

RADIO CONTROLLED MODEL AIRPLANE KIT  
INSTRUCTION MANUAL



Wing Span: 61.75 in.  
Wing Area: 975 sq. in. Weight: 7lb. 3oz.  
Length: 52.5 in. Wing Loading: 17 oz./sq. ft.  
Engine: .60-.91 2-stroke Radio: 4 channel  
.70-.91 4-stroke

## UPROAR .60

UP60P02 V1.1

### WARRANTY

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

In that Tower 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 buyers are not prepared to accept the liability associated with the use of this product, they are advised to return this kit immediately in new and unused condition to Tower Hobbies.**

**READ THROUGH THIS INSTRUCTION BOOK FIRST. IT CONTAINS IMPORTANT INSTRUCTIONS AND WARNINGS CONCERNING THE BUILDING AND USE OF THIS MODEL.**

### Congratulations!

If you have been looking for a way to put the FUN back into your Sunday flying, you have just found it with the Uproar 60. The Uproar 60 is a nimble hot-dogger that assembles fast and is easy on the budget. The Uproar 60 does not require any special building or flying skill - just traditional building methods and a little tail-dragger time.

With its oversized control surfaces it turns, loops and rolls in the blink of an eye. But the thick airfoil and light wing loading allow the plane to slow way down for gentle spot landings. If equipped with an engine like the O.S. .60 FP, it's possible to be airborne in a matter of feet, zip through three rolls, and loop back for a landing before most of your buddies are off the ground. With an O.S. .91 FX, you can make your Uproar 60 jump off the ground and go straight up out of sight, then shut the engine off and spin it down, do two loops, a couple more rolls and land at your feet. What more can we say? The Uproar 60 is the most flying fun you can buy, regardless of the cost.

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**FOLLOW THIS IMPORTANT SAFETY PRECAUTION TO PROTECT YOUR MODEL, YOURSELF AND OTHERS.**

Your UPROAR 60 is not a toy, but rather a sophisticated, working model that functions very much like an actual airplane.

Because of its realistic performance, the UPROAR 60, 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 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>

- 6-minute epoxy (TOWR3300)
- 30-minute epoxy (TOWR3350)
- Balsa filler (HCAR3401)
- Waxed paper
- Masking tape
- Clothespins
- Isopropyl rubbing alcohol (70%)

**TOOLS**

- Sanding block and sandpaper (80-grit, 150-grit, 220-grit)
- Hobby knife and #11 blades (HCAR0311)
- Single edge razor blades (HCAR0312)
- Razor plane (MASR1510)
- Electric drill
- Small Phillips and flat blade screwdrivers
- Pliers with wire cutter
- Sealing iron (TOWR3250)
- Heat gun (TOWR3200)
- T-pins (HCAR5150)
- Straightedge with scale
- Drill bits (1/16", 3/16", 5/32", 1/8", 9/64", 13/64", 1/4")
- Razor saw (optional)

**IMPORTANT BUILDING NOTES**

Unroll the plan sheets, then reroll the plans inside-out to make them lie flat.

**ITEMS REQUIRED FOR COMPLETION**

**HARDWARE:** We recommend using Great Planes®, Hobbico® and Tower Hobbies® brand accessories for your modeling needs.

- 4-Channel radio with five servos, Y-harness and four 12" extensions
- .60 - .91 2-Stroke / .70 - .91 4-Stroke
- Engine mount (GPMG1091)
- (4) 8-32 x 1" Machine screws (GPMQ3048)
- (2) 8-32 x 3/4" Machine screws (GPMQ3046)
- (6) 8-32 Blind nuts (GPMQ3328)
- 10 - 12 oz. Fuel tank (GPMQ4104, 4105)
- (2) 3" Wheels (GPMQ4225)
- (4) 5/32" Wheel collars (GPMQ4306)
- 1" Tail wheel (GPMQ4241)
- (2) 3/32" Wheel collars (GPMQ4302)
- 12" Medium fuel tubing (GPMQ4131)
- (2) Rolls covering film (TowerKote™ Film)
- (16) Hinges (GPMQ3950)
- 24" Flexible pushrod cable and tube (throttle) (GPMQ3700)
- (2) Screw-Lock Pushrod Connectors (GPMQ3870)
- (4) Faslink Pushrod Connectors (optional) (GPMQ3820)
- (1) 2-1/4" Spinner (GPMQ4515)

**SUPPLIES**

- 2 oz. Thin CA (HCAR3600)
- 2 oz. Medium CA (HCAR3650)
- 2 oz. Thick CA (HCAR3670)

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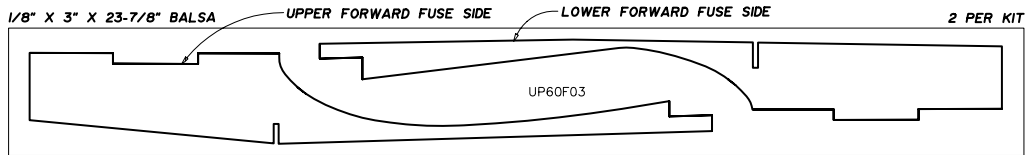
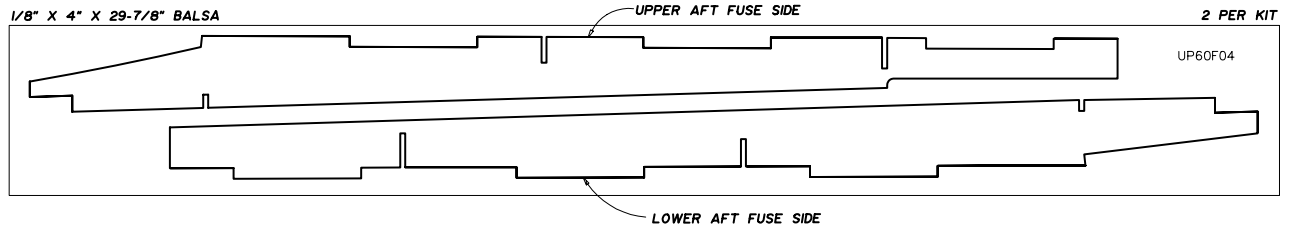
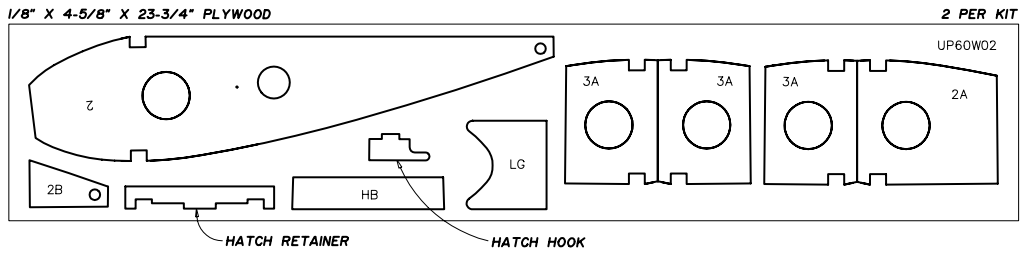
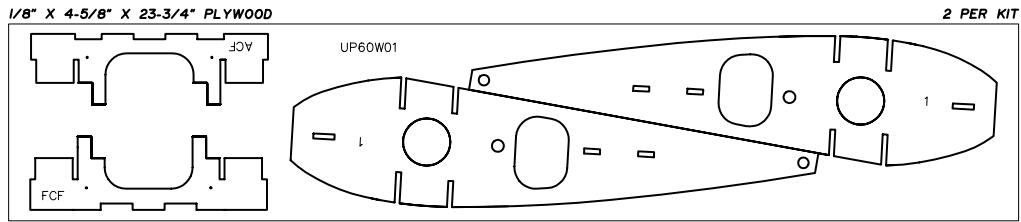
Using a felt-tip or ball-point pen, lightly write the part name or size on each piece as you remove it from the box. Refer to the parts list and plans for sizes and quantities. Use the die-cut patterns shown on pages 5-6 to identify the die-cut parts and mark them before removing them from the sheet. Save all leftovers. If any of the die-cut parts are difficult to remove, do not force them! Instead, cut around the parts with a hobby knife or lightly sand the back of the sheet. After removing the die-cut parts, use your sanding block to lightly sand the edges to remove any die-cutting irregularities. **Note:** Do not alter the shape of the parts, just take off the rough edges.

