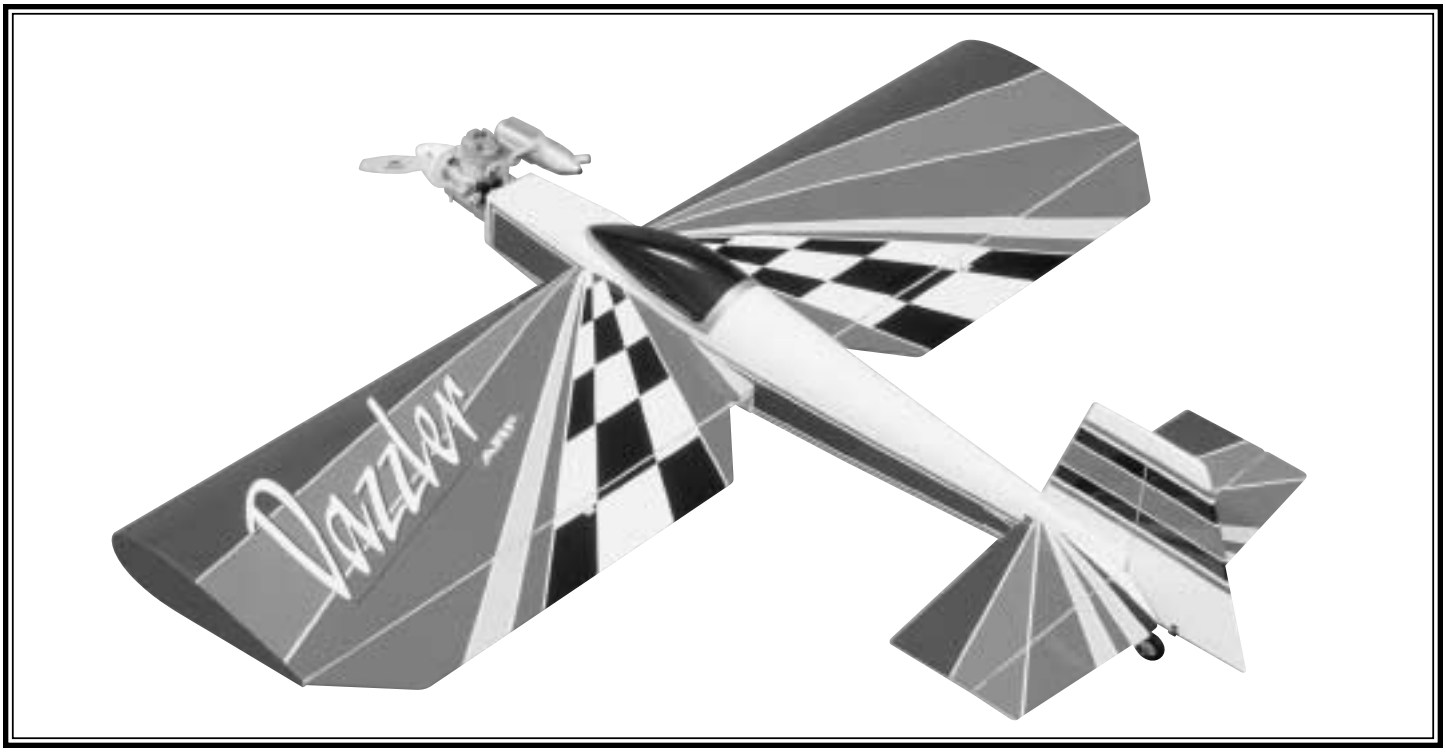
Dazzler™

.40-size Almost-Ready-to-Fly Aerobatic Model ARF

INSTRUCTION MANUAL



WARRANTY

Great Planes® Model Manufacturing Co. guarantees this kit to be free from defects in both material and workmanship at the date of purchase. This warranty does not cover any component parts damaged by use or modification. **In no case shall Great Planes' liability exceed the original cost of the purchased kit.** Further, Great Planes reserves the right to change or modify this warranty without notice.

In that Great Planes has no control over the final assembly or material used for final assembly, no liability shall be assumed nor accepted for any damage resulting from the use by the user of the final user-assembled product. By the act of using the user-assembled product, the user accepts all resulting liability.

If the buyer is not prepared to accept the liability associated with the use of this product, the buyer is advised to return this kit immediately in new and unused condition to the place of purchase.

To make a warranty claim send the defective part or item to Hobby Services at the address below:

Hobby Services
3002 N. Apollo Dr. Suite 1
Champaign, IL 61822
USA

Include a letter stating your name, return shipping address, as much contact information as possible (daytime telephone number, fax number, e-mail address), a detailed description of the problem and a photocopy of the purchase receipt. Upon receipt of the package the problem will be evaluated as quickly as possible.

READ THROUGH THIS MANUAL BEFORE STARTING CONSTRUCTION. IT CONTAINS IMPORTANT INSTRUCTIONS AND WARNINGS CONCERNING THE ASSEMBLY AND USE OF THIS MODEL.

GREAT PLANES® MODEL MANUFACTURING COMPANY
Champaign, Illinois
(217) 398-8970, Ext 5
airsupport@greatplanes.com

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INTRODUCTION

The Dazzler ARF is a great follow up to our Dazzler kit but you don't have to do the building! This plane has all of the great flight characteristics of a sport / fun fly airplane. This coupled with its good looks will make it a standout at your flying field. With minimal effort you will have this plane in the air in no time and performing to all of your abilities. We hope you enjoy the Dazzler as much as we have enjoyed bringing it to you!

For the latest technical updates or manual corrections for the Dazzler, visit the web site listed below and select the Great Planes Dazzler ARF. A “tech notice” box will appear in the upper left corner of the page if there is new technical information or changes.

http://www.greatplanes.com/airplanes/index.html

PROTECT YOUR MODEL, YOURSELF & OTHERS...FOLLOW THESE IMPORTANT SAFETY PRECAUTIONS

1. The Dazzler ARF should not be considered a toy, but rather a sophisticated, working model that functions very much like a full-size airplane. Because of its performance capabilities, the Dazzler, if not assembled and operated correctly, could possibly cause injury to yourself or spectators and damage property.

2. You must assemble the model **according to the instructions**. Do not alter or modify the model, as doing so may result in an unsafe or unflyable model. In a few cases the instructions may differ slightly from the photos. In those instances the written instructions should be considered correct.
3. You must take time to **build straight, true** and **strong**.

4. You must use an R/C radio system that is in first-class condition, and a correctly sized engine and components (fuel tank, wheels, etc.) throughout the building process.

5. You must properly install all R/C and other components so that the model operates properly on the ground and in the air.

6. You must check the operation of the model before **every** flight to insure that all equipment is operating and that the model has remained structurally sound. Be sure to check clevises or other connectors often and replace them if they show any signs of wear or fatigue.

7. If you are not already an experienced R/C pilot, you should fly the model only with the help of a competent, experienced R/C pilot.

8. While this kit has been flight tested to exceed normal use, if the plane will be used for extremely high stress flying, such as racing, the modeler is responsible for taking steps to reinforce the high stress points.

Note: We, as the kit manufacturer, provide you with a top quality kit and instructions, but ultimately the quality and flyability of your finished model depends on how you build it; therefore, we cannot in any way guarantee the performance of your completed model, and no representations are expressed or implied as to the performance or safety of your completed model.

Remember: Take your time and follow the instructions to end up with a well-built model that is straight and true.

If you have not flown this type of model before, we recommend that you get the assistance of an experienced pilot for your first flights. If you're not a member of a club, your local hobby shop has information about clubs in your area whose membership includes experienced pilots.

In addition to joining an R/C club, we strongly recommend you join the AMA (Academy of Model Aeronautics). AMA membership is required to fly at AMA sanctioned clubs. There are over 2,500 AMA chartered clubs across the country. Among other benefits, the AMA provides insurance to its members who fly at AMA sites and events. Additionally, training programs and instructors are available at AMA club sites to help you get started the right way. Contact the AMA at the address or toll-free phone number below:

Academy of Model Aeronautics
5151 East Memorial Drive
Muncie, IN 47302-9252
Tele. (800) 435-9262
Fax (765) 741-0057

Or via the Internet at: *http://www.modelaircraft.org*

DECISIONS YOU MUST MAKE

This is a list of items required to finish the Dazzler that must be purchased separately. For some of these items there is more than one option which will require a bit of decision making ahead of time. Order numbers (in parentheses) are provided for your convenience.

Engine Selection

There are several engines that will work well in your Dazzler. We recommend a hot 2-stroke such as an **O.S.® .46FX (OSMG0546)** or **SuperTigre® G45 (SUPG0150)** for the best performance. An **O.S. FS-52 Surpass™ (OSMG0852)** would be the best choice for a 4-stroke. 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

The Dazzler will require a good 4-channel radio such as the **Futaba® 4YF (FUTJ40**)** with five servos. If you are the type of flyer that likes to use flaperons or switch back and forth between normal rates and extreme high rates, you may want to consider a six channel computer radio such as the **Futaba 6XAS (FUTK34**)** to get the most out of the Dazzler.

ADDITIONAL ITEMS REQUIRED

Hardware and Accessories

Items in parentheses such as (GPMQ4243) are suggested part numbers recognized by distributors and hobby shops and are listed for your ordering convenience. ***GPM*** *is the Great Planes brand,* ***TOP*** *is the Top Flite® brand, and* ***HCA*** *is the Hobbico® brand.*

- ❑ Four-Channel Radio with Five Servos (minimum of 40 oz/in of torque for flight controls)
- ❑ "Y" Harness for Aileron (HCAM2500)
- ❑ Engine - See *Engine Selection*
- ❑ Spare Glow Plugs (O.S. #8 for most 2-Stroke engines, OSMG2691, or O.S. Type F for most 4-stroke engines, OSMG2692)
- ❑ Propeller (Top Flite Power Point® - refer to your engine's instructions for proper size)
- ❑ 2' Medium 3/32" Glow Fuel Tubing (GPMQ4131)

Building Supplies & Tools

These are the building tools that are required. We recommend Great Planes Pro™ CA and Epoxy glue.

