HOBBISTAR 60 MKII

ASSEMBLY INSTRUCTIONS

Wingspan: 71" [1,803mm]
Wing area: 887.5" [57.24 sq. dm.]
Weight: 7 lbs [3,630g]
Wing loading: 18 oz/sq ft [55 g/sq. cm]
Length: 55" [1,397mm]
Radio: 4-ch (four servos)
Engine: .61 two-stroke, .91 four-stroke
[10cc 2-stroke, 15cc 4-stroke]

90-DAY LIMITED WARRANTY

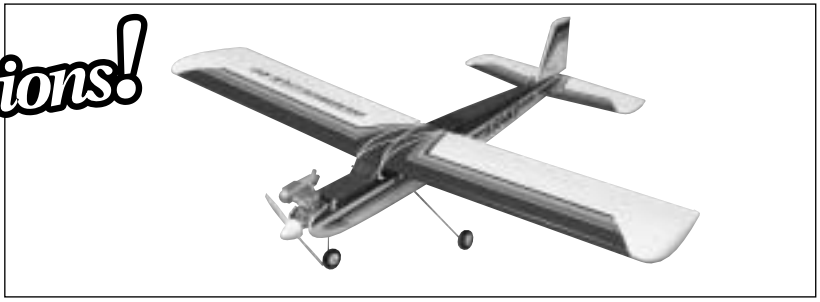
If you, as the original owner of this model, discover defects in parts and workmanship within 90 days of purchase, Hobbico will repair or replace it – at the option of our authorized U.S. repair facility, Hobby Services – without charge. Our liability does not include the cost of shipping to us. However, Hobby Services will pay shipping expenses to return your model to you. You must provide proof of purchase, such as your original purchase invoice or receipt, for your model's warranty to be honored. This warranty does not apply to damage or defects caused by misuse or improper assembly, service or shipment. Modifications, alterations or repair by anyone other than Hobby Services voids this warranty. We are sorry, but we cannot be responsible for crash damage and/or resulting loss of kits, engines, accessories, etc.

Your Hobbistar .60 MKII ARF must be returned directly to Hobby Services for warranty work. The address is: **Hobby Services, Attn: Service Department, 1610 Interstate Drive, Champaign, IL 61822-1067. Phone: (217) 398-0007.** Please follow the instructions below when returning your model. This will help our experienced technicians to repair and return it as quickly as possible.

1. ALWAYS return your entire system, including airplane and radio.
2. Disconnect the receiver battery switch harness and make sure that the transmitter is turned off. Disconnect all batteries and drain all fuel.
3. Include a list of all items returned and a THOROUGH, written explanation of the problem and service needed. If you expect the repair to be covered under warranty, also include your proof of purchase.
4. Include your full return address and a phone number where you can be reached during the day.

If your model is past the 90 day warranty period or is excluded from warranty coverage, you can still receive repair service through Hobby Services at a nominal cost. Repair charges and postage may be prepaid or billed COD. Additional postage charges will be applied for non-warranty returns. All repairs shipped outside the United States must be prepaid in U.S. funds only. All pictures, descriptions and specifications found in this instruction manual and on the product package are subject to change without notice. Hobbico maintains no responsibility for inadvertent errors.

Congratulations!



You're about to build in just hours what took aviation pioneers years–a powered machine that flies. Specially created for you and other first-time radio control modelers, Hobbico's Hobbistar .60 MKII offers nearly all the excitement of piloting a real airplane...and develops skills that will take you anywhere you want in your hobby.

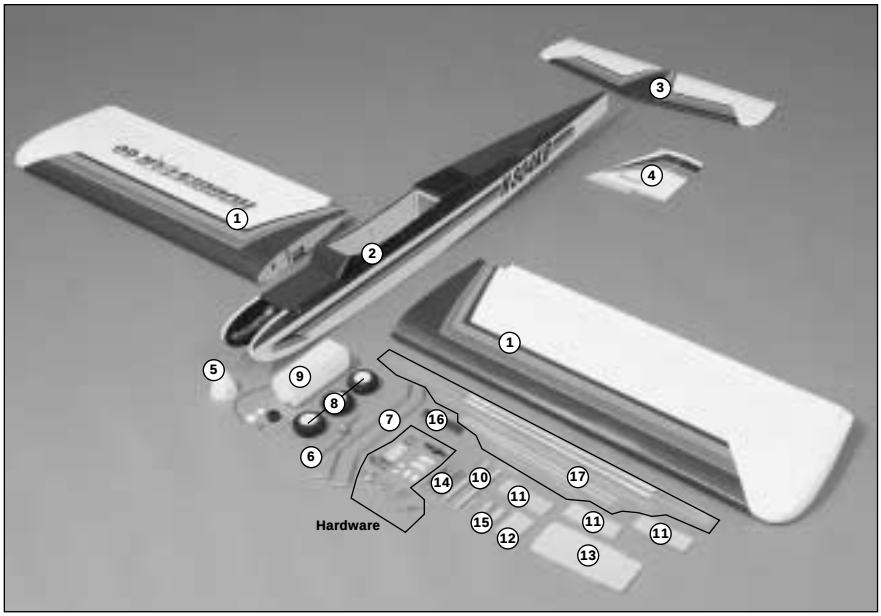
Kit Contents / Ordering Replacement Parts

Need to purchase replacement parts for your Hobbistar .60 MKII ARF? Please see the chart below regarding purchase information for parts. Please note that only those items listed are available and individual pieces within a particular set (such as a single aileron or a firewall) cannot be purchased separately.

Item	**Description**	**How to Purchase**
Missing pieces		Contact Hobby Services (see warranty front page)
Plans	Construction Plans	Plans are not available for ARF models
Manual	Instructions	Contact Hobby Services (see warranty front page)
Hardware	Individual hardware items	Contact your hobby supplier*
HCAA3107	**MKII Fuselage**	Contact your hobby supplier*
HCAA3106	**MKII Landing Gear**	Contact your hobby supplier*
HCAA3108	**MKII Wing Set**	Contact your hobby supplier*
HCAA3109	**MKII Tail Set**	Contact your hobby supplier*
HCAA3104	**MKII Wing Tip**	Contact your hobby supplier*

*Please visit your favorite hobby shop or contact your favorite mail order / Internet order firm to purchase these items. As a distributor, we support our retailers by referring all business to them, so our support team does not normally sell these items. Please feel free to visit **www.hobbico.com** and click on "Where to Buy" to assist you in locating a dealer in your area.

Kit / Airframe Parts & Hardware



Kit / Airframe Parts	
1 Wing with Ailerons	**11** Wing Joiner
2 Fuselage	**12** Aileron Servo Tray
3 Stab with Elevators	**13** Plywood Servo Tray
4 Fin with Rudder	**14** Engine Mount Straps
5 Spinner	**15** Aileron Servo Tray Blocks
6 Nose Gear Wire	**16** Wing Joining Tape
7 Main Landing Gear Wire (2)	**17** Pushrods and Pushrod Tubes
8 Wheels (3)	
9 Fuel Tank with Hardware	
10 Wing Dowels	

Other General Items Required

Clothespins
Epoxy Brushes (GPMR8062)
Mixing Sticks (GPMR8055)
1/4" Foam Rubber (HCAQ1050)
T-Pins (HCAR5150)
Masking Tape (TOPR8018)
Monofilament String
Felt-Tip Pen
Sanding Block
Adjustable Wrench
Paper Towels
Builders Triangle Set (HCAR0480)
Plastic Wrap or Wax Paper
Round Toothpicks
Wire Cutter
#64 Rubber Bands
70% Isopropyl Alcohol
Small Hobby Clamps
Razor Saws

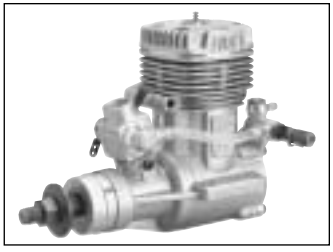
Other Items You'll Need:

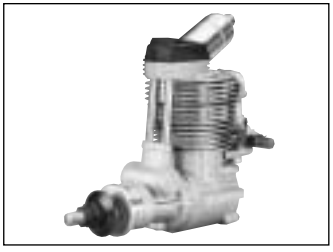
Glues

Choose 6-minute and 30-minute epoxy, such as Great Planes® Pro™ Epoxy, which has been formulated especially for R/C model building. Pro Epoxies offer a strong bond and a variety of curing times suited for every step of assembly. You'll also need a thin instant-setting CA (cyanoacrylate), medium CA+, plus rubbing alcohol for easy epoxy cleanup. Great Planes Pro Threadlocker is also recommended to secure threaded fasteners.

Tools

Tools and accessories required for assembly include a hobby knife; small and large Phillips screwdrivers; needle nose pliers; electric drill with 1/16" [1.5mm] and 1/8" [3mm] bits; ruler; 2 feet of medium (3/32") fuel tubing; and 150 to 200-grit sandpaper.



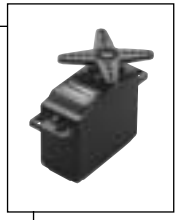


Model Engine

Power your Hobbistar .60 MKII with a hot 2-stroke such as an O.S®. .61 FX. If you prefer a 4-stroke, an O.S. FS-91 is an ideal choice. Your choice of 2-stroke or 4-stroke will determine the location of the throttle servo and throttle pushrod exit on the firewall, so plan ahead.

Radio Equipment

In selecting a radio system for your Hobbistar .60 MKII, you'll need at least a 4-channel radio system with four standard servos. Many of the 4-channel radios offered include only three servos, so it may be necessary to purchase an extra servo along with your radio system. The servos and receiver will be mounted on-board your model and need to be cushioned from shock and vibration. One-half inch thick foam rubber sheets (HCAQ1050) are available from your hobby dealer for this purpose.



