

AT-6 TEXAN

Legendary Warbirds CUSTOM-WOOD Series

INSTRUCTION MANUAL

Almost Ready-to-Fly



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.

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.

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



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PROTECT YOUR MODEL, YOURSELF & OTHERS

Your AT-6 ARF is not a toy, but rather a sophisticated, working model that functions very much like a full-size airplane. Because of its realistic performance, the AT-6 ARF, if not assembled and operated correctly, could possibly cause injury to yourself or spectators and damage property.

To make your R/C modeling experience totally enjoyable, we recommend that you get experienced, knowledgeable help from an instructor with assembly and during your first flights. You'll learn faster and avoid risking your model before you're truly ready to

solo. Your local hobby shop has information about flying clubs in your area whose membership includes qualified instructors.

You can also contact the national Academy of Model Aeronautics (AMA), which has more than 2,500 chartered clubs across the country. Through any one of them, instructor training programs and insured newcomer training are available. 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>

INTRODUCTION

The Great Planes **AT-6 ARF** is a high performance sport airplane that closely resembles the full-size AT-6 both in appearance and performance. The fuselage in front of the wing has been lengthened slightly to allow the model to be balanced without the need for excess nose weight. The AT-6 ARF is very stable and predictable, allowing even low time pilots to enjoy it.

This is not a beginner's airplane! While the **AT-6 ARF** is easy to build and flies great, we must discourage you from selecting this kit as your **first** R/C airplane. It lacks the self-recovery characteristics of good basic trainers such as the Great Planes **PT™ Series**. On the other hand, if you have already learned the basics of R/C flying, and you are able to safely handle a .40-size low wing airplane, the **AT-6 ARF** is an excellent choice to try your skills at flying a sport scale airplane.

PRECAUTIONS

1. 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 as correct.
2. Take time to build straight, true and strong.
3. Use an R/C radio system that is in first-class condition, and a correctly sized engine and components (fuel tank, wheels, etc.) throughout your building process.
4. You must properly install the R/C radio system and other components so that the model operates properly on the ground and in the air.
5. You must test the operation of the model before every flight to insure that all equipment is operating and you must make certain that the model has remained structurally sound. Be sure to check clevises or other connectors often and replace them if they show signs of wear or fatigue.

Note: We, as the kit manufacturer, provide you with a top quality kit and great instructions, but ultimately the quality 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.

Please inspect all parts carefully before starting to build! If any parts are missing, broken or defective, or if you have any questions about building or flying this airplane, please call us at (217) 398-8970. You can also check our web site at www.greatplanes.com for the latest AT-6 ARF updates, or e-mail your questions to productsupport@greatplanes.com. If you are calling for replacement parts, please reference the part numbers and the kit identification number (the small sticker on the end of the carton) and have them ready when calling.

DECISIONS YOU MUST MAKE

Engine Selection

There are several engines that will work well in your AT-6 ARF. We recommend a 2-stroke such as an **O.S.® .40 LA**, **O.S. .40 FX**, or **O.S. .46 FX**, or the **SuperTigre® G40**. For unsurpassed power and realistic sound, an **O.S. FS-52** 4-stroke can't be beat.

Required Accessories

*Items in parentheses (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
- Engine – See **Engine Selection** Above
- Propeller (Top Flite® Power Point®—Refer To Your Engine's Instructions For Proper Size)
- Medium Fuel Tubing (GPMQ4131)
- 6" Servo Extension (1)
- "Y" connector (1) when using a basic 4-channel radio
- Slimline Sport Scale muffler

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 Pro Epoxy (GPMR6045)
- 30-Minute Pro Epoxy (GPMR6047)
- Epoxy Brushes (GPMR8060)
- Pro Thread Locking Compound (GPMR6060)
- T-pins (HCAR5150)
- Adjustable Wrench
- Plastic Wrap or Waxed Paper
- Isopropyl Alcohol (70%)

- Mixing Sticks (GPMR8055)
- Round Toothpicks
- Hobby Knife (TOWR1010), #11 Blades (TOWR1015)
- Small Hobby Clamps
- String
- Builders Triangle Set (HCAR0480)
- Masking Tape (TOPR8018)
- Sandpaper (coarse, medium, fine grit)
- Easy-Touch™ Bar Sander (GPMR6170, or similar)
- 1/4" Latex Foam Rubber Padding (HCAQ1000)
- Paper Towels
- Felt-Tip Marker
- Wire Cutter
- File
- Drill Bits: 1/16" (1.5mm), 5/64" (2mm), 3/32" (2.4mm), 1/8" (3mm), 3/16" (4.7mm), 1/4" (6mm)

Optional Supplies & Tools

- CA Applicator Tips (HCAR3780)
- CA Debonder (GPMR6039)
- Sealing Iron (TOPR2100)
- Heat Gun (TOPR2000)
- Single-edge Razor Blades (HCAR0312)
- Curved Tip Canopy Scissors For Trimming Plastic Parts (HCAR0667)
- Switch and Charge Jack (GPMM1000)
- Fuel Filler Valve (GPMQ4160)

Optional Retract Items

- Hobbico Mechanical Retracts Main (HCAP4010)
- Retract servo (compatible with your radio system)
- Threaded pushrods (2) (GPMQ3750)
- Nylon Clevis (2) (GPMQ3800)
- Wheel Collars (2) (GPMQ4306)
- 1-1/4" x 5/32" Axle (GPMQ4280)

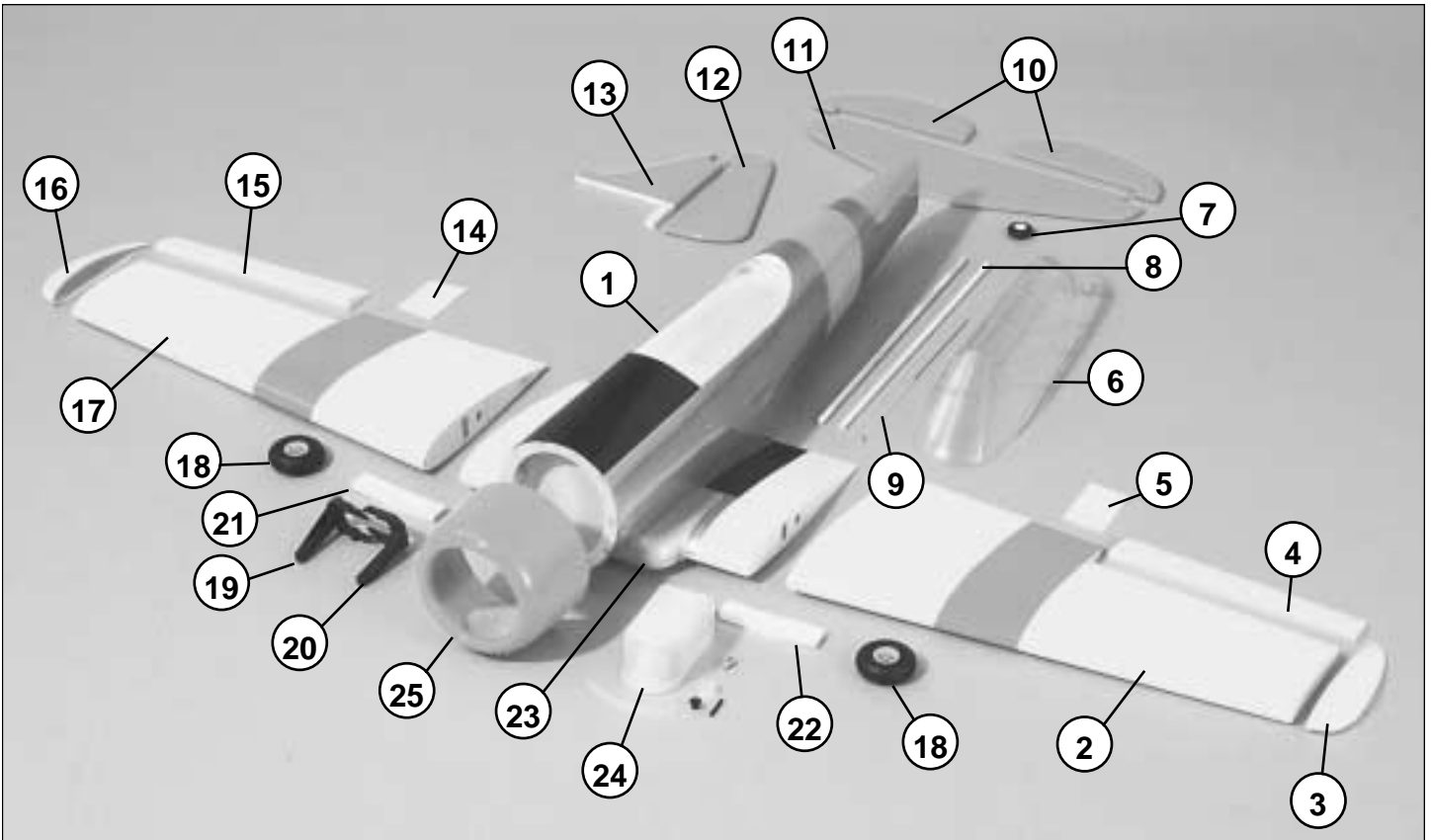
General Inspection

Remove the fuselage, wing panels, rudder assembly and stabilizer assembly from their bags. Inspect all items closely to check for any damage. If any of the control surfaces are attached, simply pull them apart and store the hinges in a safe place until it is time to reattach them. The manual begins with all the surfaces shown separated.

Your AT-6 is covered with high quality Top Flite MonoKote® covering. If any of the covering has loosened, use a heat gun or sealing iron to tighten it.

Building Notes

Several times during construction we refer to the "top" or "bottom" of the model or a part of the model. It is understood that the "top" or "bottom" of the model is as it would be when the airplane is right side up and will be referred to as the "top" even if the model is being worked on upside-down.



