

HOBBICO **AVISTAR 40**TM

ALMOST READY-TO-FLY RADIO CONTROLLED MODEL AIRPLANE

- ALL AIRFRAME PARTS ARE FACTORY ASSEMBLED FOR PERFECT ALIGNMENT AND QUICK ASSEMBLY.
- ALL PRE-ASSEMBLED COMPONENTS ARE FACTORY COVERED.
- CLASSIC DESIGN WITH DURABLE Balsa AND PLYWOOD CONSTRUCTION.
- SEMI-SYMMETRICAL AIRFOIL GIVES THE AVISTAR 40 PREDICTABLE FLIGHT CHARACTERISTICS.

WINGSPAN: 60"
LENGTH: 45"
WING AREA: 600 sq. in.
WEIGHT: 4.5 lbs.



RADIO: 4-Channel (NOT INCLUDED)
ENGINE: 40-45 Two Stroke (NOT INCLUDED)
ACCESSORIES: Starting Battery w/Clip, Fuel, Etc. (NOT INCLUDED)

IMPORTANT: BEFORE YOU BEGIN.

If this is your first R/C airplane kit, a word of caution is in order. **BEFORE** you begin assembly, carefully look through the box and thoroughly read the instruction manual. Also check the parts list against the items in the box to be sure you have everything that is on the parts list. 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.

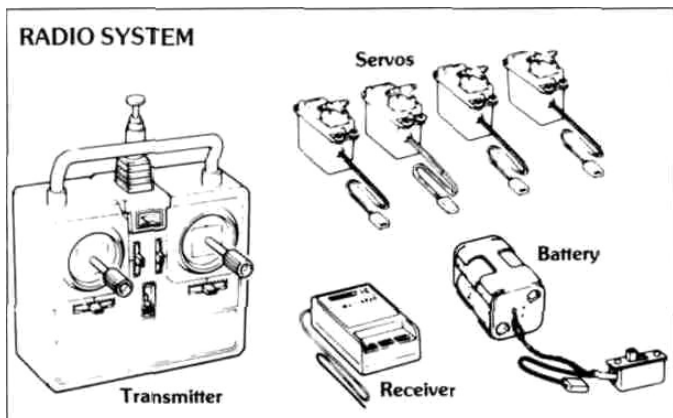
Only after you are thoroughly familiar with the construction process should you proceed with assembly. **Remember! Under no circumstances will a dealer accept a kit back for return if assembly has already begun.**

If the Avistar 40 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 Avistar 40 kit is one of the finest models of its type and will offer you many hours of enjoyment.

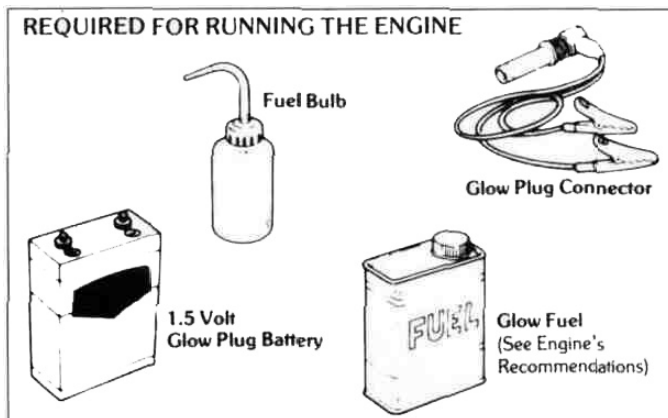
ADDITIONAL ITEMS

Please check the additional items listed below for those materials not furnished but recommended.

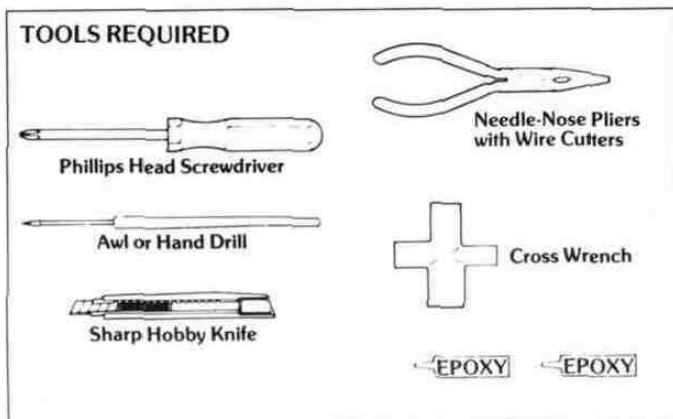
Dubro #163 Wing seat tape(1)	Devcon #5250 Silicone rubber 2 oz.(1)
Dubro #121 E-Z connectors.....(6)	Dave Brown Products #MMEP
or	30 minute epoxy(1)
Goldberg #361 Snap 'R' Keepers(6)	Pacer Tech #444 Zap lock med 1/4 oz.(1)
Goldberg #482 1/2 foam rubber.....(1)	Arco #64 Rubber bands 1/4 lb.(1)
Goldberg #461 Wing skids.....(1)	



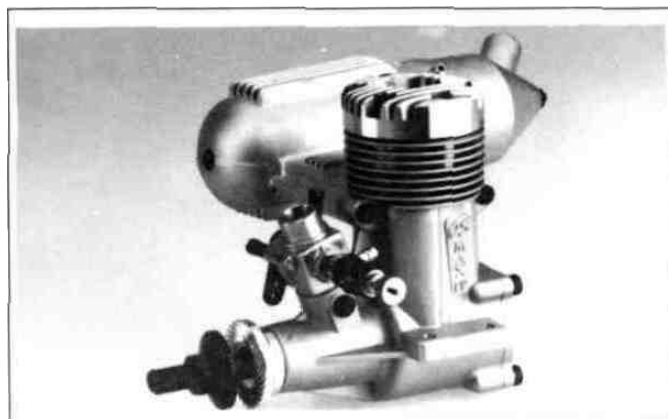
A four channel radio control system with 4 servos is required for the Avistar 40. The various components are pictured above.



Most engines require a 1 .5V glow plug starting battery, a glow plug clip, and a quality brand fuel (consult the engine manufacturer's recommendations).



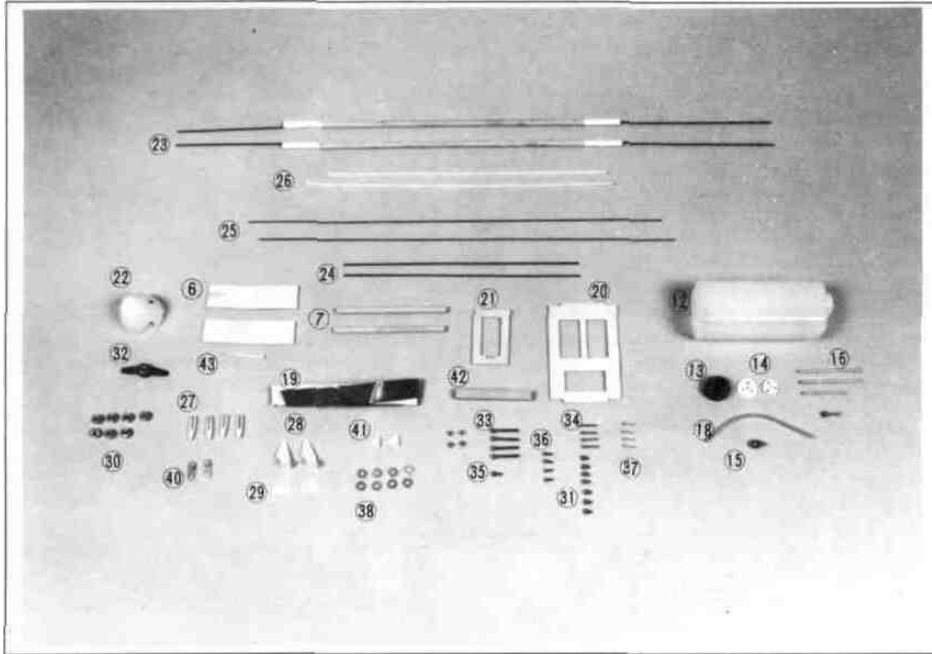
Here are a few tools that are necessary to properly finish this kit. They should be available from your local hobby dealer or hardware store.



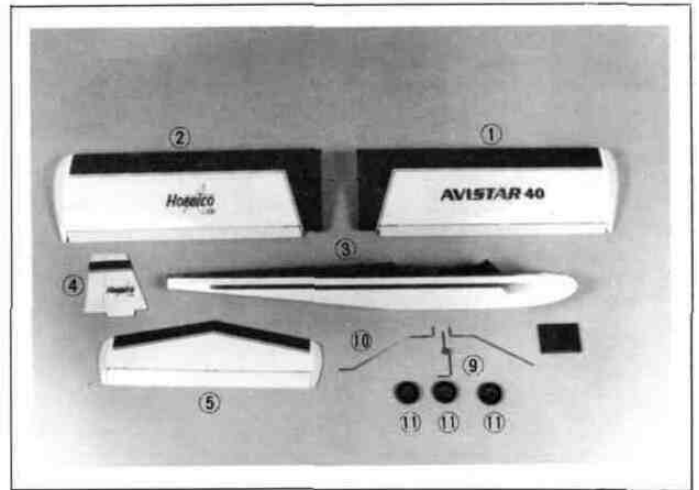
A quality brand engine will be needed. We recommend the OS 40 FP two cycle engine. Also a prop and fuel tubing will be required for the engine.

PARTS LIST

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



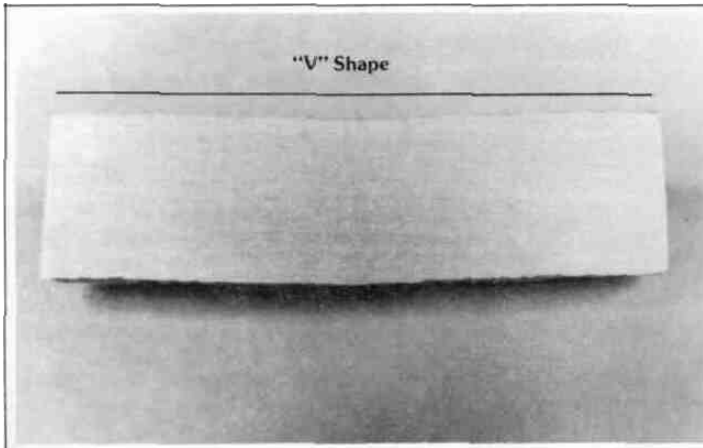
1	Right wing	1
2	Left wing	1
3	Fuselage	1
4	Vertical stabilizer and rudder	1
5	Horizontal stabilizer and elevator	1
6	Wing joiners	2
7	Wing mounting dowels	2
8	Fuel tank compartment cover	1
9	Front steerable nose gear	1
10	Main landing gear	2
11	Tires and wheels	3
12	Fuel tank	1
13	Neoprene ring	1
14	Plastic disk	(1) large (1) small
15	Clunk weight	1
16	Fuel pipe	3
17	M3x18 self tapping screw	1
18	Silicone fuel line	1
19	Center tape	1
20	Servo tray	1
21	Aileron servo tray	1
22	Spinner	1
23	Stabilizer control rods	2
24	Aileron control rods (93/4)	2
25	Throttle and nose gear control rods (173/4)	2
26	Plastic guide tubes	2