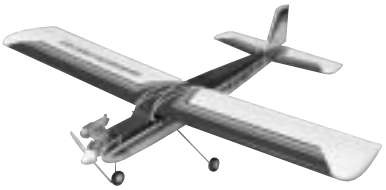
Protect Your Model, Yourself & Others... Follow This Important Safety Precaution

Your Hobbico Hobbistar .60 MKII is not a toy, but rather a sophisticated, working model that functions very much like an actual airplane. Because of its realistic performance, the Hobbistar .60 MKII, if not assembled and operated correctly, could possibly cause injury to yourself or spectators and damage property.

If this is your first trainer, or if you are uncomfortable in making the initial flight of your Hobbistar .60 MKII, it is recommended that you get help from an experienced, knowledgeable modeler with your initial flights.

You may also want to contact the Academy of Model Aeronautics (AMA), which has more than 2,500 chartered clubs across the country. Through the AMA, you should either be able to locate a modeler nearby that can help, or at least be able to phone one that can verbally instruct you for any potential problems that could occur. Contact the AMA at the address or phone number below:

Academy of Model Aeronautics
5151 East Memorial Drive
Muncie, IN 47302
Office: (765) 287-1256
Toll Free: (800) 435-9262
Fax: (765) 741-0057
Internet:http://www.modelaircraft.org



AMA
SINCE 1936
JOIN THE AMA

WARNING! This is not a Toy! Please follow these safety precautions:

Before you fly:

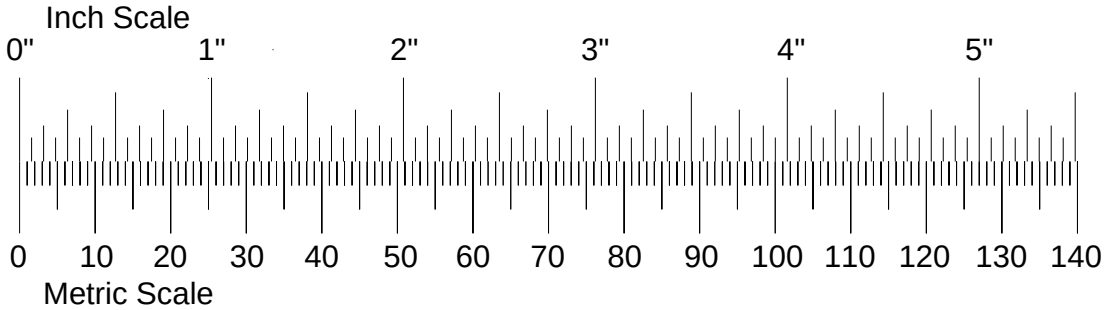
1. Make sure that no other fliers are using your radio frequency.
2. Your radio transmitter must be the FIRST thing you turn ON, and the LAST thing you turn OFF.
3. Double check all control surfaces.
4. Make sure that the transmitter & receiver batteries are fully charged.

Fuel storage and care:

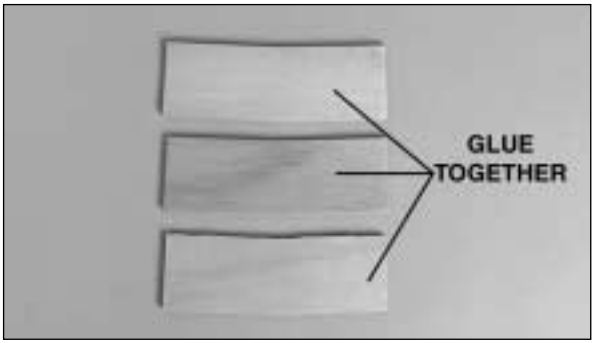
1. Do not smoke near your engine or fuel.
2. Store all engine fuel in a safe, cool, dry place, away from children and pets. Model fuel will evaporate, so make sure that you always store it with the cap secure.

When starting and running your engine:

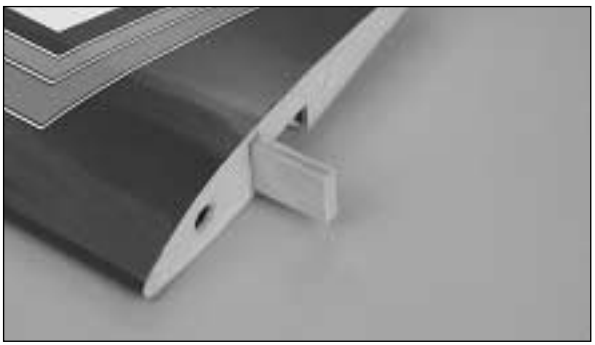
1. Always wear safety glasses.
2. Make certain that your glow plug clip is securely attached to the glow plug and cannot pop off, possibly falling into the spinning propeller.
3. Use a “chicken stick” or electric starter to start the engine – NOT your fingers.
4. Make sure that the wires from your starter and glow plug clip cannot become tangled with the spinning propeller.
5. Do not stand at the side of the propeller when you start or run the engine. Even at idle speed, the spinning propeller will be nearly invisible.
6. If any engine adjustments are necessary, approach the engine only from behind the spinning propeller.



Wing Assembly

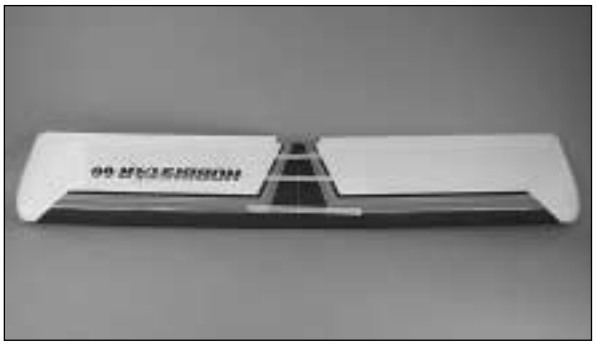


❏ 1. Locate three plywood **wing joiners.** Using 6-minute epoxy, glue them together to form the wing joiner.

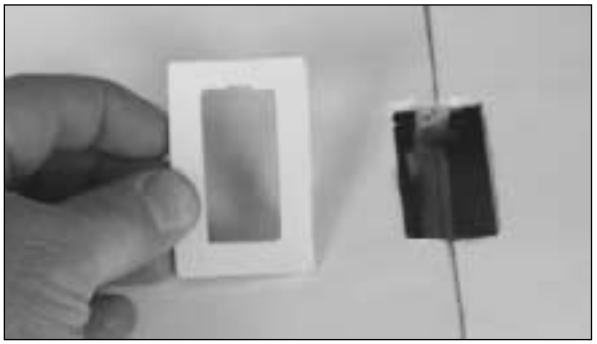


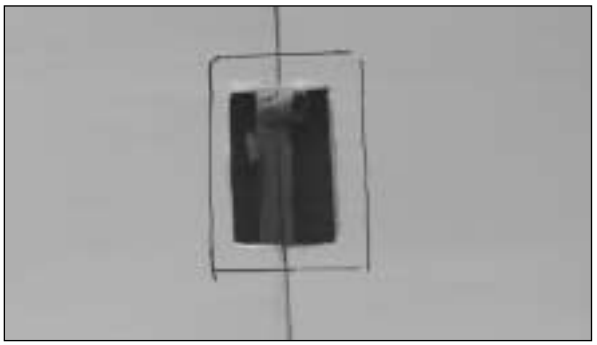
❏ 2. After the glue has cured, test fit the joiner into the **wing.** Be sure that the upward angle of the joiner is towards the top of the wing.

❏ 3. Once you are satisfied with the fit of the wing joiner, apply a liberal amount of 30-minute epoxy to the joiner and the wing ribs. Put the wing joiner into the joiner box in the wing and push the two wing halves together and allow the glue to cure.

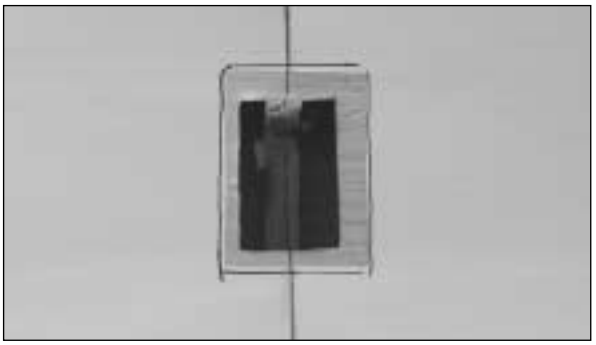


❏ 4. Use masking tape to hold the two wing halves together while the epoxy cures. Wipe away any excess epoxy from the wing surface with Isopropyl alcohol.

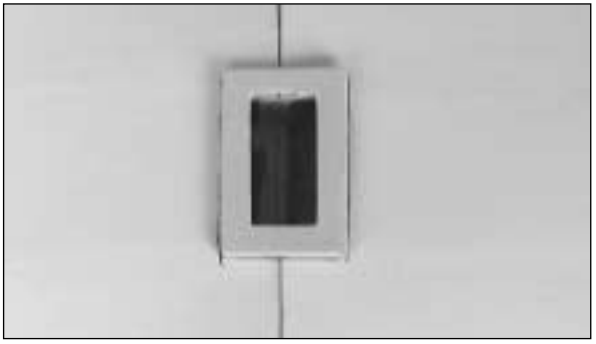




❏ 5. Locate the plywood **aileron servo tray.** Place it in position over the opening in the bottom of the wing. With a felt-tip pen, mark the position of the servo tray.