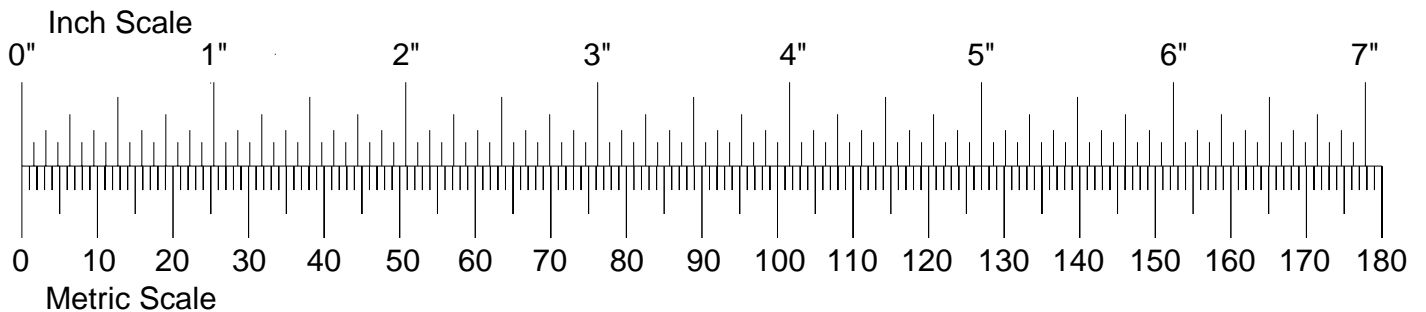
Key #	Description	Qty		Replacement Parts
1	Fuselage	1	13	Canopy GPMA2080
2	Left Wing Panel	1	14	Cowling GPMA2081
3	Left Wing Tip	1	15	Wing Set GPMA2082
4	Left Aileron	1	16	Tail Set GPMA2083
5	Left Aileron Servo Hatch	1	17	Fuselage Set GPMA2084
6	Canopy	1	18	Landing Gear Set . . . GPMA2085
7	Tail Wheel	1	19	
8	Pushrods	2	20	
9	Pushrod Wire w/guide	1	21	
10	Elevator	2	22	
11	Stabilizer	1	23	
12	Rudder	1	24	
			25	

METRIC CONVERSIONS

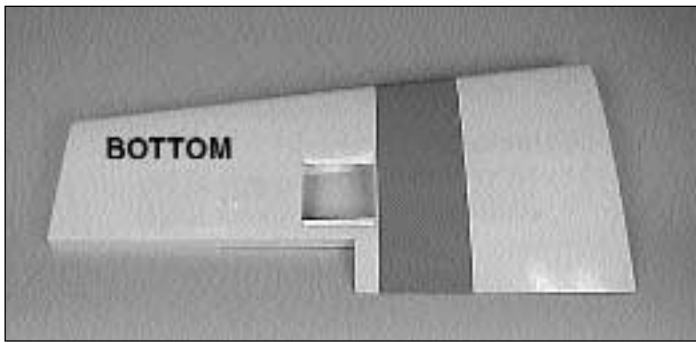
1/64" = .4 mm
 1/32" = .8 mm
 1/16" = 1.6 mm
 3/32" = 2.4 mm
 1/8" = 3.2 mm
 5/32" = 4.0 mm
 3/16" = 4.8 mm
 1/4" = 6.4 mm

3/8" = 9.5 mm
 1/2" = 12.7 mm
 5/8" = 15.9 mm
 3/4" = 19.0 mm
 1" = 25.4 mm
 2" = 50.8 mm
 3" = 76.2 mm
 6" = 152.4 mm

12" = 304.8 mm
 18" = 457.2 mm
 21" = 533.4 mm
 24" = 609.6 mm
 30" = 762.0 mm
 36" = 914.4 mm

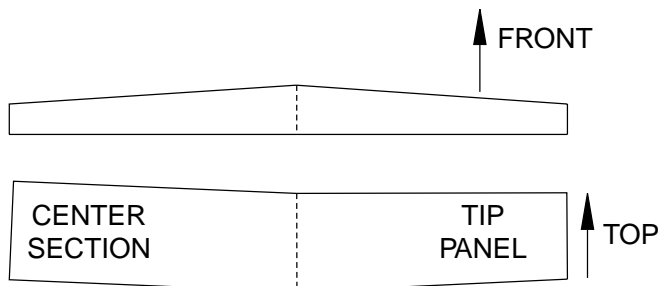
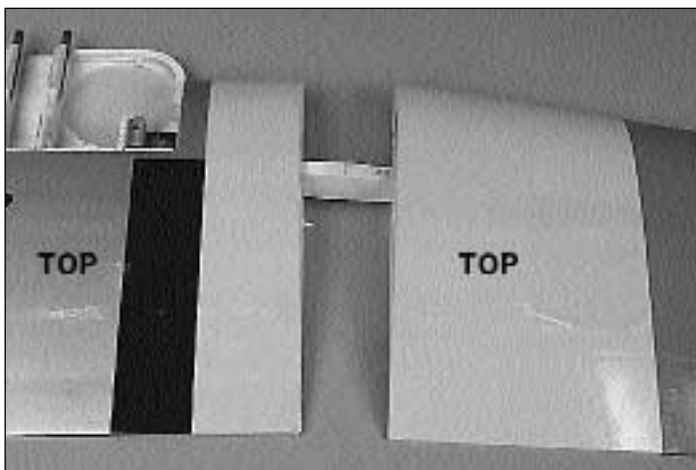


WING ASSEMBLY



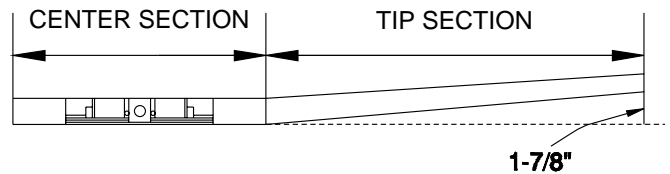
1. Remove the covering from the **Aileron Servo Openings** on the bottom of the wing only. Cut 1/8" (3mm) inside of the opening to allow some material to iron down inside the opening. Use a sealing iron to secure the covering around the opening.

2. Locate the preinstalled strings in the **Center Section** and **Outer Panels**. When attaching the outer panels to the center section, the strings for installing the aileron servos must be moved so they do not interfere with the fit of the panels. Don't remove the string because you will use it to pull your aileron servo cords through the wing later.



3. Locate the hardwood wing joiners. Use the sketch to differentiate the left and right joiners. (The sketch is of the right wing joiner.) Draw a centerline on both sides of the right joiner. Test fit the wing joiner into the right wing panel and the right side of the center section. A snug fit of the

joiner is desirable. If the joiner does not fit properly, lightly sand any uneven surfaces from the joiner edges and sides. **Note:** The wing joiners are tapered to fit into the wing panels. Make sure the angles are lined up to provide the correct alignment of the wing panels and center section. Use the sketch to determine the orientation of the joiner.

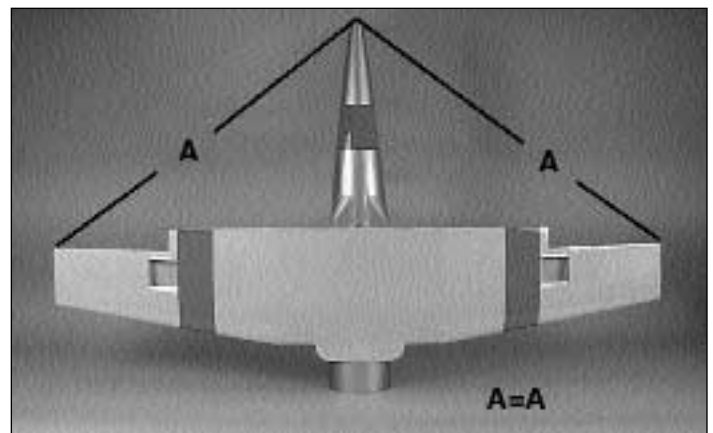


Make a dry run of the following step without using any glue so you will know how to join your wing together.

4. Untape the preinstalled strings in the **Center Section** and **Outer Panels**. Tie the strings together, being careful not to pull the strings out of the panels. Note: Don't remove the strings because you will use them to pull your aileron servo cords through the wing later. Use a liberal amount of 30-minute epoxy to glue the wing joiner into the right wing panel and center section. Apply epoxy to all sides of the joiner, joiner pockets, and center ribs of both the right wing panel and center section. Join the wing panel and center section. Use masking tape to tightly tape the right wing panel and center section together. Be certain the leading and trailing edges align. Wipe off any excess epoxy from the outside of the wing with a paper towel and rubbing alcohol. With the center section upright and flat on your building surface, measure the distance from your work surface to the tip of the outer panel to make sure you have the correct amount of polyhedral as shown in the sketch.

5. After the epoxy has cured, repeat the above steps 3 and 4 to join the left wing panel to the center section.

WING INSTALLATION

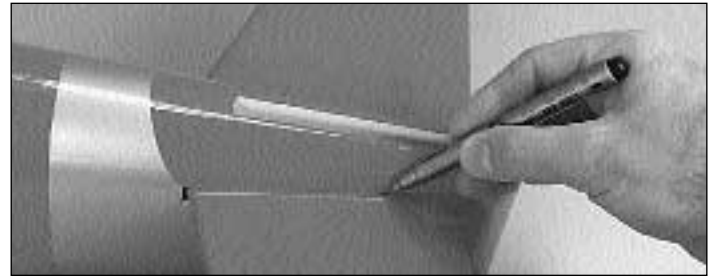


1. Place the wing on the **Fuselage**. Measure from the aft center of the fuselage to one wing tip and record the

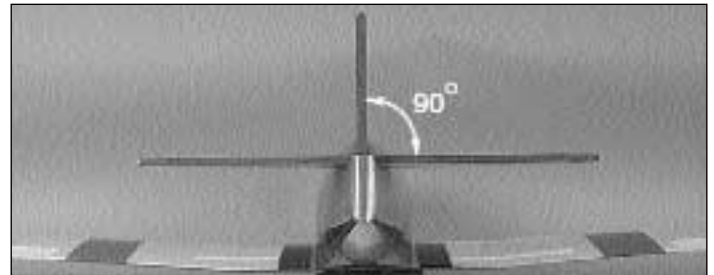
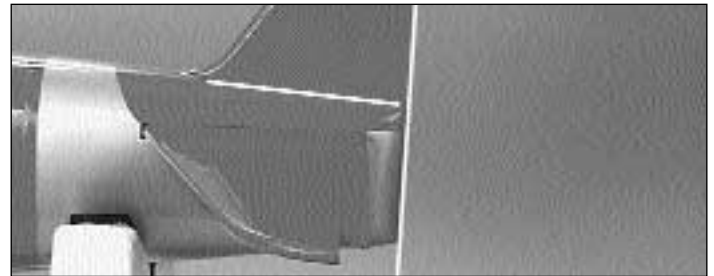
distance. Measure from the same point to the opposite wing tip, and compare it to the first measurement. If the measurements are not the same, adjust the wing and remeasure until they are equal. Place a mark on the wing and fuselage so it can be repositioned accurately for the following steps.

❑ 2. Remove the covering from the wing center section where the wing bolts will pass through the wing.

❑ 3. Bolt the wing to the fuselage using the 1/4-20 x 2" **Nylon Bolts**. Check the alignment of the wing and enlarge the holes in the wing if necessary to allow the wing to be shifted to match the alignment marks.



❑ 3. When the alignment looks good, mark the outline of the fuselage onto the stabilizer. Remove the stabilizer, and trim the covering 1/32" (.8mm) inside of the lines, **being careful not to cut into the underlying wood**. Slide the stabilizer back into the fuselage, recheck the alignment, and wick thin CA along the joint between the stabilizer and fuselage.