- ❑ 2 oz. Pro CA (Thin, GPMR6003)
- ❑ 2 oz. Pro CA+ (Medium, GPMR6009)
- ❑ 6 minute Epoxy 4 oz.(GPMR6042)
- ❑ 30 minute Epoxy 4 oz. (GPMR6043)
- ❑ CA Accelerator (GPMR6035)
- ❑ #1 Hobby Knife Handle (HCAR0105)
- ❑ #11 Blades (HCAR0311, 100 Qty)
- ❑ Masking Tape (TOPR8018)
- ❑ Electric Power Drill
- ❑ Slip-Joint & Needle Nose Pliers
- ❑ Screwdrivers – Flat Blade & Phillips
- ❑ Pro™ Thread Locking Compound (GPMR6060)
- ❑ Isopropyl Alcohol (70%)
- ❑ Drill Bits: 1/16" [1.5mm], 3/32" [2.5mm], 5/32" [4mm]
- ❑ T-Pins (HCAR5100)

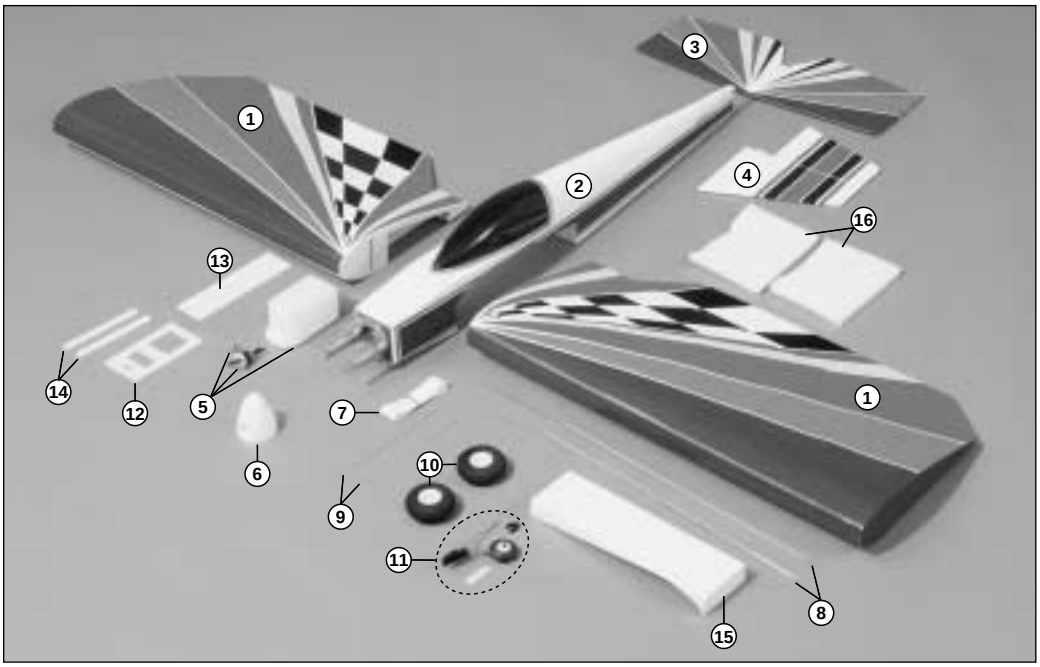
Optional Supplies & Tools

- ❑ CA Applicator Tips (HCAR3780)
- ❑ CA Debonder (GPMR6039)
- ❑ Switch and Charge Jack (GPMM1000)
- ❑ C.G. Machine™ (GPMR2400)
- ❑ Power Point® Balancer (TOPQ5700)
- ❑ Fingertip Prop Balancer (GPMQ5000)

KIT CONTENTS

Before starting to build, use the **Kit Contents** list to take an inventory of this kit to make sure it is complete and inspect the parts to make sure they are of acceptable quality. If any parts are missing or are not of acceptable quality, or if you need assistance with assembly, contact **Great Planes Product Support**. When reporting defective or missing parts, use the part names exactly as they are written in the Kit Contents list on this page.

3002 N. Apollo Drive, Suite 1
Champaign, IL 61822
Telephone: (217) 398-8970
Fax: (217) 398-7721
E-mail: airsupport@greatplanes.com



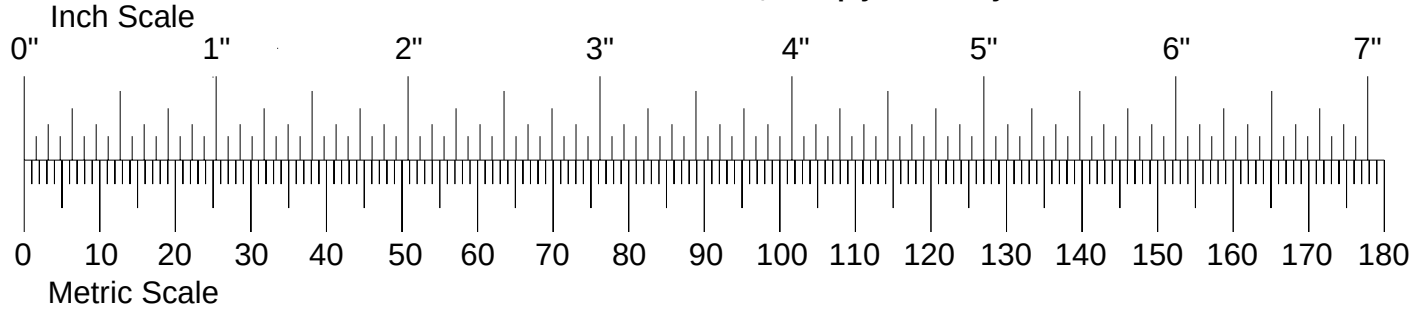
Kit Contents (Photographed)

1 Wing
2 Fuselage
3 Stab
4 Fin
5 Fuel Tank Assembly
6 Spinner
7 Wing Tape
8 Pushrods
9 Aileron Pushrods
10 Main Wheels (2)
11 Tailwheel Assembly
12 Servo Tray
13 Wing Joiner
14 Servo Tray Mounting Rails
15 Radio Compartment Cover
16 Foam Rubber

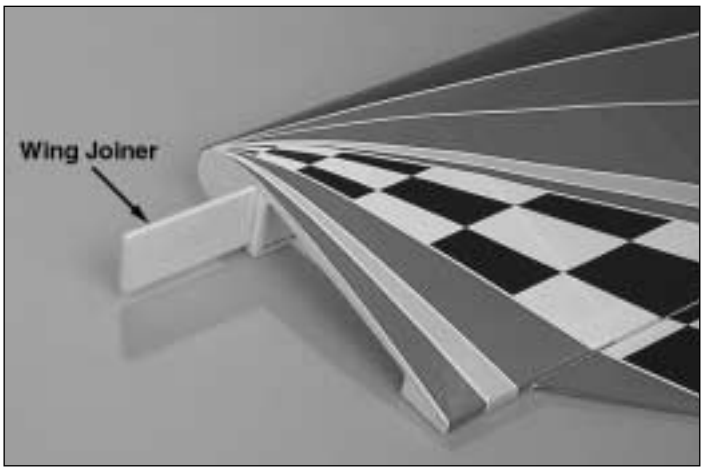
Kit Contents (Not Photographed)

- (2) .074 x 36" pushrod wire, threaded one end (elevator, rudder)
- (2) .074 x 6" pushrod wire, threaded one end (aileron)
- (4) Large control horn (elevator/rudder/aileron)
- (8) 2-56 x 1/2" machine screws (elev/rudder/ail)
- (4) Nylon clevises (elevator/rudder/(2)aileron)
- (4) Nylon Faslink (elevator/rudder/(2)aileron)
- (4) 5/32" wheel collar (for main landing gear)
- (4) 6-32 set screw (for the wheel collars)
- (4) Silicone clevis retainers (elevator/rudder/(2)aileron)
- (17) 2 x 1/2" sheet metal screws (L.G. straps, battery compartment, tail wheel bracket)
- (2) Screw lock connector (throttle linkage)
- (2) Nylon retainer (throttle linkage)
- (2) 4-40 x 1/4" Socket head cap screw (throttle linkage)
- (1) Wire cable .056 x 36" (throttle linkage)
- (1) Plastic tube (throttle linkage)
- (4) Nylon hump landing gear strap (landing gear)
- (4) 3mm x 20mm bolts (Pre-installed for engine mount)
- (4) 3mm washer (Pre-installed for engine mount)
- (4) 3mm lock washer (Pre-installed for engine mount)
- (4) 3mm blind nut (Pre-installed for engine mount)
- (4) 1mm screws (Pre -installed in fuel tank hatch)
- (2) Aluminum straps (mounting engine to engine mount)
- (4) 8/32 bolts (for mounting engine to the engine mounting straps and engine mount)
- (8) 8-32 nuts (for mounting engine to the engine mounting straps and engine mount)
- (4) 8-32 lock washers (for mounting engine to the engine mounting straps and engine mount)
- (2) 1mm machine screws (tailwheel bracket)
- (1) 1mm wheel collar (retains tailwheel)
- (1) 2mm allen set screw (for wheel collar)
- (4) 1/4" x 9/16" x 9/16" wood block
- (6) wooden triangle gussets
- (4) Nylon straps (mounting belly pan)
- (1) Main landing gear
- (2) Outer pushrod tubes (installed)
- (1) Decal sheet

To convert inches to millimeters, multiply inches by 25.4

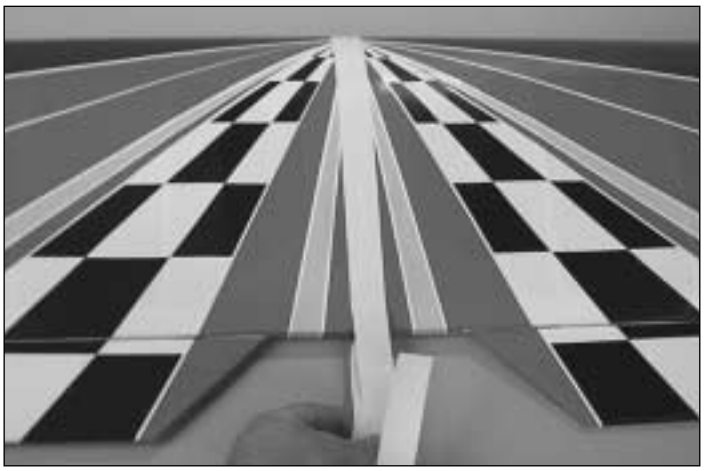


WING ASSEMBLY



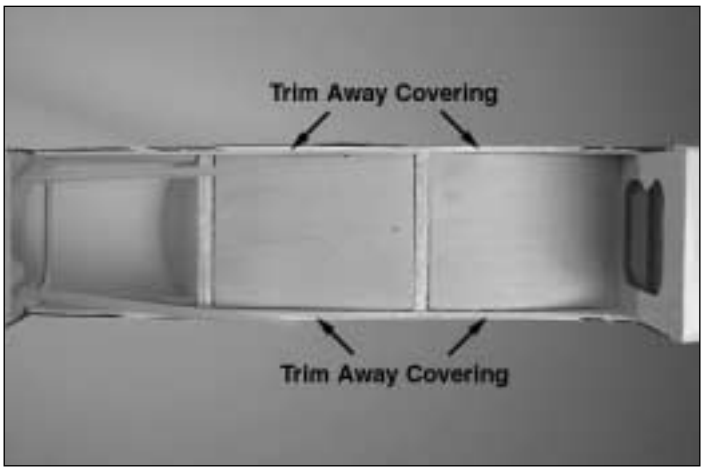
❏ 1. Locate the left and right **Wing Panel** and **Wing Joiner**. Test fit the two wing halves to the wing joiner. Once you are satisfied with the fit, glue the wing joiner into the right wing panel with 6-minute epoxy. Set it aside to cure. **Note:** Be sure to remove any epoxy that squeezes out before it cures.

