PROFILE 38™

INSTRUCTION MANUAL

Wingspan: 50 in [1270mm]
Wing Area: 416 sq in [27dm²]
Weight: 4 – 5 lbs [1810 – 2270g]
Wing Loading: 22 – 27 oz/sq ft [68 – 85g/dm²]
Length: 36 – 3/4 in [933mm]
Radio: 4-channel transmitter with 6 standard servos
Engine: .15 – .25 cu. in. [2.5 – 4.0cc] two-stroke

MADE IN USA

WARRANTY

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

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

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

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

GREAT PLANES® MODEL MANUFACTURING COMPANY
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P382P03 for GPMA0487 V1.0 Printed in USA

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INTRODUCTION

Along with the P-51, the P-38 is one of the most admired planes of WW2. It is also one of the most difficult to build and fly. But the Great Planes Profile 38 has eliminated those hurdles. The booms of the Great Planes Profile 38 build quickly and flat on your building board. The center pod is molded from ABS, eliminating the difficult job of sheeting the compound curves. Through extensive testing and design we have minimized the flight problems that occur when an engine quits in flight. So if you're ready for an easy building, fun to fly plane, let's get started.

While the Profile 38 is easy to fly, it does not have the total self-recovery and stability of a basic trainer like the Great Planes series of PT basic trainers. Therefore, if you have never flown an R/C airplane before, we strongly recommend that you do not attempt to fly the Profile 38 without first learning to fly a trainer. On the other hand, if you have already become proficient at flying low wing airplanes, the Profile 38 is an excellent choice for your first twin engine plane.

For the latest technical updates or manual corrections to the Profile 38, visit the web site listed below and select the Great Planes Profile 38. If there is new technical information or changes to this kit a "tech notice" box will appear in the upper left corner of the page.

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

Scale Covering Schemes

If you would like photos of the full-size P-38 to study the photos to add more scale details, photo packs are available from:

Bob's Aircraft Documentation
3114 Yukon Ave.
Costa Mesa, CA 92626

Telephone: (714) 979-8058
Fax: (714) 979-7279
E-mail: *www.bobsairdoc.com*

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

1. Your Profile 38 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 Profile 38, 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 already an experienced R/C pilot, you should fly the model only with the help of a competent, experienced R/C pilot.

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

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.

Before starting to build, compare the parts in this kit with the Parts List, and note any missing parts. Also inspect all parts to make sure they are of acceptable quality. If any parts are missing, broken or defective, or if you have any questions about building or flying this airplane, please contact Great Planes at the address or telephone number below. If you are contacting us for replacement parts, please be sure to provide the full kit name (Profile 38) and the part numbers as listed in the Parts List.

Great Planes Product Support:
3002 N Apollo Drive, Suite 1
Champaign, IL 61822
Telephone: (217) 398-8970
Fax: (217) 398-7721
E-mail: *productsupport@greatplanes.com*

You can also check our web site at *www.greatplanes.com* for the latest Profile 38 updates.

If you 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.

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

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

DECISIONS YOU MUST MAKE

Engine Selection

Recommended Engine Size: .15 to .25 cu. in. 2-stroke
Two .15 size engines will fly the Profile 38 well. However, if one engine quits in the air, the plane will not have enough power to maintain level flight. The plane will have to land. With two .25 size engines, if one engine quits in the air, the plane can continue flying on one engine.

REQUIRED ITEMS

Required Accessories

- ❑ Engine and suitable propellers
- ❑ 4-Channel radio with 6 standard servos
- ❑ (2) 12" [300mm] Servo extension (HCAM2711 for Futaba®)
- ❑ (2) Y-harnesses (HCAM2751 for Futaba)
- ❑ 1/4" [6mm] R/C foam rubber (HCAQ1000)
- ❑ (2) 4 oz. [120cc] Fuel tank (GPMQ4101)
- ❑ 3' [900mm] Standard silicone fuel tubing (GPMQ4131)
- ❑ #64 Rubber bands (1/4 lb [113g] box, HCAQ2020)
- ❑ (1) 2" [51mm] Nose wheel (GPMQ4221)
- ❑ (2) 2-1/2" [64mm] Main wheels (GPMQ4223)
- ❑ (2) 2" [51mm] White spinner (GPMQ4510)
- ❑ (2) Rolls covering film (if covering in one color), box cover model was covered with:

  Aluminum (TOPQ0205)
  Black (TOPQ0208)
  White (TOPQ0204)
  Cub Yellow (TOPQ0220)
  Olive Drab (TOPQ0210)

Adhesives & Building Supplies

In addition to common household tools (screwdrivers, drill, etc.), this is the "short list" of the most important items required to build the Profile 38. *We recommend **Great Planes Pro**™ CA and Epoxy glue.*

- ❑ 1 oz. [30g] Thin Pro CA (GPMR6002)
- ❑ 1 oz. [30g] Medium Pro CA+ (GPMR6008)
- ❑ Pro 30-minute epoxy (GPMR6047)
- ❑ Pro 6-minute epoxy (GPMR6045)
- ❑ HobbyLite™ balsa-colored balsa filler (HCAR3401)
- ❑ Plan Protector™ (GPMR6167) or wax paper
- ❑ Drill bits: 1/16" [1.6mm], 3/32" [2.4mm], 7/64" [2.8mm], 1/8" [3.2mm], 5/32" [4mm], 3/16" [4.8mm],
- ❑ Small metal file
- ❑ Stick-on segmented lead weights (GPMQ4485)
- ❑ Silver solder w/flux (GPMR8070)
- ❑ #1 Hobby knife (HCAR0105)
- ❑ #11 Blades (100-pack, HCAR0311)
- ❑ Single-edge razor blades (10-pack, HCAR0212)
- ❑ Small T-pins (100, HCAR5100)
- ❑ Medium T-pins (100, HCAR5150)
- ❑ Sanding tools and sandpaper assortment (see ***Expert Tip–Easy-Touch™ Bar Sander*** section on page 5)

Covering Tools

- ❑ Top Flite® MonoKote® sealing iron (TOPR2100)
  or
- ❑ 21st Century® sealing iron (COVR2700)
- ❑ Top Flite Hot Sock™ iron cover (TOPR2175)
  or
- ❑ 21st Century iron cover (COVR2702)
- ❑ Top Flite MonoKote trim seal iron (TOPR2200)
  or
- ❑ 21st Century trim seal iron (COVR2750)
- ❑ Top Flite MonoKote heat gun (TOPR2000)

Optional Supplies & Tools

Here is a list of optional tools mentioned in the manual that will help you build the Profile 38.

- ❑ Pro Aliphatic resin (2 oz. [60g], GPMR6160)
- ❑ 2 oz. [57g] Spray CA activator (GPMR6035)
- ❑ 4 oz. [113g] Aerosol CA activator (GPMR634)
- ❑ CA applicator tips (HCAR3780)
- ❑ CA debonder (GPMR6039)
- ❑ Kyosho® masking film (KYOR1040)
- ❑ Epoxy brushes (6, GPMR8060)
- ❑ Mixing sticks (50, GPMR8055)
- ❑ Mixing cups (GPMR8056)
- ❑ Razor plane (MASR1510)
- ❑ Builder's triangle set (HCAR0480)
- ❑ Metal template set (30°/60°/90° and 45° triangles, HCAR0500)
- ❑ Scale warbird template (TOPQ2187)
- ❑ 36" Metal ruler (HCAR0475)
- ❑ Curved-tip canopy scissors (for trimming plastic parts, (HCAR0667)
- ❑ Pliers with wire cutter (HCAR0630)
- ❑ Robart Super Stand II (ROBP1402)
- ❑ 18" x 24" [460 x 610mm] Builder's cutting mat (HCAR0455)
- ❑ 16" x 48" [410 x 1220mm] Building board (GPMR6950)
- ❑ Hobbico® Duster™ can of compressed air (HCAR5500)
- ❑ Masking tape (TOPR8018)
- ❑ Threadlocker™ thread locking cement (GPMR6060)
- ❑ Denatured alcohol (for epoxy clean up)
- ❑ Panel Line Pen (TOPQ2510)
- ❑ Z-bend pliers (HCAR2000)
- ❑ Rotary tool such as Dremel® Moto-Tool®
- ❑ Rotary tool reinforced cut-off wheel (GPMR8200)
- ❑ Servo horn drill (HCAR0698)
- ❑ Hobby Heat™ micro torch (HCAR0750)
- ❑ Dead Center™ Engine Mount Hole Locator (GPMR8130)
- ❑ AccuThrow™ Deflection Gauge (GPMR2405)
- ❑ Slot Machine™ hinge slotting tool (110V, GPMR4010)
- ❑ CG Machine™ (GPMR2400)
- ❑ Laser incidence meter (GPMR4020)
- ❑ Precision Magnetic Prop Balancer™ (TOPQ5700)

EXPERT TIP

EASY-TOUCH™ BAR SANDER

A flat, durable, easy to handle sanding tool is a necessity for building a well finished model. Great Planes makes a complete range of Easy-Touch Bar Sanders and replaceable Easy-Touch Adhesive-backed Sandpaper. While building the P-38 Profile, two 5-1/2" [140mm] Bar Sanders and two 11" [280mm] Bar Sanders equipped with 80-grit and 150-grit Adhesive-backed Sandpaper were used.

Here's the complete list of Easy-Touch Bar Sanders and Adhesive Backed Sandpaper:

5-1/2" [140mm] Bar Sander (GPMR6169)
11" [280mm] Bar Sander (GPMR6170)
22" [560mm] Bar Sander (GPMR6172)
33" [840mm] Bar Sander (GPMR6174)
44" [1120mm] Bar Sander (GPMR6176)
11" [280mm] Contour Multi-Sander (GPMR6190)

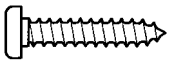
12' [3.66m] roll of Adhesive-backed 80-grit sandpaper (GPMR6180)
150-grit (GPMR6183)
180-grit (GPMR6184)
220-grit (GPMR6185)
Assortment pack of 5-1/2" [140mm] strips (GPMR6189)

We also use Top Flite 320-grit (TOPR8030, 4 sheets) and 400-grit (TOPR8032, 4 sheets) wet-or-dry sandpaper for finish sanding.

IMPORTANT BUILDING NOTES

- There are two types of screws used in this kit:

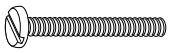
Sheet metal screws are designated by a number and a length.



For example #6 x 3/4"

This is a number six screw that is 3/4" long.

Machine screws are designated by a number, **threads per inch**, and a length. **SHCS** is just an abbreviation for "socket head cap screw" and that is a machine screw with a socket head.



For example 4-40 x 3/4".

This is a number four screw that is 3/4" long with forty threads per inch.

- 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.

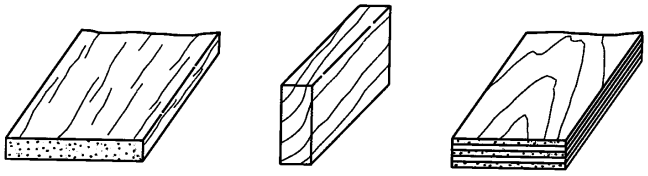
- Whenever just ***epoxy*** is specified you may use ***either*** 30-minute (or 45-minute) epoxy ***or*** 6-minute epoxy. When 30-minute epoxy is specified it is **highly** recommended that you use only 30-minute (or 45-minute) epoxy, because you will need the working time and/or the additional strength.

- ***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.

COMMON ABBREVIATIONS

Fuse = Fuselage
Stab = Horizontal Stabilizer
Fin = Vertical Fin
LE = Leading Edge
TE = Trailing Edge
LG = Landing Gear
Ply = Plywood
" = Inches
mm = Millimeters
SHCS = Socket Head Cap Screw

TYPES OF WOOD



Balsa **Basswood** **Plywood**

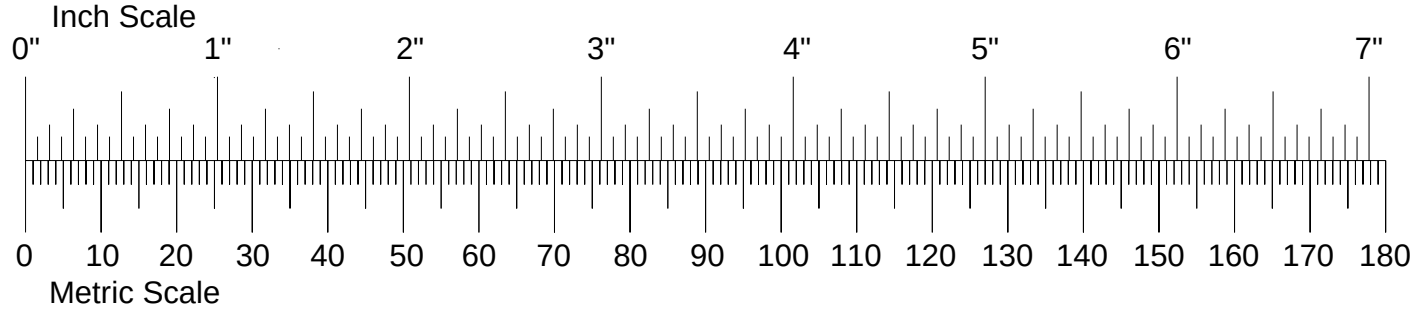
GET READY TO BUILD

1. Unroll the plan sheet. Re-roll it inside out to make it lie flat.

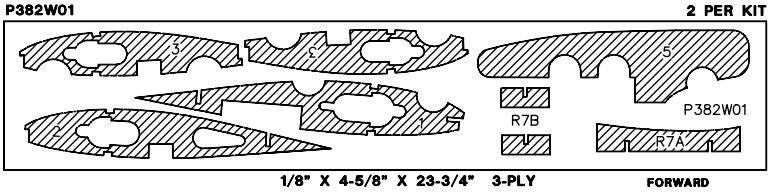
2. Remove all parts from the box. As you do, figure out the name of each part by comparing it with the plans and the parts list included with this kit. Using a felt-tip or ballpoint pen, lightly write the part **name** or **size** on each piece to avoid confusion later. Use the die-cut drawings shown on page 7 to identify the die-cut parts and mark them before removing them from the sheet. **Save all scraps.** If any of the die-cut parts are difficult to punch out, do not force them! Instead, cut around the parts with a hobby knife. After punching out the die-cut parts, use your Bar Sander or sanding block to **lightly** sand the edges to remove any die-cutting irregularities or slivers.

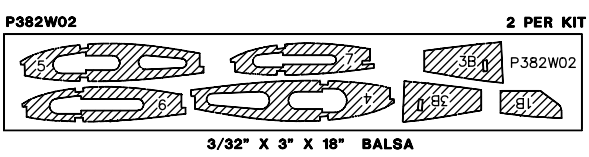
METRIC CONVERSIONS

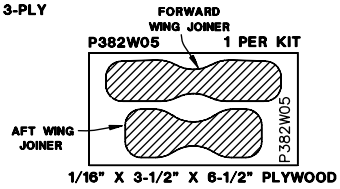
1/64"	.4 mm	3/8"	9.5 mm	12"	304.8 mm
1/32"	.8 mm	1/2"	12.7 mm	18"	457.2 mm
1/16"	1.6 mm	5/8"	15.9 mm	21"	533.4 mm
3/32"	2.4 mm	3/4"	19.0 mm	24"	609.6 mm
1/8"	3.2 mm	1"	25.4 mm	30"	762.0 mm
5/32"	4.0 mm	2"	50.8 mm	36"	914.4 mm
3/16"	4.8 mm	3"	76.2 mm		
1/4"	6.4 mm	6"	152.4 mm		

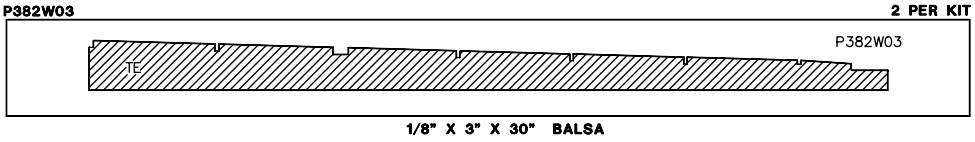


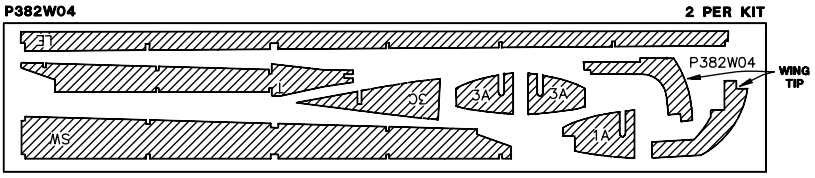
DIE-CUT DRAWINGS

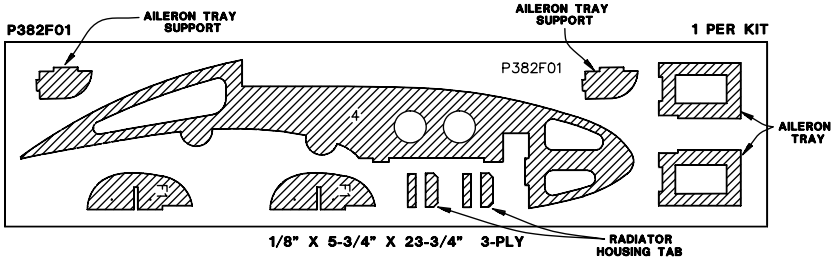


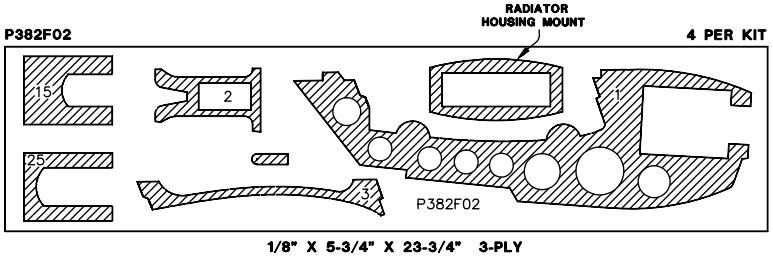


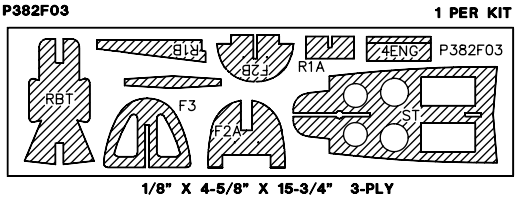


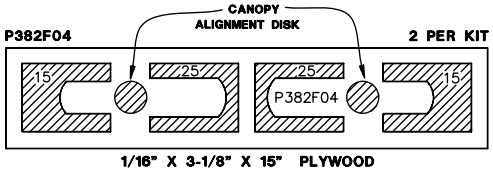


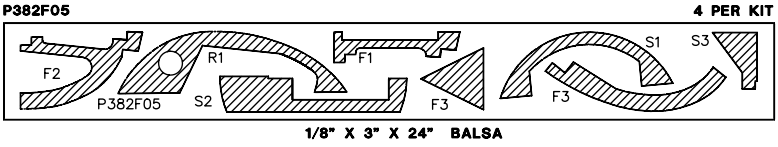










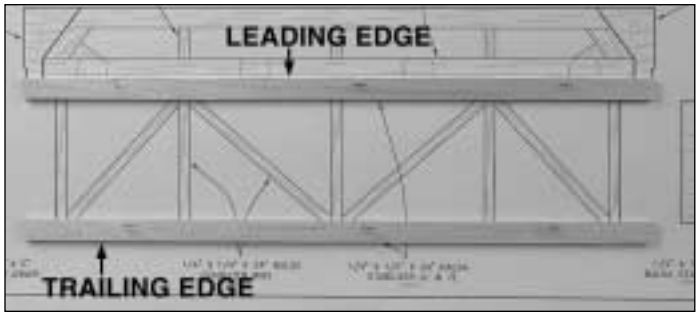


BUILD THE TAIL SURFACES

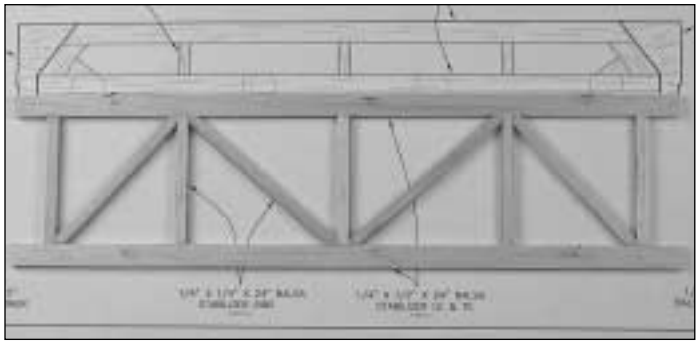
Build the Stabilizer

❏ 1. Unroll the plan sheets. Roll them inside out so they will lie flat.

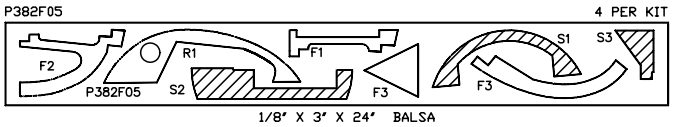
❏ 2. Position the wing plan so the stab plan is over your flat building board. Cover the plan with Great Planes Plan Protector™ or wax paper so glue will not adhere.

