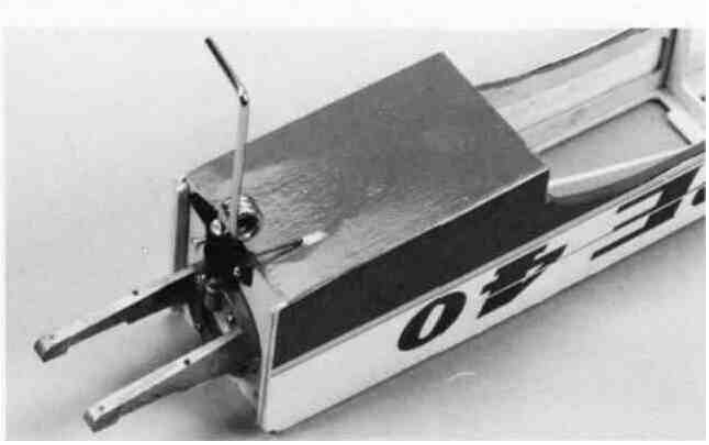
5. Drill a 1/8" hole angling back at the mark.



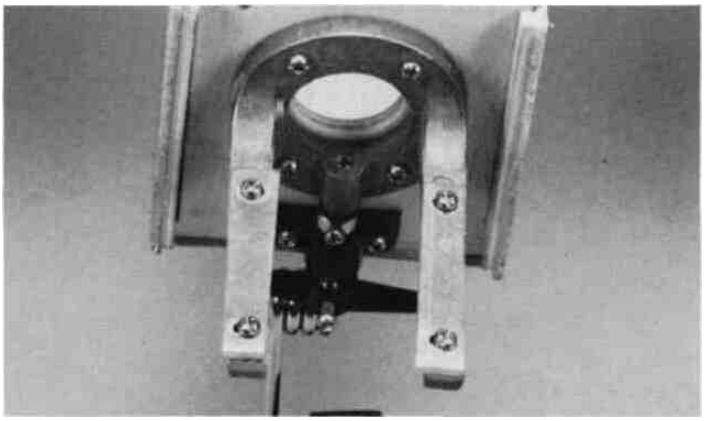
Attach the bellcrank onto the front gear strut **and** secure with a 3 x 8mm screw onto the flat.



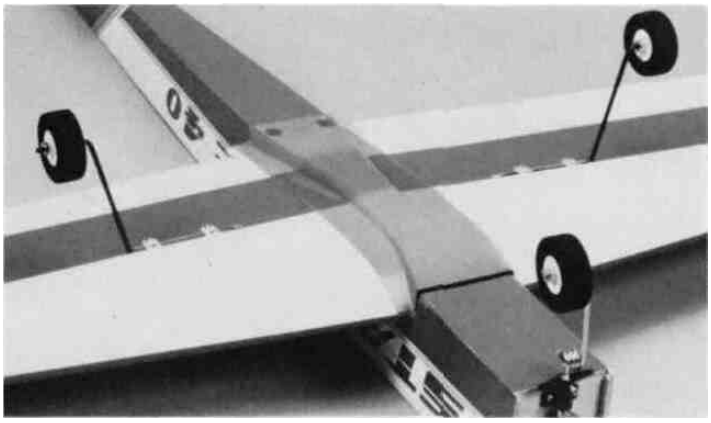
6. Epoxy in the white tube so that it only protrudes 1/8" out of the fuselage Make sure all exposed wood around the tube is covered with glue in order to seal against fuel.



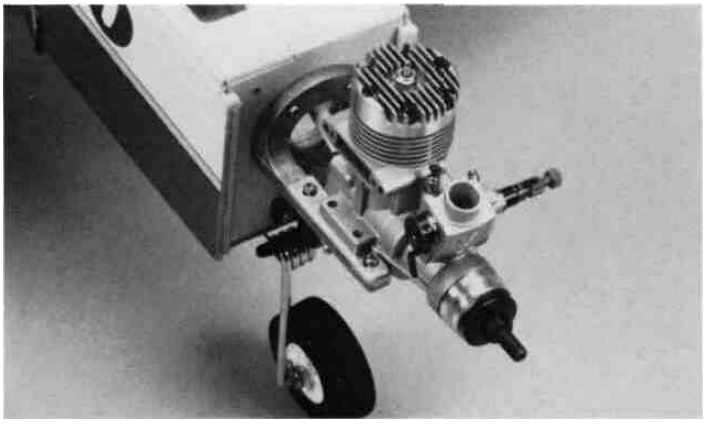
7. Make a Z-bend on one end of the 450mm control rod. Install the front strut with the rod and secure with a collar and a 3 x 5mm screw.



1. Temporarily install the two mounting plates onto the mount so the engine will angle slightly to the right for 2 degrees. Tighten the screws only until they seat so that you can still move the plates.

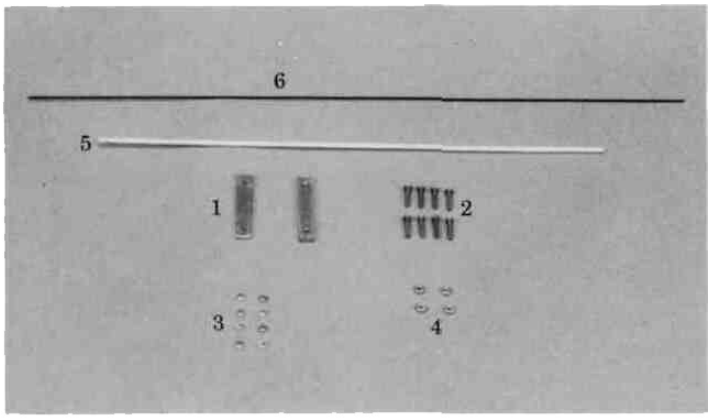


8. Install the wheels using a wheel collar on each side of the wheel. Fasten the collars with 3 x 5mm screws.

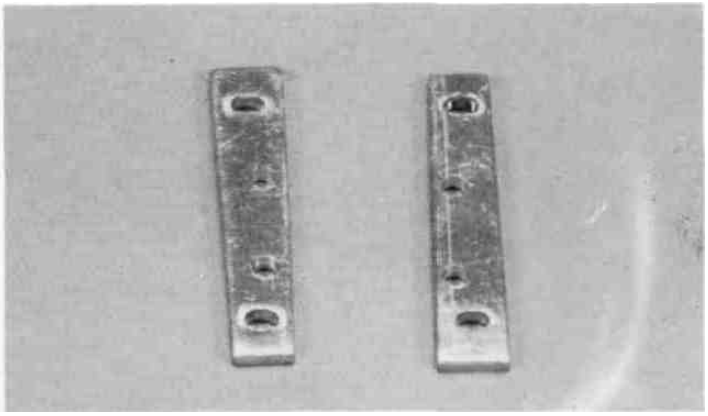


2. Set the engine on the mounting plates so that the center line of the engine is in line with the center of the engine mount. Make sure that the engine has a slight right thrust angle of 1 or 2 degrees and that the front of the drive washer on the engine is 4-5/8" from the firewall Next, squeeze the plates against the engine and mark the mounting holes on the plates.

Engine Installation

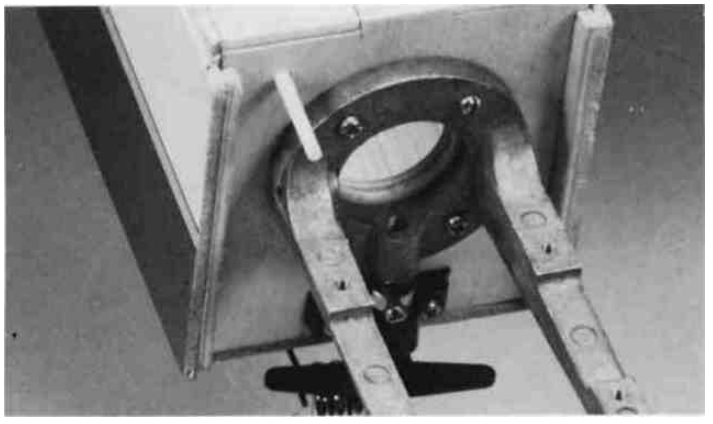


1	Mounting Plates	2
2	3 x 15mm Screws	8
3	Lockwashers	8
4	3mm Nuts	4
5	White Tube	1
6	450mm rod	1

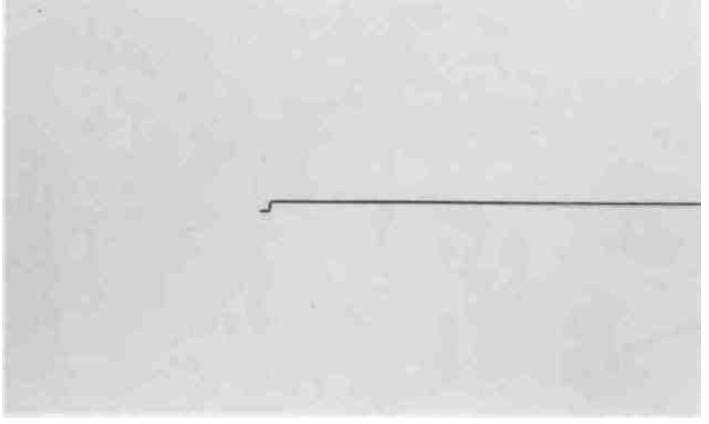


3. Remove the plates and drill four 1/8" holes at the marks. Carefully remove off any burrs with a hobby knife.

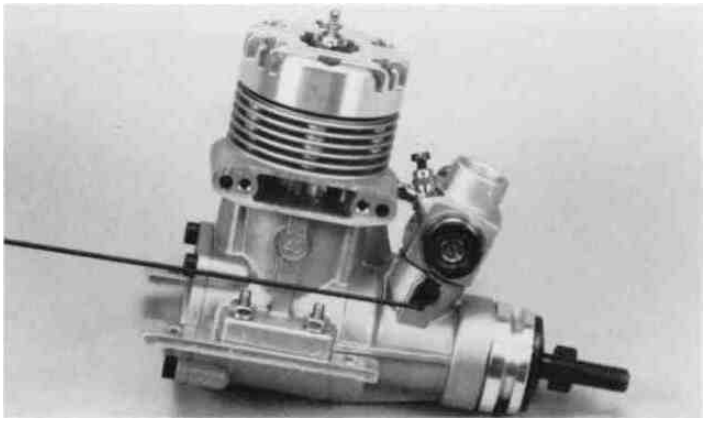
4. Mount the engine to the mounting plates using four 3 x 15mm screws, four lock washers, and four 3mm nuts as shown. **Note: Use thread locking compound on the screws and nuts to prevent them *from* loosening under vibration.**



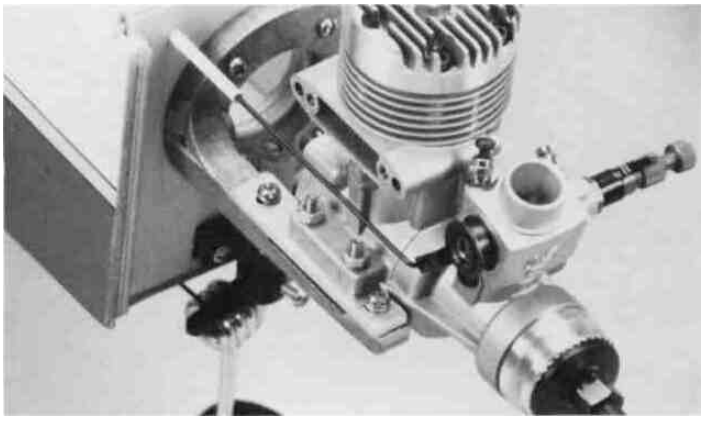
5. Epoxy the white tube into the fuselage so that it sticks out I".