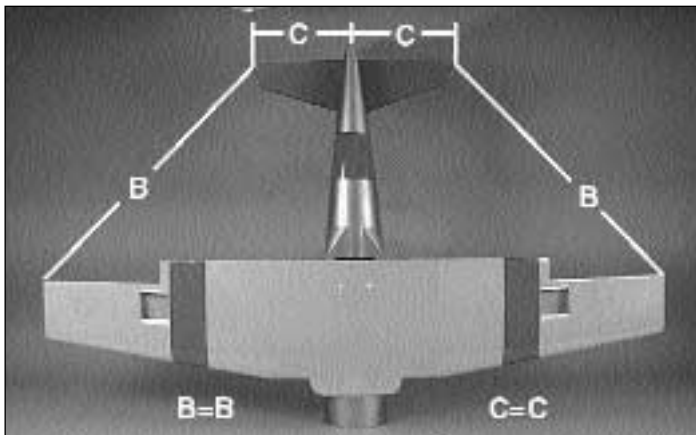


❑ 4. Test fit the **Fin** in the slot at the aft edge of the fuselage. The trailing edge of the fin must be flush with the aft edge of the fuselage. Draw a line along the bottom of the fin at the fuselage and remove the covering 1/32" (.8mm) below the line, **being careful not to cut into the underlying wood**. Use 30-minute epoxy to glue the fin in position. Work the epoxy into the slot in the fuselage, filling any loose-fitting joints between the fuselage and stabilizer. Check the alignment of the fin to the stabilizer with a triangle, then secure it in position with masking tape until the epoxy has cured. Double check the alignment of the fin with the stabilizer while the epoxy cures.

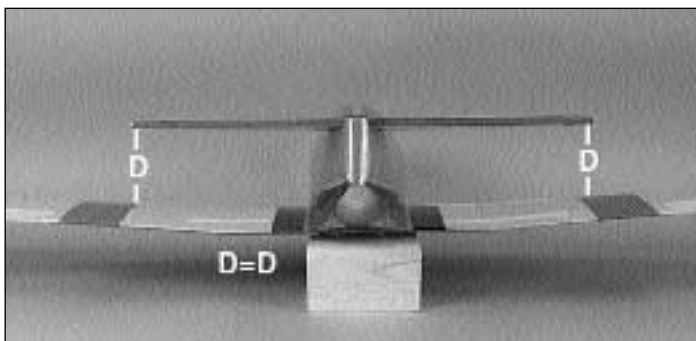


❑ 5. Drill a 1/8" (3mm) hole 1" (25mm) up from the bottom of the **Rudder**. Cut a groove down from the hole to the bottom for the plastic bushing on the **Tail Gear Assembly** to ride in. Apply petroleum jelly to the wire and work it into the plastic bushing. Use 6-minute epoxy to glue the tail gear assembly into the rudder.

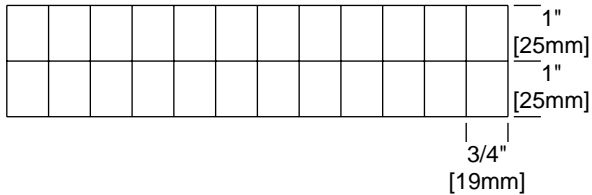
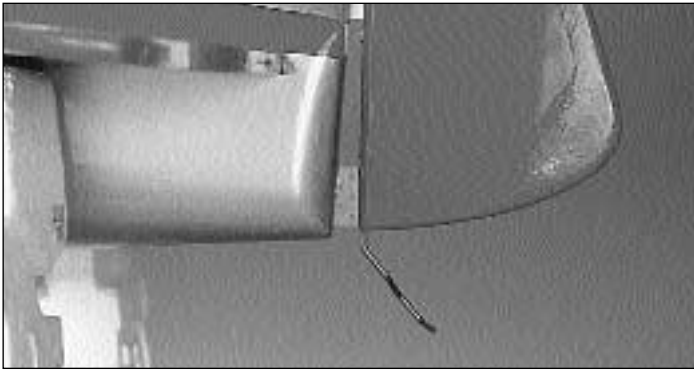
INSTALL THE TAIL COMPONENTS



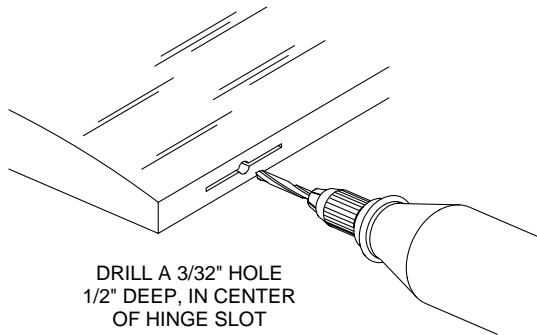
❑ 1. Remove the covering on the fuselage for the **Horizontal Stabilizer**. Slide the stabilizer into position, and check the alignment as shown in the photo.



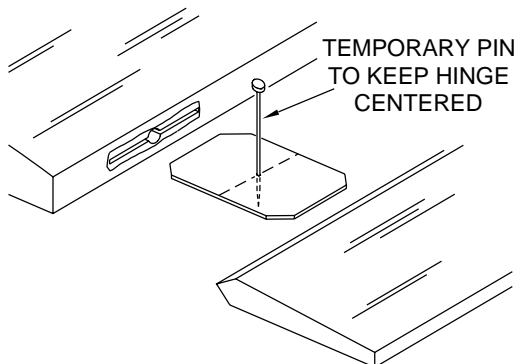
❑ 2. Mount the wing to the fuselage using the nylon bolts. Stand back 8 to 10 feet (2.5 to 3 meters) and view the model from the front and rear. The stabilizer tips should be equally spaced above the level of the wing. If not, lightly sand the high side of the stab saddle to correct the problem. Work slowly and check the alignment often.



❑ 6. Cut a slot in the aft tail post for the tail gear bushing. Test fit the rudder to the fin and the tail gear wire with the hinges. If the hinges are difficult to install or don't go in far enough, carefully enlarge the hinge slots with a hobby knife and a #11 blade. Cut the hinges to the size shown above from the 2" (51mm) x 9" (229mm) hinge material. Use the following procedure for gluing the hinges and tail gear assembly.

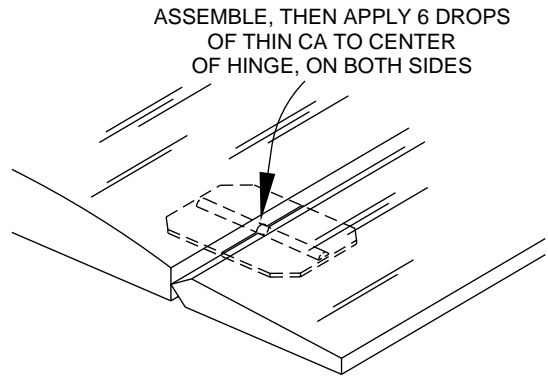


❑ A. Drill a 3/32" hole, 1/2" deep, in the center of the hinge slot. If you use a Dremel® MultiPro™ for this task, it will result in a cleaner hole than if you use a slower speed drill. Drilling the hole will twist some of the wood fibers into the slot, making it difficult to insert the hinge, so you should reinsert the knife blade, working it back and forth a few times to clean out the slot.



❑ B. Hint: If the hinges don't remain centered, remove the rudder and insert a pin in the center of the hinges.

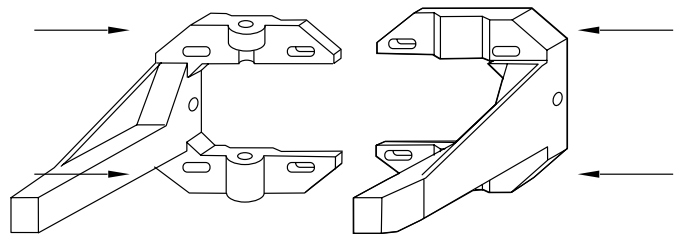
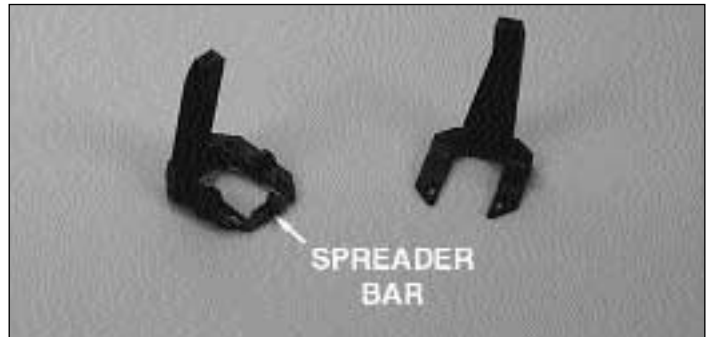
❑ C. Pack the tail gear wire slot in the fuselage with epoxy. To insure that you have working time, we recommend using 30-minute epoxy. Rejoin the rudder to the fin using the hinges. Use a tissue dampened with alcohol to wipe away excess epoxy before it cures. Make sure there is approximately a 1/64" gap between the rudder and the fin.



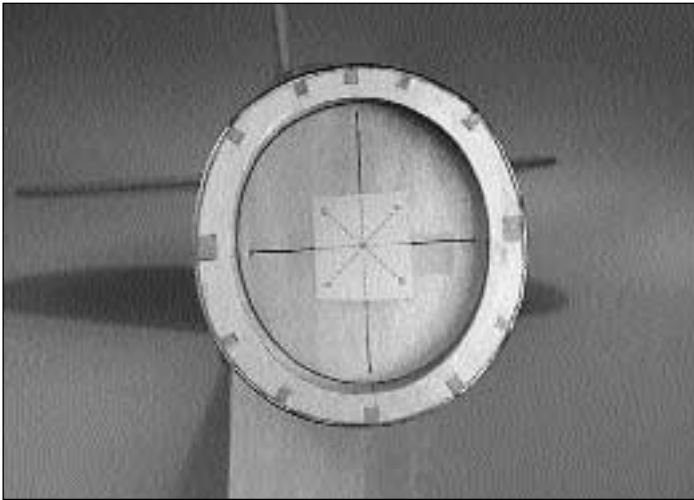
❑ D. Add six drops of thin CA to the center of the hinges on both sides. Use a paper towel to absorb excess CA from the hinge gap before it cures. Do not use CA accelerator; allow the CA to cure slowly.

❑ 7. Use the same hinging method to join the **Elevators** to the stab.