Be sure to work on a flat surface. Unroll your plans onto your building table and cover the plans with waxed paper. There are notes on the plans that tell you what material to use to make each part.

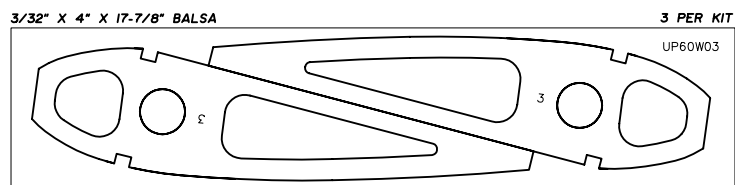
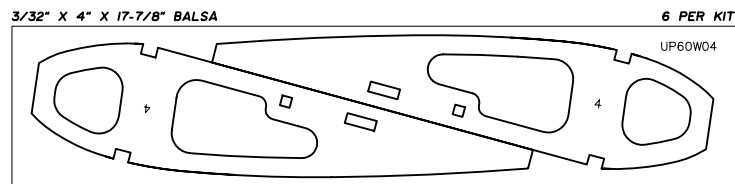
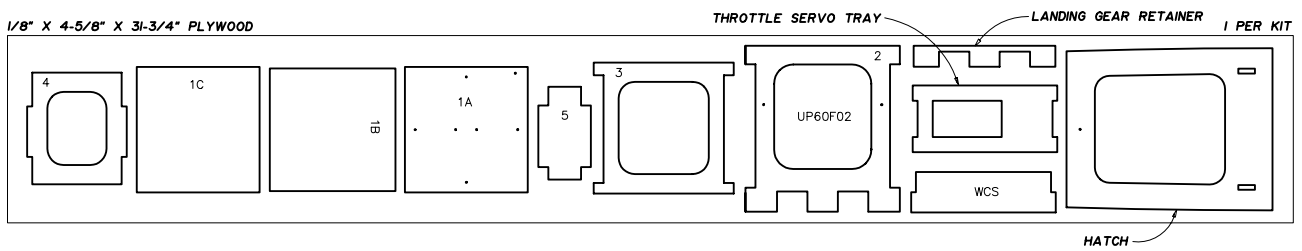
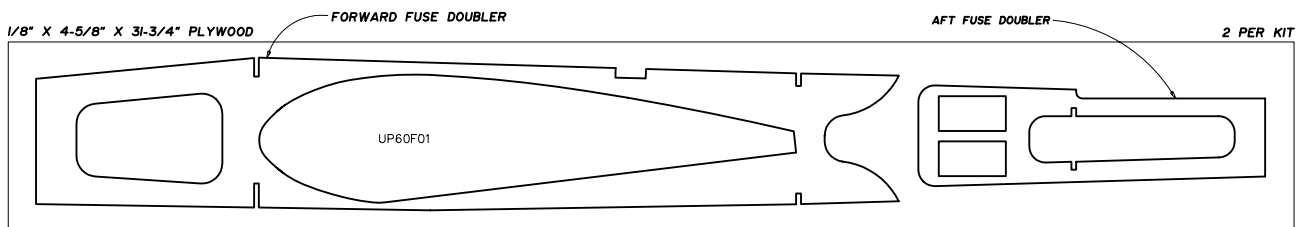
When instructed to TEST FIT parts, this means DO NOT USE GLUE. Just make sure that everything fits properly - THEN glue the parts together if instructed to do so.

The easiest way of cutting balsa sticks is with a razor saw. Position the stick over the plan, mark its size, then cut the part on top of a piece of scrap lumber. A modeling miter box works well for cutting square corners and 45 degree gussets. A single-edge razor blade also works well for cutting balsa sticks. Because the blades are both sharp and thin, they don't crush balsa as easily as #11 hobby blades.

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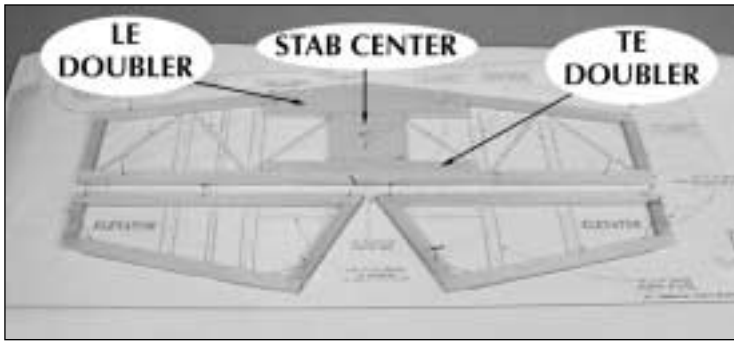
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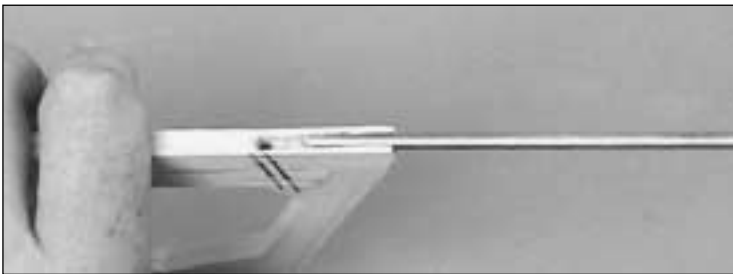
## BUILD THE TAIL SURFACES

### STAB AND ELEVATORS

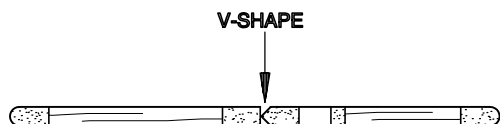


○ 1. Working over the plans covered with wax paper, cut the stab center from a 5/16" x 3" x 3" balsa sheet. Pin the stab center over its location. Glue the shaped 5/16" balsa LE doubler to the stab center. Use 5/16" x 1/2" x 30" balsa to build the TE doubler, outer framework of the stabilizer and both elevators, gluing each piece in position as you proceed.

○ 5. While the parts are taped together, round off all outside edges around the perimeter of the assembly.

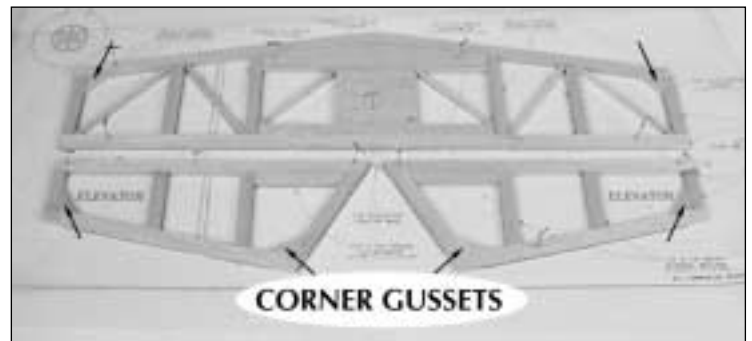


○ 6. Remove the elevators. Drill a 5/32" hole (1" deep) through the center of each elevator's LE at the locations you marked in step #4. Cut a groove from the hole you drilled to the root end of each elevator. The groove will allow the joiner wire to fit flush with the elevator's LE.