6. Make a Z-bend in the 450mm rod as shown

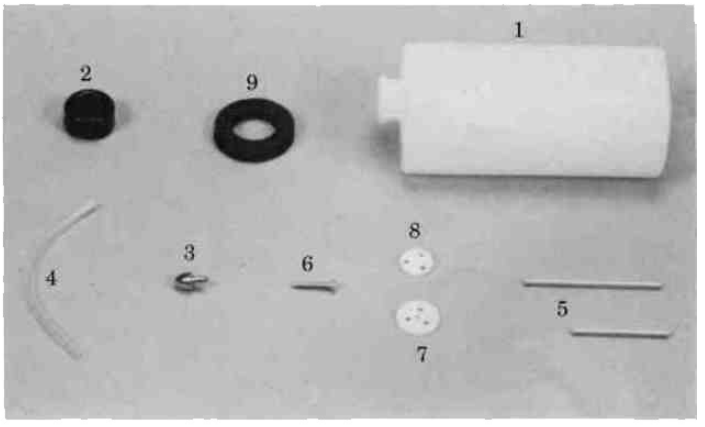


7. Install the throttle control rod on the throttle arm of the engine.

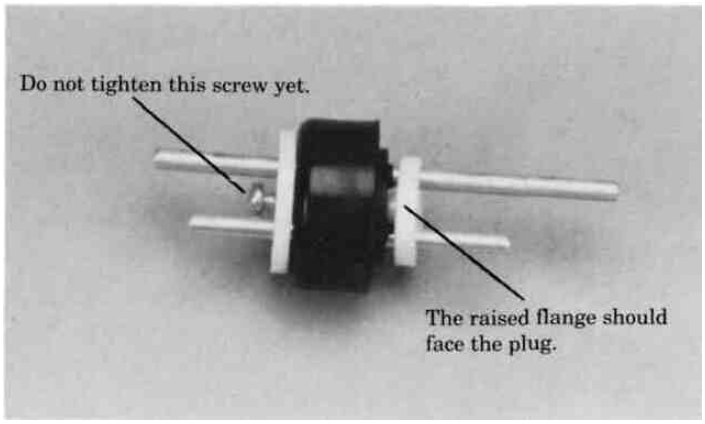


8. Slide the throttle control rod into the white tube and attach the engine to the mount. Use four 3 x 15mm screws and four lock washers to hold the engine in place. **Note: Use thread locking compound on the screws.**

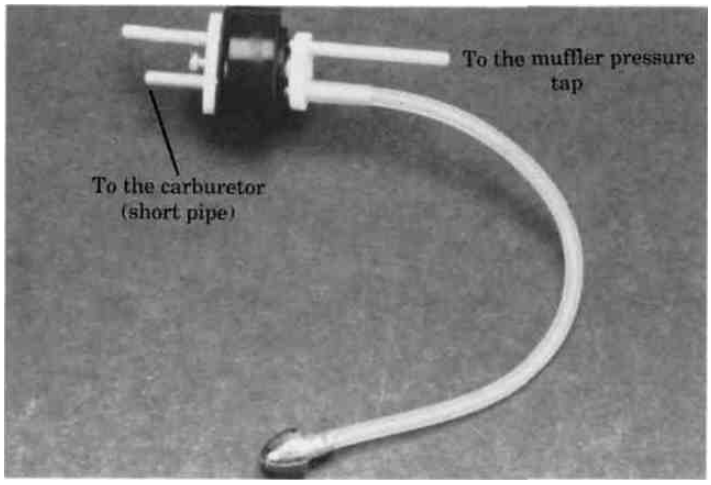
Fuel tank Assembly



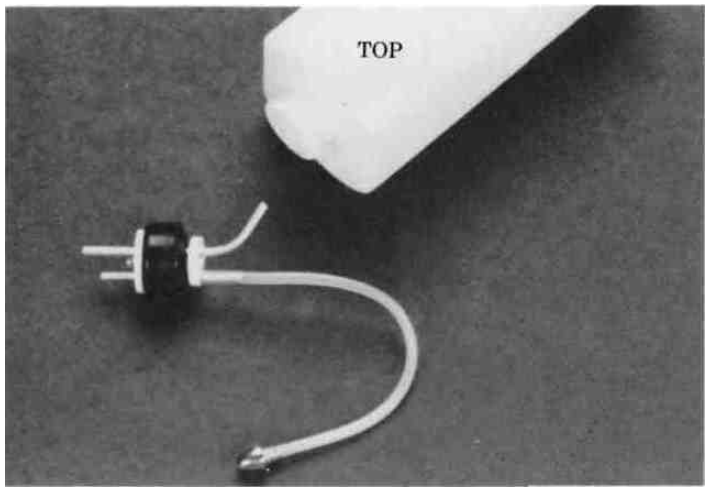
1	Fuel Tank	1	6	3 x 18mm S/T Screw	1
2	Rubber Cap	1	7	Large Disc	1
3	Clunk	1	8	Small Disc	1
4	Fuel Line	1	9	Neoprene Ring	1
5	Fuel Pipes	3			



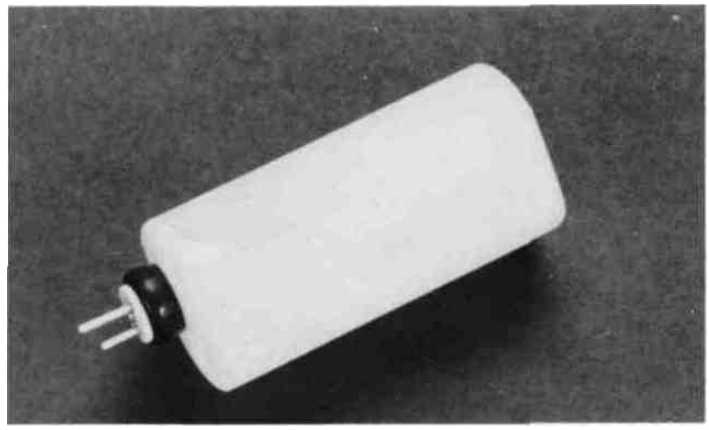
1. Install one of the long and one of the short fuel pipes through the rubber cap. Center the pipes in the cap and place the two plastic discs onto each side. The large one should be on the outside. The flange on the small one should face the rubber cap. Put the 3 x 18mm self-tapping screw in the center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



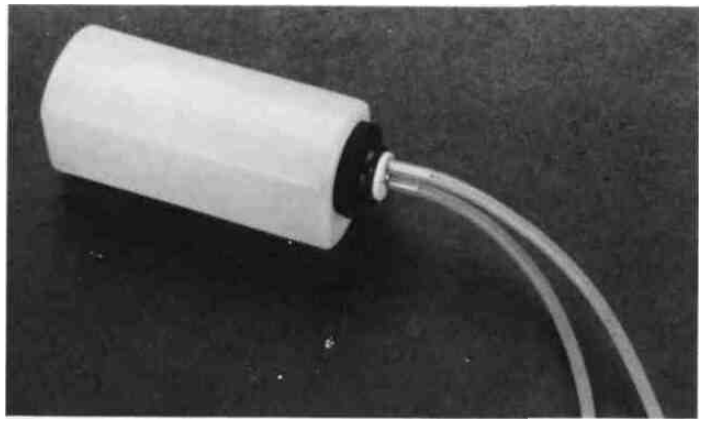
Attach the fuel line to the short fuel pipe and attach the clunk to the other end. Adjust the length of the line so that the clunk reaches nearly to the rear of the tank but not up against it once installed.



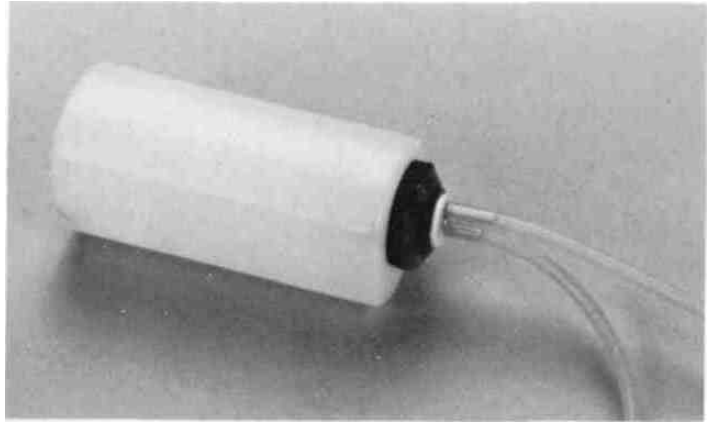
Carefully bend the other fuel pipe so it will just touch the inside top of the fuel tank



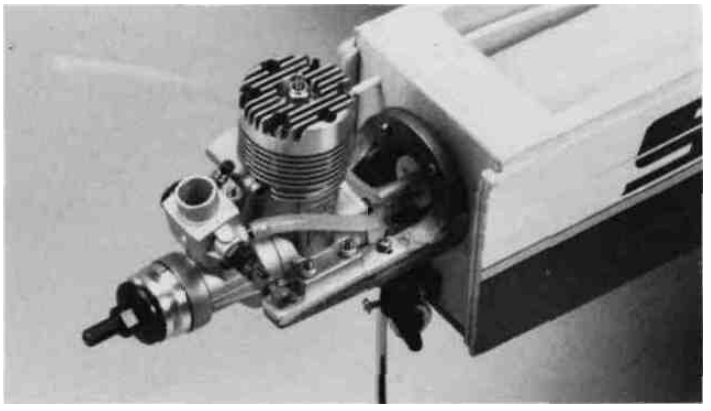
4. Attach the completed fuel tank cap to the tank. Make sure that the bent pipe is pointing to the top. Slide the cap on until the lip on the fuel tank is in the groove of the cap. Then tighten the screw. Check to make sure the clunk is free to swing at the bottom of the tank.



