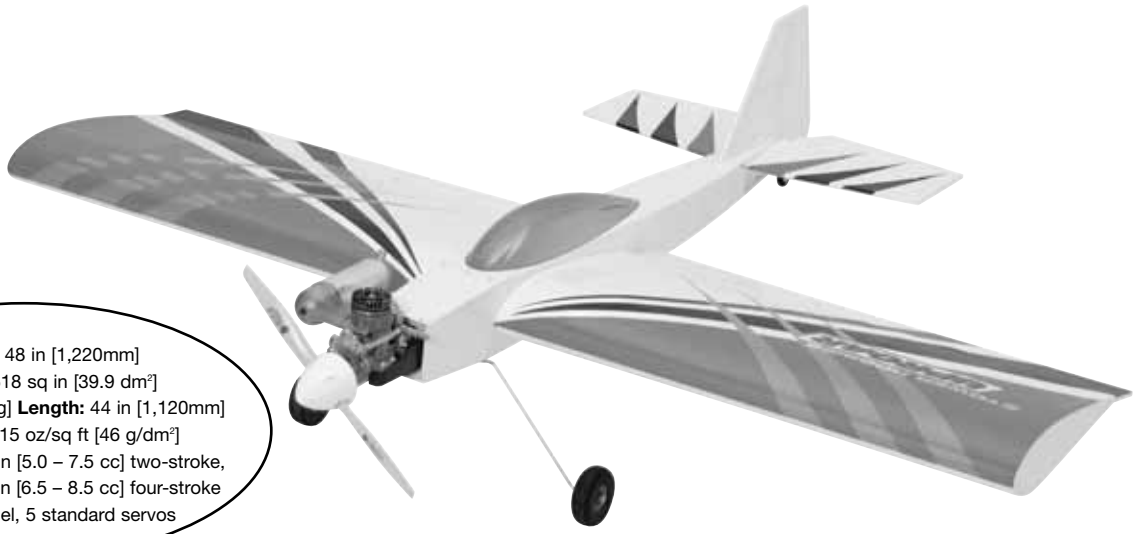
UPROAR ARF



Wingspan: 48 in [1,220mm]
Wing Area: 618 sq in [39.9 dm²]
Weight: 4 lbs [1,810 g] **Length:** 44 in [1,120mm]
Wing Loading: 15 oz/sq ft [46 g/dm²]
Engine: .32 – .46 cu in [5.0 – 7.5 cc] two-stroke,
.40 – .52 cu in [6.5 – 8.5 cc] four-stroke
Radio: 4-channel, 5 standard servos

WARRANTY

Tower Hobbies® 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 Tower Hobbies' liability exceed the original cost of the purchased kit.** Further, Tower Hobbies reserves the right to change or modify this warranty without notice.

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

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

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

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

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

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

TOWER HOBBIES®

Tower Hobbies
P.O. Box 9078
Champaign, IL 61826
(800) 637-6050
www.towerhobbies.com

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INTRODUCTION

Thank you for purchasing the Tower Hobbies Uproar™ 40 ARF. The Uproar 40 ARF is great for pilots who are ready to graduate from their trainer and take the next step with their first aerobatic sport model. The Uproar 40 ARF is also great for experienced pilots who just want something quick and simple to get together for a care-free day at the field. The Uproar's small size, light weight and one-piece construction make transporting it to the field quick and easy so you'll be in the air in no time.

For the latest technical updates or manual corrections to the Tower Hobbies Uproar 40 ARF visit the Tower Hobbies web site at *www.towerhobbies.com*. Open the "Airplanes" link, then select the Tower Hobbies Uproar 40 ARF. If there is new technical information or changes to this model a "tech notice" box will appear in the upper left corner of the page.

AMA

We urge you to join the AMA (Academy of Model Aeronautics) and a local R/C club. The AMA is the governing body of model aviation and membership is required to fly at AMA clubs. Though joining the AMA provides many benefits, one of the primary reasons to join is liability protection. Coverage is not limited to flying at contests or on the club field. It even applies to flying at public demonstrations and air shows. Failure to comply with the Safety Code (excerpts printed in the back of the manual) may endanger insurance coverage. Additionally, training programs and instructors are available at AMA club sites to help you get started the right way. There are over 2,500 AMA chartered clubs across the country. Contact the AMA at the address or toll-free phone number below:

Academy of Model Aeronautics
5151 East Memorial Drive
Muncie, IN 47302
Tele: (800) 435-9262
Fax (765) 741-0057
Or via the Internet at:
http://www.modelaircraft.org

IMPORTANT!!! Two of the most important things you can do to preserve the radio controlled aircraft hobby are to avoid flying near full-scale aircraft and avoid flying near or over groups of people.

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

1. Your Tower Hobbies Uproar 40 ARF should not be considered a toy, but rather a sophisticated, working model that functions very much like a full-size airplane. Because of its performance capabilities, the Uproar 40 ARF, if not assembled and operated correctly, could possibly cause injury to yourself or spectators and damage to property.

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

3. You must take time to **build straight, true** and **strong**.

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

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

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

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

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

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

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

ADDITIONAL ITEMS REQUIRED

HARDWARE & ACCESSORIES
This is the list of hardware and accessories required to finish the Uproar 40 ARF. Order numbers are provided in parentheses.

- ❍ 4-channel radio with five standard servos
- ❍ Engine (see manual cover for size recommendations)
- ❍ Propeller and spare propellers suitable for your engine
- ❍ Y-harness (FUTM4130 for Futaba®)
- ❍ 1/4" [6mm] R/C foam rubber (HCAQ1000)
- ❍ 3' [900mm] Standard silicone fuel tubing (GPMQ4131)
- ❍ 2-1/4" [55mm] White spinner (GPMQ4515)

ADHESIVES & BUILDING SUPPLIES
In addition to common household tools and hobby tools, this is the "short list" of the most important items required to assemble the Uproar 40 ARF. ***Tower Hobbies Build-it™*** *CA and Epoxy glue are recommended.*

- ❍ 1/2 oz. [15g] Thin Pro CA (GPMR6001)
- ❍ 1/2 oz. [15g] Medium Pro CA+ (GPMR6007)
- ❍ Pro 30-minute epoxy (GPMR6047)
- ❍ Threadlocker™ thread locking cement (GPMR6060)
- ❍ Drill bits: 1/16" [1.6mm], 3/32" [2.4mm], 1/8" [3.2mm], 3/16" [4.87mm]
- ❍ Small metal file
- ❍ Stick-on segmented lead weights (GPMQ4485)
- ❍ #1 Hobby knife (HCAR0105)
- ❍ #11 blades (5-pack, HCAR0211)
- ❍ #11 blades (100-pack, HCAR0311)

OPTIONAL SUPPLIES & TOOLS
Here is a list of optional items mentioned in the manual that will help you assemble the Uproar40 ARF.

- ❍ Pro 6-minute epoxy (GPMR6045)
- ❍ R/C-56 canopy glue (JOZR5007)
- ❍ CA applicator tips (HCAR3780)
- ❍ CA debonder (GPMR6039)
- ❍ 3M 75 Repositionable spray adhesive (MMMR1900)
- ❍ Epoxy brushes (6, GPMR8060)
- ❍ 1/8" [3.2mm] Brass tube (for cutting balsa)
- ❍ Mixing sticks (50, GPMR8055)
- ❍ Mixing cups (GPMR8056)
- ❍ Builder's Triangle Set (HCAR0480)
- ❍ Curved-tip canopy scissors for trimming plastic parts (HCAR0667)
- ❍ Pliers with wire cutter (HCAR0630)
- ❍ Denatured alcohol (for epoxy clean up)
- ❍ K & S #801 Kevlar® thread (for stab alignment, K+SR4575)
- ❍ Servo horn drill (HCAR0698)
- ❍ Dead Center™ Engine Mount Hole Locator (GPMR8130)
- ❍ AccuThrow™ Deflection Gauge (GPMR2405)
- ❍ CG Machine™ (GPMR2400)
- ❍ Precision Magnetic Prop Balancer™ (TOPQ5700)
- ❍ Sealing iron (TOPR2100)
- ❍ Iron cover (TOPR2175)
- ❍ Trim sealing iron (TOPR2200)

IMPORTANT BUILDING NOTES

• When you see the term ***test fit*** in the instructions, it means that you should first position the part on the assembly **without using any glue**, then slightly modify or *custom fit* the part as necessary for the best fit.

• Whenever the term ***glue*** is written you should rely upon your experience to decide what type of glue to use. When a specific type of adhesive works best for that step, the instructions will make a recommendation.

• Whenever just ***epoxy*** is specified you may use **either** 30-minute (or 45-minute) epoxy **or** 6-minute epoxy. When 30-minute epoxy is specified it is **highly** recommended that you use only 30-minute (or 45-minute) epoxy, because you will need the working time and/or the additional strength.

• ***Photos*** and ***sketches*** are placed **before** the step they refer to. Frequently you can study photos in following steps to get another view of the same parts.

• The stabilizer and wing incidences and engine thrust angles have been factory-built into this model. However, some technically-minded modelers may wish to check these measurements anyway. To view this information visit the web site at *www.towerhobbies.com* and click on "Technical Data." Due to manufacturing tolerances which will have little or no effect on the way your model will fly, please expect slight deviations between your model and the published values.

COMMON ABBREVIATIONS

Fuse = Fuselage
Stab = Horizontal Stabilizer
Fin = Vertical Fin
LE = Leading Edge
TE = Trailing Edge
LG = Landing Gear
" = Inches
mm = millimeters

ORDERING REPLACEMENT PARTS

Replacement parts for the Uproar 40 ARF are available from Tower Hobbies or Hobby Services using the order numbers in the Replacement Parts List that follows. Contact Tower at *www.towerhobbies.com*, or call toll free (800) 637-6050. Contact Hobby Services by calling (217) 398-0007, or via facsimile at (217) 398-7721. If ordering via fax, include a Visa or MasterCard number and expiration date for payment.

