

# EXTRA 300S

Aerobatic .40-Size

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.**

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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## TABLE OF CONTENTS

<b>Important Safety Precaution</b> .....	<b>2</b>
<b>Introduction</b> .....	<b>2</b>
<b>Precautions</b> .....	<b>2</b>
<b>Decisions You Must Make</b> .....	<b>3</b>
Engine Selection .....	3
<b>Preparations</b> .....	<b>3</b>
Required Accessories .....	3
Building Supplies and Tools .....	3
Optional Supplies and Tools .....	3
General Inspection .....	4
Pushrod Template #1 .....	4
Pushrod Template #2 .....	4
Inch/Metric Ruler .....	4
Parts List .....	5
<b>Begin Construction</b> .....	<b>6</b>
Fuelproof the Fuselage .....	6
Join the Wing Halves .....	6
Mount the Engine & Install the Fuel Tank .....	7
Mount the Stab & Fin .....	9
Mount the Landing Gear .....	11
<b>Join The Control Surfaces</b> .....	<b>13</b>
Rudder Assembly .....	13
Hookup the Ailerons .....	14
Install the Elevator Pushrod .....	15
Install the Rudder Pushrod .....	16
<b>Final Assembly</b> .....	<b>16</b>
Install the Wing Belly Pan .....	16
Mount the Canopy .....	17
Mount the Servo Tray .....	17
Final Radio Installation .....	18
<b>Get Your Model Ready To Fly</b> .....	<b>19</b>
Balance Your Model .....	19
Balance the Model Laterally .....	19
Final Hookups & Checks .....	19
Set the Control Throws .....	20
<b>Preflight</b> .....	<b>20</b>
Identify Your Model .....	20
Charge Your Batteries .....	20
Balance Your Propellers .....	21
Find a Safe Place to Fly .....	21
Ground Check Your Model .....	21
Range Check Your Radio .....	21
Check List .....	21
Engine Safety Precautions .....	22
<b>AMA Safety Code (excerpt)</b> .....	<b>22</b>
General .....	22
Radio Control .....	23
<b>Flying</b> .....	<b>23</b>
Takeoff .....	23
Flying .....	23
Landing .....	23
<b>Flight Log</b> .....	<b>Back Cover</b>

### PROTECT YOUR MODEL, YOURSELF & OTHERS...FOLLOW THIS IMPORTANT SAFETY PRECAUTION

Your Extra 300 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

Extra 300 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 **Extra 300 ARF** is a high performance sport airplane that closely resembles the full size Extra 300 both in appearance and performance. However, the Extra 300 ARF is very stable and predictable, allowing even intermediate skill level pilots to enjoy it.

**This is not a beginner's airplane!** While the **Extra 300 ARF** is easy to assemble 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 **Extra 300 ARF** is an excellent choice to try your skills at flying a sport 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.

**Remember: Take your time and follow directions to end up with a well-built model that is straight and true. 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. If you are calling for replacement parts, please reference the part numbers and the kit identification number (stamped on the end of the carton) and have them ready when calling.**

We can also be reached by E-Mail at:

[productsupport@greatplanes.com](mailto:productsupport@greatplanes.com)

## DECISIONS YOU MUST MAKE

### Engine Selection

There are several engines that will work well in your Extra 300 ARF. We recommend a *hot* 2-stroke such as an **O.S.® .46FX** or **SuperTigre™ G45**. If you prefer a 4-stroke, an **O.S. FS-70** is the ticket. 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.

## PREPARATIONS

### 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 W/Five Servos
- "Y" Harness For Aileron Servos
- Engine – See **Engine Selection**
- Spare Glow Plugs (O.S. #8 For Most 2-Stroke Engines, OSMG2691)
- Propeller (Top Flite® Power Point™—Refer To Your Engine's Instructions For Proper Size)
- 3' Medium 3/32" Fuel Tubing (GPMQ4131)
- 1/4" Latex Foam Rubber Padding (HCAQ1000)
- Fueling System (Great Planes Top Fueler, GPMQ4160)
- (2) Flexible Cable Pushrod (GPMQ3702)
- 1/5 Scale Pilot (Williams Bros. Sportsman Pilot, WBRQ2485)

## Building Supplies and 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)
- CA Accelerator (GPMR6035)
- 30-Minute Pro Epoxy (GPMR6047)
- 1/4" Red Striping Tape (GPMQ1330)
- #1 Hobby Knife Handle (HCAR0105)
- #11 Blades (HCAR0311, 100 Qty)
- Builders Triangle Set (HCAR0480)
- Masking Tape (TOPR8018)
- Electric Power Drill
- Slip-Joint & Needle Nose Pliers
- Monofilament String For Stabilizer Alignment
- Screwdrivers (Flat Blade & Phillips)
- Pro Thread Locking Compound (GPMR6060)
- Isopropyl Alcohol (70%)
- Drill Bits: 1/16", 5/64", 3/32", 7/64", 1/8", 3/16", 11/64", 15/64", 1/4"
- Top Flite Trim Seal Tool™ (TOPR2200)
- Felt-Tip Pen
- Sandpaper: 80, 220 & 320-grit
- Metal File

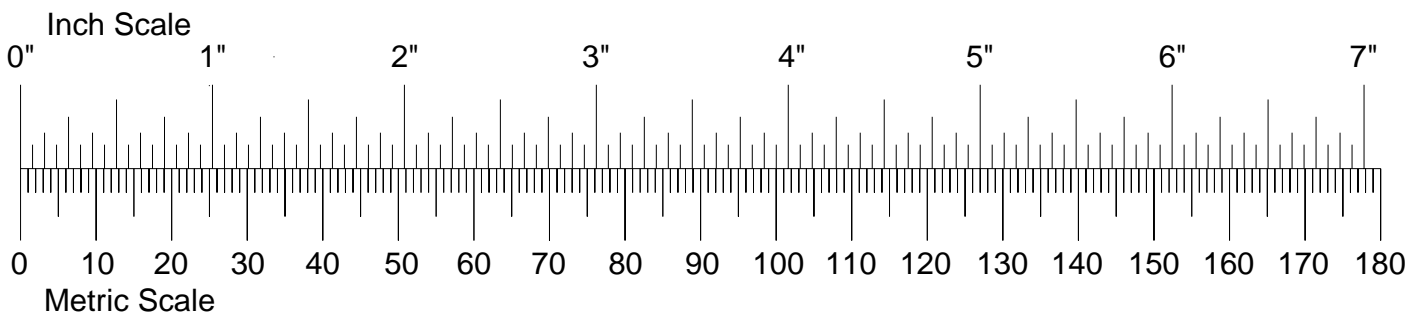
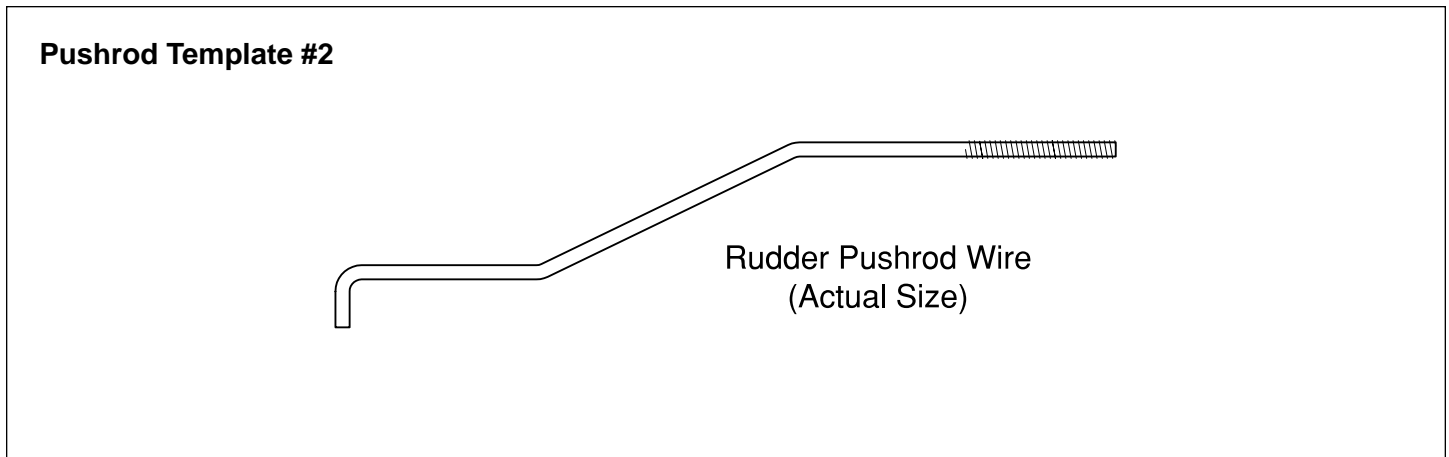
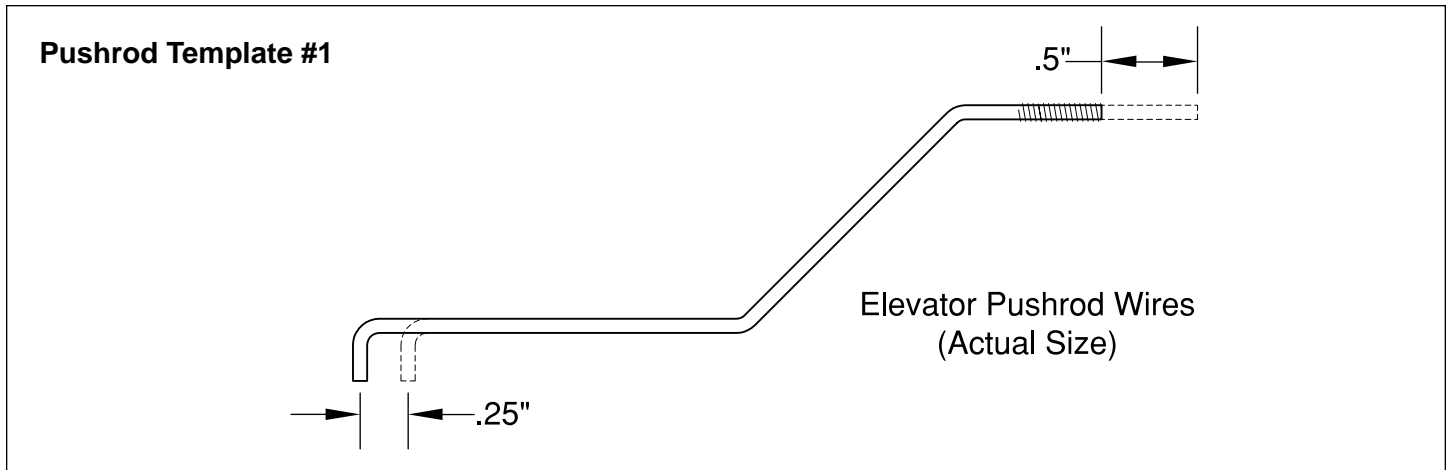
## Optional Supplies and Tools

- 6-Minute Pro Epoxy (GPMR6045)
- CA Applicator Tips (HCAR3780)
- Canopy Glue (JOZR5007)
- Epoxy Brushes (GPMR8060)
- Epoxy Mixing Sticks (GPMR8055, Qty. 50)
- CA Debonder (GPMR6039)
- Trim Seal Tool (TOPR2200)
- Dremel® Moto-Tool™ Or Similar W/Cut-Off Wheel
- Hot Sock™ (TOPR2175)
- Dead Center™ Engine Mount Hole Locator (GPMR8130)
- 3/32" Brass Tube
- Curved Tip Canopy Scissors For Canopy Trimming (HCAR0667)
- LustreKote™ Paint For Aluminum Landing Gear (White Primer TOPR7801, Missile Red TOPR7201)
- Switch and Charge Jack (GPM1000)