5. Glue the neoprene ring to the tank with silicone sealer. Attach two pieces of fuel tubing (5" long) to each of the pipes.

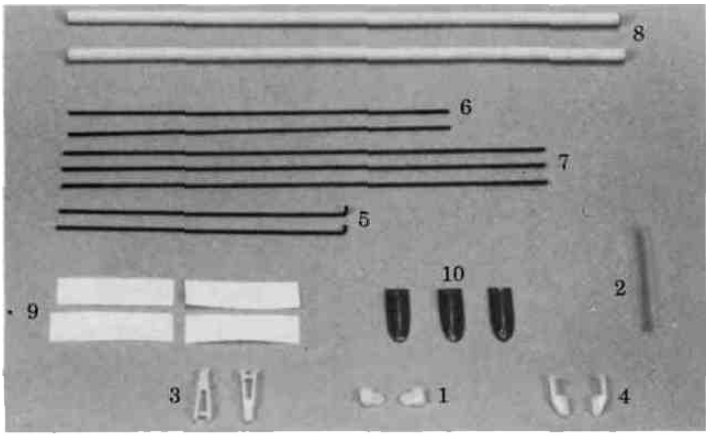


6. Put a bead of silicone sealer on the ring. Proceed with the next step before the sealer dries.

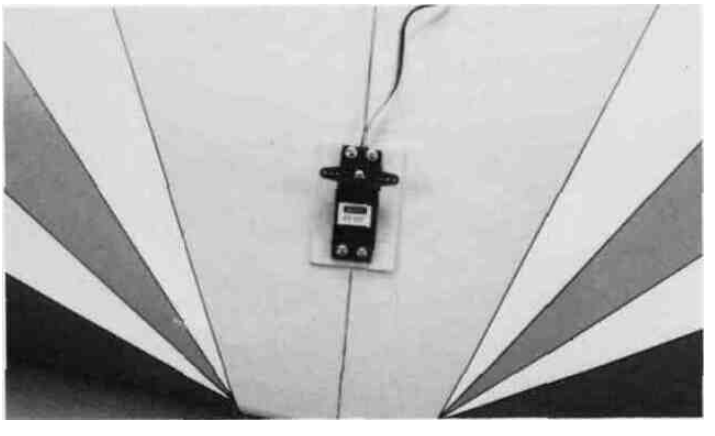


8. Install the completed tank into the fuselage. Route the fuel tubing through the hole and push the tank cap through until seated. Attach the carburetor line (bottom one) to the engine. Shorten as needed.

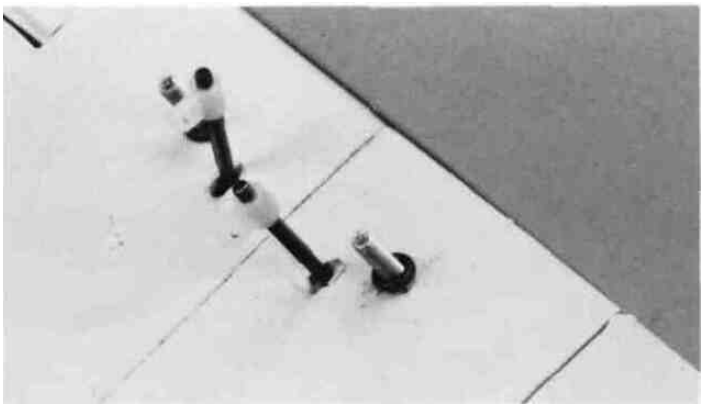
Radio Installation



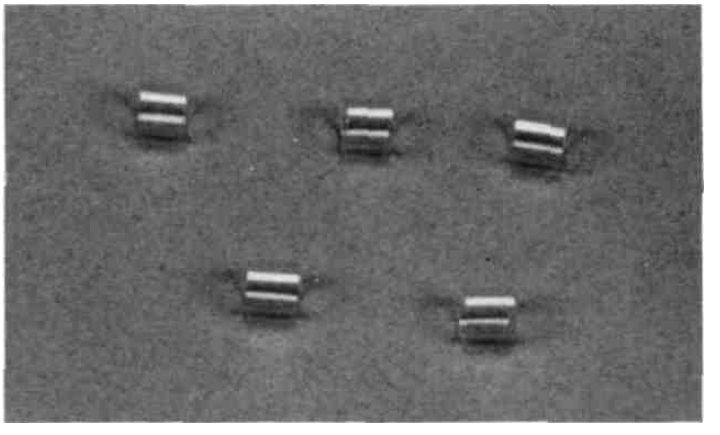
1	Aileron Horns.....2	6	Short Rods.....2
2	Clevis Retaining Tube 1	7	Long Rods.....3
3	Snap Clevis.....2	8	Wooden Push Rods.....2
4	Rod Clevis.....2	9	Shrink Tubing.....4
5	Bent Rods 2	10	Push Rod Exits.....3



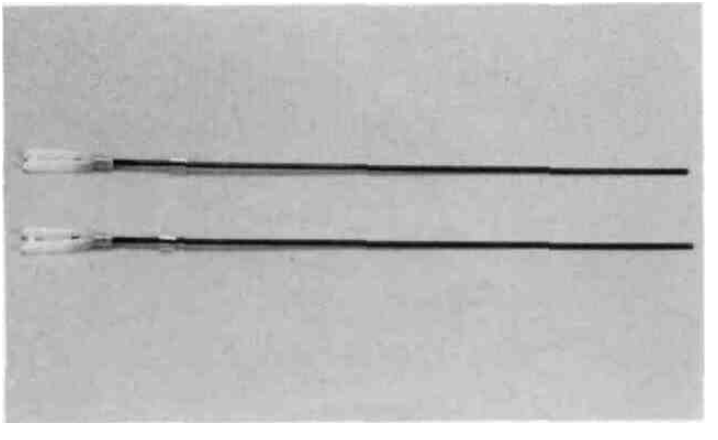
1. Check the fit of your aileron servo in the aileron servo tray. You may have to trim away some of the servo tray for a good fit. Install the grommets onto the servo and mount using the screws provided with the radio system.



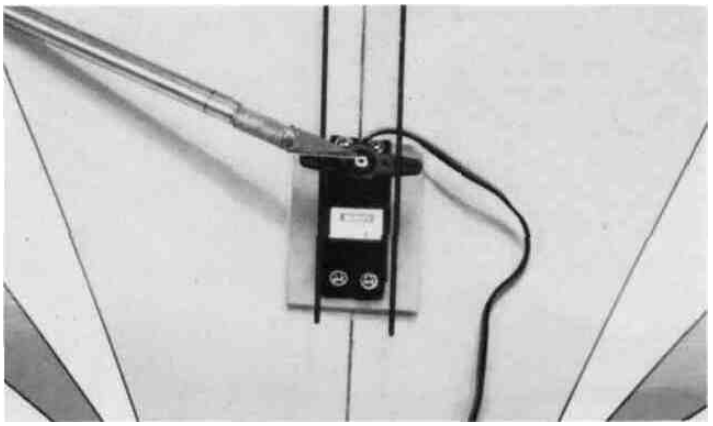
2. Screw the aileron horns onto the aileron arms. Make sure you use the two horns with the larger holes.



3. Cut five 3/16" pieces of the clevis retaining tubing. **You will** use two now and three later.

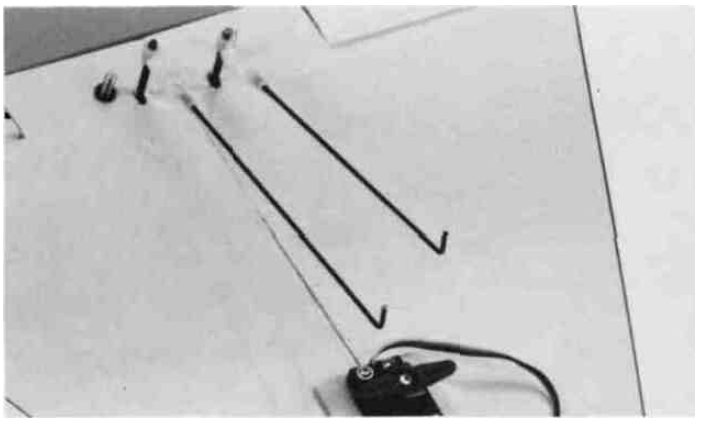


4. Screw two snap clevises halfway up the threads on the shorter control rods. Next, slide two of the 3/16" clevis retaining tubes onto the rods.

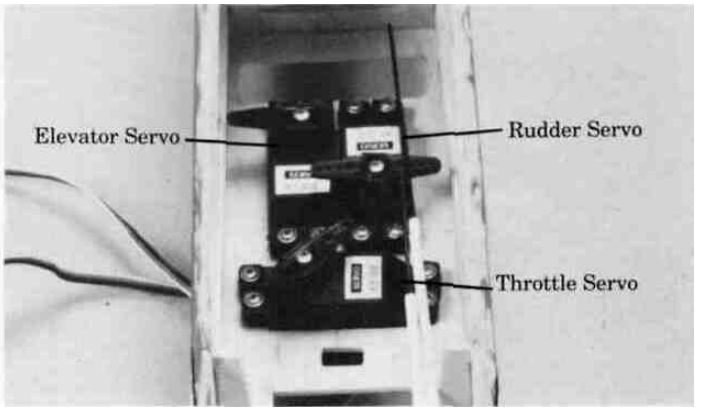


5. Attach the clevises to the aileron horns and slide on the retaining tubes. After checking the neutral position of the aileron servo and ailerons, put a mark on the push rods (scratching with a hobby knife) where the servo arm holes line up. Be sure the ailerons are in there neutral position.