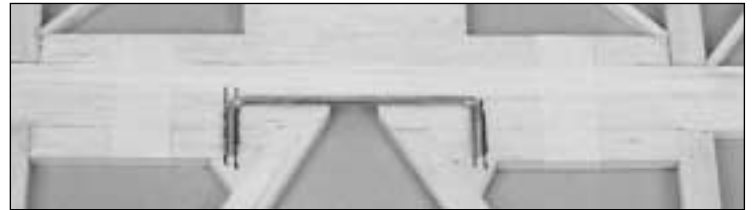
**SAND THE LE OF EACH CONTROL SURFACE TO A V-SHAPE AS SHOWN**

○ 7. Draw a centerline on the LE of both elevators. Sand the LE of the elevators to a "V" shape as shown on the plans.



○ 2. Cut and install six corner gussets and two elevator LE doublers from 5/16" x 1/2" x 30" balsa.

○ 3. Cut and install the internal bracing from the 5/16" x 1/2" x 30 balsa stick. Cut and install the diagonal bracing from the 1/8" x 5/16" x 30" balsa as shown on the plans.



○ 4. Attach the elevators to the stabilizer with masking tape, making sure the outer edges are flush. Position the 1/8" elevator joiner wire over the elevators as shown on the plans. Mark the location of the joiner wire torque rods.

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○ 8. Test fit the joiner wire into both elevators. Make sure that both elevators are flat on the work surface and that the tips of the elevators align with the tips of the stab. If necessary, remove the joiner wire, then make adjustments by bending the ends of the joiner wire.

○ 9. Roughen the joiner wire with coarse sandpaper. Pack 30-minute epoxy into the elevator's holes with a toothpick, then permanently install the joiner wire. Be sure the elevators are flat on the work surface and that the LE is perfectly straight.

### FIN AND RUDDER



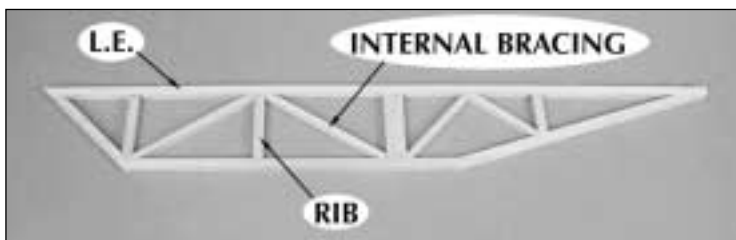
○ 1. Working over the plans covered with waxed paper, assemble the outside framework of the fin and rudder using 5/16" x 1/2" x 30" balsa.

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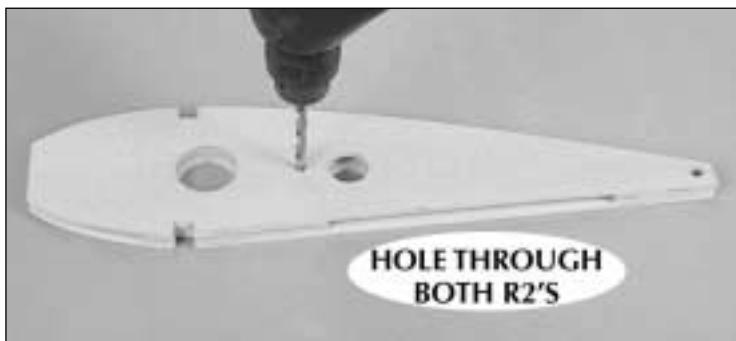
- 2. Add the corner gussets cut from 5/16" x 1/2" balsa.
- 3. Add the 5/16" x 1/2" and 1/8" x 5/16" balsa internal bracing.
- 4. Using the plans for reference, mark and drill a 1/8" hole (3/4" deep) into the lower LE of the rudder to accept the tail gear wire. Cut a groove from the hole to the bottom of the rudder to allow clearance for the tail gear bearing.
- 5. Round off the leading and top edge of the fin and the trailing and top edge of the rudder. Shape the LE of the rudder only to a "V" along the hinge line as shown on the plans.

## BUILD THE WING

### AILERONS



- ○ 1. Working over the plans covered with waxed paper, build the aileron frames and five aileron ribs from 3/8" x 3/8" x 30" balsa.



- 2. Drill a 13/64" hole through R2 and R2A at the punch mark in R2. **Note:** The punch mark is only visible on one of the R2 ribs. Align one rib over the other and drill through both of them.

- 3. Tap the holes in both R2's with 1/4-20 tap.

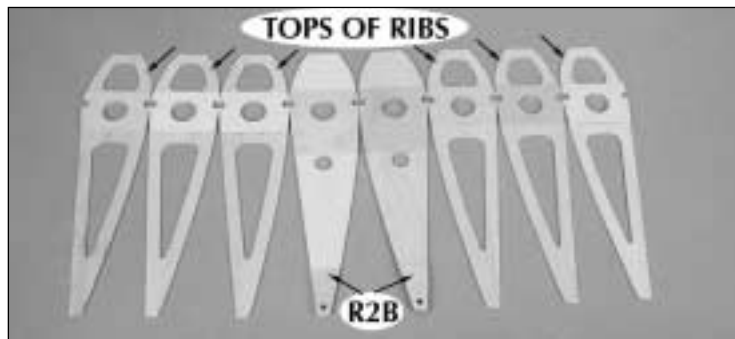
- 4. Test fit the paper tube into the holes in the ribs R1, R2 and R3. It may be necessary to enlarge the holes slightly to fit the tubes. **Note:** Leave the aluminum tube in the paper tube while fitting in the ribs so that the paper does not get distorted.

- ○ 2. Add the internal bracing using 1/4" x 3/8" x 30" balsa. Glue the aileron together with thin CA.

- ○ 3. Draw a centerline on the LE of both ailerons. Sand the LE of the ailerons to a "V" shape as shown on the plans.

- ○ 4. Don't round off the TE of the ailerons. Just lightly sand the edges.

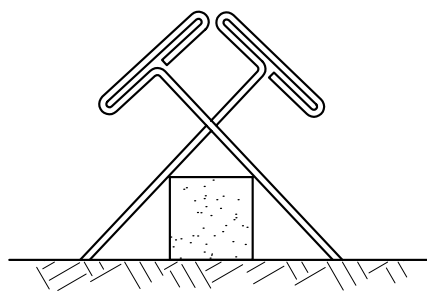
### RIB PREPARATION



- 1. Place the R2 and R3 ribs on your work surface with the airfoil tops of the ribs towards each other. Glue the doublers R2A and R2B to ribs R2. Glue the doublers R3A to ribs R3.

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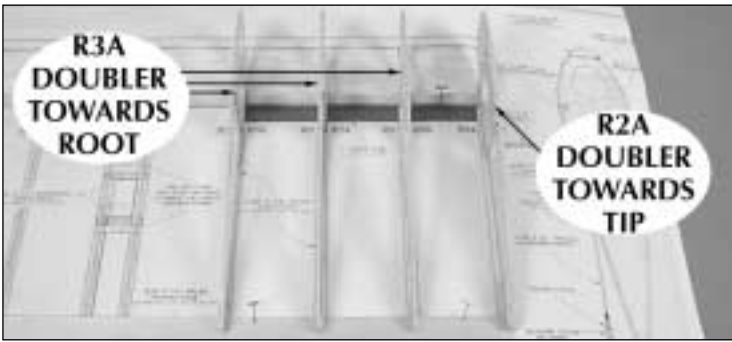
### WING PANELS



- ○ 1. Cover the wing plan with waxed paper. Use cross-pinning (see illustration) to hold a wing spar in position where shown on plans. The spar should be even with the wing's root.