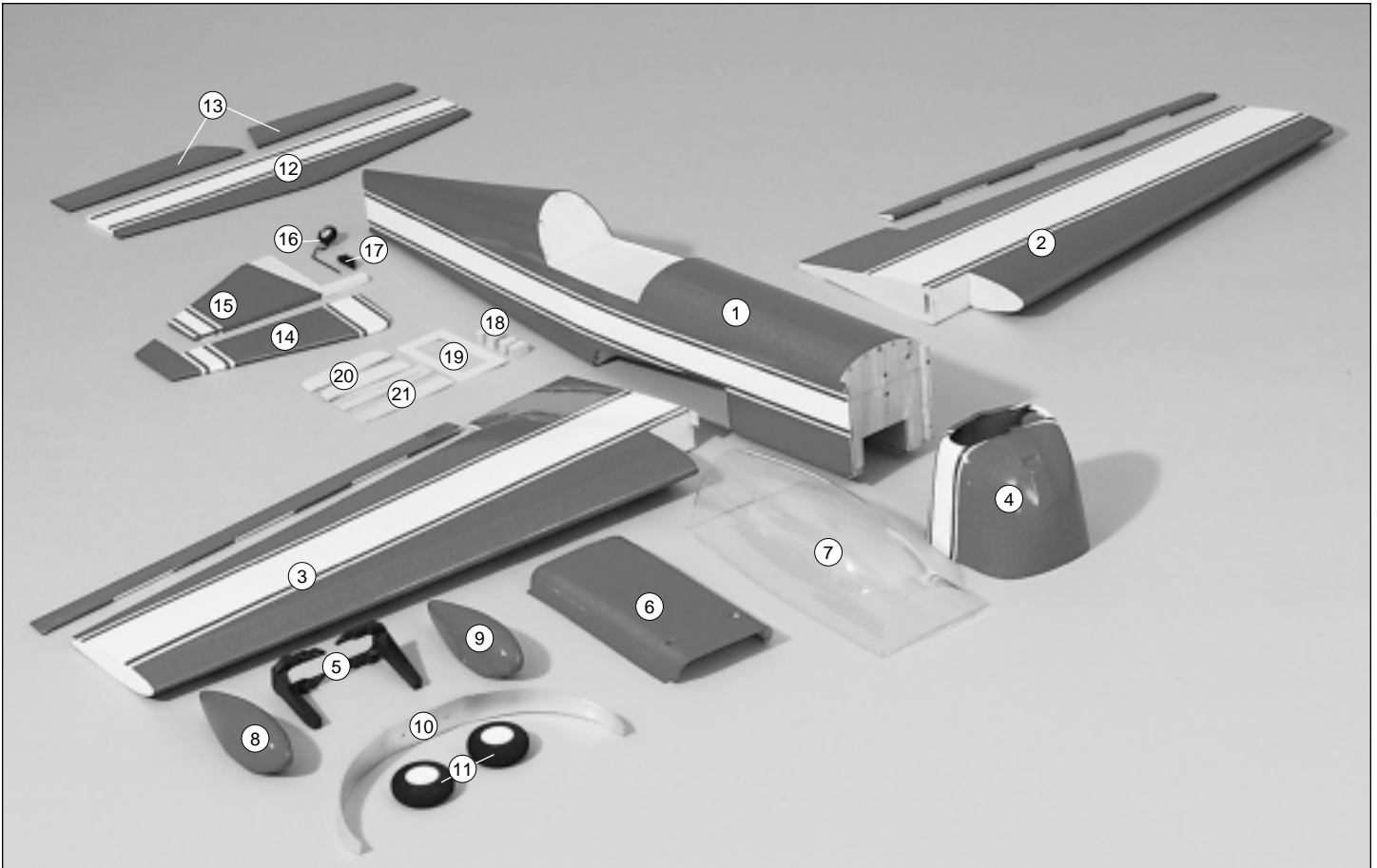
## General Inspection

1. Closely inspect the fuselage, wing panels, rudder assembly and stabilizer assembly for damage. If you find any damage, contact the place of purchase, or Hobby Services at Great Planes for a replacement.
2. Eliminate any wrinkles you find in the covering by shrinking them away with a heat gun, then apply pressure to the area with a covering iron and a hot sock. This will securely bond the covering to the wood so the wrinkles will be less likely to reappear in the future.

Refer to these Pushrod Templates when instructed in this manual.



## Parts List



Key#	Description	Qty
1	Fuselage	1
2	Left Wing Panel w/Aileron	1
3	Right Wing Panel w/Aileron	1
4	Cowl	1
5	Adjustable Engine Mount	2
6	Wing Belly Pan	1
7	Canopy	1
8	Right Wheel Pant Halves	2
9	Left Wheel Pant Halves	2
0	Aluminum Landing Gear	1
-	Main Wheels	2
=	Stabilizer	1
q	Elevator Assembly	2
w	Rudder	1
e	Vertical Fin	1
r	Tail Wheel Assembly	1
t	Tail Wheel Bracket	1
y	Cowl Mounting Blocks	4
u	Servo Tray	1
i	Belly Pan Formers	1
o	Wing Joiners	1

### Parts Not Shown In Photo

Description	Qty
Propeller Spinner (Red)	1
1" Fiberglass Tape	1
CA Hinge Strip (2" x 9")	1
Hardware Bag	1
Decal Sheet	1

### Replacement Parts

If needed, replacement parts for Extra 300 ARF are available through your hobby supplier.

Wing Set.....	GPMA2170
Fuselage Kit .....	GPMA2171
Tail Fin Set.....	GPMA2172
Canopy .....	GPMA2173
Cowl .....	GPMA2174
Wheel Pants .....	GPMA2175
Landing Gear Set .....	GPMA2156

## BEGIN CONSTRUCTION

### Fuelproof the Fuselage

1. Coat the firewall and all other bare wood around the firewall with fuelproof paint or 30-minute epoxy thinned with alcohol. Fuelproof other areas of bare wood in the fuselage that may be exposed to fuel or engine exhaust such as the fuel tank area and the front and back of the wing saddle. Avoid getting epoxy in the threads of the blind nuts in the back of the firewall.
2. Set the fuselage aside while the paint dries and you work on the wing.

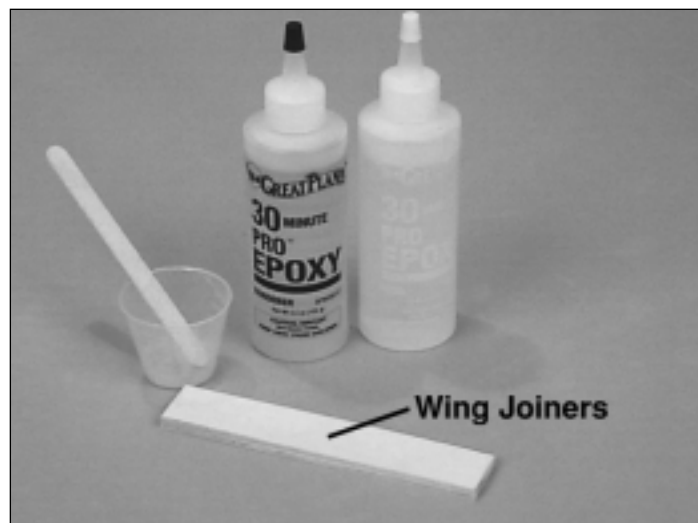
### Join the Wing Halves



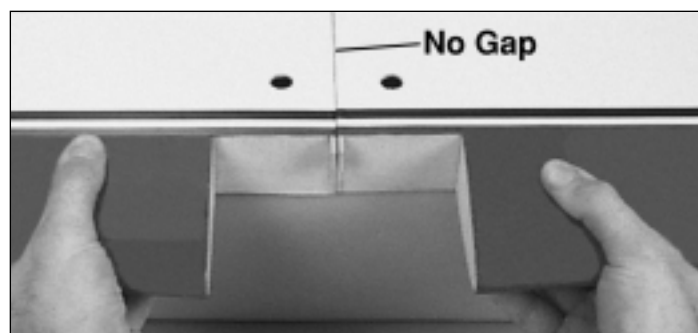
1. Cut the covering 1/8" inside the edges of the opening in the bottom of the right wing panel for the aileron servo. Use your Top Flite MonoKote Trim Iron to seal the covering to the sides of the opening.

**Note:** Inside the wing you'll notice a piece of string with a piece of wood tied to it. Don't remove the string because you will use it to pull your aileron servo cord through the wing later.

2. Cut the covering from the half-inch hole in the top of the wing sheeting near the root (for your servo cords to exit) and from the hole near the TE for the wing bolt.
3. Repeat this procedure for the left wing panel.



4. Use 30-minute epoxy to glue both 1/8" x 15/16" x 5-1/4" plywood **wing joiners** together. Wipe away any excess epoxy.



5. Test fit the wing halves with the wing joiner. If necessary, sand any high spots on the root end of the wing panels so there is **no gap** when you join them.

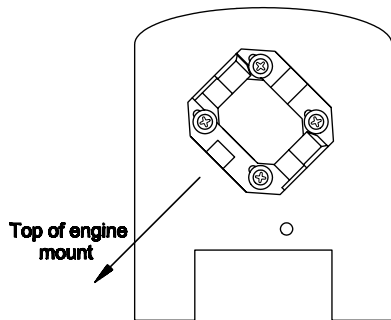
Make a *dry run* of the following step **without using any glue** so you will know how to clamp your wing together.



6. Thoroughly coat the *joiner pockets* and the mating ends of **both** wing halves with 30-minute epoxy. Set the wing halves aside and proceed quickly. Coat all surfaces of **one half** of the wing joiner with 30-minute epoxy and place it in one of the wing halves. Coat the other half of the joiner with 30-minute epoxy and join the other wing. Use a piece of balsa or cardboard to wipe away excess epoxy. Use two C-clamps to hold the front of the wing together and use masking tape to tightly tape the rest of the wing together.

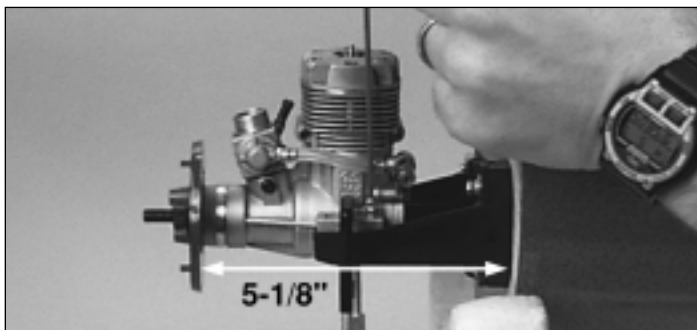
Insert short dowels or a couple of screwdrivers into the wing bolt holes and wrap the dowels with rubber bands for additional clamping power at the rear of the wing. Be certain the trailing edges align. Use a tissue dampened with alcohol to wipe away any more epoxy that oozes out of the wing, then set the wing on one of its tips leaning against a wall. Do not disturb the wing until the epoxy has fully cured.

### Mount the Engine & Install the Fuel Tank



❑ 1. Cut the *spreader bar* from both engine mount halves and trim any remaining plastic so the halves slide together. Temporarily mount your engine mount to the firewall as shown in the sketch with four 6-32 x 1" SHCS (socket head cap screws), #6 lock washers and #6 flat washers but don't tighten the screws all the way yet.

❑ 2. Adjust the engine mount so it will fit your engine. Tighten the engine mount screws. Temporarily place the back plate of the spinner included with this kit on your engine. Refer to the following photo. Position your engine on the mount so the spinner back plate is 5-1/8" from the firewall. Hold your engine to the mount with small clamps or something similar.

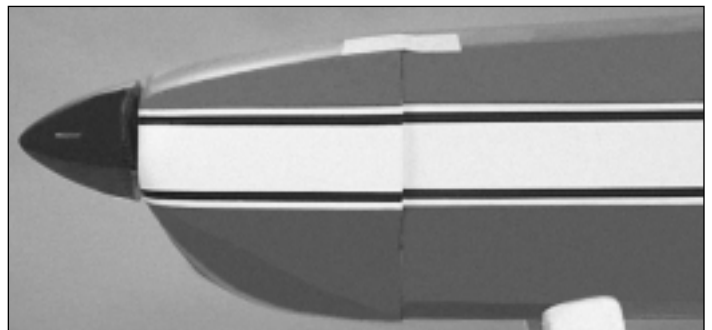


❑ 3. Mark the location of the engine mounting holes on the engine mount. We use the Great Planes *Dead Center Engine Mount Hole Locator* (GPMR8130) shown in the photo.

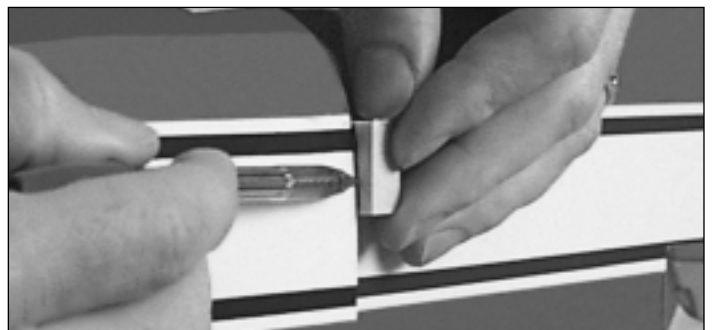
❑ 4. Remove your engine from the mount and drill 7/64" holes at the marks you made. Add a drop of household oil to the holes in the mount (so it will be easier for you to install the screws), then mount your engine to the mount with four #6 x 1" screws and #6 flat washers. **Hint:** If you have a drill press (or if you can borrow your friend's), remove the engine mount from the firewall and drill the holes using the drill press.

**Note:** Some modelers prefer to mount their engines with machine screws (not included) rather than the sheet metal screws supplied with this kit. The Great Planes Adjustable Engine Mounts accept threads well, so if this is your choice use the appropriate drill and tap for the screws you intend to use. 4-40 Screws are acceptable but use 6-32 screws if they will fit into your engine. Tap the threads into the holes and mount your engine.

❑ 5. Remove the spinner back plate from your engine, then slip the cowl over the front of the fuse. If the head of your engine interferes with the cowl, you can temporarily remove the head, or cut a hole in the cowl just large enough to accommodate the engine. After the cowl is mounted, you can enlarge the hole to allow some clearance for a more finished appearance.