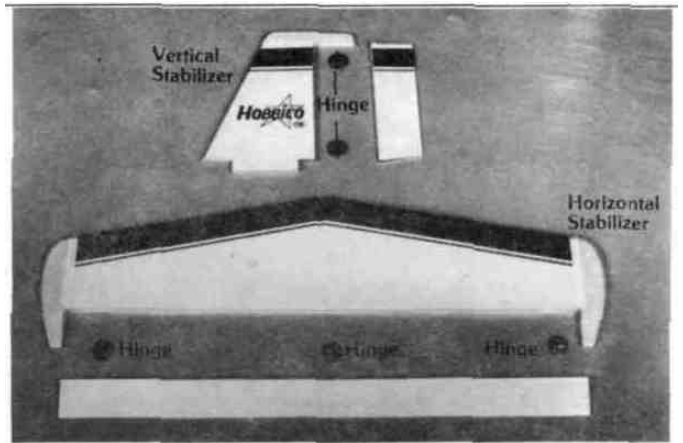
MISC. HARDWARE

27	Clevis	4
28	Control horns	2
29	Control horn back plate	2
30	4mm x 10mm wheel collars	7
31	m3x4 screw	7
32	Nose gear control horn	1
33	m3x25 screw	4
34	m2x15 screw	4
35	m3x8 screw	1
36	m2 6x8 self tapping screw	4
37	m2x12 self tapping screw	4
38	m4 washers	8
39	m3 nut	4
40	Landing gear straps	2
41	Aileron control horns	2
42	Aileron servo tray blocks (3/8 sq x 3 long)	1
43	Alignment peg	1

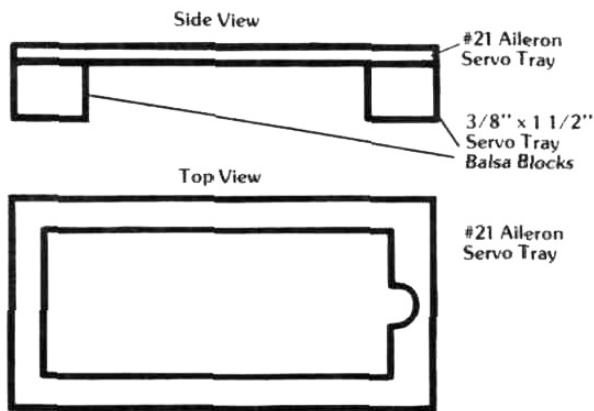
PRE-ASSEMBLY



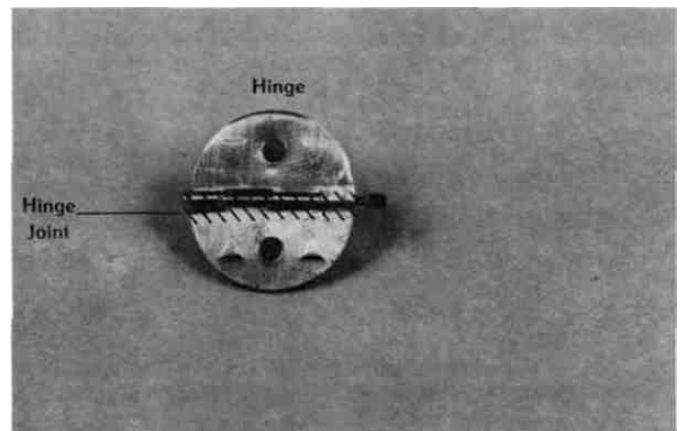
- 1 Locate part #6 wing joiner. Join the two wing joiners together using a light coat of epoxy. They should form a "V" shape as shown above.



- 4 Locate the #4 vertical stabilizer and #5 horizontal stabilizer. The rudder is temporarily attached to the vertical stabilizer. The elevator is temporarily attached to the horizontal stabilizer. Remove the rudder, elevator, and metal hinges.



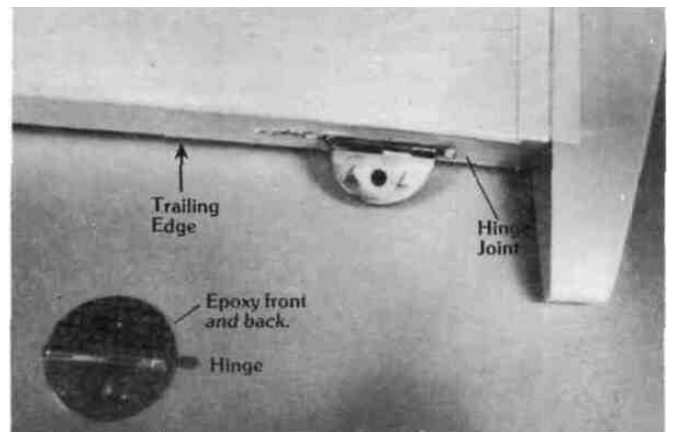
- 2 Assemble the aileron support tray with parts #21 aileron servo tray and #42 3/8" x 3/8" balsa aileron servo tray blocks. Cut the aileron servo tray blocks 1-1/2" long. Epoxy the balsa blocks to the plywood tray as shown above.



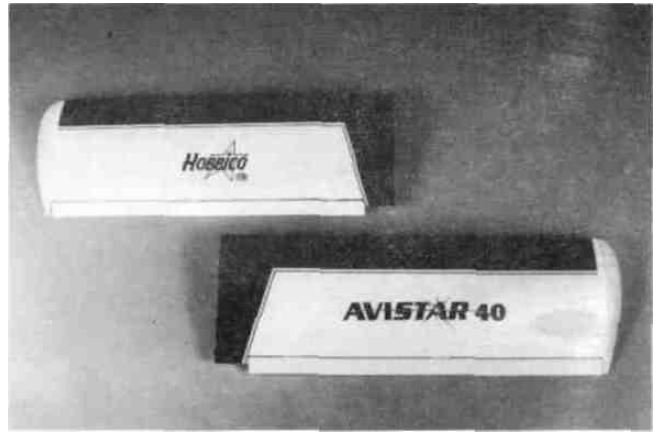
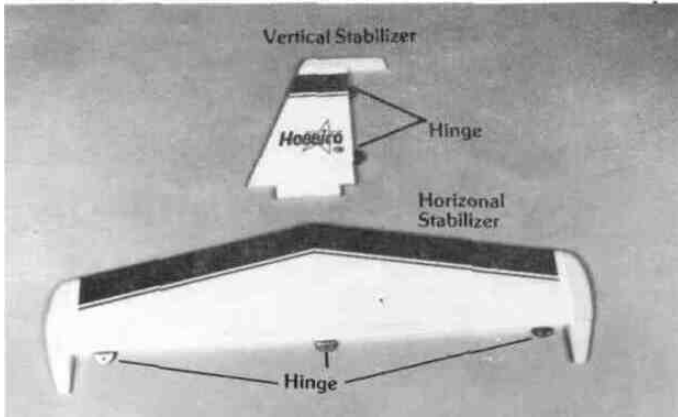
- 5 Apply a small amount of vaseline along the hinge joint on both sides of the hinge. This will prevent epoxy from getting in the hinge joint and ruining the hinge. Do not get vaseline on the rest of the hinge. If this happens the epoxy will not hold the hinge and the aileron may separate from the wing causing a crash. Do this step to all eleven hinges.



- 3 All ailerons are mounted temporary from the factory. Remove the ailerons from the wings. Now remove the three metal hinges on each wing.

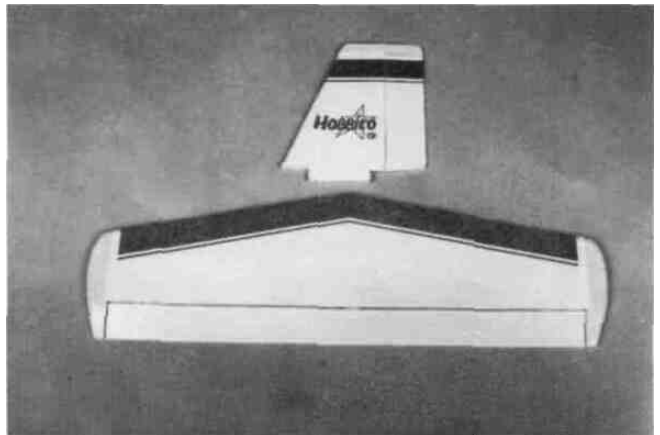
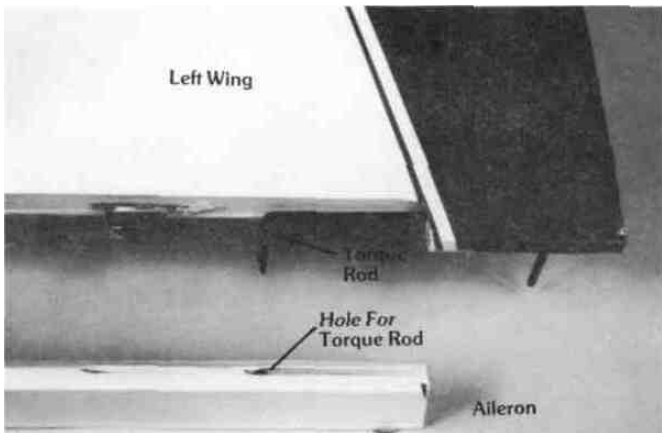


- 6 Apply epoxy to both sides on one end of the hinge as shown. Slide the hinge back into the slot in the wings trailing edge. Wipe off any excess epoxy before it cures. The hinge pin must be against the trailing edge of the wing to allow the ailerons installed later to fit correctly. Install all six hinges, three in each wing, and set the wings aside until the epoxy cures.



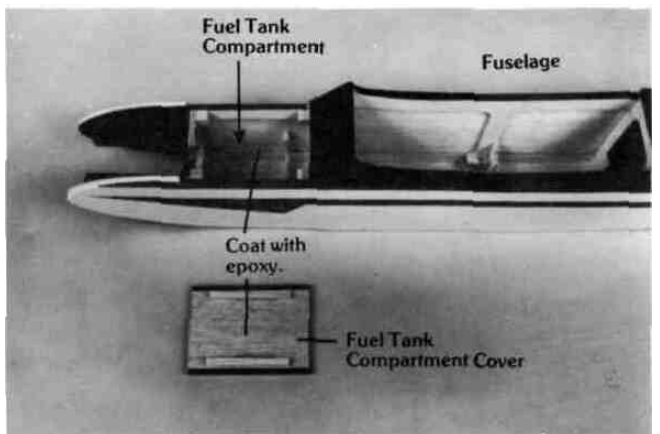
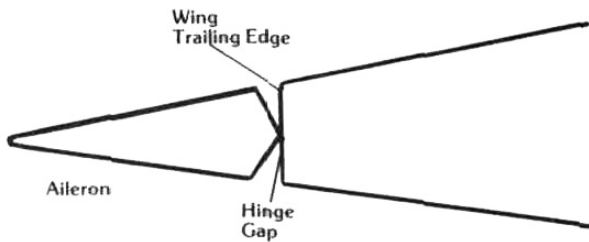
7 Using the same procedure for epoxying the hinges that was used in Step 6, epoxy the three hinges into the horizontal stabilizer. Epoxy two hinges into the vertical stabilizer

10 Remove the aileron and apply epoxy to the hinges and the part of the torque rod that is inserted into the aileron. Carefully install the aileron on the hinges and torque rod. Install the ailerons on both wings leaving no hinge gap



8 After the epoxy holding the hinges has cured locate the ailerons that were removed from the wing in Step 3. Test fit the aileron on the wing. Be sure the torque rod fits in the hole in the edge of the aileron. The torque rod is what will transmit motion from the servo to the aileron.