Mail parts orders and payments by personal check to:

Hobby Services
3002 N Apollo Drive, Suite 1
Champaign IL 61822

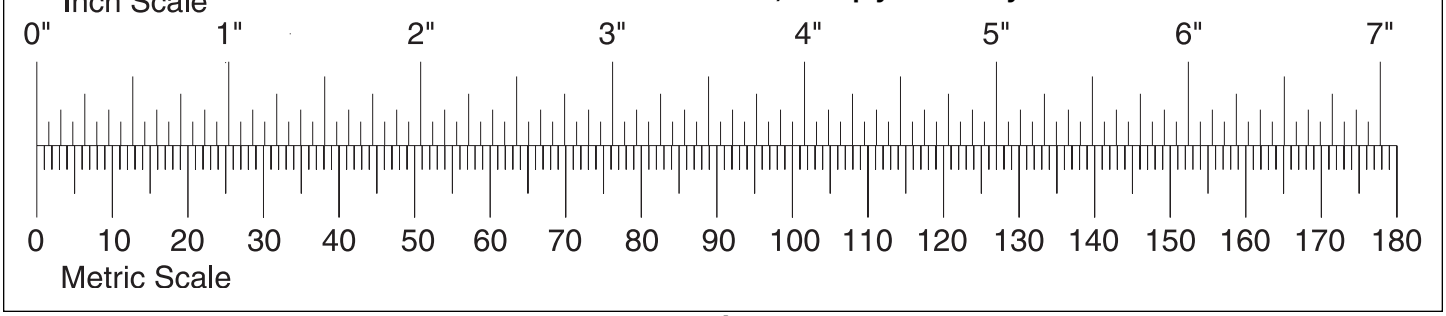
Be certain to specify the order number exactly as listed in the Replacement Parts List. Payment by credit card or personal check only; no C.O.D.

If additional assistance is required for any reason contact Product Support by e-mail at *productsupport@towerhobbies.com*, or by telephone at (217) 398-8970.

Replacement Parts List

Order Number	Description	How to Purchase
	Missing pieces	Contact Product Support
	Instruction manual	Contact Product Support
	Full-size plans	Not available
TOWA2165	Wing Set	Contact Your Hobby Supplier to Purchase These Items
TOWA2166	Fuselage	
TOWA2167	Tail Set	
TOWA2168	Canopy	
TOWA2169	Landing Gear	
TOWA2170	Tail Wheel Assembly	

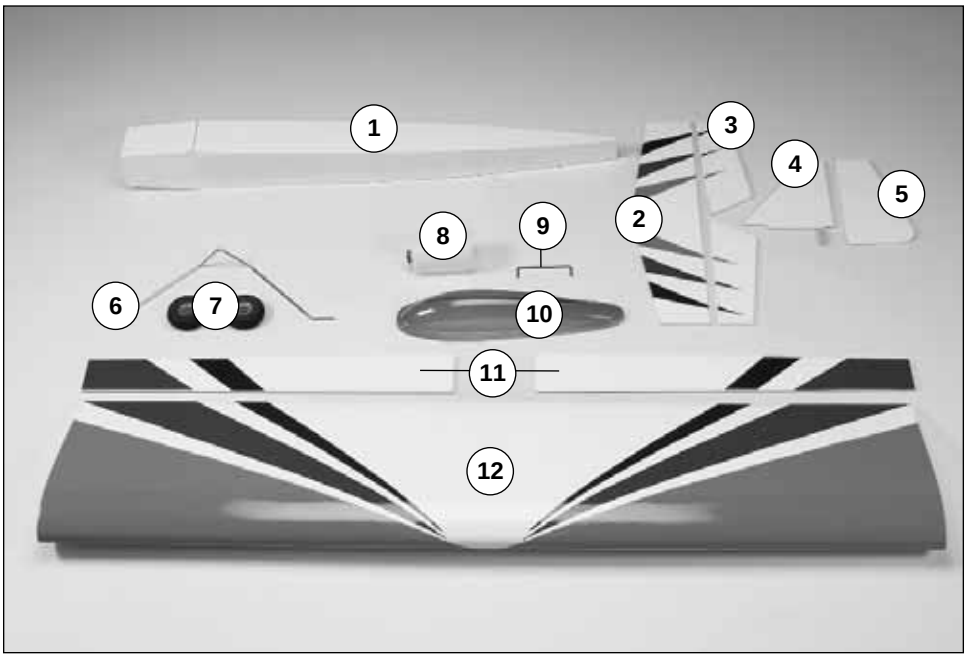
To convert inches to millimeters, multiply inches by 25.4



KIT INSPECTION

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

Tower Hobbies Product Support
3002 N Apollo Drive, Suite 1
Champaign, IL 61822
Telephone: (217) 398-8970, ext. 5
Fax: (217) 398-7721
E-mail: *airsupport@towerhobbies.com*



Kit Contents

1. Fuselage, Radio Hatch, Fuel Tank Hatch
2. Horizontal Stab
3. Elevators
4. Fin
5. Rudder
6. Main Landing Gear Wire
7. Main Wheels
8. Fuel Tank
9. Elevator Joiner Wire
10. Canopy
11. Ailerons
12. Wing

Kit Contents (not photographed)

Engine Mount
Plastic Tail Wheel Collar
Throttle Pushrod (with Z-bend)
Pushrod Guide Tube
24" [610mm] Elevator and Rudder Pushrods
(2) 6" [150mm] Aileron Pushrods
1.5mm Allen Wrench
Tail Gear Wire
Tail Wheel

Nylon Hardware:
(17) CA Hinges

(4) Control Horns
(4) Clevises
(4) 90° Pushrod Connectors
(4) Landing Gear Straps
(4) Silicone Clevis Retainers

Nuts/Bolts:
(4) 4 x 20mm Machine Screws
(4) 3.5 x 20mm Wood Screws
(8) 2 x 15mm Machine Screws
(26) 2 x 8mm Wood Screws
(4) 4mm Blind Nuts
(5) 3mm Set Screws

(4) Wheel Collars
(1) Pushrod Connector with Thumb Nut
(1) 2mm Washer

ASSEMBLY

PREPARATION

❍ 1. Use a covering iron set on medium heat (about 250°F [120°C]) with a protective covering sock to remove any wrinkles in the covering and make sure the covering is bonded to the wood structure underneath.

❍ 2. Use a hobby knife with a sharp #11 blade to cut the covering from the fuselage over the openings for the wing, tail surfaces and for the pushrod tubes on both sides of the fuselage. Remove the small balsa block. **Suggestion:** Keep the larger pieces of covering cut out from the wing opening in case patches are ever required in the future.

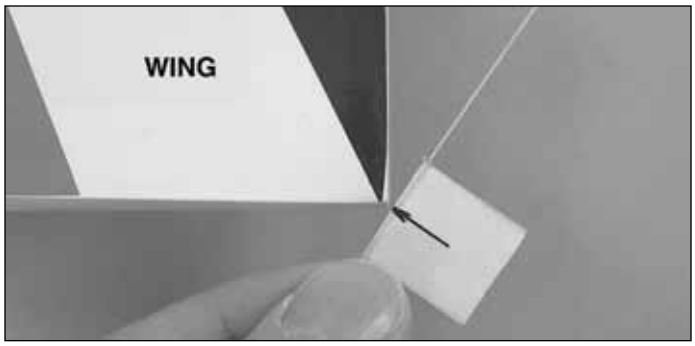
JOIN THE WING TO THE FUSELAGE

Note: The **top** of the fuselage is the side with the fuel tank hatch. The **bottom** of the fuselage is the side with the radio hatch under the wing opening. **Be certain you don't inadvertently install the wing upside-down.**

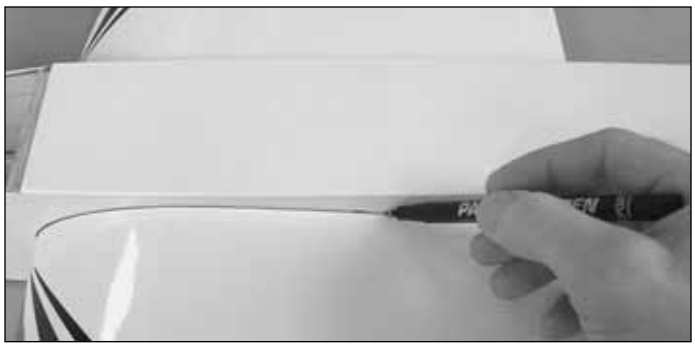
❍ 1. Slide the wing into the fuselage. Take accurate measurements to center the wing from side-to-side.

Read the next two steps before proceeding so you will understand the process.

❍ 2. Stick a T-pin through the center of the top of the fuselage at the rear. Tie a loop in one end of a 36" [1m] piece of non-elastic string such as monofilament or Kevlar line (K+SR4575). Slip the loop in the string over the T-pin.



❍ 3. Fold a piece of masking tape over the string near the other end and draw an arrow on it. Slide the tape along the string and align the arrow with one end of the wing as shown in the photo. Swing the string over to the same position on the other end of the wing. Pivot the wing and slide the tape along the string until the arrow aligns with both ends of the wing. Make sure the wing remains centered from side-to-side throughout the process.

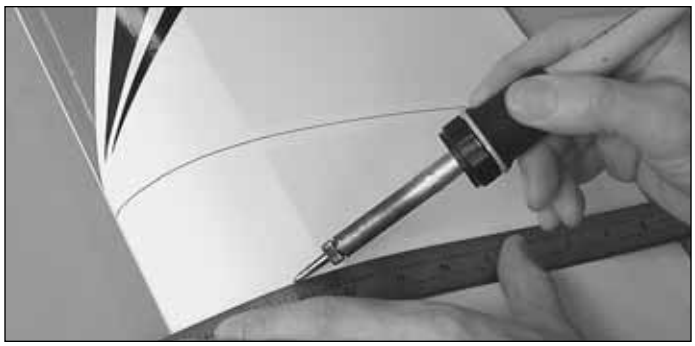


❍ 4. Use a fine-point felt-tip pen such as a Top Flite® Panel Line Pen (TOPQ2510) to mark the outline of the fuselage all the way around both sides of the wing.

❍ 5. Before removing the wing, use a short piece of wire or something similar to mark the location of the hole in the former for the throttle pushrod guide tube onto the leading edge of the wing. Remove the wing from the fuselage and drill a 1/8" [3.2mm] hole through the wing at the mark.

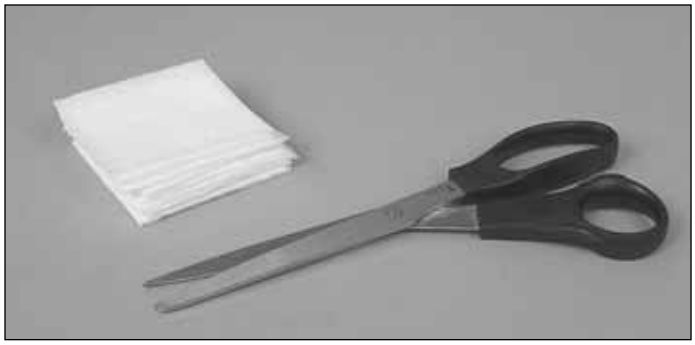
❍ 6. Use a single-edge razor blade, a **sharp, new** #11 blade or follow the ***Expert Tip*** below to cut the covering from the wing along the lines. Use care to cut **only** into the covering and **not** into the wood. Cutting into the balsa will weaken the structure.