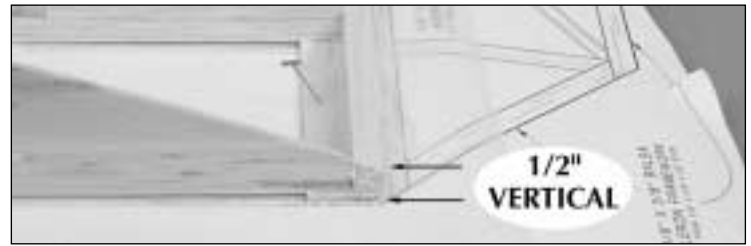
- ○ 2. Cut the four 3/32" x 7/8" x 36" balsa TE sheets down to 28". Save the 8" pieces for the center section of the wing. Pin one sheet over the plans flush with the TE of the wing. **NOTE:** These sheets extend past the rear end of the ribs by 3/8".

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○ ○ 3. Position R2 (see note) and the three R3 wing ribs on the spar at the locations shown. Be sure the flat portion of the airfoil is toward the building board and the ribs are fully seated on the spar. Use a small drafting triangle to hold each rib vertical while you glue it in position. **Note:** the doubler on the R2 rib goes towards the wing tip. The doublers on the R3 ribs go towards the root of the wing.

○ ○ 4. Glue six R4 ribs onto the spar and TE sheet using your drafting triangle to hold the ribs vertical.

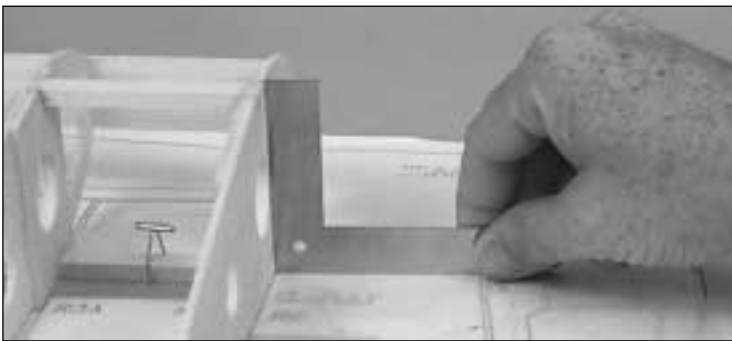


○ ○ 5. Cut two 28" TE sticks from 3/8" x 1/2" x 36" balsa. Glue the TE (1/2" dimension is vertical) to the ribs and bottom TE sheeting. Sand the top of the TE (with a long sanding block) flush with the top of the ribs at an angle that matches the slope of the airfoil.

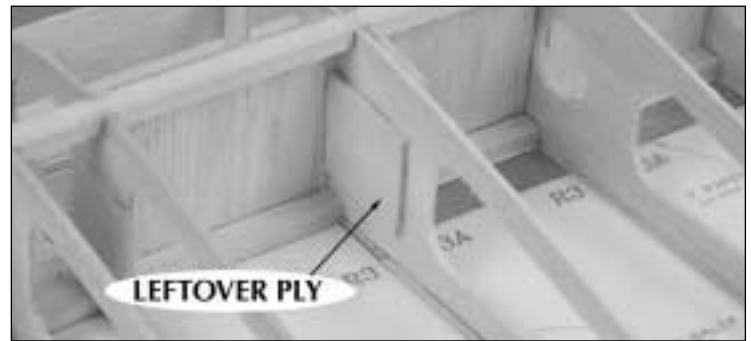


○ ○ 6. Cut two 28" sub LE's from the 3/32" x 1-1/4" x 36" balsa sheets. Center the sub LE vertically on the front of the ribs (and flush with the wing's centerline), then glue it in position. Sand the top edge flush with the top of the airfoil.

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○ ○ 7. Glue the 1/4" x 3/8" x 30" top basswood spar in position. Use a drafting triangle to be sure the root end is even with the bottom spar.



○ ○ 9. Use a leftover piece of ply to cap the wing tube hole in the outer R3 rib on the wing tip side.



○ ○ 8. Remove the T-pins from the spar. Using a 3/32" x 3" x 30" balsa sheet, cut and install the shear webs.



○ ○ 10. Glue the paper tube into the holes in the R2 and R3 ribs. Cut the paper tube off flush with R2.

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○ ○ 11. Glue the 3/32" x 3" x 30" sheeting to the Sub LE, aligning it with the forward edge of the sub LE.



○ ○ 12. Carefully lift the LE sheeting, away from the ribs. Working quickly, apply a bead of medium or thick CA to each rib and the front half of the spar, then roll the sheet down

against the ribs and spar. Hold in place until the CA cures. Wick some thin CA between the sheet and the spar to secure the aft edge of the sheet to the spar.



○ ○ 13. Remove the T-pins from the TE sheeting. Glue the 3/32" x 7/8" x 30" top TE sheet in place.

○ ○ 14. Cut and install cap strips for the top of each rib from 3/32" x 3/8" x 30" balsa sticks. Remove the wing from your building board.

○ ○ 15. Cut the sub LE, LE sheeting, TE sheeting and TE flush with R2 and the tip Rib R4.

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○ ○ 16. Use the 1/4" x 1/4" x 24" basswood to make two aileron servo rails 1-5/8" long. Insert two of the rails into the notches between the closely spaced R4 ribs. Use a servo of your choice to set the correct spacing between the rails, then glue the rails securely in position.



○ ○ 17. Use leftover cap strip material to make the servo opening frame.

○ ○ 18. Sand the bottom of the sub LE to the shape of the ribs the same as you did for the top of the wing.

○ ○ 19. Pin the 3/8" x 1-1/2" x 30" balsa stick to the TE of the plans. Align the TE of the wing with the balsa stick and place weights on the TE to hold the wing in place.



○ ○ 20. Glue the 3/32" x 3" x 30" sheeting to the Sub LE, aligning it with the LE of the sub LE.

○ ○ 21. Carefully lift up the LE sheeting, away from the ribs. Working quickly, apply a bead of medium or thick CA to each rib and the front half of the spar, then roll the sheet into contact. Hold the sheet until the CA cures. Wick some thin CA between the sheet and the spar to secure the aft edge of the sheet to the spar.

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○ ○ 22. Remove the weight from wing. Cut and install cap strips from the 3/32" x 3/8" x 30" balsa sticks.

○ ○ 23. Sand the LE sheeting and cap strips even with the root and tip rib.



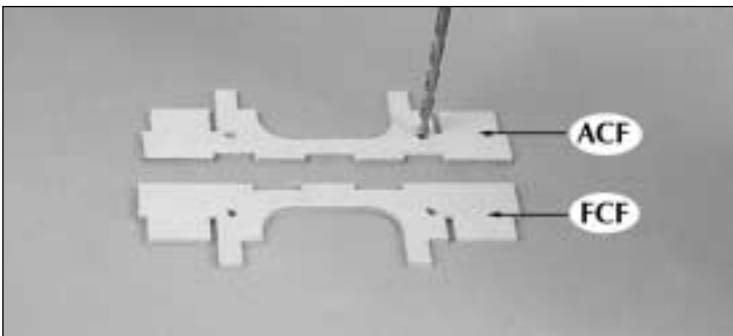
○ ○ 24. Sand the LE sheeting flush with the sub LE.

○ ○ 25. Glue the 3/8" x 1-3/8" x 30" balsa LE in place. Trim the piece that overhangs the end of the wing. **Note:** If you are

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○ 29. Follow steps 1 - 28 to build the second wing panel using the extra pieces you cut previously. Be sure to build a left and right wing panel.

### BUILD THE WING CENTER SECTION



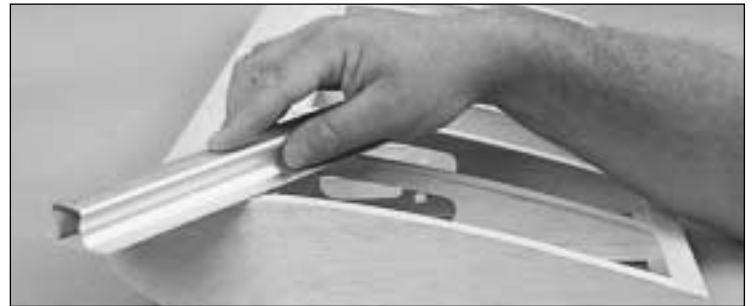
○ 1. Drill two 3/16" holes at the punch marks in one of the die-cut 1/8" ply forward center formers (FCF). Do the same in one of the aft center formers (ACF).

building the second wing half, use the 3/8" x 1-3/8" x 36" balsa LE. Save the leftover piece for the LE of the center section.