❏ 2. After the glue has cured, apply 6-minute epoxy to the other end of the joiner and the root ribs. Press the two wing halves together. Use masking tape to hold the two wings together while the glue cures.

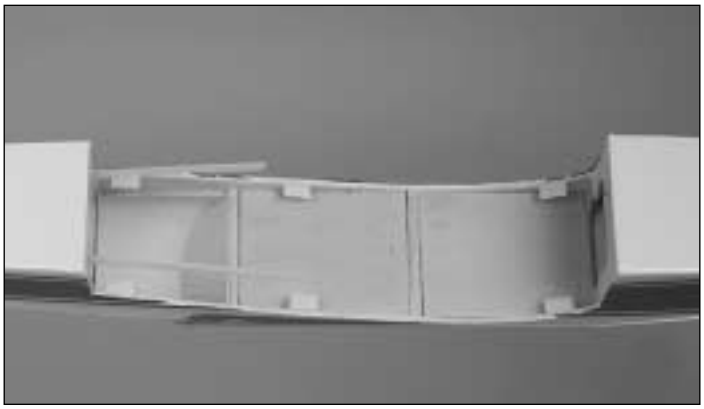


❏ 3. After the glue has cured apply the self adhesive **wing tape** to the wing joint.

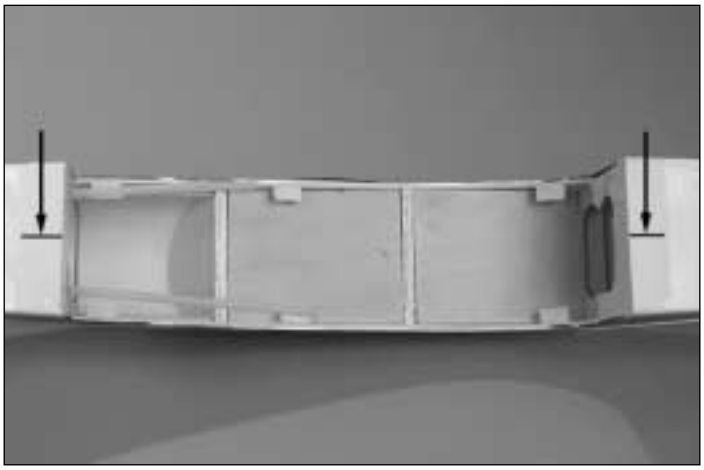
WING INSTALLATION



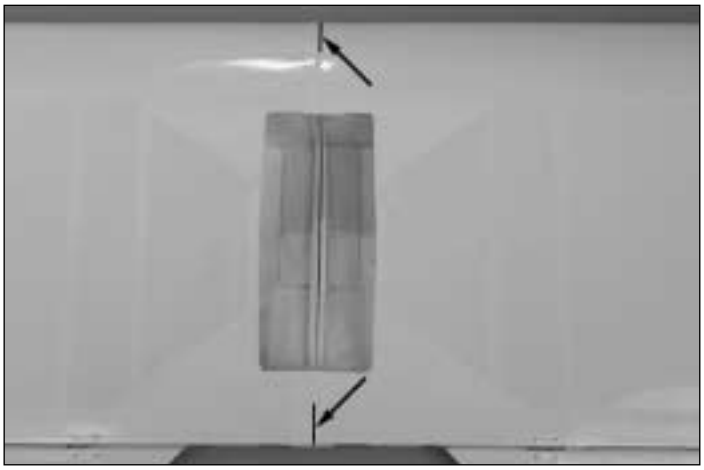
❏ 1. Trim away the covering on the wing saddle.



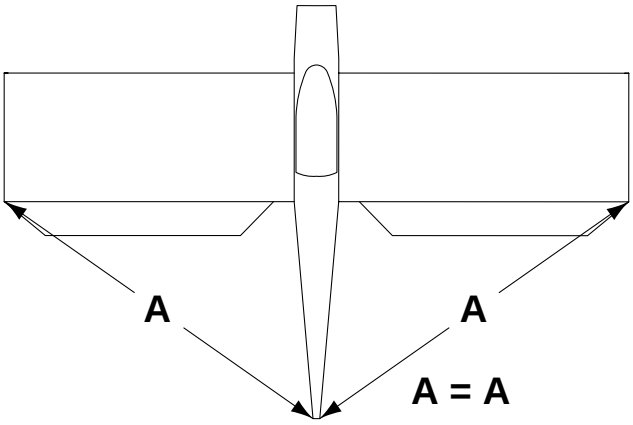
❏ 2. Locate six **triangle wood blocks**. Glue them in place on the inside of the fuselage flush with the wing saddle in the locations shown in the photograph. *(These blocks provide additional surface area when we glue the wing to the fuselage. Placement is not critical as long as three are placed on each side)*.



❏ 3. Place masking tape on the fuselage, one piece ahead of the wing saddle and one piece behind the wing saddle. Make a mark on each piece of tape exactly at the center of the fuselage.

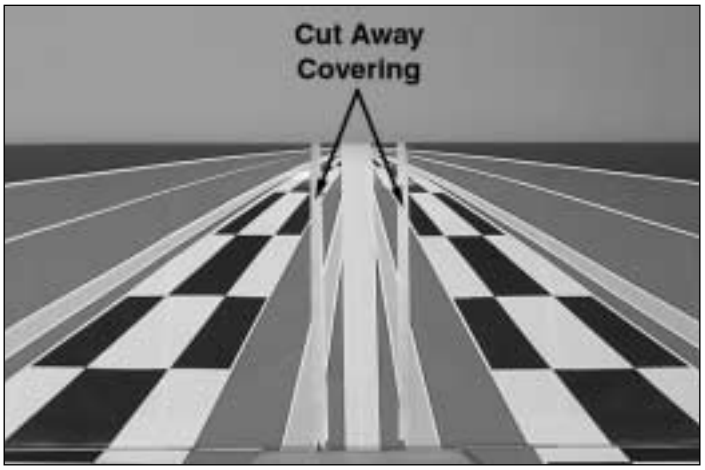


❑ 4. Make a mark on the center of the wing at the leading and trailing edge.



❑ 5. Place the wing on the fuselage, aligning the marks you made on the fuse and wing. Measure from the aft center of the fuselage to one wing tip and record the distance. Measure from the same point to the opposite wing tip and compare it to the first measurement. If the measurements are not the same, adjust the wig and re-measure until they are equal.

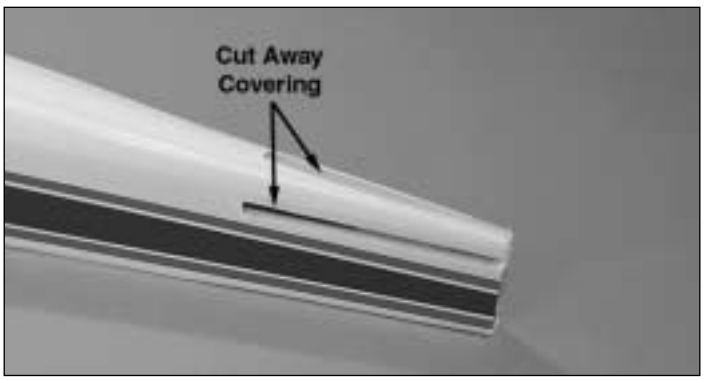
❑ 6. Once the wing is properly positioned, turn the wing and fuselage over and mark the location of the fuselage on the top of the wing.



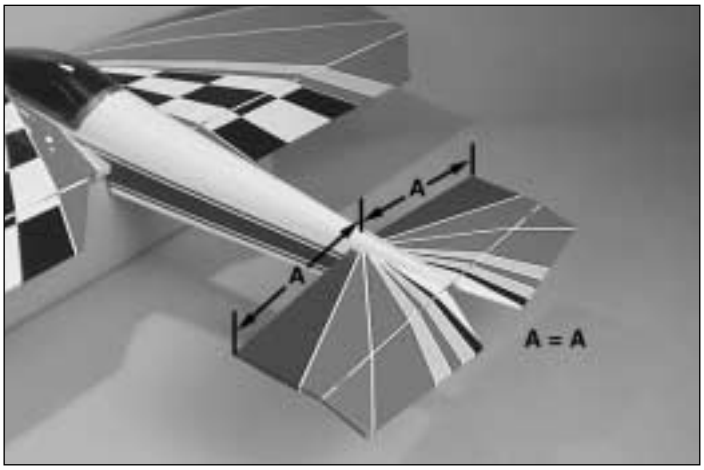
❑ 7. Cut away a 1/2" [13mm] strip of the film from the wing. Be sure the cut is inside of the line. **Important:** Use only enough pressure to cut through the film. Cutting into the wing sheeting will weaken the strength of the wing.

❑ 8. Block the wing up off of the bench. Apply 6-minute epoxy onto the wood where the covering has been cut away and to the wood blocks. Place the fuselage onto the wing. Place weight (bags of lead shot work well) onto the fuselage to hold it in place on the wing and let the glue cure.