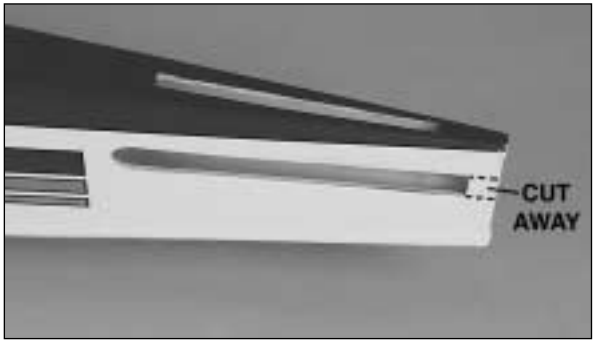
❏ 6. Use a hobby knife to cut away the material that you have just marked with the felt-tip pen. Cut lightly, being sure that you do not cut into the surface of the wood.

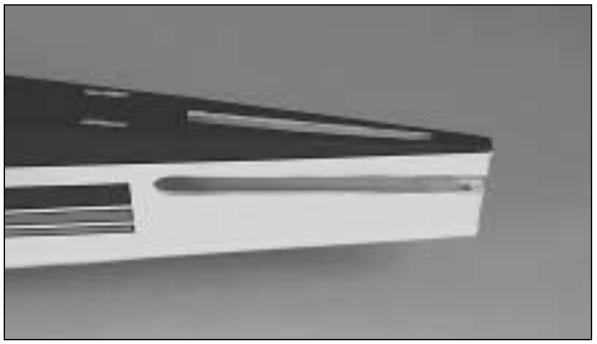


❏ 7. Use 6-minute epoxy to glue the servo tray to the opening in the bottom of the wing. **Important Note:** *Before gluing the tray in place, test fit your servo into the wing. The opening is deep enough to accommodate most servos. If it is not deep enough for your particular brand of servos, glue the servo tray to the two 1/4" [6mm] balsa blocks included in the kit and then, glue the blocks to the wing with epoxy.*

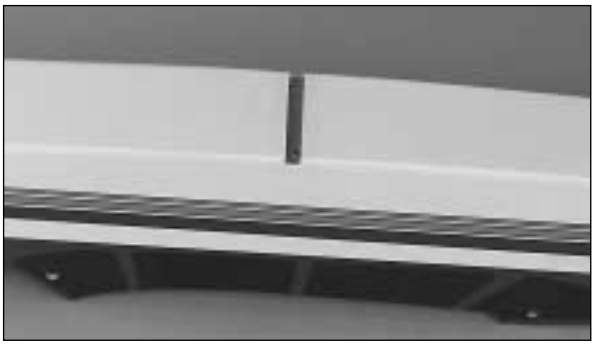
❏ 8. Locate the blue **wing joining material.** Peel off the backing and carefully place it over the seam on the top and bottom of the wing.

Prepare the Fuselage



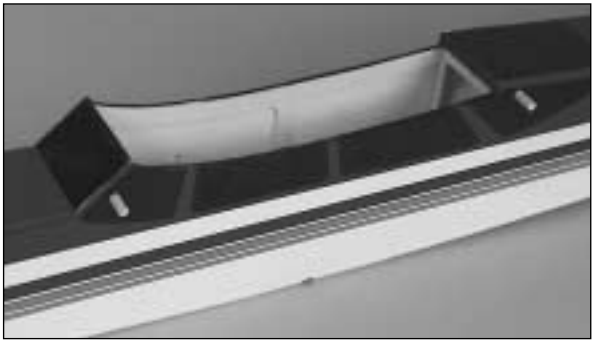


❏ 1. Cut away the covering at the rear of the **fuselage** for the horizontal stab, fin and pushrod openings. Cut away the remainder of the stab opening at the rear of the fuselage with your hobby knife.



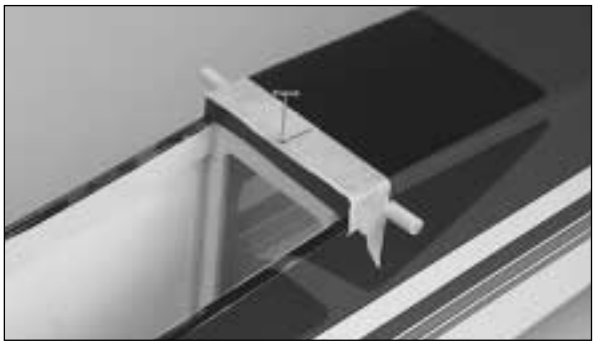
❑ 2. Turn the fuselage over and cut away the covering on the bottom of the fuselage for the landing gear.

❑ 3. Cut away the covering at the wing saddle for the wing hold down dowel holes.

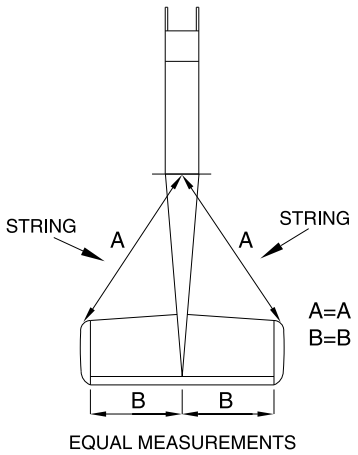


❑ 4. Using 6-minute epoxy, glue the two **wooden dowels** in place at the wing saddle.

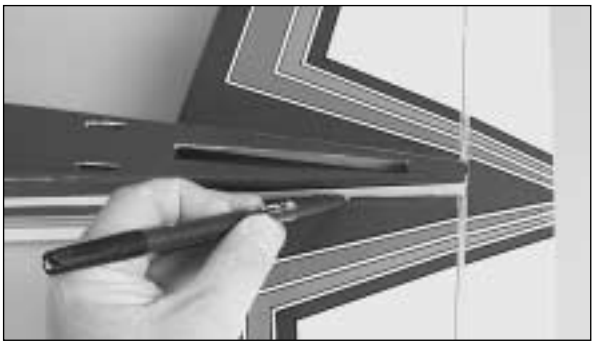
❑ 5. Fit the **horizontal stabilizer** in place at the rear of the fuselage. **Do not glue it in place!**



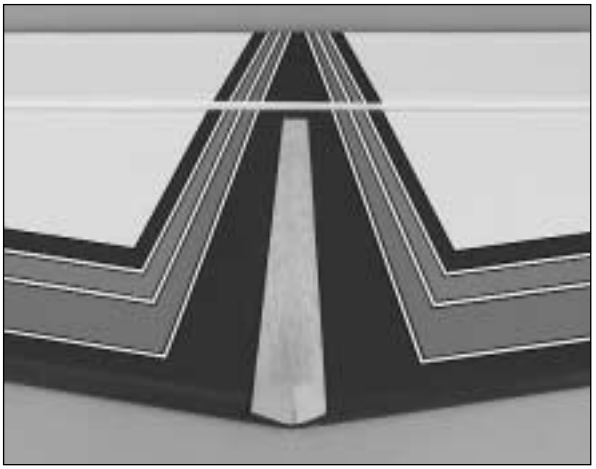
❑ 6. Apply a piece of masking tape across the top of the fuselage at the back of the wing saddle. Mark the center of the fuselage on the tape. Insert a T-pin on the center mark.



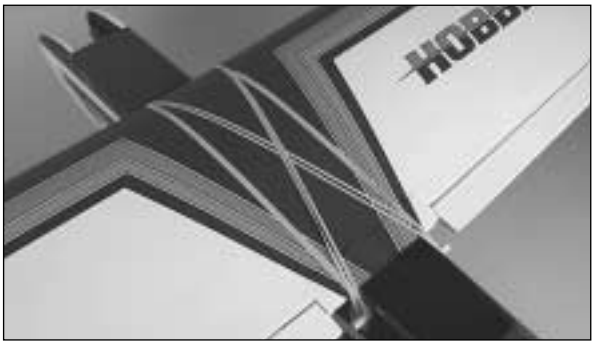
❑ 7. Attach one end of monofilament string or a small tape measure to the T-pin. Measure back to the end of the stabilizer on the left side of the fuselage. Do the same for the right side of the fuselage. When the distance from the T-pin to each side of the stabilizer is equal, the stab is properly positioned.



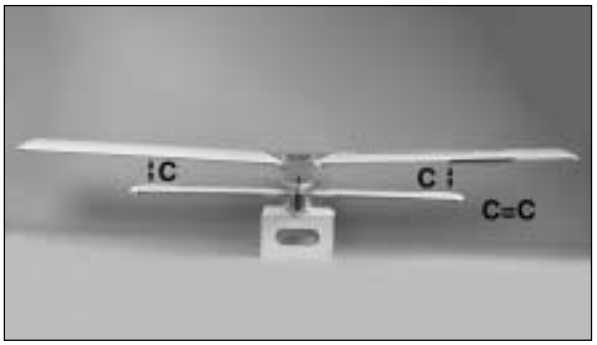
❑ 8. Once the stab has been properly positioned, use a felt-tip marker and trace the outline of the fuse onto the stabilizer. Do this on both the top and bottom of the stabilizer.



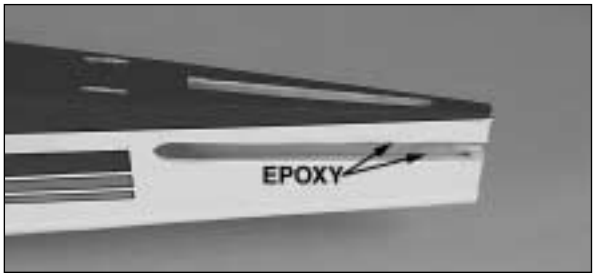
❑ 9. Cut away the covering inside of the lines you made on the stab. Do this on both the top and the bottom of the stabilizer, being careful not to cut into the wood sheeting.