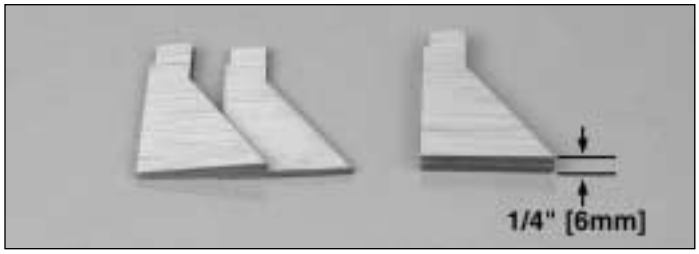


❏ 3. From two of the straightest 1/4" x 1/2" x 24" [6mm x 13mm x 610mm] balsa sticks, cut the **stabilizer leading** and **trailing edge** to match the stabilizer plan. Pin the leading and trailing edge over the plan.

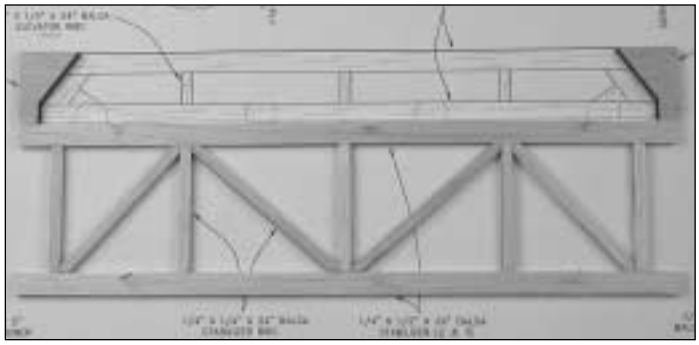


❏ 4. From 1/4" x 1/4" x 30" [6mm x 6mm x 762mm] balsa sticks, cut and glue the **stabilizer ribs** between the leading and trailing edge.

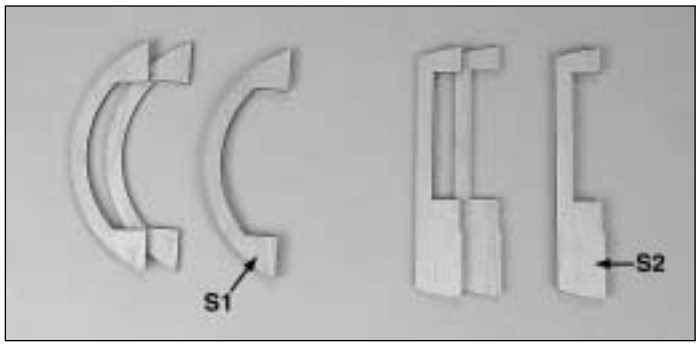




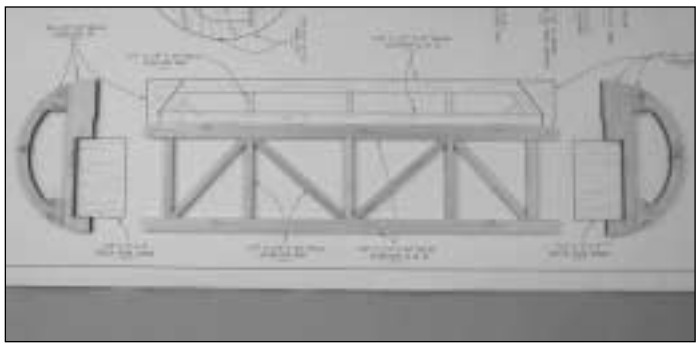
❏ 5. Locate the four die-cut 1/8" [3mm] balsa **S3 stabilizer tips**. Make two sets of S3's by gluing two of the 1/8" [3mm] S3's together to make 1/4" (6mm) thick S3's.



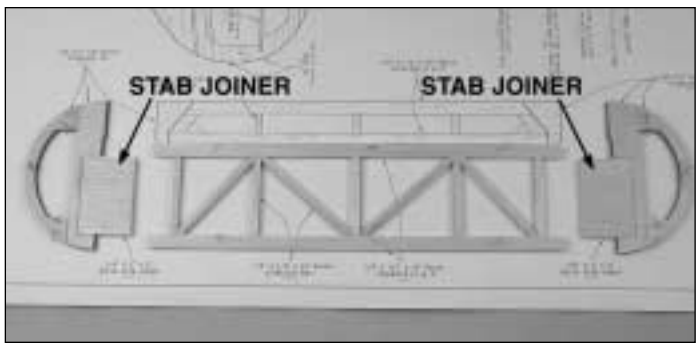
❏ 6. Glue the S3 stabilizer tips to the trailing edge of the stabilizer.



❏ 7. Locate the four die-cut 1/8" [3mm] balsa **S1** and **S2 stabilizer tips**. Glue two of the S1's together and two of the S2's together to make two 1/4" (6mm) thick S1's and S2's.



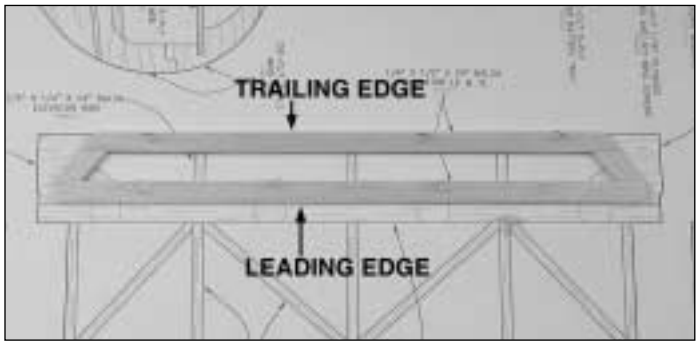
❏ 8. Pin S1 to the stabilizer tip plan. Pin and glue S2 to S1.



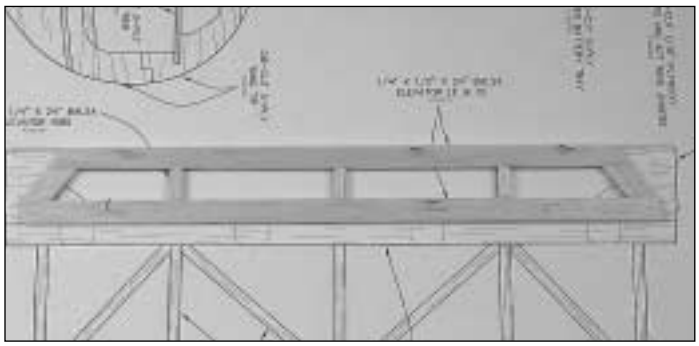
❏ 9. From the 1/4" x 3" x 5" [6mm x 76mm x 127mm] balsa sheet, cut two **stabilizer joiners** as shown on the stabilizer plan. Glue the joiners to S2. The stabilizer tips will be glued to the stabilizer later when the main booms are attached to the wing.

❑ 10. Remove the stab from your building board. Inspect all the glue joints and add CA to any joints that don't look strong. Fill any gaps with balsa sanding dust and a drop or two of thin CA.

Build the Elevator



❑ 1. From two 1/4" x 1/2" x 24" [6mm x 13mm x 610mm] balsa sticks, cut the **elevator leading** and **trailing edge** to match the elevator plan. Pin the leading and trailing edge over the plan. Cut and glue the elevator ends to the leading and trailing edge.

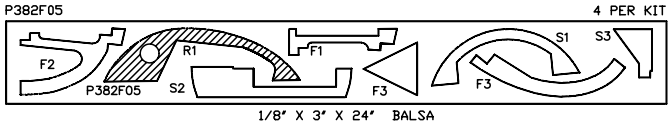


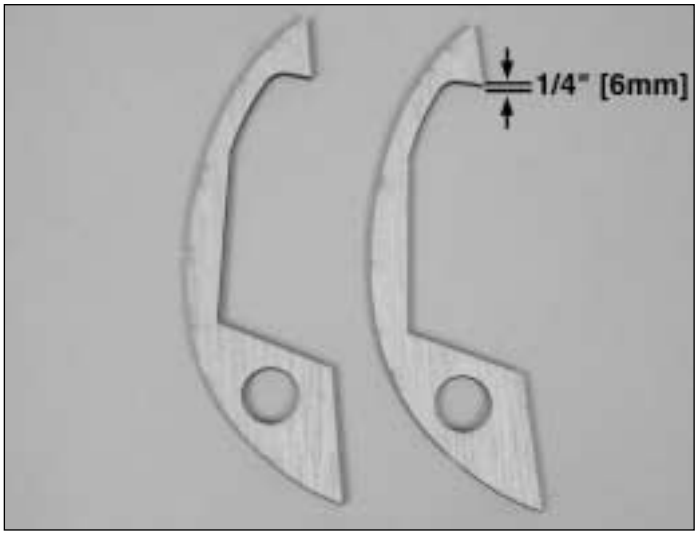
❑ 2. From a 1/4" x 1/4" x 30" [6mm x 6mm x 762mm] balsa stick, cut and glue the **elevator ribs** between the leading and trailing edge.

❑ 3. From the remaining 1/4" x 1/2" x 24" [6mm x 13mm x 610mm] balsa stick, cut and glue **gussets** in the corner between the elevator leading edge and elevator ends.

❑ 4. Remove the elevator from your building board. Inspect all the glue joints and add CA to any joints that don't look strong. Fill any gaps with balsa sanding dust and a drop or two of thin CA. First sand both sides of the stab and elevator flat and even. Then, round the edges of the stab and elevator as shown on the plan.

Build the Rudder

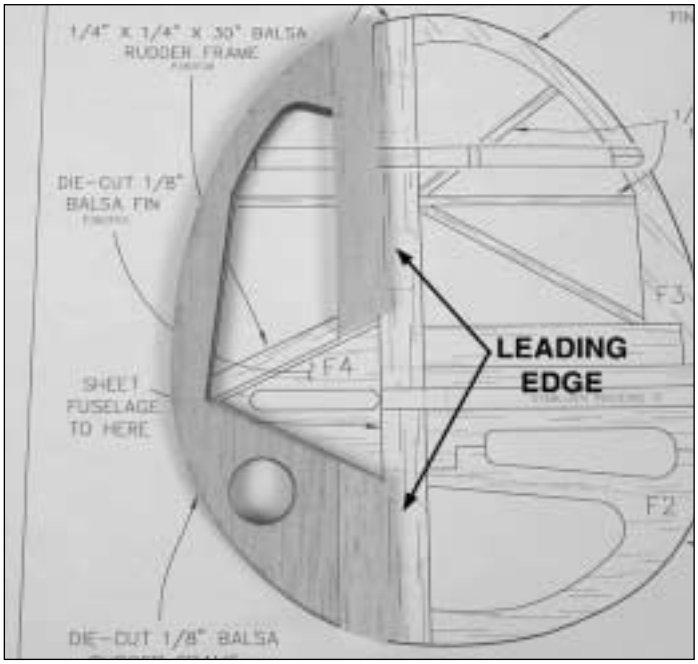




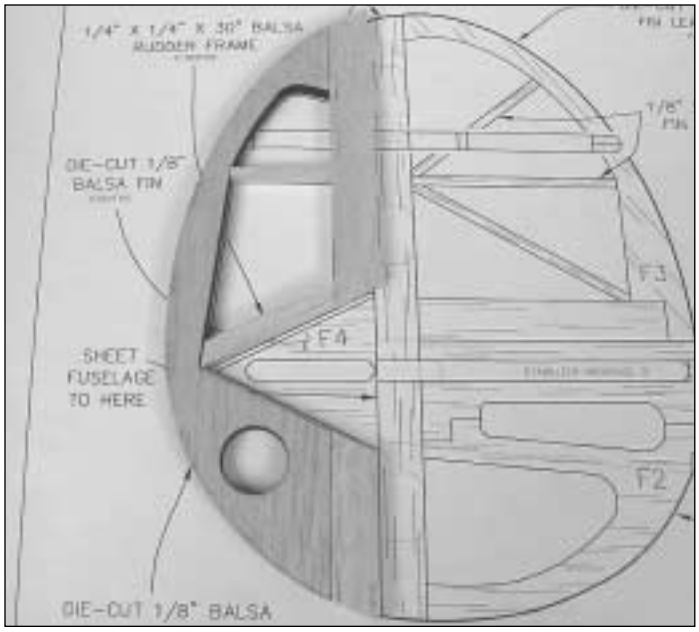
❑ 1. Locate the four die-cut 1/8" [3mm] balsa **R1 rudder trailing edges**. Glue two of the R1's together to make two 1/4" [6mm] thick R1's.

❑ 2. Position the fuse plan so the rudder plan is over your flat building board. Cover the plan with Great Planes Plan Protector or wax paper so glue will not adhere.

❑ ❑ 3. Pin the rudder trailing edge over the plan.



❑ ❑ 4. From remaining 1/4" x 1/2" x 24" [6mm x 13mm x 610mm] balsa sticks, cut the **rudder leading edge** to match the rudder plan. Pin and glue the leading edge to the die-cut trailing edge.



❏ ❏ 5. From the 1/4" x 1/4" x 30" [6mm x 6mm x 762mm] and 1/8" x 1/4" x 24" [3mm x 6mm x 610mm] balsa sticks, cut and glue ribs to the leading and trailing edges.

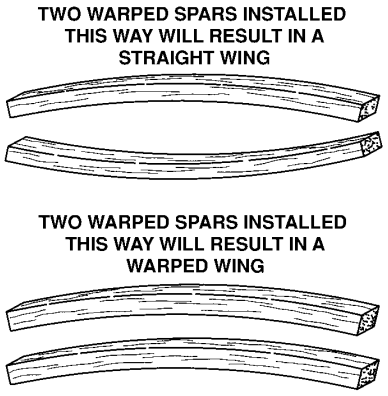
❏ ❏ 6. Remove the rudder from your building board. Inspect all the glue joints and add CA to any joints that don't look strong. Fill any gaps with balsa sanding dust and a drop or two of thin CA. Use a bar sander to sand both sides of the rudder flat and even.

❏ 7. Return to step 2 and build the second rudder.

BUILD THE WING

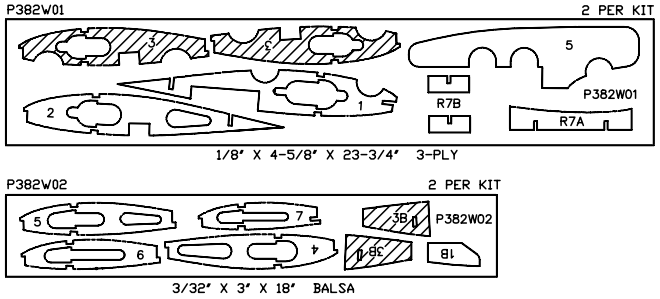
Build the Wing Panels

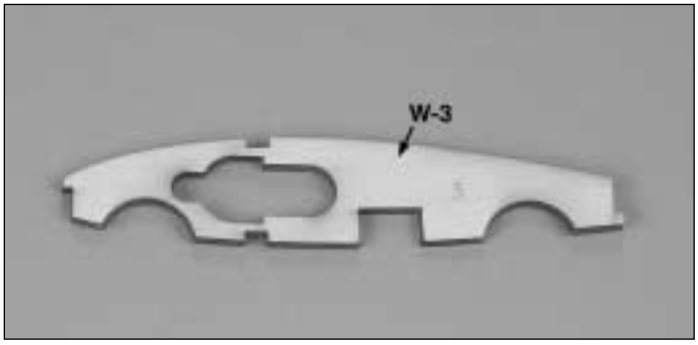
Start by building the left wing panel upside-down over the left wing panel plan so your progress matches the photos.



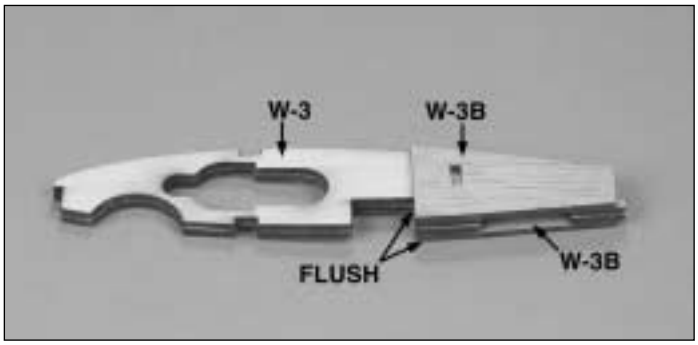
❏ 1. Match the four 1/8" x 1/4" x 24" [3mm x 6mm x 610mm] basswood main spars so any warps will counteract each other.

❏ 2. Cover the wing panel plan with waxed paper or Great Planes Plan Protector.



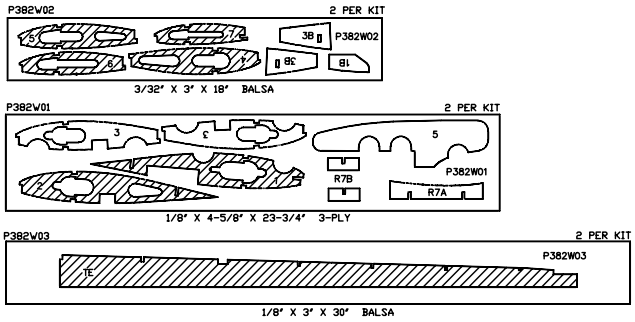


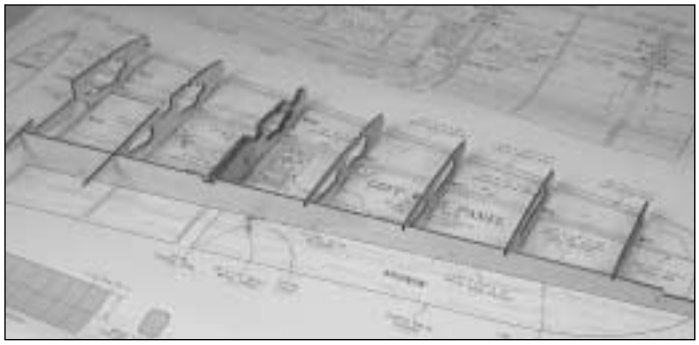
❏ ❏ 3. Glue two of the die-cut 3-ply **W-3 ribs** together.



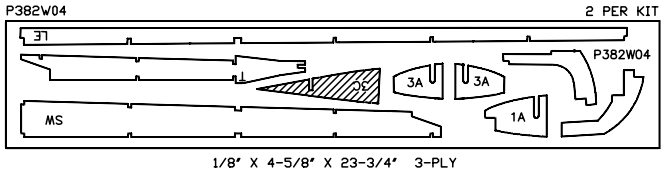
❏ ❏ 4. Glue the die-cut 3/32" [2mm] balsa **W-3B ribs** to both sides of the aft end of the W-3 rib.

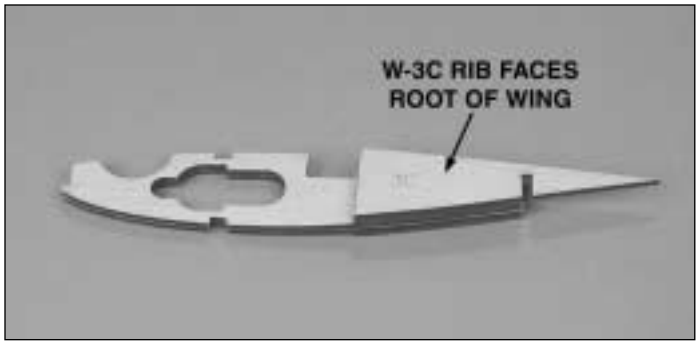
❏ ❏ 5. Position one of the main spars over the plan. Align the end of the main spar with the outboard edge of rib W-7.





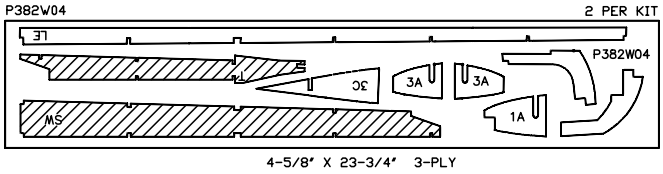
❑ ❑ 6. Pin the die-cut 1/8" [3mm] balsa **sub-trailing edge** over the plan, perpendicular to the building board. Position the die-cut **ribs** on the main spar, inserting the aft end of the ribs in the notches of the sub-trailing edge.