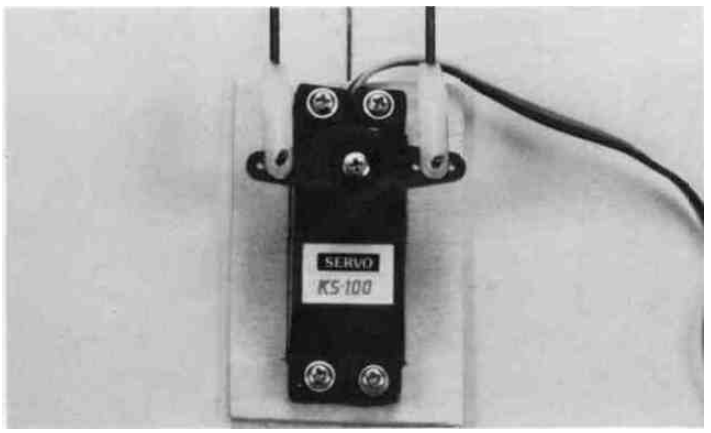
8. Connect the aileron servo to the receiver and check the movement of the ailerons. Make sure that both ailerons are neutral when the servo is neutral. Adjust the clevises as needed.



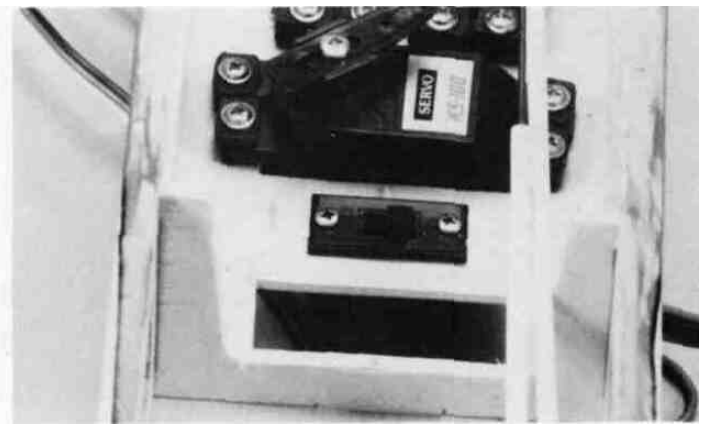
6. At each mark, bend the pushrods at a right angle. Next, cut off the push rods 6mm from the bend.



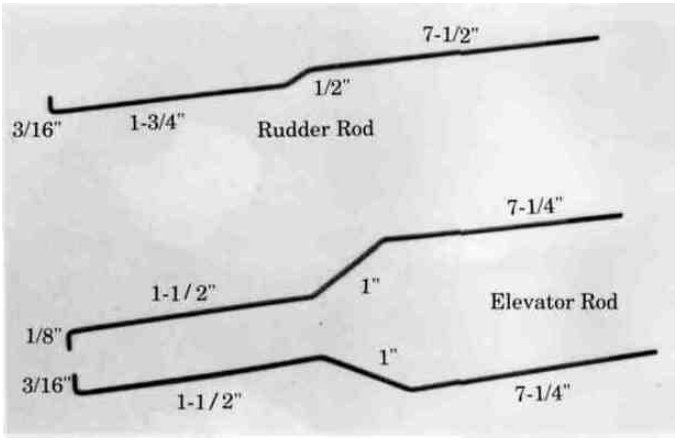
9. Install the three remaining servos into the tray using the grommets and screws provided with the radio system. Be sure that the servos are positioned as shown. You may have to trim the tray slightly for a perfect fit.



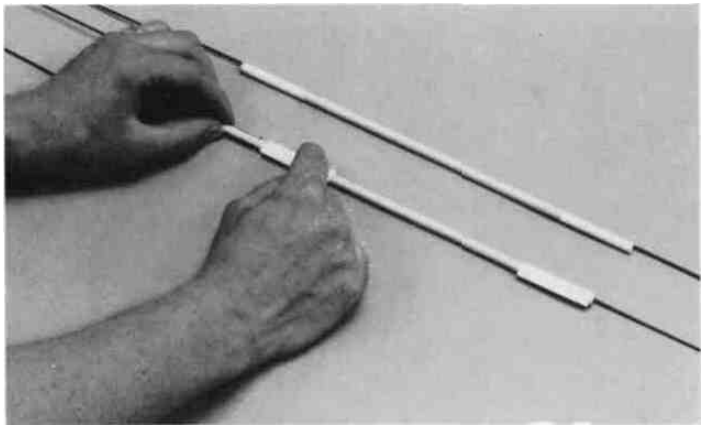
7. Attach the rods to the servo arm using the rod clevis. Install the clevis from the underside of the servo horn then snap onto the rod.



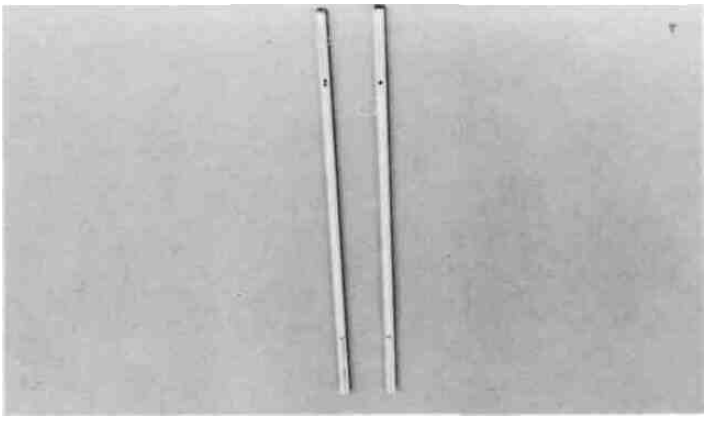
10. Install the switch into the tray. You will have to drill the two mounting holes depending on the switch. For a cleaner look, install the Dubro #203 Kwik-Switch mount.



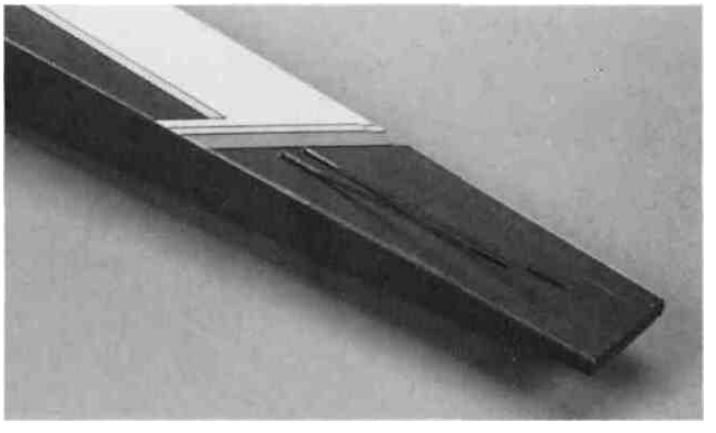
11. Bend the three long rods as shown for the elevator and rudder. Note: the pre-bent rods will be used later in step 13.



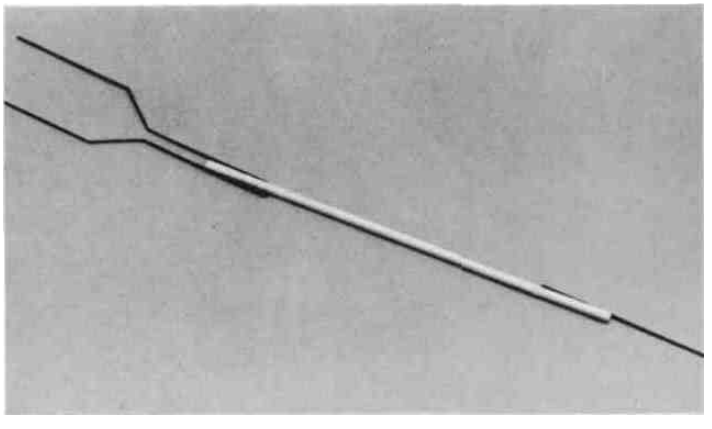
14. Next, do the same with the rudder push rod. Make sure that each rod fits in the groove Now slide the four pieces of shrink tubing over the ends of the wooden rods and shrink them with a heat gun or lighter To ensure durability, place a drop or two of Cyanoacrylate glue on the edges of the shrink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



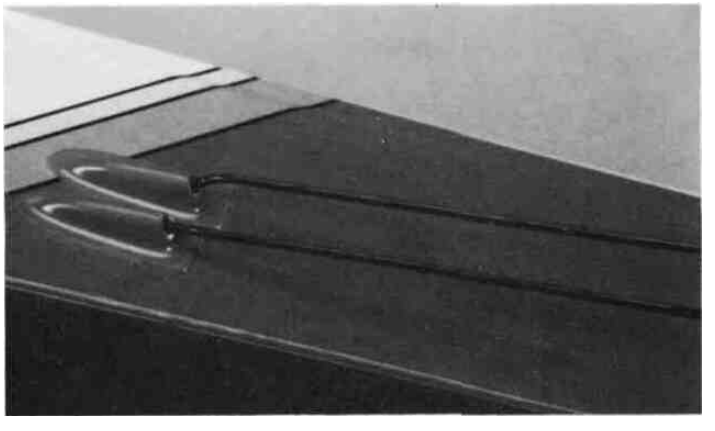
12 Drill a 1/16" hole 1 1/2" from the ends (2 holes 1/16" apart on one end of one rod) of both wood push rods With a hobby knife, carefully cut straight grooves from the holes to the ends Only cut a groove on one side of each end, except for the end of the rod with two holes. For this end, make a groove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



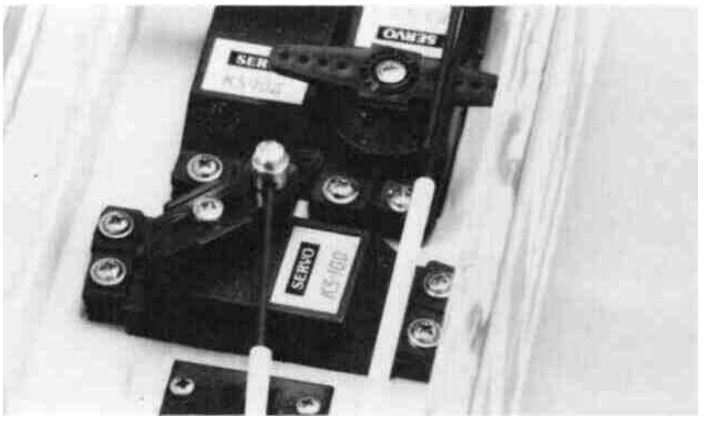
15. Trim out the three push rod exits at the tail and insert the rudder and elevator pushrods into the fuselage from the front. It may be necessary to bend the rods slightly for a perfect fit.