Expert Tip

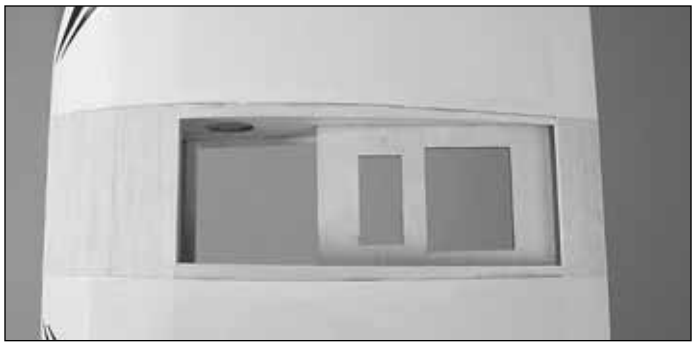


How to cut covering from balsa.

To avoid cutting into the balsa, use a soldering iron guided by a straightedge to cut the covering. The tip of the soldering iron doesn't have to be sharp, but a fine tip does work best. Move the soldering iron at a rate that will melt through the covering without burning the wood. The hotter the soldering iron, the faster it must travel to melt a fine cut without burning any wood.



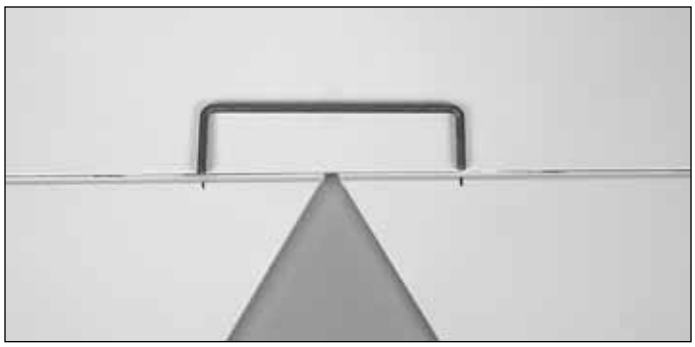
❍ 7. Lay two or three paper towels on top of each other. Cut them into small squares. These small paper towel squares will come in handy for wiping away excess ink, epoxy and CA throughout the assembly process.



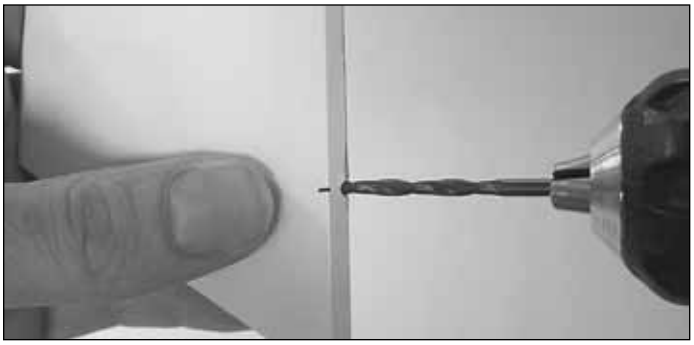
❍ 8. Remove any ink with one of your small paper towel squares lightly dampened with denatured alcohol–wipe ***away*** from the seam–otherwise the ink will bleed under the covering. Peel the covering from the wing. Re-seal the covering to the wing where it may have lifted.

❍ 9. Slide the wing into the fuselage. Mix approximately 1/4 oz. of 30-minute epoxy. Use a piece of wire or a small dowel to apply the epoxy all the way around the wing where it joins the fuselage. Move the wing from side-to-side to work the epoxy into the joint. Center the wing using the pin and string, then wipe away excess epoxy. Check the wing alignment once more. Do not disturb until the epoxy has hardened.

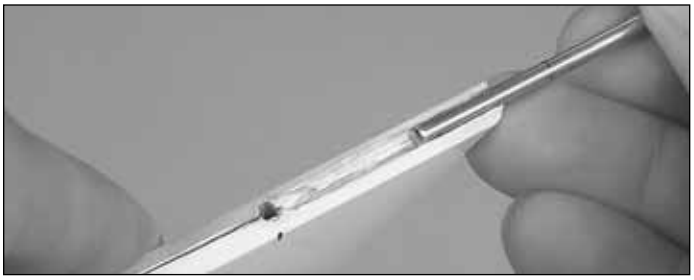
JOIN THE STABILIZER TO THE FIN



❍ 1. Position the elevators against the stab with the tips aligned. Center the joiner wire over the elevators and mark the ends of the wire on the elevators.



❍ 2. Drill a 1/8" [3.2mm] hole in both elevators for the joiner wire.



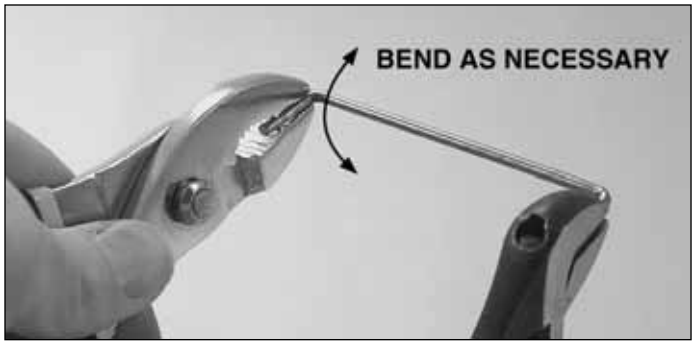
❍ 3. Use a 1/8" [3.2mm] brass tube sharpened on the end as shown in the following ***Expert Tip*** or a hobby knife to cut out the elevators to accommodate the joiner wire.

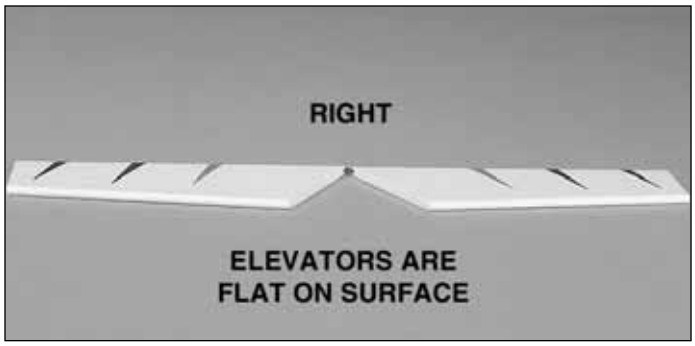
Expert Tip

How to sharpen a brass tube for cutting balsa.

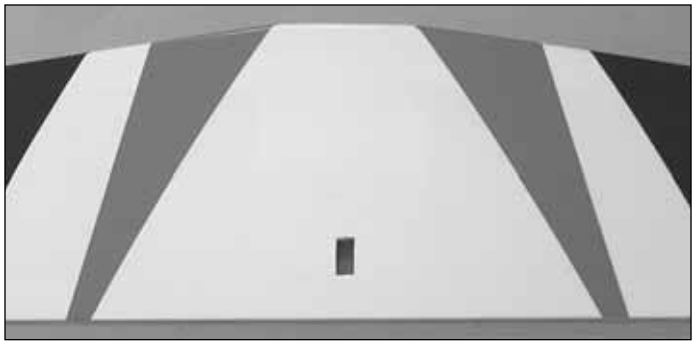
1. Sharpen the **outside** of the tube with a cutoff wheel or a metal file.

2. Sharpen the **inside** of the tube with a hobby knife. Now you have a sharp tube that will easily cut balsa.

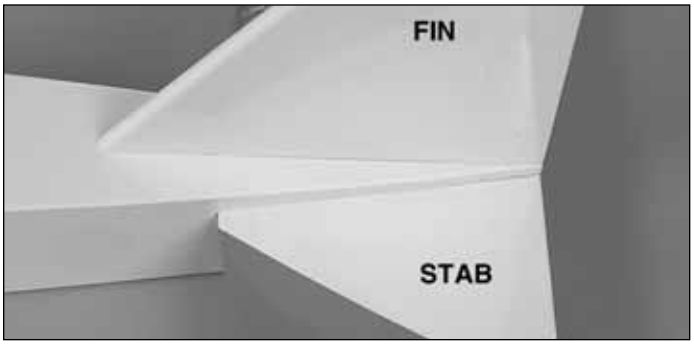




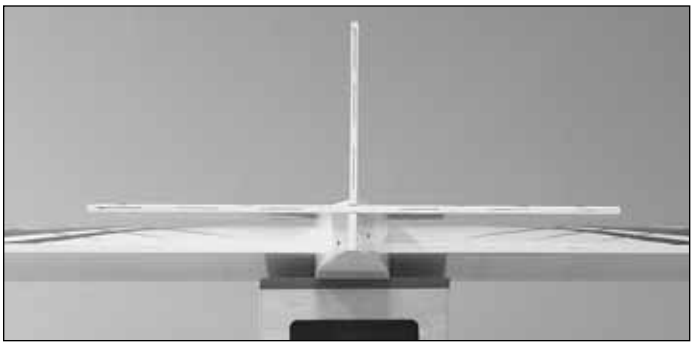
❍ 4. Test fit the joiner wire into the elevators. Lay the assembly on your flat workbench. See if the elevators are parallel with each other. If necessary, remove the joiner wire and use pliers to bend the wire as necessary until you can get the elevators to lie flat. Set the elevators and the joiner wire aside.



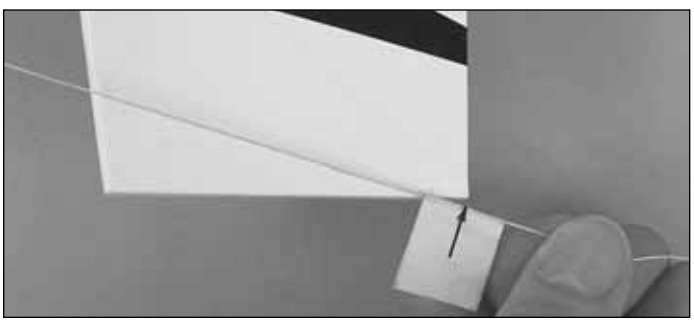
❍ 5. Cut the covering from the top and bottom of the stab over the slot.



❍ 6. Slide the stab into the fuselage, then key it into position with the vertical stabilizer (from now on referred to as the “fin”).



❍ 7. Stand behind the model and view the alignment of the stab and wing. The stab should be parallel with the wing. If the stab is not parallel with the wing, place a small weight on the “high side” of the stab to get it into alignment. If a little bit of weight isn’t enough, remove the fin and stab from the fuselage and carefully sand the saddle as necessary to get the stab into alignment with the wing.

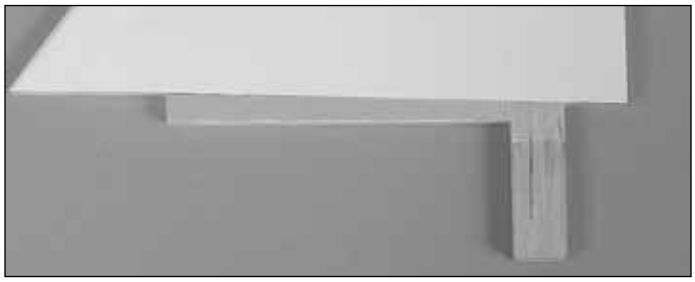


❍ 8. Once you have achieved stab alignment, use the pin-and-string technique to center the stab the same way you did the wing, only this time stick the T-pin through the top of the firewall over the centerline.