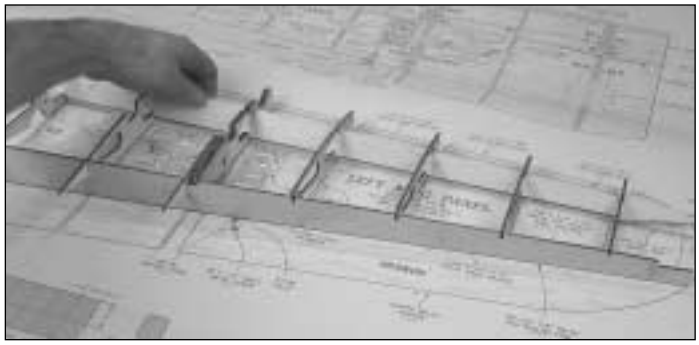


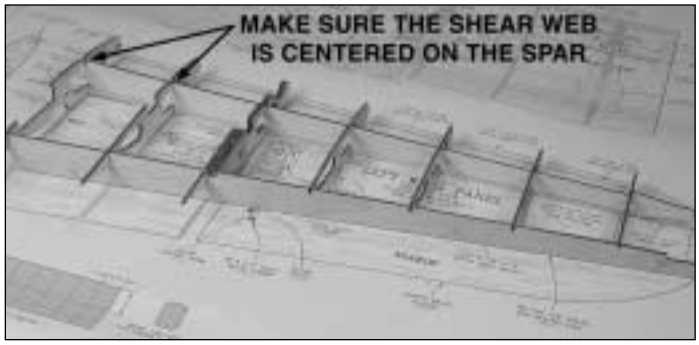


❑ ❑ 7. Note which side of rib W-3 faces the root of the wing. Remove W-3 and glue the die-cut 3-ply W-3C rib to this side.

❑ ❑ 8. Reinstall W-3 on the main spar and sub-trailing edge. Repin the main spar to your building board with the pins outside of rib W-1. Pin rib W-7 perpendicular to your building board. Remove the remaining pins holding the main spar to the building board. This will allow the shear web to be installed in the next step.



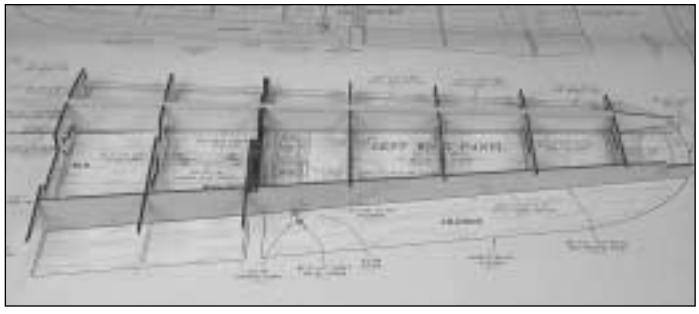




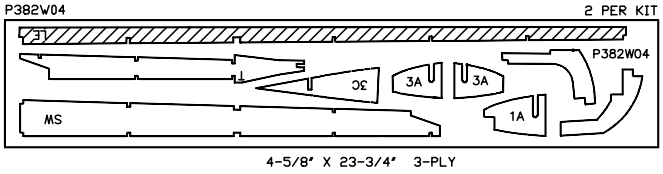
❑ ❑ 9. Glue the two-piece die-cut 3-ply **shear web** together. Use a straightedge to keep the two pieces aligned. From the root rib, insert the shear web through the center of the ribs. Carefully rotate it so that the “T” on the shear web is towards your building board and the notches are aligned with the ribs. Position the shear web so that it is as far back in the rib as possible. The shear web will be centered on the main spar. Pay special attention at ribs 1 and 2.

❑ ❑ 10. Pin the ribs to your building board next to the main spar. Once the shear web is in position, glue it to the ribs and the main spar.

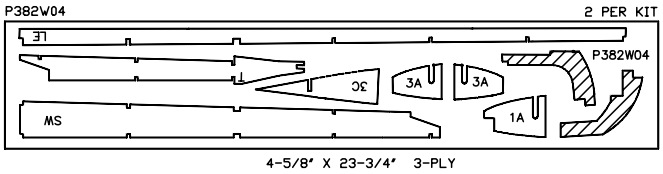
❑ ❑ 11. With the ribs fully seated in the sub-trailing edge, glue the ribs to the sub-trailing edge.

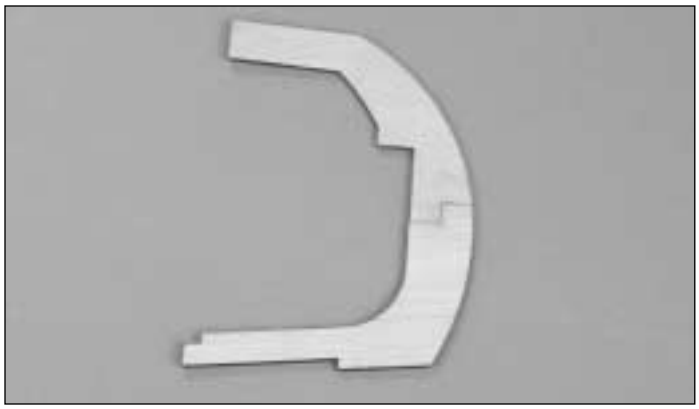


❑ ❑ 12. Test fit the second main spar in the ribs. Make sure it is flush with the top of the ribs. Once satisfied with the fit, remove the spar and apply a bead of medium CA along the top edge of the shear web and the main spar notch of the ribs and reinstall the spar.

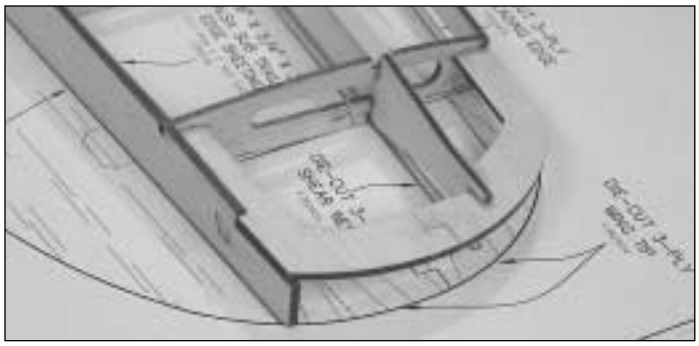


❑ ❑ 13. Position the die-cut 3-ply **sub-leading edge** over the tabs on the front of the ribs. As you glue the sub-leading edge to the ribs, make sure the sub-trailing edge and main spar is down on your building board.





❑ ❑ 14. Glue the two die-cut 3-ply **wing tip pieces** together as shown on the plan.

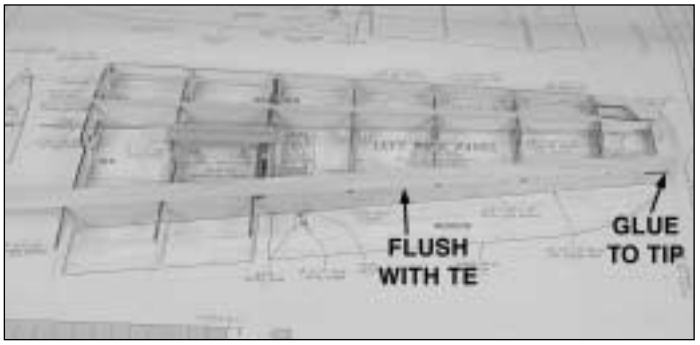


❑ ❑ 15. Glue the wing tip to the sub-trailing edge, shear web and rib W-7.

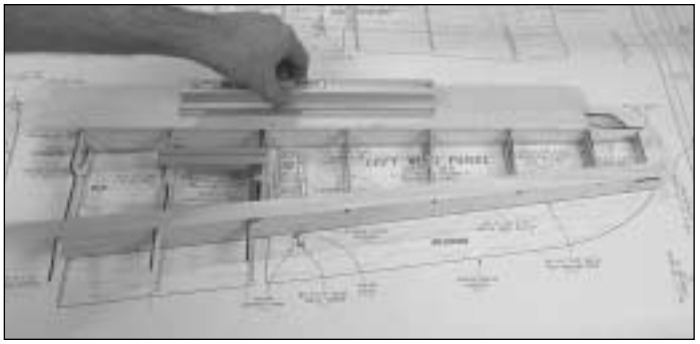
❑ ❑ 16. Using a sanding bar with 220-grit sandpaper, lightly sand the top of the ribs, main spar, sub-leading edge and sub-trailing edge all flush.

❑ ❑ 17. Use epoxy to glue the hardwood **landing gear rail** in the notches of ribs W-2 and W-3. Make sure that the landing gear rail protrudes above the ribs by 1/16" [1.6mm] and is flush with the side of rib W-3. Before the epoxy hardens, wipe off any excess from rib W-2 using a paper towel dampened with denatured alcohol.

Sheet the Wing Panels



❑ 1. From one of the 1/16" x 3" x 30" [1.6mm x 76mm x 762mm] balsa sheets, cut a 1/16" x 5/8" x 30" [1.6mm x 16mm x 762mm] **trailing edge strip**. Glue the strip to the sub-trailing edge, ribs W-1 through W-7 and the wing tip.

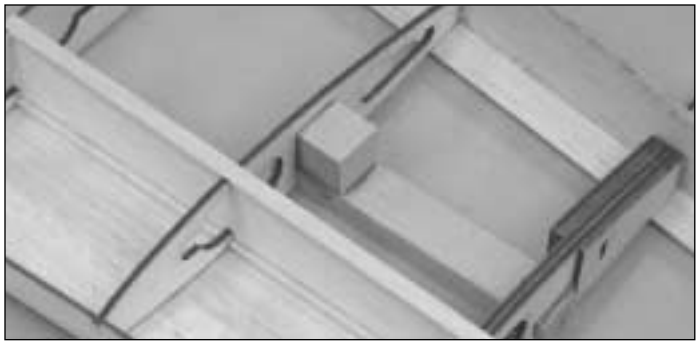


❑ ❑ 2. True one edge of a 1/16" x 3" x 24" [1.6mm x 76mm x 610mm) balsa sheet to make a **leading edge sheet**. The sheet is installed from the middle of the main spar to the sub-leading edge by first applying medium CA along the front half of the main spar, the edge of the ribs and the sub-leading edge. Position the sheet on the main spar and slowly press the sheet down onto the ribs and leading edge. Use a sanding bar to press the sheet down evenly.

❑ ❑ 3. From a second 1/16" x 3" x 30" [1.6mm x 76mm x 762mm] balsa sheet, make a **trailing edge sheet** to fit from rib W-1 to W-3. Cut the sheet 2-1/8" [54mm] wide. Glue the sheet to the trailing edge strip and the top of the ribs.

❑ ❑ 4. Remove the wing panel from your building board. Check all the glue joints. Pay special attention to the joint between the shear web and the main spars. The shear web must be securely glued to the main spar.

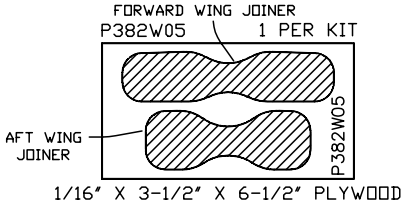
❑ ❑ 5. Trim the sheeting flush with rib W-1 and the sub-leading edge.

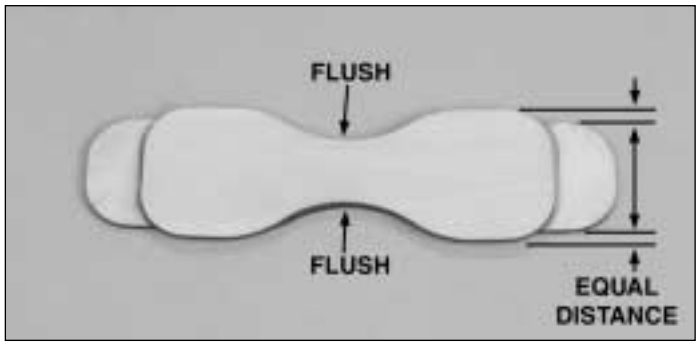


❑ ❑ 6. Use epoxy to glue the 3/4" x 3/4" x 3/4" [19mm x 19mm x 19mm] hardwood **landing gear torque block** to the landing gear rail and rib W-2.

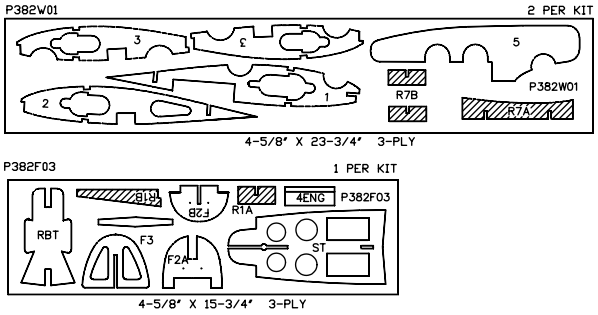
❑ 7. Return to step 2 and build the right wing panel.

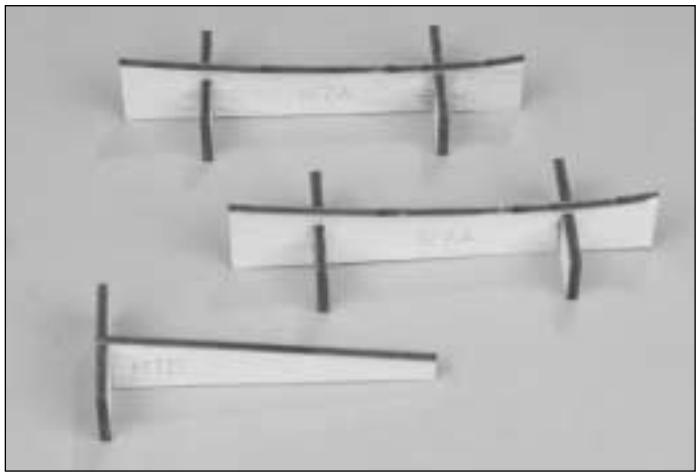
Join the Wing Panels



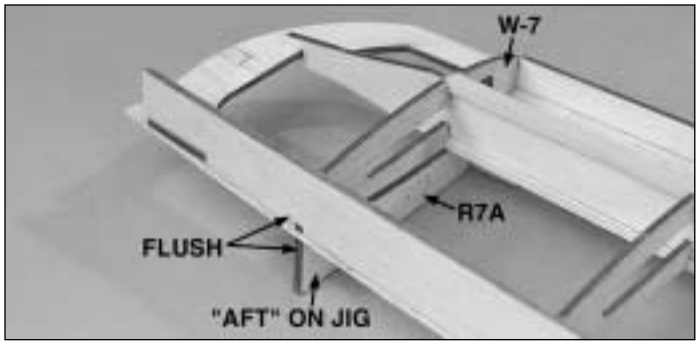


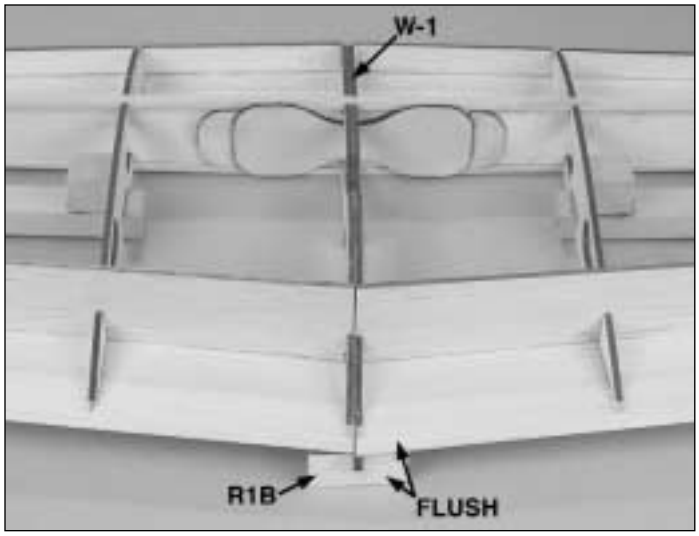
❑ 1. Use epoxy to glue the two die-cut 1/16" [1.6mm] plywood **wing joiners** together, aligning the joiners at the center. Before the epoxy hardens, wipe off any excess with a paper towel dampened with denatured alcohol.

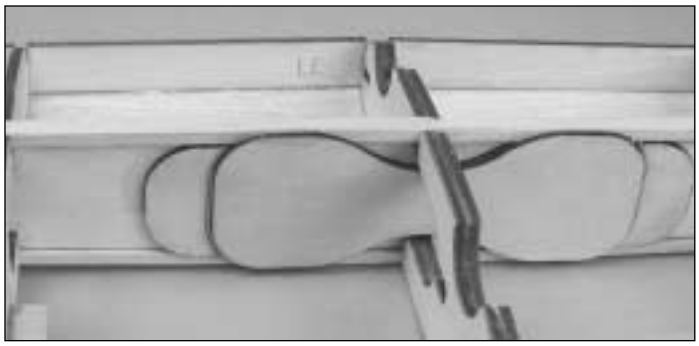




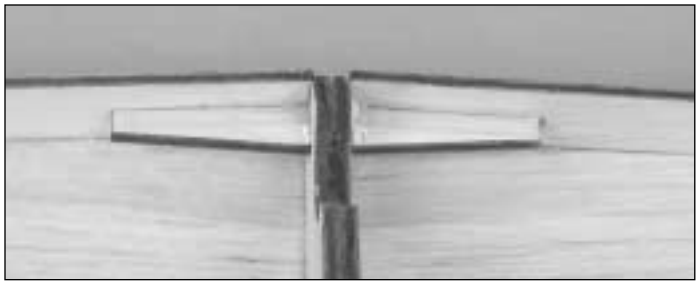
❑ 2. Assemble and glue the two die-cut 3-ply **R7A** and one **R1B rib jigs**.



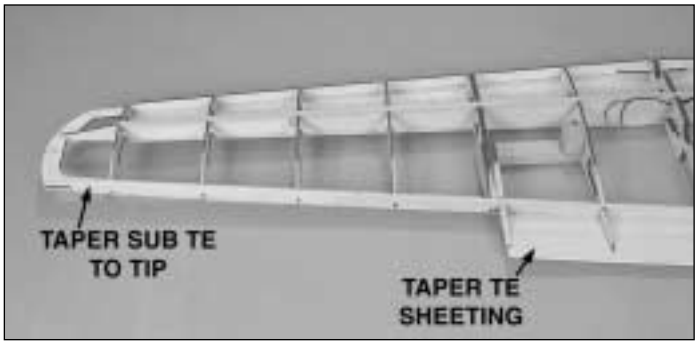




❏ 3. Fit the R7A jigs under the W-7 ribs and the R1B jig under the W-1 ribs so that the aft edge of the jigs are flush with the trailing edge of the wing. Apply 30-minute epoxy to the root ribs and use clamps to hold the wing halves together. Apply epoxy to the front of the wing joiner and insert it through W-1 as shown. The forward joiner is against the shear web and the aft joiner is against the main spars. Wipe off any excess epoxy and use clamps to hold the joiner in position until the epoxy cures.

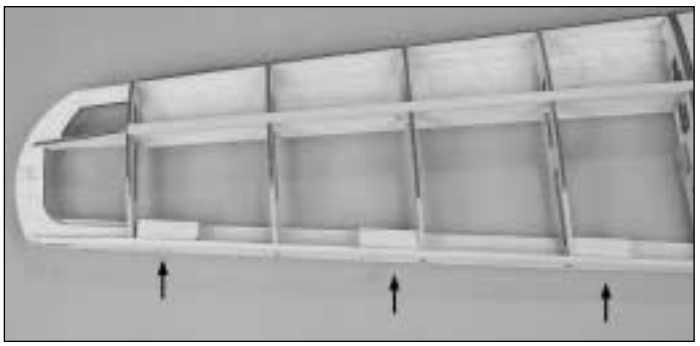


❏ 4. Use epoxy to glue the die-cut 3-ply **sub-leading edge joiner** in the front of the W-1 ribs and the sub-leading edge.



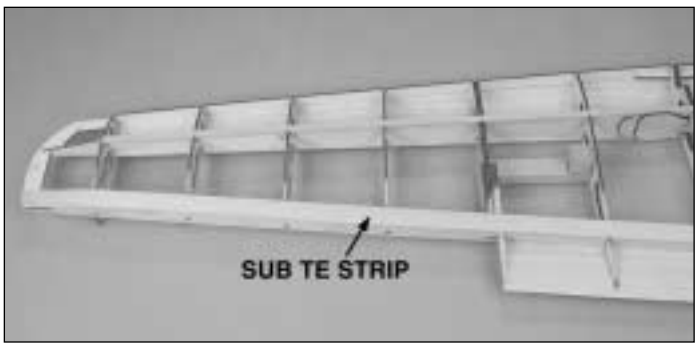
❏ 5. Use a planer and bar sander to trim the sub-trailing edge flush with the top of the ribs. Taper the tip of the sub-trailing edge so that the trailing edge strip can be glued to the wing tip.

❏ 6. Use a bar sander to taper the trailing edge sheeting to match the taper on ribs W-1 through W-3. See the wing cross-section on the wing plan.

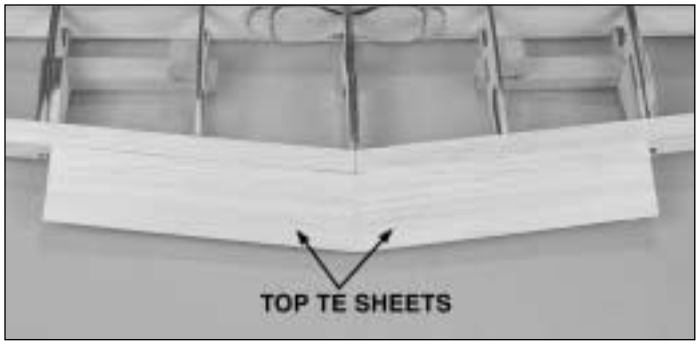


❏ 7. From the 1/2" x 1/2" x 12" [13mm x 13mm x 305mm] balsa stick cut six 1-1/2" [38mm] long hinge blocks. Glue the hinge blocks in position against the sub-trailing edge.