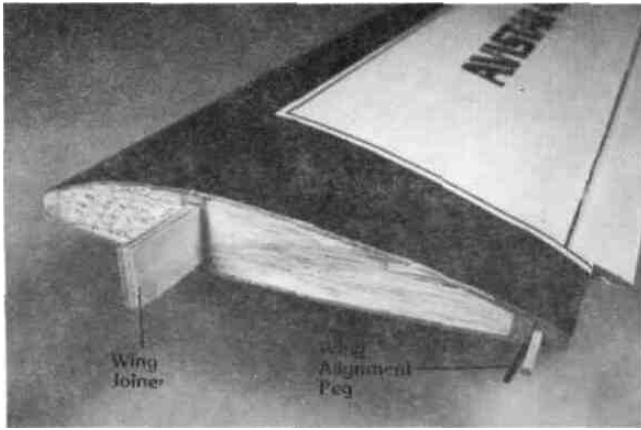
11 Install the rudder on the vertical stabilizer and elevator on the horizontal stabilizer using the same procedure used for the aileron. Be careful not to leave a gap in the hinge gap



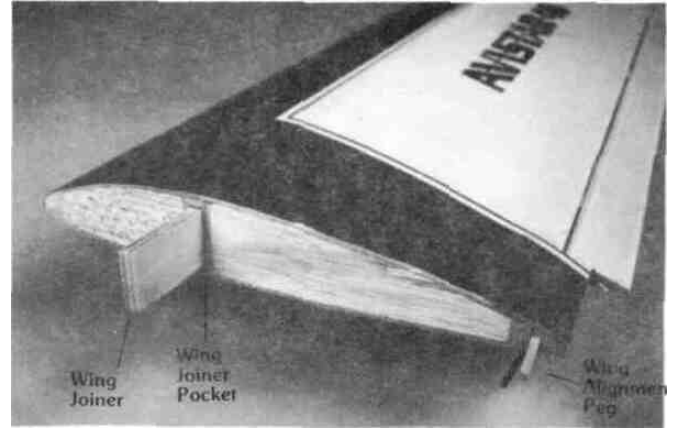
9 With the aileron temporarily installed there should be no gap in the hinge gap. If the plane is flown with a hinge gap of more than 1/16" flutter, a rapid vibration, may be created. This flutter may cause the ailerons to come loose or in severe cases break the wing

12 Coat the fuel tank compartment with an even coat of epoxy. Cover all exposed balsa and plywood parts. Be careful not to fill any holes. Also at this time coat the bottom of the #8 fuel tank compartment cover. This will prevent the fuel from destroying the wood

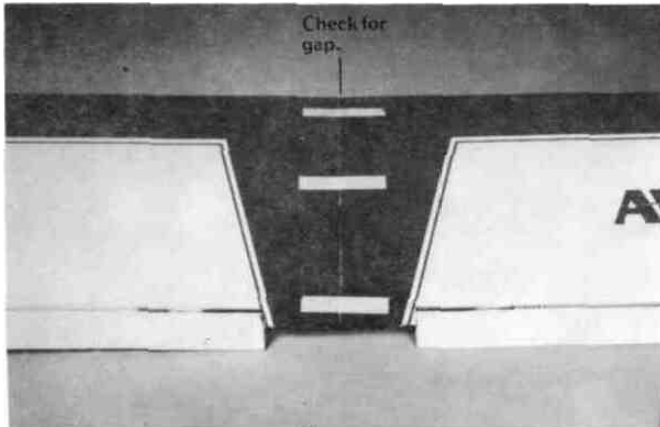
WING JOINER INSTALLATION



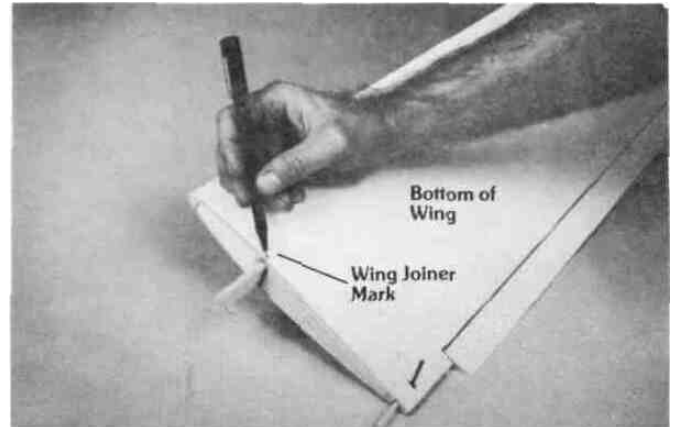
1 Using the wing joiner assembled in Step 1 of pre assembly insert the wing joiner into the wing panel temporarily Also install the wing #43 alignment peg as shown **Do not glue at this time**



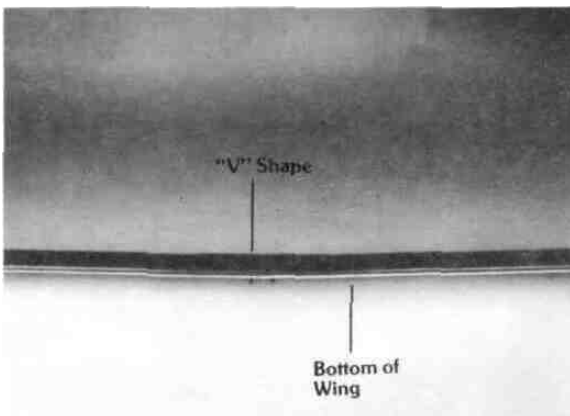
4 When you are satisfied with the fit of the wing joiner remove the wings from the joiner Mix a batch of 30 minute epoxy and using the right wing panel (has Avistar on top) smear the inside of the right wing joiner pocket with a heavy coat of epoxy Also coat half of the wing joiner with epoxy and push into the wing joiner pocket Coat half of the wing alignment peg with epoxy and insert it into the hole at the rear of the wing root Clean the epoxy from the wing root to prevent epoxy build up Allow the epoxy to cure



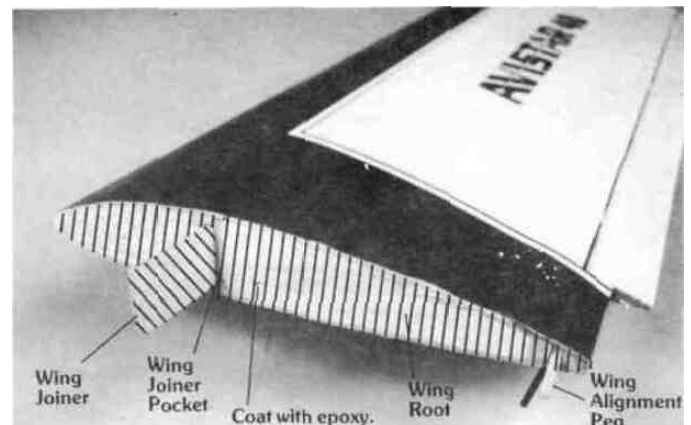
2 Slide the other wing panel onto the wing joiner Slide the two wing halves together Check for proper alignment There should be no gap between the wing halves If there is trim the end of the wing joiner slightly to allow proper fit **Do not glue at this time**



5 Mark the location on the bottom of the wing where the wing joiner is installed

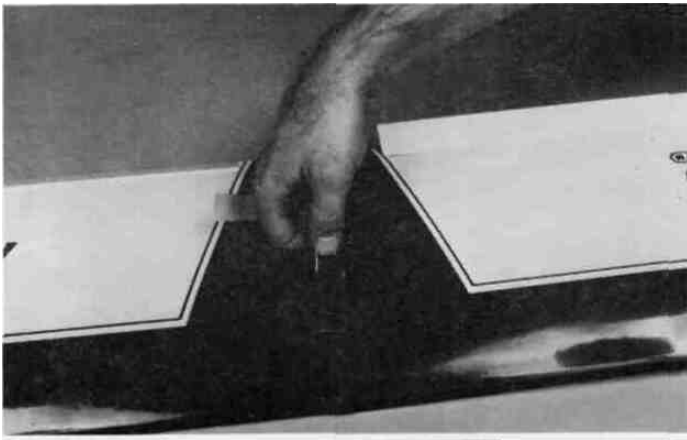


3 The wing should form a "V" when assembled as shown The top of the wing has lettering on it



6 When the epoxy has cured you may proceed to join both wing panels together Mix a batch of epoxy and heavily coat the wing joiner pocket of the left wing Also apply an even coat of epoxy on both wing roots Be sure to cover the whole wing root When satisfied with the gluing slide the wing panels together and check for fit Wipe excess glue from the joint Isopropyl alcohol works well for this It is best to use masking tape to hold the wing halves together until the epoxy cures

Note: You may proceed with fuselage preparation and come back to here after the wing is ready.

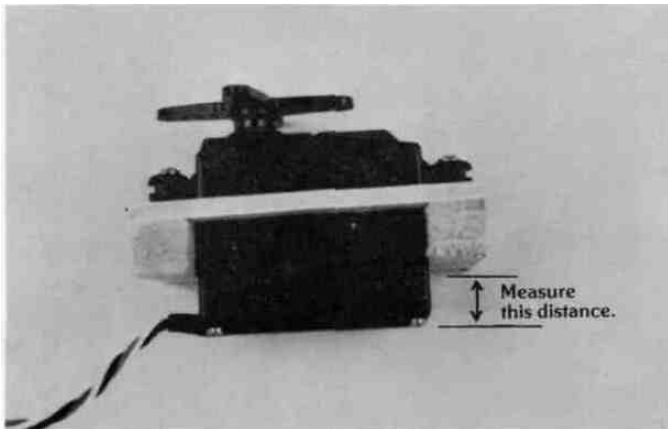


7 After the epoxy has fully cured (overnight) remove the masking tape and apply the center tape. Begin at the bottom trailing edge, wrap forward and around to top trailing edge overlapping the beginning point

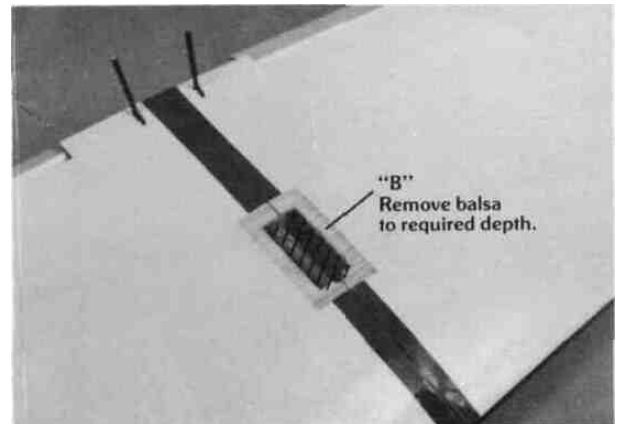


3 Remove the servo tray and, following the picture, remove the covering from area "A".

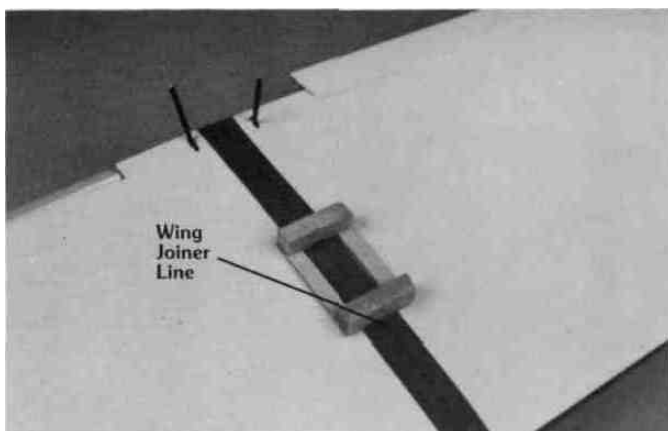
AILERON SERVO TRAY INSTALLATION



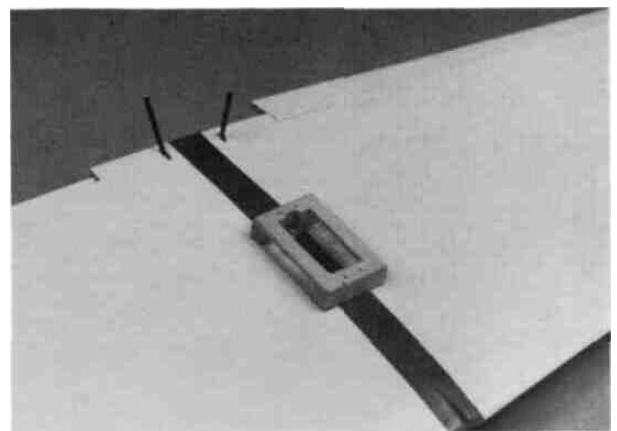
1 Locate the pre-assembled #21 aileron servo tray with #42 balsa blocks and a servo from your radio system. Slip the servo into the tray and measure the distance from the bottom of the servo to the bottom of the balsa block.



4 Then remove the balsa wood from area "B". Remove enough balsa wood to accommodate the servo previously measured in Step 1.