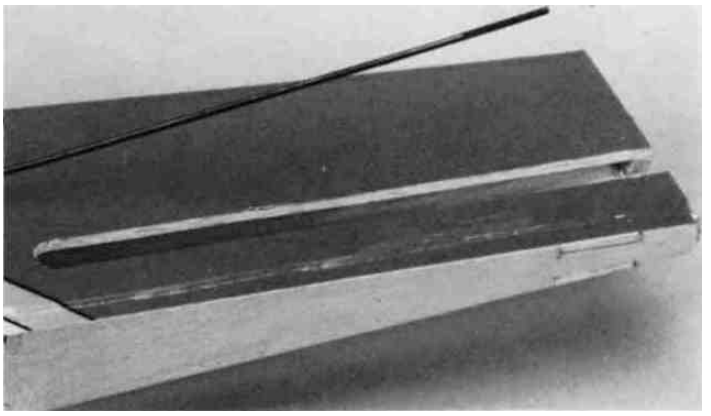
13. Assemble the elevator pushrod as shown. Place the two elevator rods into the double grooved end of the rod Next, place one of the short (pre-bend) rods into the other end.



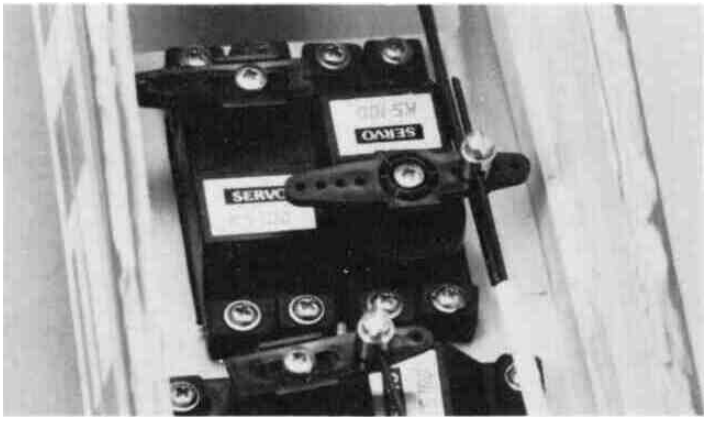
16. Using PlastiZap, glue the three plastic push rod exits to the fuselage Check to make sure that the rods will easily move in and out with no resistance. You may have to bend the rods slightly for perfect fit



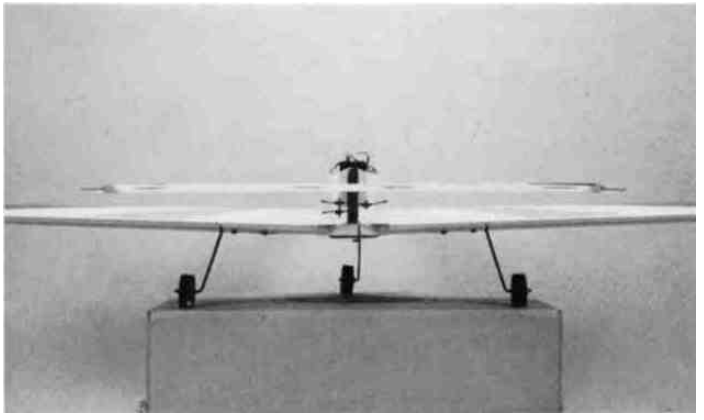
17. Slide the throttle rod through an E-Z Connector and attach to the servo arm. With the throttle at low position, pull back the rod and tighten the screw on the connector. Plug the throttle servo into the receiver and check for proper operation.



1. Trim out the covering and the wood piece at the tail of the plane.

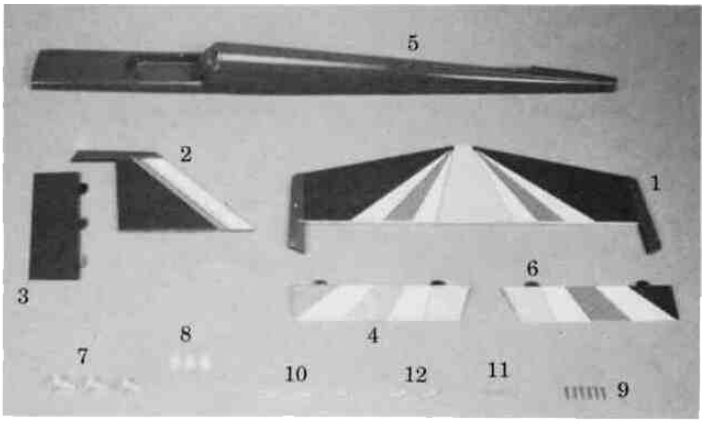


18. Slide the nose wheel rod through an E-Z Connector and attach to the servo arm. With the rudder servo at center position, center the nose wheel straight and tighten the screw on the connector. Plug the rudder servo into the receiver and check for proper operation.

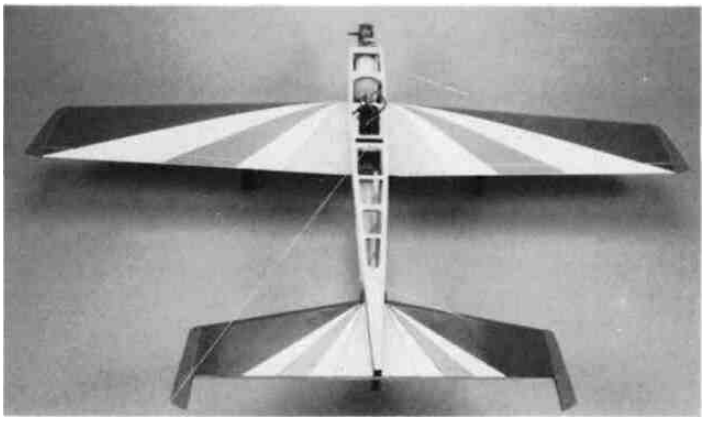


2. Temporarily install the wing. Next, place the horizontal stabilizer in place. Visually inspect the wing and stabilizer to see if they are parallel. If not, sand the higher side of the stabilizer mount until the stabilizer is parallel. **It is critical for proper performance that these two surfaces are parallel. Take extra time to ensure a correct fit.**

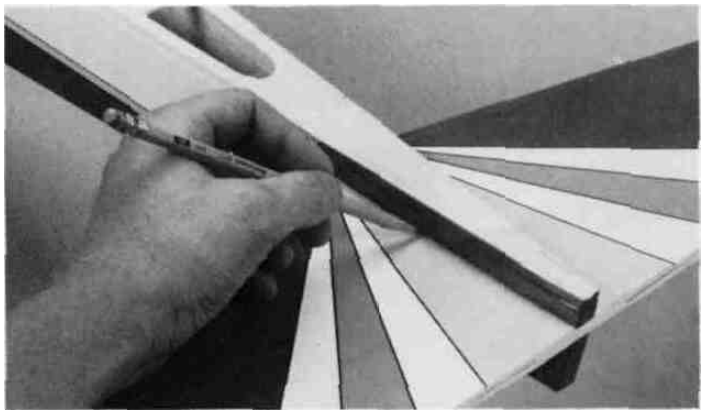
Tail Assembly



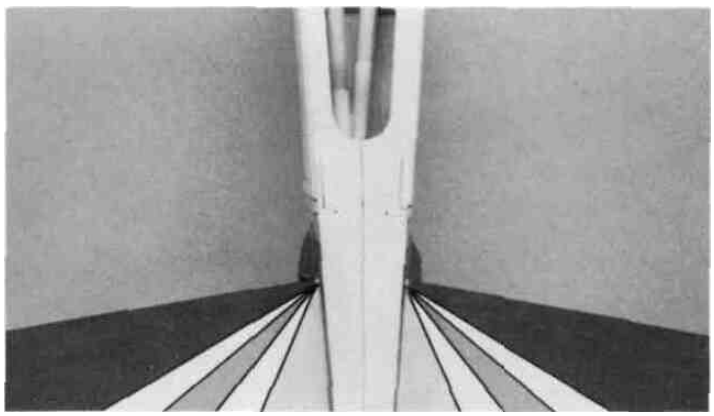
1	Horizontal Stabilizer 1	7	Control Horns.....3
2	Vertical Stabilizer.....1	8	Control Horn Backplates...3
3	Rudder.....1	9	2 x 20mm Screws 6
4	Elevators 2	10	Snap Clevis.....3
5	Turtle Deck 1	11	Retaining Tubes.....3
6	Hinges.....7	12	Rod Clevis.....2



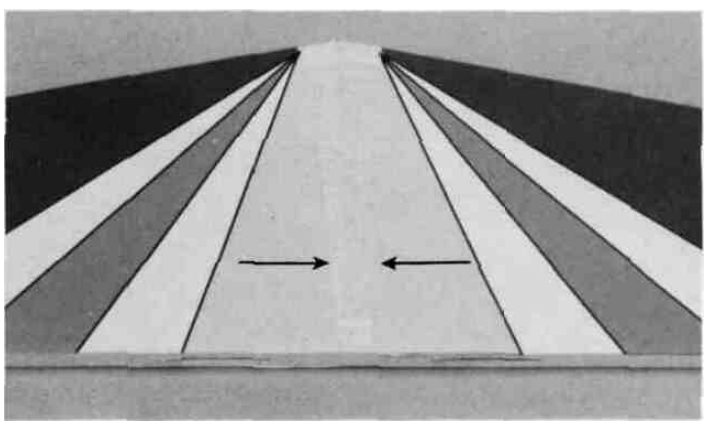
3. Next, take a piece of string and attach it with a pin to the top center of the fuselage. Make sure that the stabilizer is centered and stretch the string to the corner of the elevator . Adjust the positioning of the stabilizer so that both corners are the same length when moving the string from side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



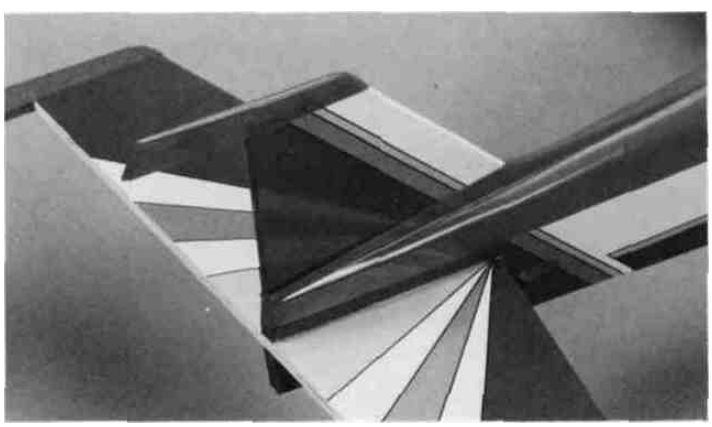
4. When the stabilizer is perfect, draw a line with a sharp pencil on both sides top and bottom (4 lines total).