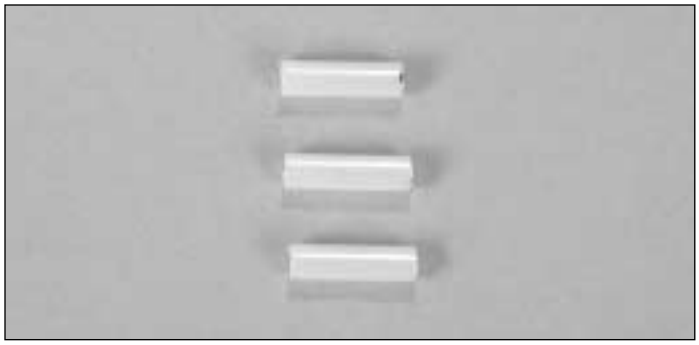
Sheet the Top of the Wing



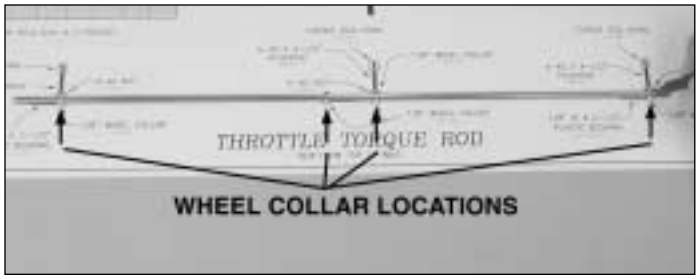
❏ 1. With the wing setting on the wing jigs, cut and glue 5/8" [16mm] balsa sub-trailing edge strips to the top of the ribs and the sub-trailing edge.



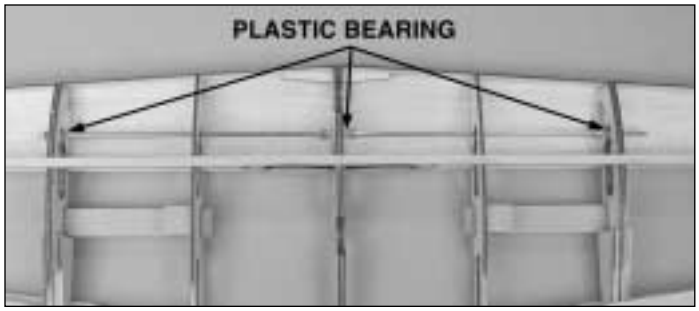
❑ 2. From the remaining 1/16" x 3" x 30" [1.6mm x 76mm x 762mm] balsa sheet, used to make the bottom trailing edge sheet, and a second 1/16" x 3" x 30" [1.6mm x 76mm x 762mm] balsa sheet, make two top trailing edge sheets. Glue the top trailing edge sheets in position.



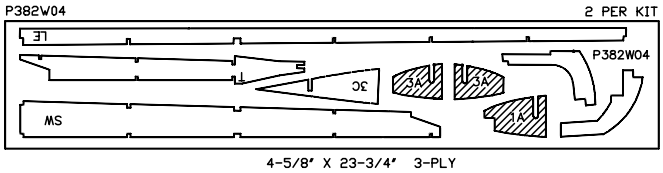
❑ 3. Use 320-grit sandpaper to roughen the 1/8" x 5" [3mm x 127mm] plastic tube. Cut three 5/8" [16mm] long **throttle torque rod bearings** from the 1/8" x 5" [3mm x 127mm] plastic tube.

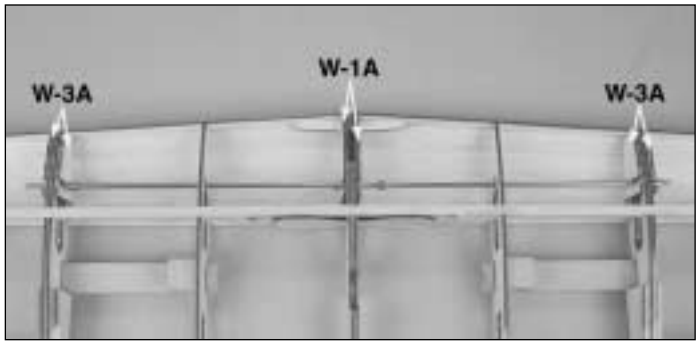


❑ 4. Lay the 1/8" x 17-1/2" [3mm x 445mm] **throttle torque rod** over the plan and mark the location of the four **1/8" [3mm] wheel collars**. Use a file to make a flat spot at each wheel collar location. Make sure the flats are all on the same side of the throttle torque rod.

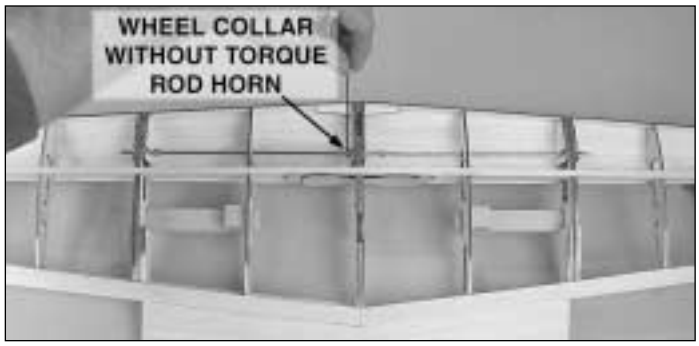


❑ 5. Insert the throttle torque rod through the wing ribs and position the wheel collars and plastic bearings on the rod.

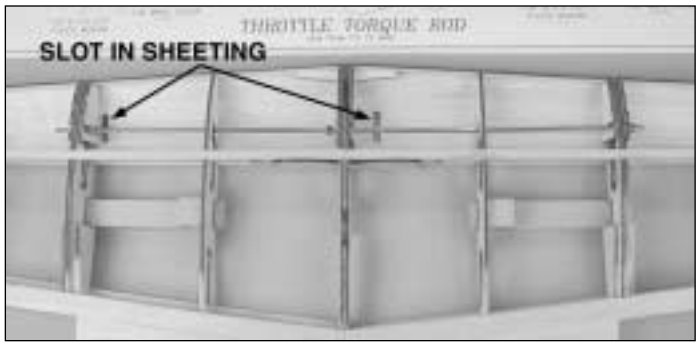




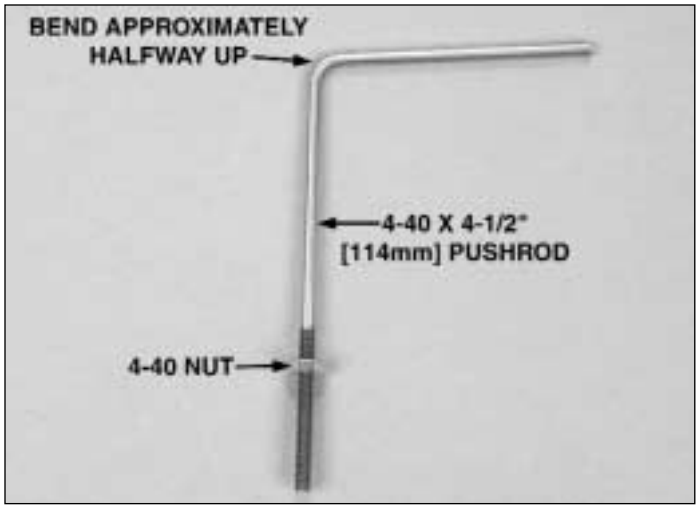
❑ 6. Use epoxy to glue the die-cut 3-ply **W-1A** and **W-3A sub-ribs** to both sides of the W-1 and W-3 ribs. Also glue the throttle torque rod bearings to the ribs. Be careful to not get epoxy in the plastic bearings. A light coat of grease on the torque rod will prevent the epoxy from sticking to the torque rod. Before the epoxy hardens, make sure the throttle torque rod rotates freely.

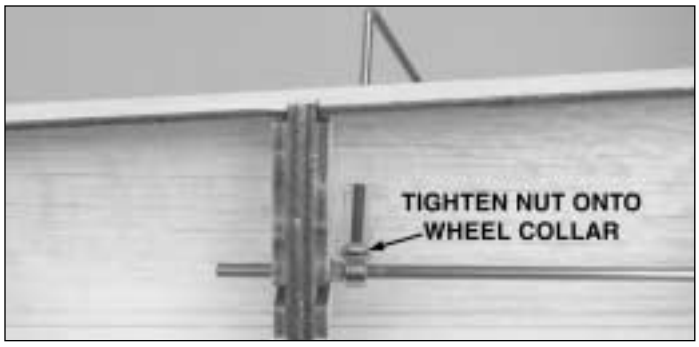


❑ 7. Position the torque rod in its correct location. Apply a drop of thread lock to a **4-40 set screw** and secure the one wheel collar, that will not have a torque rod horn installed on it, on the throttle torque rod. Make sure that the set screw is tightened on the flat spot on the throttle torque rod.



❑ 8. With the three remaining wheel collars in position, cut slots in the bottom sheeting under the wheel collars.



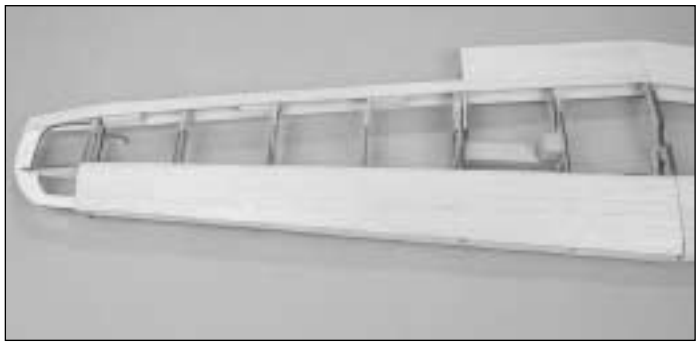


❏ 9. Thread a **4-40 nut** onto a **4-40 x 4-1/2" [114mm] pushrod**. Make an L-bend in the non-threaded end of the pushrod. **Important:** Put a drop or two of thread lock or epoxy at the end of the threaded end of the pushrod. Without the thread lock or epoxy the pushrod will vibrate loose. Insert the pushrod through the slot in the sheeting and screw the pushrod into one of the wheel collars. Make sure the pushrod is tightened on the flat spot on the throttle torque rod. Tighten the 4-40 nut against the wheel collar. Make sure the pushrod and nut are tight.

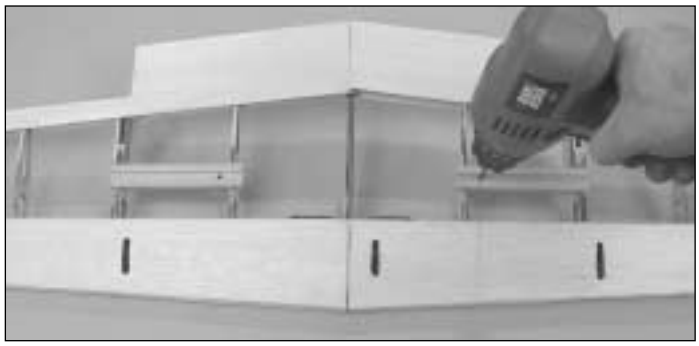
❏ 10. Install the remaining two pushrods in the other two wheel collars. The pushrods should be aligned with each other. If the pushrods are not aligned, you may need to slightly adjust the flat spots with a file.

❏ 11. Cut off the unthreaded portion of the pushrod. Thread a nylon torque rod horn onto each pushrod so that the top of the torque rod horn is flush with the end of the threads.

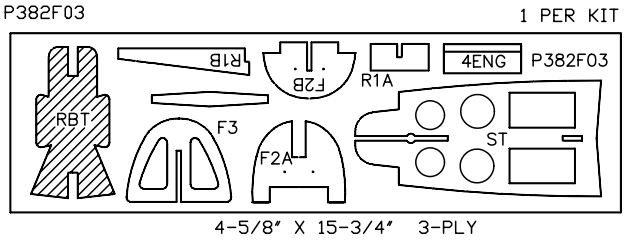
❏ 12. Use a bar sander to sand the top of the sub-leading edges flush with the top of the ribs.



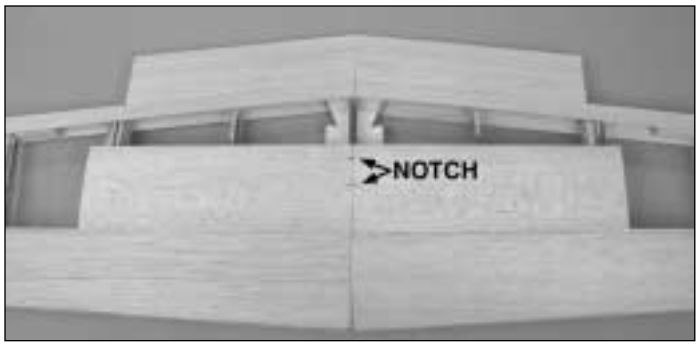
❏ 13. Position the wing back on its jigs. Use the two remaining 1/16" x 3" x 24" [1.6mm x 76mm x 610mm] balsa sheets to sheet from the center of the main spar to the sub-leading edge. **Note:** You may need to enlarge the slots for the throttle torque rod horns so that they can be rotated up into the wing to allow the wing to set on the jigs.



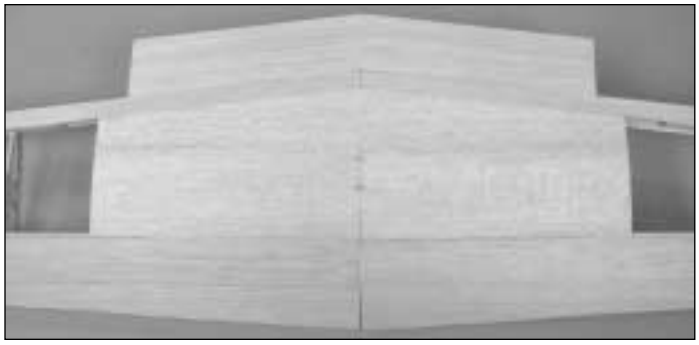
❏ 14. Mark the center of the landing gear torque block on the landing gear rail. Drill a 5/32" [4mm] hole through both the landing gear rail and torque block, perpendicular to the rail.



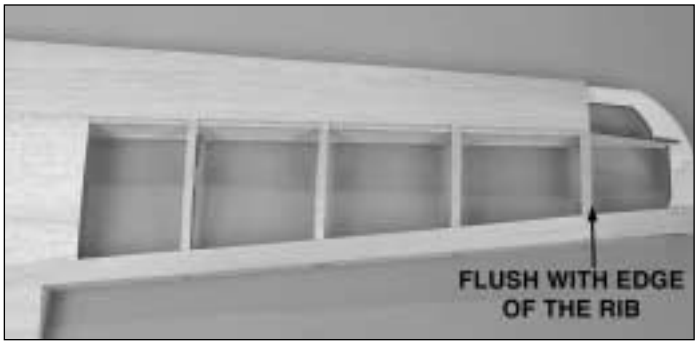
❑ 15. Glue the die-cut 3-ply **receiver battery tray** to rib W-1 and the sub-trailing edge.



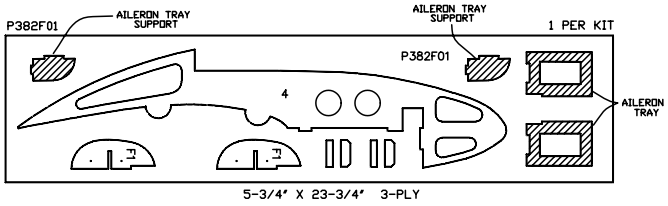
❑ 16. From the 1/16" x 3" x 30" [1.6mm x 76mm x 762mm] balsa sheet, cut three pieces 8-1/2" [216mm] long for the **wing center sheeting**. Glue one piece against the leading edge sheet, between ribs W-1 and W-3. Mark the location of the notch in rib W-1. Then, glue on the second sheet.



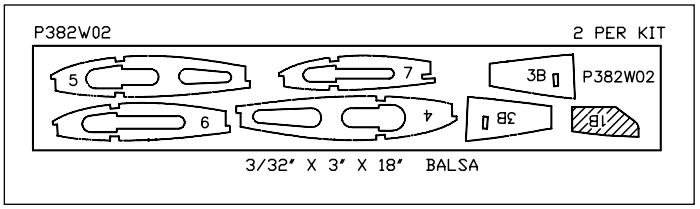
❑ 17. From the third sheet, fit and glue two pieces between the trailing edge strip and the previous wing center sheeting.



❑ 18. From the 1/16" x 1/4" x 24" [1.6mm x 6mm x 610mm] balsa stick, cut and glue **cap strips** to the top of ribs W-4 through W-7.



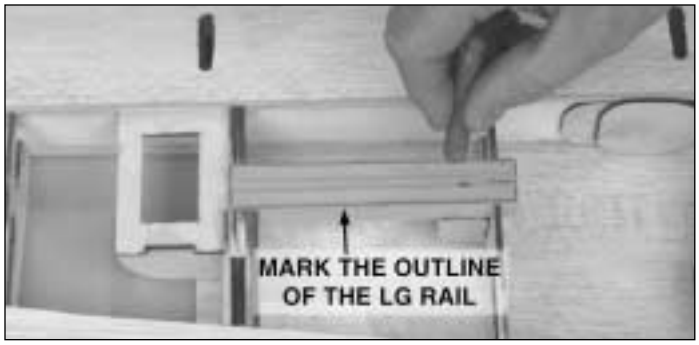
❑ 19. Glue the die-cut 3-ply **aileron servo trays** and **aileron tray supports** to ribs W-3 and the bottom of the main spar.



❑ 20. Glue the die-cut 3/32" [2mm] balsa sub-ribs W-1B to each side of the W-1 rib over the notch.

❑ 21. From the 1/16" x 3" x 30" [1.6mm x 76mm x 762mm] balsa sheet, cut three pieces 8-1/2" [216mm] long for the **bottom wing center sheeting**. Save the remaining sheet. The two forward center sheets must be trimmed to fit around the landing gear rails so that they fit flush with the top of the rails.

EXPERT TIP



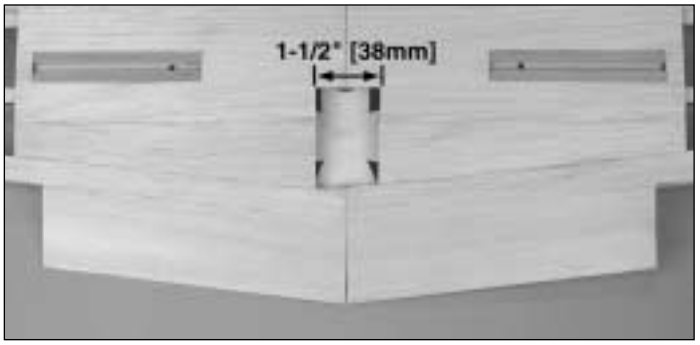
How To Locate Structure Under Sheeting

A. Using chalk, mark the outline of the landing gear rail.

B. Position the sheeting against the aft edge of the leading edge sheeting. Press down on the sheeting around the landing gear rail. This will leave a chalk mark on the sheeting.

C. Cut the hole for the landing gear rail slightly smaller. Then, trim the sheeting to fit.

❑ 22. Once you have the 1/16" [1.6mm] center sheeting trimmed to fit around the landing gear rail, glue the sheeting to the main spar, bottom of the ribs and the landing gear rail. Trim the sheeting from over the receiver battery tray.



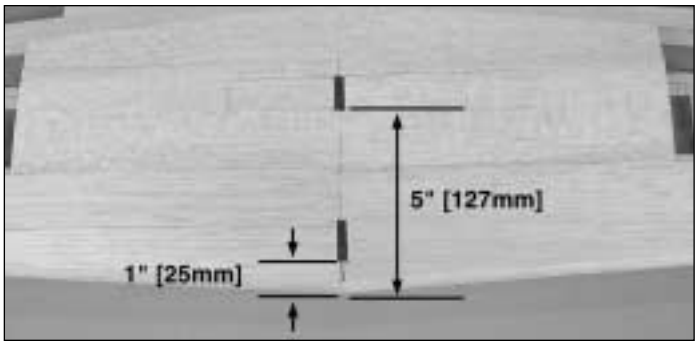
❑ 23. From the third 8-1/2" [216mm] sheet, trim and glue the aft center sheeting to the sub-trailing edge strip and the top of the ribs.

❑ 24. From the 1/16" x 1/4" x 24" [1.6mm x 6mm x 610mm] balsa stick, cut and glue cap strips to the bottom of ribs W-4 through W-7.