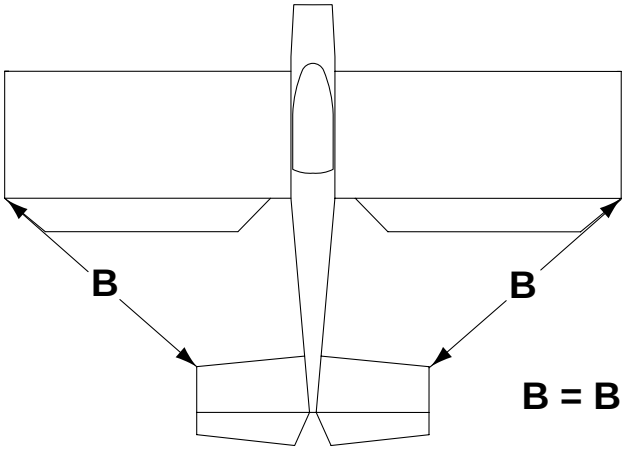
INSTALL THE STABILIZER AND ELEVATOR



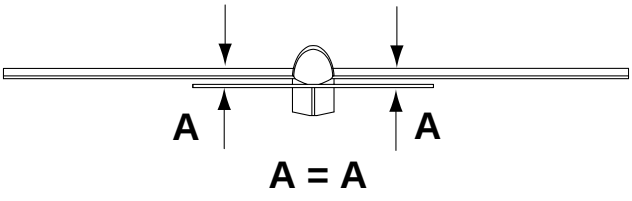
❑ 1. Cut away the covering from the openings in the fuselage for the **stab** and **fin**.



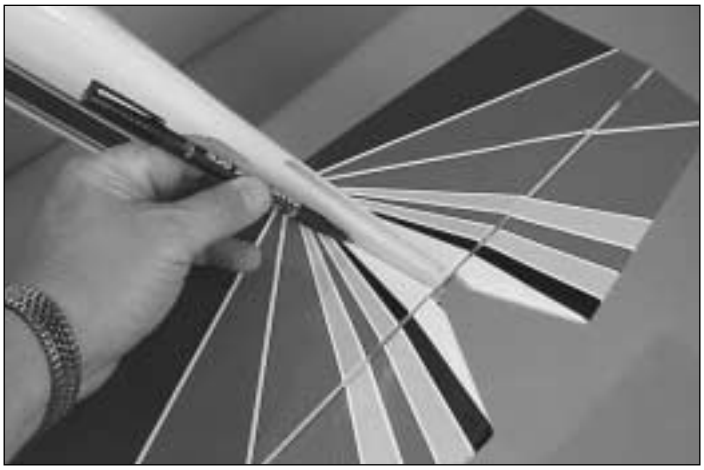
❑ 2. Slide the stabilizer into the fuselage. Center the stabilizer in the fuselage by measuring the distance from the center of the fuselage to the tip of the stabilizer. The stabilizer is centered when the measurements from both sides are equal.



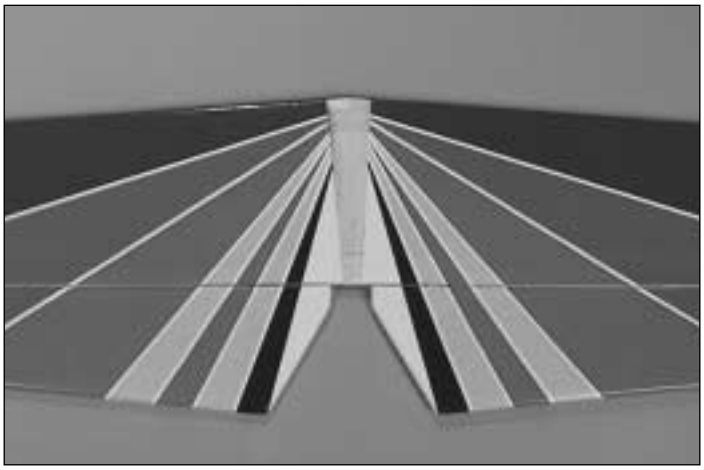
❑ 3. Align the stab by measuring from the wing tip back to the tip of the stabilizer. Do this until both sides are equally spaced.

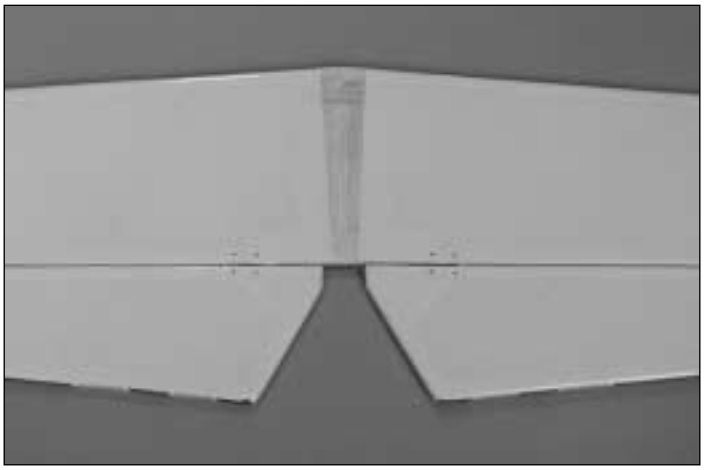


❑ 4.With the stab in place, stand back 8 – 10 feet [2.5 – 3 meters] and view the model from the front and rear. The stab tips should be equally spaced below the level of the wing. If not, lightly sand the high side of the **stab saddle** to correct the problem. Work slowly and check the alignment often.



❑ 5. When you are satisfied with the position of the stab, use a felt-tip pen to mark the sides of the fuselage on the bottom and top of the stab. Remove the stab from the fuselage.





❑ 6. Use a **fresh** #11 blade to carefully cut through the covering inside the lines you marked on the bottom and top of the stab that indicate the fuse sides. **Do not cut the wood under the covering! This will weaken the structure and may cause the stab to fail in flight.** Remove the covering from the center of the stab within the lines you cut.

❑ 7. Use a liberal coating of 30-minute epoxy to glue the stab in position. Double check the alignment with the wing and fuse while the epoxy cures.

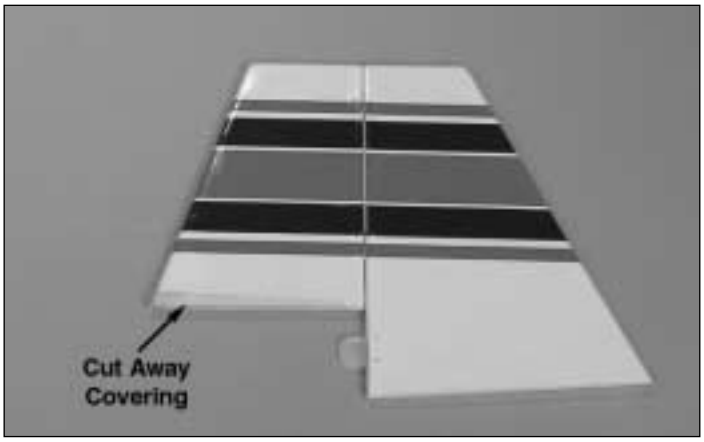
INSTALL THE FIN AND RUDDER

❏ 1. If you haven't already cut away the covering in the slot where the fin and rudder assembly are installed, do so now.

❏ 2. Slide the fin into the slot. Make a mark on the end of the fuselage where the hinge from the rudder needs to slide into the fuselage.

❏ 3. The pre-cut slot in the fuselage for the rudder hinge may be a bit tight for the hinge. With a #11 knife blade, widen the slot until the hinge fits the slot with enough room to be able to get epoxy in the slot with the hinge. Test fit the fin onto the fuselage, making sure the hinge fits into the slot.

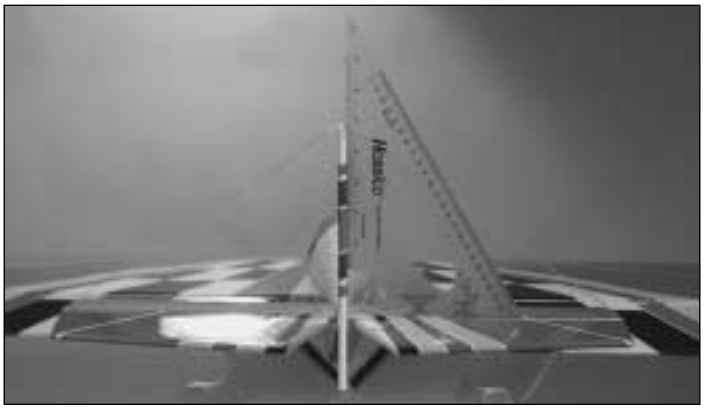
❏ 4. Use a felt tip-pen to mark the sides of the fin where it meets the fuselage.

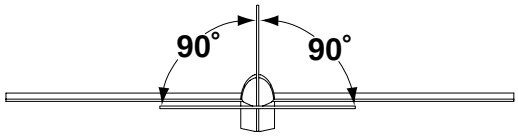


❏ 5. Cut the covering away from the fin inside the lines you just made, being careful not to cut into the wood. Remove any film that may be on the bottom of the fin where the bottom of the fin makes contact with the fuselage.

❏ 6. Apply a small amount of petroleum jelly or small drop of oil onto the joint of the hinge. This will prevent the glue from getting into the hinge when gluing it to the fuselage.

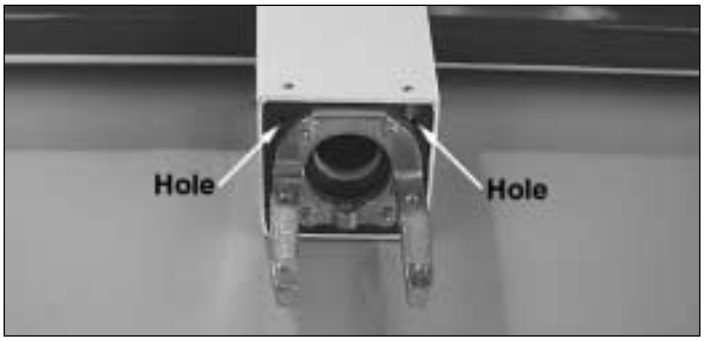
❏ 7. Apply a liberal amount of 30-minute epoxy to the fin and the hinge. Put the fin assembly in place on the fuselage.





❏ 8. Use a triangle to make certain that the fin is exactly 90° to the stab. Use masking tape to hold the fin in position to the stab while the glue cures.