ENGINE INSTALLATION

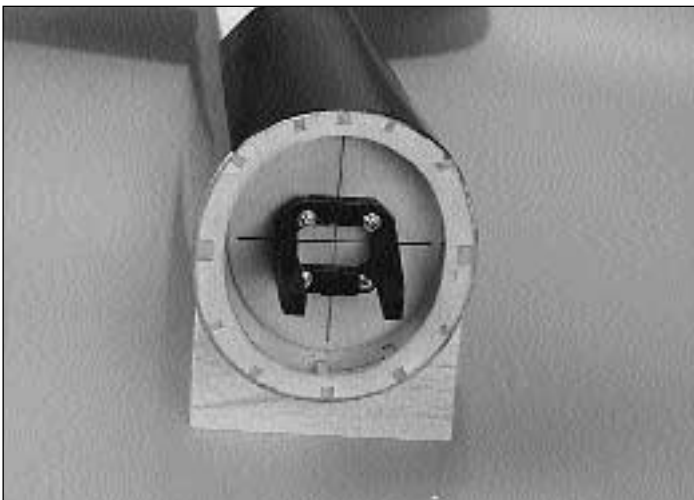


❑ 1. Cut the "spreader bar" from each **Engine Mount** half. Carefully trim any extra material left by the spreader bar from each mount half. The surfaces where the spreader bars were attached must be smooth to allow the mount halves to fit together. Trim the flashing off any rough edges if necessary.



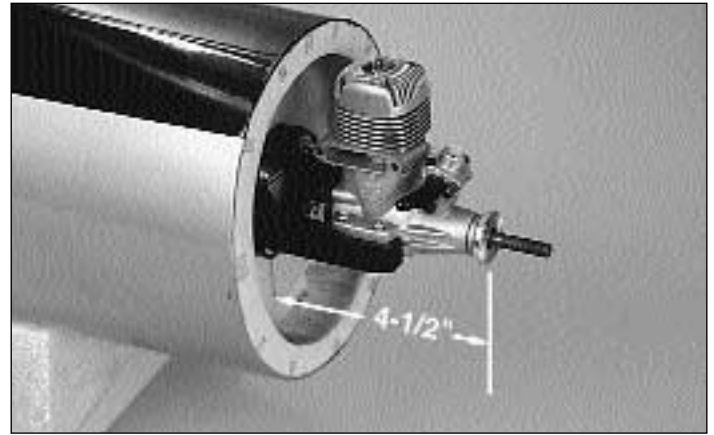
❑ 2. Connect the marks on the firewall to locate the center of the firewall.

❑ 3. Cut the **Engine Mount Template** from page 19 of this manual and tape it to the firewall as shown above. At the locations on the template, drill four 3/16" (4.7mm) holes in the firewall for the engine mount blind nuts.



❑ 4. Install four 6-32 **Blind Nuts** to the inside of the firewall. Pull the blind nuts into the back side of the firewall using a 6-32 machine screw (with a flat washer under the head of the bolt). Fit the two halves of the Engine Mount together. Use four #6 **Flat Washers** and four 6-32 x 3/4" **Machine Screws** to secure the engine mount to the firewall. Do not tighten the screws at this time, as the mount must be adjusted for the engine.

❑ 5. Test fit your engine into the mount. Adjust the width of the rails to fit the engine snugly. Tighten the mount screws to allow marking the engine mounting holes without moving the rails.

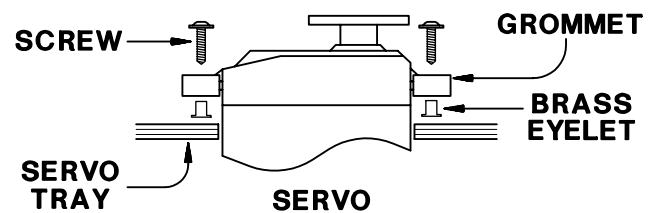


❑ 6. Position the engine on the engine mount rails so the propeller thrust washer (or spinner backplate) is 4-1/2" (114mm) ahead of the firewall. Use a Great Planes Dead Center™ Hole Locator (GPMR8130 not included) to scribe the four engine mount holes onto the rails. You may use a sharpened piece of wire to scribe the mount holes and then, use a center punch at the marks to prevent the drill bit from wandering. Drill 3/32" (2.4mm) pilot holes through the rails. Be sure to hold the drill perpendicular to the rails. If you have access to a drill press, this is a good tool for this purpose. Put a drop of oil into each hole. Use four #4 x 5/8" **Sheet Metal Screws** to secure the engine to the mount.

❑ 7. Drill a 3/16" (4.7mm) hole in the firewall for the throttle pushrod. The hole location will depend on whether you are installing a 2-stroke or 4-stroke engine.

❑ 8. Roughen the outside surface of the 11-3/4" (298mm) **Throttle Pushrod Tube** with coarse grit sandpaper. Insert the pushrod tube through the hole in the firewall. Push it in until about 1/4" (6mm) of the tube is left exposed forward of the firewall. Use medium CA to glue the tube to the firewall, but leave it free inside the fuselage until the servos are installed.

RADIO INSTALLATION



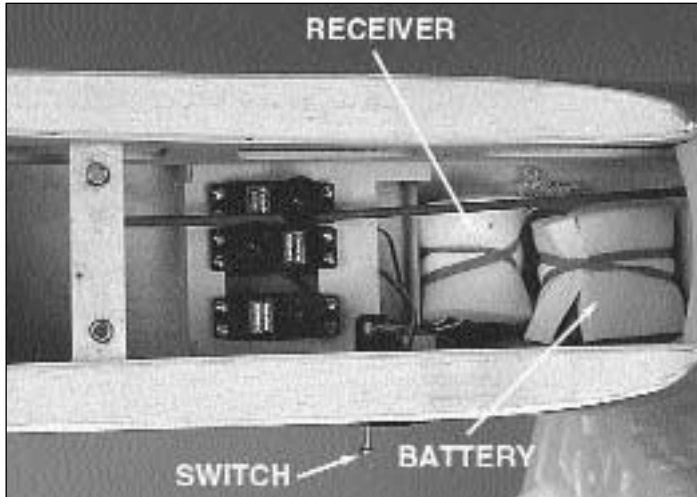
❑ 1. Use the following sequence for mounting the servos into the servo tray.

A. Install rubber grommets and brass eyelets in the servos using the provided sketch.

B. Test fit the servos in the tray. Enlarge the openings if needed to create a 1/32" (.8mm) gap around the servo.

C. Mark servo mounting hole locations on the tray, then drill 1/16" (1.5mm) pilot holes through each mark.

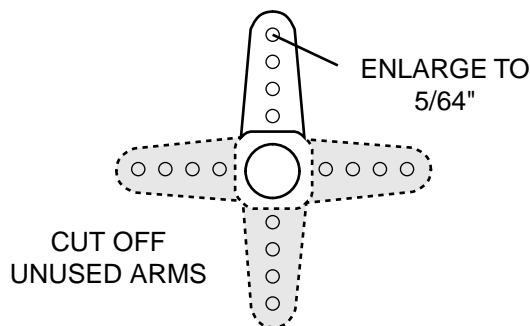
D. Mount the servos with the screws provided with your radio system. Notice the servo orientation when installing.



3. Install and hook up following the manufacturer's recommendations - three servos, the receiver, switch and battery as shown in the photo. We added a Great Planes Switch Mount & Change Jack (GPMM1000, not included) for convenience and ease of use at the field, installed on the side of the fuselage. Center the elevator, rudder and throttle trims on the transmitter.

Prepare **two** "cross" style servo horns as follows but don't install them on the servos until instructed to do so.

Note: The size and shape of servo horns varies from manufacturer to manufacturer. The sketches and photos show a typical radio installation with standard horns. All standard servo horns should fit in the AT-6.

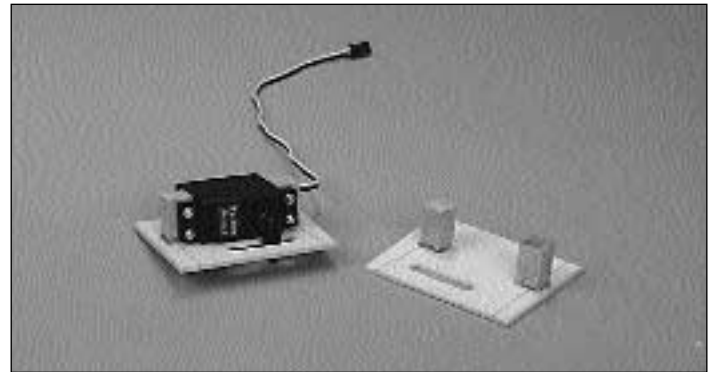


A. Cut off three arms from **two** servo horns included with your radio control set to make them into "one arm" servo horns. Use your Bar Sander to remove the remaining jagged edges left from the cut-off arms.

B. Enlarge the holes in the horns with a 5/64" drill.

C. Turn on your transmitter and receiver, then position the aileron, rudder, elevator and throttle trim tabs on your

transmitter in the center. This is called "centering" the servos and will allow you to place the servo horns on the servos in a neutral position. Attach the arms to the servos as shown in the following photo.

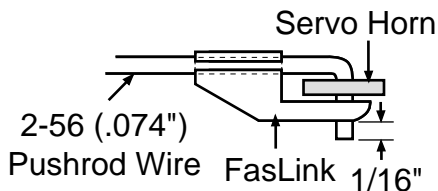
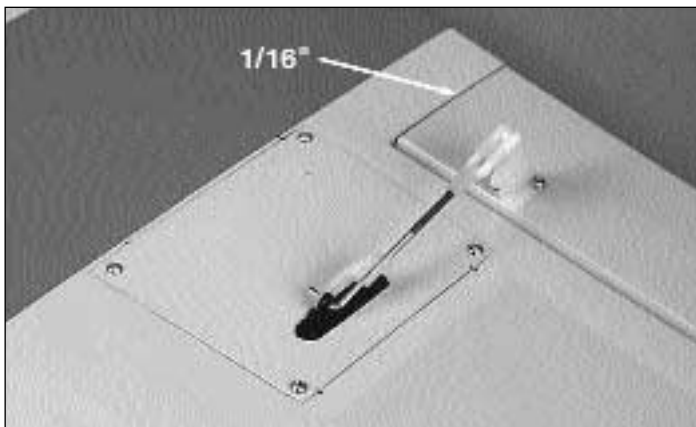


4. Epoxy the 7/16" x 7/16" x 3/4" (11mm x 11mm x 19mm) hardwood **Servo Mounting Blocks** to the **Aileron Servo Hatches**. Install the aileron servos as shown in the photo. **NOTE:** Both aileron servos should be identical to prevent any mismatch in speed or throw. After "fishing" the servo wires through to the opening at the center of the wing, plug them into a "Y" harness. Before permanently screwing the servo hatches into position, hook up your radio and double check the *centering* and *direction* of both aileron servos.

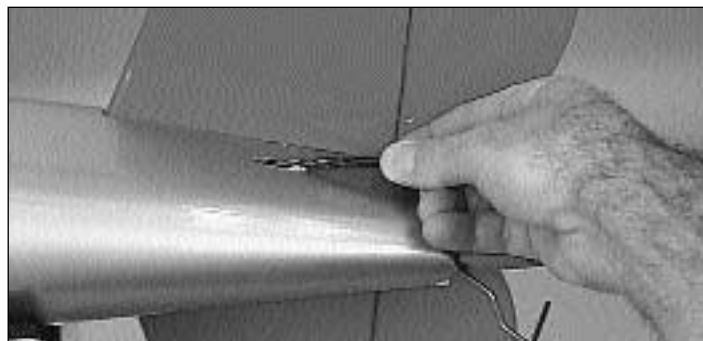


5. With the servo hatches in position, drill 1/16" (1.5mm) holes through the servo hatches and into the servo rails at each of the four corners. (It may be necessary to trim the hatch support rails as necessary to provide clearance for the servo mounting blocks.) Remove the hatches, and enlarge the holes in the **hatches** using a 3/32" (2.4mm) drill bit. Use #2 x 3/8" **Sheet Metal Screws** to install the servo hatches.