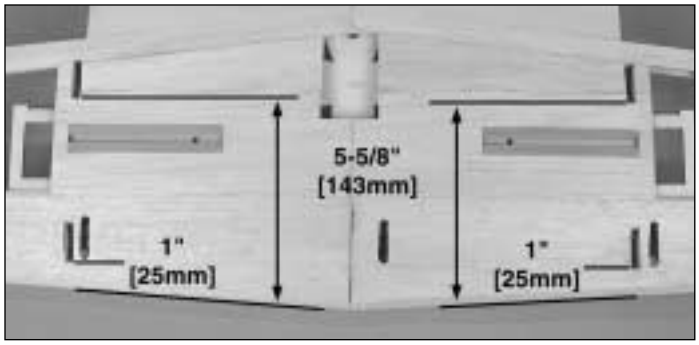
❑ 25. Use a bar sander to sand the top and bottom leading edge sheeting flush with the sub-leading edge.

❑ 26. Glue the two 1/4" x 3/4" x 24" [6mm x 19mm x 610mm] balsa **leading edges** to the front of the sub-leading edge.

❑ 27. Using a razor plane and bar sander, round the leading edge to match the wing cross-section.



❑ 28. Trim the top sheeting from over the two alignment slots in ribs W-1. The first slot is approximately 1" [25mm] from the leading edge and the second one is approximately 5" [127mm] from the leading edge. A T-pin works great for locating the slots.



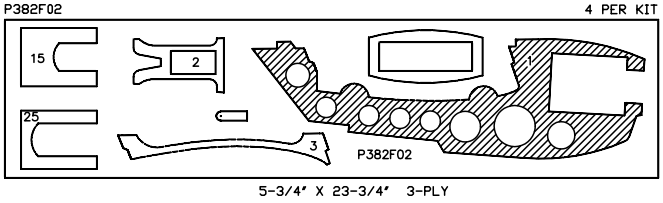
❑ 29. Trim the bottom sheeting from over the four alignment slots in ribs W-3. The first slot is approximately 1" [25mm] from the leading edge and the second one is approximately 5-5/8" [143mm] from the leading edge.

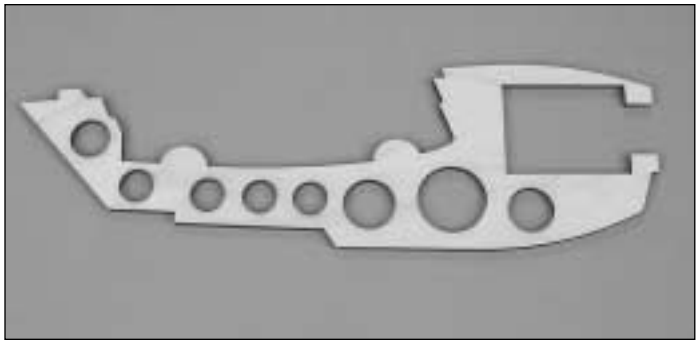
You can set the wing aside for now. We will install the ailerons after we fit the two booms on the wing.

BUILD THE BOOMS & FINS

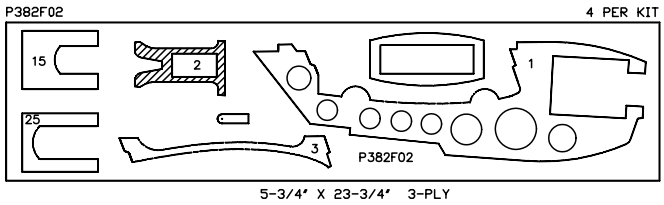
Assemble the Boom

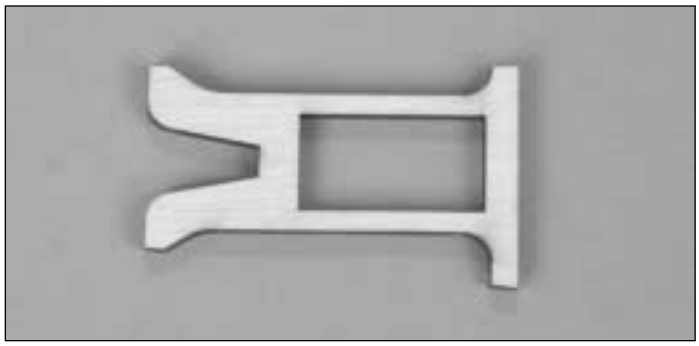
❑ 1. Cover the boom plan with wax paper or Great Planes Plan Protector.



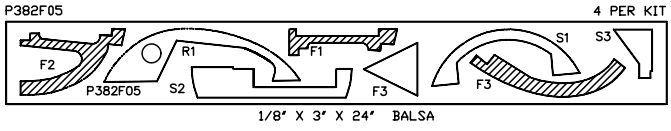


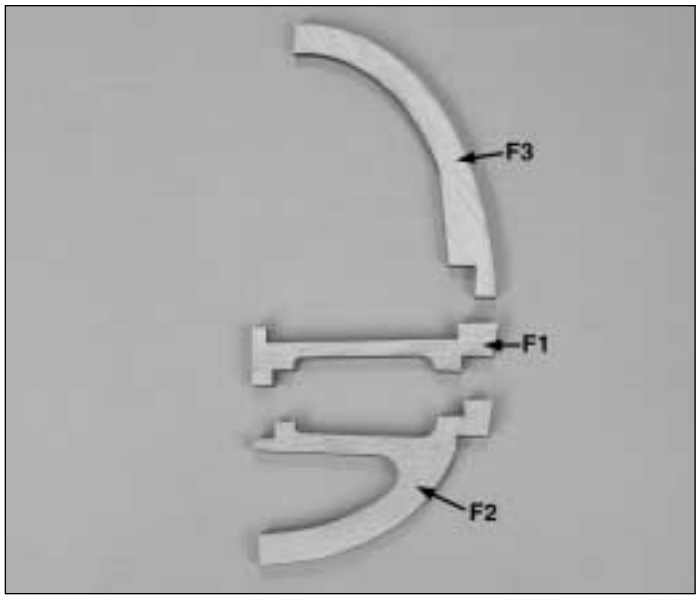
❑ ❑ 2. Glue two of the die-cut 3-ply **boom main frames (1)** together. Make sure the edges are aligned.



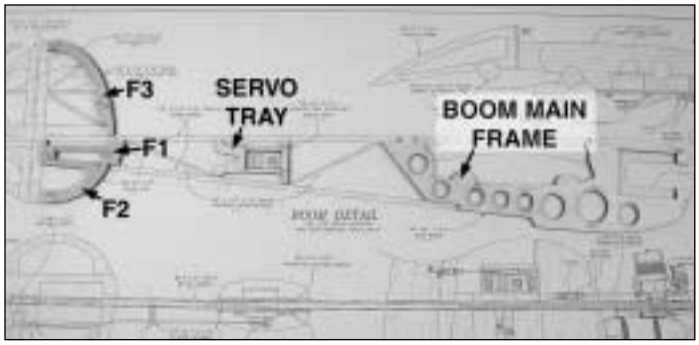


❑ ❑ 3. Glue two of the die-cut 3-ply **elevator** and **rudder servo trays** together.

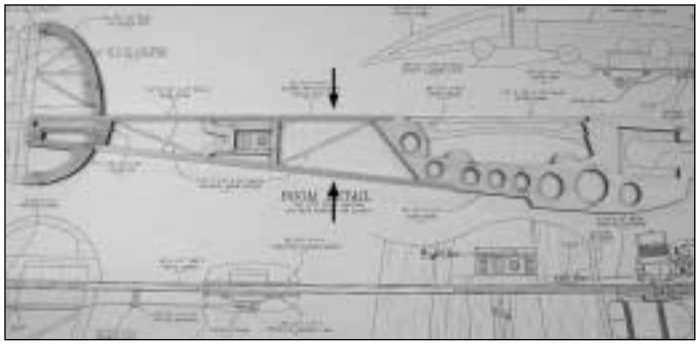




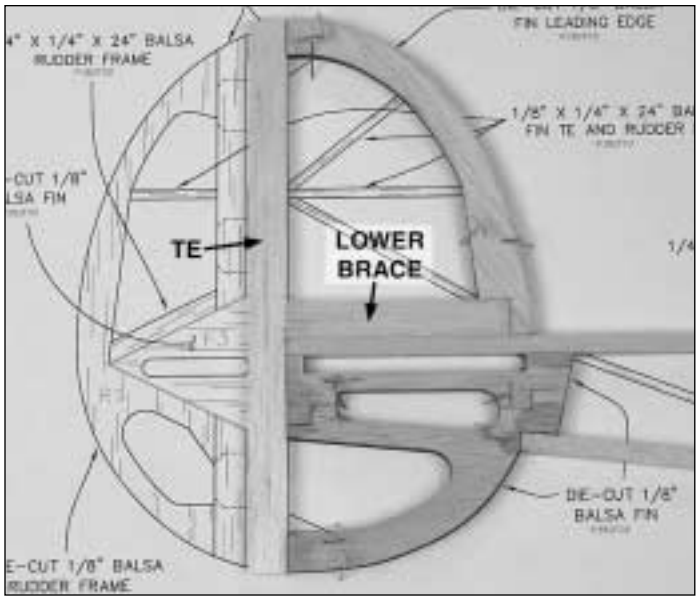
❑ ❑ 4. Glue two of the die-cut 1/8" [3mm] balsa **fin frame F1**, **F2** and **F3** together to make 1/4" [6mm] thick parts.



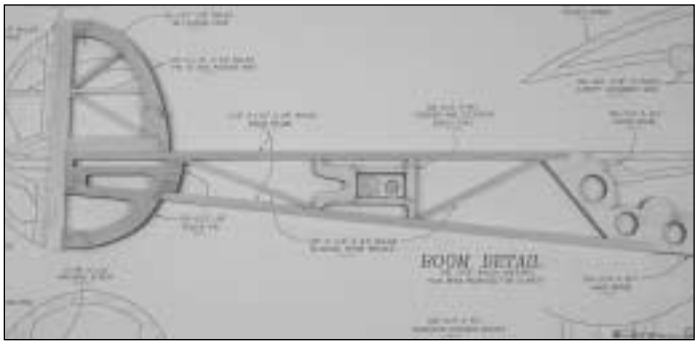
❑ ❑ 5. Pin the boom main frame, elevator and rudder servo tray and the fin frame to your building board over the boom plan. Glue the F1 and F2 fin frames together.



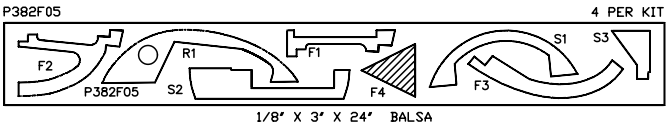
❑ ❑ 6. From the 1/4" x 1/4" x 30" [6mm x 6mm x 762mm] balsa sticks, cut and glue an upper and lower **boom frame** between the boom main frame, servo tray and the fin.

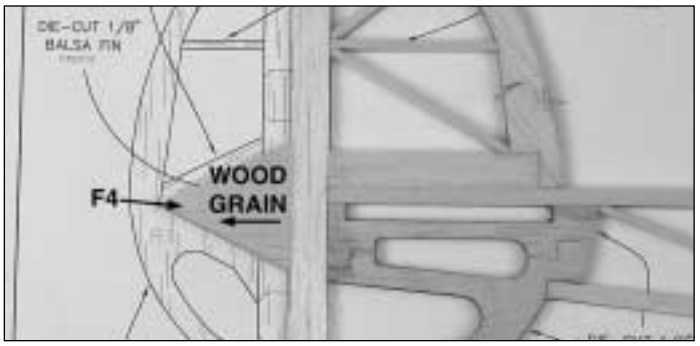


❑ ❑ 7. From the 1/4" x 1/2" x 24" [6mm x 13mm x 610mm] balsa stick, cut and glue the **fin trailing edge** and **lower brace** to the fin frame.



❑ ❑ 8. From 1/8" x 1/4" x 24" [3mm x 6mm x 610mm] balsa sticks, cut and glue **diagonal boom braces** and **fin ribs** to the boom frame.



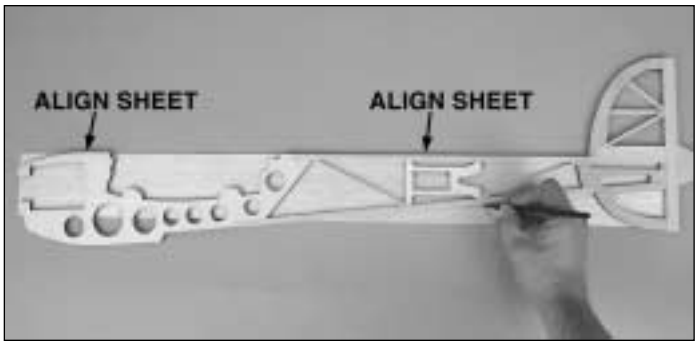


❑ ❑ 9. Glue two of the die-cut 1/8" [3mm] balsa **aft fins (F4)** together. Glue the aft fin to the trailing edge of the fin. Note the direction of the wood grain.

❑ 10. Remove the boom from your building board and return to step 2 and build the second boom.

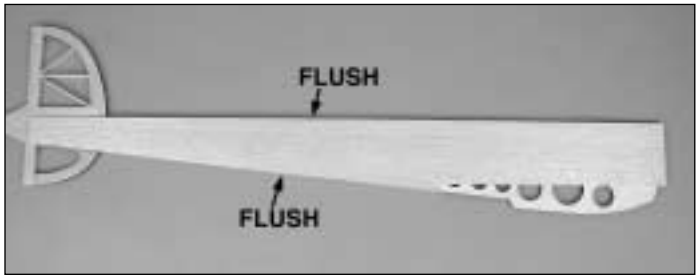
Sheet the Boom

❑ ❑ 1. Remove the boom from your building board. Use a bar sander to sand both sides of the boom even.

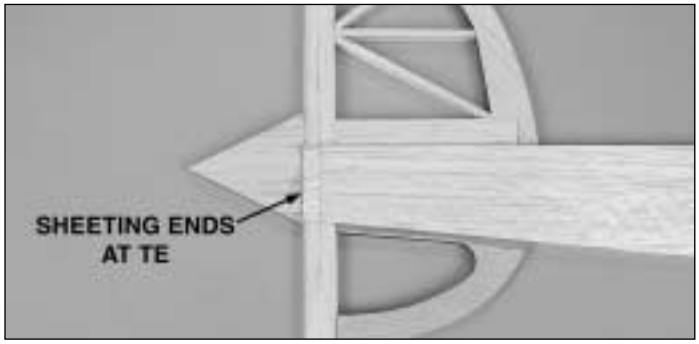


❑ ❑ 2. Position the boom on top of a 1/16" x 3" x 30" [1.6mm x 76mm x 762mm] balsa sheet. Align the sheet with the front and top of the boom. Draw a line on the balsa sheet along the bottom of the boom.

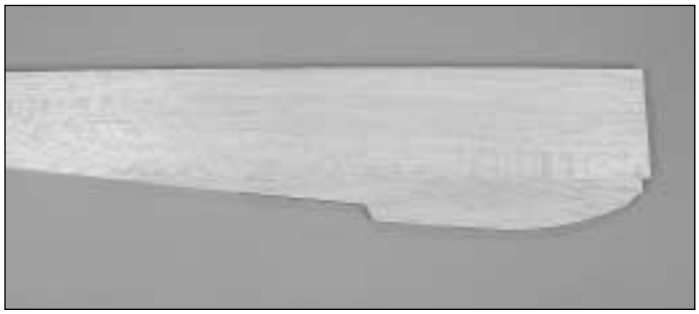
❏ ❏ 3. Use a straightedge to trim the sheet along the line through the end of the sheet.



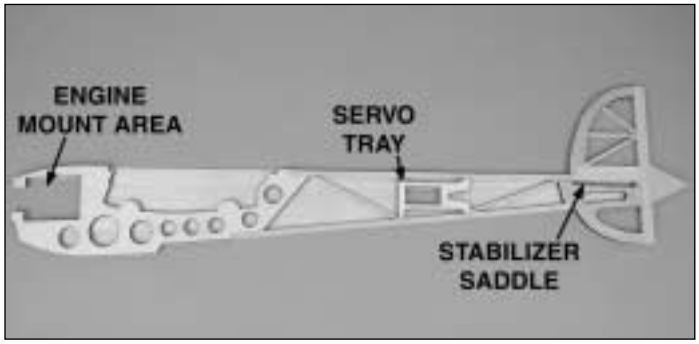
❏ ❏ 4. Check the fit of the sheet on the boom. Make sure the sheet is flush with the top and bottom of the wing. With the boom and balsa sheet flat on your building board, use medium CA to glue the sheet to the boom.



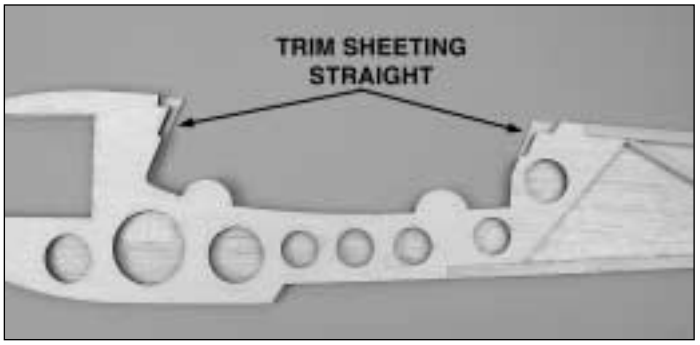
❏ ❏ 5. Use a piece of leftover 1/16" [1.6mm] balsa sheet from the wing to finish the aft sheeting. The sheet should align with the trailing edge of the fin.

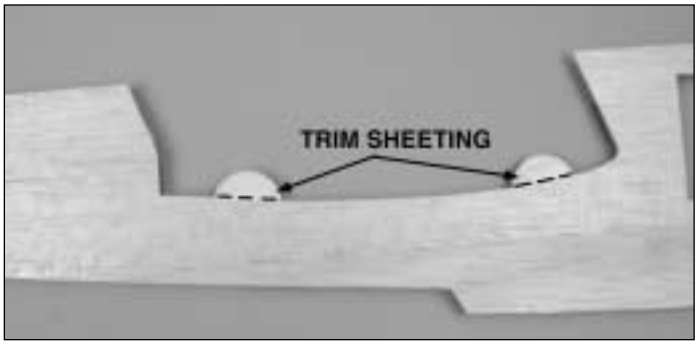


❏ ❏ 6. From a second 1/16" x 3" x 30" [1.6mm x 76mm x 762mm] balsa sheet, finish sheeting the bottom of the boom. Trim the sheet around the outside of the boom.



❏ ❏ 7. Using a sharp hobby knife, trim the sheeting from inside the engine mount area, the servo tray and the stabilizer saddle.

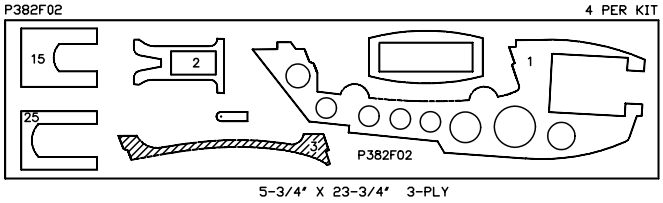


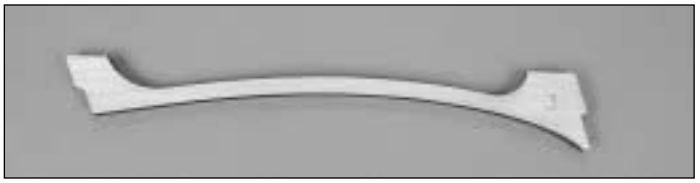


❏ ❏ 8. Trim the wing saddle as shown. Note that the sides are straight with the sheeting overhanging the boom. Also trim the sheeting from over the two mounting tabs.

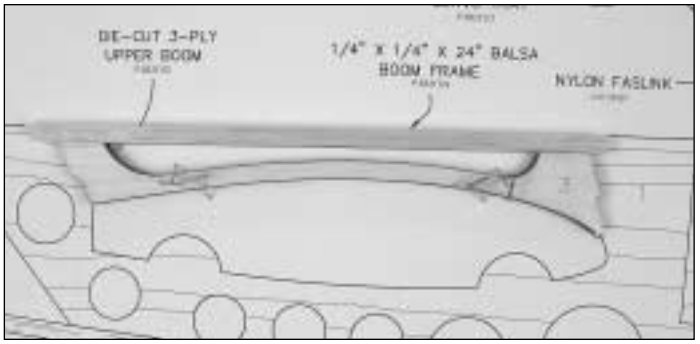
❏ ❏ 9. Repeat the process to sheet the other side of the boom.

❏ 10. Return to step 2 and sheet both sides of the other boom.



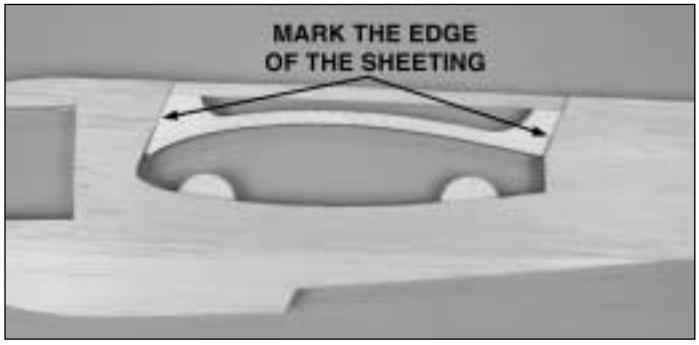


❏ ❏ 11. Glue two of the die-cut 3-ply **upper booms** together.