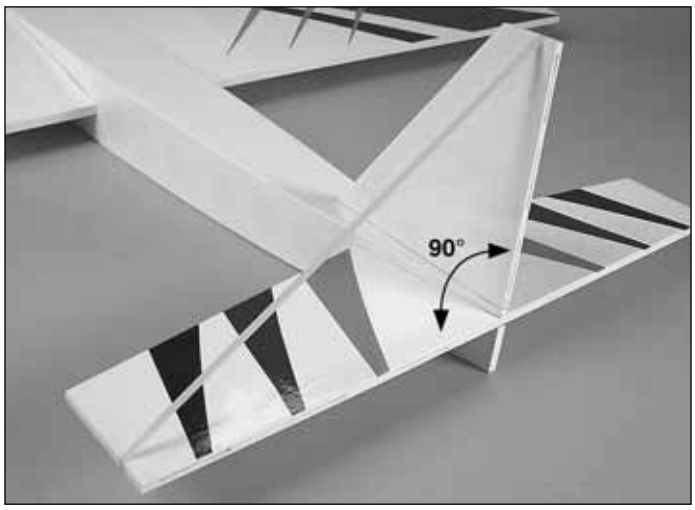
❍ 9. Use a fine-point felt-tip pen to mark the top and bottom of the stab around both sides of the fuselage. Also mark the outline of the front of the fin on the top of the fuselage.

❍ 10. Remove the fin and stab, carefully cut the covering from the stab and the top of the fuselage. Wipe away any residual ink.

❍ 11. Securely glue the stab into position with 30-minute epoxy. Temporarily install the fin to help center the stab and use the pin and string for alignment. Also make certain the stab is parallel with the wing. Remove the fin so you do not inadvertently glue it into position and wipe away excess epoxy before it hardens.



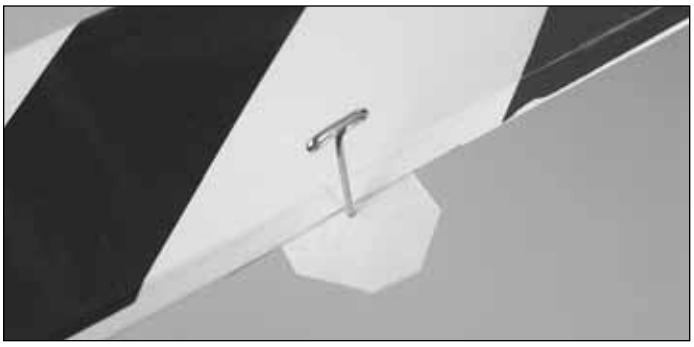
❍ 12. Cut the covering from the bottom of both sides of the fin as shown in the photo.

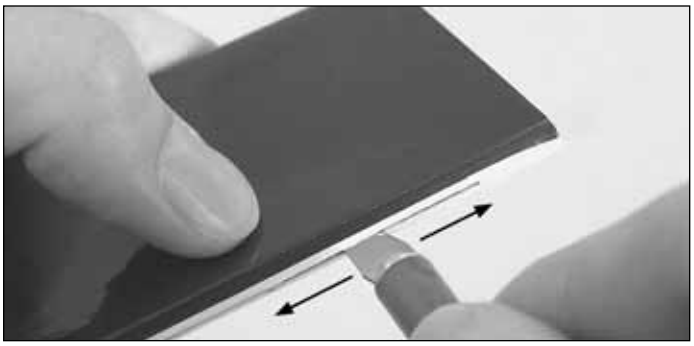


❍ 13. After the epoxy from the stab has hardened, glue in the fin. Use a builder’s square to make certain the fin is perpendicular to the stab. If necessary, use tape to pull the tip of the fin to one side or the other.

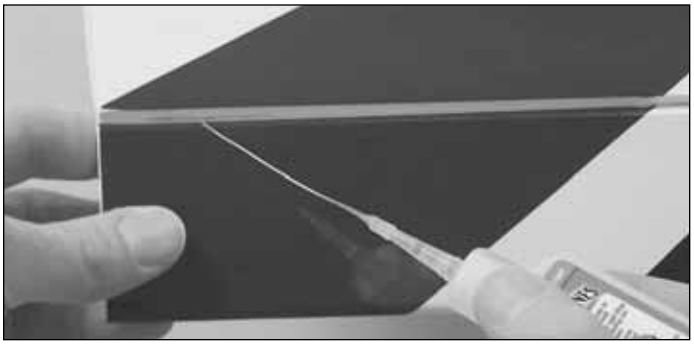
GLUE IN THE HINGES

Start with the left aileron.





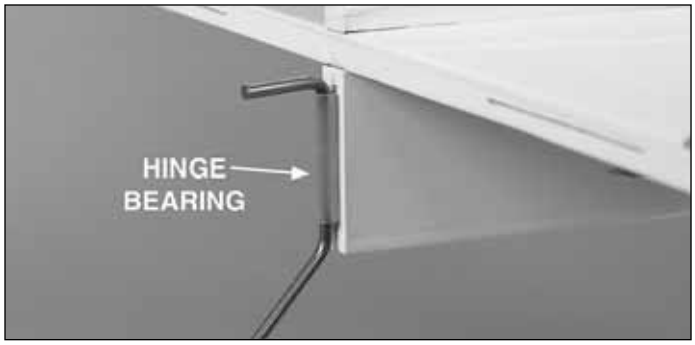
❍ ❍ 1. Stick a T-pin through the middle of four CA hinges. Insert the hinges into the left aileron. The T-pins will keep the hinges centered. If any of the hinges are too tight or don't go in all the way, remove the hinge and use a #11 blade to widen and/or deepen the slots. The hinges should fit snug, but not with so much resistance that they are difficult to insert.



❍ ❍ 2. Join the aileron to the wing with the hinges. Take out the T-pins. Adjust the aileron so there is a small gap–just enough to see light through or to slip a piece of paper through. Carefully add six drops of thin CA to the top and bottom of all four hinges. Proceed slowly, waiting a few seconds between drops to allow the CA to soak in–otherwise, excess CA will run into the hinge gap. If you do get any CA in the gap, use one of your paper towel squares to quickly absorb the CA before it hardens. **Hint:** A small CA applicator tip like the one in the photo (HCAR3780) will allow you to pinpoint your drops of CA.

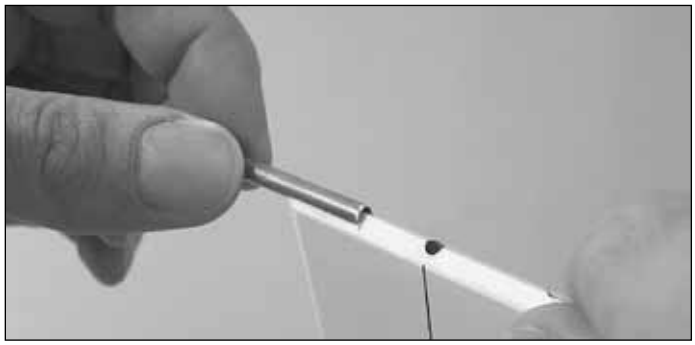
❍ 3. Join the right aileron to the wing the same way.

❍ 4. Secure the tail wheel to the tail gear wire by pressing on the plastic collar.



❍ 5. Use a small razor saw or a hobby knife to widen the hinge slot in the fuselage for the nylon hinge bearing on the tail gear. Test fit the bearing.

❍ 6. Hold the rudder up to the fin. Mark the location of the "arm" of the tail gear wire onto the rudder.

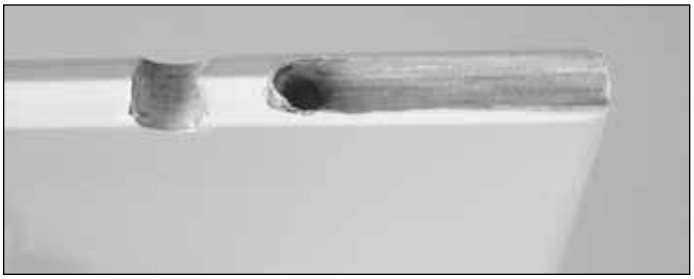


❍ 7. The same as was done for the elevators, drill a 3/32" [2.4mm] hole and cut a 1/8" [3.2mm] groove into the rudder for the wire and the nylon bearing. Set the rudder aside.

❍ 8. Clean the elevator joiner wire with denatured alcohol or other solvent. Roughen the wire with coarse sandpaper so glue will adhere.

❍ 9. Test fit the elevators and joiner wire to the stabilizer with the hinges. Make any adjustments necessary for a good fit. Remove the elevators and joiner wire.

❍ 10. Coat the joiner wire and use a toothpick or a wire to fill the holes and the grooves in the elevators with 30-minute epoxy. Install the joiner wire and wipe away excess epoxy. Join the elevators to the stabilizer with the hinges before the epoxy hardens. Permanently glue in the hinges with thin CA.

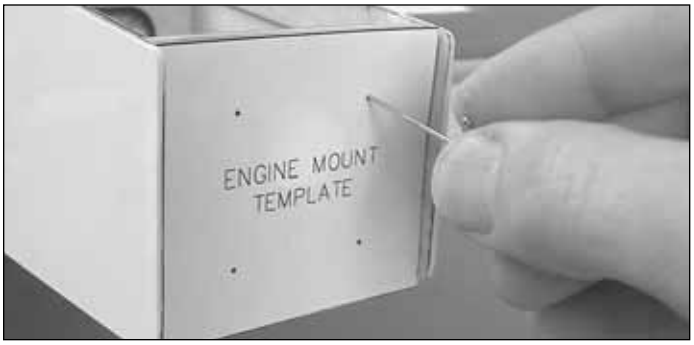


❍ 11. Cut a half-round notch in the rudder to accommodate the elevator joiner wire. Lightly coat the notch with epoxy to fuelproof the bare wood.

❍ 12. Apply a dab of petroleum jelly or a small drop of oil to both ends of the bearing to keep glue from adhering. Use a thin, metal ruler or something similar to thoroughly work epoxy into the slot in the fuselage. Coat the hinge of the bearing with epoxy, then fit the bearing into the fuselage and wipe away excess epoxy.

❍ 13. Apply 30-minute epoxy to the arm and in the hole in the rudder, then join the rudder to the fin with the hinges. Use thin CA to glue in the hinges.