6. Cut six hinges from the hinge material. Install the **Ailerons** using the hinges. Push the ailerons against the trailing edge of the wing so there is approximately a 1/64" (.4mm) gap between the leading edge of the aileron and the trailing edge of the wing. Leave a gap of 1/16" (1.5mm) between the end of the aileron and the wing as shown in the following photo to allow the ailerons to move freely without binding against the wing. Add six drops of thin CA to the center of the hinges on both sides. Use a paper towel to absorb excess CA from the hinge gap before it cures. Do not use CA accelerator; allow the CA to cure slowly.



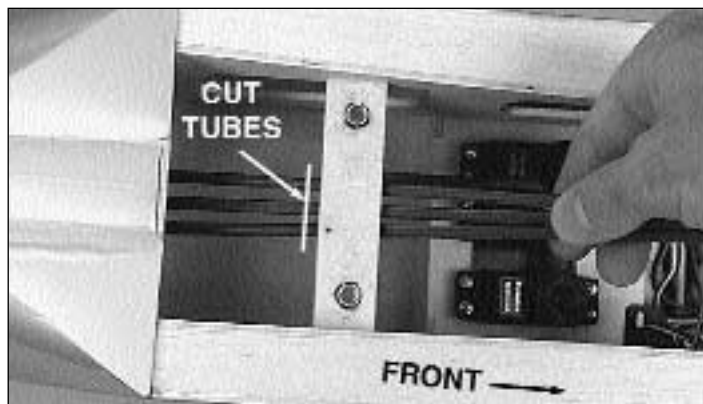
7. Two 2-56 x 6" **Threaded End Rods** are supplied to make the **Aileron pushrods**. Thread a nylon **Clevis** onto a pushrod about 14 turns and add a **Silicone Retainer** to the clevis. Attach the clevis to the control horn. Hold the horn in position on the aileron and mark the location of the mounting holes. Drill 3/32" (2.4mm) mounting holes through the ailerons at the marks. Wick two to three drops of Thin CA into the holes to harden the underlying balsa, then re-drill the holes. Attach the horns using 2-56 x 3/4" **Socket Head Cap Screws** and **Nylon Nut Plates**. Do not over-tighten the screws, crushing the underlying balsa. Center the ailerons, then mark the pushrods at the point where they meet the holes on the servo arm. Make a 90-degree bend in the wires at this mark. Cut off the excess wire 3/8" (9.5mm) above the bend. Insert the bent wire pushrod into the servo horn, then attach the linkage to the servo using a nylon **FasLink™** as shown in the photo. Repeat this step for the other aileron linkage.



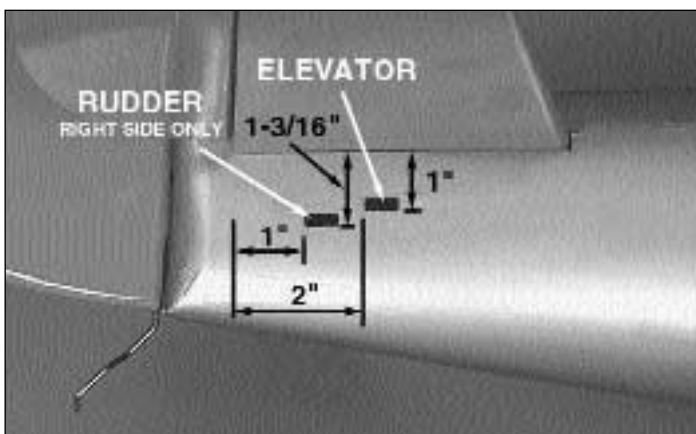
9. Use a 3/16" (4.7mm) drill bit to chamfer the holes for easier installation of the pushrod tubes.



10. Locate the three 36" (914mm) **Outer Pushrod Guide Tubes** and scuff the outsides with coarse grit sandpaper. Route the tubes through the fuselage and into the radio compartment. The tubes must protrude at least 1/2" (13mm) from the fuse side exits.



11. Cut the pushrod tubes at the aft edge of the wing bolt plate.

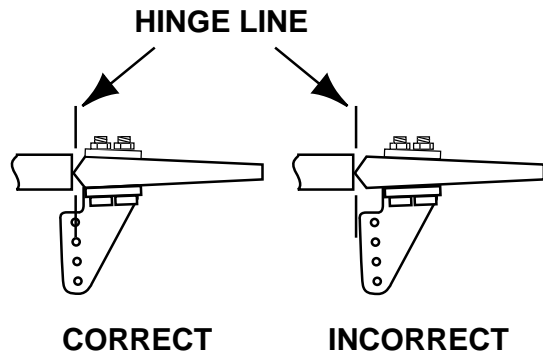


8. Cut the slots in both sides of the fuselage for the elevator **Pushrod Tube** to exit the fuselage. Cut the pushrod exit for the rudder only on the right side of the fuselage as shown in the photo. The slots will extend 1/2" (13mm) forward and 3/16" (4.7mm) upward from the locations in the photo.

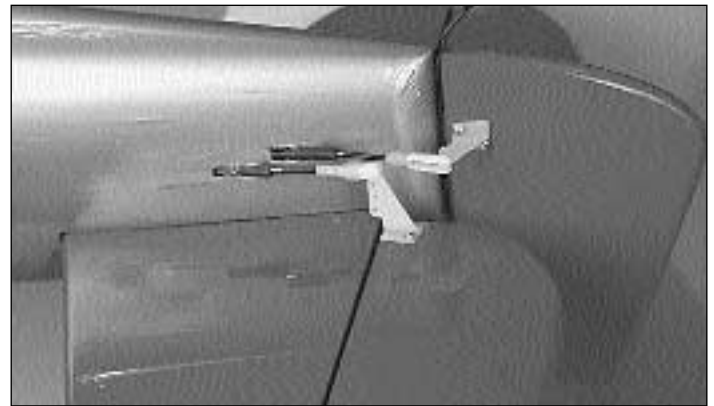


12. Insert one of the 2-56 x 36" **Threaded End Rods** into the rudder tube in the fuselage. The pushrod should

slide easily into the tube. Screw a nylon clevis on the pushrod about 14 turns and add a silicone retainer to the clevis. Trim the bottom hole from a control horn as shown in the photo and attach the clevis to the outermost hole.

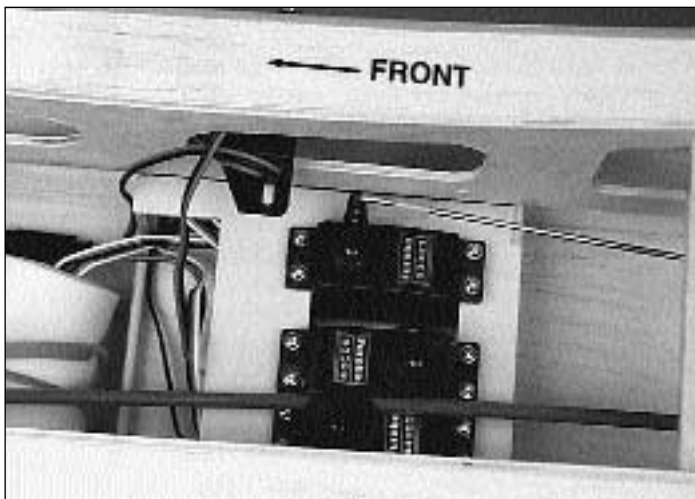


❑ 13. Install the rudder nylon control horn in line with the pushrod. Hold the horn in position and mark the location of the mounting holes. Drill $3/32$ " (2.4mm) mounting holes through the marks. Wick two to three drops of Thin CA into the holes to harden the underlying balsa, then redrill the holes. Attach the horns using 2-56 x $5/8$ " **Machine Screws** and **Nylon Nut Plates**. Do not over-tighten the screws, crushing the underlying balsa.



❑ 17. Install the elevator nylon control horns in line with the pushrods. Hold the horns in position and mark the location of the mounting holes. Drill $3/32$ " (2.4mm) mounting holes through the marks. Wick two to three drops of Thin CA into the holes to harden the underlying balsa, then redrill the holes. Attach the horns using four 2-56 x $5/8$ " machine screws and nylon nut plates. Do not over-tighten the screws, crushing the underlying balsa.

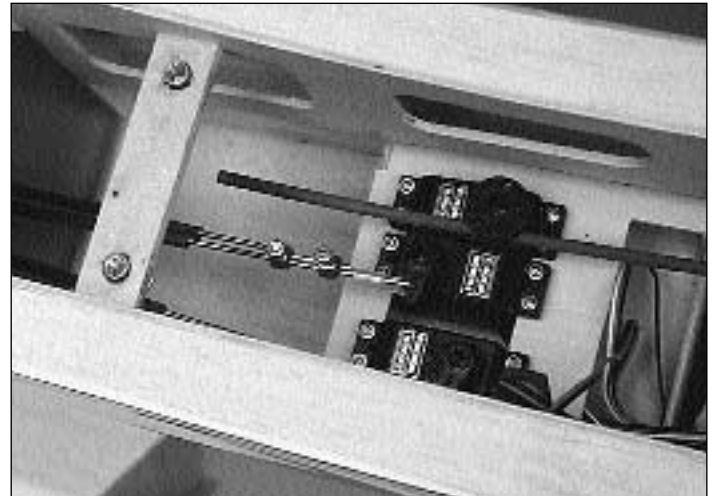
❑ 18. Center one of the elevators and elevator servo and mark the pushrod where it crosses the servo arm. Enlarge the servo horn hole with a $5/64$ " (2mm) drill bit.



❑ 14. Center the rudder and rudder servo and mark the pushrod where it crosses the servo arm. Enlarge the servo horn hole with a $5/64$ " (2mm) drill bit.

❑ 15. Make a 90-degree bend in the pushrod on your mark, then insert it through the enlarged hole in the servo arm. Secure the wire in place with a nylon FasLink pushrod keeper. Trim the excess wire just above the FasLink. Use the photo showing the installation of the aileron linkage for clarification.

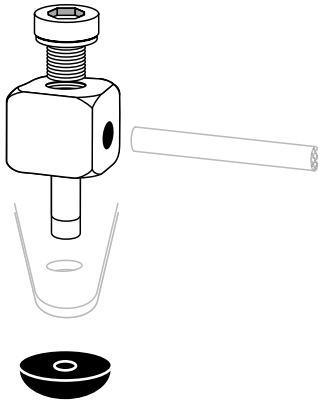
❑ 16. Insert the remaining two 2-56 x $3/16$ " threaded end rods into the elevator tubes in the fuselage. Screw a nylon clevis on each of the pushrods about 14 turns and add silicone retainers to the clevises.