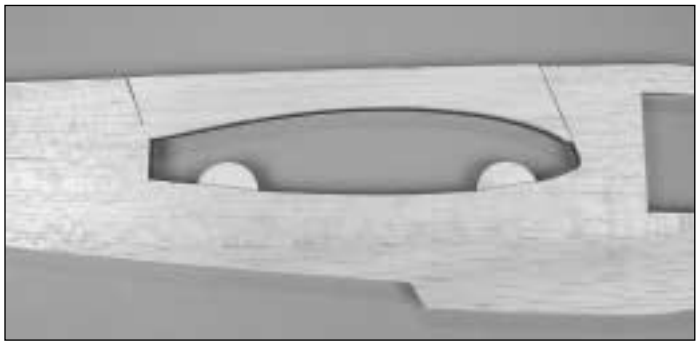
❏ ❏ 12. Pin the upper boom to the plan. Trim and glue a leftover 1/4" x 1/4" [6mm x 6mm] balsa stick to the top of the upper boom.

❑ ❑ 13. Remove the upper boom from the plan. Using a bar sander, sand the upper boom even.



❑ ❑ 14. Test fit the upper boom to the main boom. Mark the upper boom at the edge of the main boom sheeting.

❑ ❑ 15. Sheet one side of the upper boom with leftover 1/16" [1.6mm] balsa sheeting. Trim the sheeting along the top and bottom and along the lines drawn in the previous step. Turn the upper boom over and sheet the other side.



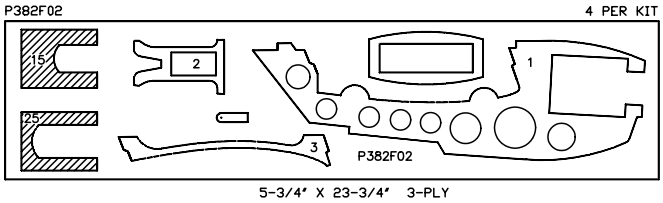
❑ ❑ 16. Test fit the upper boom to the main boom. The sheeting does not have to mate perfectly. Later, after the upper boom and main boom are glued to the wing, balsa filler can be used to cover any imperfections.

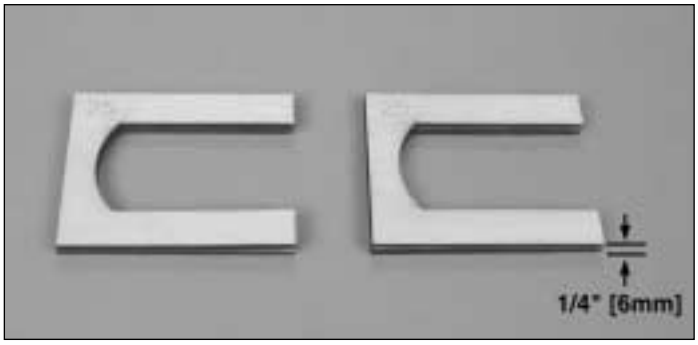
❑ 17. Return to step 11 and assemble the second upper boom.

Assemble the Engine Mounts

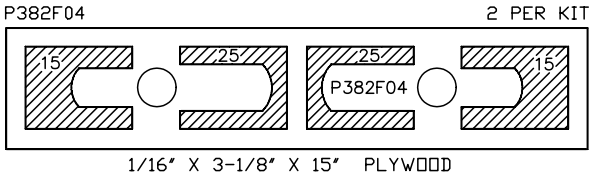
❑ 1. Mark one of the main booms left and the other right; it doesn't matter which.

❑ 2. Decide what size engines you are going to use. We have provided die-cut mounts for the O.S.® .15 LA and the .25 LA. If you are using a different engine, you may need to trim the mounts to fit your engine. The .15 size mounts have a "15" embossed on them and the .25 size mounts have a "25" embossed on them. Both mounts are assembled and installed using the same method.

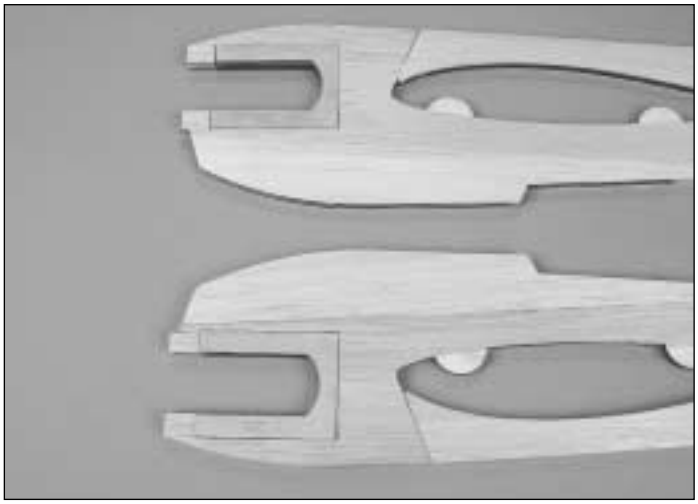




❑ 3. Locate the four die-cut 3-ply **engine mount cores**. Use CA to glue two of the cores together making a pair of engine mounts.

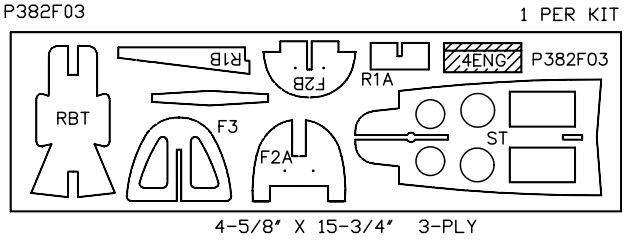


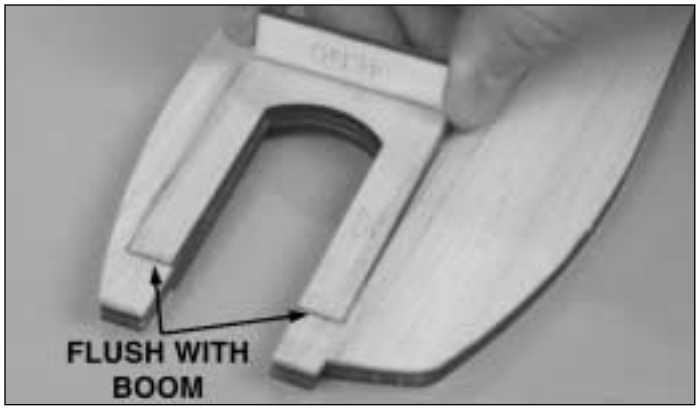
❑ 4. Locate the four die-cut 1/16" [1.6mm] plywood **engine mount outers**. Glue one of the outers to each side of the engine mount cores.



❑ 5. Test fit the engine mounts in the cutouts at the front of the main booms and trim as necessary.

❏ 6. Position the right main boom as shown.

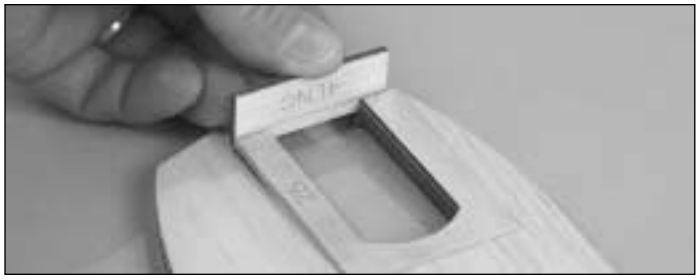




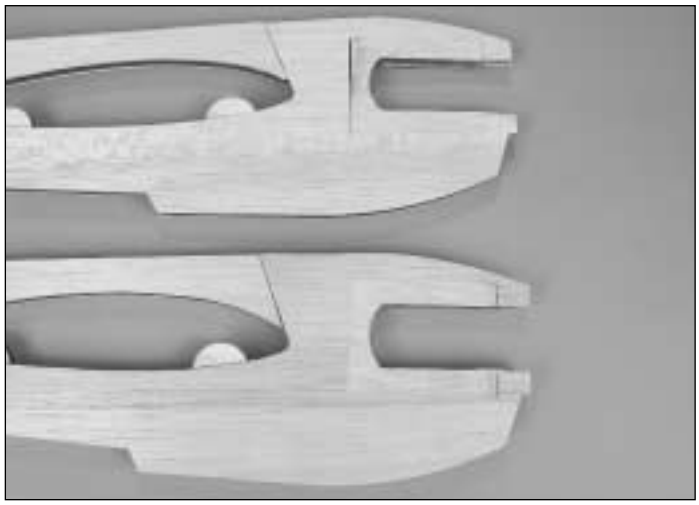
❏ 7. Locate the die-cut 3-ply **4° engine gauge**. With the right main boom flat on your building table, position the engine gauge at the aft edge of the engine mount. Raise the aft edge of the engine mount until it is aligned with the embossed line on the gauge. You may need to lightly sand the engine mount to allow it to be rotated in the main boom.

Note: The right main boom has right thrust and the left main boom has left thrust.

❏ 8. Once the engine mount is in position, use epoxy to glue it in the main boom. Make sure the forward end of the engine mount is flat on your building board and the aft end is set to the line on the engine gauge. Wipe off any excess epoxy with a paper towel dampened with denatured alcohol. T-pins can be used to hold the engine mount in position until the epoxy cures.



❏ 9. While the epoxy is curing on the right main boom, position the left main boom flat on your building table. Position the engine gauge at the front of the engine mount. Raise the forward edge of the engine mount until it is aligned with the embossed line on the gauge. You may need to lightly sand the engine mount to allow it to be rotated in the main boom.



❏ 10. Use leftover 1/16" [1.6mm] balsa sheet to fill in behind the engine mount. Sand the sheeting flush with the main boom.

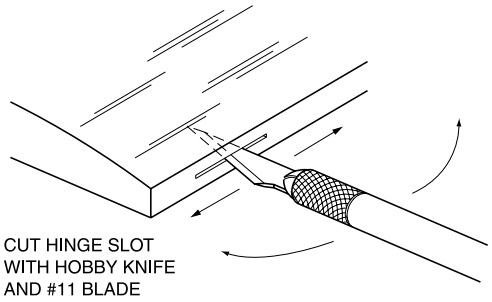
Attach the Rudder to the Fin

❏ ❏ 1. Lay the fin and rudder over the plan. Lightly mark the hinge locations on the leading edge of the rudder and the trailing edge of the fin.

❏ ❏ 2. Cutting hinge slots can be simplified with the Great Planes Slot Machine™. This simple electric tool cuts a perfect width slot for CA hinges.

❏ ❏ 3. To cut the hinge slots, first locate the centerline of the leading and trailing edges using the Great Planes Precision Hinge Marking Tool (GPMR4005). Place the blades of the Slot Machine on the wood where you want the slot. Lightly press the teeth into the wood. When you are satisfied with the location, press the button on the handle and the blades will cut easily into the balsa wood.

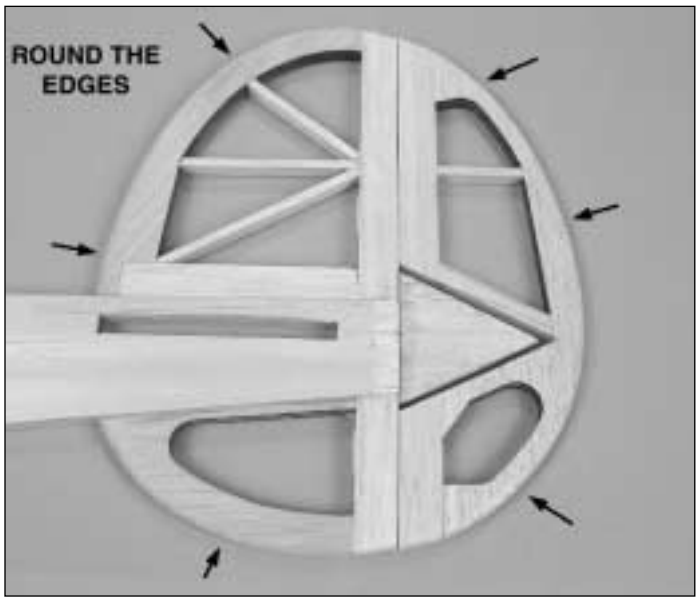
EXPERT TIP



If You Do Not Have A Slot Machine

Cut the hinge slots in the rudder and fin using a hobby knife with a #11 blade. Mark the centerline of the rudder leading edge and the fin trailing edge. Begin by carefully cutting a very shallow slit at the hinge location to accurately establish the hinge slot. Make three or four more cuts, going a little deeper each time. As you cut, slide the knife from side to side until the slot has reached the proper depth and width for the hinges.

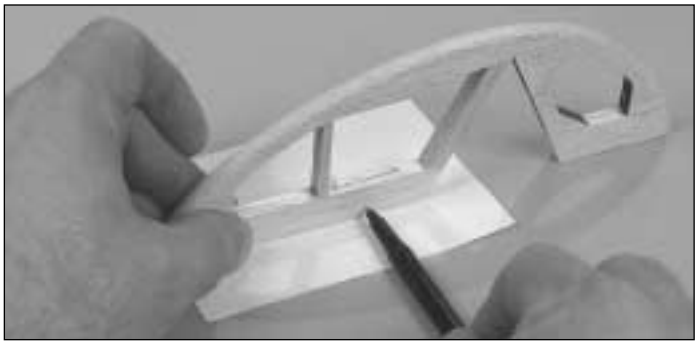
❏ ❏ 4. Cut the 3/4" x 1" [19mm x 25mm] hinges for the rudder from the supplied 2" x 9" [51mm x 229mm] **hinge material**. Then, snip off the corners as shown on the wing plan. **Temporarily** join the rudder to the fin with the hinges, adjusting any hinge slots if necessary so they all align. **Do not glue in the hinges until you are instructed to do so after the airplane is covered.**



❏ ❏ 5. With the rudder temporarily attached to the fin, round the leading edge of fin and the trailing edge of the rudder.

❏ ❏ 6. Refer to the ***Expert Tip*** that follows and shape the leading edge of the rudder to a "V" as shown on the plan.

EXPERT TIP



How To Bevel The Leading Edge

A. Place the leading edge of the rudder on your work surface and use your pen to mark a "bevel to" line on both sides, about 3/32" [2mm] high.

Note: You will probably have to adjust the height of the rudder with card stock so your "bevel to" line is not too high.

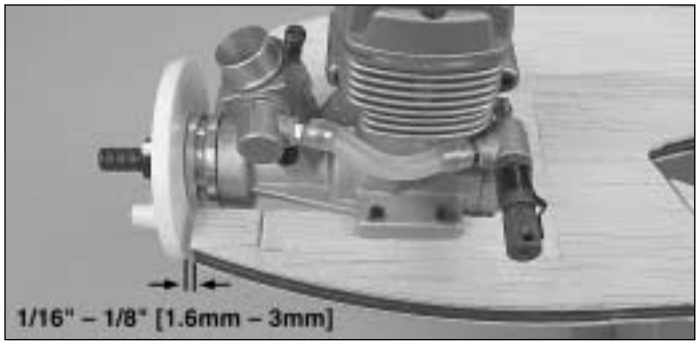
B. Using the "bevel to" lines and the centerline as a guide, make the "V" on the leading edge of the rudder with a razor plane or the Great Planes Multi-Sander (GPMR6190) with 150-grit sandpaper.

❏ 7. Return to step 1 and temporarily attach the second rudder.

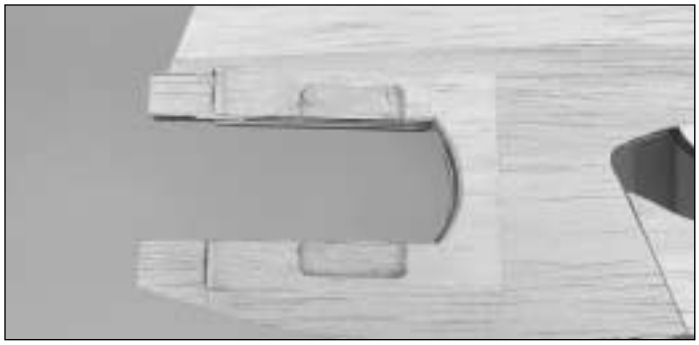
❏ 8. Repeat the process to hinge and make a "V" on the elevator and stabilizer.

INSTALL THE ENGINES

It is much easier to temporarily mount the engines now, before the booms are permanently attached to the wing.



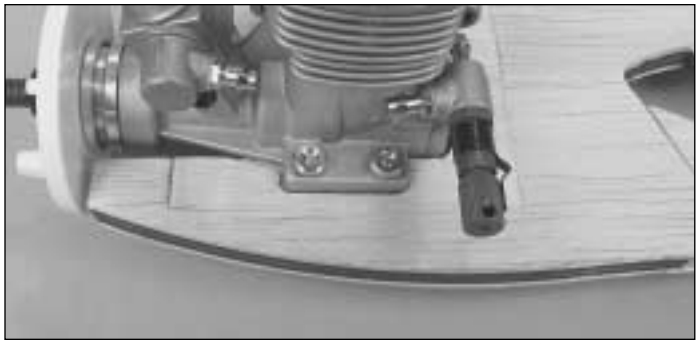
❏ ❏ 1. Mount the spinner backplate to the engine you are using. Position the engine on the right boom engine mount. The head of the engine should point to the right when viewed from behind the plane. See the box lid if you are confused. The backplate should be approximately 1/16" to 1/8" [1.6mm to 3mm] forward of the boom and the engine should be centered in the mount. Trim the engine mount if needed.



❏ ❏ 2. Mark the outline of the engine mounting lugs on the boom. Use a sharp hobby knife to cut a recess in the balsa. Do not cut into the plywood engine mount.

❏ ❏ 3. Position the engine in the recess and check its fit. When satisfied, mark the location of the engine mounting holes. A great method for marking the engine mounting holes is to use the **Great Planes Dead Center™ Engine Mounting Hole Locator**.

❏ ❏ 4. Remove the engine from the boom. Drill a 7/64" [2.8mm] diameter hole at each mark. Try to keep the drill bit perpendicular to the engine mount.



❏ ❏ 5. Put a #4 flat washer on a 4-40 x 3/4" [19mm] machine screw. Insert the screw through the back of the engine mount and then through the engine mounting lugs. Temporarily secure the engine to the mount with a #4 lock washer and 4-40 nut. Install the other three screws, washers and nuts.

❏ 6. Return to step 1 and install the second engine on the left boom.

❏ 7. Once both engines have been mounted, remove them and proceed to attaching the booms to the wing.

MOUNT THE BOOMS ON THE WING

Prepare the Booms & Wing

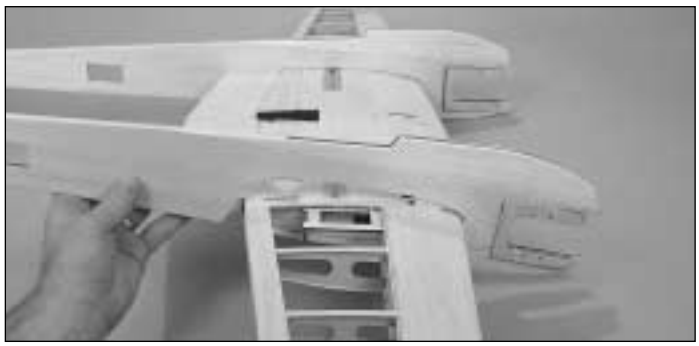
❏ 1. Sand a small radius along the top and bottom edges of both booms. Fill any major dents with balsa filler.

EXPERT TIP

How To Remove Annoying Dents In Balsa

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 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.

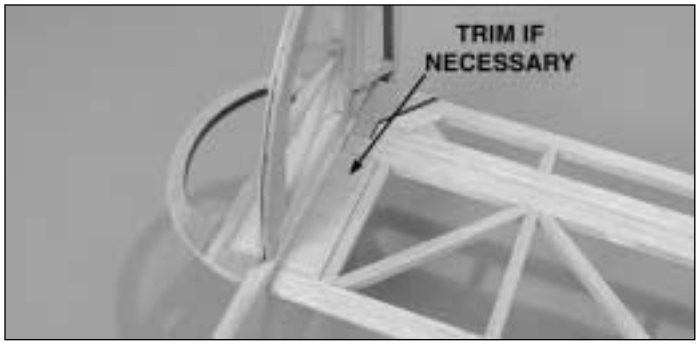
❏ 2. Finish-sand the wing, removing any surface blemishes. Blend the wing sheeting and cap strips. Sand the shear web at the wing tips so that it blends into the tip. Then, sand a radius on both wing tips.



❏ 3. Test fit the left and right booms on the wing. The tabs on the booms should fit snug in the slots in the wing. Trim the slots slightly if they are too tight.

❏ 4. Slide the upper booms over the wing.

❏ 5. Insert the stabilizer tips in the boom. Position the stabilizer center between the booms so that the ends of the stabilizer center are against the booms. With the booms and the bottom of the fins resting on your building table and the booms perpendicular to the table, measure the distance between the booms at the leading and trailing edges of the wing and at the leading edge of the stabilizer. All three measurements must be the same. If they are not, you may need to slightly trim the ends of the stabilizer center or the slots in the wing.