ENGINE INSTALLATION

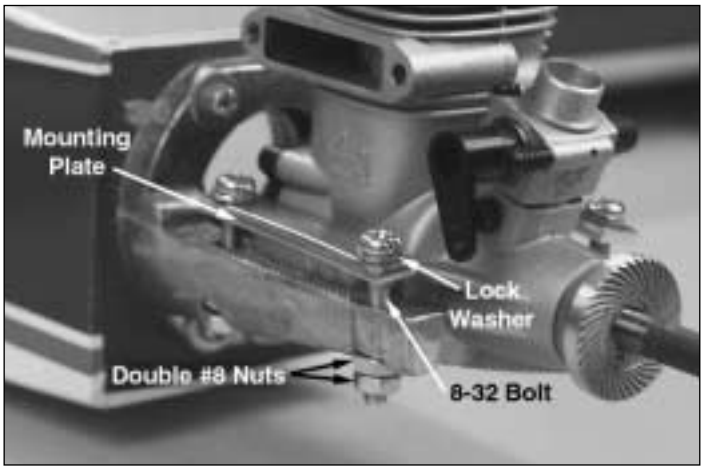


❏ 1. Determine the position for the throttle linkage that best suits the engine you are installing. We used the O.S. 40 LA. Determine which hole in the corner of the firewall best fits your engine, then insert the **plastic outer pushrod** to pass through it.

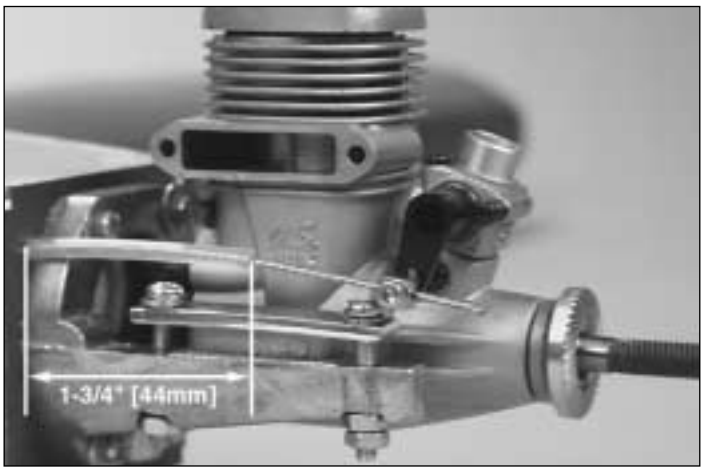
❏ 2. Install the outer plastic pushrod through the fuel tank compartment and under the wing. **Do not** glue the pushrod in place yet!

❑ 3. Locate the two aluminum **engine mount straps, four 8-32 x 1" bolts, four #8 lock washer and eight #8 nuts.**

❑ 4. Position the engine in place on the **engine mount**. Place the engine mount strap on each side of the engine.

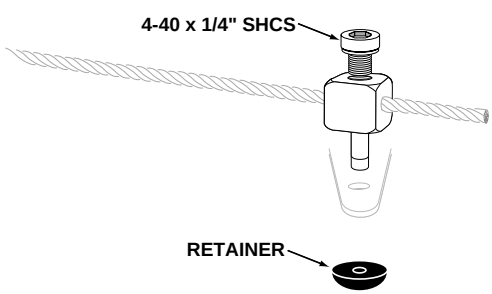


❑ 5. Attach the engine to the mount by using the 8-32 bolts, #8 lock washer and one #8 nut per bolt. When installing the engine it is important that the crankshaft be 90 degrees to the firewall. Once the engine is firmly bolted to the mount, attach a second #8 nut to the bolt. This double-nut installation will prevent the bolt and nut from vibrating loose.



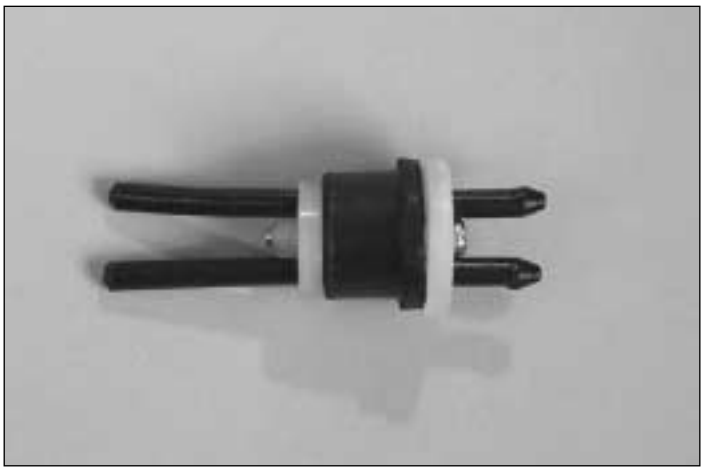
❑ 6. Be sure the outer plastic pushrod extends through the firewall 1-3/4" [44mm], then glue it in place to the firewall.

❑ 7. Install the **braided cable** into the outer plastic pushrod.

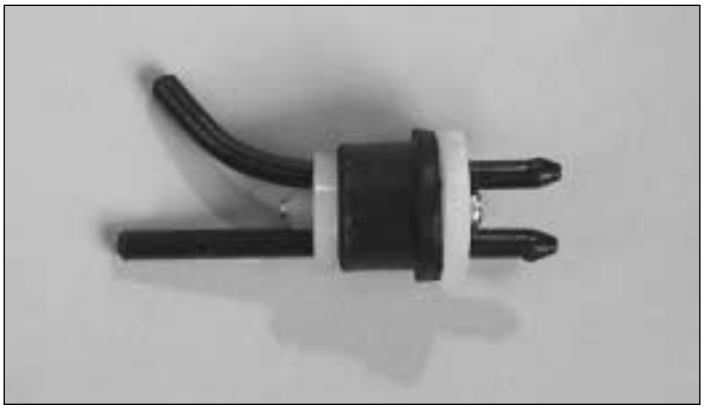


❑ 8. Attach the cable to the throttle barrel with the screw lock connector as shown above.

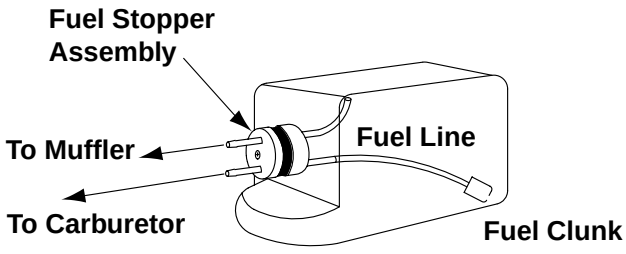
FUEL TANK INSTALLATION



❑ 1. Locate the **fuel stopper assembly**. Assemble it as shown.



❑ 2. Bend one of the two plastic tubes as shown. The tube with the bend is the vent line, the straight one is for the fuel pickup.



❑ 3. Complete the **fuel tank** assembly as shown. The final step, once the assembly is inserted into the tank, is to tighten the screw a few turns to pull the rubber stopper against the wall of the fuel tank.

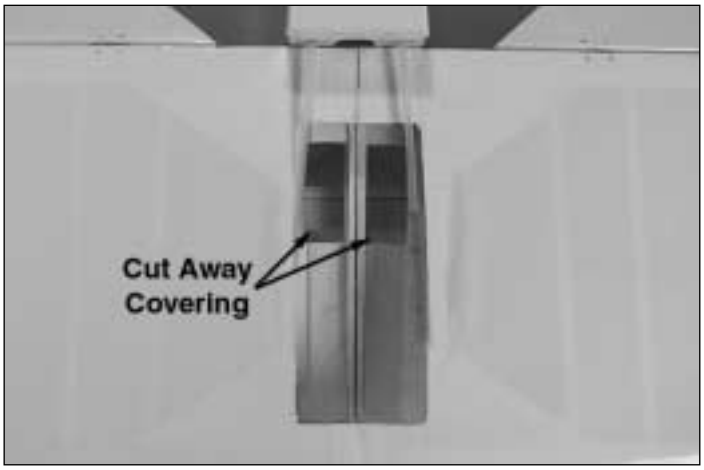
❑ 4. Remove the hatch to the fuel tank compartment.

❑ 5. Cut a piece of foam the size of the bottom of the fuel tank. Place this foam inside the fuel tank compartment. Then insert the tank into the fuel tank compartment.

❑ 6. Attach a piece of silicone fuel tubing to each of the fuel tank fittings. Pass the lines through the hole in the firewall. Connect the lines to the engine. The line attached to the fuel clunk attaches to the carburetor and the other to the pressure fitting on the muffler. **Note:** Refer to the sketch at Step 3 to see exact fuel line connection.

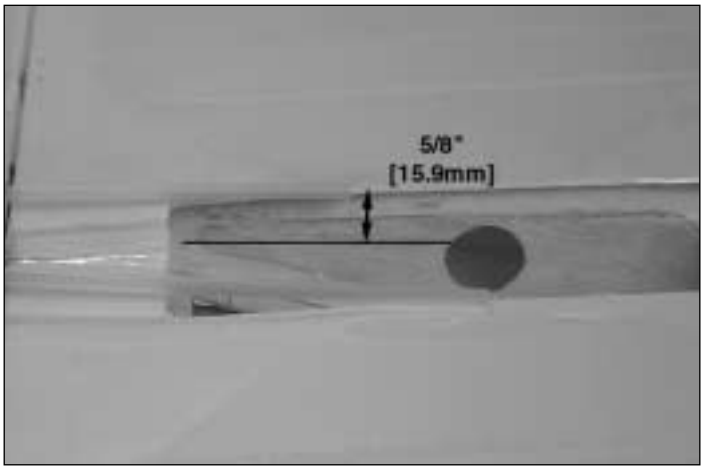
❑ 7. Cut another piece of foam and place it on top of the fuel tank, then reinstall the fuel compartment hatch to the fuselage.