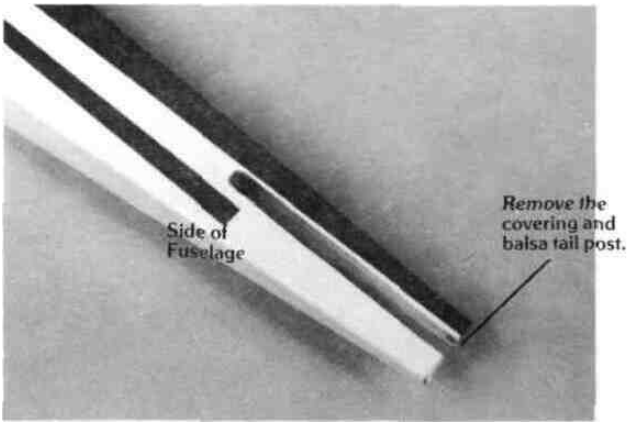


2 Remove the servo from the servo tray. Turn the servo tray upside down (balsa blocks up) and lay the end of the tray on the line drawn in Step 5 of wing joiner installation. Using a felt tip pen trace around the outside and inside of the servo tray.

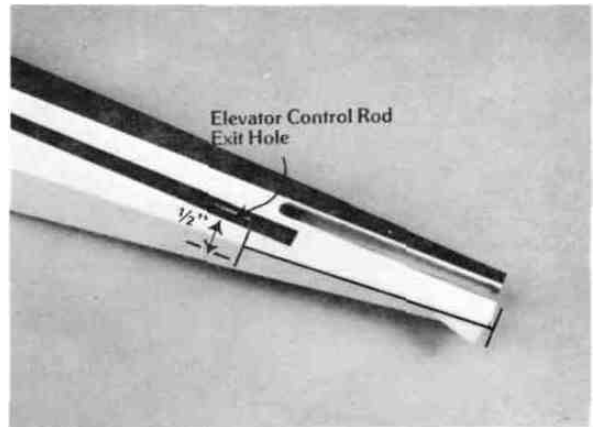


5 Set the servo in the servo tray and test fit the servo tray to the mounting area. When satisfied with the fit, remove the servo and epoxy the servo tray to the mounting area.

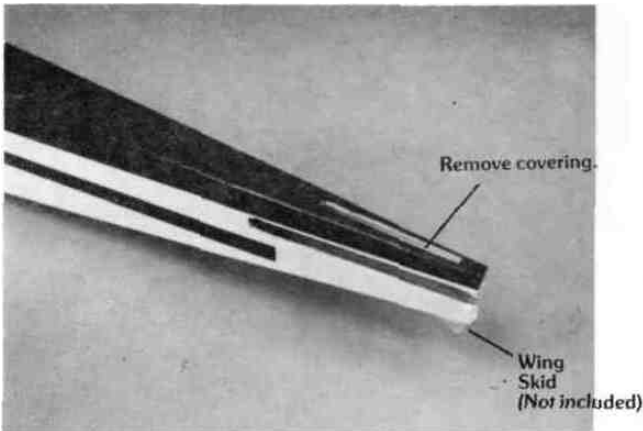
FUSELAGE PREPARATION



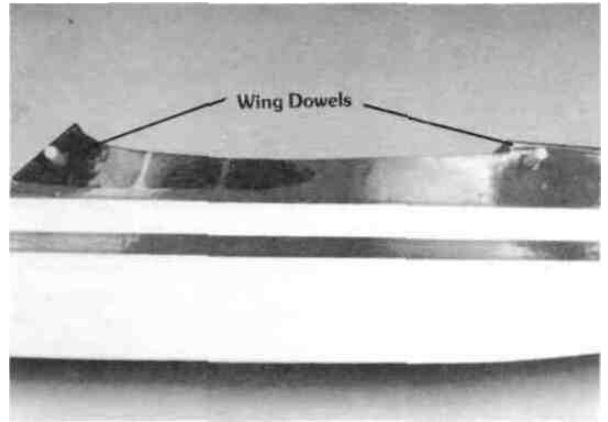
1 On the side at the rear of the fuselage use your finger to locate the stabilizer cut outs. They will be soft spots under the covering on both sides. Using a sharp knife remove the covering material from the soft spots on both sides. During the process you will find a balsa tail post. This must also be removed to allow the installation of the horizontal stabilizer.



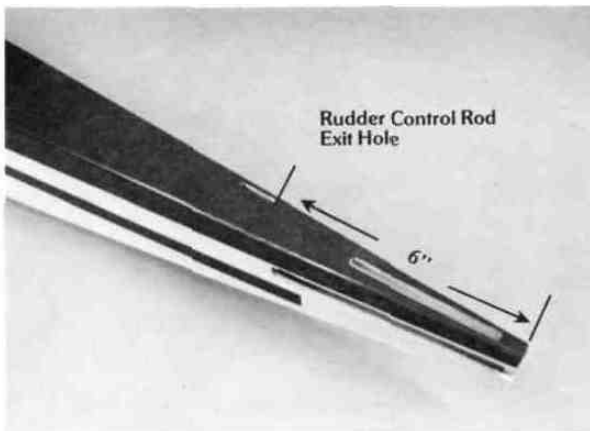
4 The elevator exit hole is located on the left side of the fuselage 6" forward of the tail post and approximately 1/2 inch above the bottom of the fuselage. You may be able to detect this as a soft spot in the fuselage. Remove the covering from the elevator exit hole.



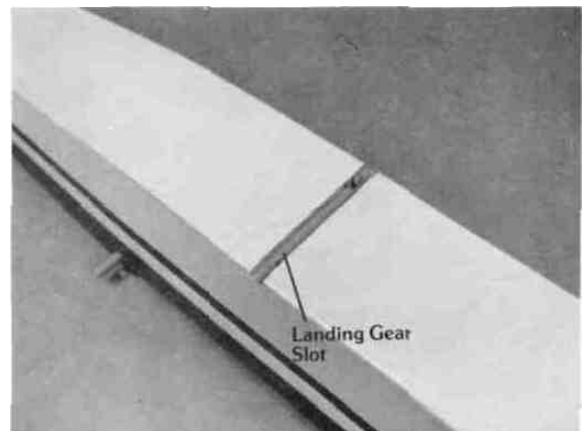
2 Again using your finger locate the vertical stabilizer slot on top of the fuselage. Remove the covering from this area. Install the wing skid to the bottom of the tail section to prevent it getting scraped up.



5 The wing dowel holes are also pre drilled. They are located in the area indicated in the photo. Using a sharp knife remove the covering material at this time. There are four holes, two on each side of the fuselage. Insert the dowels so that they protrude equal distance on each side of the fuselage. Epoxy part of the dowel protruding from the sides of the fuselage. This will keep fuel from ruining the dowels.

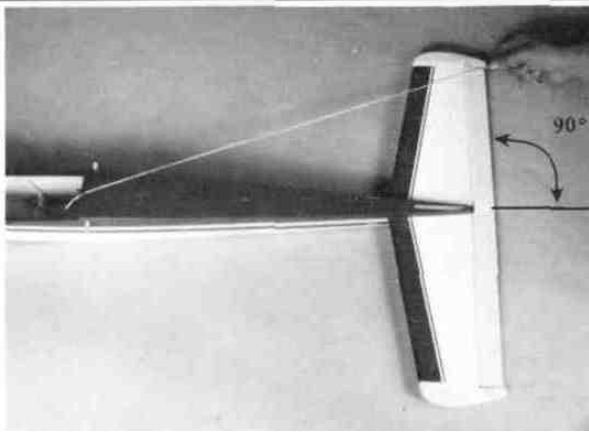


3 The factory has pre cut the rudder and elevator control rod exit holes. These are approximately 1/8 inch wide and 1 inch long. The location of the rudder exit hole is approximately 6 inches forward from the tail post and on top of the fuselage and slightly to the right when viewing the plane from the tail. The area appears slightly darker. Remove the covering from this area at this time.

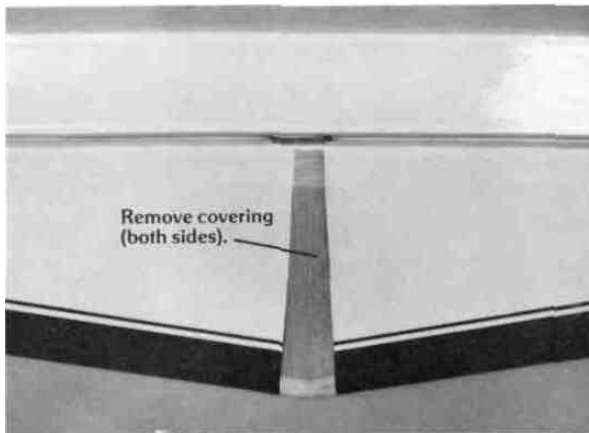


6 The main landing gear slot is located on the bottom of the fuselage approximately 14 inches back from the nose (or front) of the plane. Using a sharp knife remove the covering from this area.

STABILIZER PREPARATION



- 1 Locate the horizontal stabilizer. Slide the stabilizer into the slot prepared in the previous section. Position the stabilizer so that it is centered in the fuselage and that the trailing edge of the elevator is 90° to the center line of the fuselage. Insert a pin through a piece of string and attach the pin to the fuselage on the center line as shown. Stretch the string to the corner of the elevator. The distance from the pin to the corner must be equal on both sides. This method will adjust the stabilizer so it is 90° to the center line of the fuselage.



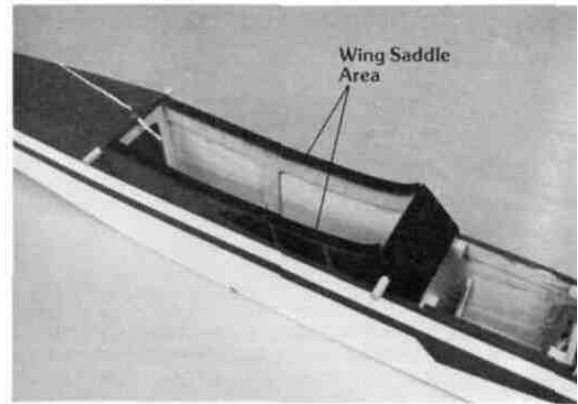
- 2 Mark on the stabilizer where the fuselage and the stabilizer touch. Do this on the top and the bottom of the stabilizer. Remove the covering in between the two lines. This will allow a more secure glue joint when the stabilizer is epoxyed later. Do not cut the balsa wood under the covering.



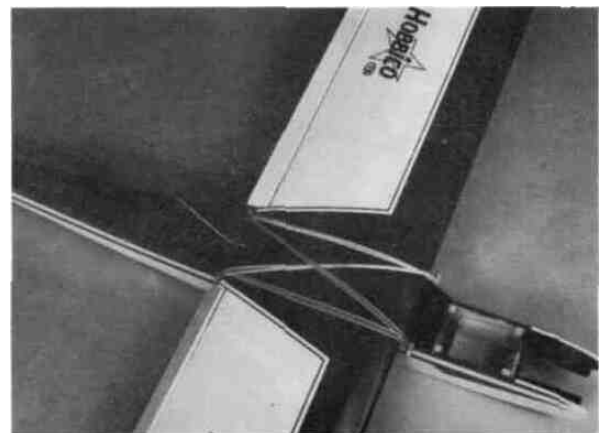
- 3 Locate the vertical stabilizer. Remove the covering on both sides as shown.

INSTALLATION OF HORIZONTAL STABILIZER

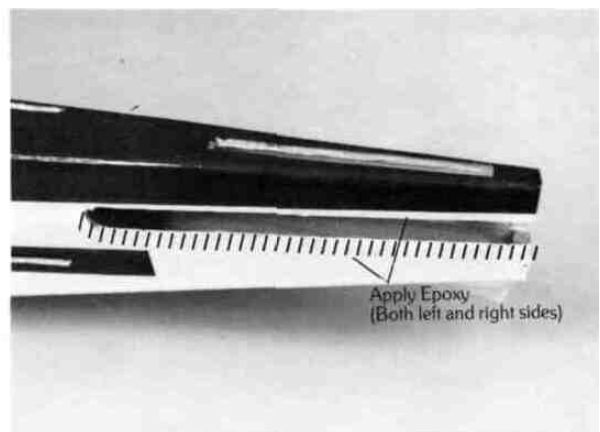
IMPORTANT: This next series of steps will determine how well your Avistar 40 will fly. So please read and reread these steps so that you are totally familiar with its sequence.