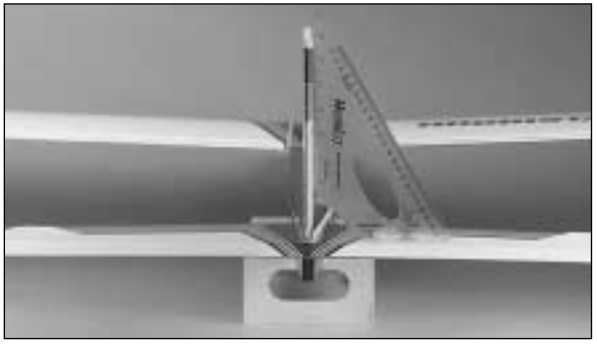
❑ 10. Use a few rubber bands and mount the wing in place on the wing saddle.



❑ 11. With the stabilizer in place in the rear of the fuselage, step back a few feet and look at the stabilizer in relation to the wing. The distance from the top of the stab to the bottom of the wing should be the same. If each end of the stabilizer is not equal in distance from the wing, lightly sand one side of the opening until both ends of the stabilizer measure the same distance from the wing.



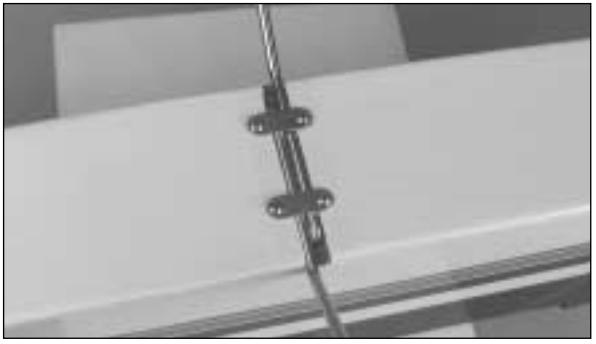
❑ 12. Once you have the stabilizer properly fit to the fuselage, remove it and apply 6-minute epoxy to the stabilizer where you cut the material away and to the wing saddle. Slide the stabilizer into the fuselage. Re-check to be sure the stabilizer is positioned properly and that it is in the correct position in relation to the wing.



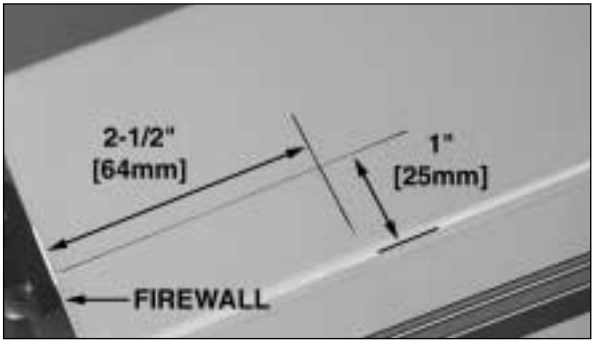
❑ 13. After the epoxy has cured on the stabilizer, test fit the **fin** into the slot in the top of the fuselage.

Use a triangle to make sure that the fin is perpendicular to the stab. Once you are satisfied with the fit, glue the fin to the fuselage with 6-minute epoxy.

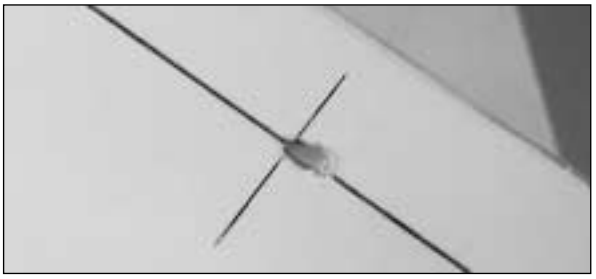
Landing Gear Installation



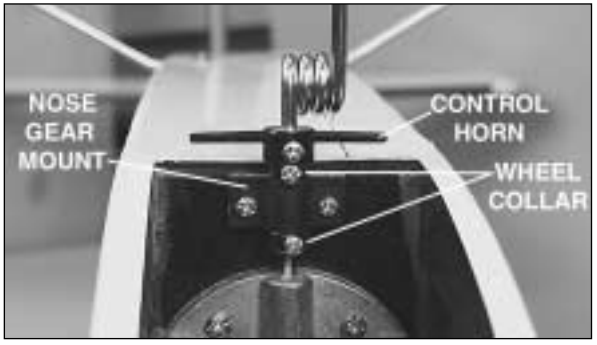
❑ 1. Insert the **landing gear struts** into the holes in the bottom of the fuselage. Secure the landing gear with the two metal straps. Mount them in place with **3mm x 10mm self-tapping screws.**



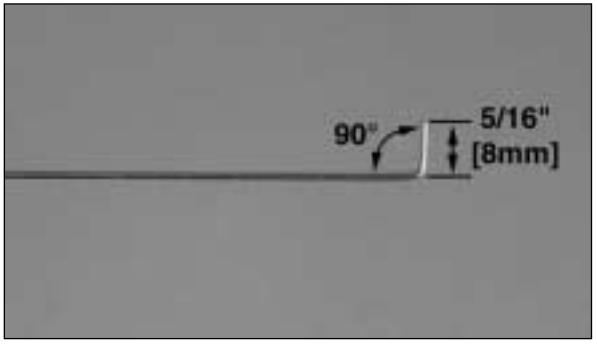
❑ 2. Draw two lines at the front of the fuselage with a felt-tip pen. Draw the lines using the dimensions shown in the above photograph.



❑ 3. At the intersection of the two lines drill a 1/8" [3mm] hole in the fuselage bottom. The hole needs to be drilled at a 30° angle. Cut one of the **white tubes** to 11" and rough it up with 240-grit sandpaper. Insert the tube into the fuselage so that the end of the tube is even with the bottom of the fuselage. Epoxy the tube to the fuselage.



❑ 4. Install the **nose gear control horn** parallel to the nose gear axle and tighten the mounting screw against the flat side of the wire. Next install a **4mm x 10mm collar** on top of the control horn and secure with a **3mm x 4mm screw.** Slide the nose gear shaft through the **nose gear mount.** Secure the gear in place with another 4mm x 10mm collar and a 3mm x 4mm screw.



❑ 5. Locate one of the 18" wire **control rods.** Make a 90° bend 5/16" [8mm] from the end of the wire.

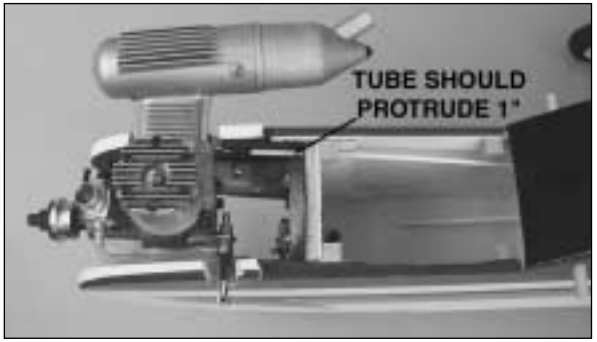
❑ 6. Slide the 18" wire **control rod** into the white nylon tube. Install the wire onto the control horn and retain it in place with the **1/16" wheel collar** and **4-40 set screw.**

❑ 7. Install the **wheel** on the nose gear. The nose wheel has a slightly smaller axle hole than the remaining two wheels. Install a 4mm x 10mm wheel collar and secure it with a 3mm x 4mm screw. Install a **5mm x 10mm wheel collar** on each side of the main landing gear. Then install the wheels and the other 5mm x 10mm wheel collar. Secure the wheel collars with the 3mm x 4mm screws. All three wheels should turn freely. If not, trim the inside of the wheel slightly.

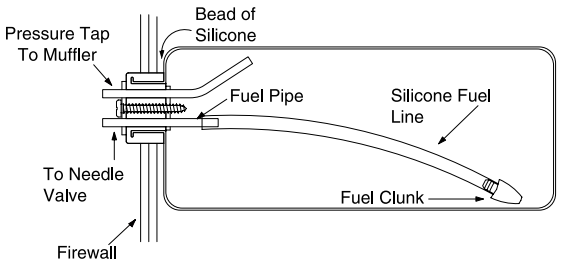
Engine Installation

❑ 1. Locate the two **metal engine mount straps.**

❑ 2. Put your engine onto the **engine mount. Note:** *Depending on your engine you may need to cut away portions of the fuselage sides for clearance for the muffler or needle valve.* Place the engine mounting straps over the mounting rails of the engine. Screw the mounting rails in place with the **4mm x 15mm screws** and **4mm lock washers.**



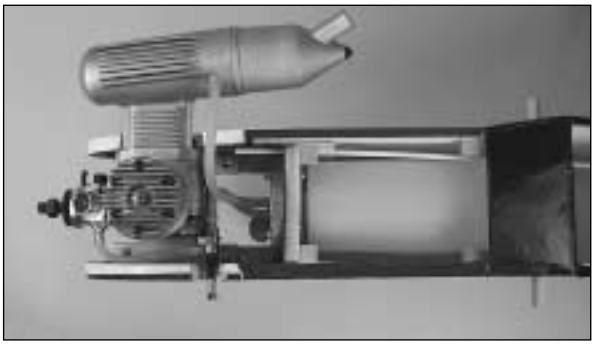
❑ 3. Remove the **fuel tank compartment cover** from the fuselage. Locate the **white nylon tube** and cut it to a length of 9". Install it through the pre-drilled hole in the firewall. Epoxy the tube in place so that 1" of the tube protrudes through the firewall.