RADIO INSTALLATION



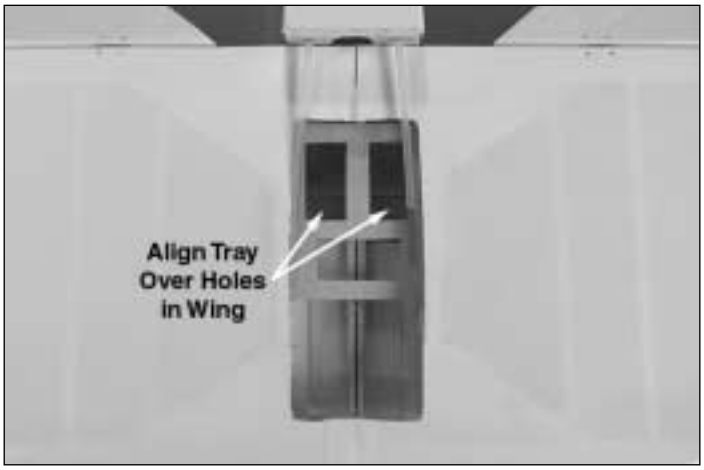
❑ 1. Cut away the covering in the wing to reveal the openings for the two servos as shown in the above photograph.

❑ 2. Trial fit the **servo tray** into the opening in the bottom of the wing. It should fit between the rib in each half of the wing. Trim the tray as needed to fit into the wing.



❑ 2. Measure down from the surface of the wing 5/8" [15.9mm]. On that mark draw a line that is parallel to the bottom of the wing. Do this on the rib on both the right and left wing panel.

❑ 3. Locate the two hardwood **landing gear rails**. Using 6-minute epoxy, glue the rails in place on the bottom of the lines you have drawn.



❑ 4. After the glue has cured, glue the servo tray to the rails with 6-minute epoxy. Be sure the side by side servo openings in the tray match up with the two servo cutouts in the wing.

❑ 5. Install a 6" [150mm] servo extension onto the end of two servos. (Hint: Tape the connectors together to insure the extension does not unplug from the servo.)

❑ ❑ 6. Install one servo into the aileron servo bay in the right wing, feeding the servo wire through the wing ribs, exiting into the radio compartment.

❑ ❑ 7. Drill four 1/16" [1.6mm] holes in the servo mounting tray for the servo screws. **Note:** Installing the screws without drilling the holes may result in the plywood servo tray splitting.

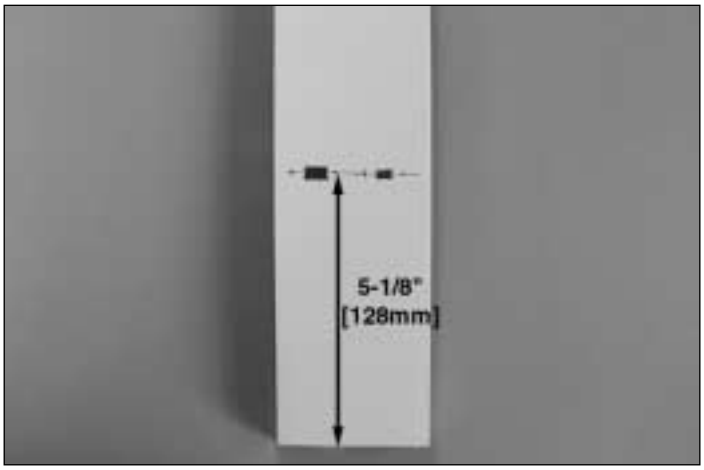
❑ ❑ 8. Install the servo using the hardware provided from the radio manufacturer.

❑ ❑ 9. Repeat steps 6-8 for the left wing.

❑ 10. Install three servos into the servo tray using the hardware provided by the manufacturer. Position the servos as shown in the photograph.

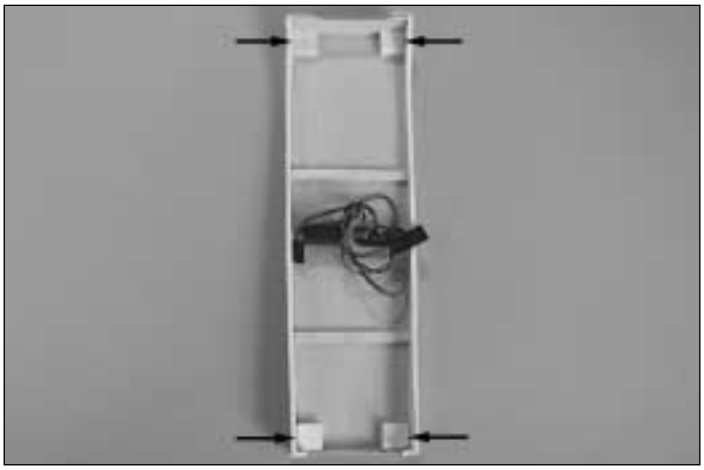
❑ 11. The open area in front of the servo tray is where you will locate the battery and receiver. Cut a piece of the **foam pad** and fit it in the opening. Lay the battery on the foam. Cut another piece of the foam pad and lay it on top of the battery, then place the receiver on top of the foam. Optional: Depending on the size of the battery and receiver you may choose to put them on end, side by side.

❑ 12. Connect all of your servo leads into the receiver as recommended by the radio manufacturer. The aileron servos can either be connected by a Y-harness or if you have a computer radio with channel assignments you can plug each servo into a separate channel. See your radio instruction manual for the set-up procedure.



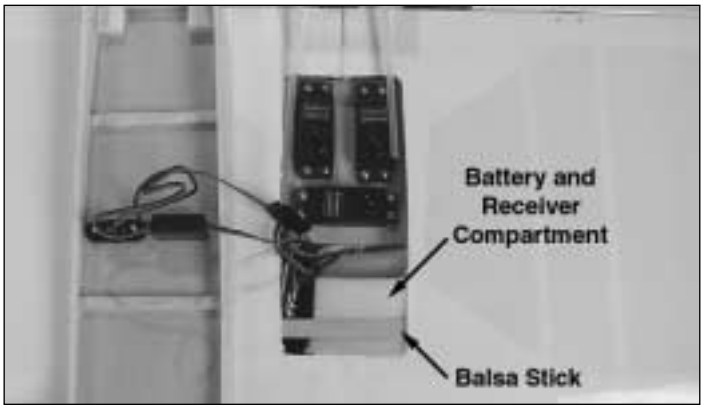
❑ 13. Locate the **radio compartment cover**. Measure 5-1/8" [128mm] from the back edge of the cover towards the center of the cover and make a mark. Draw a line across the width of the cover. This is the center line for the switch and charging jack installation. It is important that this line falls between the servo tray and the cavity for the battery and receiver or there may not be enough room for the switch and charge jack. Before cutting the location for them, visually check to be sure the line falls in the correct location.

❑ 14. Cut the openings and install the switch and charge jack.



❑ 15. Locate four 1/4" x 9/16" x 9/16" [6 x 14 x14mm] **hardwood blocks**. Glue them in each corner on the inside of the radio compartment cover.

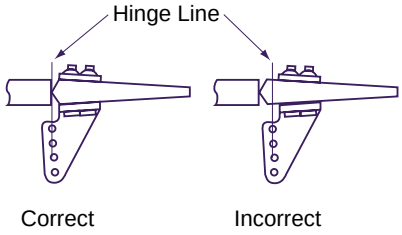
❑ 16. Connect the battery to the switch harness and receiver.



❏ 17. After the radio and battery have been installed it is recommended that you place another small piece of foam on top of the receiver and then hold the receiver in place with a balsa stick (not included) as shown in the photograph.

❏ 18. Cut away the covering where the pushrods exit the fuselage. Install the two 36" [900mm] solid wire **pushrods** into the plastic outer pushrod tubes. Be sure the threaded end of the pushrod exits at the rear of the fuselage.

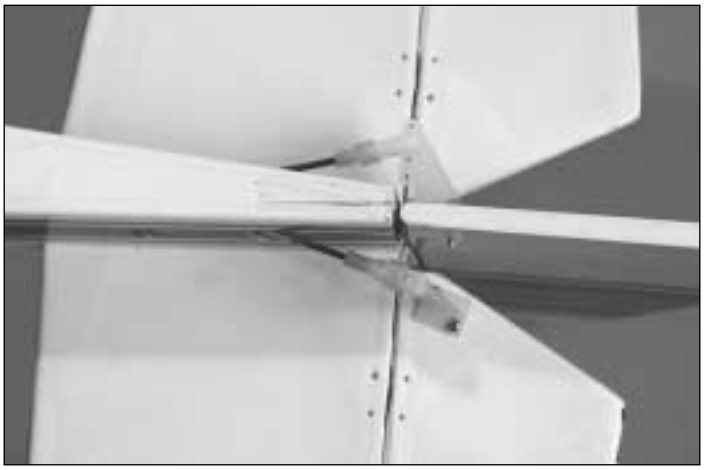
❏ 19. Install a silicone clevis keeper onto the threaded end of the rod. Install a clevis onto the threaded end of the rod by turning the clevis onto the threads 14 turns.



❏ 20. Locate one of the nylon **control horns** and the control horn **mounting plate**. Position the control horn on the left side of the rudder, in line with the solid wire pushrod, centering the control horn on the hinge line as shown in the above diagram.

❏ 21. Mark the location of the screw holes for the control horn. Drill a hole through the marks with a 1/16" [1.6mm] drill.

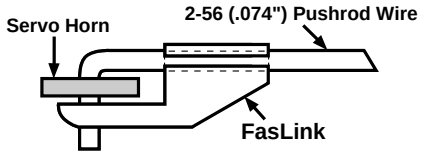
❏ 22. Install the control horn with two 2-56 screws. The screws should pass through the horn and the rudder, then screw into the control horn mounting plate on the opposite side of the rudder.



❏ 23. Attach the clevis to the outermost hole in the horn, then slide the silicone retainer over the clevis. Repeat this for the elevator control horn.

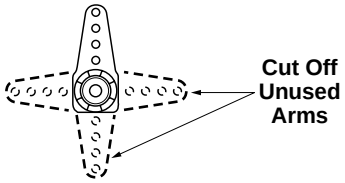
❏ 24. Turn on your radio and receiver. Center the servos and then install the servo arms as shown.

❏ 25. Center the elevator. Make a mark on the solid wire pushrod where it lines up with the hole in the servo arm. Make a 90-degree bend at the mark. Cut the rod above the bend to a length of 3/16" [4.8mm].



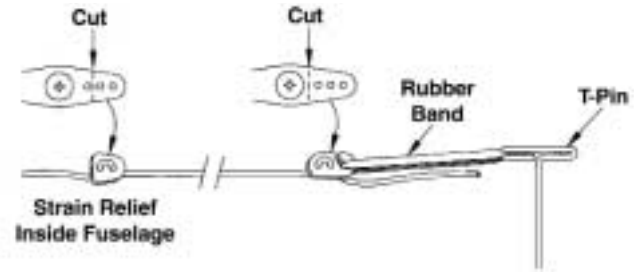
❏ 26. Install the rod into the hole in the servo arm and then attach a **Faslink** to hold the pushrod to the servo arm.