MOUNT THE ENGINE

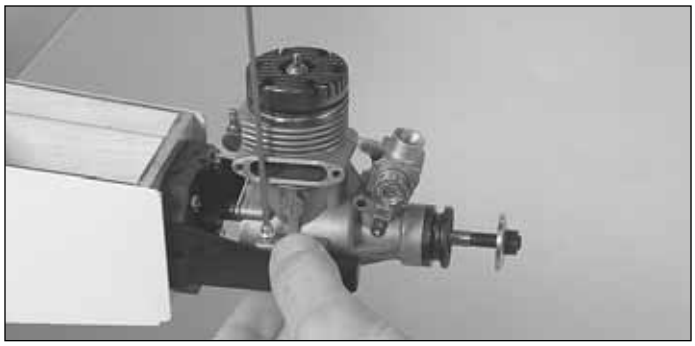


❍ 1. Cut out the **Engine Mount Template** from the back of the manual. Use repositionable spray adhesive or tape to hold the template on the firewall. Use a large T-pin or something similar to mark the bolt locations on the template onto the firewall.

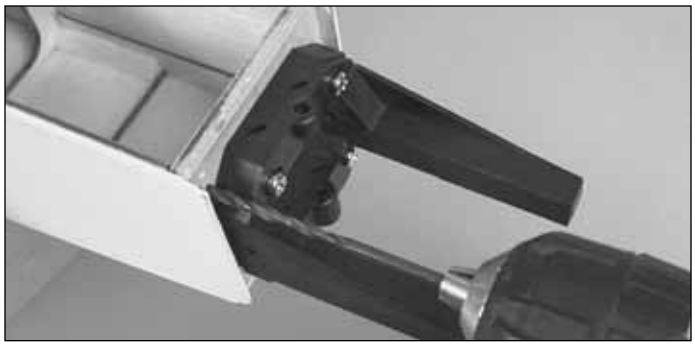
❍ 2. Remove the template. Drill 1/16" [1.6mm] holes through the firewall at the marks. Enlarge the holes with a 3/16" [4.8mm] drill.

❍ 3. Press the blind nuts into the holes in the back of the firewall. If necessary, trim the triangle stock to clear the flange of any of the blind nuts that are too close. Use the engine mounting bolts with washers to draw the blind nuts all the way in.

Note: To achieve the correct balance point specified in the back of this manual, it is most likely that a couple of ounces of tail weight will be required. To reduce the amount of tail weight, mount the engine as far aft as possible on the engine mount.



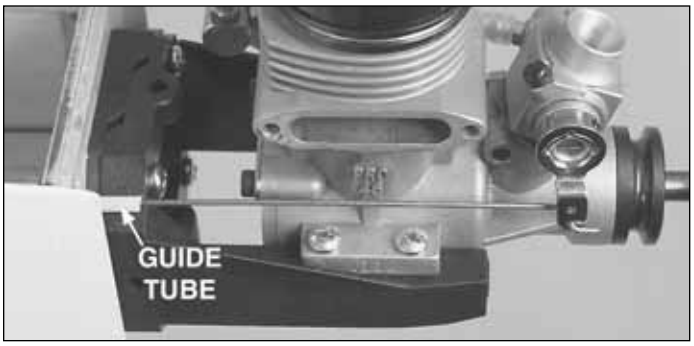
❍ 4. Attach the engine mount to the firewall with four 4 x 25mm bolts, but don't tighten the bolts all the way. Place the engine on the mount and adjust the width to fit your engine. Now tighten the bolts. Use a Great Planes Dead Center Engine Mount Hole Locator or a wire sharpened on the end to mark the location of the engine mounting bolt holes on the engine mount.



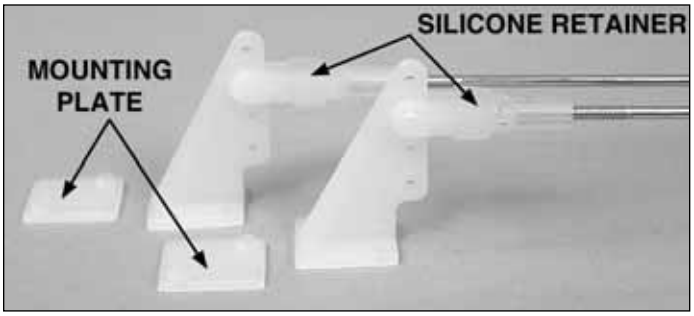
❍ 5. Take the engine off the mount. Drill a 1/8" [3.2mm] hole through the firewall that will be in line, or as much in line as you can get, with the carburetor arm on the engine. **Note:** Make certain the pushrod, when installed in the hole, will not interfere with the fuel tank.

❍ 6. Drill 7/64" [2.8mm] holes through the engine mount at the marks you made for mounting the engine. Mount the engine to the engine mount with four 3.5 x 20mm sheet metal screws and 3.5mm washers.

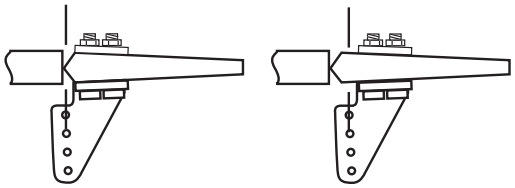
INSTALL THE PUSHRODS

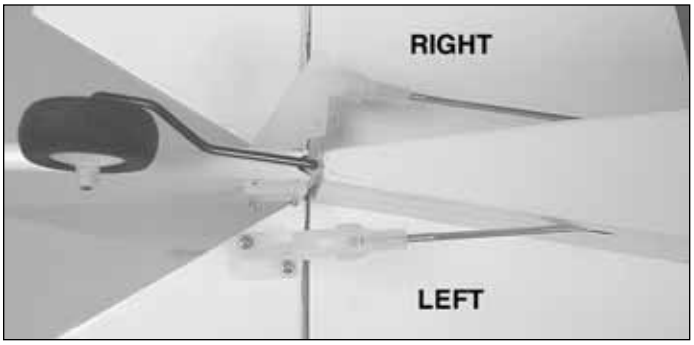


❍ 1. Use coarse or medium-grit sandpaper to roughen the outside of the plastic throttle pushrod guide tube so glue will adhere. Guide the tube through the firewall into the radio compartment. Connect the throttle pushrod wire to the carburetor arm on the engine (this will require removal of the carb arm), then guide the pushrod wire through the tube.



❍ 2. Thread a clevis about twenty full turns onto a 24" [610mm] wire pushrod. Slip a silicone retainer over the clevis. Cut the mounting plate from a control horn, then connect the clevis to the second-from-the-outer hole of the horn. Make another assembly the same way.





❍ 3. Slide the pushrods through the guide tubes in the back of the fuselage. Place the **left** control horn on the elevator and place the **right** control horn on the rudder. Align the horns with the hinge gap as shown in the sketch.

❍ 4. Mark the location of the mounting holes for the control horns on the rudder and elevator. Drill 3/32" [2.4mm] holes at the marks. Mount the horns with 2 x 15mm screws and the nylon mounting plates. **Caution:** Do not overtighten the screws. Otherwise, you will strip out the mounting plates and the horns will not be securely mounted.

HOOK UP THE CONTROLS

Expert Tip

Center your servos.

Futaba servos come with four- or six-arm servo arms. The unused arms are usually cut off. But did you know that each individual arm on Futaba servo arms is slightly different? Before cutting off any arms, determine which one to keep. First, hook up the servos to the receiver and battery. Then, center the trims on the transmitter and turn the system on. Test fit one of the servo arms on one of the servos in the four (or six) possible positions until you find an arm that will be 90 degrees to the pushrod. That's the arm to keep. Cut off the rest. Now the trims won't have to be used to center the servos.

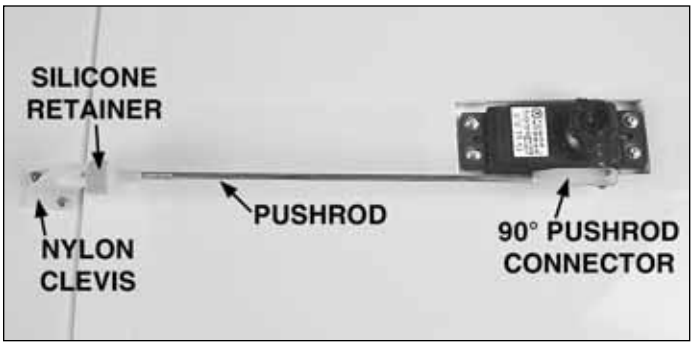
❍ 1. Cut the covering 1/8" [3mm] inside the openings in the wing for the aileron servos. Use a trim iron to seal the covering down inside the openings.

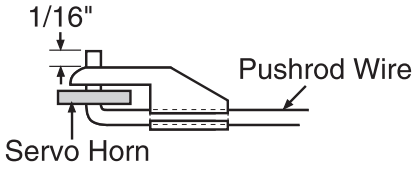
❍ 2. Use the string in the wing to pull the aileron servo wires into the radio compartment, then place the servos in the openings.

❍ 3. Drill 1/16" [1.6mm] holes through the mounting plates in the wing for the servo mounting screws.

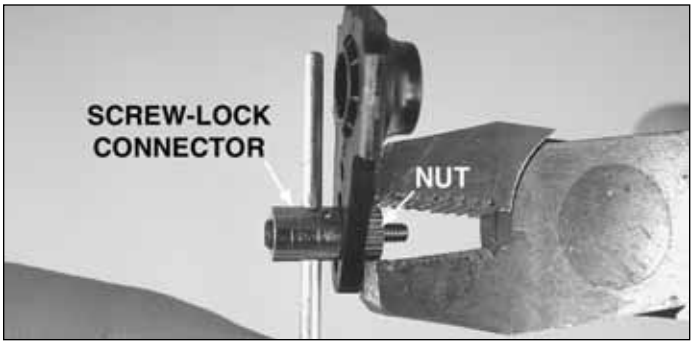
❍ 4. Mount the servos in the wing using the screws that came with the servos. **IMPORTANT:** Remove the screws,

add a few drops of thin CA to the screw holes, allow the CA to harden, then remount the servos. This will harden the screw holes so the screws will have a better “bite.”



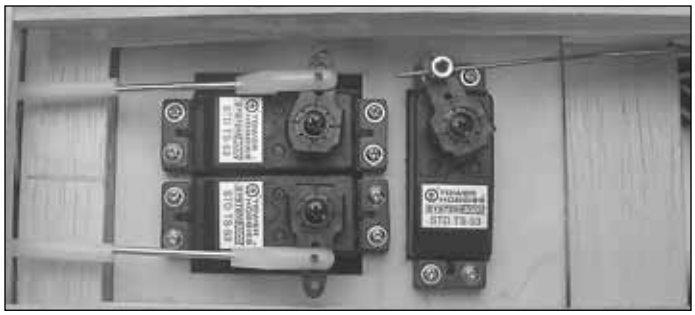


❍ 5. Use a Hobbico Servo Horn Drill (HCAR0698) or a 5/64" [2mm] drill to enlarge the holes in one of the servo arms you will be using for the aileron servo. Connect the aileron to the aileron servo using the hardware shown in the photo. After making a 90° bend in the pushrod and connecting it to the servo with the pushrod connector, cut the excess wire 1/16" [2mm] from the connector.