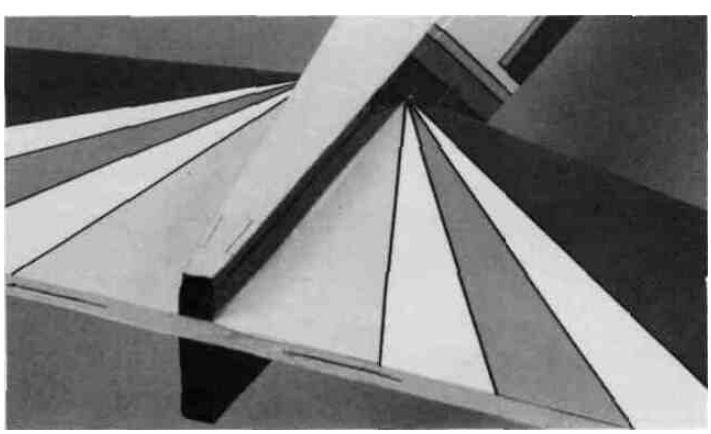
7. Measure the rear fuselage to find the center. Draw a line along center.



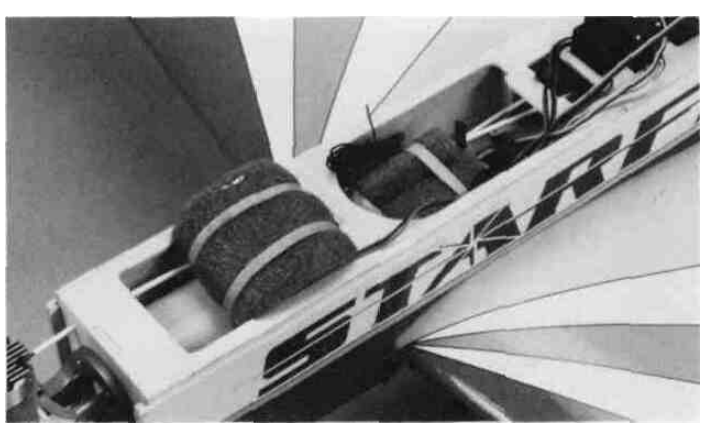
5. Remove the covering between the lines using a hobby knife.



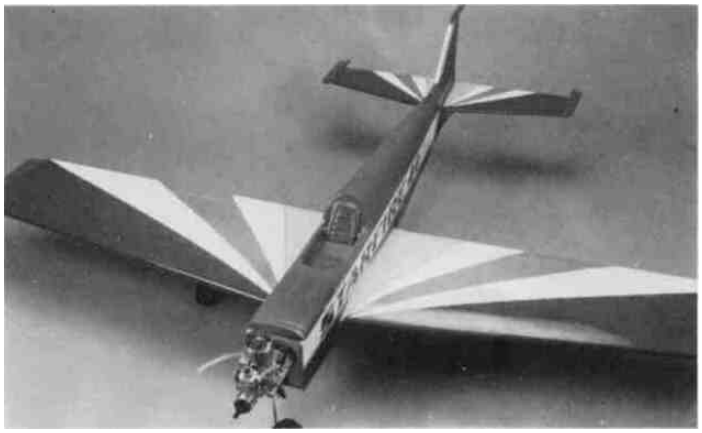
8. Apply slow cure epoxy to the line and the bottom of the vertical fin and install the vertical fin. Line up the fin with the rear of the fuselage and the center line. Temporarily install the turtle deck as a guide for the fin. Check the fin using a 90° angle to ensure that it is straight up and down. Let cure.



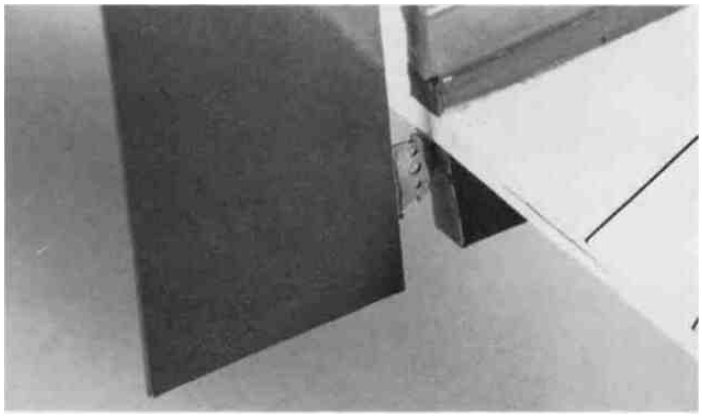
6. Using slow cure epoxy, glue the stabilizer in place applying glue to the exposed wood areas. Recheck the alignment using the string as done earlier in step 3. Wipe off any excess glue using a soft cloth and rubbing alcohol.



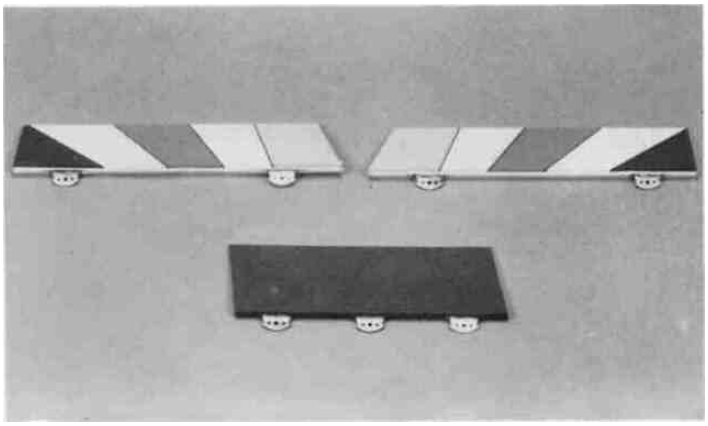
9. Wrap the battery and receiver in foam and install. Place the battery above the fuel tank and the receiver behind the fuel tank. Make sure that the radio is hooked up correctly and that an aileron extension is being used.



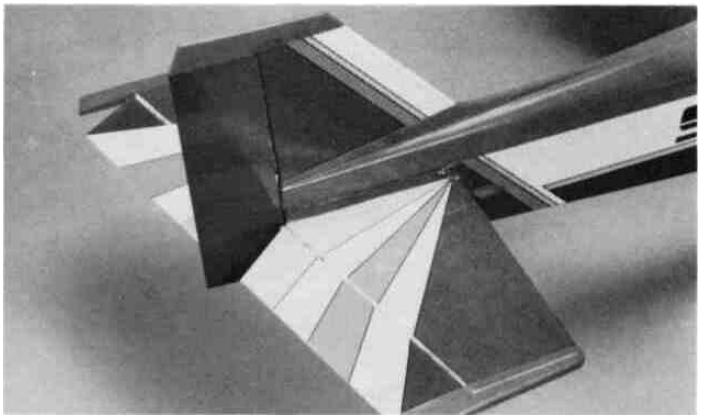
10 Trial fit the turtle deck onto the fuselage and check for a good fit Once satisfied with the fit attach the turtle deck to the fuselage using Plastizap CA glue Be careful not to use to much glue



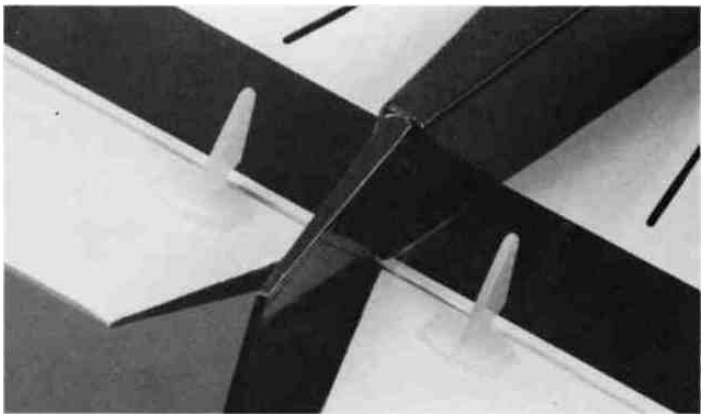
11 Trial fit the rudder onto the vertical fin Notice where the bottom hinge meets the fuselage and mark a spot in the fuselage where the rudder hinge slot will need to be using a hobby knife



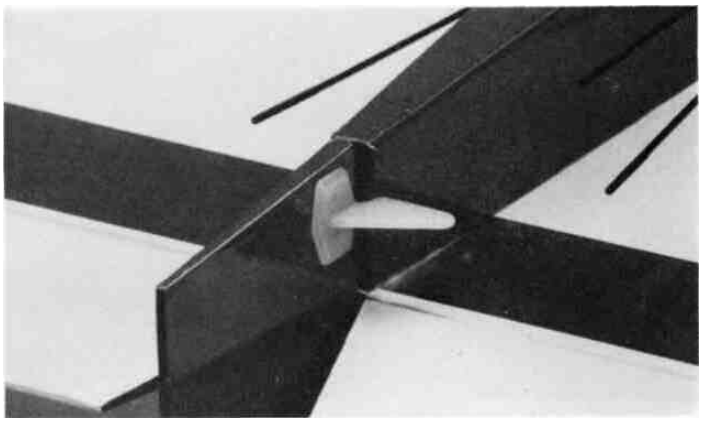
12 Using slow cure epoxy, glue the seven hinges into the elevator halves and the rudder Do not use too much glue or you may glue the hinge joint solid