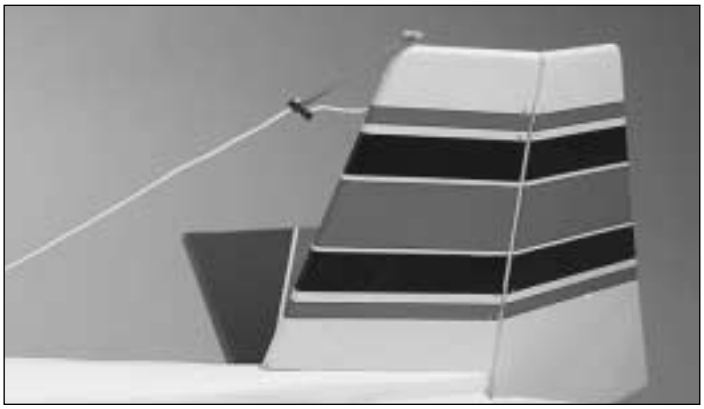
❏ 27. Turn on the transmitter and receiver. Set the throttle to full open. Install the braided cable into the screw-lock connector, then open the carburetor on your engine to full open. Insert the screw-lock connector into the outermost hole in the servo arm following the same installation instructions as you used attaching the cable to the throttle barrel during the engine installation. Cut the excess cable with a sharp wire cutter. Turn off the radio system when this is completed.



❑ 28. Cut unused arms from a leftover servo arm.

❑ 29. Drill a 1/16" [1.5mm] hole in bottom of the radio compartment cover.





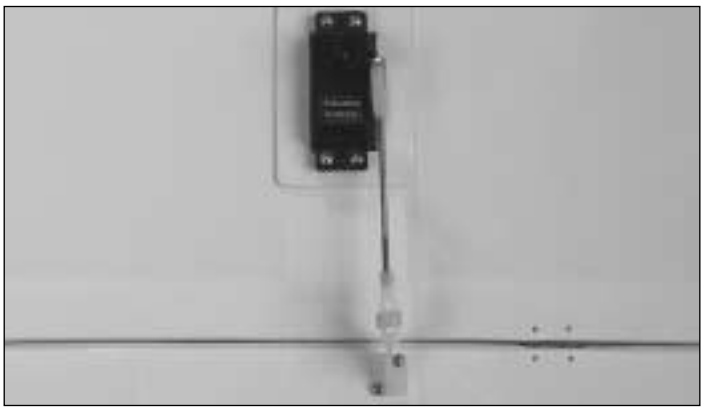
❑ 30. Use the arms to make a strain relief for the antenna wire. After cutting the servo arms, thread the antenna through the hole you drilled in the radio compartment cover and attach the antenna to the vertical fin with a rubber band and T-pin as shown above.

❑ ❑ 31. Turn on the receiver and radio to center the servos for the ailerons. Install a servo arm onto the servo so that the arm is parallel to the aileron.

❑ ❑ 32. Install a control horn onto the left aileron using the same installation technique used for the elevator and rudder.

❑ ❑ 33. Locate one of the 6" [150mm] **wire pushrods**. Install a silicone clevis keeper onto the wire then attach a clevis by turning it onto the threaded end of the pushrod 14 turns.

❑ ❑ 34. Center the aileron. Make a mark on the solid wire pushrod where it lines up with the outermost hole in the servo arm. Make a 90-degree bend at the mark. Cut the rod above the bend to a length of 3/16" [4.8mm].



❑ ❑ 35. Attach the pushrod to the aileron the same way it was done for the elevator and rudder.

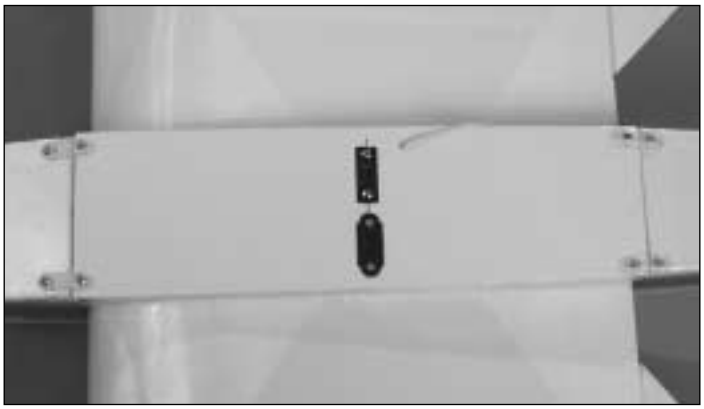
❑ 36 Repeat this procedure for the right aileron.

INSTALLING THE RADIO COMPARTMENT COVER

❑ 1. Turn the airplane upside down on your bench. Trial fit the radio compartment cover in place on the wing.

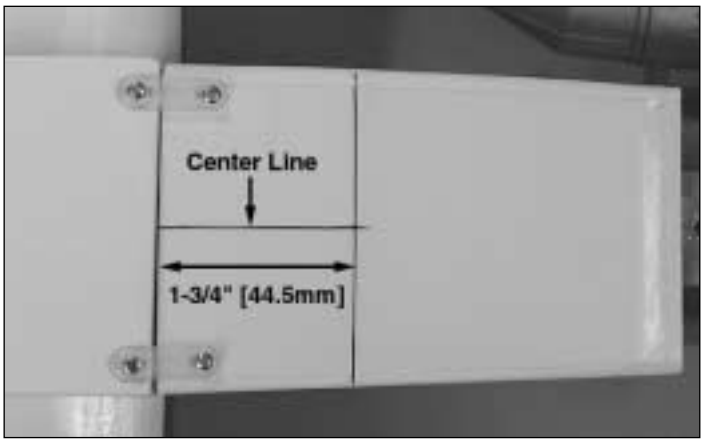
❑ 2. Drill a 1/16" [1.6mm] hole in the corners of the cover, drilling through the cover and the hardwood blocks you glued in place earlier.

❑ 3. Attach a nylon strap with a **#2 x 1/2"** [13mm] screw at each of the holes you drilled.



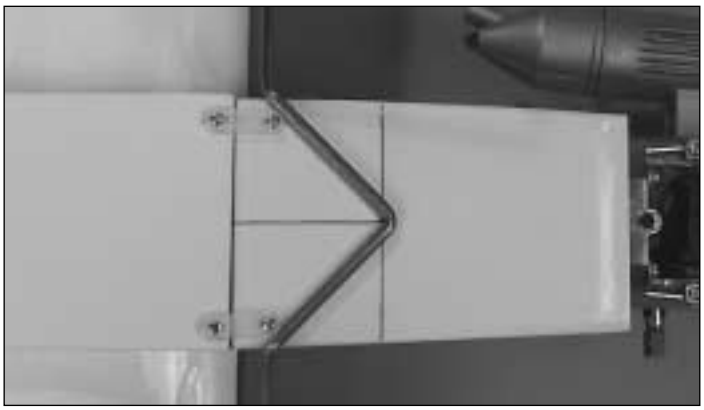
❑ 4. Position the straps so that they lay across the radio compartment cover and the fuselage. Drill a hole in the fuselage where each strap contacts the fuselage. Then screw each strap to the fuselage.

INSTALLING THE LANDING GEAR

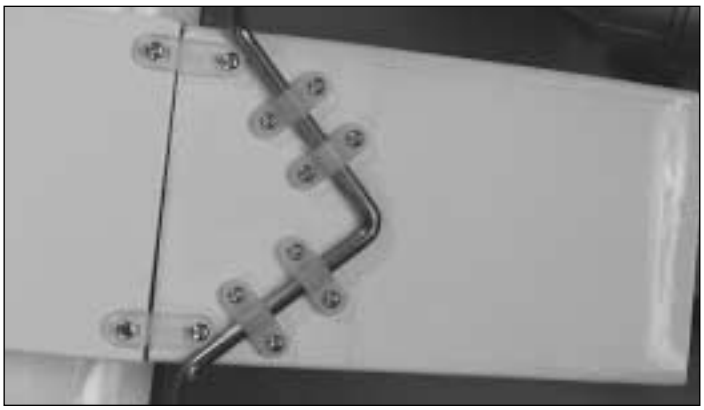


❏ 1. Draw a center line on the bottom of the fuselage in front of the wing L.E., beginning where the fuselage meets the radio compartment cover.

❏ 2. Measure from the back edge of the fuselage forward 1-3/4" [44mm]. Draw a line across the fuselage on this mark.

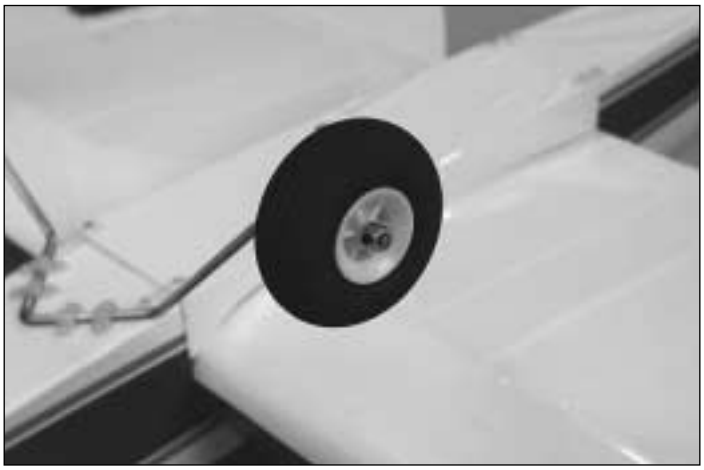


❏ 3. Locate the pre-bent wire **landing gear**. Place the wire on the fuselage over the reference lines you have drawn, aligning the center of the bend in the wire on the center line of the fuselage.