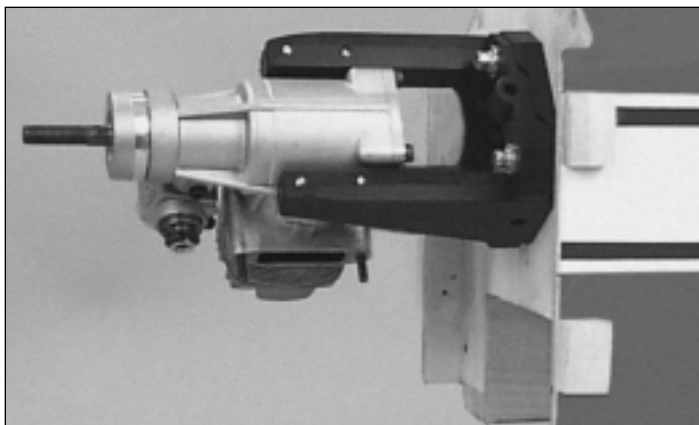


❑ 6. Reinstall the spinner. Align the front of the cowl with the spinner and tape it to the fuselage. Use the stripes on the cowl and the fuselage as a cue for alignment.



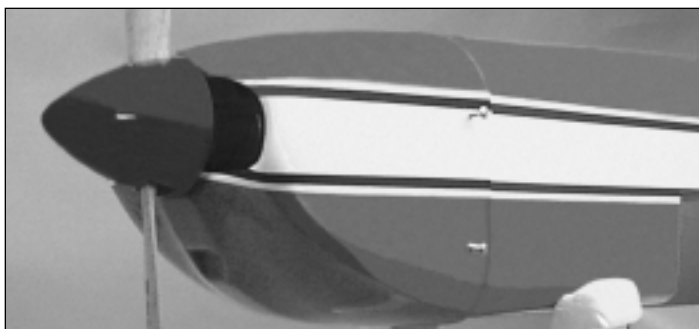
❑ 7. Position one of the 1/2" x 1/2" x 3/4" hardwood **cowl mounting blocks** at the aft edge of the left side of the cowl near the top. Use a ballpoint pen to mark the aft edge of the cowl on the cowl mounting block. Mark the remaining three cowl mounting blocks the same way for the left side of the cowl near the bottom and the right side of the cowl near the bottom and the top.

❑ 8. Trim the cowl mounting blocks along the lines you marked in step 7.

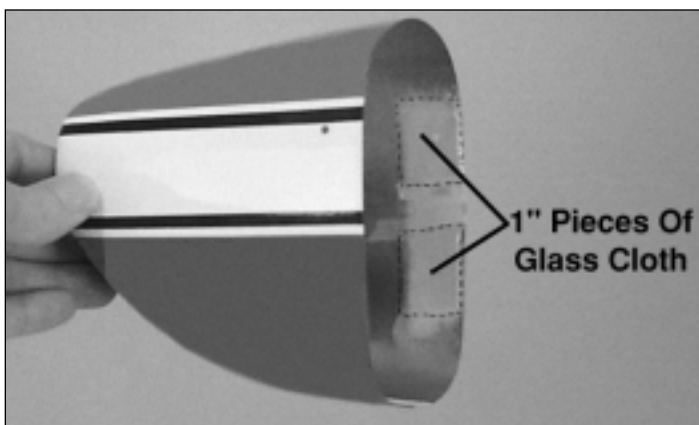


❑ 9. Cut the covering from the front edge of the fuse for the cowl mounting blocks and glue them in position.

❑ 10. Reposition the cowl on the fuse and mount the spinner to your engine. Align the cowl with the spinner and the fuse and tape it in position. View the cowl carefully to make sure the cowl is centered horizontally and vertically on the spinner.

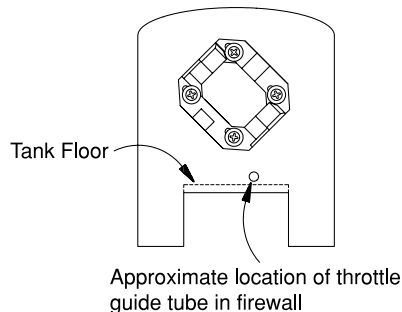


❑ 11. Drill a 5/64" (or 3/32") hole through the cowl and one of the cowl mounting blocks. Screw a #4 x 1/2" SMS (sheet metal screw) through the cowl just far enough into the cowl mounting block to temporarily hold that part of the cowl in place. One at a time, drill a hole and insert a screw into the remaining three cowl mounting blocks the same way.

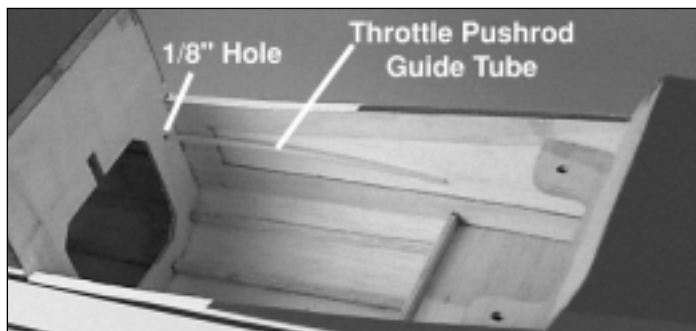


❑ 12. Remove the spinner and cowl. Roughen the inside of the cowl around the four screw holes with 80-grit

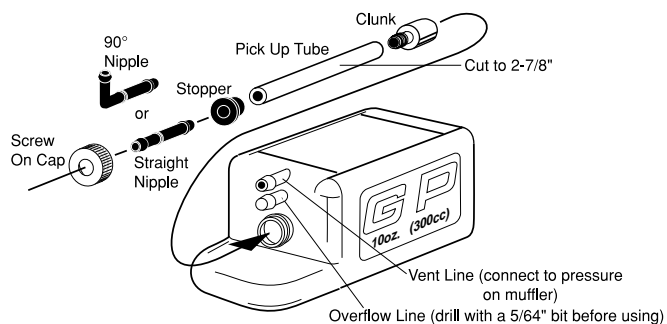
sandpaper. Cut four 1" pieces from the strip of glass cloth and glue them to the inside of the cowl over the mounting holes with 30-minute epoxy as shown in the photo. Set the cowl aside while the epoxy cures. Use a small amount of epoxy to fuelproof the cowl mounting blocks.



❑ 13. Mark the firewall where the throttle pushrod guide tube will enter. This location may vary depending on your engine. Make sure the guide tube will not interfere with the fuel tank. Ideally, the hole should be 3/16" above the bottom edge of the firewall so it can rest on top of the fuel tank floor behind the firewall. Drill a 1/8" hole through the firewall for the throttle pushrod guide tube.



❑ 14. Drill a 1/8" hole through the former where shown in the photo. Roughen the outside of the guide tube so glue will stick, then insert the throttle pushrod guide tube through the firewall and the former. You will cut the guide tube to the correct length when you install the servos.

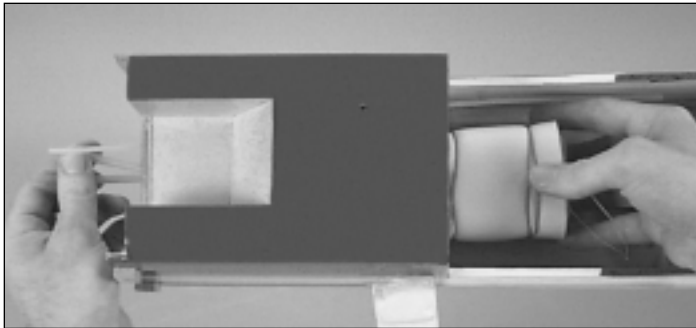


❑ 15. Cut the clear **pick up tube** included with this kit to a length of 2-7/8". Assemble the fuel tank as shown in the sketch using the **straight nipple**. After you assemble the tank hold it up to the light and make sure the **clunk** does not contact the rear of the tank. If necessary, disassemble the tank and shorten the pick up tube.



❑ 16. Wrap the tank with 1/4" foam rubber secured with a couple of rubber bands. Tie a piece of string to the loop in the back of the tank so you can pull it out of the fuselage when you do your seasonal fuel tank inspection (*you do perform a fuel tank inspection at the beginning of each flying season, don't you?*)

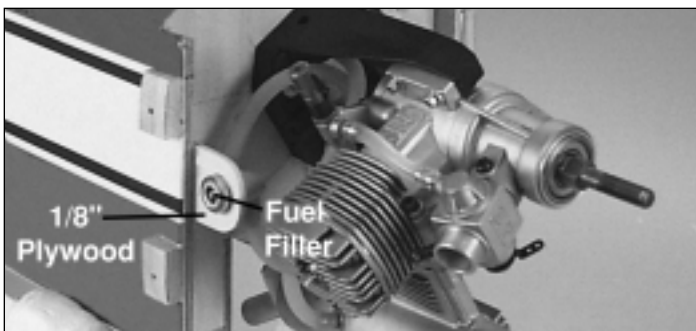
❑ 17. Remove your engine mount. Drill 15/64" (or 1/4") holes through the firewall for your fuel lines. Make sure you drill the holes where they will not interfere with the engine mount.



❑ 18. Fit approximately 12" to 14" of fuel line on the pickup and vent lines of your fuel tank. Pull the fuel lines through the holes you drilled in the firewall as you install your tank. Be certain you do not kink the fuel lines.

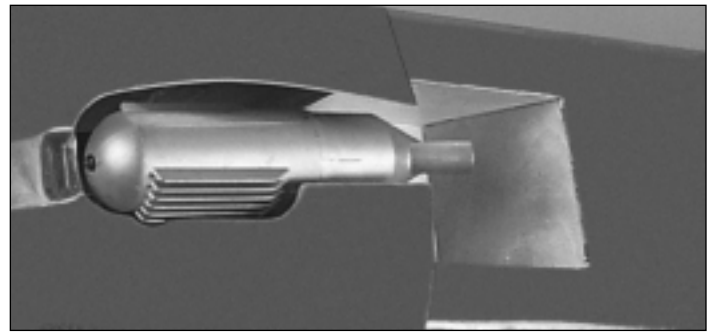
❑ 19. Secure your fuel tank by stuffing extra foam rubber in the fuselage behind the tank.

*Before we move on, we might as well finish up the rest of the "front end."*



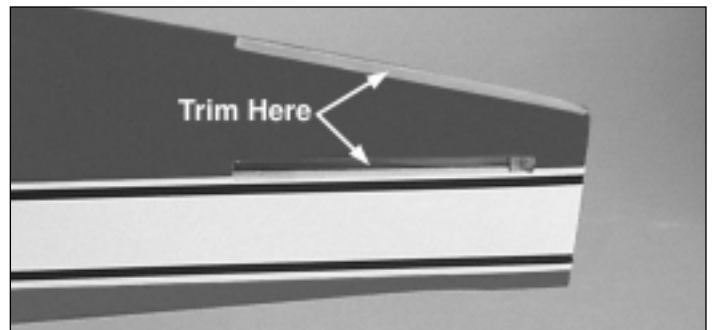
❑ 20. Mount your fueling system. We used a Great Planes Easy Fueler™ Fuel Filling Valve (GPMQ4160, not included with this kit). Mount the filler valve on the carb inlet side of the engine compartment on a scrap piece of 1/8" plywood (not included).

❑ 21. Enlarge the four 1/16" mounting holes you drilled **in the cowl** with a 1/8" drill. Fit the cowl on the fuse over the cowl mounting blocks. If necessary, trim the cowl mounting blocks to accommodate the added thickness of the glass cloth so you don't have to force the cowl into place.

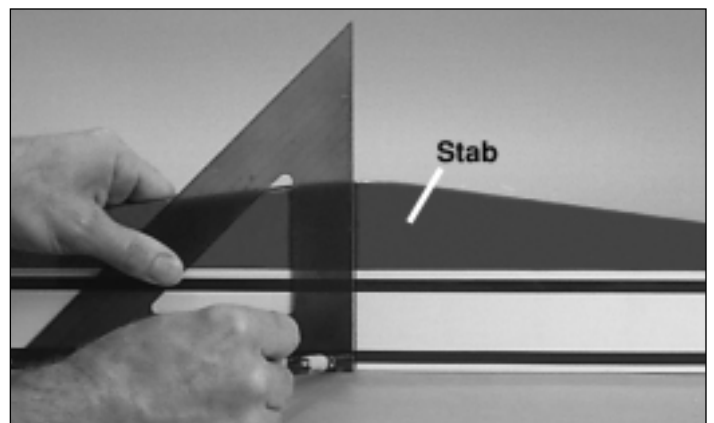


❑ 22. Mount your muffler to your engine. Trim the cowl where necessary so it does not interfere with the muffler allowing an approximate 1/8" clearance all the way around. Trim the cowl to accommodate your fuel filler and needle valve as well.