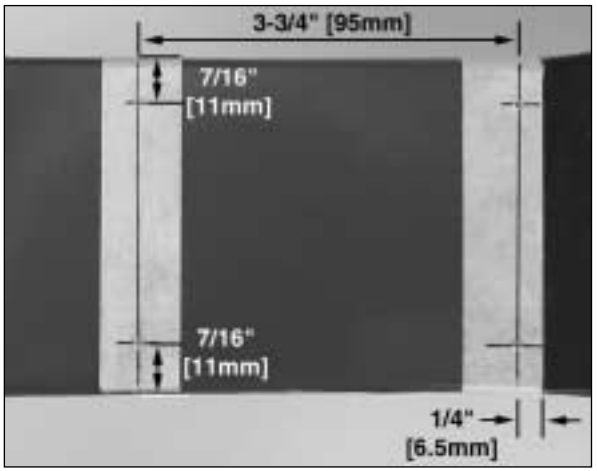
❑ 4. Assemble the fuel tank using the above sketch and the following instructions. Push the two **aluminum tubes** through the **rubber stopper** until 1/2" [13mm] of the tubes protrudes from the front of the stopper. Slide the **large cap** onto the front of the stopper and the **small cap** onto the back. Insert the **stopper screw** into the center hole in the front of the cap, then just begin to screw it through the stopper into the aft of the stopper cap.

❑ 5. Push one end of the **silicone pickup tube** all the way onto the **clunk,** and the other end all the way onto one aluminum tube. Bend the other aluminum tube (vent) upward at about a 45° angle, being careful not to kink the tube.

❑ 6. Insert the stopper assembly into the **fuel tank** and tighten the stopper screw.



❑ 7. Install the tank into the fuel tank compartment. Apply a bead of silicone sealant around the fuel tank cap when installing the tank into the fuselage. Attach silicone fuel line from the tank to the carburetor and muffler pressure fitting.



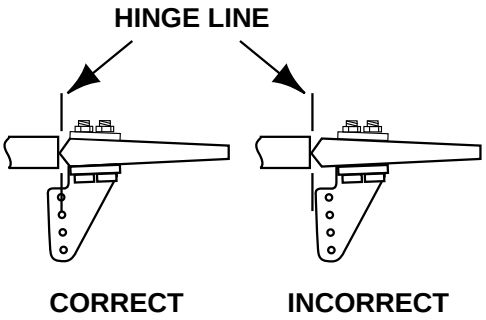
❑ 8. Put masking tape onto the fuel tank compartment cover as shown. Mark lines on the tape at the dimensions shown in the photograph. Drill four 1/16" [1.5mm] holes at the intersection of the lines, drilling through the cover and the four hardwood blocks in the fuselage. Secure the hatch to the fuselage with four 2.6mm x 12mm screws.

Pushrod Installation

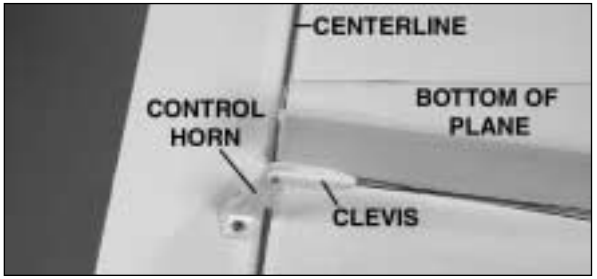
❑ 1. Locate one of the **wooden pushrods** with wire on each end. Insert the threaded end of the rudder pushrod into the fuselage, working it around until the end of the pushrod is extending through the exit hole on the top of the fuselage.

❑ 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 lower left side of the fuselage.

❑ 3. Install the **nylon clevis** onto the threaded end of the pushrod. Turn the clevis onto the rod with 14-turns of the clevis.

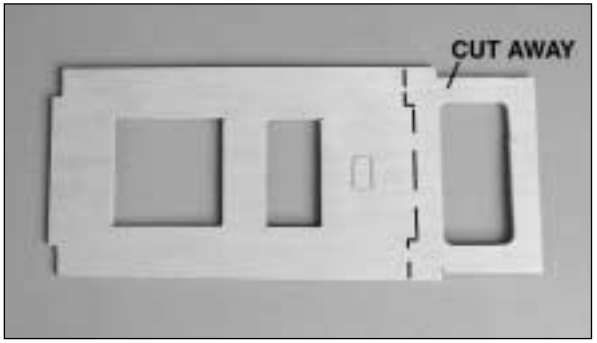


❑ 4. Position the **rudder control horn** on the rudder. Make a mark with a felt-tip pen where the holes need to be drilled. **Note:** *When installing the control horns, the centerline of the control horn holes must be the same as the center line of the hinge joint as shown in the above sketch.* Drill a 1/16" [1.5mm] hole through the marks you just made. Insert the **2mm x 20mm** screws through the control horn and into the **control horn backplate.**

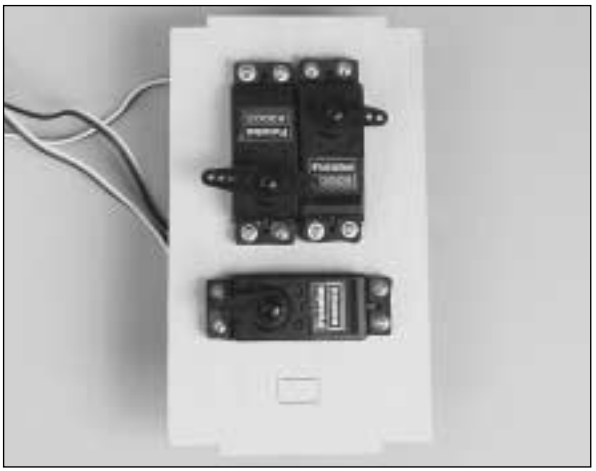


❑ 5. Position the elevator control horn on the elevator following the same procedure used for the rudder.

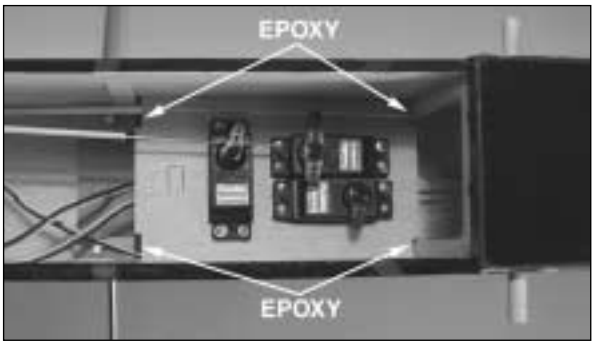
Radio Installation



❑ 1. Locate the plywood **servo tray.** Cut off the portion of the tray indicated by the dashed line.



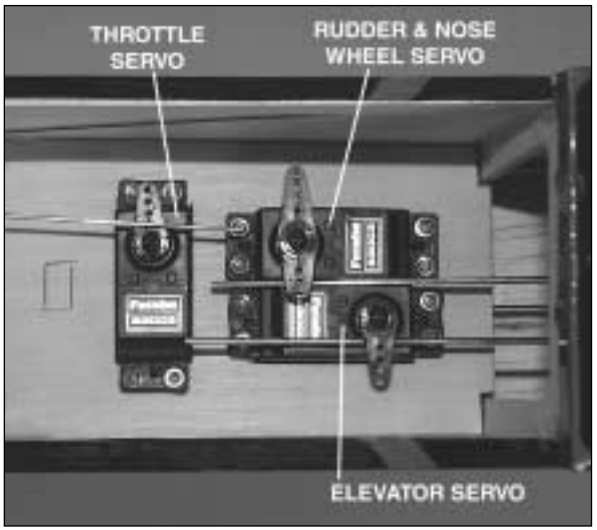
❏ 2. Using the hardware that comes with your servos, install the servos as shown. Use a 1/6" [1.5mm] drill to pre-drill the holes for the servo mounting screws. If you do not pre-drill the holes there is a chance that the plywood may split.



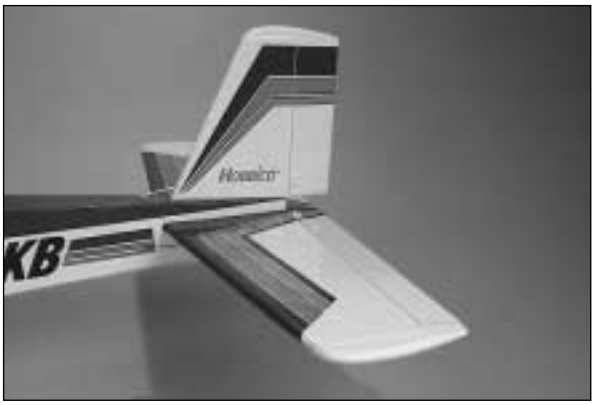
❏ 3. Use 6-minute epoxy to glue the tray in place inside of the fuselage. When properly installed, the servo tray will rest firmly on the rear former.

❏ 4. On both sides of the fuselage there is a cut out for your radio switch. Cut away the material on one side of the fuselage for the switch harness. Mount the switch to the fuselage following the instructions included with your radio system.

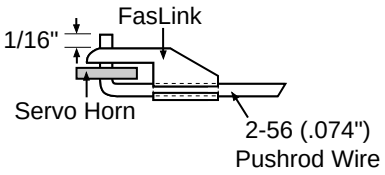
❏ 5. Plug the switch into the receiver and the receiver battery. Plug the servos into the receiver (consult your radio instruction manual for proper installation if you are unfamiliar with this). Wrap the receiver and the battery in foam rubber. Use rubber bands to keep the foam in place. It is important that the receiver and battery be wrapped in the foam to protect them from engine vibration. Place the receiver and battery in place as shown. We recommend that you glue scrap balsa stick to the fuselage to keep them in place.