❍ 6. Mount the screw-lock pushrod connector to the throttle servo arm. If a small washer was included with the connector, it is not used. A piece of leftover pushrod wire may be used as a miniature *torque bar* to hold the connector while tightening the nut, but don’t overtighten. The connector should be able to pivot in the hole of the servo arm without too much resistance. **IMPORTANT:** Be certain to use a small drop of Threadlocker on the threads of the nut so it will not come loose.

Refer to this photo to mount the servos in the fuselage and hook up the pushrods.

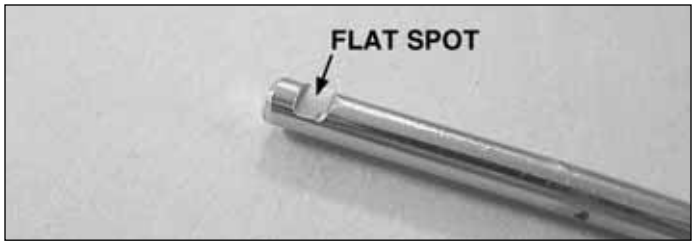


❍ 7. Place the elevator and rudder servos in the servo tray as shown. Fit the throttle pushrod wire into the screw-lock pushrod connector on the throttle servo arm. Make a few bends in the wire as necessary so the servo arm will fit easily on the throttle servo, then mount the arm to the servo. Center the carburetor arm and center the servo arm. Temporarily tighten the set screw in the connector, then cut the excess wire about 3/8" [10mm] past the connector.

❍ 8. The same as was done with the ailerons, center the elevator and rudder, then make a 90° bend in the wires where they go into the servo arms. Connect the wires to the servo arms with the nylon 90° pushrod connectors and cut off the excess wire.

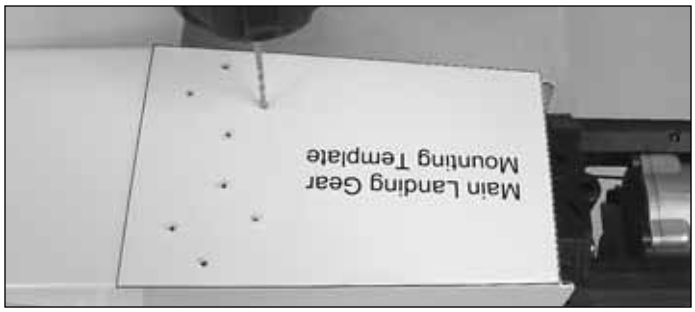
❍ 9. Drill the holes and use the servo screws to mount the servos to the servo trays. Don’t forget to remove the screws and harden the screw holes with thin CA.

MOUNT THE LANDING GEAR



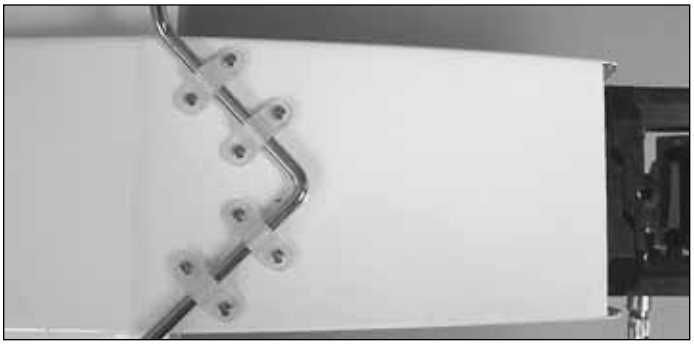
❍ 1. Use a small metal file to file a flat spot near both ends of the main landing gear wire.

❍ 2. Mount the wheels to the main landing gear using the wheel collars provided. Be certain to add a few drops of Threadlocker to the threads on the set screws before inserting them into the collars. Add a few drops of oil to both sides of the wheel at the collars.



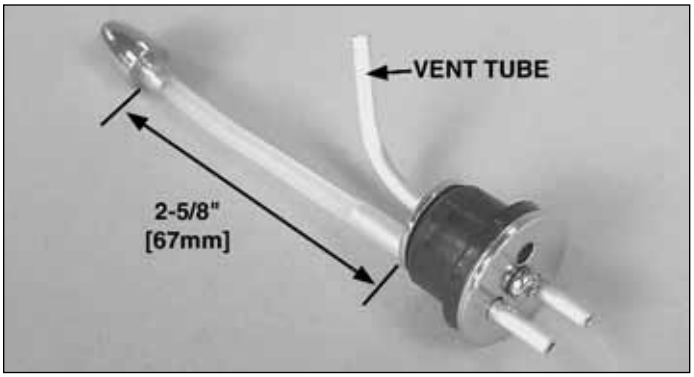
❍ 3. Cut the **Main Landing Gear Template** from the back of the manual. Use tape or repositionable spray adhesive to

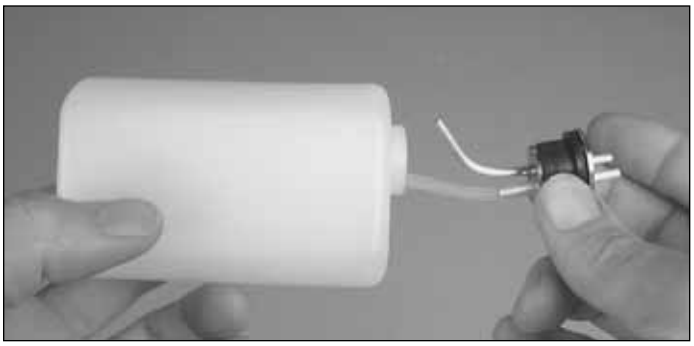
temporarily hold the template down. Drill 1/16" [1.6mm] holes through the bottom of the fuselage at the marks for the landing gear strap screws. Remove the template.



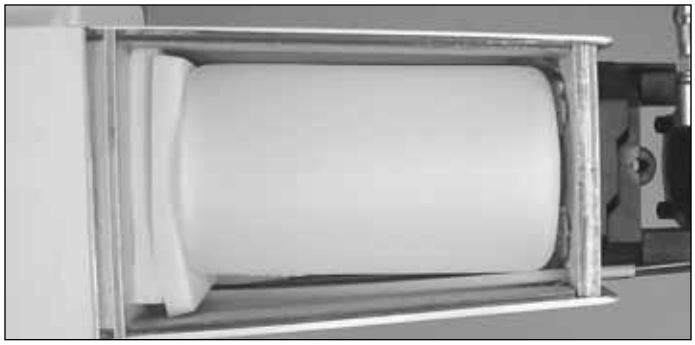
❍ 4. Mount the landing gear with the nylon straps and eight 2 x 8mm wood screws. Remove the screws, harden the holes with a few drops of thin CA, allow to harden, then remount the gear.

INSTALL THE FUEL TANK



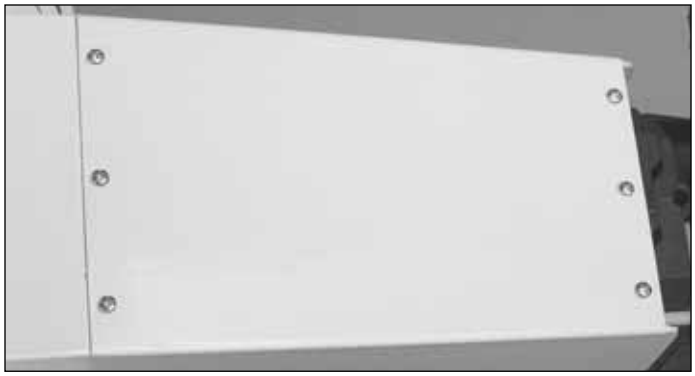


❍ 1. Assemble the stopper assembly as shown in the photo. The fuel pickup tube should be 2-5/8" [67mm] long. Bend the vent tube upward so it will be near the top of the fuel tank when the stopper is inserted. Insert the stopper assembly and tighten the screw. Be certain the fuel pickup does not contact the rear of the tank.



❍ 2. Lay a sheet of 1/4" [6mm] R/C foam in the bottom of the fuel tank compartment. Install the fuel tank with the neck in the hole in the firewall. Double-over another sheet of 1/4" [6mm] foam and insert it behind the fuel tank.

❍ 3. Test fit the fuel tank hatch over the top of the fuselage. If the front brace glued to the inside of the hatch interferes with the fuel tank, use a hobby knife to strip the brace from the hatch. Discard the brace.



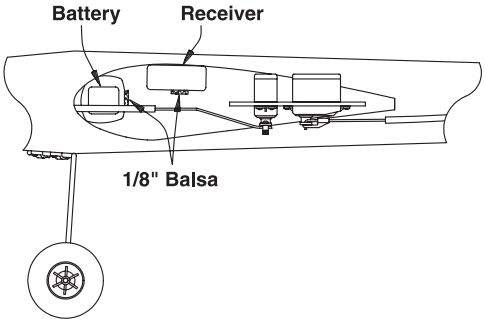
❍ 4. Drill three 1/16" [1.6mm] holes through the front of the hatch and the top of the firewall and three more holes through the rear of the hatch and the stick going across the aft edge of the former. Enlarge the holes in the hatch only with a 3/32" [2.4mm] drill, then mount the hatch with six 2 x 8mm screws.

❍ 5. Remove the hatch. Harden the screw holes in the fuselage with thin CA. Fuelproof the inside of the hatch with fuelproof paint or epoxy thinned with denatured alcohol.

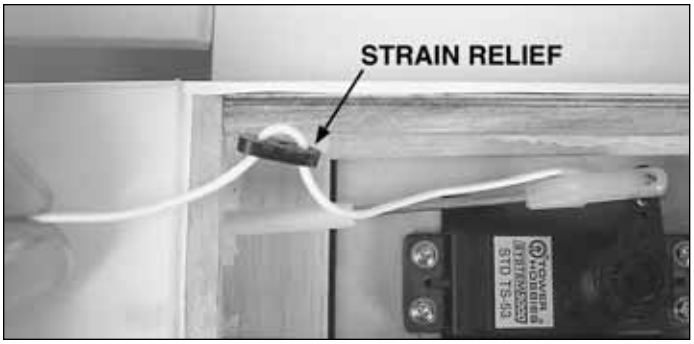
FINISH RADIO INSTALLATION

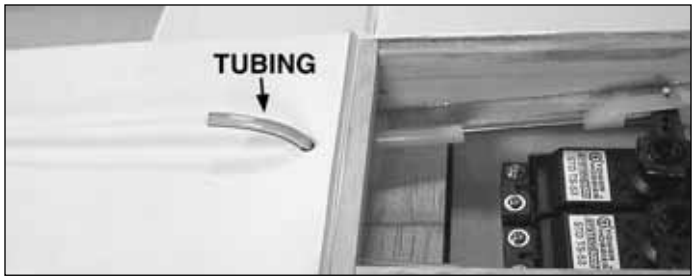
❍ 1. Neatly wrap the receiver and battery pack in 1/4" [6mm] R/C foam rubber. Secure the foam with rubber bands or tape. It's also a good idea to secure the connection between the switch and the battery pack with heat shrink tubing, tape or clips intended for that purpose.