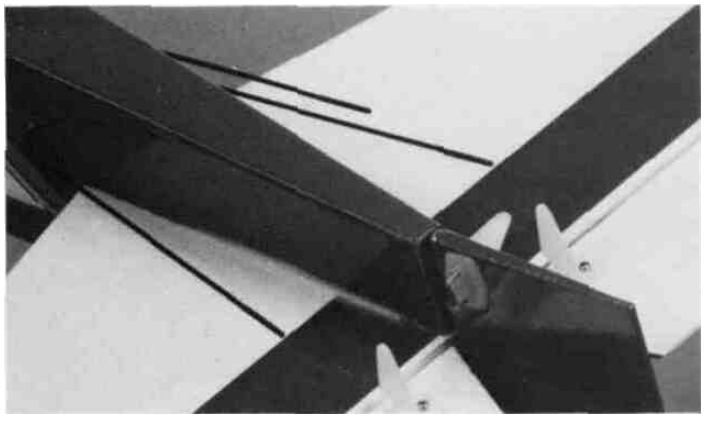
13 Glue on the control surfaces with slow cure epoxy and allow to cure Check the operation of the elevator and the rudder to ensure smooth performance If they seem stiff, continue to exercise until they loosen up



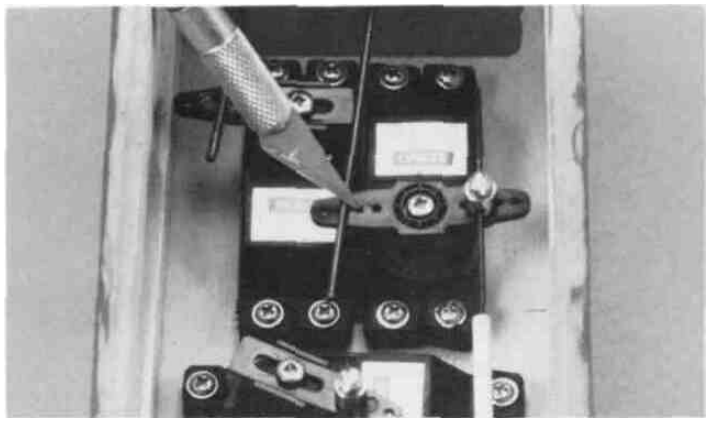
14 Position the control horns on the elevators and mark the holes for each onto the surface



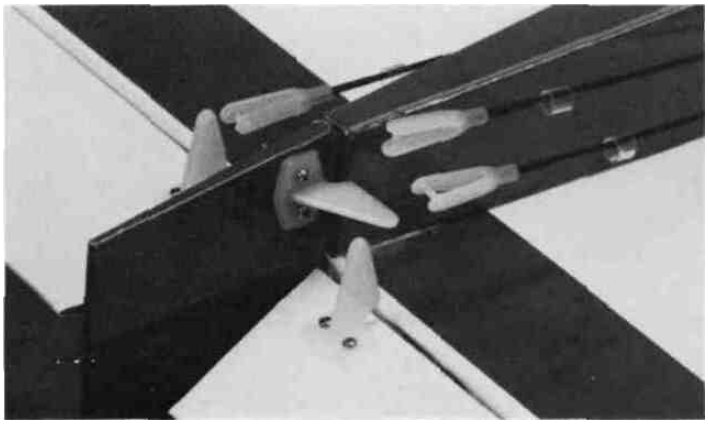
15 Position the control horn on the rudder and mark the holes onto thissurface



16. Drill six 1/16" holes at the marks. Make sure to drill straight in through to the other side and mount the three horns to the surfaces with the 2 x 20mm screws. Pass the screws through the horn, through the surface and finally thread them into the backplates.

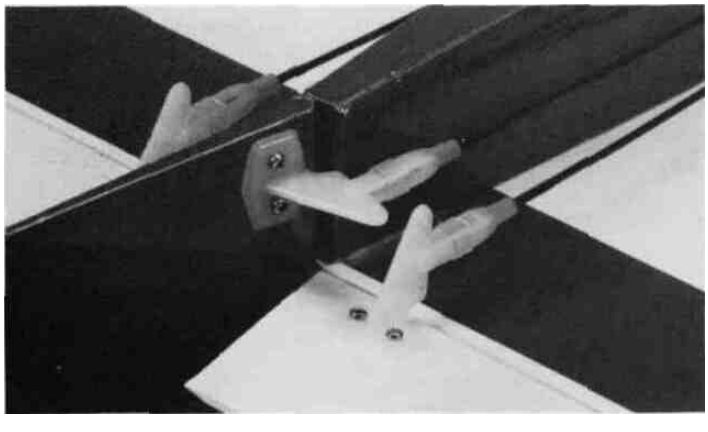


19. Align the control rods over the respective servo horns and make a mark where they intersect. Make sure that the control surfaces are in neutral (center position) before marking.

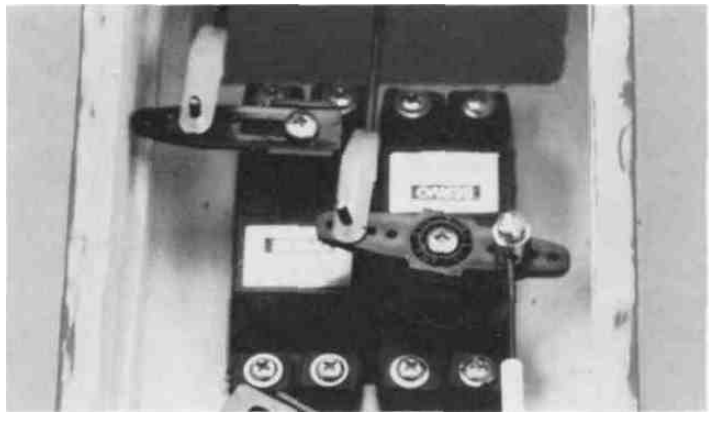


17. Slide one of the retaining tubes onto each rod. Screw on the plastic snap clevises to the three push rods coming out of the fuselage. Screw them on half way **up** the threads.

20. 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.

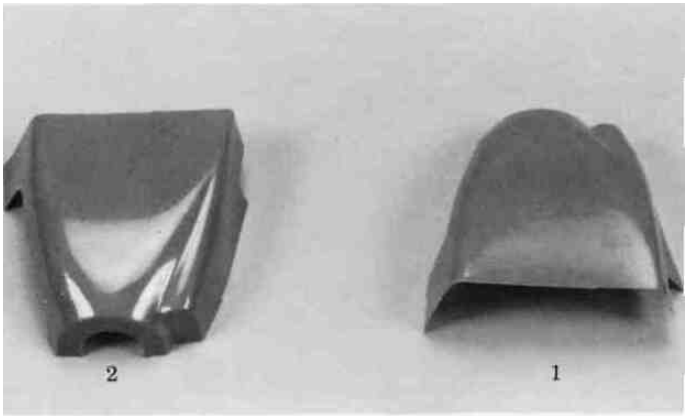


18. Attach the respective control rods to each horn. Use the middle hole of the horn. Make sure that both elevator surfaces are the same. You will have to adjust the clevises to equalize. Next, slide up the retaining tubes to lock the clevises.

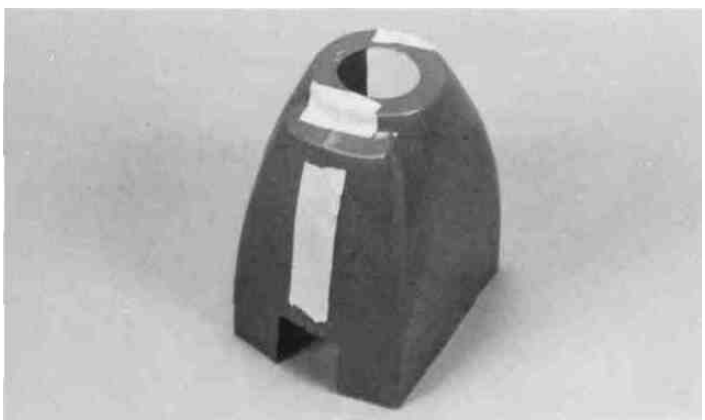


21. Attach the rods to the servos using the rod clevises as shown in the above picture. You may need to enlarge the holes in the horns slightly for a good fit. Check to ensure that when right rudder is given, the nose wheel also turns right. If not, simply install the E-Z Connector on the other side of the servo arm.