- 1 Using wing saddle tape, apply a strip to the wing saddle area as shown.



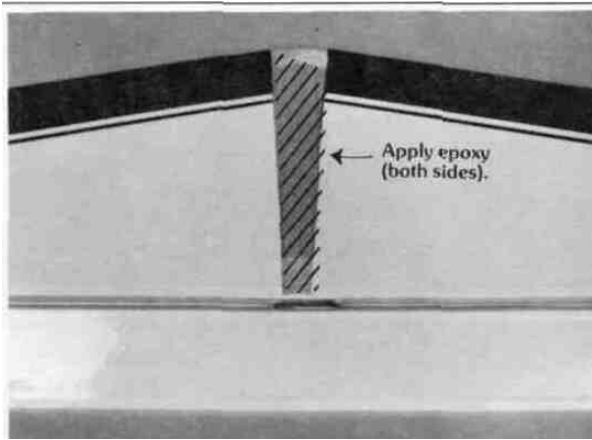
- 2 Using four rubber bands (#64) temporarily secure the wing to the fuselage. This becomes your basic reference point.



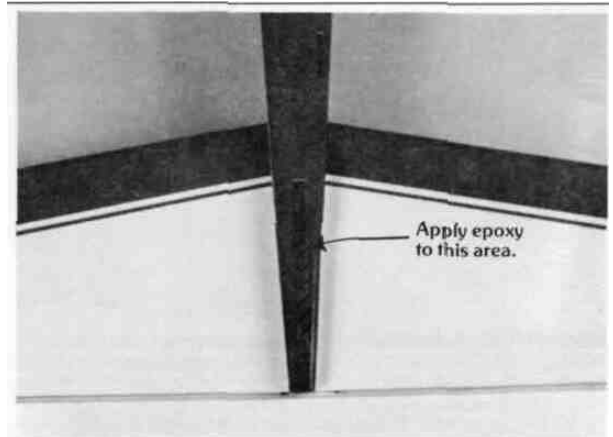
- 3 Lay the fuselage with wing attached on any flat surface. Mix a batch of 30 minute epoxy. You will have plenty of time to work so don't hurry. Using a scrap piece of plywood left over from the aileron servo tray, apply a generous amount of epoxy to the inside area, top and bottom, and along the sides of the stabilizer slot as shown.

INSTALLATION OF VERTICAL STABILIZER

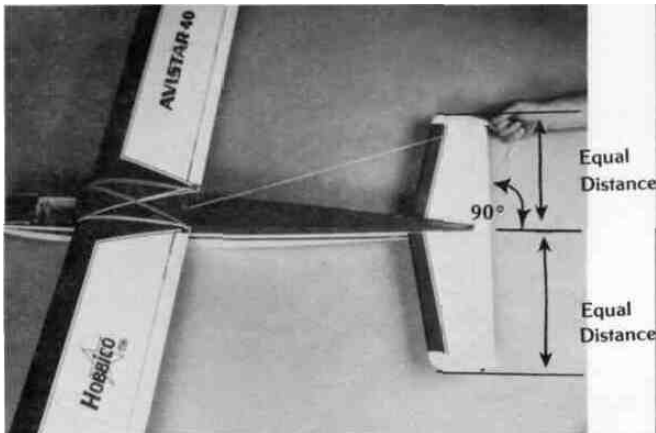
Now if we have done a good job with the wing-stabilizer relationship the installation of the rudder should be easy. The vertical stabilizer needs to be at 90° to the horizontal stabilizer and the horizontal stabilizer is parallel to the wing. A drafting triangle would be helpful here.



- 4 Using the same scrap of plywood apply an even coat of epoxy to the top and bottom of the horizontal stabilizer in the area where you removed the covering



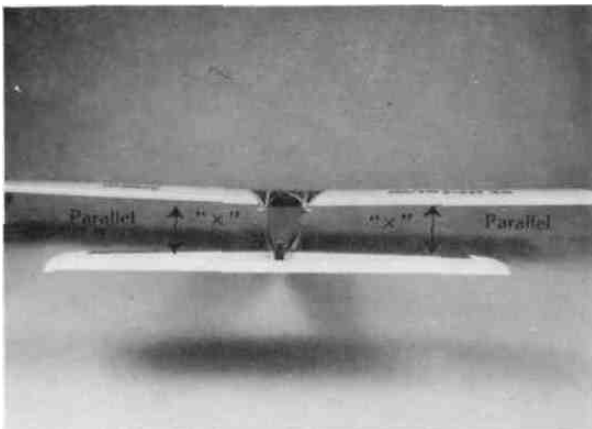
- 1 Looking into the fuselage vertical stabilizer slot apply some epoxy to the top surface of the horizontal stabilizer that is visible inside the fuselage



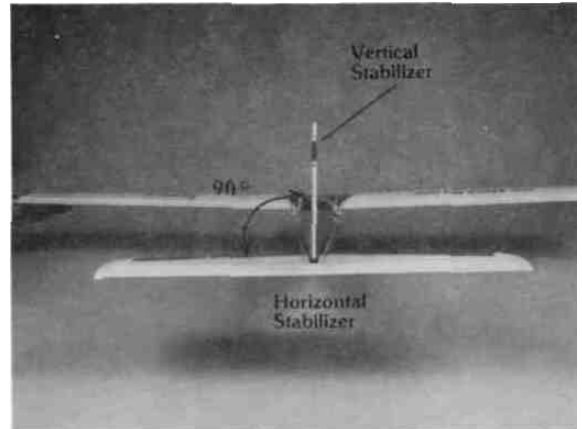
- 5 Slide the stabilizer into the slot from the rear. This fit should be close but not tight. Using a ruler (12") check to see if you have equal distance from the center of the tail to the outside edge of the stab. Now using the string explained in the stabilizer preparation section adjust the stabilizer so it is 90° to the center line of the fuselage.



- 2 Mix a small batch of epoxy and apply it to the area inside the fuselage on the surface of the exposed wood. Apply an even coat to the vertical stabilizer base where you removed the covering. Insert the vertical stabilizer into the slot and push down until the stabilizer stops.

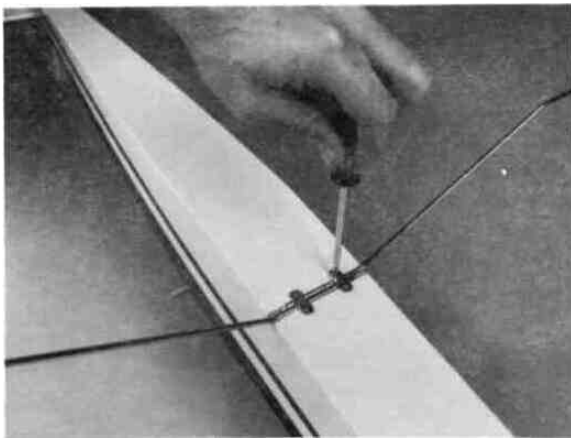


- 6 Now view the stabilizer wing relationship from behind with the plane resting on a level surface (see photo above). Distance "x" should be the same. If not shim the stabilizer using a small silver of wood to get the proper relationship. Let the epoxy cure thoroughly.

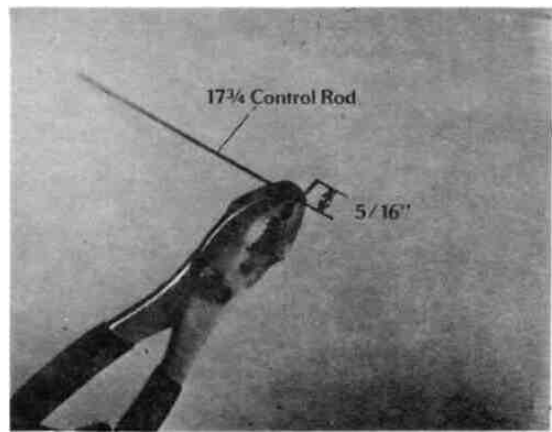


- 3 Using the triangle check to see if the rudder is 90° to the horizontal stabilizer. If so a couple of straight pins will hold the rudder in position until the epoxy cures.

MAIN LANDING GEAR INSTALLATION

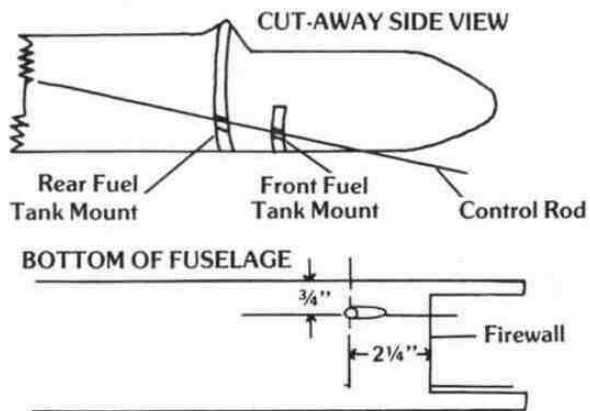


Place a small bead of silicone sealant in the groove, then insert the landing gear strut into the fuselage in the holes on the bottom as shown. Secure the struts in place with the metal straps and m3x10 screws.



- 3 If using the Snap 'R' Keeper make a 90° bend 5/16" from the end of the 17 3/4" control rod as shown. If using the E-Z connector, install the connector on the bottom of the nose gear control horn following the manufacturer's instructions.

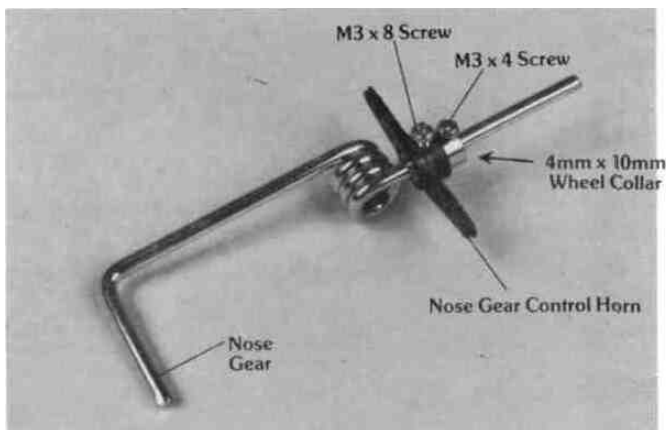
NOSE GEAR CONTROL ROD



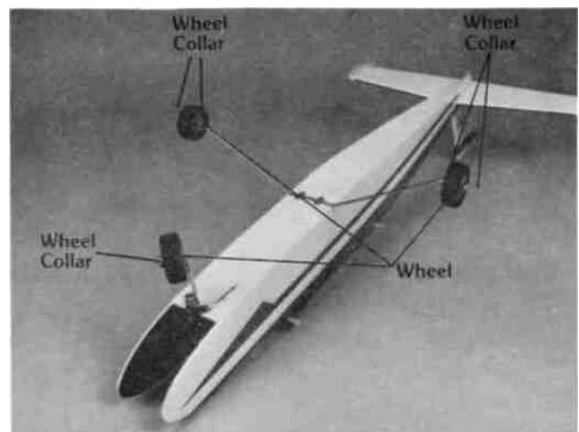
- 1 Drill a 1/8" hole in the fuselage bottom right side at a 30° angle so that the drill also drills through the front fuel tank mount. Insert the 17 3/4" x 1/16" rod through the holes and mark where the rod hits the rear fuel tank mount. Remove the rod and rough-up the white plastic tube with 240 grit sandpaper. Drill a 1/8" hole where you made the mark in the rear fuel tank mount. Insert the white plastic tube through the holes so that the end of the tube is even with the bottom of the fuselage. Epoxy the tube to the fuel tank mounts and the bottom of the fuselage.