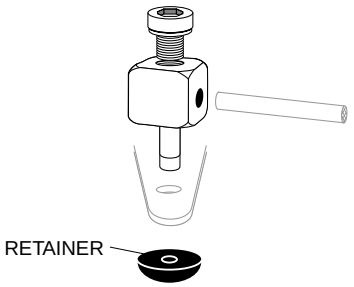
❏ 6. Center the trims on the transmitter, turn on the transmitter and receiver and allow the servos to center themselves. Once they are centered, install the servo arms onto the servos, positioning the arms as shown in the photograph.



❑ 7. Set the rudder and elevator so they are in the neutral position as shown.



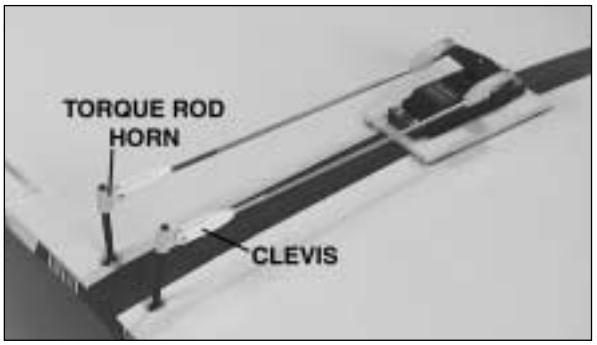
❑ 8. With the elevator servo and the elevator both in the neutral position, make a mark on the elevator pushrod where the hole in the servo arm is. Make a 90° bend at the mark on the pushrod. Insert the pushrod into the hole in the servo arm and attach a Great Planes FasLink™ (GPMQ3820) to the pushrod. Repeat this step for the rudder pushrod. Should you decide to use some other installation method, follow the manufacturer's instructions.



❑ 9. Locate a **screw-lock pushrod connector,** a **4-40 set screw** and the **nylon retainer.** Install it on the remaining arm on the rudder servo by first sliding the nose gear steering pushrod through the hole in the fitting and then assembling the screw-lock pushrod connector as shown in the above sketch. Set the nose wheel to be straight and then tighten the 4-40 set screw onto the pushrod wire.

❑ 10. Turn on the transmitter and receiver. Set the throttle to full open. Install the pushrod into the other screw-lock pushrod connector, then open the carburetor on your engine to full open. Connect the throttle linkage following the same steps as used for the nose gear steering.

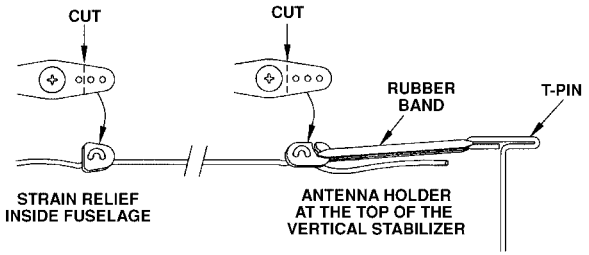
❑ 11. Install the servo into the plywood servo tray in the center of the wing. Use a 1/6" [1.5mm] drill to pre-drill the holes for the servo mounting screws.



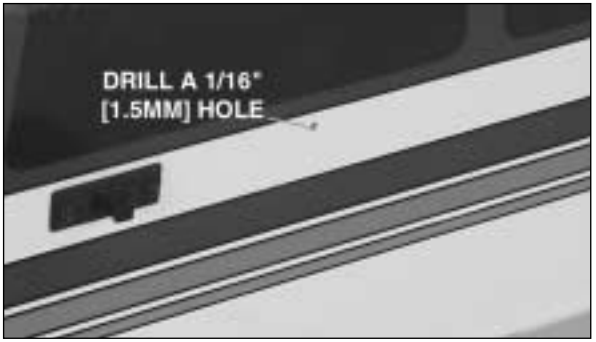
❑ 12. Install the clevises on the threaded ends of the pushrods by turning the clevis 14 times. Thread the nylon torque rod horn onto the aileron torque rod and then attach the clevis to the horn.

❑ 13. Connect the aileron servo to the receiver and center the aileron servo. Center the right aileron, then align the pushrod to the servo arm. Make a mark on the pushrod when it is in line with the hole in the servo horn. Bend the wire 90 degrees on the mark you just made. After making the bend in the pushrod, install it through the hole in the servo horn and attach it with a Faslink.

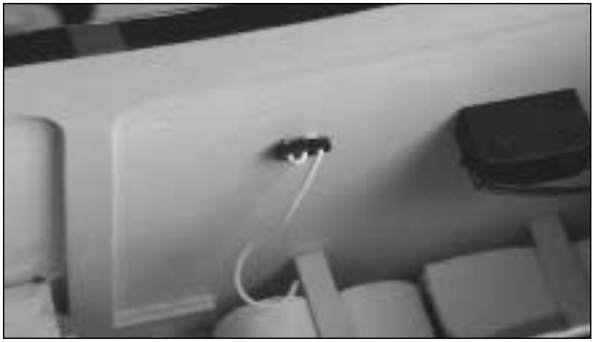
❑ 14. Follow the same procedure for the left aileron.

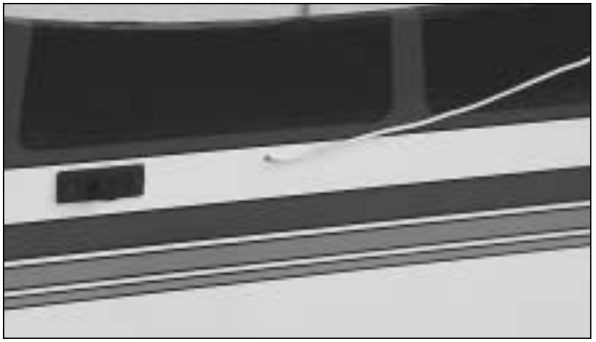


❏ 15. Cut off two leftover servo arms as shown in the above diagram. These will be used to make a simple strain relief for your receiver antenna.

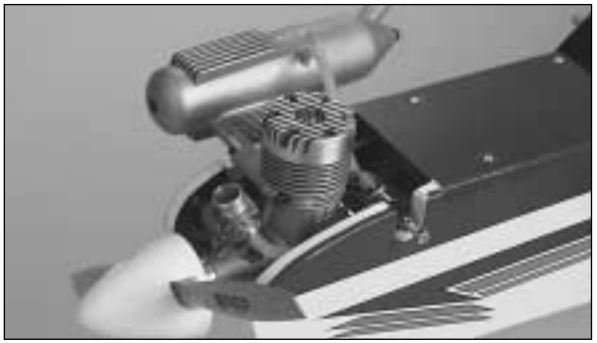


❏ 16. Drill a 1/16" [1.5mm] hole in the fuselage.





❏ 17. After cutting the servo arms, thread the antenna through the hole you drilled in the fuselage and attach the antenna to the vertical fin with a rubber band and T-pin as shown above.



❏ 18. Install the propeller recommended by the engine manufacturer along with the spinner.

Final Assembly

Control Throw Adjustment

By moving the position of the clevis at the control horn toward the outermost hole, you will decrease the amount of throw of the control surface. Moving it toward the control surface will increase the amount of throw. If these adjustments don't accomplish the job, you may need to work with a combination of adjustments by also repositioning the pushrod at the servo end. Moving the pushrod towards the center of the servo horn will decrease the control surface throw – outward will increase it.

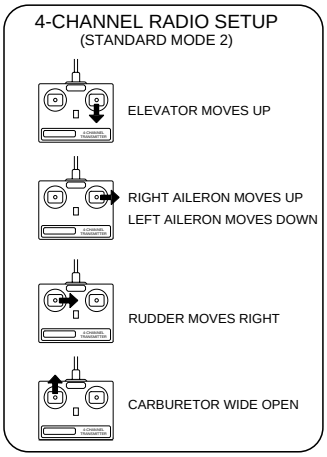
Control Surface Throws

Note: Throws are measured at the widest part of the elevators, rudder and ailerons. We recommend the following control surface throws as a starting point:

Elevator:	1/2" [13mm] Up and Down
Rudder:	1" [26mm] Right and Left
Ailerons:	1/2" [13mm] Up and Down

One leading cause of crashes is flying an airplane with its control throws set differently from those recommended in the instructions. The Great Planes AccuThrow™ lets you quickly and easily measure actual throws first, so you can make necessary corrections before you fly. Large, no-slip rubber feet provide a firm grip on covered surfaces without denting or marring the finish. Spring tension holds AccuThrow's plastic ruler steady by each control surface. Curved to match control motions, the ruler provides exact readings in both standard or metric measurements. GPMR2405.

Make sure the control surfaces move in the proper direction as illustrated in the following sketch:



Balance Your Model

Note: This section is **VERY** important and must **NOT** be omitted! A model that is not properly balanced will be unstable and possibly unflyable.

❏ 1. The balance point (C.G.) is located 3-1/2 [89mm] back from the leading edge of the wing. Balance your Hobbistar 60 using a Great Planes C.G. Machine™ Airplane Balancer (GPMR2400) for the most accurate results. This is the balance point at which your model should balance for your first flights. Do not at any time balance your model outside the recommended range.

❏ 2. With the wing attached to the fuselage, all parts of the model installed (ready to fly), and an empty fuel tank, block up the tail as necessary to level the stab. Lift the model at the desired balance point, and observe the tail of the aircraft. If the tail drops, the model is "tail heavy" and you must add weight* to the nose to balance the model. If the

nose drops, it is “nose heavy” and you must add weight* to the tail to balance the model.