Note: As mentioned during engine installation, it is likely that a couple of ounces of tail weight will be required to achieve the correct balance point specified in the back of this manual. If you are using a larger or heavier engine (such as the Tower Pro .46), the battery pack could be mounted behind the receiver.



❍ 2. Connect the aileron servo wires in the fuselage to a Y-connector. Connect the receiver switch and the servos to the receiver. Install the battery pack and receiver and hold them in place by gluing strips of 1/8" [3mm] balsa across them as suggested in the sketch.

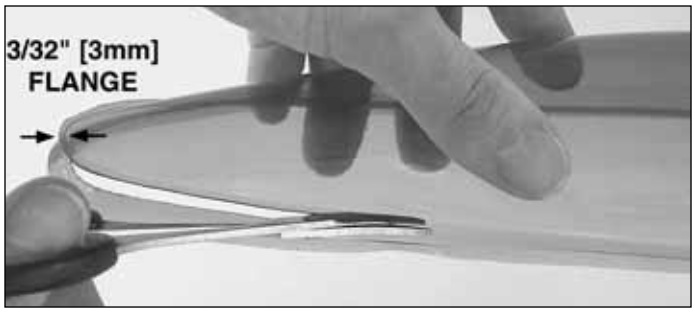




❍ 3. Make a *strain relief* for the receiver antenna from a cut-off servo arm. Guide the antenna through the strain relief, then through a piece of tubing through a hole in the bottom of the fuselage. Secure the rear of the antenna to the bottom of the fuselage with tape or a small rubber band.

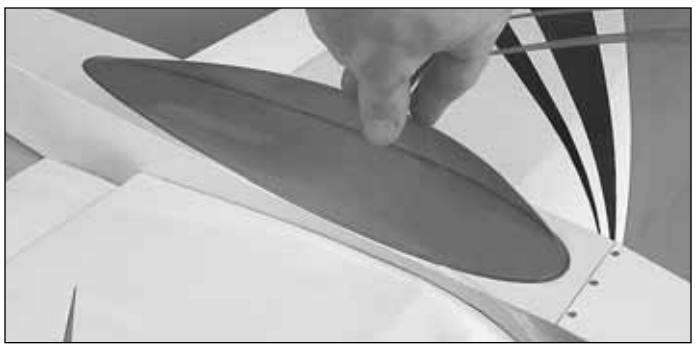
❍ 4. Mount the receiver on/off switch to the radio hatch. Mount the radio hatch to the bottom of the fuselage the same way you mounted the fuel tank hatch.

MOUNT THE CANOPY



❍ 1. Cut out the canopy leaving a 3/32" [3mm] flange all the way around. True the edges with a bar sander and 80-grit sandpaper, then use 400-grit sandpaper to sand off the flashing.

❍ 2. If you wish to install a pilot, now is the time to paint and glue it into position.



❍ 3. Wash the canopy in warm, soapy water. Glue the canopy to the fuselage with R/C-56 canopy glue (JOZR5007) or

medium CA. If using CA, be certain to use it sparingly and DO NOT use any CA accelerator. If accelerator is used, or if you use too much CA it will *fog* the canopy.

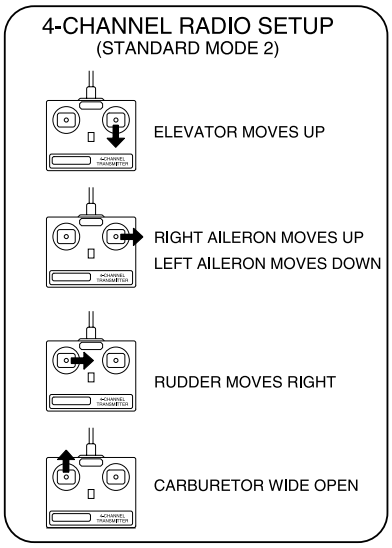
GET THE MODEL READY TO FLY

Mount the muffler and connect the fuel lines. Install a 2-1/4" [55mm] spinner (not included) and appropriate-size, balanced propeller.

CHECK THE CONTROL DIRECTIONS

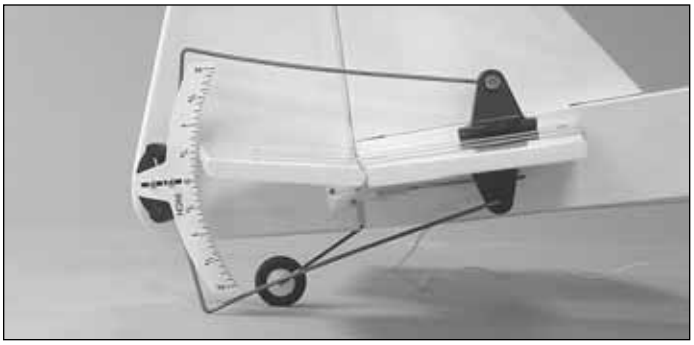
❍ 1. Turn on the transmitter and receiver and center the trims. If necessary, remove the servo arms from the servos and reposition them so they are centered. Reinstall the screws that hold on the servo arms.

❍ 2. With the transmitter and receiver still on, check all the control surfaces to see if they are centered. If necessary, adjust the clevises on the pushrods to center the control surfaces.



❍ 3. Make certain that the control surfaces and the carburetor respond in the correct direction as shown in the diagram. If any of the controls respond in the wrong direction, use the servo reversing in the transmitter to reverse the servos connected to those controls. Be certain the control surfaces have remained centered. Adjust if necessary.

SET THE CONTROL THROWS



Use a Great Planes AccuThrow or a ruler to measure and set the control throw of each control surface as indicated in the chart that follows. If your radio does not have dual rates, we recommend setting the throws at the low rate setting.

Note: The throws are measured at the **widest part** of the elevators and rudder.

These are the recommended control surface throws:

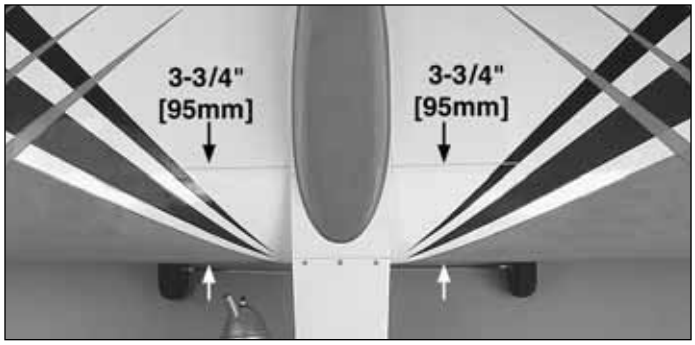
	High Rate	Low Rate
ELEVATOR:	3/4" [19mm] up 3/4" [19mm] down	1/2" [13mm] up 1/2" [13mm] down
RUDDER:	1-1/4" [32mm] right 1-1/4" [32mm] left	
AILERONS:	3/4" [19mm] up 3/4" [19mm] down	1/2" [13mm] up 1/2" [13mm] down

IMPORTANT: The Tower Hobbies Uproar 40 ARF has been **extensively** flown and tested to arrive at the throws at which it flies best. Flying your model at these throws will provide you with the greatest chance for successful first flights. If, after you have become accustomed to the way the Uproar 40 ARF flies, you would like to change the throws to suit your taste, that is fine. However, too much control throw could make the model difficult to control, so remember, "more is not always better."

BALANCE THE MODEL (C.G.)

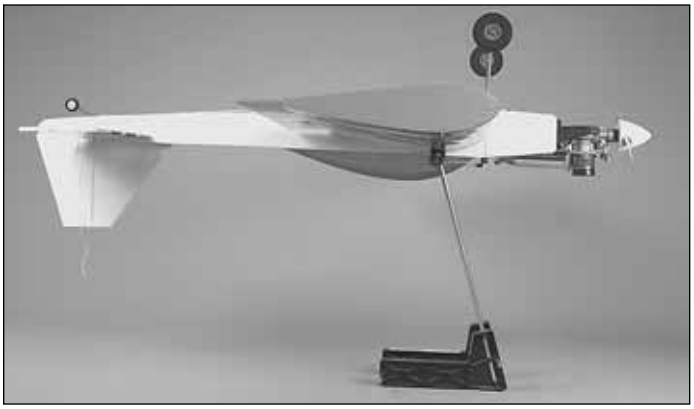
More than any other factor, the **C.G.** (balance point) can have the **greatest** effect on how a model flies, and may determine whether or not your first flight will be successful. If you value this model and wish to enjoy it for many flights, **DO NOT OVERLOOK THIS IMPORTANT PROCEDURE.** A model that is not properly balanced will be unstable and possibly unflyable.

At this stage the model should be in ready-to-fly condition with all of the systems in place including the engine, landing gear, radio system, propeller and spinner.



❍ 1. If you will be using a Great Planes C.G. Machine to balance your model, set the rulers to 3-3/4" [95mm]. Place the plane upside-down on the machine. If you will not be using the C.G. Machine, use a felt-tip pen or narrow (1/8" [3mm] or less) tape to accurately mark the C.G. on the top of the wing on both sides of the fuselage 3-3/4" [95mm] back from the leading edge of the wing.

This is where your model should balance for the first flights. Later, you may wish to experiment by shifting the C.G. up to 1/4" [6mm] forward or 1/4" [6mm] back to change the flying characteristics. Moving the C.G. forward may improve the smoothness and stability, but the model may then require more speed for takeoff and make it more difficult to slow for landing. Moving the C.G. aft makes the model more maneuverable, but could also cause it to become too difficult to control. In any case, **start at the recommended balance point** and do not at any time balance the model outside the specified range.



❍ 2. With the wing attached to the fuselage, all parts of the model installed (ready to fly) and an empty fuel tank, place the model upside-down on the Great Planes C.G. Machine, or lift it upside-down at the balance point you marked. You should be able to feel the tape lines with your fingers.