- 4 Slide the nose gear shaft through the nose gear mount. Secure the gear in place with a 4mm x 10mm wheel collar and m3x4 screw. Slide the 17 3/4" control rod into the white tube in the bottom of the fuselage. Connect the rod to the nose gear control horn using the Snap 'R' Keeper or E-Z connector and following the manufacturer's instructions.

WHEEL INSTALLATION

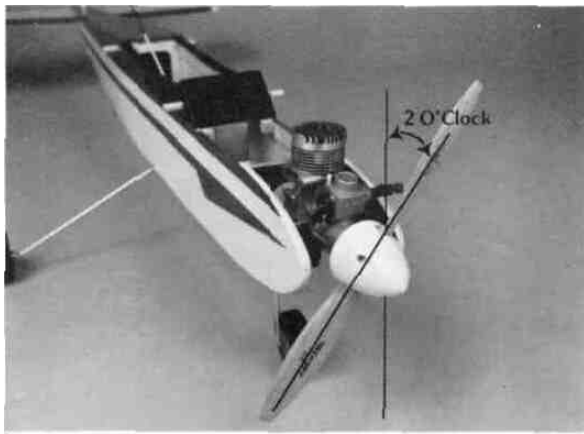


- 2 Install the nose gear control horn parallel to the nose gear axle and tighten the mounting screw. Next install a 4mm x 10mm wheel collar on top of the control horn and secure with a m3x4 screw.

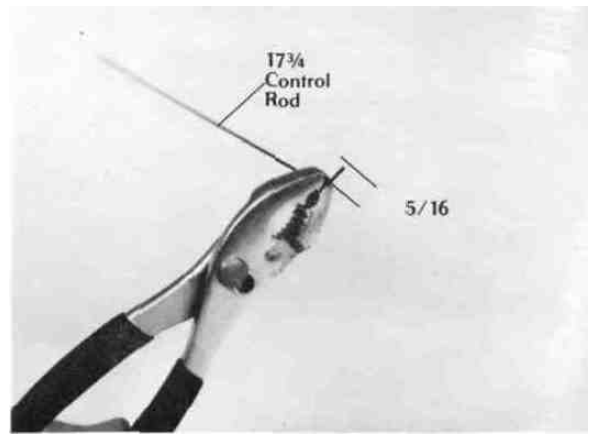


- Install a wheel on the nose gear. Then install a 4mm x 10mm wheel collar and secure it with a m3x4 screw. Install a 4mm x 10mm wheel collar on each side of the main landing gear. Then install the wheels and then the other 4mm x 10mm wheel collar. Secure the wheel collars with the m3x4 screws. All three wheels should turn freely.

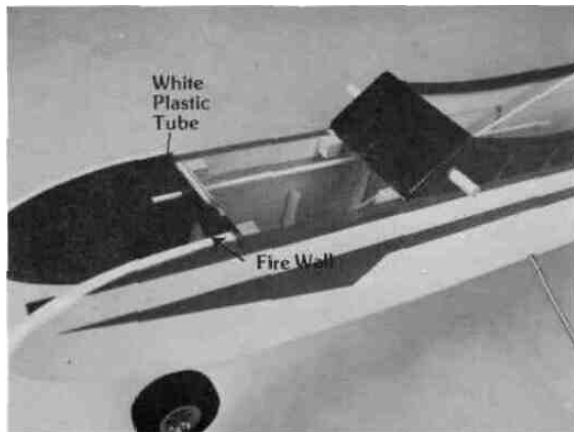
ENGINE INSTALLATION



- 1 Install the back plate of the spinner then install the prop so that when the prop is at 2 o'clock there is resistance from the compression of the engine. Tighten the prop nut securely and install the spinner using the two screws that came with the spinner.



- 4 If using the Snap R Keeper make a 90° bend 5/16 from the end of the 17 3/4 control rod as shown. If using the E-Z connector, install the connector on the throttle control horn following the manufacturer's instructions.

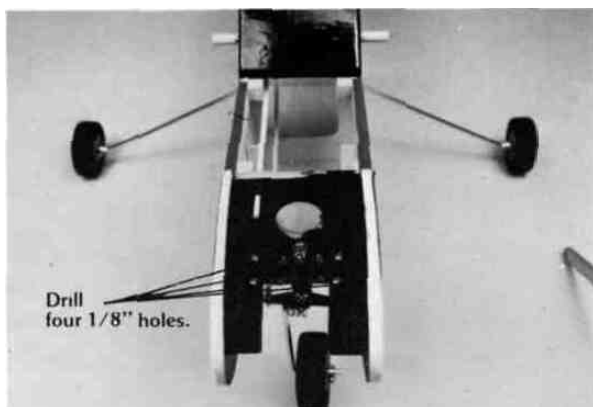


- 2 Locate the pre drilled 1/8" hole in the firewall. Before installing the white plastic tube rough it up with 240 grit sandpaper. This will help the epoxy to hold better. Install the white plastic tube into the hole. Epoxy the tube to the firewall leaving approximately 1/2" of the tube protruding out of the front of the firewall.

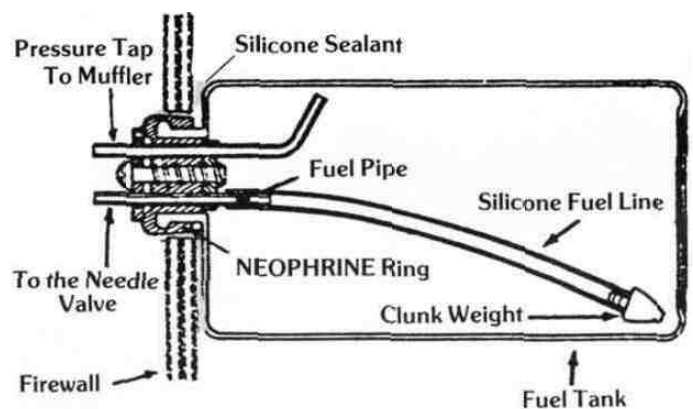


- 5 Install the control rod on the throttle control horn following the manufacturer's instructions. Next slide the control rod into the white plastic tube installed in the firewall. Secure the engine to the engine mount. Slide a 4mm washer onto a 3mm x 20mm screw. Insert the screw through the engine mounting holes. Apply zap lock to the threads of the screw where they protrude from the engine mount. Install a 4mm washer then a 3mm nut. Tighten the nut securely. The zap lock will prevent the nut from vibrating loose.

ASSEMBLY OF FUEL TANK

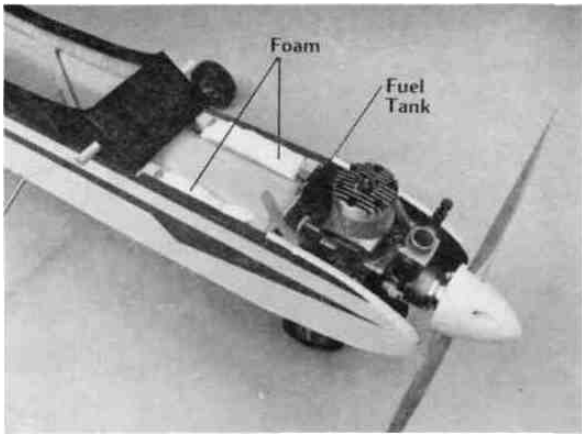


- 3 Set the engine on the engine mount so that the propeller clears the front of the fuselage and the center line of the engine is in line with the center line of the fuselage. Mark the engine mounting holes. Remove the engine and drill four 1/8" holes on the marks.

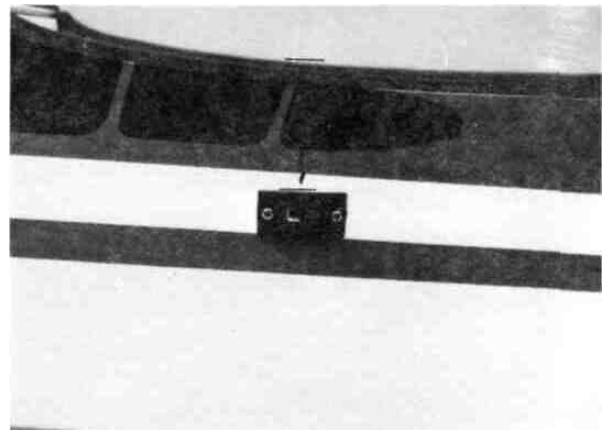


- 1 Assemble the fuel tank as shown. Apply a bead of silicone sealant around the fuel tank cap as shown when installing it into the fuselage.

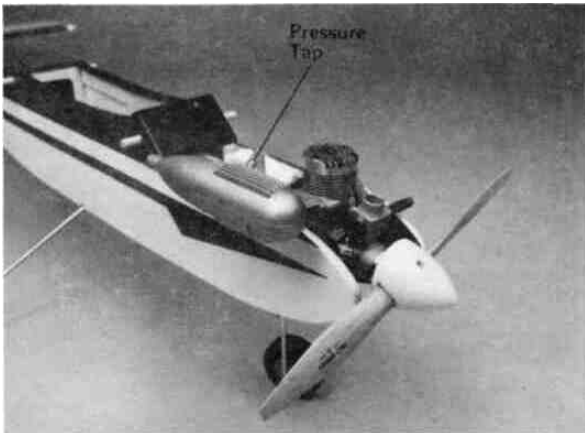
RADIO INSTALLATION



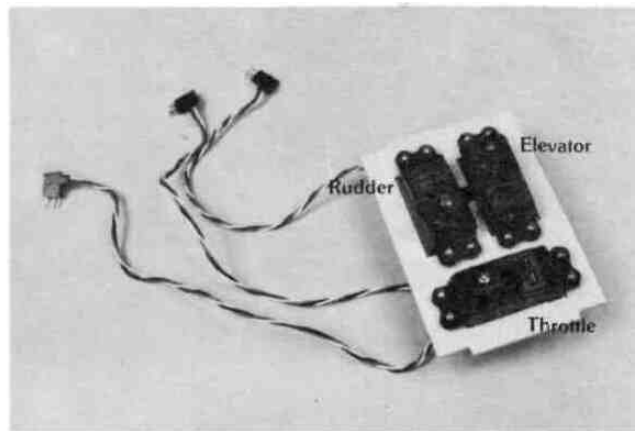
- 2 Wrap the fuel tank with natural foam to insulate it from vibration. Install the fuel tank so that the cap is through the hole in the firewall. Install two five inch pieces of fuel tubing to the fuel pipes from the fuel tank. Connect the tubing from the line with the clunk weight attached (called the fuel pick up line) to the carburetor. The other line is connected to the muffler pressure tap in the next step.



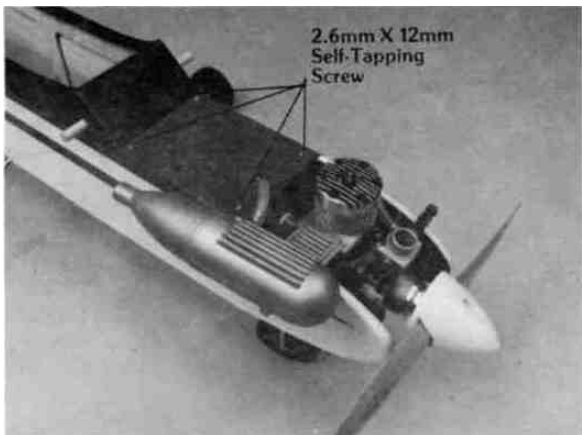
- 1 Using your radio switch as a guide, make the necessary opening for mounting the switch on the left side of the fuselage, as viewed from above and looking toward the engine, and 1 1/4" down from the wing saddle. Install the switch at this time. Mounting the switch on this side will prevent fuel from damaging the switch.