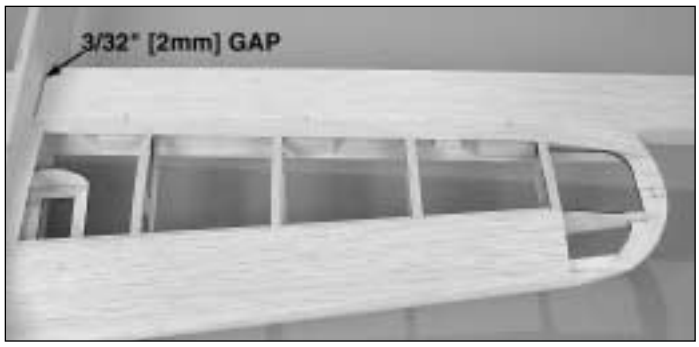


❏ 6. Trim the stabilizer joiners so that the stabilizer center fits against the boom and the joiner fits between the stabilizer center leading edge, trailing edge and outer rib.

❏ 7. Once the booms are parallel and the stabilizer tips fit well in the stabilizer center, use 30-minute epoxy to glue the main and upper booms to the wing, the stabilizer tips to the booms and the stabilizer center to the booms and stabilizer joiner. Make sure the main booms are perpendicular to your building table. Check the measurements between the booms before the epoxy hardens. Use a paper towel dampened with denatured alcohol to wipe off any excess epoxy before it hardens.

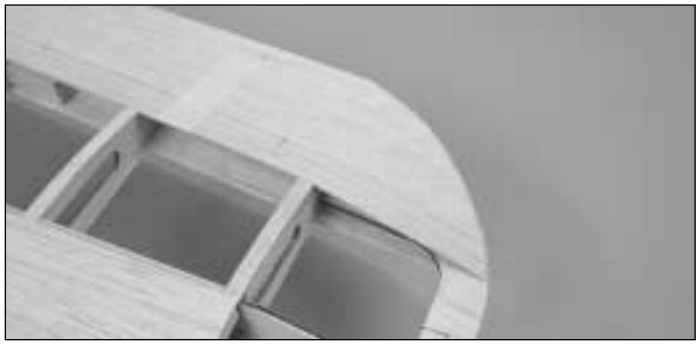
❏ 8. Use balsa filler to fill any open joints between the main boom, the wing and the upper boom. Once the balsa filler has dried, sand the upper boom so that it is flush with the main boom.

Install the Ailerons



❏ ❏ 1. Trim and sand the inboard end of the shaped balsa **aileron** to match the angle of the main boom. Leave a 3/32" [2mm] gap between the aileron and the main boom. Mark the three hinge locations on the aileron and the trailing edge of the wing. **Note:** The center of the hinge should be in the center of the 1/2" [13mm] hinge block.

❏ ❏ 2. Mark the centerline on the leading edge of the aileron and the trailing edge of the wing. Cut the hinge slots in the wing and aileron and temporarily install the aileron on the wing. Use tape to hold the aileron tight against the trailing edge of the wing.



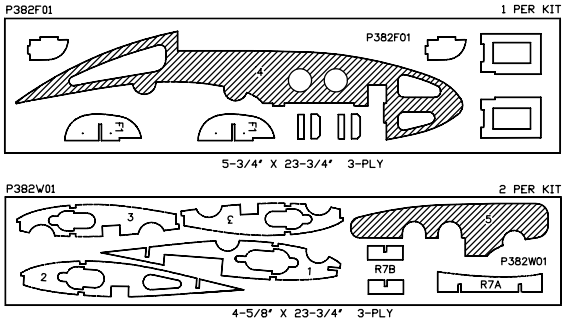
❏ ❏ 3. Trim and sand the aileron to match the shape of the wing tip.

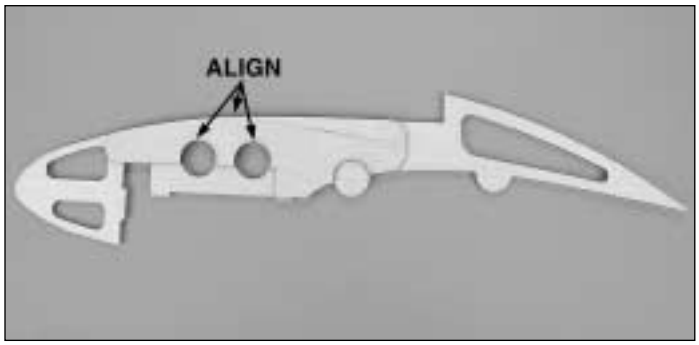
❏ ❏ 4. Draw a line 3/32" [2mm] back from the leading edge on both sides of the aileron. Use a razor plane and a bar

sander to make a “V” on the leading edge of the aileron. Reinstall the aileron on the wing. Make sure that the aileron can move up at least 1/2" [13mm] and down at least 1/2" [13mm].

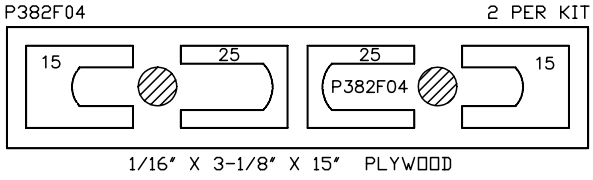
❑ 5. Return to step 1 and make the other aileron.

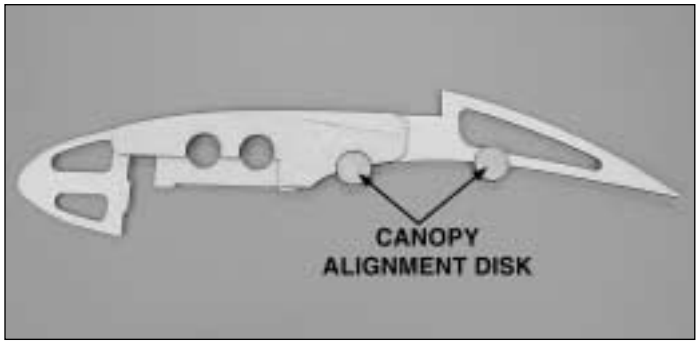
Build the Canopy Frame



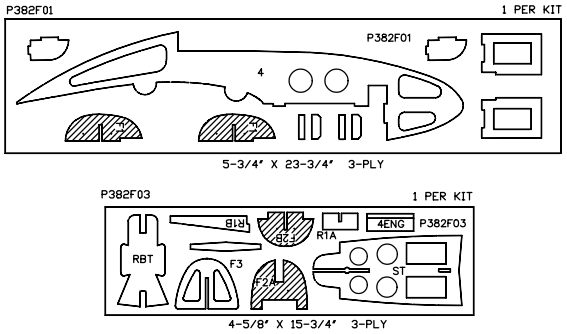


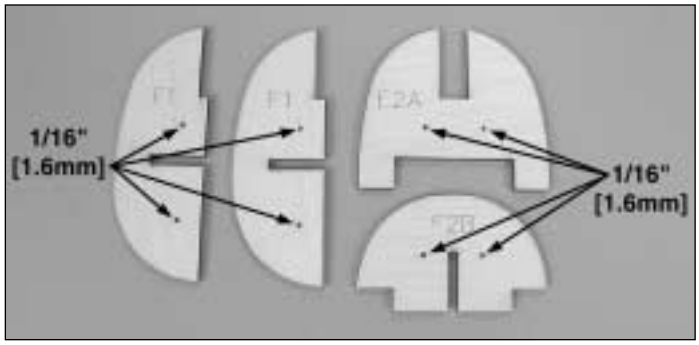
❑ 1. Glue the die-cut 3-ply **canopy frame doublers (5)** to both sides of the die-cut 3-ply **canopy frame (4)**, aligning the edges of the frames and the two center holes.



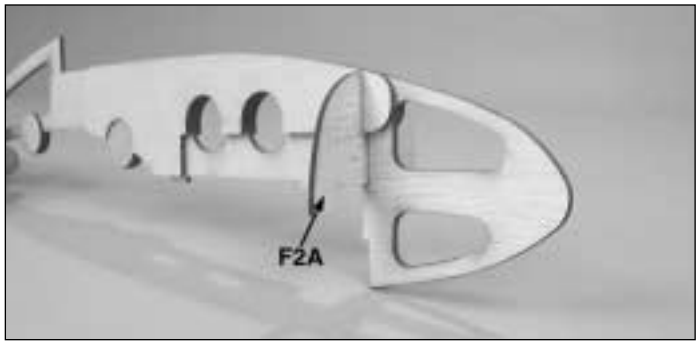


❑ 2. Glue the four die-cut 1/16" [1.6mm] plywood **canopy alignment disks** on each side of the alignment tabs on the canopy frame.

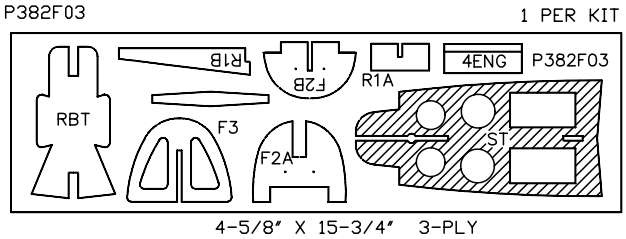


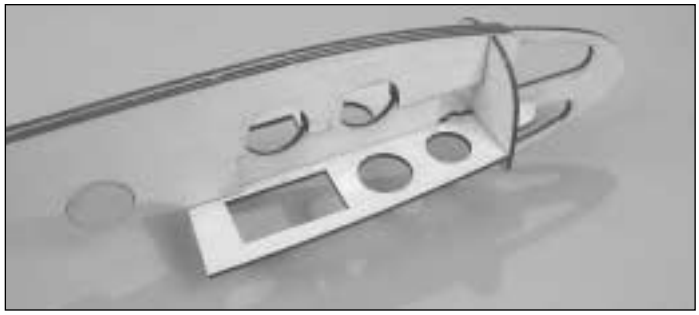


❑ 3. Drill 1/16" [1.6mm] pilot holes at the punch marks in the die-cut 3-ply formers **F1**, **F2A** and **F2B**.

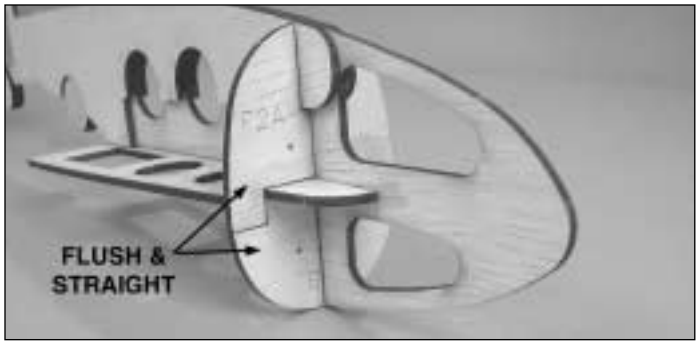


❑ 4. Glue former F2A to the canopy frame so it is perpendicular to the frame.

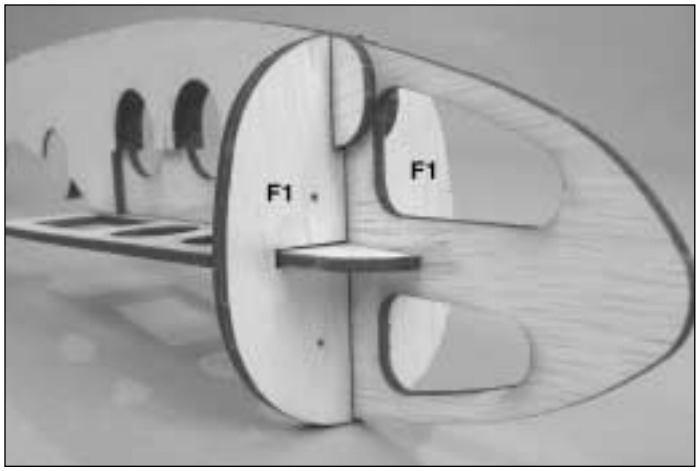




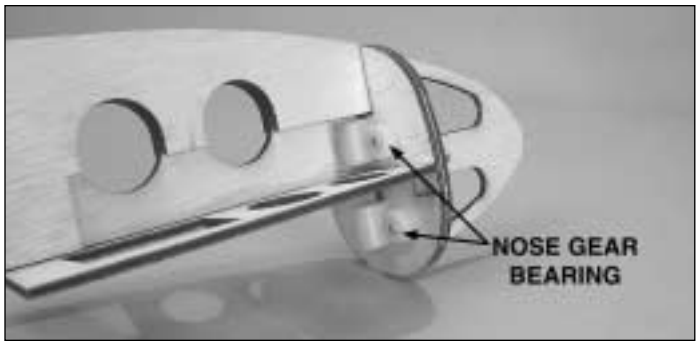
❑ 5. Glue the die-cut 3-ply **servo tray** to the canopy frame and former F2A, perpendicular to the frame.



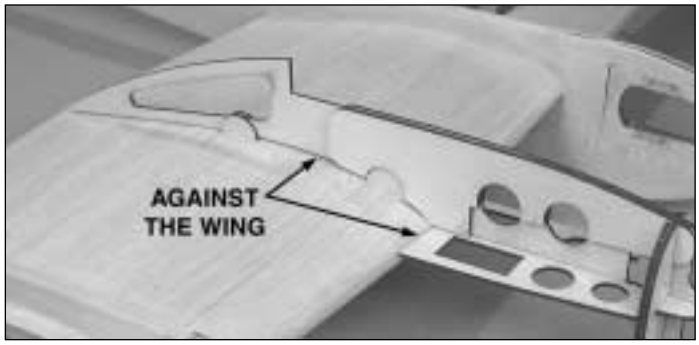
❑ 6. Glue the die-cut former F2B to the bottom of the canopy frame and former F2A. Make sure F2B is aligned with F2A.



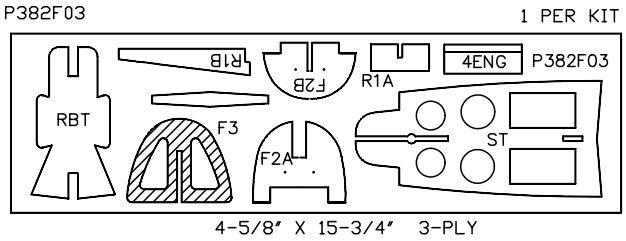
❑ 7. Lightly sand the front of the F2A/B formers to remove any excess glue. Glue both die-cut formers F1 to the front of the F2A/B formers.

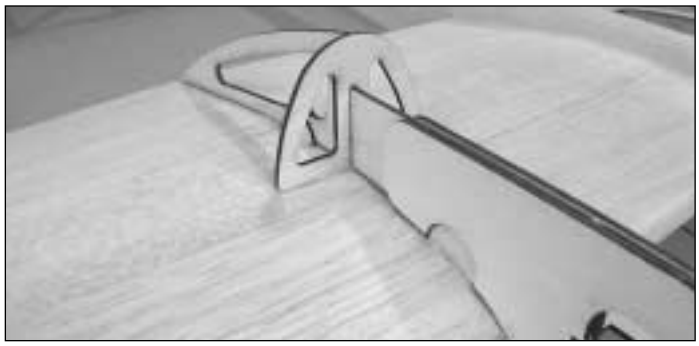


❑ 8. Cut the nylon **nose gear bearing** in two and trim off the "spreader bars." Loosely attach the nose gear bearings to the back of the F2 formers using four **#2 x 1/2" [13mm] sheet metal screws**. Insert the **nose gear** in the bearings, then tighten the screws.



❑ 9. Test fit the canopy frame on the top of the wing. If the alignment tabs are too tight in the slots you can lightly sand the tabs. The frame should contact the top of the wing and the aft edge of the servo tray should contact the leading edge. Once satisfied with the fit, use epoxy to glue the canopy frame and servo tray to the wing. Make sure the canopy frame is straight.





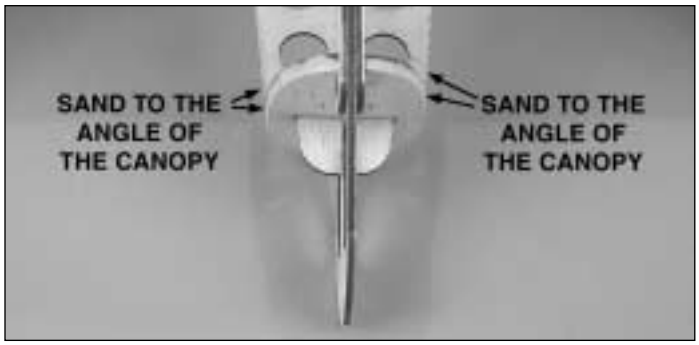
❑ 10. Glue the die-cut 3-ply **former F3** perpendicular to the canopy frame and the top of the wing.

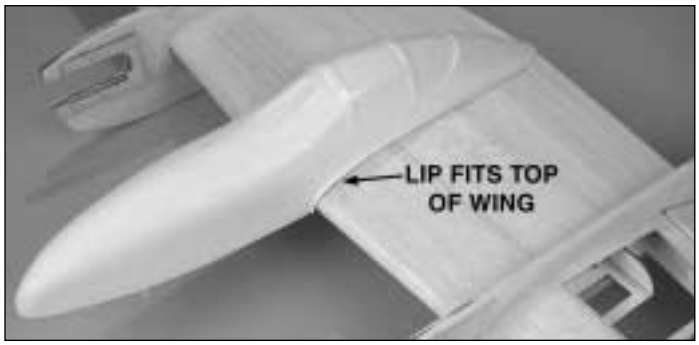
Fit the Canopy on the Frame

❑ 1. Trim the **ABS top canopy** along the molded cut lines where it fits over the wing. Cut the front half of the canopy along the very bottom, below the cut line. Save the excess plastic you cut off. You can use a hobby knife to carefully

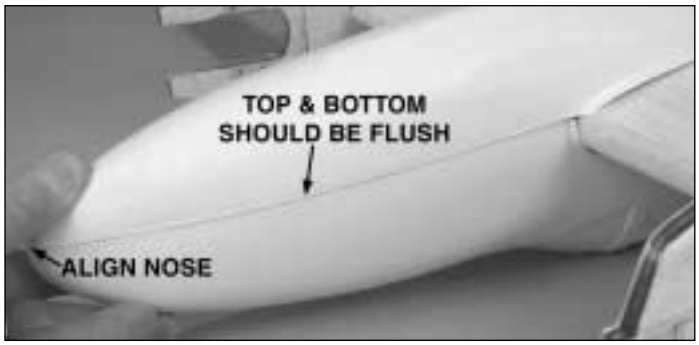
score along the cut lines and flex the plastic until the excess breaks free, or use a Hobbico Curved-tip Canopy Scissors (HCAR0667) to cut along the lines.

❑ 2. Trim the ABS bottom canopy the same way.

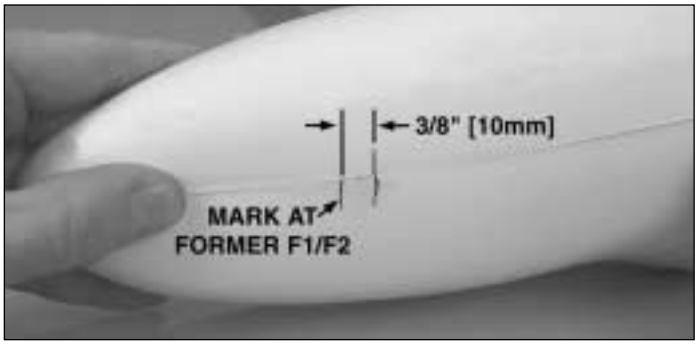




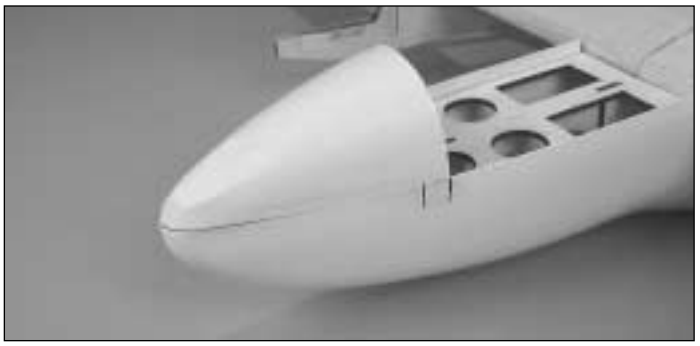
❑ 3. Fit the top canopy to the canopy frame. The lip of the canopy should fully contact the top of the wing. Sand the canopy frame if needed. Sand the edges of formers F1/F2 to match the angle of the servo tray. Make sure the canopy frame does not cause the canopy to bulge out, especially at formers F1/F2. When satisfied with the fit, use masking tape to temporarily attach the canopy to the wing.