❍ 3. If the tail drops, the model is "tail heavy" and the battery pack and/or receiver must be shifted forward or weight must be added to the nose to balance. If the nose drops, the model is "nose heavy" and the battery pack and/or receiver must be shifted aft or weight must be added to the tail to balance. If possible, relocate the battery pack and receiver to minimize or eliminate any additional ballast required. If additional weight is required, nose weight may be easily added by using a "spinner weight" (GPMQ4645 for the 1 oz. [28g] weight, or GPMQ4646 for the 2 oz. [57g] weight). If spinner weight is not practical or is not enough, use Great Planes (GPMQ4485) "stick-on" lead. A good place to add stick-on nose weight is to the firewall. Begin by placing incrementally increasing amounts of weight on the bottom of the fuselage over the nose or tail until the model balances. Once you have determined the amount of weight required, it can be permanently attached. If required, tail weight may be added by cutting open the bottom of the fuselage and gluing it permanently inside.

Note: Do not rely upon the adhesive on the back of the lead weight to permanently hold it in place. Over time, fuel and exhaust residue may soften the adhesive and cause the weight to fall off. Use #2 sheet metal screws, RTV silicone or epoxy to permanently hold the weight in place.

❍ 4. **IMPORTANT:** If you found it necessary to add any weight, recheck the C.G. after the weight has been installed.

BALANCE THE MODEL LATERALLY

❍ 1. With the wing level, lift the model by the engine propeller shaft and the bottom of the fuselage under the trailing edge of the fin. Do this several times.

❍ 2. If one wing always drops when you lift the model, it means that side is heavy. Balance the airplane by adding weight to the other wing tip. **An airplane that has been laterally balanced will track better in loops and other maneuvers.**

PREFLIGHT

IDENTIFY YOUR MODEL

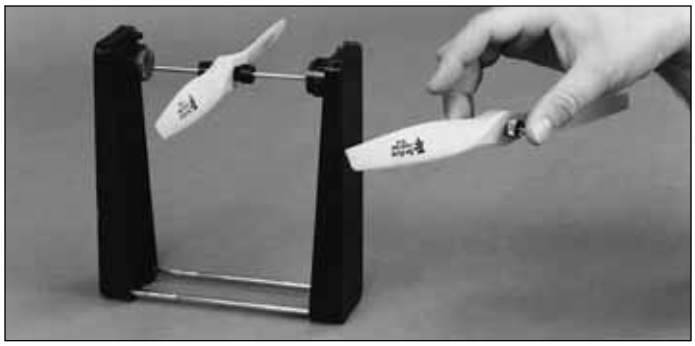
No matter if you fly at an AMA sanctioned R/C club site or if you fly somewhere on your own, you should always have your name, address, telephone number and AMA number on or inside your model. It is **required** at all AMA R/C club flying sites and AMA sanctioned flying events. Fill out the identification tag on the back cover page and place it on or inside your model.

CHARGE THE BATTERIES

Follow the battery charging instructions that came with your radio control system to charge the batteries. 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.

CAUTION: Unless the instructions that came with your radio system state differently, the **initial** charge on **new** transmitter and receiver batteries should be done for 15 hours **using the slow-charger that came with the radio system**. This will "condition" the batteries so that the next charge may be done using the fast-charger of your choice. If the initial charge is done with a fast-charger the batteries may not reach their full capacity and you may be flying with batteries that are only partially charged.

BALANCE THE PROPELLERS



Carefully balance your propeller and spare propellers before you fly. An unbalanced prop can be 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.

GROUND CHECK

If the engine is new, follow the engine manufacturer's instructions to break-in the engine. After break-in, confirm that the engine idles reliably, transitions smoothly and rapidly to full power and maintains full power–indefinitely. After you run the engine on the model, inspect the model closely to make sure all screws remained tight, the hinges are secure, the prop is secure and all pushrods and connectors are secure.

RANGE CHECK

Ground check the operational 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, or a damaged receiver crystal from a previous crash.

ENGINE SAFETY PRECAUTIONS

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 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.

Do not run the engine in an area of loose gravel or sand; the propeller may throw such material in your face or eyes.

Keep your face and body as well as all spectators away from the plane of rotation of the propeller as you start and run the engine. Keep these items away from the prop: loose clothing, shirt sleeves, ties, scarfs, long hair or loose objects such as pencils or screwdrivers that may fall out of shirt or jacket pockets into the prop.

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

Make all engine adjustments from behind the rotating propeller.

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

To stop a glow engine, cut off the fuel supply by closing off the fuel line or following the engine manufacturer's recommendations. Do not use hands, fingers or any other body part to try to stop the engine. To stop a gasoline powered engine an on/off switch should be connected to the engine coil. Do not throw anything into the propeller of a running engine.

AMA SAFETY CODE (excerpt)

Read and abide by the following excerpts from the Academy of Model Aeronautics Safety Code. For the complete Safety Code refer to *Model Aviation* magazine, the AMA web site or the Code that came with your AMA license.

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 utilized 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.

5) I will not fly my model unless it is identified with my name and address or AMA number, on or in the model. **Note:** This does not apply to models while being flown indoors.

7) 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 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) At all flying sites a straight or curved line(s) must be established in front of which all flying takes place with the other side for spectators. Only personnel involved with flying the aircraft are allowed at or in the front of the flight line. Intentional flying behind the flight line is prohibited.

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

5) **I will not knowingly operate my model within three miles of any pre-existing flying site except in accordance with the frequency sharing agreement listed** (in the complete AMA Safety Code).

9) Under no circumstances may a pilot or other person touch a powered model in flight; **nor should any part of the model other than the landing gear, intentionally touch the ground, except while landing**.

CHECK LIST

During the last few moments of preparation your mind may be elsewhere anticipating the excitement of the first flight. Because of this, you may be more likely to overlook certain checks and procedures that should be performed before the model is flown. To help avoid this, a check list is provided to make sure these important areas are not overlooked. 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 they are completed (that's why it's called a *check list!*).

- ❍ 1. Check the C.G. according to the measurements provided in the manual.
- ❍ 2. Be certain the battery and receiver are securely mounted. Simply stuffing them into place with foam rubber is not sufficient.
- ❍ 3. 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.
- ❍ 4. Balance your model *laterally* as explained in the instructions.
- ❍ 5. Use thread locking compound to secure critical fasteners such as the set screws that hold the wheel collars to the landing gear, screws that hold the carburetor arm (if applicable), the screw-lock pushrod connector on the throttle servo, etc.
- ❍ 6. Add a drop of oil to the axles so the wheels will turn freely.
- ❍ 7. Make sure all hinges are **securely** glued in place.
- ❍ 8. Reinforce holes for wood screws with thin CA where appropriate (servo mounting screws, hatch covers, main landing gear screws).
- ❍ 9. Confirm that all controls operate in the correct direction and the throws are set up according to the manual.
- ❍ 10. Make sure all the servo arms are mounted to the servos with the screws included with your radio.
- ❍ 11. Make sure none of the servo wires or Y-connectors can get caught in any of the pushrods or servo arms.
- ❍ 12. Make sure the fuel lines are connected and are not kinked.
- ❍ 13. Balance your propeller (and spare propellers).
- ❍ 14. Tighten the propeller nut and spinner.
- ❍ 15. Place your name, address, AMA number and telephone number on or inside your model.
- ❍ 16. Cycle your receiver battery pack (if necessary) and make sure it is fully charged.
- ❍ 17. If you wish to photograph your model, do so before your first flight.
- ❍ 18. Range check your radio when you get to the flying field.

FLYING

The Tower Hobbies Uproar 40 ARF is a great-flying model that flies smoothly and predictably. The Uproar 40 ARF does not, however, possess the self-recovery characteristics of a primary R/C trainer and should be flown only by pilots who have some R/C experience.

CAUTION (THIS APPLIES TO ALL R/C AIRPLANES): If, while flying, you notice an alarming or unusual sound such as a low-pitched "buzz," this may indicate control surface *flutter*. Flutter occurs when a control surface (such as an aileron or elevator) or a flying surface (such as a wing or stab) rapidly vibrates up and down (thus causing the noise). In extreme cases, if not detected immediately, flutter can actually cause the control surface to detach or the flying surface to fail, thus causing loss of control followed by an impending crash. The best thing to do when flutter is detected is to slow the model **immediately** by reducing power, then land as soon as safely possible. Identify which surface fluttered (so the problem may be resolved) by checking all the servo grommets for deterioration or signs of vibration. Make certain all pushrod linkages are secure and free of play. If it fluttered once, under similar circumstances it will probably flutter again unless the problem is fixed. Some things which can cause flutter are; Excessive hinge gap; Not mounting control horns solidly; Poor fit of clevis pin in horn; Side-play of wire pushrods caused by large bends; Excessive free play in servo gears; Insecure servo mounting; and one of the most prevalent causes of flutter; Flying an over-powered model at excessive speeds.

Before the first flight of the day don't forget to do a range check with the engine off and with the engine running. Also don't forget to check to make sure all the controls respond in the correct direction before EVERY flight.

Before takeoff, see how the Uproar 40 ARF handles on the ground and check to see if the tail wheel is straight. Do not use the rudder trim to get the model to roll straight. Instead, use pliers to carefully bend the tail gear wire as necessary. When ready for takeoff, point the model down the runway into the wind. Gently apply full throttle to keep the model from "looping out" on the ground. When adequate speed has been reached gently apply up elevator to lift the model into the air. After reaching a safe altitude fly around for a few minutes to see how the Uproar 40 ARF behaves in different situations. Adjust the trims as necessary to get the model to fly straight-and-level. If you find the Uproar 40 ARF a bit of a handful you can always **throttle back** to make it fly and react slower. While still at a safe altitude make a few practice landing approaches by cutting the throttle

to see how the model behaves in “landing mode.” Make mental notes (or have a friend make notes) of any trim or C.G. changes that may be required. Land when ready. After landing, make any mechanical adjustments so the trims can be returned to center. Make an inspection of the model to make sure all systems are operating and all fasteners are still tight and present.

One final note about flying your model. Have a goal or flight plan in mind for **every** flight. This can be learning a new maneuver(s), improving a maneuver(s) you already know, or learning how the model behaves in certain conditions (such as on high or low rates). This is not necessarily to improve your skills *(though it is never a bad idea!)*, but more importantly so you do not surprise yourself by impulsively attempting a maneuver and suddenly finding that you’ve run out of time, altitude or airspeed. Every maneuver should be deliberate, not impulsive. For example, if you’re going to do a loop, check your altitude, mind the wind direction (anticipating rudder corrections that will be required to maintain heading), remember to throttle back at the top, and make certain you are on the desired rates (high/low rates). A flight plan greatly reduces the chances of crashing your model just because of poor planning and impulsive moves. **Remember to think.**

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

GOOD LUCK AND GREAT FLYING!

This model belongs to:

Name

Address

City, State, Zip

Phone number

AMA number

Cut out or copy the identification tag and put it on or inside your model.

ENGINE MOUNT TEMPLATE

MAIN LANDING GEAR MOUNTING TEMPLATE