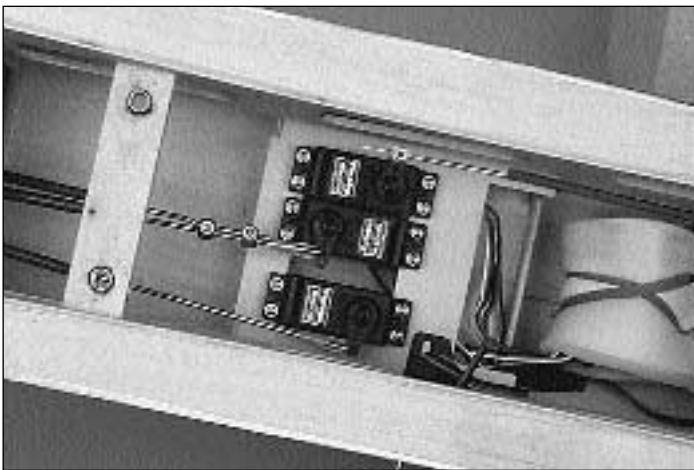
❑ 19. Slide two of the $5/32$ " **Wheel Collars** onto the pushrod wire that will attach to the elevator servo. Make a 90-degree bend in the pushrod on your mark, then insert it through the enlarged hole in the servo arm. Secure the wire in place with a nylon FasLink Pushrod Keeper. Trim the excess wire just above the FasLink.

❑ 20. While keeping both elevators centered, connect the two elevator pushrods to each other with two $5/32$ " wheel collars and two 6-32 x $1/4$ " **Socket Head Cap Screws** as shown in the photo. Use threadlock on the screws to prevent loosening.

THROTTLE PUSHROD INSTALLATION



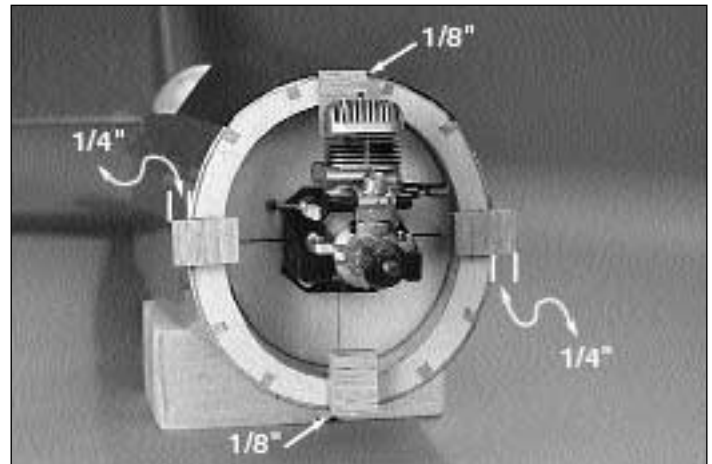
- ❑ 1. Install a Brass **Screw-lock Pushrod Connector** with the 4-40 x 1/8" **Cap Screw** on the throttle servo horn. Snap the **Nylon Retainer** onto the screw-lock pushrod connector post beneath the servo horn.
- ❑ 2. Assemble the 17-1/2" (444mm) **Throttle Pushrod Wire** by installing a nylon clevis about 14 turns and a silicone retainer onto the threaded end. Trim the outer tube and then slide the throttle pushrod into its outer tube (from the firewall).
- ❑ 3. Bend the throttle pushrod as necessary to reach the throttle arm without binding. When satisfied with the fit, insert the pushrod through the screw-lock pushrod connector on the servo. Connect the clevis to the throttle on the engine, snap the clevis closed, then slide the retainer in place.



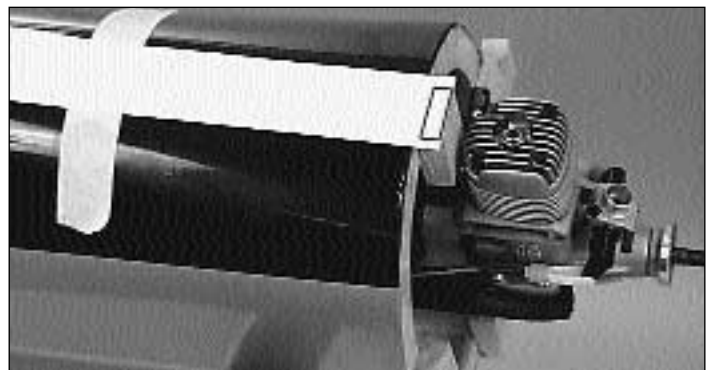
- ❑ 4. With the radio switched on, move the throttle trim and control stick to the fully closed position, by pulling them back (or downward) all the way. Manually close the throttle on the carburetor completely. Tighten the cap screw on the screw-lock pushrod connector. Check throttle operation with the radio and make adjustments to the linkages as necessary for smooth operation. Use the appropriate holes in the servo and throttle arms to provide the correct amount of throttle movement and to prevent the servo from binding at its end points.

FINAL ASSEMBLY

The following steps cover fitting the cowl to an O.S. engine using a Slimline muffler.



- ❑ 1. Prepare the Fuselage for the 13/16" x 7/16" x 1-3/16" (20.5mm x 11mm x 30mm) hardwood **Cowl Mounting Blocks** by sanding the areas shown using 120-grit sandpaper. These areas need to be flat and the bare wood exposed so the blocks can be glued securely. It is recommended to remove the engine during the sanding process to prevent any dust from entering the engine.
- ❑ 2. Use 6-minute epoxy to glue the cowl mounting blocks to the fuselage. Now is a good time to use 6-minute epoxy to make sure all of the exposed wood is fuel proofed. The outside edge of the top and bottom blocks must be 1/8" (3mm) above and below the outside edges of the fuselage. The side blocks extend 1/4" (6mm) beyond the outside edge of the fuselage. After the epoxy has cured, use a sanding block to sand a slight radius on each block. This is done to match the curvature of the cowl, and to prevent the cowl from cracking.



- ❑ 3. Use a piece of card stock to locate the edges of the cowl mounting blocks. Use additional pieces to locate the glow plug and needle valve.
- ❑ 4. Slide the cowling into position, without disturbing the card stock. Temporarily attach the propeller to the engine. Position the cowling to have 3/16" (4.7mm) clearance between the propeller and the front of the cowling.

❑ 5. Drill the locations for the cowl mounting screws using a 1/8" (3mm) drill bit. Mark the locations on the cowl mounting blocks. Use a 3/32" (2.4mm) drill bit to drill into the blocks. Install the screws and then remove them. Wick thin CA into the holes to harden the wood, which will prevent the screws from stripping the underlying wood.

❑ 6. Use 1/2" (13mm) squares of fiberglass cloth (not included) to make reinforcements behind the holes of the cowling.

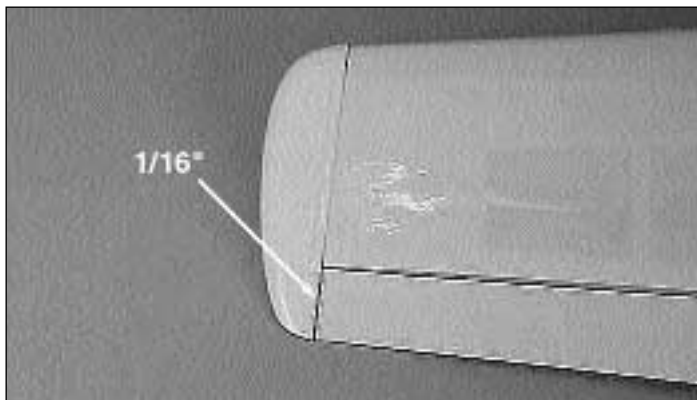


❑ 7. Using card stock, mark the positions for the glow plug and needle valve. Install the cowl, and transfer the locations to the cowl. Carefully trim the cowl, removing small amounts of material as you progress.

Note: If your engine's carburetor is inaccessible with the cowl in position, now would be a good time to add a Great Planes Fuel Filler Valve (not included, GPMQ4160) to the side of your aircraft. Instructions for installation are included with the valve.

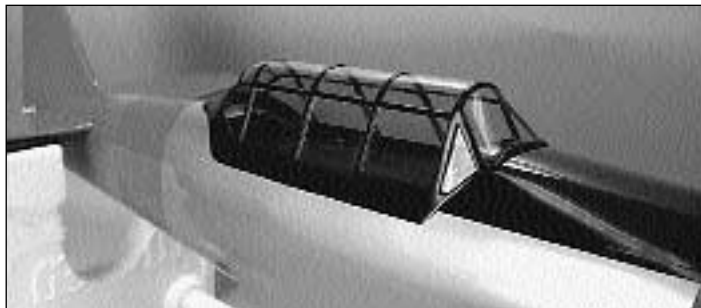
❑ 8. Mount the finished cowl with four #4 x 1/2" **Sheet Metal Screws** and four #4 **Washers**.

❑ 9. Attach the muffler of your choice to the engine, and trim the cowling so it can exit.



❑ 10. Attach the Wing Tips to the wing using medium CA. Leave a 1/16" (1.5mm) gap between the Aileron and Wing Tip.

FINISH THE COCKPIT



❑ 1. Carefully trim the canopy along the cut lines with scissors or Lexan® shears. Test fit the canopy on the fuse as you proceed, making small adjustments as required for a good fit.

❑ 2. Paint the framework on the outside of the canopy using black paint. Test the paint on a sample of the canopy material to make sure the paint is compatible. Straight out of the spray can, Top Flite LustreKote® is not recommended for painting the clear plastic that your canopy is made from and will eventually deform it. But, if you have an airbrush, it **is** possible to paint your canopy with LustreKote. However, you **must** use the following procedure. Spray an ounce or two of LustreKote through a tube (such as a large drinking straw or a brass tube) into a container. Let it sit for about an hour or two to allow the damaging elements to "boil off." Using an air brush, you may now spray your canopy with your specially prepared LustreKote. For airbrushing, we recommend thinning LustreKote with lacquer thinner. If you prefer to spray your canopy frame directly from a spray can, we have had success with Pactra Formula U and Chevron paint. Always **test your painting methods on leftover plastic** before you try it on your model!

❑ 3. Paint the exposed wood of the cockpit with black paint. You can use Top Flite LustreKote without any special preparations to the paint or the model. Just make sure to mask off any areas you do not want painted. Install pilots if so desired, after painting.

❑ 4. Roughen the bottom 1/8" (3mm) of the inside canopy edge, being careful not to scratch any exposed areas. Glue the canopy into position with 6-minute epoxy or R/C-56 glue.