Note: Nose weight may be easily installed by using a “spinner weight.” Tail weight may be added by using Great Planes (GPMQ4485) “stick-on” lead weights.

*If possible, first attempt to balance the model by changing the position of the receiver battery. If you are unable to obtain good balance by doing so, then it will be necessary to add weight to the nose or tail to achieve the proper balance point. Remember to secure the receiver and battery after your model has been balanced.

Balance Your Model Laterally

IMPORTANT: Do not confuse this procedure with “checking the C.G.” or “balancing the airplane fore and aft.”

Now that you have the basic airplane nearly completed, this is a good time to balance the airplane laterally (side-to-side). Here is how to do it:

❏ 1. Assemble the model as in preparation for flight. (No fuel is required for this procedure.)

❏ 2. With the wing level, lift the model by the engine propeller shaft and the fin post (this may require two people). Do this several times.

❏ 3. If one wing always drops when you lift the model, it means that side is heavy. Balance the airplane by adding weight to the opposite, lighter wing tip.

Note: An airplane that has been laterally balanced will track better in loops and other maneuvers.

Preflight

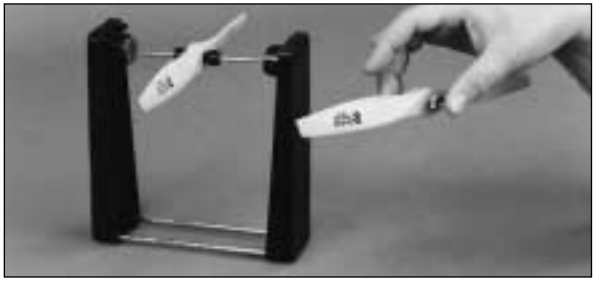
At this time check all connections including servo horn screws, clevises, servo cords and extensions.

Charge the Batteries

Follow the battery charging procedures in your radio instruction manual. You should always charge your transmitter and receiver batteries the night before you go flying and at other times as recommended by the radio manufacturer.

Balance the Propeller

Carefully balance your propellers before flying. An unbalanced prop is the single most significant cause of vibration. Not only may engine mounting screws vibrate out, possibly with disastrous effect, but vibration may also damage your radio receiver and battery. Vibration may cause your fuel to foam, which will, in turn, cause your engine to run lean or quit.



We use a Top Flite Precision Magnetic Prop Balancer™ (TOPQ5700) in the workshop and keep a Great Planes Fingertip Balancer (GPMQ5000) in our flight box.

Find a Safe Place to Fly

We strongly suggest that the best place to fly is an AMA chartered club field. Ask the AMA or your local hobby shop dealer if there is a club in your area and join. Club fields are set up for R/C flying and that makes your outing safer and more enjoyable. The AMA address and telephone number are in the front of this manual. If a club and flying site are not available, find a large, grassy area at least 6 miles away from houses, buildings and streets and any other R/C radio operation like R/C boats and R/C cars. A schoolyard may look inviting but is too close to people, power lines and possible radio interference.

Ground Check the Model

Inspect your radio installation and confirm that all the control surfaces respond correctly to the transmitter inputs. The engine operation must also be checked by confirming that the engine idles reliably, transitions smoothly and rapidly to full power and maintains full power, indefinitely. The engine must be “broken-in” on the ground by running it for at least two tanks of fuel. Follow the engine manufacturer’s recommendations for break-in. Make sure that all screws remain tight, that the hinges are secure and that the prop is on tight.

Range Check Your Radio

Whenever you go to the flying field, check the operational range of the radio before the first flight of the day. First, make sure no one else is on your frequency (channel). With your transmitter on, you should be able to walk at least 100 feet away from the model and still have control. While you work the controls, have a helper stand by your model and tell you what the control surfaces are doing. Repeat this test with the engine running at various speeds with a helper holding the model. If the control surfaces are not always responding correctly, do not fly! Find and correct the problem first. Look for loose servo connections or corrosion, loose bolts that may cause vibration, a defective on/off switch, low battery voltage or a defective receiver battery, a damaged receiver antenna, or a receiver crystal that may have been damaged from a previous crash.

Engine Safety Precautions

Note: Failure to follow these safety precautions may result in severe injury to yourself and others.

Keep all engine fuel in a safe place, away from high heat, sparks or flames, as fuel is very flammable. Do not smoke near the engine or fuel; and remember that the engine exhaust gives off a great deal of deadly carbon monoxide. Do not run the engine in a closed room or garage.

Get help from an experienced pilot when learning to operate engines.

Use safety glasses when starting or running engines. Do not run the engine in an area of loose gravel or sand; the propeller may throw such material in your face or eyes.

Keep your face and body as well as all spectators away from the plane of rotation of the propeller as you start and run the engine.

Keep these items away from the prop: loose clothing, shirt sleeves, ties, scarfs, long hair or loose objects such as pencils or screwdrivers that may fall out of shirt or jacket pockets into the prop.

Use a “chicken stick” or electric starter to start the engine. Do not use your fingers to flip the propeller. Make certain the glow plug clip or connector is secure so that it will not pop off or otherwise get into the running propeller.

Make all engine adjustments from behind the rotating propeller.

The engine gets hot! Do not touch it during or right after operation. Make sure fuel lines are in good condition so fuel will not leak onto a hot engine, causing a fire.

To stop a glow engine, cut off the fuel supply by closing off the fuel line or following the engine manufacturer’s recommendations. Do not use hands, fingers or any other body part to try to stop the engine. Do not throw anything into the propeller of a running engine.

AMA Safety Code (excerpt)

Read and abide by the following Academy of Model Aeronautics Official Safety Code:

General

1. I will not fly my model aircraft in sanctioned events, air shows, or model flying demonstrations until it has been proven to be airworthy by having been previously successfully flight tested.

2. I will not fly my model aircraft higher than approximately 400 feet within 3 miles of an airport without notifying the airport operator. I will give right of way to and avoid flying in the proximity of full-scale aircraft. Where necessary an observer

shall be used to supervise flying to avoid having models fly in the proximity of full-scale aircraft.

3. Where established, I will abide by the safety rules for the flying site I use and I will not willfully and deliberately fly my models in a careless, reckless and/or dangerous manner.

7. I will not fly my model unless it is identified with my name and address or AMA number, on or in the model.

9. I will not operate models with pyrotechnics (any device that explodes, burns, or propels a projectile or any kind).

Radio Control

1. I will have completed a successful radio equipment ground check before the first flight of a new or repaired model airplane.

2. I will not fly my model aircraft in the presence of spectators until I become a qualified flier, unless assisted by an experienced helper.

3. I will perform my initial turn after takeoff away from the pit or spectator areas and I will not thereafter fly over pit or spectator areas, unless beyond my control.

4. I will operate my model using only radio control frequencies currently allowed by the Federal Communications Commission.

Flying

You will find the Hobbistar 60 MKII a predictable, easy flying airplane. The plane is very good for learning how to fly and will allow you to proceed into some advanced flying maneuvers once you have learned the basics.

Takeoff

Before the first flight it is a good idea to taxi the plane on the ground to get a feel for the ground handling characteristics of the plane. Once you feel comfortable with the way it taxis, it is time to line it up on the end of the runway. Slowly advance the throttle and use the rudder / nose wheel steering to maintain a straight run down the runway. When the airplane begins to pick up significant speed, slowly pull back on the elevator stick on your radio. Maintain a gentle climbing attitude until the plane is approximately 75 feet high, then begin a turn away from the pit area.

Flying

Once airborne, you will find that the plane is a very predictable and docile flyer. Until you are very comfortable with the plane, it is recommended that you practice gentle turns, both to the left and the right. Once you are comfortable with making both right and left hand turns you may want to experiment with rolls and loops. The plane is capable of most all of the flying maneuvers a newcomer will ever want to learn.

CAUTION (THIS APPLIES TO ALL R/C AIRPLANES): If, while flying, you notice any unusual sounds, such as a low-pitched “buzz,” this may be an indication of control surface “flutter.” Because flutter can quickly destroy components of your airplane, any time you detect flutter you must immediately cut the throttle and land the airplane! Check all servo grommets for deterioration (this will indicate which surface fluttered), and make sure all pushrod linkages are slop-free. If it fluttered once, it will probably flutter again under similar circumstances unless you can eliminate the slop or flexing in the linkages. Here are some things which can result in flutter: Excessive hinge gap; Not mounting control horns solidly; Sloppy fit of clevis pin in the control horn; Elasticity present in flexible plastic pushrods; Side-play of pushrod in guide tube caused by tight bends; Sloppy fit of Z-bend in servo arm; Insufficient glue used when gluing in the elevator joiner wire or aileron torque rod; Excessive flexing of aileron, caused by using too soft balsa aileron; Excessive “play” or “backlash” in servo gears; and Insecure servo mounting.

Landing

When it is time to land the plane, set up straight in line with the end of the runway at approximately 75 feet. Gradually begin to decrease the power and the plane will begin to descend. Maintain the wings in a level

attitude as the plane descends. Maintain approximately 1/3rd throttle until you are above the end of the runway. At this point you should be at an altitude of approximately ten feet. Now is the time to decrease the throttle to just above idle, maintain a level wing attitude and flare the airplane to a smooth touch down by pulling back on the elevator stick.

Have a ball! But always stay in control and fly in a safe manner.