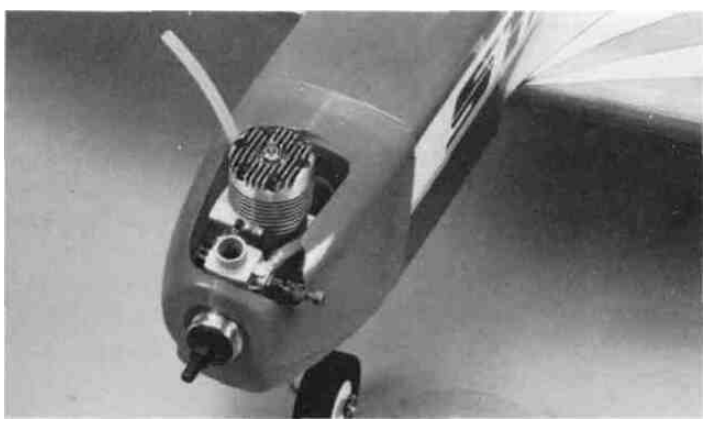
Cowl Installation



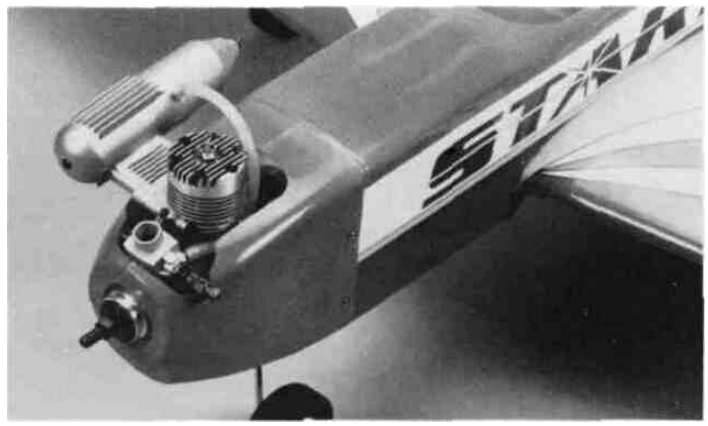
1 Right Cowl.....1
2 Left Cowl.....1



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 beam with Plastizap CA glue Let cure

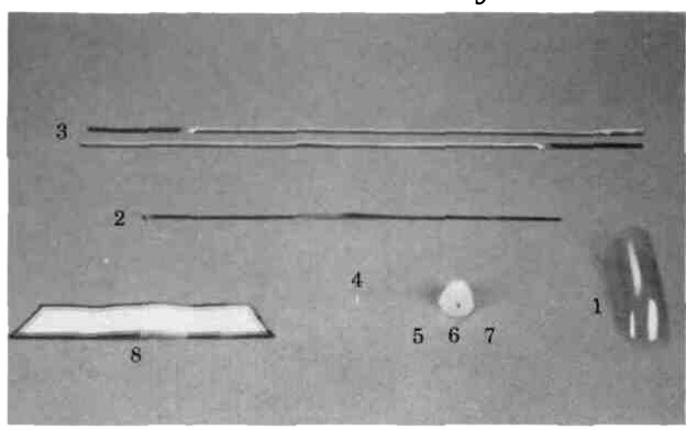


2 Trial fit the cowl over the engine You will have to trim slightly to allow clearance for the needle valve and muffler

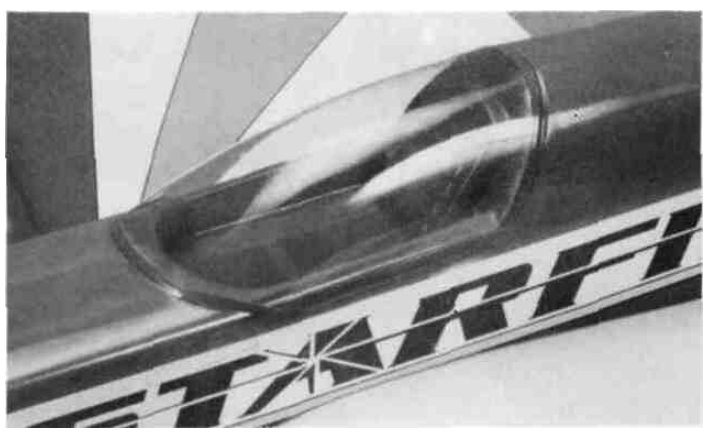


3 Position the cowl in place and drill two 2mm holes 1 1/2 apart on each side and install the 2 5 x 10mm S/T screws to secure the cowl in place Attach the muffler and pressure line

Final Assembly

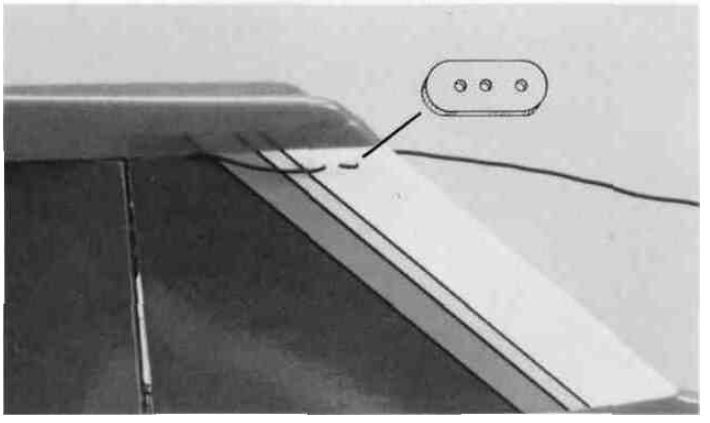


1	Canopy.....1	5	Spinner.....1
2	Red Striping Decals.....1	6	Spinner Backplate.....1
3	Side Decals.....2	7	2.5 x 12mm S/T Screws.....2
4	Antenna Retainer.....1	8	Cowl Decal.....1

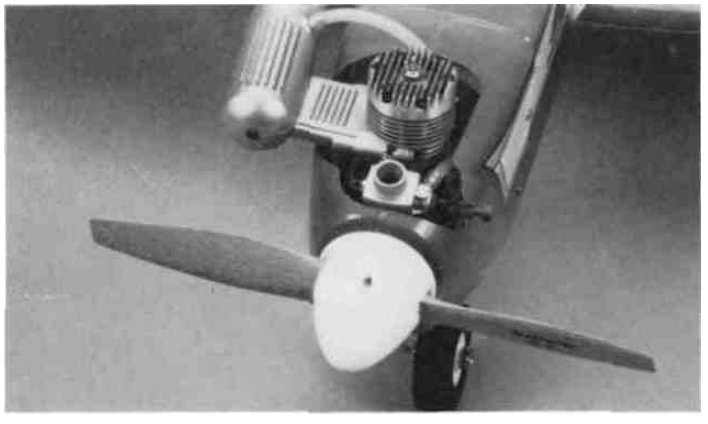


1 Using Plastizap CA glue the canopy onto the fuselage and apply the red striping decal around the perimeter

2. Next, carefully apply the decals to the cowl and the turtle deck. Use the box lid for a reference.

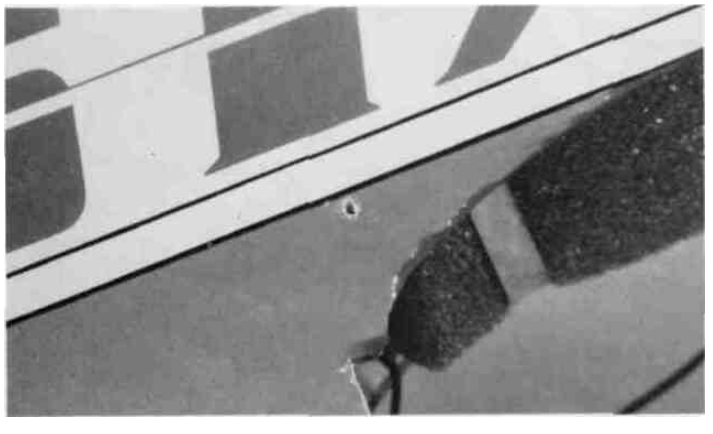


5. Route the antenna through the hole in the fuselage and through the hole in the tail. Use the plastic retainer and secure the wire to the tail.



3. Install the spinner back plate, prop, prop washer, prop nut **and** spinner with the 2.5 x 12mm S/T screws.

CENTER OF GRAVITY

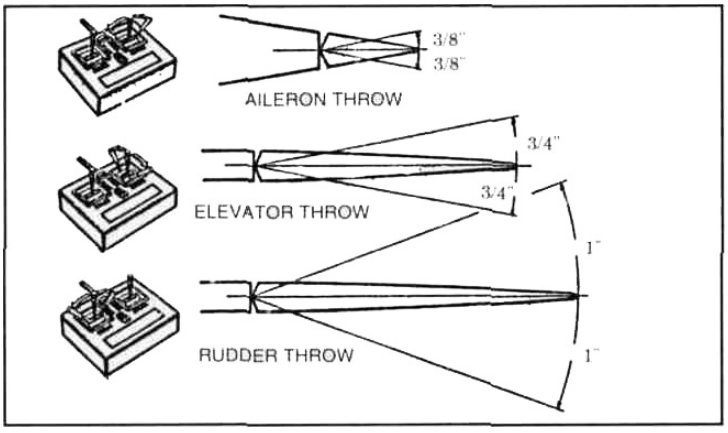


4. Drill two 1/16" holes for the antenna. Position the first hole in the left side of the fuselage and the second hole at the top of the vertical fin.

Measure back 4-1/4" to 4-1/2" from the leading edge of the wing next to the fuselage. Balance the plane at this point. If not, add weight to the nose or the tail until it balances perfectly. 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 sluggish 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 and with radio equipment installed. The plane should balance within 4-1/4" to 4-1/2" back from the leading edge at the fuselage. 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	3/8"	3/4"
Elevator	3/4"	***1-1/2"***
Rudder	1"	***2"***

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 Starfire 40
- 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 (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 readv 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 safest slowest speed It may still seem very fast and may 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 any excess oil that may have collected 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 chipped props as they may 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.

STARTING THE 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 manufacturers 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 though 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)
Fuel and fuel pump or fuel bulb.
Extra props and prop wrench
Screw drivers, knife, pliers, and wrenches.
Epoxy and something to mix it on.
Paper Towels
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

RECEIVERBATTERY
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 receiver 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 as necessary

HOBBICO AIRPLANE KITS

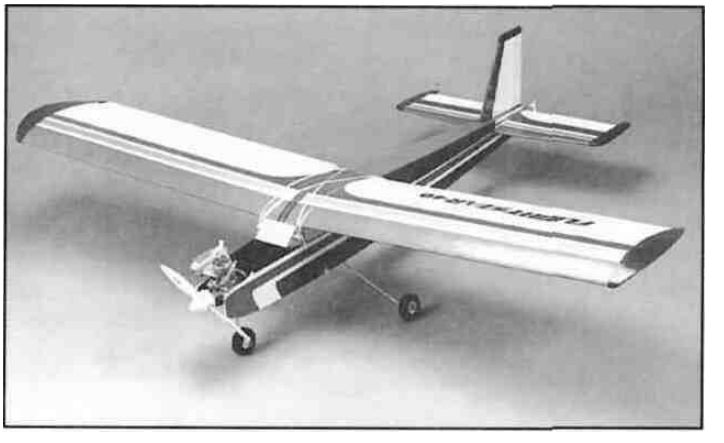
HCAA2600 - ASAP Extra 300

HCAA2010 - AWARF Avistar 40

HCAA2650 - ASAP P-40E Warhawk

HCAA2100 - AWARF Hobbistar 60

HCAA2580 - ASAP Telestar 40
HCAA2520 - ASAP Telestar 25



HCAA2050 - AWARF Flightstar 40