CONTROL THROW ADJUSTMENT

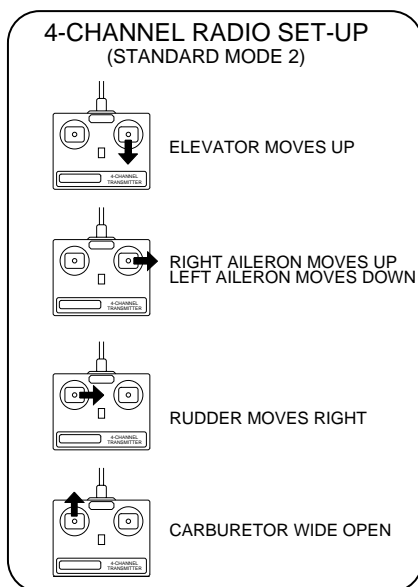
By moving the position of the clevis at the control horn toward the outermost hole, you will decrease the amount of throw of the control surface. Moving it toward the control surface will increase the amount of throw. If these adjustments don't accomplish the job, you may need to work with a combination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

Note: Throws are measured at the widest part of the elevators, rudder and ailerons. If your radio does not have dual rates, set the control throws to halfway between the specified high and low rates. We recommend the following control surface throws as a starting point.

	High Rates	Low Rates
Elevator	1/2" up, 1/2" down (13mm up, 13mm down)	1/4" up, 1/4" down (6mm up, 6mm down)
Ailerons	11/16" up, 11/16" down (17mm up, 17mm down)	7/16" up, 7/16" down (11mm up, 11mm down)
Rudder	1-1/8" right, 1-1/8" left (28mm right, 28mm left)	5/8" right, 5/8" left (16mm right, 16mm left)

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.

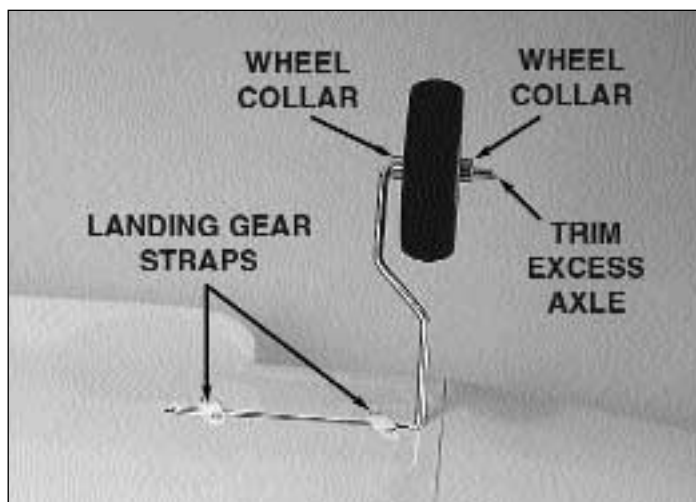
Route the antenna to the tail of the model. You may use your preferred method or the method we use in the Great Planes model shop. Drill a 1/4" (6mm) hole through the fuse side in the proximity of the receiver. Cut a 1/2" (13mm) long piece of fuel tubing and install it in the hole. Install a strain relief then, route the antenna through the fuel tubing to the bottom of the fuse at the tail. Use a rubber band to attach the antenna to the tail gear wire. Do not cut or shorten the antenna wire. Leave any excess to hang free.



Make sure the control surfaces move in the proper direction as shown in the sketch.

WHEEL INSTALLATION

Fixed Gear & Tail Gear



1. Remove the covering from the landing gear slot. Test fit the **Main Landing Gear**. It's helpful if you use a file to remove any burrs or sharp edges from the ends of the wire. The gear will be swept forward toward the leading edge of the wing. Seat the landing gear wire in the landing gear rail on the wing. Use a **Nylon Landing Gear Strap** as a guide to drill 1/16" (1.5mm) pilot holes for the screws. Secure the landing gear with two nylon straps and four **#2 x 3/8" Sheet Metal Screws**.

2. Install the main wheels using four 3/16" **Wheel Collars** and 6-32 **Set Screws**. Grind or file a flat spot at the point of set screw contact. This provides a better area for the set screw to bite and helps keep the wheel in place. Trim off any excess axle wire after installing the wheel collar.

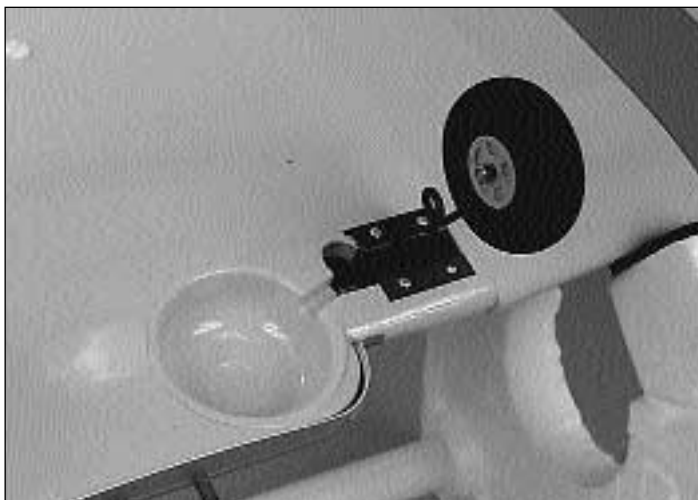
3. Repeat step 2 for the tail wheel. Use a 3/32" **Wheel Collar** and a 4-40 **Set Screw**.

4. Check the fit of the **Wing Center Section Cover**. Trim the wing if the cover is slightly larger than the opening. Glue the cover to the wing using medium CA.

Retractable Landing Gear

Note: None of the hardware used in the retract installation is included in the kit. All hardware must be purchased separately.

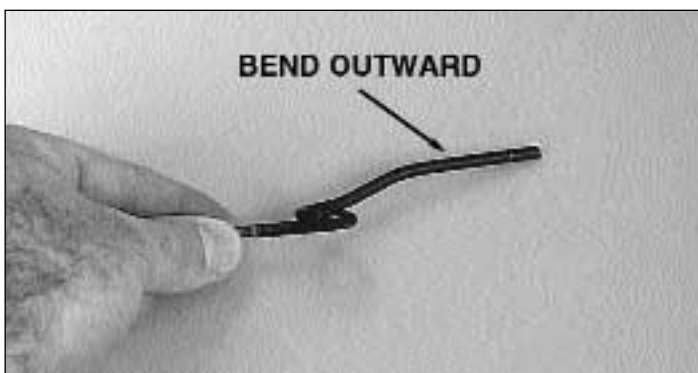
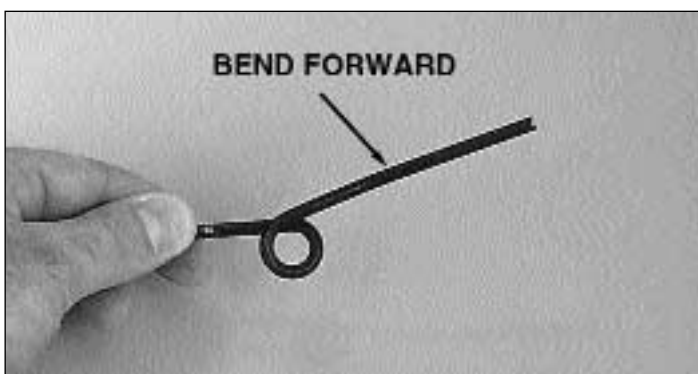
The installation of the retracts **requires** a high degree of testing and adjusting. Retract installation is only recommended for experienced modelers.



1. Remove the covering from the opening in the center section for the retract mechanism. Test fit the retract into the wing. Remove the balsa sheeting from the wing to expose the retract rails. Install the retract mechanism using four #4 x 1/2" sheet metal screws.

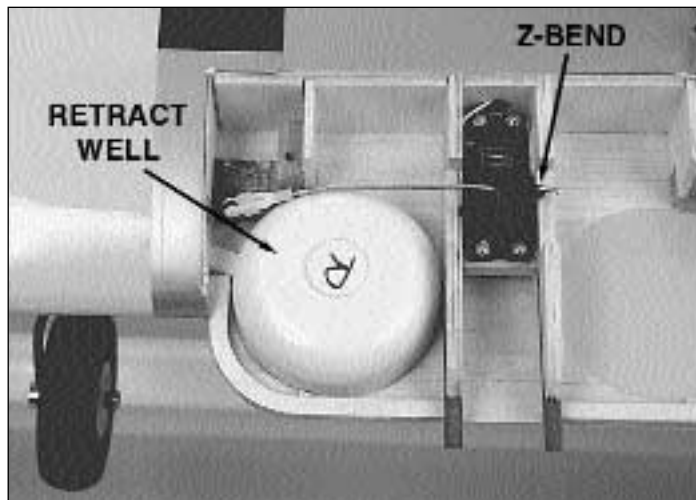
2. Install the main wheel onto the axle. Secure the position of the wheel using a wheel collar and set screw. Trim off any excess axle wire after installing the wheel.

3. Glue the **Retract Wheel Well** into the wing using medium CA.



4. Now for the hard part. Bend the retract strut so the wheel will retract into the well. The strut will be bent forward, and outward, to work correctly.

5. Repeat steps 1 through 4 for the other retract.



6. Install the retract servo into the center section using two hardwood blocks. The servo must be mounted as low as possible in the wing.

7. Install the linkages necessary to operate the retracts. Use a "Z" bend at the servo to keep everything low. Cycle the retracts to the "down" position. Look at both wheels, and check to see if they have a slight amount of toe-in. If not, adjust them, as slight toe-in will help in the ground handling of your AT-6. Cycle the retracts a few times using the radio, just to make sure the wheels are in the correct locations, and the gear is not binding.

8. Check the fit of the **Wing Center Section Cover**. If the retract servo binds on the cover, cut a hole to allow for servo arm clearance. Trim the wing if the cover is slightly larger than the opening. Glue the cover to the wing using medium CA.

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:

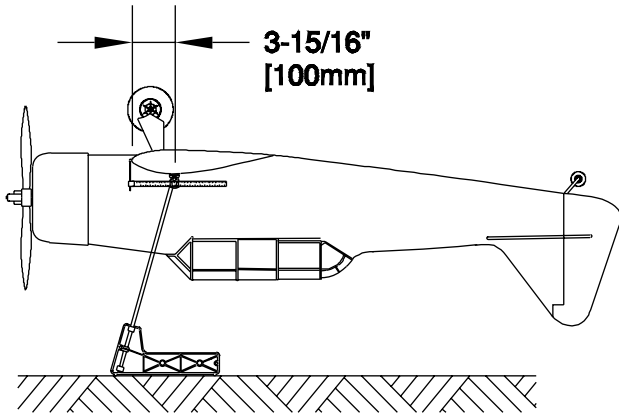
1. Assemble the model in as in preparation for flight. (No fuel is required for this procedure.)

2. With the wing level, lift the model by the engine propeller shaft and the bottom of 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.