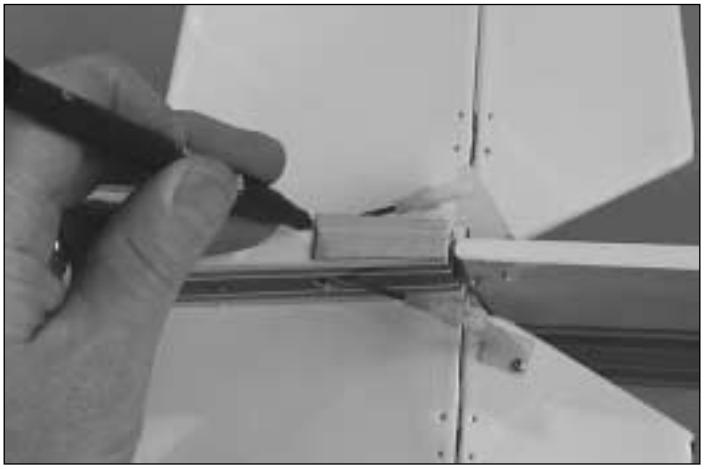
❏ 4. Locate four humped nylon **landing gear straps**. Drill 1/16" holes in the fuselage for the straps, then screw them in place as shown in the photograph using the **#2 x 1/2" [13mm] sheet metal screws**.

❏ ❏ 5. Locate four 5/32" [4mm] **wheel collars**. Insert a **6-32 set screw** into each one. Place one wheel collar onto the main landing gear wire. Lock it in place onto the wire 1" [25mm] from the end of the wire.



❏ ❏ 6. Insert a **foam wheel** onto the wire followed by another wheel collar. Tighten the wheel collar in place on the wire to lock the wheel in place. Hint: The wheel collar will tighten better to the wire if you file a small flat spot where the set screw contacts the wire.

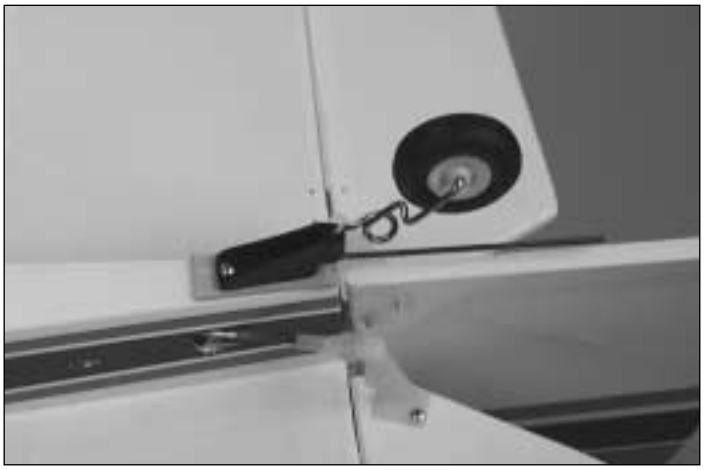
❏ 7. Repeat this for the remaining wheel.



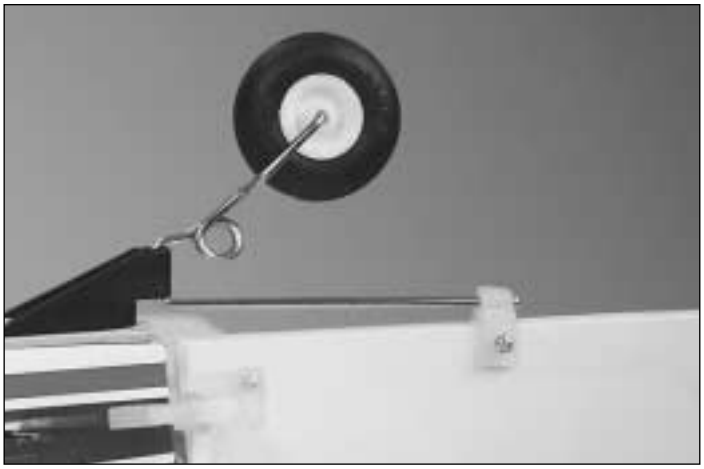
❏ 8. Locate the plywood **mounting plate** for the tailwheel assembly. Place it on the bottom of the aft end of the fuselage. Use a felt tip pen to mark the location of the plate on the fuselage.

❏ 9. Cut away the covering inside of the lines you have drawn. Then glue the plywood plate to the fuselage with 6-minute epoxy.

❏ 10. When the glue has cured, place the tailwheel assembly in place on the plywood plate. Mark the locations of the mounting holes. With a 3/64" [1.2mm] drill bit, drill through the marks on the plywood plate.

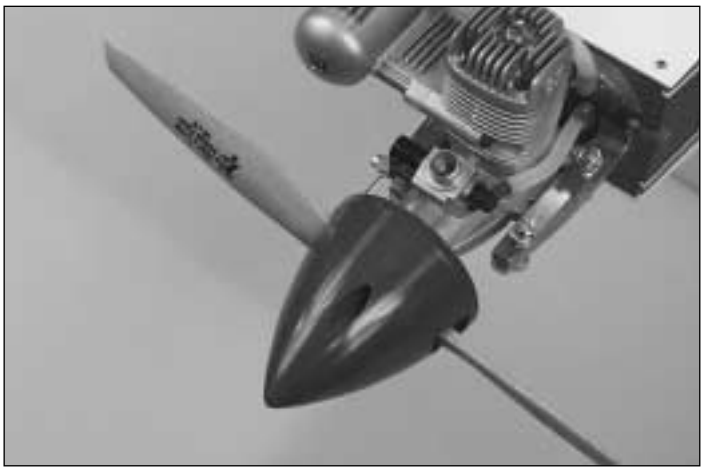


❑ 11. Screw the tailwheel assembly to the plate.



❑ 12. Locate the plastic tailwheel bracket. Slide it onto the wire, then press it firmly onto the rudder. Once in place drill a 1/16" [1.6mm] hole into the rudder. Secure the bracket to the rudder with a #2 x 1/2" [13mm] sheet metal screw.

FINAL ASSEMBLY



❑ 1. Install the spinner and the propeller appropriate for your choice of engine.

Control Throw Adjustment

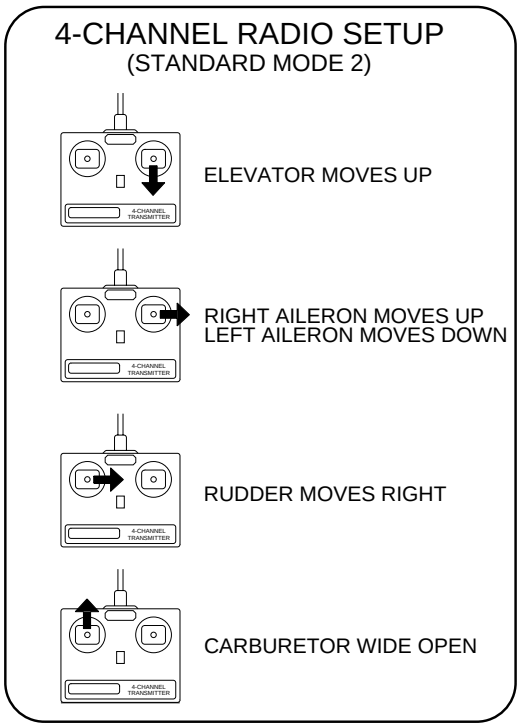
By moving the position of the clevis at the control horn toward the outermost hole, you will decrease the amount of throw of the control surface. Moving it toward the control surface will increase the amount of throw. If these adjustments don't accomplish the job, you may need to work with a combination 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:

	Low Rate	**High Rate**
ELEVATOR:	3/8" [9.5mm] up	1/2" [13mm] up
	3/8" [9.5mm] down	1/2" [13mm] down
RUDDER:	1-1/4" [32mm] right	Same
	1-1/4" [32mm] left	Same
AILERONS:	3/8" [9.5mm] up	3/4" [19mm] up
	3/8" [9.5mm] down	3/4" [19mm] 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™ GPMR2405 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.



Make sure the control surfaces move in the proper direction as illustrated in the above 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" [75mm] back from the leading edge of the wing.** Balance your Dazzler 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. After initial trim flights and when you become more acquainted with your Dazzler, you may wish to experiment by shifting the balance up to 1/4" [6mm] forward or backward to change its flying characteristics. Moving the balance forward may improve the smoothness and stability, but the model may then require more speed for takeoff and may become more difficult to slow for landing. Moving the balance aft makes the model more agile with a lighter, snappier "feel" and often improves knife-edge capabilities. In any case, please start at the location we recommend. Do not at any time balance your model outside the recommended range.

❑ 2. With 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.

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. Make sure the fuel tank is empty.

❑ 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.

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

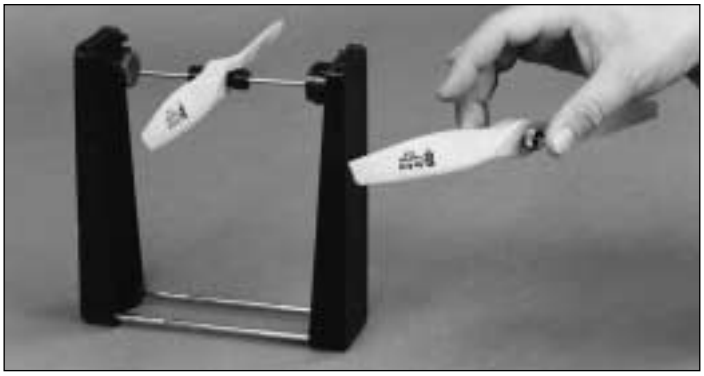
At this time check all connections including servo horn screws, clevises, servo cords and extensions.

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 and receiver 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 safely 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.

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

5. 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

The Dazzler is a very fun and enjoyable plane to fly. It is very predictable when balanced at the recommended C.G. and the control throws are set at the low rate recommendation. Set up this way you will find that it performs most aerobatic maneuvers with ease. Move the C.G. back and step up to the high rate control throws and you will have a very responsive, fun fly type of plane!

Takeoff

The Dazzler has no bad ground handling characteristics. Simply line up on the runway, advance the throttle slowly, make steering corrections as needed with the rudder and you will be airborne in about 50 feet.

Flying

Once airborne you will find that the Dazzler performs slow flight maneuvers as easily as it performs at faster speeds. Tight loops, large loops, slow rolls, fast rolls, inverted flight are all easily done with the Dazzler. Do you like to participate in fun fly competitions? Try the limbo! You will be surprised how low and slow you can fly!

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 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 comes time to land the Dazzler, you will find it is as predictable to land as it was to fly. Simply line it up on the runway and slowly decrease the speed. When you are over the runway, drop the throttle and flare to a three point landing!

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 you 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 as certain 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 lose 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 the back cover.

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 45º 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.