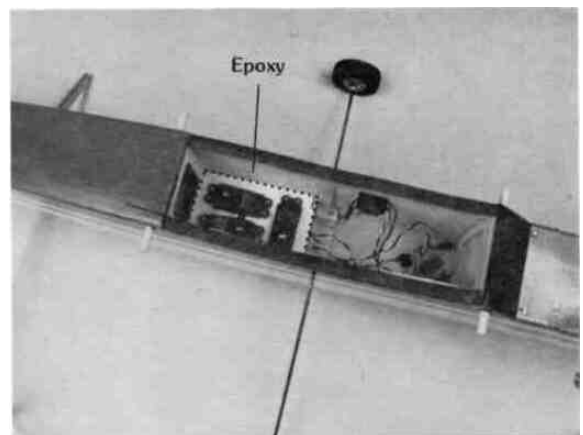
- 3 Install the muffler following the manufacturer's instructions. Connect the pressure line to the muffler pressure tap.



- 2 Test fit your servos into the servo tray. Trim the tray as necessary to fit. If mini-sized or over-sized servos are being used, it may be necessary to make an additional servo tray. We recommend using standard size servos. Arrange them as shown in the picture above. Before securing the servos to the servo tray, read the instructions that came with your radio on how to install the servos.

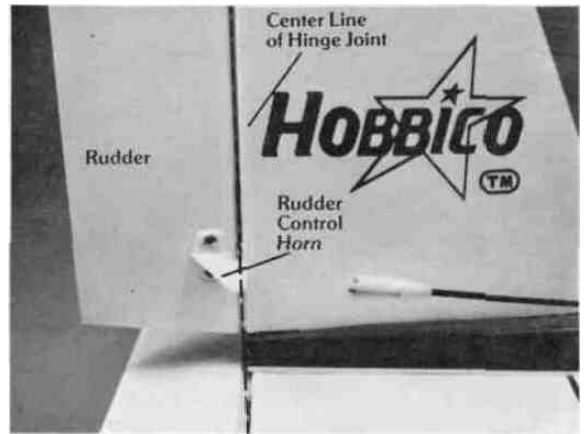
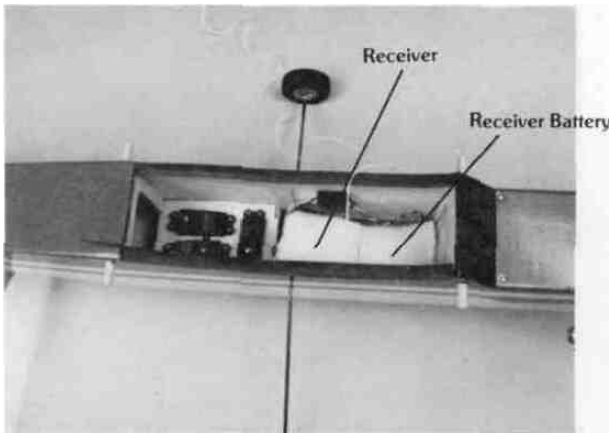


- 4 Set the hatch cover over the fuel tank compartment. Drill four 1/16" holes as shown. Secure the hatch using four 2.6mm x 12mm screws.



- 3 Mount the servo tray onto the rails inside the rear of the fuselage. Epoxy the tray in place. Use enough glue to hold the tray in place, but be very careful not to glue the servos to the tray or the fuselage.

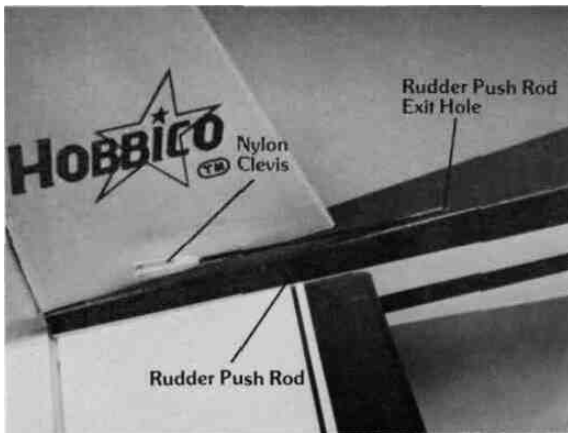
CONTROL HORN INSTALLATION



- 4 Plug the servos and switch into the receiver and the receiver battery into the switch. Then wrap the receiver and the receiver battery in natural foam. Use rubber bands to loosely hold the foam in place. This foam packing protects the radio components from damaging engine vibrations. Place the battery toward the front of the compartment.

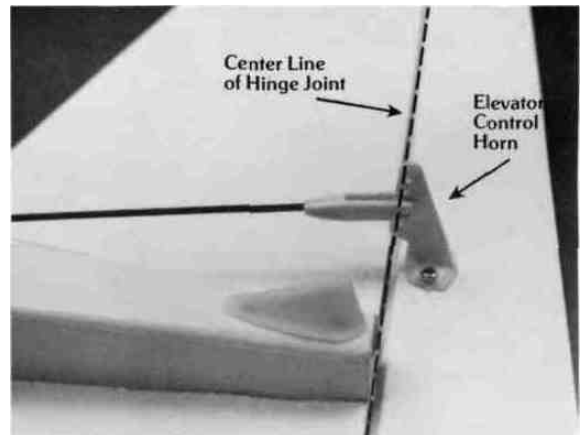
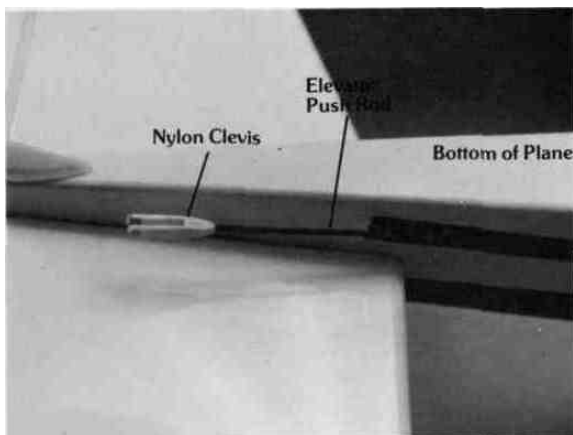
- 1 When installing control horns the center line of the control horn holes must be the same as the center line of the hinge joint. If not, the control surface will move farther one way than the other.

PUSH ROD INSTALLATION



- 1 Insert the threaded end of the rudder pushrod into the fuselage, working it around until the end of the push rod is extending through the exit hole on the top of the fuselage. This may take some time. Install the nylon clevis onto the threaded end of the push rod.

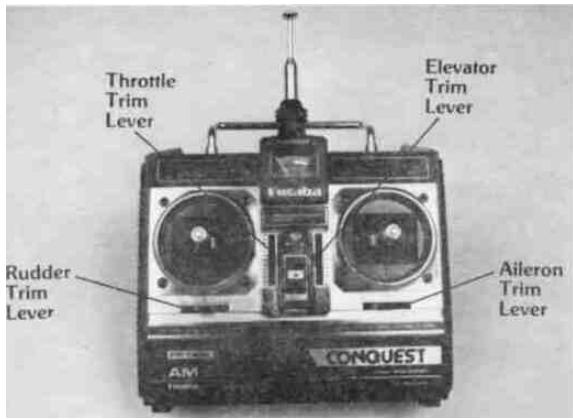
- 2 Mount the rudder control horn so that it is on the center line of the hinge joint and pointing toward the push rod as shown. Mark the location of the two mounting holes and drill a hole on the marks. Insert the m2x2 screws through the horn and into the control horn back plate. Attach the clevis to the control horn.



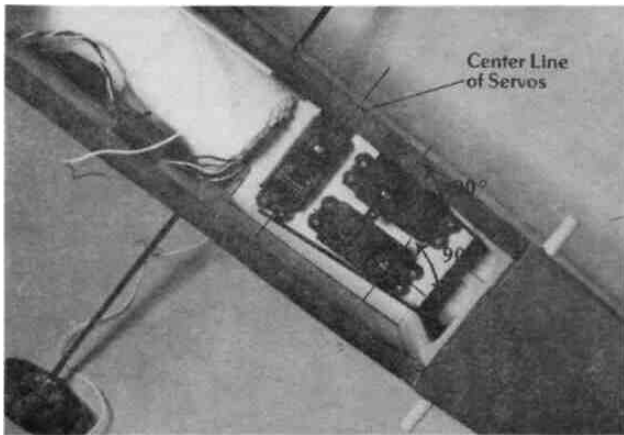
- 2 Insert the threaded end of the elevator pushrod into the fuselage, working it around until the end of the rod is extending through the exit hole on the left lower side of the fuselage. This may take some time. Install the nylon clevis onto the threaded end of the push rod.

- 3 Mount the elevator control horn on the elevator so it is on the elevator hinge joint center line and pointing toward the elevator pushrod. Using the same procedure as before, install the m2x12 screws and control horn back plate. Attach the clevis to the control horn.

CONTROL ROD ADJUSTMENT

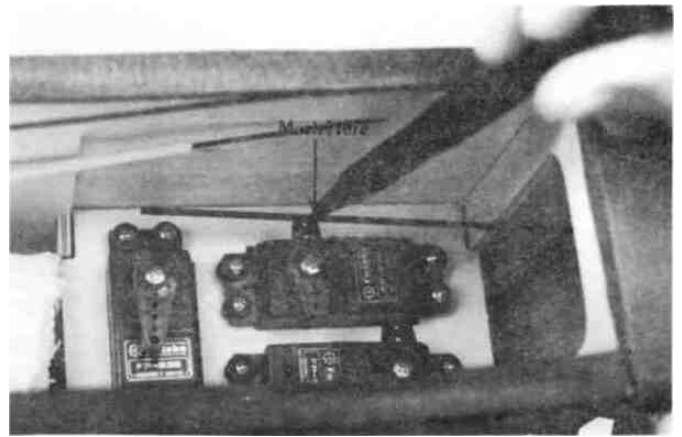


- 1 Be sure that your radio system is fully charged and the servos are plugged into the receiver. Turn on the transmitter then receiver. Set the trim levers to the neutral position. Turn the receiver then the transmitter back off.

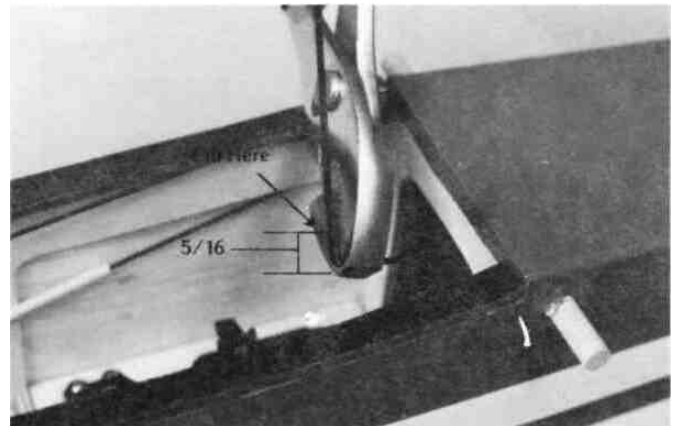


- 2 Adjust the servo arms so that they are positioned as shown above. The screw holding the arm on may need to be removed so that the arm can be removed and adjusted.

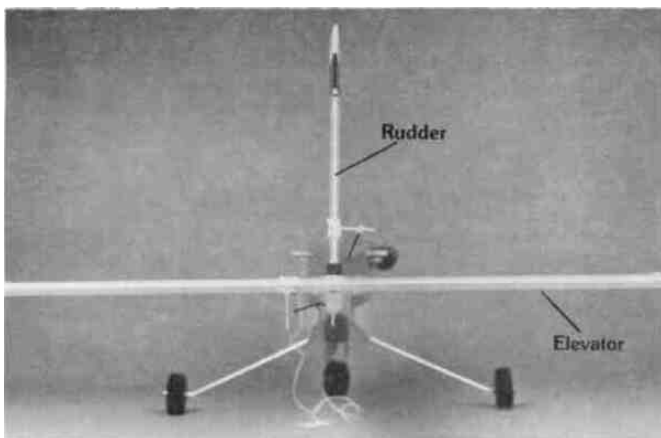
RADIO INSTALLATION



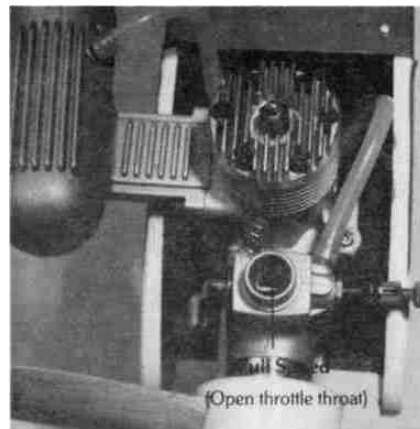
- 4 If using the Snap R' Keeper mark on the push rod where the hole in the servo arm is.