○ ○ 26. Use a razor plane or carving blade and coarse sandpaper to shape the LE. Use the die-cut LE template to test the accuracy of your work as you proceed.

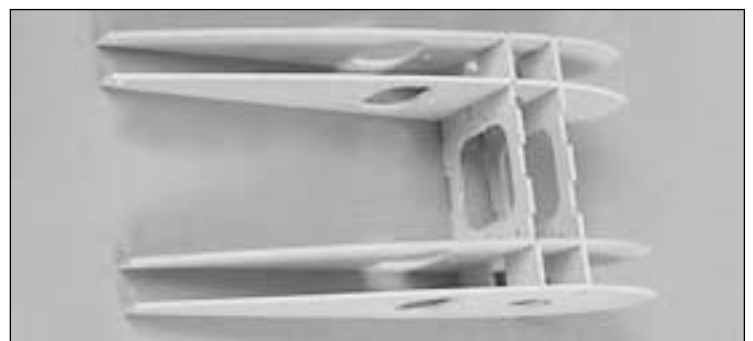
○ ○ 27. Glue the 1/8" x 4" x 30" balsa sheet onto the wing, creating the wing tip.



○ ○ 28. Sand the 1/8" balsa wing tip to the shape of the rib.



○ 2. Select FCF and ACF formers that are **NOT** drilled. Fit the formers into the slots in the bottom of two R1 ribs as shown.



○ 3. Fit the drilled formers FCF and ACF into the slots in the top of the two R1 ribs. Fit the other two R1 ribs in place.

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○ 4. While keeping the ribs flat on your work surface, fit the remaining piece of paper tube through the ribs. Glue the assembly together. After the glue has dried, sand the paper tube flush with the outside edge of the outside R1 ribs.

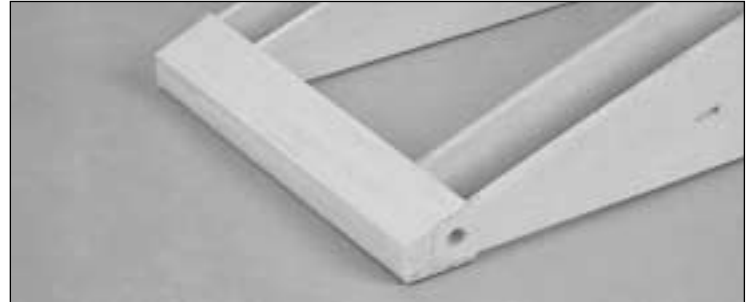


○ 5. Fit the wing tube in the left half of the wing. Slide the center section onto the tube with a piece of waxed paper between the TE of the R1 and R2 ribs and under the TE of the R1 ribs. Glue the 3/32" x 7/8" TE sheet (saved from the wing halves) to the two left R1s ONLY.



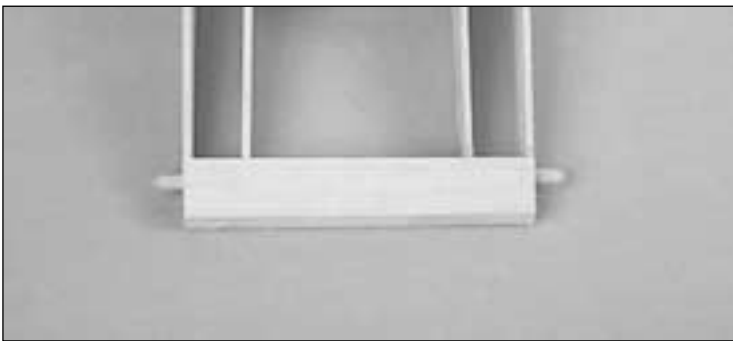
○ 6. Slide the right wing onto the wing tube. Trim the TE sheeting to length.

○ 7. Put waxed paper between the center section and the right wing panel and glue the two right R1 ribs to the TE sheeting.

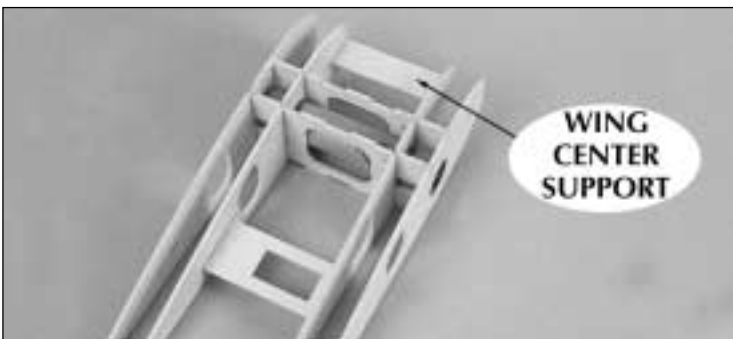


○ 8. Remove the wing panels from the center section. Glue the 1/2" x 3/8" TE in place. Sand the top to the shape of the ribs. Glue the top 3/32" x 7/8" TE sheet in place. Trim the TE and TE sheet flush with the outside edge of the outer ribs.

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○ 9. Cut the 1/4" diameter x 4" dowel in half. Round the ends of the dowels. Glue the dowels in the holes in the center section, leaving 1/2" sticking out. Cut two 7/8" long pieces of the 1/4" x 1/4" basswood. Glue in place behind the wing bolt holes.

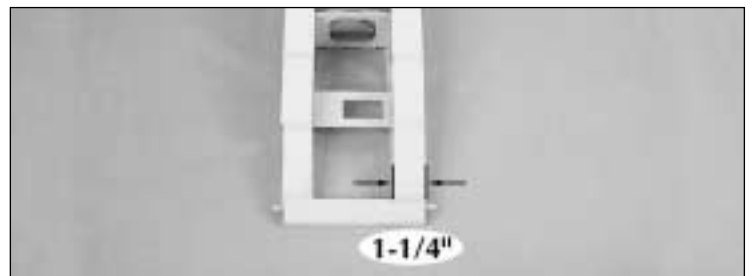


○ 10. Glue the Wing Center Support (WCS) and the throttle servo tray in place.



○ 11. Fit the tube and wing halves to the center section again. Put waxed paper between the R1 and R2 ribs. Test fit the 3/32" x 1-1/4" sub LE in place. After you are satisfied with the fit, glue the sub LE in place. Remove the wing halves from the center section.

○ 12. Sand the sub LE to the shape of the ribs.

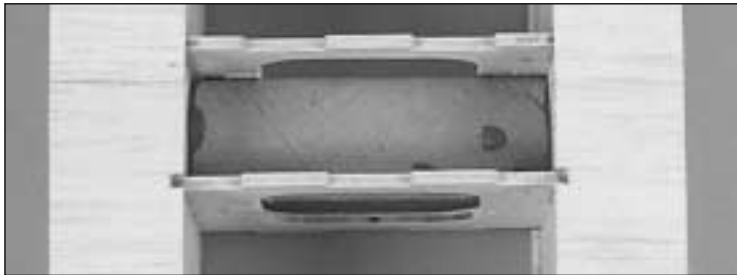


○ 13. Cut sixteen 1-1/4" long pieces of sheeting from a 3/32" x 3" x 30" sheet. Glue this center sheeting in place, leaving a little bit hanging over the outside of the ribs.

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○ 14. Sand the sheeting flush with the outside ribs and the sub LE.

○ 15. Glue the 3/8" x 1-1/2" LE in place. Sand it to shape.