Appendix

Flight Trimming

Note: *The following article has been reprinted in part for future reference and also as a guide for your flight instructor or experienced flying partner to help you with trimming your model. If further information is required, please contact your local hobby dealer, local flying club or call Great Planes at (217) 398-8970.*

A model is not a static object. Unlike a car, which you can only hunt left or right on the road (technically, a car does yaw in corners, and pitches when the brakes are applied), a plane moves through that fluid we call air in all directions simultaneously. The plane may look like it's going forward, but it could also be yawing slightly, slipping a little and simultaneously climbing or diving a bit! The controls interact. Yaw can be a rudder problem, a lateral balance problem or an aileron rigging problem. We must make many flights, with minor changes between each, to isolate and finally correct the problem.

The chart accompanying this article is intended to serve as a handy field reference when trimming your model. Laminate it in plastic and keep it in your flight box. You just might have need to consult it at the next contest! The chart is somewhat self-explanatory, but we will briefly run through the salient points.

First, we are assuming that the model has been C.G. balanced according to the manufacturer's directions. There's nothing sacred about that spot – frankly, it only reflects the balance point where a prototype model handled the way the guy who designed it thought it should. If your model's wing has a degree more or less of incidence, then the whole balance formula is incorrect for you. But, it's a good ballpark place to start.

The second assumption is that the model has been balanced laterally. Wrap a strong string or monofilament around the prop shaft behind the spinner, then tie the other end to the tail wheel or to a screw driven into the bottom of the aft fuse. Make the string into a bridle harness and suspend the entire model inverted (yes, with the wing on!). If the right wing always drops, sink some screws or lead into the left wing tip, etc. You may be surprised to find out how much lead is needed.

At this point the model is statically trimmed. It's only a starting point, so don't be surprised if you wind up changing it all. One other critical feature is that the ailerons must have their hinge gap sealed. If shoving some Scotch® tape or MonoKote® into the hinge gap to prevent the air from slipping from the top of the wing to the bottom, and vice-versa, bothers you, then don't do it.

To achieve the maximum lateral trim on the model, the hinge gap on the ailerons should be sealed. The easiest way to do this is to disconnect the aileron linkages, and fold the ailerons as far over the top of the wing as possible (assuming they are top or center hinged). Apply a strip of clear tape along the joint line. When the aileron is returned to neutral, the tape will be invisible, and the gap will be effectively sealed. Depending on how big the ailerons are, and how large a gaping gap you normally leave when you install hinges, you could experience a 20 percent increase in aileron control response just by this simple measure.

Your first flights should be to ascertain control centering and control feel. Does the elevator always come back to neutral after a 180° turn or Split-S? Do the ailerons tend to hunt a little after a rolling maneuver? Put the plane through its paces. Control centering is either a mechanical thing (binding servos, stiff linkages, etc.), an electronic thing (bad servo resolution or dead band in the radio system), or C.G. (aft Center of Gravity will make the plane wander a bit). The last possibility will be obvious, but don't continue the testing until you have isolated the problem and corrected it.

Let's get down to the task of trimming the model. Use the tachometer every time you start the engine, to insure consistent results. These trim flights must be done in calm weather. Any wind will only make the model weather vane. Each "maneuver" on the list assumes that you will enter it dead straight-and-level. The wings must be perfectly flat, or else the maneuver will not be correct and you'll get a wrong interpretation. That's where your observer comes in. Instruct him to be especially watchful of the wings as you enter the maneuvers.

Do all maneuvers at full throttle. The only deviation from this is if the plane will routinely be flown through maneuvers at a different power setting.

Let's commence with the "engine thrust angle" on the chart. Note that the observations you make can also be caused by the C.G., so be prepared to change both to see which gives the desired result. Set up a straight-and-level pass. The model should be almost hands-off. Without touching any other control on the transmitter, suddenly chop the throttle. Did the nose drop? When you add power again, did the nose pitch up a bit? If so, you need some down thrust, or nose weight. When the thrust

is correct, the model should continue along the same flight path for at least a dozen plane lengths before gravity starts to naturally bring it down.

Do each maneuver several times, to make sure that you are getting a proper diagnosis. Often, a gust, an accidental nudge on the controls, or just a poor maneuver entry can mislead you. The thrust adjustments are a real pain to make. On most models, it means taking the engine out, adding shims, then reassembling the whole thing. Don't take shortcuts.

Don't try to proceed with the other adjustments until you have the thrust line and/or C.G. correct. They are the basis upon which all other trim settings are made.

Also, while you have landed, take the time to crank the clevises until the transmitter trims are at neutral. Don't leave the airplane so that the transmitter has some odd-ball combination of trim settings. One bump of the transmitter and you have lost everything. The trim must be repeatable, and the only sure way to do this is to always start with the transmitter control trims at the middle.

The next maneuver is somewhat more tricky than it looks. To verify C.G., we roll the model up to a 45° bank, then take our hands off the controls. The model should go a reasonable distance with the fuse at an even keel. If the nose pitches down, remove some nose weight, and the opposite if the nose pitches up. The trick is to use only the ailerons to get the model up at a 45° bank. We almost automatically start feeding in elevator, but that's a no-no. Do the bank in both directions, just to make sure that you are getting an accurate reading of the longitudinal balance.

We now want to test the correct alignment of both sides of the elevator (even if they aren't split, like a Pattern ship's, they can still be warped or twisted). Yaw and lateral balance will also come into play here, so be patient and eliminate the variables, one-by-one. The maneuver is a simple loop, but it must be entered with the wings perfectly level. Position the maneuver so that your assistant can observe it end-on. Always loop into the wind. Do several loops, and see if the same symptom persists. Note if the model loses heading on the front or back side of the loop. If you lose it on the way up, it's probably an aileron problem, while a loss of heading on the way back down is most likely a rudder situation.

Note that the Yaw test is the same looping sequences. Here, however, we are altering rudder and ailerons, instead of the elevator halves. We must repeat that many airplanes just will not achieve adequate lateral trim without sealing the hinge gaps shut. The larger you make the loops (to a point), the more discernable the errors will be.

The Lateral Balance test has us pulling those loops very tightly. Pull straight up into a vertical and watch which wing drops. A true vertical is hard to do, so make sure that your assistant is observing from another vantage point. Note that the engine torque will affect the vertical fall off, as will rudder errors. Even though we balance the wing statically before leaving for the field, we are now trimming it dynamically.

The Aileron Coupling (or rigging), is also tested by doing Hammerheads Stalls. This time, however, we want to observe the side view of the model. Does the plane want to tuck under a bit? If so, then try trimming the ailerons down a small bit, so that they will act as flaps. If the model tends to want to go over into a loop, then rig both ailerons up a few turns on the clevises. Note that drooping the ailerons will tend to cancel any washout you have in the wing. On some models, the lack of washout can lead to some nasty characteristics at low speeds.

Again, we reiterate that all of these controls are interactive. When you change the wing incidence, it will influence the way the elevator trim is at a given C.G. Re-trimming the wing will also change the rigging on the ailerons, in effect, and they may have to be readjusted accordingly.

The whole process isn't hard. As a matter of fact it's rather fun – but very time consuming. It's amazing what you will learn about why a plane flies the way it does, and you'll be a better pilot for it. One thing we almost guarantee, is that your planes will be more reliable and predictable when they are properly trimmed out. They will fly more efficiently, and be less prone to doing radical and surprising things. Your contest scores should improve, too.

We wish to acknowledge the Orlando, Florida, club newsletter, from which the basics of the chart presented here were gleaned.

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See the Flight Trimming Chart on Page 23

TRIM FEATURE	MANEUVERS	OBSERVATIONS	CORRECTIONS
CONTROL CENTERING	Fly general circles and random maneuvers.	Try for hands off straight and level flight.	Readjust linkages so that Tx trims are centered.
CONTROL THROWS	Random maneuvers	A. Too sensitive, jerky controls. B. Not sufficient control.	If A, change linkages to reduce throws. If B, increase throws.
ENGINE THRUST ANGLE[1]	From straight flight, chop throttle quickly.	A. Aircraft continues level path for short distance. B. Plane pitches nose up. C. Plane pitches nose down.	If A, trim is okay. If B, decrease downthrust. If C, increase downthrust.
CENTER OF GRAVITY LONGITUDINAL BALANCE	From level flight roll to 45° bank and neutralize controls.	A. Continues in bank for moderate distance. B. Nose pitches up. C. Nose drops.	If A, trim is good. If B, add nose weight. If C, remove nose weight.
YAW[2]	Into wind, do open loops, using only elevator. Repeat tests doing outside loops from inverted entry.	A. Wings are level throughout. B. Yaws to right in both inside and outside loops. C. Yaws to left in both inside and outside loops. D. Yaws right on insides, and left on outside loops. E. Yaws left in insides, and right on outside loops.	If A, trim is correct. If B, add left rudder trim. If C, add right rudder trim. If D, add left aileron trim. If E, add right aileron trim.
LATERAL BALANCE	Into wind, do tight inside loops.	A. Wings are level and plane falls to either side randomly. B. Falls off to left in loops. Worsens as loops tighten. C. Falls off to right in loops. Worsens as loops tighten.	If A, trim is correct. If B, add weight to right wing tip. If C, add weight to left wing tip.
AILERON RIGGING	With wings level, pull to vertical climb and neutralize controls.	A. Climb continues along same path. B. Nose tends to go to inside loop. C. Nose tends to go to outside loop.	If A, trim is correct. If B, raise both ailerons very slightly. If C, lower both ailerons very slightly.

1. Engine thrust angle and C.G. interact. Check both.
2. Yaw and lateral balance produce similar symptoms. Note that fin may be crooked. Right and left references are from the plane's vantage point.

BUILDING NOTES

Kit Purchased Date: _____

Where Purchased: _____

Date Construction Started: _____

Date Construction Finished: _____

Finished Weight: _____

Date of First Flight: _____

FLIGHT LOG