- 5 Make a 90° bend at the mark on the push rods. Cut the excess wire as shown, and install the Snap R' Keepers to the rod and servo arms following the manufacturer's instructions. If using E Z connectors install them on the servo arms and attach the rods following the manufacturer's instructions.

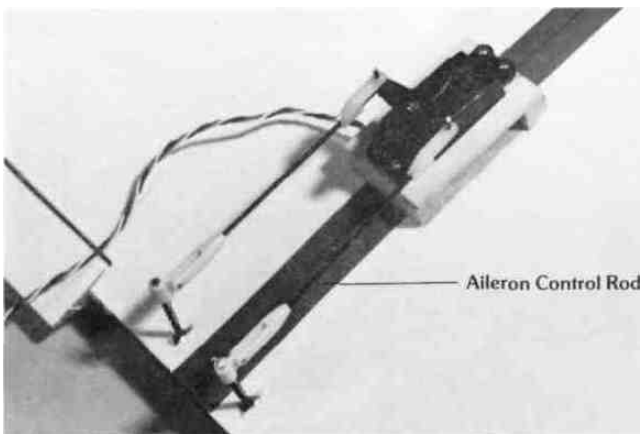


- 3 Set the rudder and elevator so that they are in the neutral position as shown.

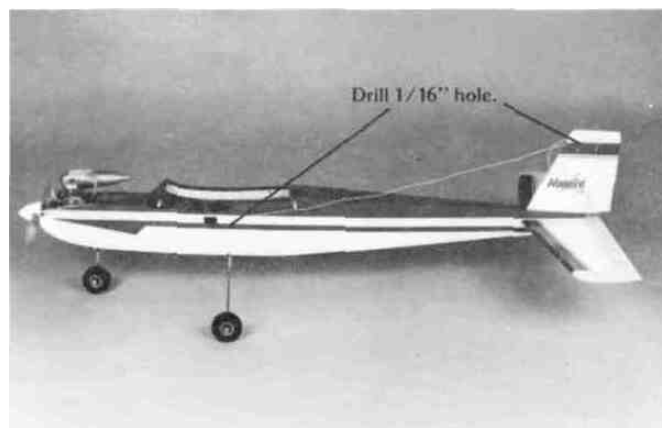


- 6 With the transmitter and receiver on, set the throttle to full speed on the transmitter. Set the throttle arm on the carburetor to full power. Install the push rod as instructed in previous step.

AILERON SERVO INSTALLATION



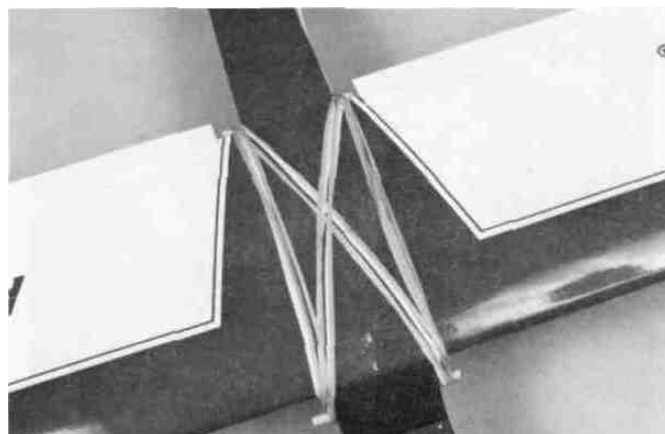
Route the servo wire through the side of the tray as shown. Using the screws supplied with your radio, mount the servo into the tray. Install the clevises on the threaded ends of the aileron control rods. Connect the control rods to the aileron horns. Center the aileron servo arm and measure the length of rod needed. Use the same procedure to connect the aileron control rods to the servo arms as used in control rod adjustment. Step 5: Uneven aileron centering will cause severe turns.



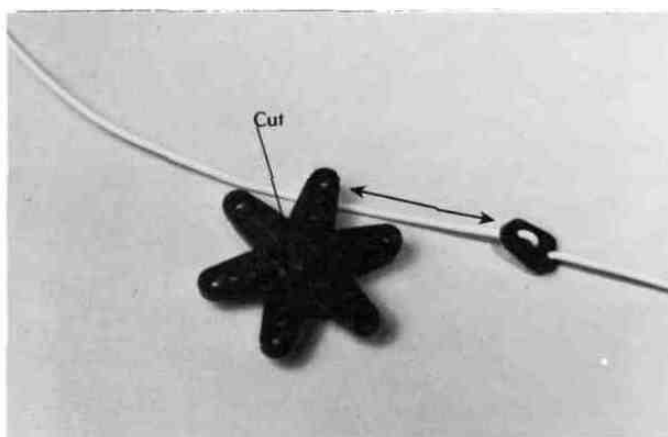
- Drill a 1/16" hole in the side of the fuselage and the upper portion of the vertical stabilizer. Install the strain relief close to the receiver. Route the receiver antenna through the holes as shown. This configuration should allow for the best radio reception. Move the strain relief up to the hole in the fuselage. Leave some slack in the antenna between the receiver and the strain relief. **Do not cut the antenna.**



Turn both the transmitter and receiver switches on. Center the trim levers on the transmitter. Rotate the adjusters in the proper direction to center the control surfaces (clockwise-shortens the length). The rudder should have 1" of throw to each side. The elevator 1/2" up and 1/2" down.



At this time be certain that the aileron servo is connected to the receiver, otherwise the wing will need to be removed later to connect it. The wing is mounted to the fuselage by using (8) #64 rubber bands. Wrap the bands around the wooden dowels as shown above. This design is to allow for those not so perfect landings that come with learning how to fly. The bands are designed to pop off during hard landings and thus help prevent major damage. Four rubber bands are needed per side.



CENTER OF GRAVITY

The center of gravity is a very important aspect of setting up the airplane properly. It will control a large part of what type of flying characteristics your plane will have. If it is nose heavy (C.G. is too far forward), the airplane will try to dive, and the elevator will be sluggish to respond to your control inputs. If the plane is tail heavy (C.G. is too far back), the airplane will be very sensitive to the elevator and possibly uncontrollable. The center of gravity should be checked with the fuel tank empty in the plane to be accurate. The range in which the airplane should balance is 3" to 3 1/4" back from the leading edge of the wing. With standard radio equipment, the plane should balance within this range. If it does not balance within this range, feel free to add weight to the nose or tail as you need to obtain proper C.G.

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. To INCREASE the amount of movement that the surface will have, move the CLEVIS CLOSER to the surface or move the (SNAP R KEEPER OR E-Z CONNECTOR) away from the center of the servo arm. To DECREASE the amount of movement, move the CLEVIS AWAY from the surface or move the (SPAN'R- KEEPER OR E-Z CONNECTOR) closer to the center of the servo arm.

- If the receiver antenna should get caught, the receiver could possibly be damaged. By putting a strain relief on the antenna, the damage may be prevented. Cut an arm off of a servo arm as shown above and thread the receiver antenna through the three holes.

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, the position of the prop is of no concern

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 Avistar Breaking in the engine allows the parts to seat to each other

- 1 Remove the carburetor fuel line and the muffler pressure line from the muffler
- 2 Fill the fuel tank through the carburetor fuel line, when the tank is full the fuel will come out the pressure line
- 3 Reconnect the tubing
- 4 Follow your manufacturer's instructions according to needle valve settings

- 5 Turn the radio on and open the throttle to full open Place your finger over the air intake on the carburetor while turning the prop counter clockwise a few times Notice the fuel line If any fuel is being sucked into the carburetor turn the prop a few more times If no fuel is reaching the carburetor recheck the fuel line plumbing
- 6 Reduce the throttle to 1/4 or 1 2 throttle for starting
- 7 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
- 8 Attach the glow plug clip at this time.
- 9 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
- 10 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 Again check with the manufacturers recommendations for engine break in procedures and valve settings
- 11 If you continue to have problems with the performance or starting of your engine, refer to the engine trouble shooting guide shown below

ENGINE TROUBLESHOOTING GUIDE

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

FLIGHT CHARACTERISTICS

Pre-Flight Check

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

Flight Safety

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

Take-Off

The airplane may be taxied around on a smooth/open section of pavement without the wing after the engine has been adjusted and the radio has been properly checked Become familiar with controlling the plane on the ground with the rudder In the air you will find that most of the time you will be using a combination of elevator and ailerons to turn the plane because they are more effective in the air On the ground the rudder is more effective A transition will need to be made once the plane leaves the ground That transition from using the rudder on the ground to using the ailerons once it leaves the ground will take a little practice 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

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

Flight

Once the plane has reached a safe altitude reduce the throttle to about half power If the airplane is properly set up (i.e. correct C.G. trims all centered engine properly set) the plane should be very stable without any wandering tendencies If the plane does tend to go one direction more than another use your trim levers on your transmitter to correct this Do not look at the transmitter while adjusting trims Then while the plane is flying straight adjust the elevator trim to correct abnormal climbing or diving If the trims will not overcome a turn or a climbing tendency land the model immediately and check for improper setup

Landing

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

Set up your landing approach downwind at 100 200 feet up and 500 800 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 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

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



YOUR FIRST FLIGHT

Pre-Flight Checklist

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

- A Make sure transmitter and receiver battery packs are fully charged
One way to check is by using a Hobbico voltmeter
- B Transmitter make sure it is the same frequency as the receiver
- C Glow plug clip and fully charged 1 1/2 volt battery
- D Fuel and fuel pump or fuel bulb
- E Rubber bands #64
- F Extra props
- G Screw driver and knife
- H Epoxy and something to mix it on
- I Paper towels (to clean the plane)

YOUR FIRST FLIGHT

Before starting the engine check and make sure all screws are tight that the hinges have not come loose the control surfaces move in the right directions according to your input on the transmitter and nobody is on your frequency

- 1 Start the engine and set the needle valve following the engine manufacturer s instruction
- 2 Hold the plane tightly and move the throttle to full speed Pick the plane up and hold it at a 45° 60° nose up for 10 15 seconds The engine should run smoothly If it starts to die the engine is either too rich or too lean and the needle valve needs readjusting

- 3 **Taxi the Avistar to the end of the runway and point the nose into the wind**
- 4 Check that the control surfaces respond to the transmitter commands
- 5 Gently advance the throttle to full power
- 6 Gently steer the Avistar left or right as necessary to obtain a straight take off
- 7 After the plane has gained speed, gently pull back on the elevator stick **Do not** allow the plane to climb too steeply
- 8 Keep the wings level and reduce the throttle some to obtain a gentle climb
- 9 To turn gently move the aileron stick to the side and pull back on the elevator If too much aileron is used the plane will bank too steeply Make a wide gentle turn When the turn is completed, return the sticks to the center
- 10 After the plane passes by you make another wide 180° turn
- 11 When learning to fly it is easier to control the plane by facing the direction the plane is going and looking over your shoulder at it
- 12 Fly in a figure eight-making left and right turns at the end of the straights
- 13 For the first landing don t worry about landing on the runway just try not to hit any objects Decide where you are going to land **and** gently turn into the wind 500 800 feet down wind
- 14 When you know you can reach the landing area, reduce the throttle You want the plane to gently descend towards the landing area Keep the wings level and do not allow the nose to rise This can produce a stall (a lack of lift) and the plane will dive steeply
- 15 If the plane is going to be short of the landing area apply some power to reach the landing area If the plane is too high apply power and climb back up to some altitude and set up to land again With practice you will be flying with more confidence and able to make nice smooth landings on a runway The only way to become a good pilot is to practice

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