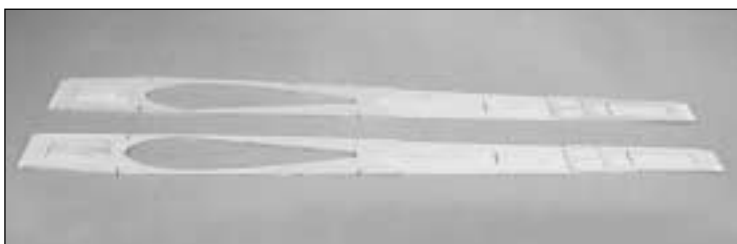
○ 16. Notch the sheeting in line with ACF on the top and bottom of the center section.



○ 17. Screw the 1/4" - 20 nylon bolts through the holes in R2 and glue them to the ribs with thin CA.

○ ○ 3. Unpin the fuse side from the building board and sand both sides smooth.

○ 4. Repeat steps 2 and 3 to build the other fuse side.

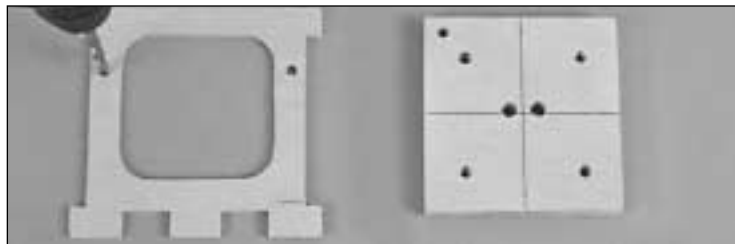


○ 5. Glue the 1/8 die-cut forward fuse doubler and aft fuse doubler to the insides of both fuse sides. **Note: Be sure to make a left and a right fuse side.**



○ 6. Cut the top servo opening in the left fuse side using the opening in the aft fuse doublers as a guide. Cut the bottom servo

## BUILD THE FUSELAGE



○ 1. Laminate the three 1/8" die-cut ply firewall pieces together with 6-minute epoxy. Draw two lines connecting the four center marks. Center your engine mount on these lines and mark the location of the mounting holes. Drill 13/64" holes through these marks and install 8/32 blind nuts (not included) on the back side of the firewall. Now would also be a good time to drill 1/4" holes for your fuel and vent lines and a 3/16" hole for the throttle pushrod. Drill 3/16" holes at the punch marks in F2.



○ ○ 2. Cover the fuselage side view on the plan with waxed paper. Pin the 1/8" die-cut balsa upper forward fuse side, lower forward fuse side, upper aft fuse side and the lower aft fuse side in place over the plans. Glue together with thin CA.

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opening in the right fuse side using the opening in the aft fuse doublers as a guide. Fit your servo in the hole and remove the balsa under the servo mounting flanges. **Note:** Be careful not to cut into the aft fuse doubler.



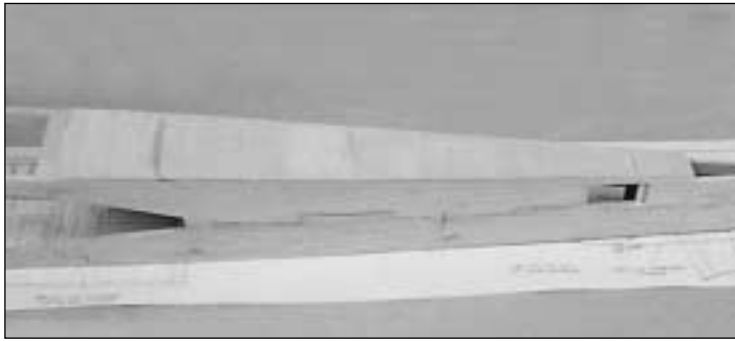
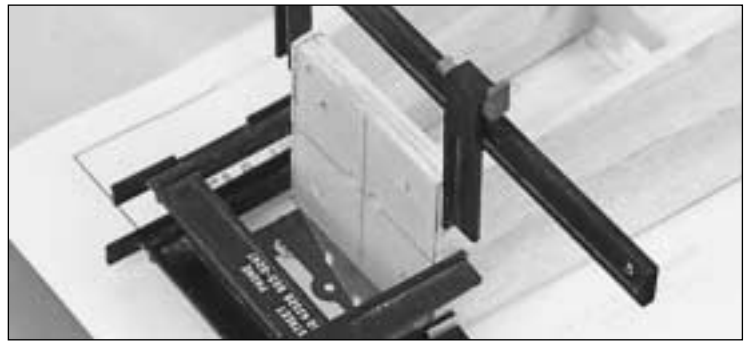
○ 7. Fit the wing center section in one fuse side. Remove the center section. Use the fitted fuse side as a template to shape the other fuse side.

○ 8. Without using any glue, insert the formers F2, F3, F4 and F5 into the notches in the fuse sides. Use masking tape to hold the assembly together.

○ 9. Position F3 over its location on the waxed paper covered bottom view of the plan, then pin the fuse sides to the building surface. Carefully align the length of the fuse over the plan, squaring up the formers and pinning the assembly in place as you proceed. Be sure the front and rear ends are aligned and that the fuse is not twisted.

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○ 10. Once satisfied that the fuse is trued up, wick some thin CA into all of the fuse side and former joints. With medium CA, glue the shaped balsa tail post between the fuse sides, flush with the rear end of the fuse sides. Check that the tail post is vertical with a drafting triangle before the glue cures.



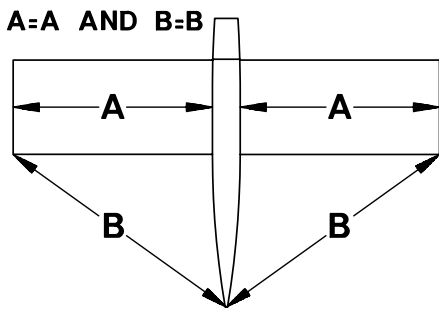
○ 11. Laminate the two die-cut 1/8 ply hatch bolt plates together. Glue the hatch bolt plate in place. Cut and install 3/32" x 3" cross-grain sheeting to the top of the fuse from the aft edge of the hatch bolt plate to the stab saddle. Sand the sheeting flush with the top edge of the fuse.

○ 12. Use 6-minute epoxy to glue the firewall to the fuse sides. Wipe off any excess epoxy before it cures, using a paper towel dampened with rubbing alcohol.



○ 13. Fit the center section of the wing in the fuse. Push the hatch retainer into the slots in the ACF. Attach the wing halves to the center section using 1/4 - 20 nylon nuts.

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○ 14. Measure the distance from each wing tip to the tail post. Shift the wing until the measurements are equal. When wing alignment is correct, use medium CA to securely glue the center section to the fuse sides. Fill any gaps with thick CA.



○ 16. If you will be flying off a smooth surface, glue the 1/4" x 3/4" x 1-1/2" ply landing gear spacers on the aft end of the landing gear rails. If you will be flying off grass, glue the 1/4" x 3/4" x 1-1/2" ply landing gear rails on the forward end of the landing gear rails.



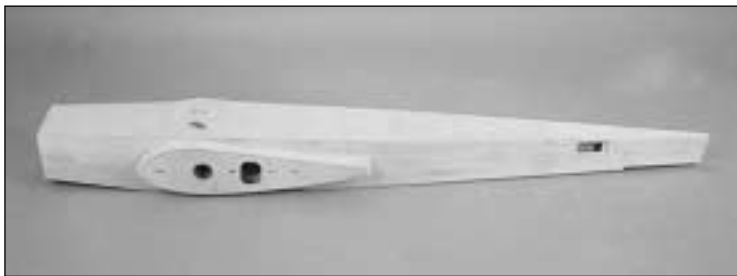
○ 15. Cut two 1-1/2" pieces and two 4-1/2" pieces from the 1/4" x 3/4" x 12" ply. Epoxy the 4-1/2" rails in the notches in formers F2, FCF and ACF. Glue the landing gear retainer over the landing gear rails.