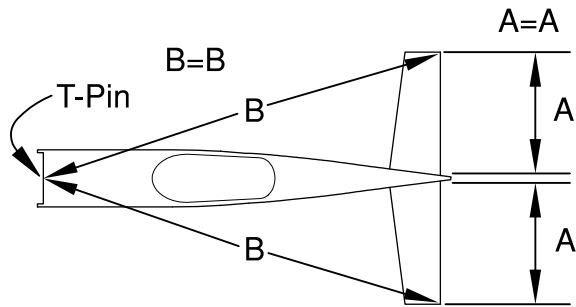
### Mount the Stab & Fin



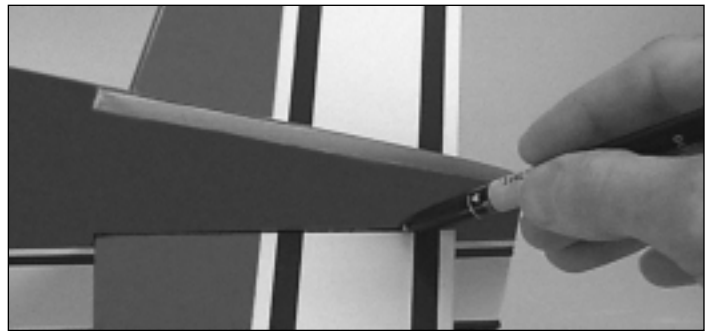
❑ 1. Use a fresh #11 blade to trim the covering from the slots in the aft end of the fuse for the stab and fin.



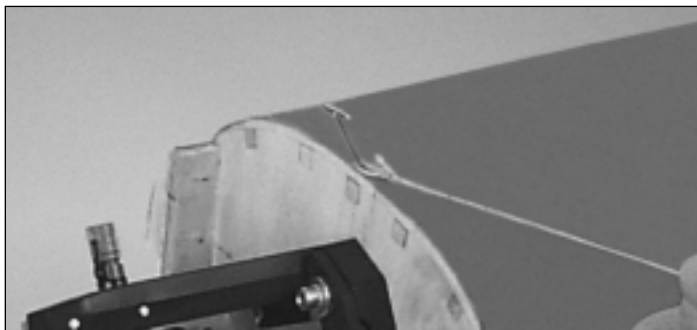
❑ 2. Measure the top of the stab and accurately mark the center with a felt-tip pen. Use a 90° triangle to mark a vertical centerline across the mark you made.



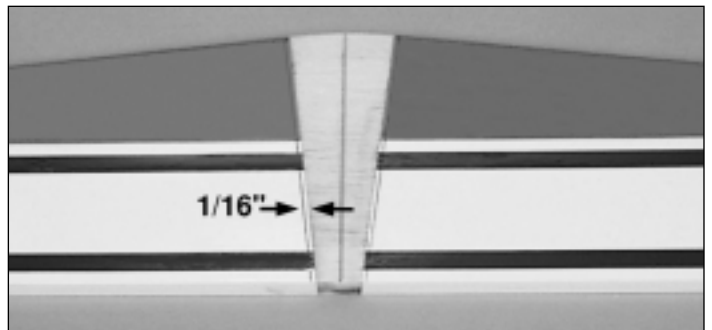
❑ 3. (Refer to this sketch while you align the stab.) Slide the stab into the fuse. Align the centerline you marked with the slot for the fin. Measure the stab on both sides of the fuse to make sure it is centered ( $A=A$ ).



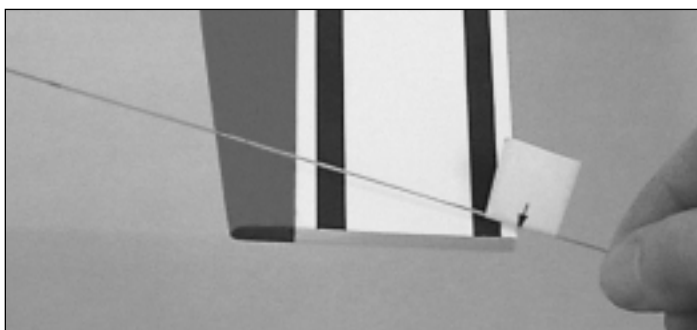
❑ 6. Use a felt-tip pen to mark the sides of the fuselage on the **top** and the **bottom** of the stab. Remove the stab from the fuselage.



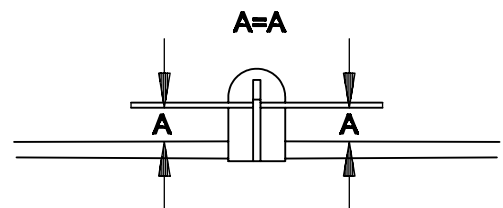
❑ 4. Remove your cowl if it's on the fuselage. Insert a T-pin into the top, middle stringer over the firewall in the front of the fuselage. Tie a small loop at one end of a 40" piece of monofilament string and slip it over the T-pin.



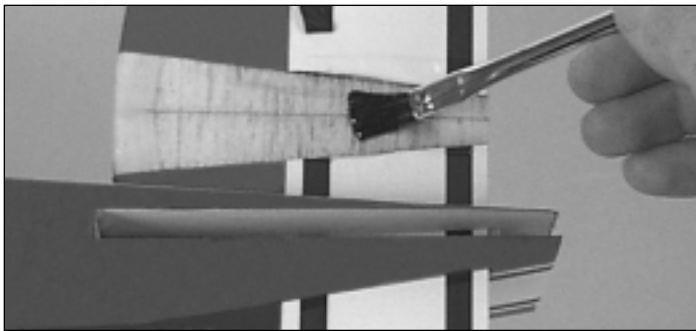
❑ 7. Use a fresh #11 blade to carefully cut through the covering 1/16" inside the lines you marked on the top and bottom of the stab that indicate the fuse sides. **Do not cut the wood under the covering! This will weaken the structure and may cause the stab to fail in flight.** Remove the covering from the center of the stab within the lines you cut.



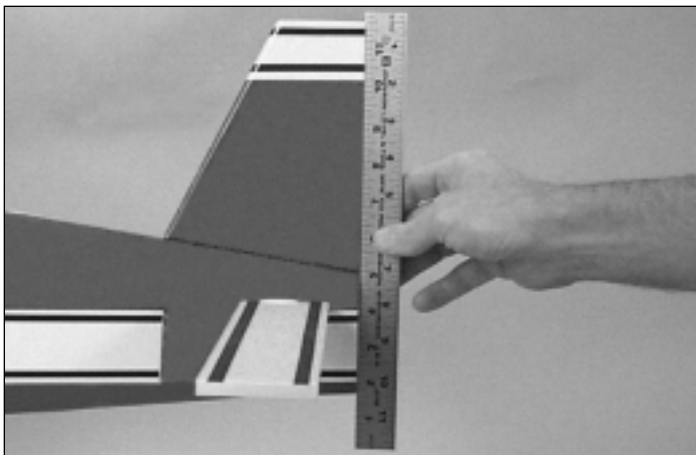
❑ 5. Fold a piece of masking tape over the other end of the string and draw an arrow on it. Slide the tape along the string and align the arrow with one end of the stab. Swing the string over to the other end of the stab. Shift the stab and slide the tape along the string until the distances between both ends of the stab and the front of the fuse are equal ( $B=B$ ). Now your stab is **centered** and **square** with the fuse.



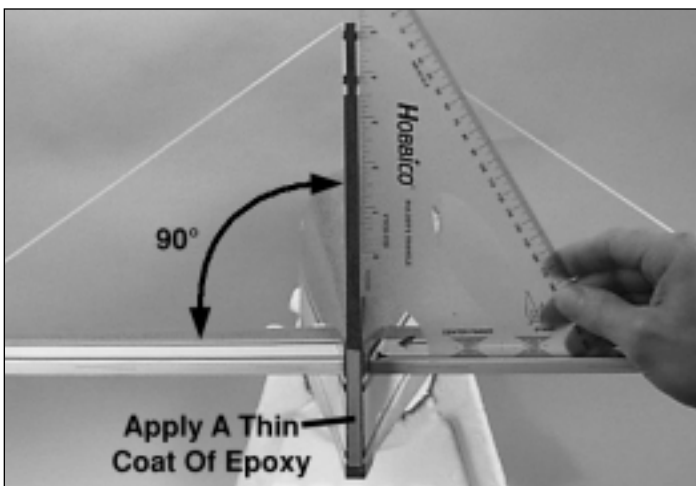
❑ 8. Reinstall the stab in the fuse. Bolt the wing to the fuse with two 6-32 x 1-1/2" bolts and flat washers. View the fuselage from the rear and make sure the stab is parallel to the wing as shown in the sketch ( $A=A$ ). If the stab is not parallel to the wing, remove the stab and **carefully** sand the fuse where it interferes with the stab, allowing the stab to become parallel to the wing. Reinstall the stab and recheck alignment from behind the fuse. Sand the fuse as necessary until the stab is parallel with the wing. Proceed carefully and remove only a small amount of material at a time.



9. Now it's time to glue the stab to the fuse. Position the stab in the fuse so the exposed balsa of the center section is visible. Apply a film of 30-minute epoxy to the bare balsa on both sides of the stab and slide it into position making sure you distribute enough epoxy in the opening. Repeat this procedure once more to make sure you have distributed plenty of epoxy in the stab saddle. Recheck alignment using the pin-and-string technique shown earlier. Wipe away excess epoxy before it cures and use T-pins to hold the stab in position until the epoxy has fully cured.



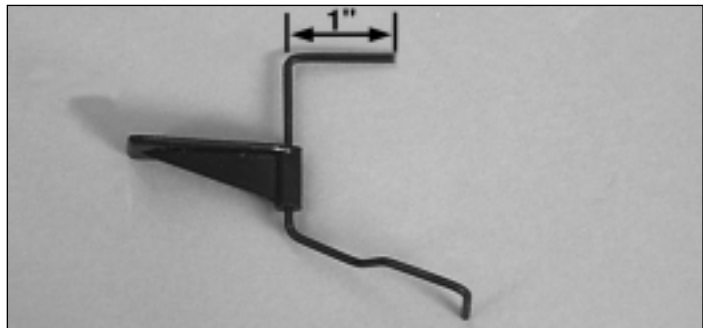
10. Test fit the fin into the fuselage. Trim where necessary so the TE of the fin aligns with the end of the fuse.



11. Use 30-minute epoxy to glue the fin to the fuse. If necessary, use masking tape to hold the fin perpendicular

to the stab. Apply a thin coat of epoxy to the bare wood on the TE of the fin. Do not disturb the fuselage until the epoxy has fully cured.

### Mount the Landing Gear

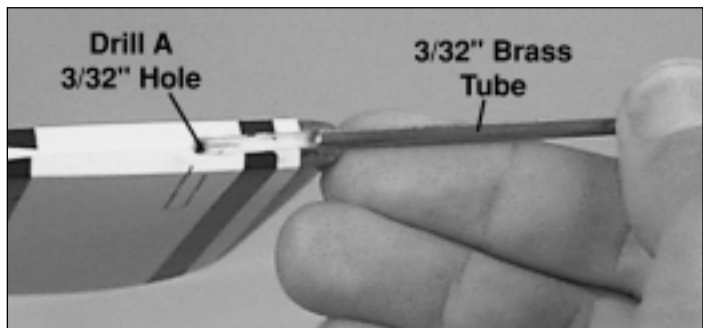


1. Slip the **tail gear wire** into the plastic **tail gear bracket**. Make certain you have installed the gear into the bracket correctly, then make a 90° bend in the wire 1" from the end.

2. Using the tail gear bracket as a *template* holding it in the location shown, drill four 1/16" holes on the bottom of the fuse. Mount the tail gear to the bottom of the fuse with four #2 x 3/8" screws.



3. Hold the rudder to the fin next to the tail gear wire (or tape the rudder to the fin). Mark the rudder where the *arm* portion of the tail gear wire will enter.

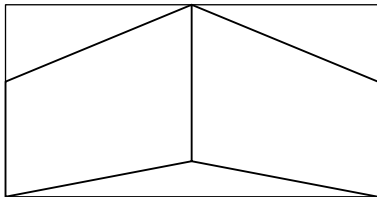


4. Cut a groove in the LE of the rudder and drill a 3/32" hole where you made your mark to accommodate the tail gear wire. **Hint:** Use a 3/32" brass tube sharpened at the end to cut the groove.

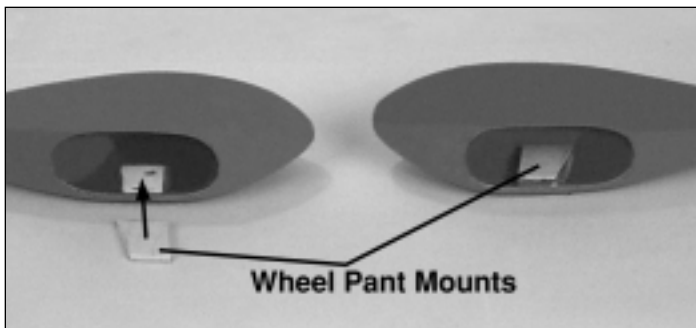
❑ 5. Test fit the rudder to the tail gear wire. View the rudder and the tail gear wire from above (when the fuselage is upside down in your cradle). If necessary, bend the tail gear wire so your model will taxi straight when your rudder is centered.