BALANCE YOUR MODEL (CG)

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 3-15/16" (100mm) back from the leading edge of the wing (or 6-13/16 (173mm) forward of the trailing edge), against the fuselage. Balance your AT-6 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 AT-6, you may wish to experiment by shifting the balance up to 3/16" (5mm) 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.

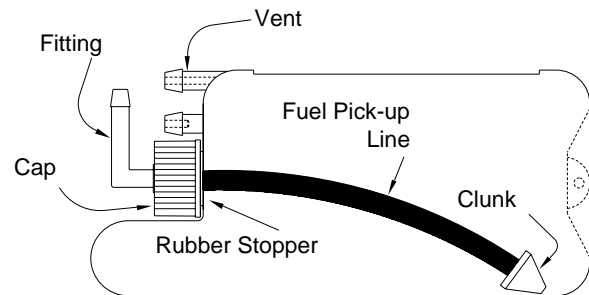
2. With all the parts of the model installed (ready to fly) and an empty fuel tank, lift the model at the balance point. If the tail drops, the model is "tail heavy" and you must add weight* to the nose to balance the model. If the nose drops, it is "nose heavy" and you must add weight* to the tail to 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.

FUEL TANK ASSEMBLY

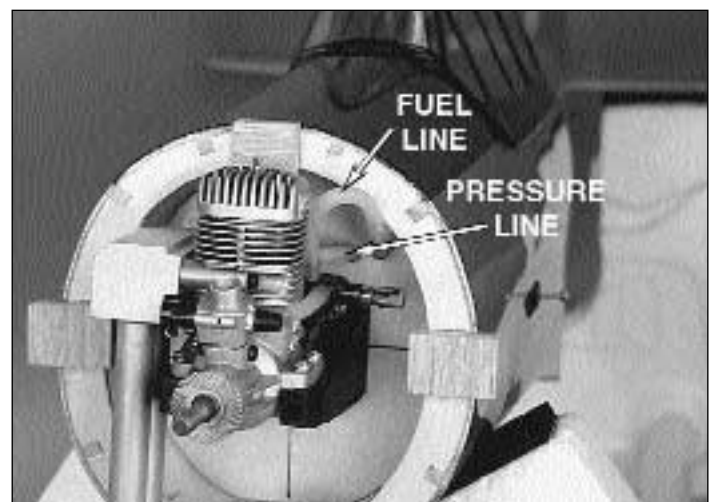
The assembly and installation of the fuel tank has been intentionally placed after balancing to allow the battery and receiver to be repositioned as necessary. Since the fuel tank is located very near the CG, installing it after balancing is acceptable.



1. The instructions for assembling the **Fuel Tank** are included with the tank. Use these to prepare your fuel tank for installation into the fuselage. Use the 90-degree tube when assembling the fuel tank.

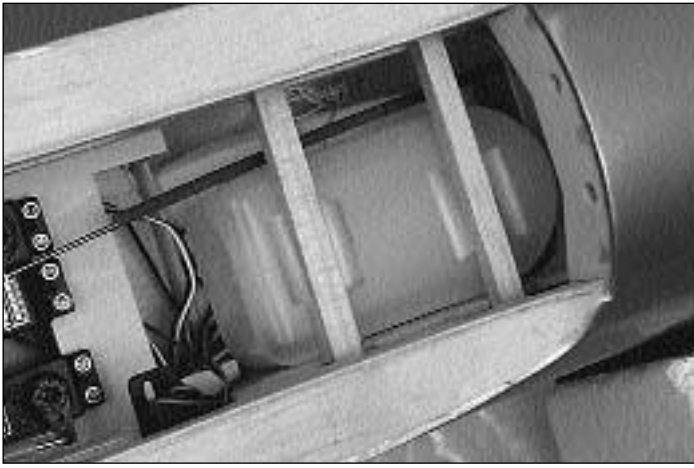
2. Wrap the tank with 1/4" foam rubber (HCAQ1000) secured with a couple of rubber bands.

FUEL TANK INSTALLATION



1. Drill two 1/4" (6mm) holes in the firewall near the center to allow the fuel tubes to exit. Place the holes so the tubes are easily routed to the muffler and carburetor. Put a few drops of CA around the holes to seal the wood.

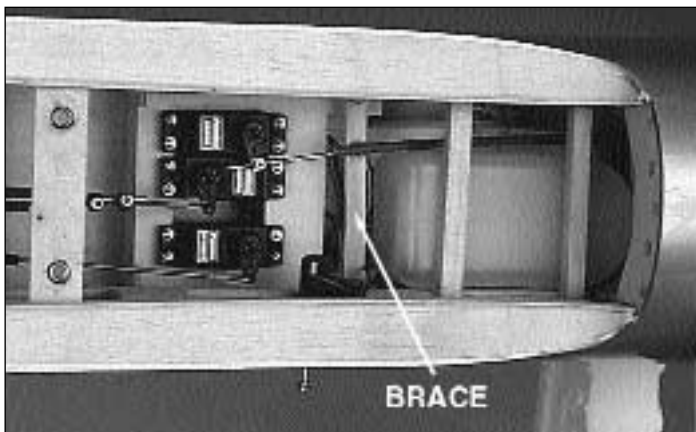
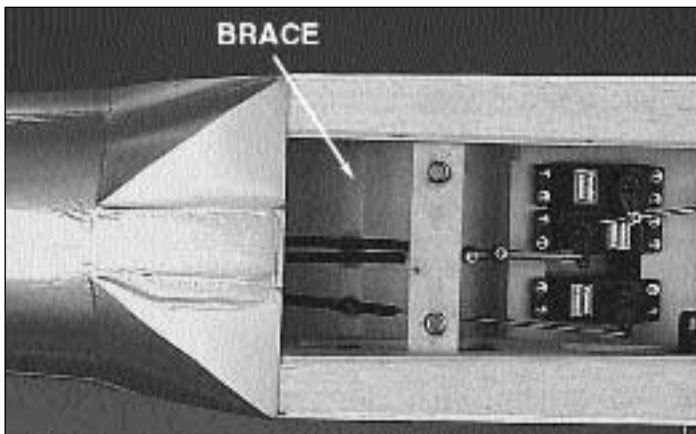
2. Place the fuel tank into the front of the fuselage. Route the tubes through the holes in the firewall.



☐ 3. Connect the tubes to the engine, paying attention to the orientation of the tubes.

☐ 4. Secure the tank in the fuselage so it will not move during flight.

SECURE THE PUSHRODS



☐ 1. Use mixing sticks to make braces for the throttle, rudder and elevator pushrods. Glue the braces into the fuselage using medium CA.

☐ 2. Use medium CA to glue the outer pushrods tubes to the pushrods exit slots in the fuselage.

PREFLIGHT

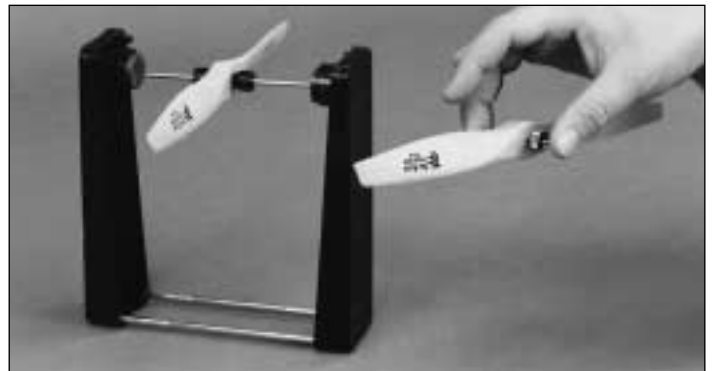
At this time check all connections including servo horn screws, clevises, servo cords and extensions. Make sure you have installed the nylon retainer on the Screw-Lock Pushrod Connector and the silicone retainers on all the clevises.

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

Since you have chosen the AT-6 ARF, we assume that you are an experienced modeler. Therefore, you should already know about AMA chartered flying fields and other safe places to fly. If for some reason you are a relatively inexperienced modeler and have not been informed, 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

The Great Planes AT-6 ARF is a great-flying plane that flies smoothly and predictably. The AT-6 does not, however, possess the self-recovery characteristics of a primary R/C trainer and should only be flown by experienced RC pilots.

Caution: (THIS APPLIES TO ALL R/C AIRPLANES): If, while flying, you notice any unusual sounds, such as a low-pitched "buzz," this may indicate control surface "flutter." Because flutter can quickly destroy components or your airplane, any time you detect flutter you must immediately cut the throttle and land the airplane! Check all servo grommets for deterioration (this may 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 control rods in servo horns; Insufficient glue used when gluing in torque rods; Excessive flexing of aileron, caused by using too soft balsa; Excessive "play" or "backlash" in servo gears; and insecure servo mounting.

Takeoff

Take off on low rates if you have dual rates on your transmitter - especially if you are taking off into a crosswind. For all models it is good practice to gain as much speed as the length of the runway will permit before lifting off. This

will give you a safety margin in case the engine quits. When the plane has gained enough flying speed to safely lift off, gradually and smoothly apply up elevator and allow the model to climb at a shallow angle (do not yank the model off the ground into a steep climb!)

Flight

We recommend that you take it easy with your AT-6 for the first several flights, gradually "getting acquainted" with this great model as your engine gets fully broken-in. If you feel as though you have your hands full, keep this in mind: pull back on the throttle stick to slow the model down. This will make everything happen a little slower and allow yourself time to think and react. Add and practice one maneuver at a time, learning how the AT-6 behaves in each. For smooth flying and normal maneuvers, use the low rate settings as listed on page 14. Use the high rate settings for hot dogging.

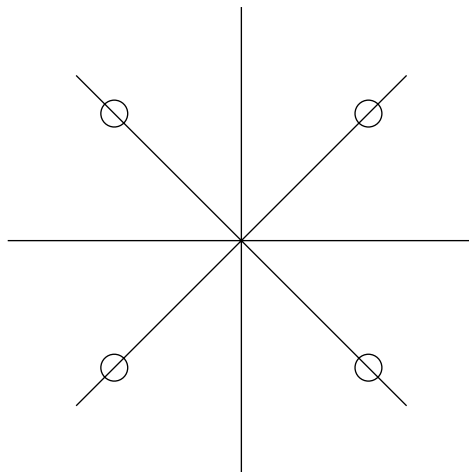
Sometime well before it's time to land, you should climb your AT-6 to a safe altitude, cut the throttle to an idle and check out the model's low speed characteristics. Do this a few times so you know what to expect upon landing and how the AT-6 handles stalls.

Landing

When it's time to land, fly a normal landing pattern and approach. Keep a few clicks of power on until you are over the runway threshold. For your first few landings, plan to land slightly faster than stall speed.

Have a ball! But always remember to think about your next move and plan each maneuver before you do it. Impulsively "jamming the sticks" without any thought is what gets most fliers in trouble rather than lack of flying skill.

Happy Landings!



ENGINE MOUNT TEMPLATE