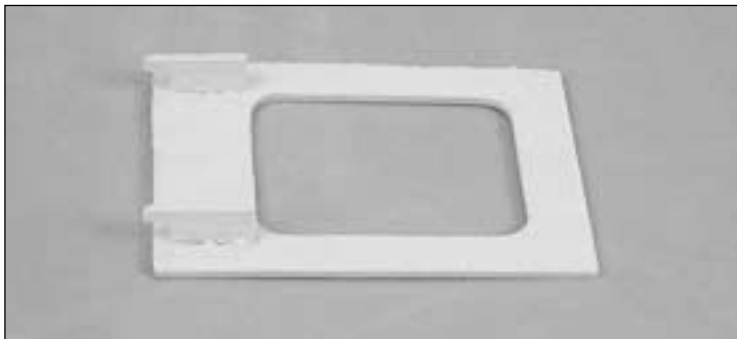
○ 17. Center the landing gear on the landing gear spacers and drill two 5/32" pilot holes through the spacers and the landing gear rails using the gear as a guide. Remove the gear and redrill to 13/64".

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○ 18. Use the 8-32 x 3/4" bolts to pull 8-32 blind nuts into the landing gear rails. Remove the landing gear from the fuse.



○ 19. Sheet the bottom of the fuse with 3/32" cross-grain sheeting. **Note:** Fit the sheeting around the landing gear spacers.



○ 20. Glue the die-cut 1/8" ply hatch hooks to the hatch. Fit the hatch in place on the fuse and drill through hatch and hatch rail with a 9/64" bit.



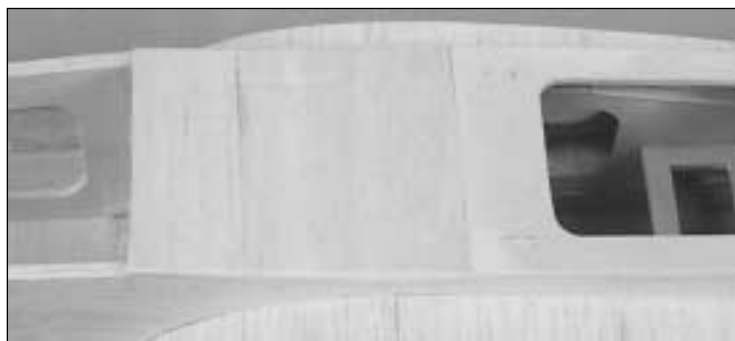
○ 23. Cut and glue a 1/4" x 1/4" basswood hatch rail to fit between the fuse sides in front of F2. Cut and glue two 1" hatch rails for the sides of the tank compartment. Cut and glue two 1/4" x 1/4" basswood firewall supports.



○ 24. Position a sheet of 1/8" x 4" wide balsa over the fuel tank compartment with an edge butted against the top sheeting at F2.



○ 21. Tap the hatch rail with a 1/4" - 20 tap. Enlarge the hole in the hatch to 1/4". Mount the hatch to the fuse with the 1/4" - 20 nylon bolt.

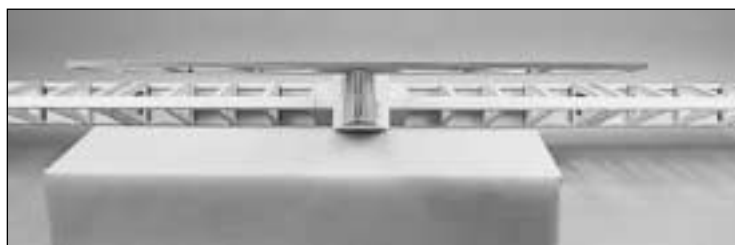


○ 22. Sheet the fuse from the hatch to F2 with 1/8" x 4" balsa leftover from the wing tips.

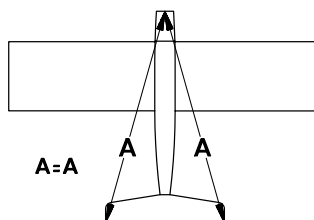
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The grain must run from front to rear. Trace the outline on the bottom surface, then cut and sand the hatch to fit. Drill six 1/16" pilot holes through the top of the hatch into the hatch rail and firewall at the locations shown for #2 sheet metal screws.

### FINAL ASSEMBLY



○ 1. Mount the wing to the fuse.



○ 2. Center the stabilizer on the stab saddle and temporarily pin it in position. Measure from each stab tip to the center of the firewall to set the correct alignment. Draw a couple of reference marks on the stab and fuse sides once it is in position.

Look at the rear of the model from several feet away. The stab must be parallel with the wing. If not, lightly sand the high side of the stab saddle to correct the problem. Once fully aligned, use

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30-minute epoxy to glue the stab in position. Hold it in position with masking tape and pins until the epoxy has cured.



○ 3. Pin the fin on the centerline of the stab. Check its alignment with the centerline of the fuse with a long straightedge, then mark its aligned location. Glue the fin to the stab with 6-minute epoxy. Make sure the fin is square to the stab with a drafting triangle, then pin and tape the fin in position until the epoxy cures.

○ 4. Cut pieces of 3/8" triangular balsa to fit on both sides of the fin, as shown on the plans. Round off the front and rear ends for better appearance. Glue them securely in position to the stab and fin.

### COVERING AND FINISHING

We recommend using a lightweight film covering material such as TowerKote or MonoKote film to finish your Uproar 60. For best results, apply the film following the manufacturer's instructions using the sequence we suggest on page 26.

2. With the wing level, lift the model by the engine propeller shaft and the fin (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 gluing a weight to the inside of the other wing tip. **NOTE:** An airplane that has been laterally balanced will track better in loops and other maneuvers.

#### COVER THE STRUCTURE WITH MONOKOTE FILM

The Uproar 60 does not require any painting to obtain the scheme shown on the box, as all of the finish is done with MonoKote Film.

Make sure the structure is smoothly sanded with 320-grit sandpaper. Remove all dust from the structure with a vacuum cleaner and Top Flite® Tack Cloth so the MonoKote film will stick well. Cover the aircraft with MonoKote film using the sequence that follows. Make sure the MonoKote film is thoroughly stuck to the structure and all of the edges are sealed. Use a Top Flite Hot Sock™ on your covering iron to avoid scratching the finish.

When covering areas that involve sharp junctions, like the tail section or around the root end of the wing, cut narrow strips (1/4" to 3/8") and apply them in the corners before covering the major surfaces. The larger pieces of MonoKote film will overlap and capture these smaller pieces. This technique also bypasses

#### REPAIRING SURFACE DINGS

Many surface blemishes on a framed model are caused by bumps and balsa chips on the work surface. This type of ding is best repaired by applying a drop or two of window cleaner or tap water to the blemish, then running a hot sealing iron over the spot to expand the wood fibers. After the surface has dried, sand the expanded area smooth.

#### FINAL SANDING

Fill any scuffs or dings with balsa filler. After the filler has hardened sand the entire structure with progressively finer grades of sandpaper, ending with 320-grit.

#### FUELPROOFING

Fuelproof the firewall and fuel tank compartment by painting them with thinned 30-minute epoxy.

#### BALANCE THE AIRPLANE Laterally

**SPECIAL NOTE:** Do not confuse this procedure with "checking the C.G." or "balancing the airplane fore and aft." That very important step will be covered later in the manual.

1. Install the engine (with muffler) and landing gear to the fuse. Mount the wing to the fuse.

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the need to cut the TowerKote film in these areas after it has been applied. **DO NOT**, under any circumstances, attempt to cut the covering material after it has been applied to the fin and stab, except around the leading and TE's.