❑ 6. Mount a 1" tail wheel to the tail gear wire with a 3/32" wheel collar and set screw on both sides of the wheel. Secure the set screws with a drop of Great Planes Pro Threadlocker (GPMR6060) or similar thread locking compound.

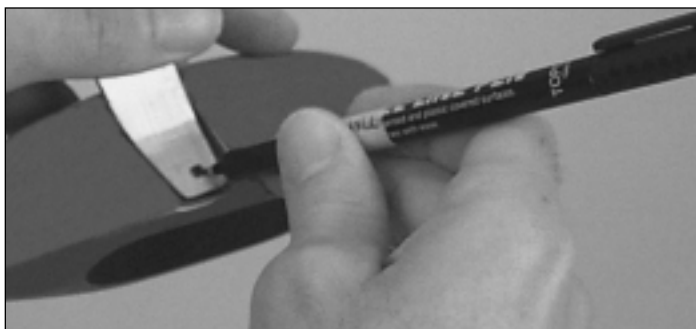
### Wheel Pant Mounts



❑ 7. Use the sketch above to make two **wheel pant mounts** from the 1/8" x 1" x 2" plywood sheet.

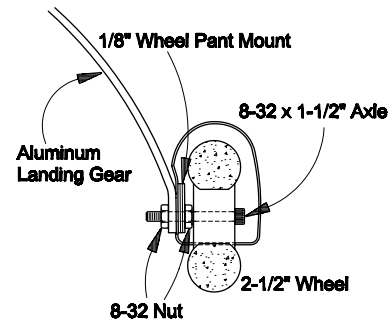


❑ 8. Use 80-grit sandpaper to scuff the inside of both wheel pants where the wheel pant mounts are to be located. Glue the wheel pant mounts inside the wheel pants with medium CA.

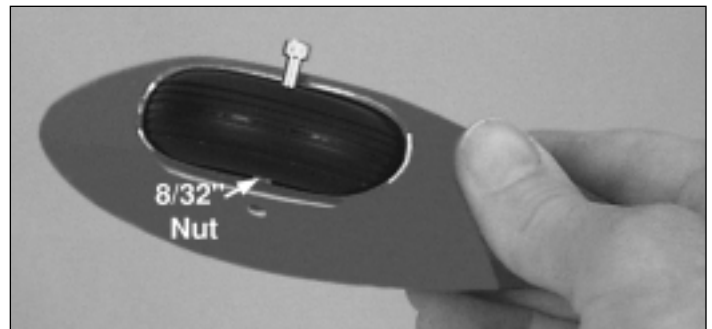


❑ 9. Use a metal file to round the edges of the landing gear where it keys into both wheel pants. Fit one of the wheel pants to the landing gear, then mark the hole in the gear onto the wheel pant. Mark the other wheel pant using the same procedure.

❑ 10. Drill a 3/16" (or 11/64" or #18) hole in both wheel pants at the mark you made.



❑ 11. (Refer to this sketch for mounting the wheel and wheel pant on the landing gear.) Fit a 2-1/2" wheel on a 8-32 x 1-1/2" **axle**. If the wheel does not fit on the axle or spin freely, enlarge the hole in the wheel with a 11/64" or #18 drill. Screw a 8-32 nut onto the axle about 1/8".



❑ 12. Slip the wheel with the axle and nut partway into one of the wheel pants.

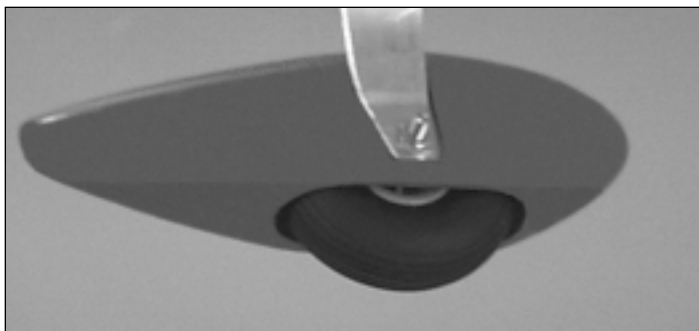


❑ 13. Use a 9/64" hex wrench to screw the axle into the plywood wheel pant mount until it comes out of the opposite side of wheel pant.

❑ 14. Use needle nose pliers or hemostats to tighten the nut inside the wheel pant until free play on the axle is removed, but the wheel can still roll freely.

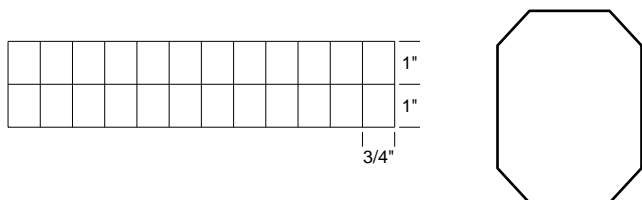
❑ 15. Fit the other wheel into the other wheel pant using the same procedures as above.

❑ 16. If you wish to polish or paint the pre-bent aluminum landing gear, now is the time to do it.



- ❑ 17. Mount both wheel pants to the landing gear with a drop of Great Planes Threadlocker or similar thread locking compound and a 8-32 hex nut on both axles.
- ❑ 18. If necessary, trim the opening in the wheel pants so the wheels can roll freely. Add a drop of household oil to the axles on both sides of the wheels.
- ❑ 19. Mount the main landing gear to the fuselage with two 8-32 x 3/4" SHCS.

## JOIN THE CONTROL SURFACES

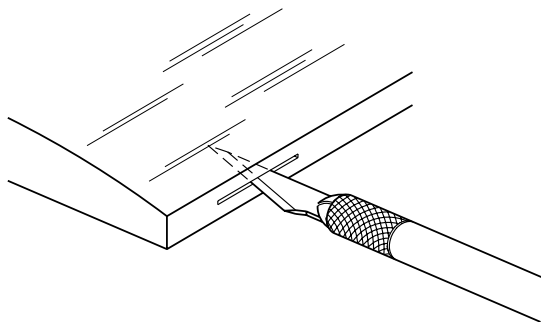


- ❑ 1. Cut fifteen 3/4" x 1" **hinges** from the **CA hinge strip** supplied with this kit. Snip the corners off so they go into the slots easier. You may cut all the hinges now, or cut them as you need them.

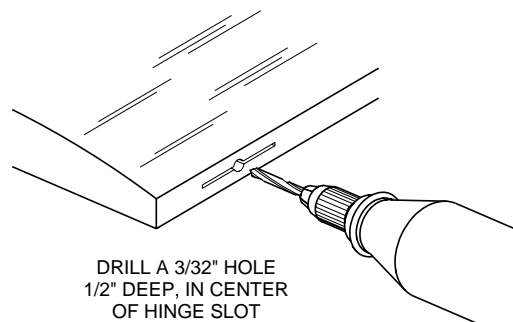
## Rudder Assembly



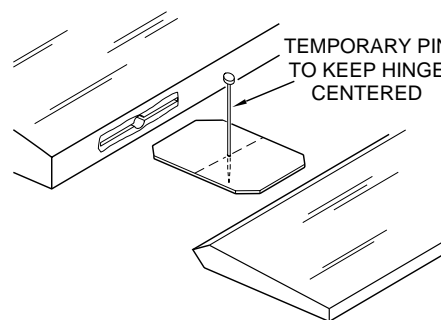
Before you glue in the hinges, apply a few drops of household oil to a tissue. Wipe the tissue over the trailing edge of the fin and the leading edge of the rudder coating them with a fine film of oil. This will prevent excess CA you use for gluing in the hinges from sticking to the rudder and fin at the hinge gap.



- ❑ 2. 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.

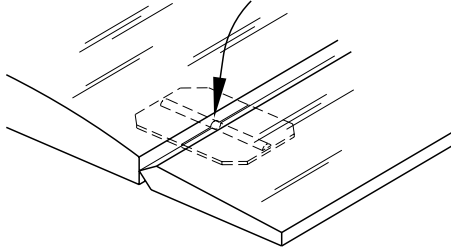


- ❑ 3. Drill a 3/32" hole, 1/2" deep, in the center of the hinge slot. If you use a Dremel® MultiPro™ for this task, it will result in a cleaner hole than if you use a slower speed drill. Drilling the hole will twist some of the wood fibers into the slot, making it difficult to insert the hinge, so you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

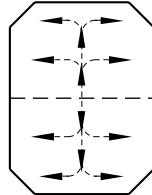


- ❑ 4. If the hinges don't remain centered, remove the rudder and insert a pin in the center of the hinges.
- ❑ 5. Pack the tail gear wire hole and the groove in the LE of the rudder with epoxy. If you work quickly, you may use 5-minute epoxy, but we recommend 30-minute epoxy. Rejoin the rudder to the 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.

ASSEMBLE, THEN APPLY 6 DROPS  
OF THIN CA TO CENTER  
OF HINGE, ON BOTH SIDES

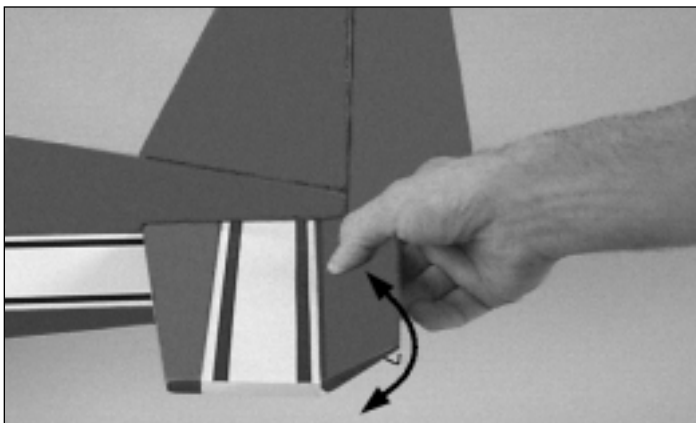


THE CA WICKS  
ALONG THE "TUNNELS"  
TO THE ENTIRE  
HINGE SURFACE



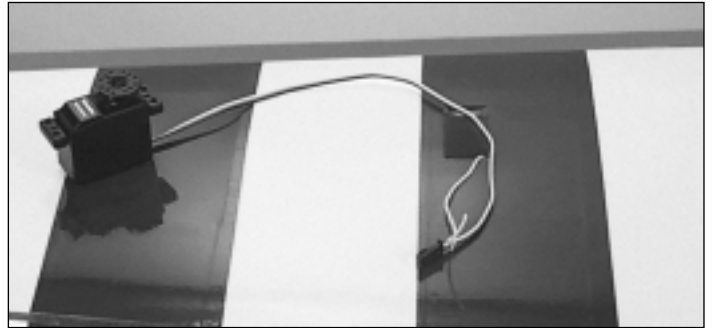
❑ 6. Cut a paper towel into approximately 2" squares. Place the fuselage on it's side so the fin and rudder are horizontal. Add six drops of thin CA to the center of the hinges on **both sides**. Use the paper towel squares to absorb excess CA from the hinge gap before it cures. **Do not use** CA accelerator; allow the CA to cure slowly.

❑ 7. Use the same hinging method to join the elevators to the stab and the ailerons to the wing.



❑ 8. After all your control surfaces are securely hinged and the CA has thoroughly hardened, move the control surfaces back and forth to *loosen them up* a little so it will be easier for your servos to move them.

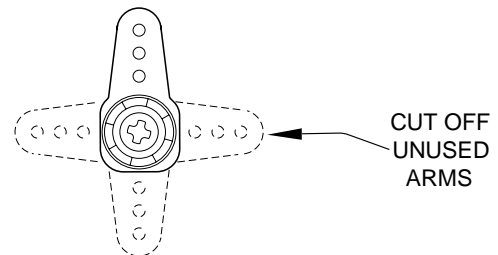
## Hookup the Ailerons



❑ 1. If you haven't already done so, install the rubber grommets and eyelets in your aileron servos. Pull the string out of one of the aileron servo compartments in the wing. Tie the string to the servo cord on one of the aileron servos.

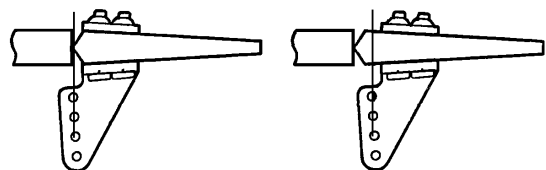
❑ 2. Fit the aileron servo in the wing. Hold the servo to the wing so the sides don't contact the wing and drill 1/16" holes for the servo mounting screws. Mount the servo to the wing with the screws included with your servos.

❑ 3. Mount your other aileron servo to the other side of the wing using the same procedures as above.



❑❑ 4. Cut the unused arms from one of your servo horns and mount it on one of your aileron servos in the wing.

❑❑ 5. Refer to the following photo. Use alcohol or other solvent to clean the film of oil from the five .074" x 12" **wire pushrods**. Screw a **nylon clevis** about fourteen turns onto one of the pushrods. Connect the clevis to the second from the outer hole of a nylon **control horn**.

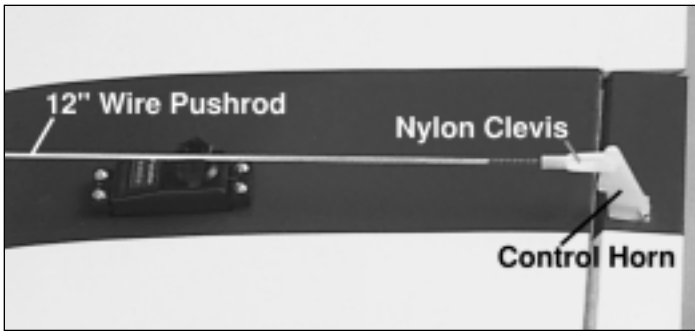


Right

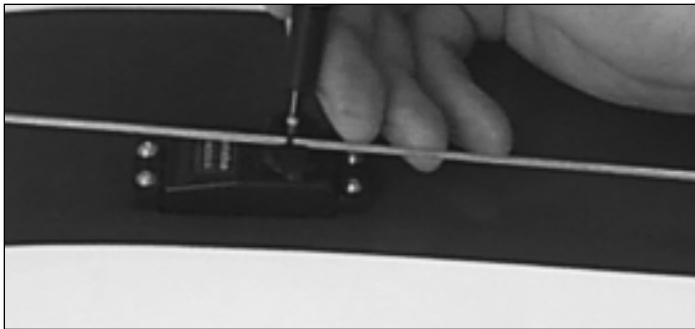
Wrong

❑❑ 6. Hold the control horn on the aileron making sure the holes align with the hinge gap. Use the control horn as a *template* to drill 3/32" holes through the aileron for the mounting screws.

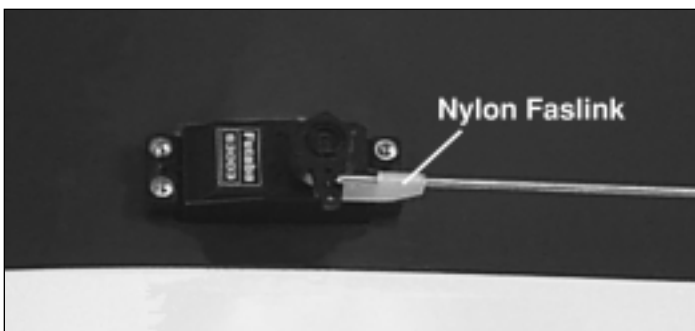
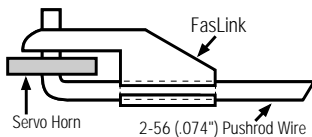
## Install the Elevator Pushrod



7. Mount the control horn to the aileron with two 2-56 x 5/8" screws and the nylon backing plate that was attached to the control horn. Slide a silicone retainer onto each clevis.



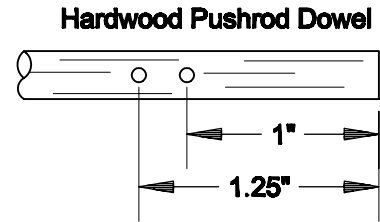
8. Use a felt-tip pen to mark the pushrod wire where it crosses the holes in the aileron servo arm.



9. Bend the pushrod at the mark you made. Cut the excess wire as shown in the sketch and connect the pushrod to the servo arm with a nylon **Faslink**.

10. Return to step 4 and connect the other aileron servo to the other aileron the same way.

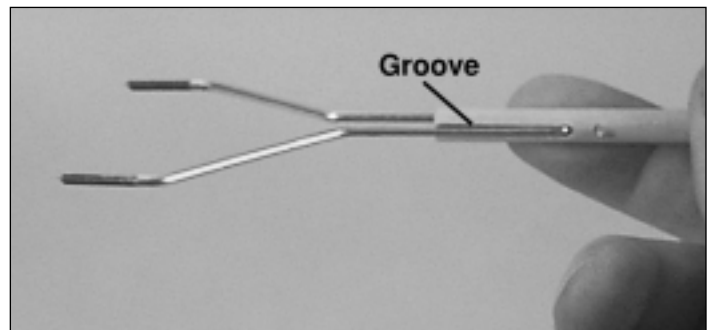
11. Turn the wing over. Use a piece of bent wire to *fish* the string out of the 1/2" holes in the center section of the wing and retrieve your aileron servo cords. Connect both aileron servo cords to a "Y" harness.



1. Cut one of the **pushrod dowels** to a length of 19". Drill two 5/64" (or 3/32") holes in one end of the pushrod as shown in the sketch. This is the aft end of the pushrod dowel.

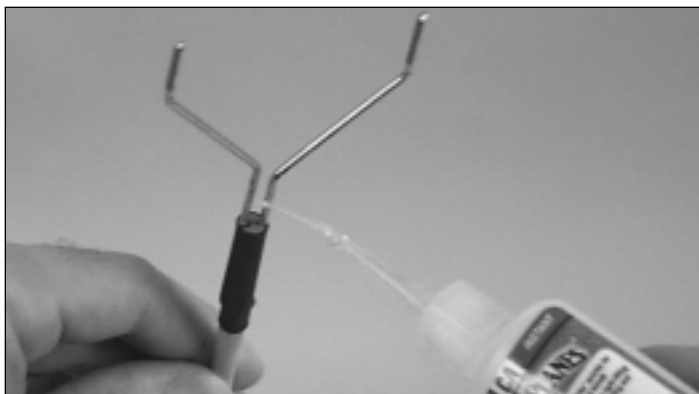
2. Drill another 5/64" hole 1" from the other end (front) of the pushrod dowel.

3. (*See the Pushrod Template #1, on page 4 for this step.*) Cut 1/2" from the threaded end of two .074" x 12" wire pushrods. Make the **elevator pushrod wires** as shown in the sketch from the two rods. Note that the sketch shows two rods, one 1/4" shorter than the other. Save the leftover pushrod wire to be used at the front of the pushrods. You should have two scrap pieces of wire, approximately 6" long.

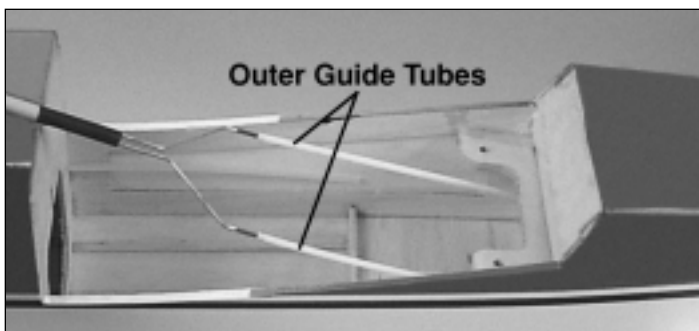


4. Use a hobby knife to cut grooves in the aft end of the pushrod dowel to accommodate the elevator pushrod wires. Test fit the pushrod wires and adjust the grooves as necessary for a good fit. **Hint:** Once you get the groove started, use the threaded end of another pushrod as a *file* to make the groove just the right size.

5. Cut a groove in the front end of the pushrod dowel using the same procedure as in step 4.



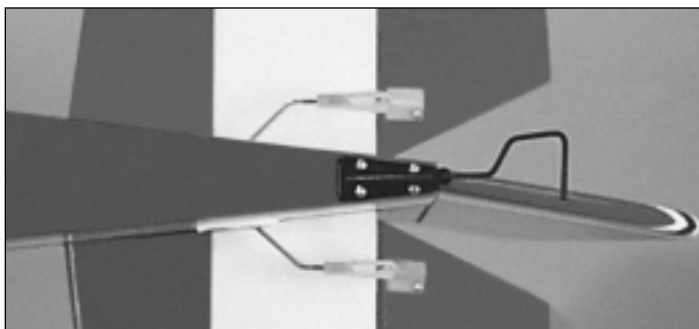
- ❑ 6. Cut a piece of 3" black **heat shrink tubing** into two 1-1/2" pieces. Secure the elevator pushrod wires to the pushrod dowel with a 1-1/2" piece of heat shrink. Use a match or lighter flame or a heat gun to shrink the tubing. After the tubing cools, permanently bond the tubing and the wires to the pushrod dowel with thin CA.



- ❑ 7. Cut the covering from the pushrod exit slots nearest the stab on both sides of the fuse. Install two outer guide tubes (from a Great Planes Flexible Cable Pushrod kit, GPMQ3702, not included) through the slots. Route the guide tubes through the fuse into the radio compartment. Screw the guide tubes to the threaded ends of the elevator pushrod wires.

- ❑ 8. Pull the guide tubes out of the fuselage until the pushrod wires come out of the slots. Remove the guide tubes.

- ❑ 9. Thread a nylon clevis onto the right pushrod wire about twenty turns. Connect the clevis to the outer hole of a nylon control horn. Connect another clevis and control horn to the left pushrod wire the same way.

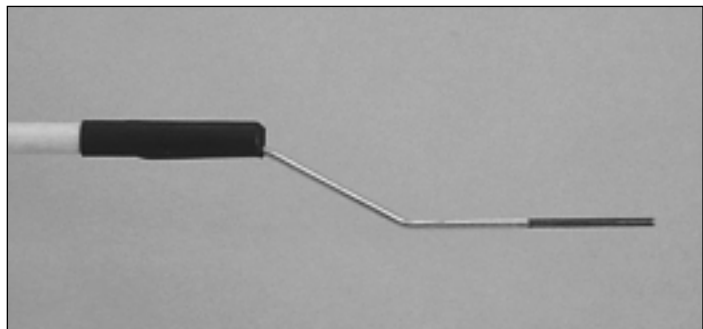


- ❑ 10. Adjust the clevises (and the bends in the pushrod wires if necessary) so both control horns rest on the

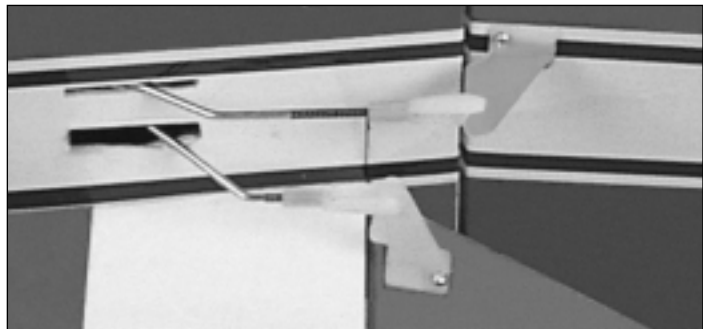
elevator in the exact same location. Make sure the holes in the control horn align with the hinge gap. Using the horns as a template, drill 3/32" holes through the elevators and mount the control horns with 2-56 x 5/8" screws and the nylon plates. Slide the silicone retainers onto each clevis.

### ***Install the Rudder Pushrod***

- ❑ 1. Cut the other pushrod dowel to a length of 19-1/2" for the **rudder pushrod dowel**. The same as you did for the elevator pushrod dowel, drill a 1/16" hole 1" from both ends of the dowel and make grooves for the pushrod wires.



- ❑ 2. (See the **Pushrod Template #2**, on page 4 for this step.) Make a rudder pushrod wire as shown in the sketch from a .074" x 12" wire pushrod. Secure the pushrod wire to the pushrod dowel with the other piece of 1-1/2" heat shrink tube and thin CA.



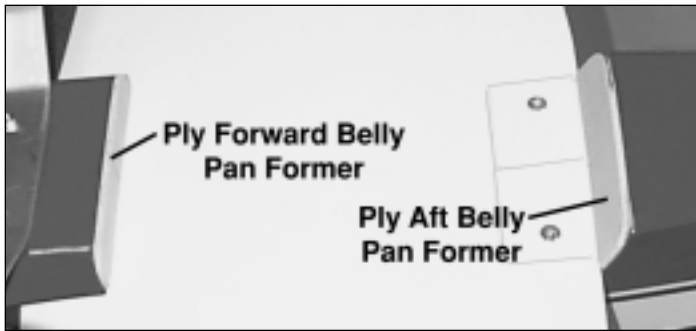
- ❑ 3. Install the rudder pushrod in the fuse using an outer pushrod guide tube to pull it through the same way you did with the elevator pushrods. Connect the pushrod to the rudder with a nylon clevis, a control horn, two 2-56 x 5/8" screws and the nylon backing plate. Slide the silicone retainers onto each clevis.

## **FINAL ASSEMBLY**

### ***Install the Wing Belly Pan***

- ❑ 1. Place the fuselage upside down in your building stand. Bolt the wing to the fuselage.