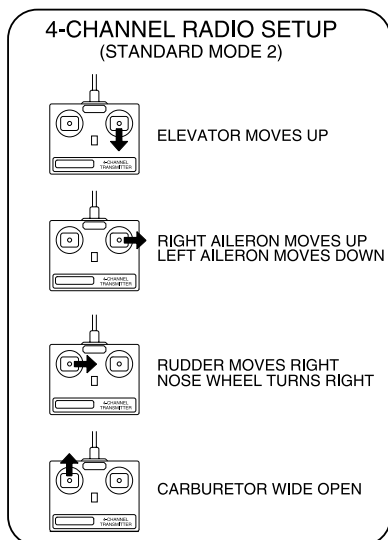
#### RECOMMENDED COVERING SEQUENCE:

- 1. Tail junction strips as described above
- 2. Wing/fuse junction (3/8" wide strips)
- 3. TE surfaces of wing
- 4. Bottom of left wing panel
- 5. Bottom of right wing panel
- 6. Top of left wing panel
- 7. Top of right wing panel
- 8. Fuse bottom
- 9. Fuse sides
- 10. Fuse top
- 11. Stab bottom
- 12. Stab top
- 13. Fin left and right side
- 14. Rudder left and right side
- 15. Bottom of elevators
- 16. Top of elevators
- 17. Ends of ailerons
- 18. Bottom of ailerons
- 19. Top of ailerons
- 20. Top and bottom hatch covers

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## FINAL HOOKUPS AND CHECKS

- 1. Cut a slot in the aft of the fuse for the tail gear bearing. Work some 6-minute epoxy into the slot at the rear of the fuse, then insert the nylon tail gear bearing. Wipe off any epoxy before it cures with a paper towel moistened with alcohol.
- 2. Draw a centerline on the TE of the fin, stabilizer and wing. Refer to the plans, then mark and cut hinge slots for all control surfaces. Mark and cut matching hinge slots on all control surfaces. If you are using laminated CA style hinges, a #11 blade in a hobby knife works well for cutting the slots.
- 3. Install the elevators and ailerons using your choice of hinges. Pack the tail gear torque rod hole in the rudder with 6-minute epoxy, then install the rudder with its hinges. **NOTE:** Be sure to lubricate the top and bottom of the nylon tail gear bearing to prevent the epoxy from "locking up" the gear.
- ○ 4. Install the aileron servos in the wing, fishing the servo leads through the ribs as you proceed. Connect the servo leads to a Y-harness, then center the servo arms.
- ○ 5. Install the aileron control horns where shown on the plans. Attach clevises to the two 12" threaded pushrods then install them using Z-bends or pushrod keepers.
- 6. Repeat steps 4 and 5 for the elevator and rudder.



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

Install the main landing gear using two 8-32 x 3/4" bolts. Install the 3" main wheels (not included) using the two 8-32 x 1-1/4" socket head bolts and 8-32 nuts.

Install the fuel tank, engine and muffler. Install the propeller and spinner.

- 7. Hookup the radio and adjust the control throws. The control throws are suggested as a starting point and may be increased or decreased once you are familiar with the flight characteristics of your particular model.

## CONTROL SURFACE THROWS

We recommend these control surface throws as a starting point:

<b>ELEVATOR:</b>	<b>High Rate</b> 1" up and down	<b>Low Rate</b> 5/8" up and down
<b>RUDDER:</b>	<b>High Rate</b> 3" right and left	<b>Low Rate</b> 2-1/2" right and left
<b>AILERON:</b>	<b>High Rate</b> 7/8" up and down	<b>Low Rate</b> 9/16" up and down

**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 halfway between the specified high and low rates.

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## BALANCE YOUR MODEL

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

- 1. Accurately mark the balance point on the bottom of the wing on both sides of the fuselage. The balance point is shown on the plan (C.G.) and is located 5" behind the LE. This is the balance point at which your model should balance for your first flights. Later, you may wish to experiment by shifting the balance up to 3/8" forward or back to change the flying characteristics. Moving the balance forward may improve the smoothness and arrow-like tracking, but it may then require more speed for takeoff and make it more difficult to slow down for landing. Moving the balance aft makes the model more agile with a lighter and snappier feel. In any case, please start at the location we recommend and do not at any time balance your model outside the recommended range.

- 2. With all equipment installed (ready to fly) and an empty fuel tank, lift the model at the balance point. If the tail drops when you lift, the model is "tail heavy" and you must move weight toward the nose to balance. If the nose drops, it's "nose heavy" and you must move weight toward the tail to balance. Try to balance the model by changing the position of the receiver battery and receiver. If this is not enough, you may need to add stick-on weights to the tail or a heavy prop hub to the nose.

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## ***PREFLIGHT***

### ***BALANCE THE PROP***

Balance your propellers carefully before flying. An unbalanced prop is the single most significant cause of damaging vibration. Not only will engine mounting screws and bolts vibrate out, possibly with disastrous effect, but vibration will also damage your radio receiver and battery.

### ***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.

### ***GROUND CHECK THE MODEL***

If you are not thoroughly familiar with the operation of R/C models, ask an experienced modeler to check if you have installed the radio correctly and that all the control surfaces move in the correct direction. The engine operation also must be checked and the engine "broken-in" on the ground. Follow the engine manufacturer's recommendations for break-in. Check to make sure all screws remain tight, that the hinges are secure and that the prop is on tight.

Do not run the engine in an area of loose gravel or sand, as 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 items such as these away from the prop: loose clothing, shirt sleeves, ties, scarves, long hair or loose objects (pencils, screw drivers) that may fall out of shirt or jacket pockets into the prop.

Use a "chicken stick" device or electric starter; follow instructions supplied with the starter or stick. 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 after operation. Make sure fuel lines are in good condition so fuel will not leak onto a hot engine causing a fire.

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

## ***RANGE CHECK YOUR RADIO***

Whenever you fly, you need to check the operation of the radio before the first flight of the day. This means 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 someone stand by your model and, while you work the controls, tell you what the various control surfaces are doing.

Repeat this test with the engine running at various speeds, with an assistant holding the model. If the control surfaces are not always acting correctly, do not fly! Find and correct the problem first.

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. Therefore 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.

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## ***FLYING***

The Tower Uproar 60 is a great-flying sport airplane that flies smoothly and predictably, yet is highly maneuverable. It does not, however, have 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 help you with your first flights.

**Takeoff:** If you have dual rates on your transmitter, set the switches to "high rate" for takeoff, especially when taking off in a crosswind. Although this model has excellent low speed characteristics, you should always build up as much speed as your runway will permit before lifting off, as this will give you a safety margin in case of a "flame-out." When you first advance the throttle and the tail begins to lift, the plane will start to turn left (a characteristic of all "taildraggers"). Be ready for this and correct by applying sufficient right rudder to hold it straight down the runway. The left-turning tendency will diminish as soon as the tail is up and the plane picks up speed. Be sure to allow the tail to come up. Don't hold the tail on the ground with too much up elevator, as the plane will become airborne prematurely and possibly stall. When the plane has sufficient flying speed, lift off by smoothly applying up elevator (don't "jerk" it off to a steep climb!) and climb out gradually.

**Flying:** We recommend that you take it easy with your Uproar 60 for the first several flights, gradually "getting acquainted" with this responsive sport plane as your engine gets fully broken-in. Add and practice one maneuver at a time, learning how she

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behaves in each. For ultra-smooth flying and most normal maneuvers, we recommend using the "low rate" settings as listed on page 27. "High rates" should be used for tearing up the sky, low level loops, snaps and spins and most quick response flying.

**Landing:** When it's time to land, fly a normal landing pattern and make your final approach into the wind. For your first landings, plan to land slightly faster than stall speed and on all three wheels, as this is the easiest way to land your Uproar 60. Later, with a little technique, you will find you can make slow landings on just the main gear, with the tail flyin' high.

We hope you enjoy your Uproar 60 and have a blast wowing the guys at the field.

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

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