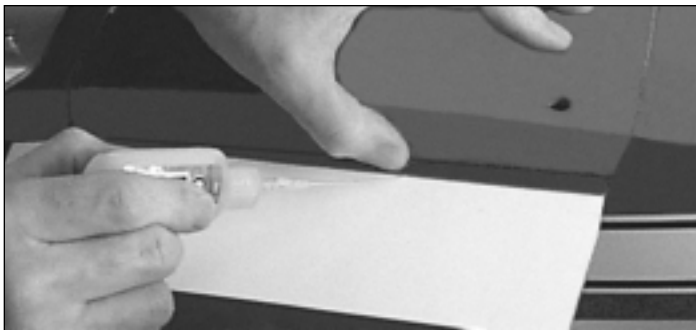




❑ 2. Trim the 1/8" plywood **forward** and **aft belly pan formers** so they match the fuse when placed in position.

❑ 3. Remove the covering only where the plywood belly pan formers contact the bottom of the wing. Use thick or medium CA to glue the belly pan formers to the wing. **Make sure** you don't inadvertently glue the wing or the belly pan formers to the fuse.

❑ 4. Use 320-grit sandpaper to lightly scuff the covering where the molded ABS belly pan will contact the bottom of the wing. Similarly, scuff the bottom of the belly pan where it will contact the wing.



❑ 5. Position the belly pan on the wing and use thin CA to glue it in place.

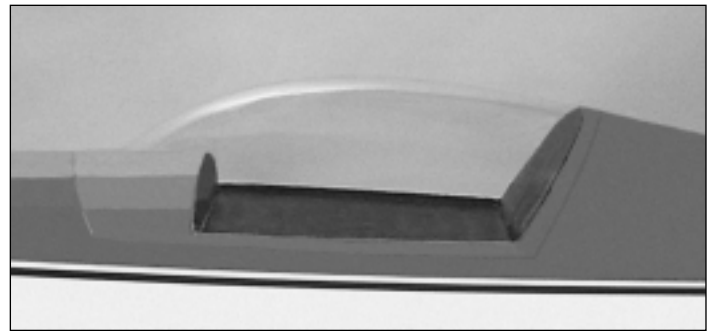
❑ 6. Unbolt the wing from the fuselage and glue the belly pan formers to the belly pan with medium CA. Now would be a good time to fuelproof the bare wood on the front of the wing and the belly pan formers the same way you fuelproofed the firewall and other parts of the fuse.

### Mount the Canopy

❑ 1. Add whatever scale details you would like to the cockpit, then glue in your pilot, or just paint the cockpit black.

❑ 2. Trim the clear molded canopy along the molded-in cutlines. Use a sanding block and 220-grit sandpaper to true the edges of the canopy for a finished appearance.

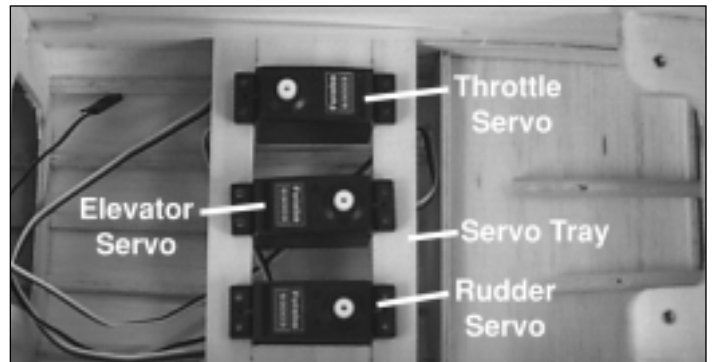
❑ 3. Wash the dust and fingerprints from the canopy with lukewarm soapy water. If you wish to paint a frame on the canopy to resemble the full size Extra, now is the time to do so. Use a paint that is compatible with the canopy. Always test your paint on a piece of leftover plastic cut from the canopy. We suggest Pactra Formula-U or Chevron.



❑ 4. Mount the canopy to the fuselage. The easiest way is to tape the edges of the canopy to the fuse with 1/4" red striping tape, or use canopy glue for the most permanent installation.

### Mount the Servo Tray

❑ 1. If you haven't already done so, mount the grommets and eyelets to your elevator, throttle and rudder servos.



❑ 2. Test fit your throttle, elevator and rudder servos in the 1/8" plywood **servo tray**. If necessary, enlarge the opening in the servo tray so the sides of your servos will not contact the servo tray. Position the servo tray in the fuselage but **do not** glue it in place until instructed to do so.

❑ 3. Mount the cowl, prop and spinner and **temporarily** place your battery pack and receiver inside the fuselage at the location where you intend to mount them.

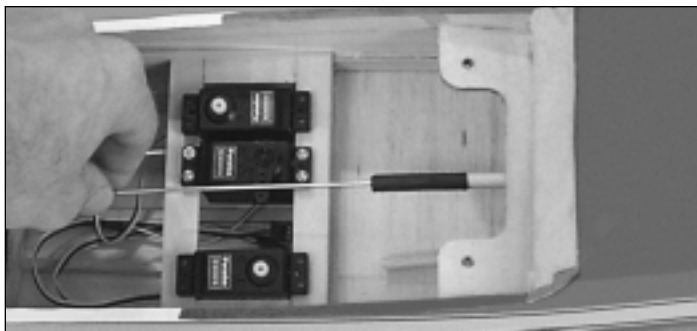
❑ 4. Bolt the wing to the fuselage. Refer to the balance point in the sketch on page 19. Use thin strips of tape or a felt-tip pen to **accurately** mark the balance point on the **top** of the wing where it meets both sides of the fuselage.

❑ 5. Turn the model **upside down** and lift the wing at the balance point or place it on a Great Planes *C.G. Machine* (GPMR2400). If the **nose** tilts downward, your model is nose heavy. Remove the wing and move the servo tray aft or shift the receiver and battery pack aft. If the **tail** tilts downward, your model is tail heavy. Remove the wing and move the servo tray forward or shift the receiver and battery pack forward. Reposition the model on your C.G. Machine or lift it at the balance point again.

❑ 6. Shift the radio components until you can get the model to balance as closely as possible to the indicated balance point. **This isn't the final C.G. check**, but it will enable you to minimize (or altogether eliminate) the amount of lead required to finally balance your model. Our model using an O.S. .46 SX balanced with the servo tray as far aft as possible, a 500mAh battery pack just in front of the servo tray and the receiver just behind the servo tray. Your model may vary.

❑ 7. Glue the servo tray in position. Temporarily remove the battery pack and receiver noting their location to achieve the correct C.G.

❑ 8. Use one of the scrap pieces of pushrod wire (approximately 6" in length), to make the front wire pushrod for the elevator. Make a 90° "L" bend in the end of the wire and secure it to the front of the elevator pushrod dowel with a 1-1/2" long piece of heat shrink tubing and thin CA.

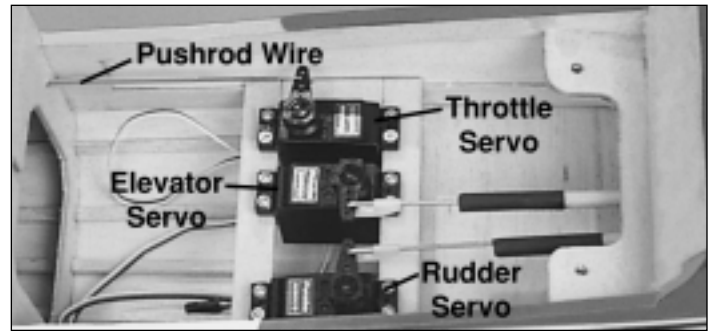


❑ 9. Place a one-arm servo horn on the elevator (middle) servo on the servo tray. Position the elevator servo in the servo tray so the elevator pushrod will run straight down the middle of the fuselage when connected to the servo. Drill 1/16" holes and mount the elevator servo to the servo tray.

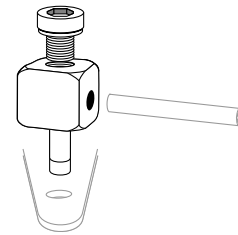
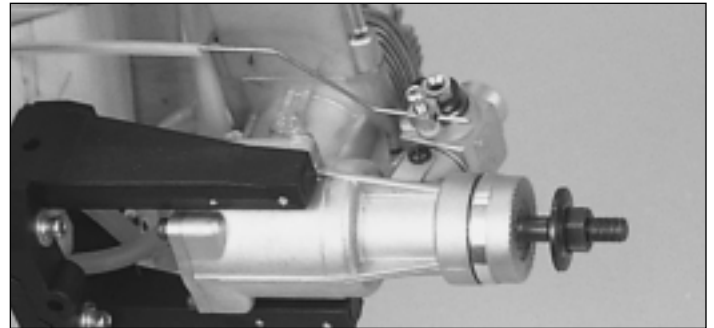
❑ 10. Mark, bend, then cut the excess off the pushrod the same way you did for the ailerons, and connect it to your elevator servo with a nylon Faslink.

❑ 11. Connect the rudder pushrod to the rudder servo the same as the elevator using heat shrink tubing to secure the pushrod wire to the dowel and using a Faslink to connect the wire to the servo. Drill 1/16" holes and mount the rudder servo to the servo tray. You can see the rudder servo in following photos.

❑ 12. Place a servo horn on your throttle servo. Cut the throttle guide tube approximately 1-1/2" in front of the throttle servo horn.



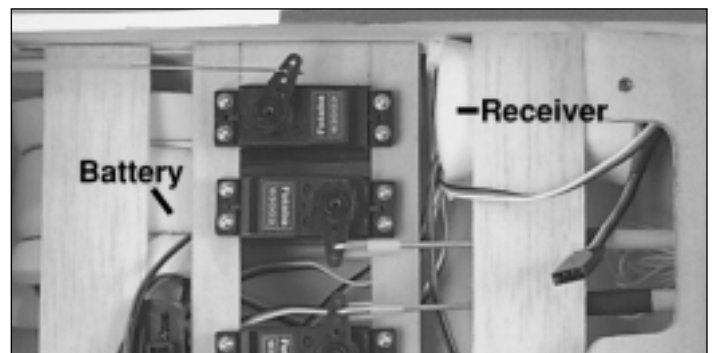
❑ 13. Remove the cowl and guide the thin **throttle pushrod wire** through the throttle guide tube. Make a "Z-bend" on the end of the pushrod wire and connect it to the throttle servo.



RETAINER

❑ 14. Cut the throttle pushrod wire to the correct length, then connect it to the carb arm using a **screw-lock pushrod connector** and a 4-40 x 1/4" SHCS. Secure the screw-lock pushrod connector to the carb arm with a nylon retainer.

### Final Radio Installation

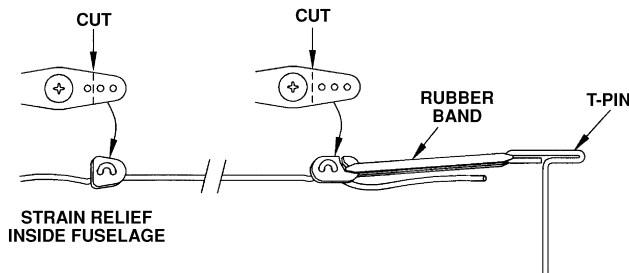


❑ 1. (Refer to this photo for mounting your radio.) Connect your servo cords, switch and an aileron extension cord to

your receiver. Wrap the receiver in foam rubber and mount it in the location determined earlier. Glue a piece of 1/8" balsa or plywood to securely hold your receiver in position. Be certain that nothing interferes with the pushrods or servo horns.

❑ 2. Wrap your battery pack and mount it in the predetermined location the same as the receiver. Be certain the battery pack is secure so it will not become dislodged during aerobatic maneuvers.

❑ 3. Mount the on/off switch and charging jack in a strategic location that will not interfere with other radio components but is easy to reach from outside the model.

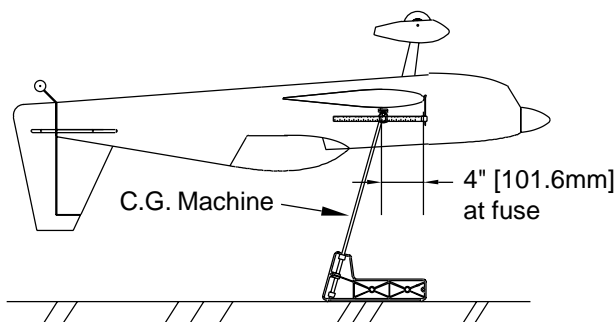


❑ 4. Make a strain relief from a cutoff servo arm and fit it to your antenna. Route the antenna out the bottom (or side) of the model and attach it to a T-pin or the tail gear wire with a small rubber band. Do not push the T-pin through the antenna wire.

## GET YOUR MODEL READY TO FLY

### Balance Your Model

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



This is the balance point at which your model should be balanced for your first flights. Later, you may experiment by shifting the balance up to **1/4" forward or backward** to change the flying characteristics. If you move the balance point **forward** it may improve the smoothness and tracking, but your Extra 300 ARF may then require more speed for takeoff and become more difficult to slow for landing. If you move the balance **aft** it may make your Extra 300 ARF more agile with a lighter *feel* and allow you to slow the model more for landing. In any case, **please start at the location we recommend and do not at any time balance your model outside the recommended C.G. range.**

All components should be in the model and it should be ready-to-fly with an **empty** fuel tank. Lift your model at the balance point or place it on your Great Planes C.G. Machine. Your balance point should be pretty close since we've already *pre-balanced* it. If necessary, add nose weight or tail weight to balance the model where indicated.

**Note:** Nose weight may be easily installed by using a spinner weight or gluing lead weights to the firewall. Tail weight may be added by using Great Planes (GPMQ4485) "stick-on" lead weights. Later if the balance is O.K., you can open the fuse bottom and glue the weights in permanently.

### Balance the Model Laterally

Do not confuse this procedure with checking the C.G. which you already performed.

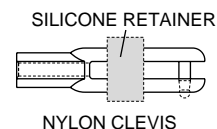
❑ 1. With the wing level and attached to the model (and the engine and muffler installed), lift the model by the propeller shaft and the fin. This may require an assistant. Do this several times.

❑ 2. The wing that consistently drops indicates the heavy side. Balance the model by adding weight to the other wing tip.

An airplane that is laterally balanced will track better during aerobatic maneuvers.

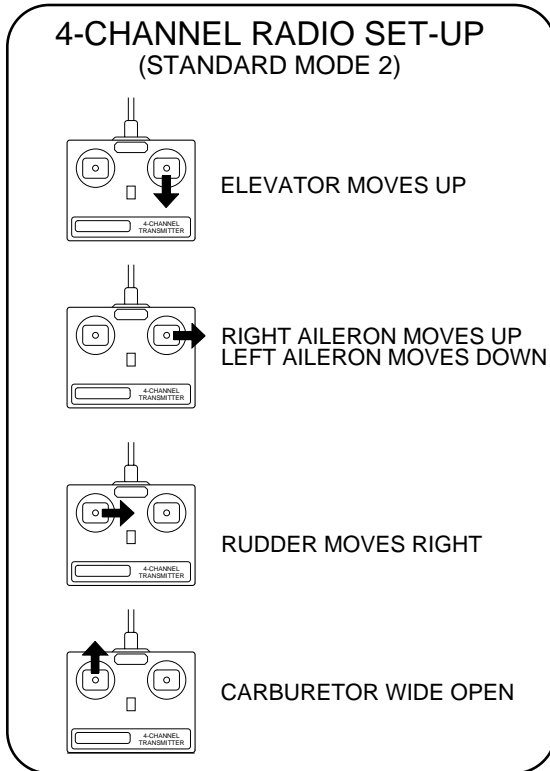
### Final Hookups & Checks

❑ 1. Take the servo horns off your servos, turn on your transmitter and center all the trims. Reinstall all the servo horns and secure them with the screws.



❑ 2. Double-check all the servos and make sure the servo horns are secure. Install a **silicone retainer** on all clevises.

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



4. Adjust your pushrod hookups and set up your radio to provide the control surface movements as follows. Use a ruler or a Great Planes Accu Throw Control Surface Deflection Meter (GPMR2405) to measure the throws.

### **Set the Control Throws**

**IMPORTANT! Do not exceed the elevator throws provided. The Extra 300 ARF requires little elevator throw to perform even the most aggressive aerobatics. Exceeding the recommended throws may result in a model that is difficult to control.**

We recommend the following control surface throws:

**Note:** The throws are measured at the **widest part** of the elevators and rudder. Adjust the position of the pushrods at the control horn and/or servo horns to determine the amount of throw. You may also use the ATV's if your transmitter has them, but the mechanical linkages should still be set so the ATV's are near 100% for the best servo resolution (smoothest, most proportional movement).

	<b>High Rate</b>	<b>Low Rate</b>
<b>ELEVATOR:</b>	5/16" [8mm] up 3/8" [9.5mm] down	1/4" [6.5mm] up 5/16" [8mm] down
<b>RUDDER:</b>	2-1/8" [54mm] right 2-1/8" [54mm] left	1-1/2" [38mm] right 1-1/2" [38mm] left
<b>AILERONS:</b>	3/8" [9.5mm] up 3/8" [9.5mm] down	1/4" [6.5mm] up 1/4" [6.5mm] down

**Note:** If your radio does not have dual rates, set the control surfaces to move **between** the high rate and low rate throws.

**Note:** The balance and control throws for the Extra 300 ARF have been extensively tested. We are confident that they represent the settings at which the Extra 300 ARF flies best. Please set up your model to the specifications listed above. If, after you become comfortable with your Extra 300 ARF, you would like to adjust the throws to suit your tastes, that's fine. Too much throw can force the plane into a snap roll, so remember, "more is not better."

## **PREFLIGHT**

### **Identify Your Model**

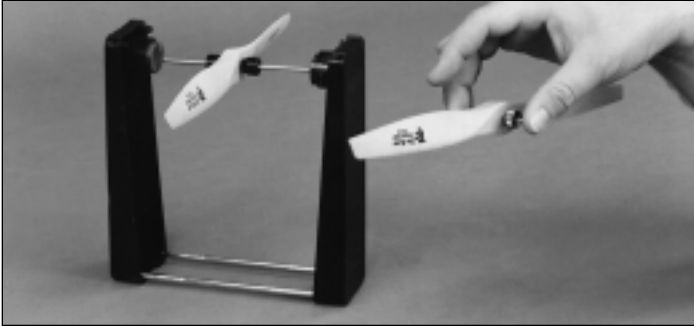
No matter if you fly at an AMA sanctioned R/C club site or if you fly somewhere on your own, you should always have your name, address, telephone number and AMA number on or inside your model. It is **required** at all AMA R/C club flying sites and AMA sanctioned flying events. Write your full name, address, telephone number and AMA number on a small card or a piece of paper and securely tape it inside your model.

### **Charge Your 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 Your Propellers

Carefully balance your propellers before you fly. An unbalanced prop is the single most significant cause of vibration that can damage your model. Not only will engine mounting screws and bolts loosen, possibly with disastrous effect, but vibration may also damage your radio receiver and battery. Vibration can also cause your fuel to foam, which will, in turn, cause your engine to run hot or quit.



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

## Find a Safe Place to Fly

The best place to fly your model is an AMA chartered R/C club flying field. Contact the AMA (their address is on page 2) or your hobby shop dealer for the club in your area and join it. Club fields are intended for R/C flying, making your outing safer and more enjoyable. The AMA also provides insurance in case of a flying accident. If an R/C flying field is not available, find a large, grassy area at least six miles from buildings, streets, and other R/C activities. A schoolyard is usually not an acceptable area because of people, power lines and possible radio interference.

## Ground Check Your Model

If you are not thoroughly familiar with the operation of R/C models, ask an experienced modeler to inspect your radio installation and control surface set-up. **Follow the engine manufacturer's instructions to break-in your engine.** After you run the engine on your model, inspect your model closely to make sure all screws remain tight and your pushrods and connectors are secure.

## Range Check Your Radio

Ground check the range of your radio before the first flight of the day. With the transmitter antenna **collapsed** and the receiver and transmitter on, you should be able to walk at least 100 feet away from the model and still have control. Have an assistant stand by your model and, while you work the controls, tell you what the control surfaces are doing.

Repeat this test **with the engine running** at various speeds with an assistant holding the model, using hand signals to show you what is happening. If the control surfaces do not respond correctly, **do not fly!** Find and correct the problem first. Look for loose servo connections or broken wires, corroded wires on old servo connectors, poor solder joints in your battery pack or a defective cell in your battery pack, or a damaged receiver crystal from a previous crash.

## Check List

During the last few moments of preparation your mind may be elsewhere, anticipating the excitement of your first flight. Because of this, you may overlook certain checks and procedures you should perform after your model is built. To help you avoid this, we've provided a check list to make sure you don't overlook these important areas. Many are covered in the instruction manual so, where appropriate, refer to the manual for complete instructions. Be sure to check the items off as you complete them (that's why we call it a *check list!*)

1. Fuelproof all areas exposed to fuel or exhaust residue such as the firewall/engine compartment, fuel tank compartment, wing saddle area, etc.
2. Check the C.G. according to the measurements provided in the manual.
3. Secure the battery and receiver with a strip of balsa or plywood. Simply stuffing them into place with foam rubber is not sufficient.
4. Extend your receiver antenna and make sure it has a strain relief inside the fuselage to keep tension off the solder joint inside the receiver.
5. Balance your model *laterally* as explained in the instructions.
6. Secure critical fasteners with thread locking compound (the screws that hold the carburetor arm, screw-lock pushrod connectors, etc.).
7. Apply a drop of oil to the wheel axles so the wheels will turn freely.
8. Make sure all hinges are securely glued in place.
9. Reinforce holes with thin CA for wood screws where servos are mounted.
10. Confirm that all controls operate in the correct direction and the throws are set up as specified on page 20.
11. Make sure that there are silicone retainers on all of the clevises.

- 12. Fasten all servo horns to the servos with the screws included with your radio.
- 13. Secure connections between servo wires and “Y” connectors or servo extensions, and the connection between your battery pack and the on/off switch with vinyl tape or heat shrink tubing.
- 14. Make sure any servo extension cords you may have used do not interfere with other systems (servo horns, pushrods, etc.)
- 15. Make sure your fuel lines and pressure lines are connected and are not kinked.
- 16. Use an incidence meter to check the wing for twists and correct them before flying.
- 17. Balance your propeller (and spare propellers).
- 18. Tighten the propeller nut.
- 19. Place your name, address, AMA number and telephone number on or inside your model.
- 20. Cycle your receiver battery pack (if necessary) and make sure it is fully charged.
- 21. If you wish to photograph your model, do this before your first flight.
- 22. Range check your radio before flying the model.

### Engine Safety Precautions

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

Store model fuel in a safe place away from high heat, sparks or flames. Do not smoke near the engine or fuel as it is very flammable. Engine exhaust gives off a great deal of deadly carbon monoxide so **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 you operate model engines.

Do not run the engine near loose gravel or sand; the propeller may throw loose material in your face or eyes.

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

Always be **aware** and very **conscious** of hand movements and be **deliberate** in your reach for the needle valve, glow plug clip, or other items near a spinning propeller.

Keep loose clothing, shirt sleeves, ties, scarfs, long hair or loose objects away from the prop. Be conscious of pencils, screwdrivers or other objects that may fall out of your shirt or jacket pockets.

Use a *chicken stick* or electric starter and follow the instructions to start your engine.

Make certain the glow plug clip or connector is secure so that it will not pop off or get into the running propeller.

Ask an assistant to hold the model from the rear while you start the engine and operate the controls.

Make all engine adjustments from **behind** the rotating propeller.

The engine gets hot! Do not touch the engine during or immediately after you operate it. Make sure fuel lines are in good condition so fuel will not leak onto a hot engine and cause a fire.

To stop the engine, close the carburetor barrel (rotor) or pinch the fuel line to discontinue the fuel flow. Do not use your hands, fingers or any body part to stop the engine. Never throw anything into the prop 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 of any kind).

## RADIO CONTROL

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

## FLYING

**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 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 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; Sloppy fit of Z-bend in servo arm; Excessive “play” or “backlash” in servo gears; and Insecure servo mounting.

The Great Planes Extra 300 ARF is a great flying semi-scale sport model that is smooth and predictable, yet is highly aerobatic. Compared to other sport planes its flight characteristics are docile and forgiving. The Extra does not, however, possess the self-recovery characteristics of a primary R/C trainer; therefore, you must either have mastered the basics of R/C flying or obtained the assistance of a competent R/C pilot to assist you with the first flights of your Extra 300 ARF.

## Takeoff

If you have dual rates on your transmitter takeoff on “high” rates—especially if you are taking off in a crosswind. Gain as much speed as your runway and flying site will permit before you lift off. This will give you a safety margin in case the engine quits. When you initially advance the throttle and the tail begins to rise, the Extra will begin to turn to the left (due to the torque of the engine—a characteristic of all tail

draggers). Be prepared for this by applying sufficient right rudder to keep the Extra running straight down the middle of the runway. The left turning tendency will decrease as the plane picks up speed. Be sure to allow the tail to rise off the ground before lifting the model into the air. Depending on the surface you are taking off from, you will need to apply little or no up elevator until flying speed is reached. Don't hold the tail on the ground with too much up elevator, as the Extra will become airborne prematurely and may stall. 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.

## Flying

We recommend that you take it easy with your Extra 300 ARF for the first several flights, gradually “getting acquainted” with this great sport model as your engine gets fully broken-in. If you feel as though you have your hands full keep this one thing in mind: **pull back on the throttle to slow the model down.** This will make everything happen a little slower allowing yourself time to think and react. Add and practice one maneuver at a time, learning how the Extra behaves in each. For smooth flying and normal maneuvers, use the low rate settings. High rate elevator may be required for crisp snap rolls and spins. For good knife-edge performance airspeed is the key.

Before it's time to land, climb your Extra to a safe altitude and cut the throttle to an idle. Observe how your Extra handles at slow speeds so you will know what to expect when its time to bring 'er in.

## 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 and on the main wheels, as this is the easiest way to land your Extra. Later, with a little practice you will find you can make slow 3-point landings.

***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 rather than lack of flying skill is what gets most fliers in trouble.***