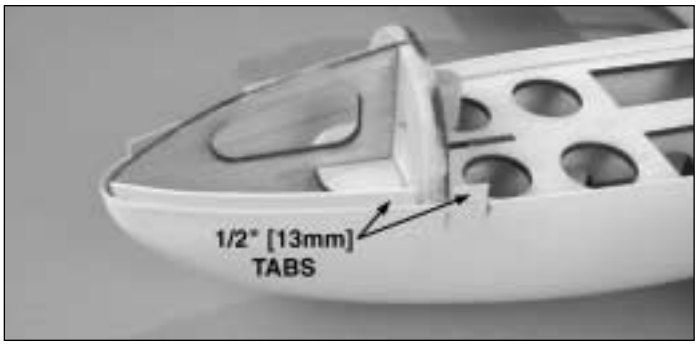
❑ 4. Turn the plane over and fit the bottom canopy on the wing. Align the nose of the top and bottom canopy. Trim the bottom canopy so that the edge of the bottom and top canopy are flush. Take off a little at a time. A bar sander with 220-grit sandpaper works great for this.

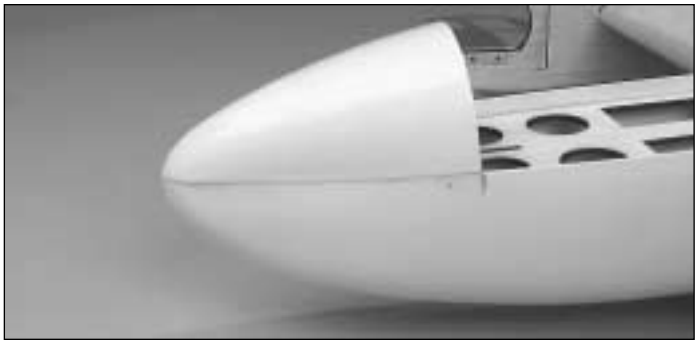


❑ 5. Mark the location of former F1/F2 on the lip of the top canopy. Mark the bottom canopy 3/8" [10mm] aft of the former.



❑ 6. Cut the nose from the bottom canopy at these marks. Wrap a piece of tape around the canopy, from mark-to-mark, to act as a guide when cutting the canopy nose.

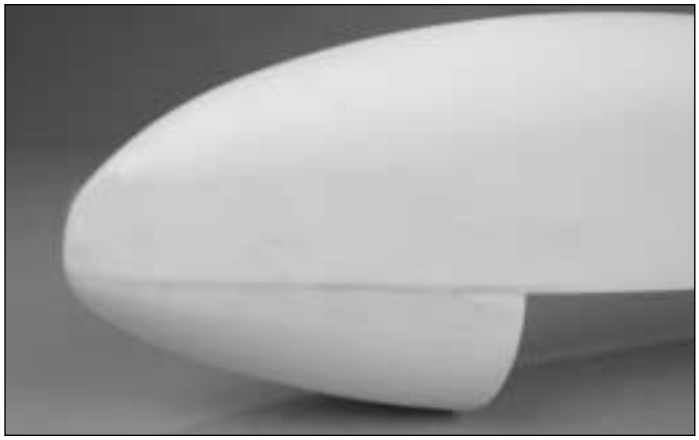




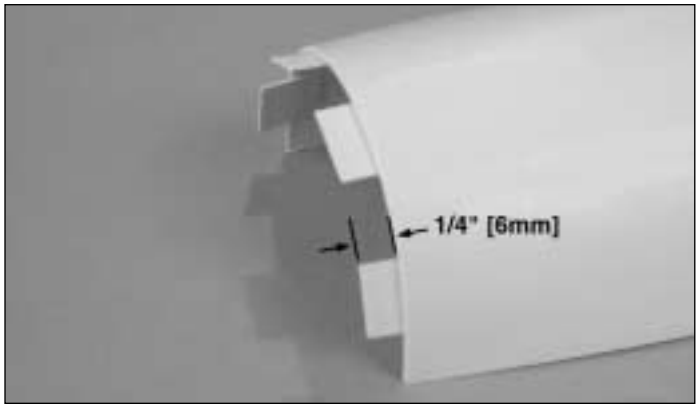
❑ 7. Sand the inside of the top canopy and the nose bottom around the edges. From the scrap ABS, trimmed from the canopies, make 1/2" [13mm] wide tabs to attach the top canopy and the nose bottom. Use CA to glue the tabs to the top canopy and the nose bottom. Do not glue the canopy to the canopy frame at this time. The canopy will be attached after the wing is covered and the canopy is painted. **Do not** use CA kicker on the ABS. Over time it will cause the ABS

to crack and if the residue is not completely removed, paint will not adhere to it.

❏ 8. Sand the seam smooth between the top canopy and the nose bottom. Fill the seam with a filler such as Bondo® Auto Body Filler or an automotive scratch and dent glazing compound. We use Bondo most of the time as it cures quickly and sands easily, but it is normally sold in large quantities. Automotive glazing compound usually comes in small tubes, dries quickly and sands easily, but for proper drying can only be applied in thin layers.



❏ 9. After the filler hardens, sand off the excess, using progressively finer sandpaper to smooth the seam. Wet-sand the entire canopy, top and bottom, with 400-grit sandpaper to prepare it for primer.



❏ 10. Temporarily reinstall the canopy on the canopy frame. Use tape to hold it in place. Fit the canopy bottom on the canopy top and trim as necessary. The aft end of the bottom canopy should align with the trailing edge of the wing. From scrap ABS, make four 1/2" x 1/2" [13mm x 13mm] square **canopy bottom tabs**. Glue the tabs to the forward edge of the bottom canopy. They should overhang the edge by 1/4" [6mm].

❏ 11. Check fit the bottom canopy on the top canopy and wing. Mounting blocks will be installed after the wing is covered to hold the canopy bottom on the wing.

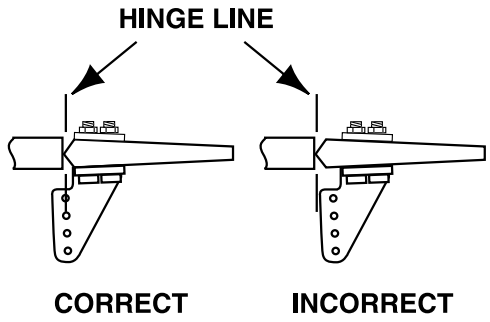
INSTALL THE RADIO SYSTEM

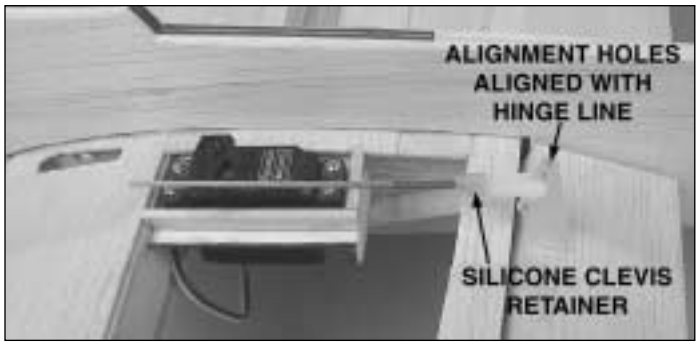
Install the Aileron Servos

❏ ❏ 1. Install the aileron servos in the aileron servo trays using the hardware provided with the servos. Note the servo orientation in the photo and on the plan.

❏ ❏ 2. From the remaining 1/8" x 1/4" [3mm x 6mm] balsa stick, cut and glue a frame around the aileron servo. This will provide a surface for the covering to adhere to. Once you remove the servo to cover the wing, use a bar sander to sand the frame flush with the wing sheeting.

❏ ❏ 3. Temporarily plug the servo into the receiver. Switch on the transmitter and then the receiver, and center the aileron servo. Install a servo arm on the servo.





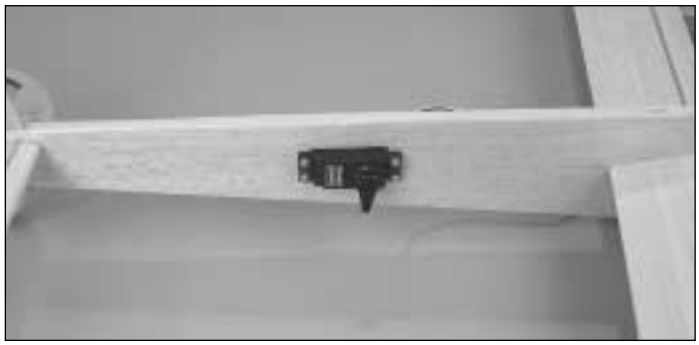
❏ ❏ 4. Thread a nylon **clevis** approximately 14 full turns onto the threaded end of a **2-56 x 4" [102mm] pushrod**. Slide a **silicone clevis retainer** over the clevis. Remove the backing plate from one of the **large control horns** and connect the clevis to the control horn. Position the control horn on the aileron so that the adjustment holes are aligned with the aileron hinge line and the pushrod is parallel with centerline of the servo. Mark the control horn mounting hole locations on the aileron.

❏ ❏ 5. Attach the aileron control horn to the aileron with two **#2 x 1/2" [13mm] sheet metal screws**. Remove the screws and put a drop of thin CA in each hole to harden the wood. After the CA has hardened, reinstall the control horn with the screws.

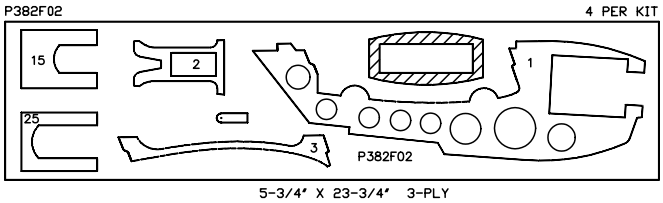
❏ ❏ 6. Center the aileron servo arm and mark where the pushrod crosses the arm. Make a 90° bend at the mark, cut the pushrod and attach it to the servo arm with a **Faslink**.

❏ 7. Return to step 1, ***Install the Aileron Servos*** and install the other aileron servo.

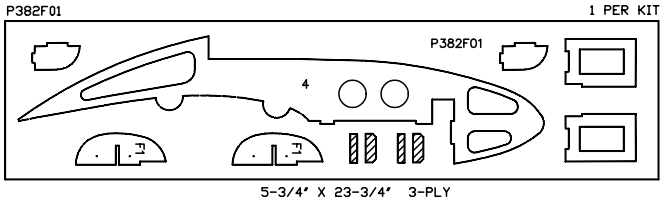
Install the Elevator & Rudder Servos



❏ ❏ 1. Using the hardware provided with the servo, install the elevator servo in the servo tray of the left boom. Note its orientation in the photo.

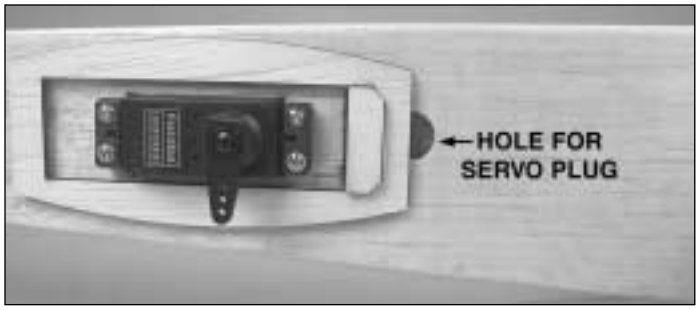


❏ ❏ 2. Tape the die-cut 3-ply **radiator housing mount** to the boom, centered around the elevator servo.

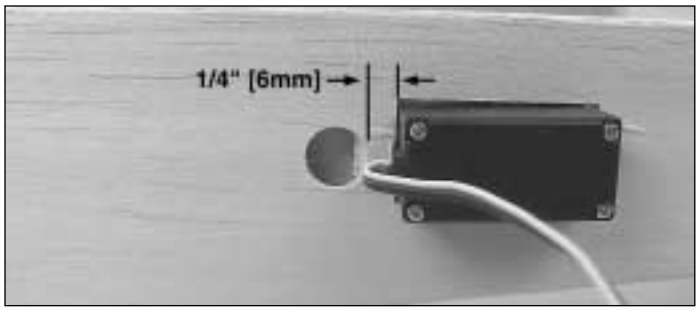


❏ ❏ 3. Glue the die-cut 3-ply **radiator tab** to the **radiator tab base**. Align the aft edge of the tab with the edge of the tab base.

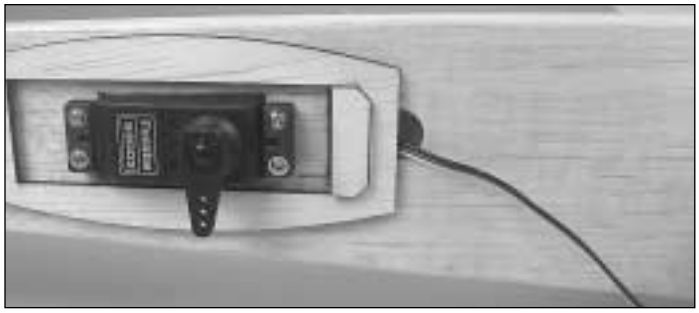
❏ ❏ 4. Position the radiator tab over the aft edge of the radiator housing mount. Mark the location of the radiator tab on the main boom. Remove the radiator housing mount and glue the radiator tab to the main boom, at the previous mark. Allow the CA to cure and reinstall the radiator housing mount, checking the fit. Make sure the radiator housing mount remains centered.



❏ ❏ 5. Make a hole in front of the radiator housing mount large enough for the servo plug to exit. Do not cut through the sheeting on the outside of the main boom. A sharpened brass tube works great for making holes in the sheeting.



❏ ❏ 6. Make a hole in the sheeting on the outside of the main boom, approximately 1/4" [6mm] in front of the servo.



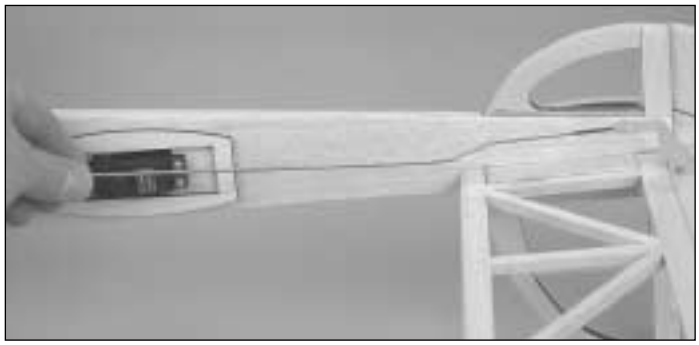
❏ ❏ 7. Route the servo lead through the holes. The lead must pass through the holes easily. Once you have the outside radiator housing installed it will be difficult to view the hole.

❏ 8. Return to step 1 and install the rudder servo in the right main boom.

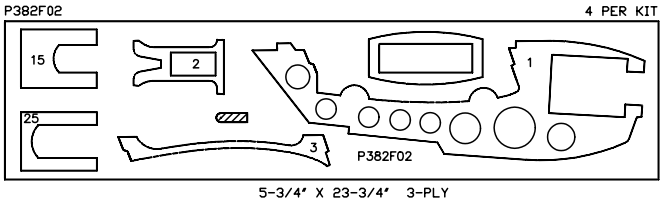
Install the Elevator Pushrod

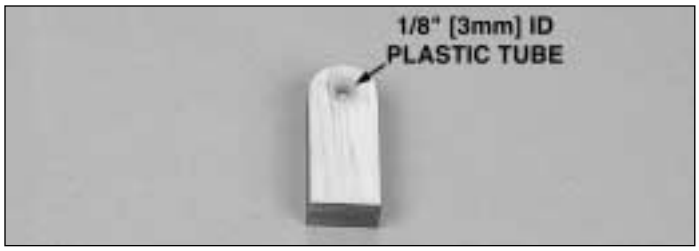
❏ 1. Position a large control horn on the elevator as shown on the plan. Mark the location of the control horn mounting holes and drill 3/32" (2.4mm) holes at the marks. Temporarily mount the elevator control horn on the elevator with the backing plate and two **2-56 x 1/2" [13mm] machine screws**.

❏ 2. Temporarily plug the elevator servo into the receiver. Switch on the transmitter and then the receiver. Center the elevator servo arm.



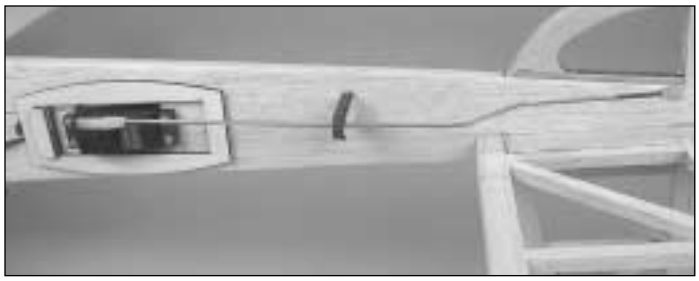
❏ 3. Thread a nylon clevis approximately 14 full turns onto the threaded end of a **2-56 x 12" [305mm] pushrod**. Slide a silicone clevis retainer over the clevis. Attach the clevis to the outer hole in the elevator control horn. Bend the elevator pushrod so that the pushrod aligns with the hole in the servo arm, closest to the center of the arm.





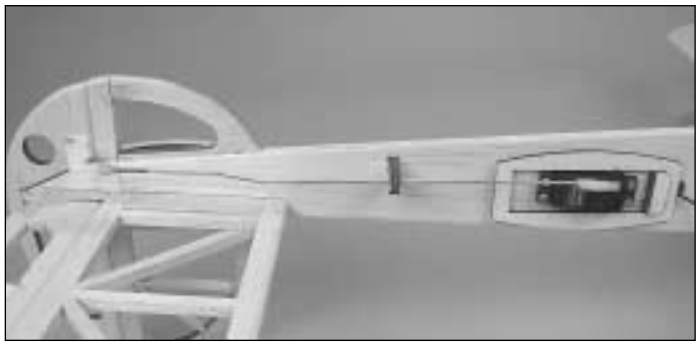
❏ 4. Glue two of the die-cut 3-ply **pushrod guides** together, aligning the edges. Drill a 3/16" [5mm] hole through the pushrod guide. Cut a 1/4" [6mm] long piece from the 1/8" [3mm] ID plastic tube. Glue the plastic tube in the pushrod guide.

❏ 5. Slide the pushrod guide over the elevator pushrod. Center the elevator servo arm. Mark the elevator pushrod where it crosses the elevator servo arm. Make an L-bend at the mark and attach the elevator pushrod to the elevator servo arm with a Faslink. Check the movement of the servo arm. If the pushrod hits the servo with the Faslink attached, move the pushrod out one hole on the servo arm.



❏ 6. Position the pushrod guide between the leading edge of the stabilizer and the aft edge of the radiator housing mount. Mark the location on the inside sheeting of the main boom. Move the pushrod guide out of the way and use a T-pin to make sure no braces are under the sheeting. If you find a brace under the sheeting, move the guide slightly toward the stabilizer and check again.

❏ 7. Use a sharp hobby knife to cut a hole in the inner main boom sheeting for the pushrod guide. Depending on the bend in the pushrod, you may need to shorten the guide. Do not glue the guide in the main boom until after the plane is covered.



❏ 8. Install the rudder pushrod the same way.

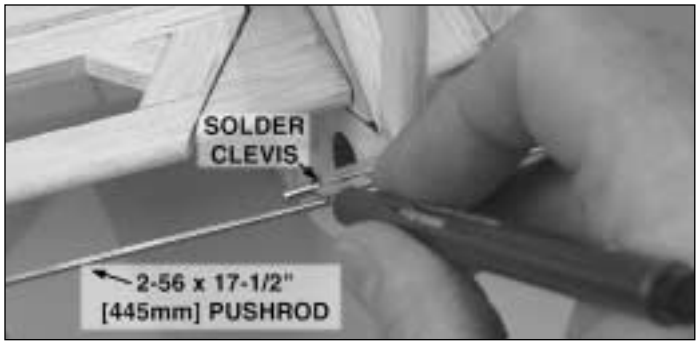
Connect the Rudders

❏ 1. Drill a 1/8" [3mm] hole in both rudders where the fin comes to a point. Make sure the drill bit is perpendicular to the rudder.

❏ 2. Apply thin CA around the holes on both sides of the rudder to harden the wood.

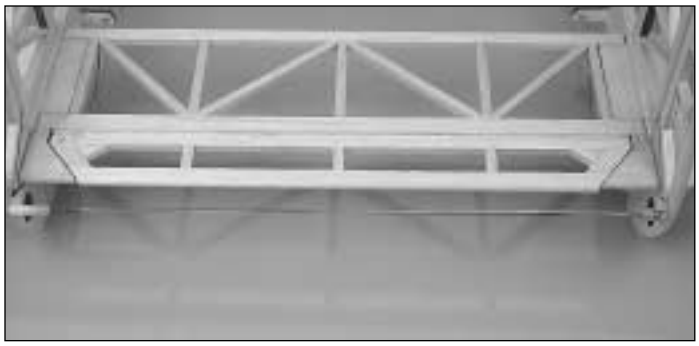
❏ 3. After the CA has hardened, insert 4-40 x 1/2" [13mm] machine screws with a #4 washers through the holes, from the outside of the rudder. Attach a 4-40 torque rod horn on both screws.

❏ 4. Thread a nylon clevis approximately 14 full turns onto the threaded end of a **2-56 x 17-1/2" [445mm]** pushrod. Slide a silicone clevis retainer over the clevis.



❑ 5. Attach the nylon clevis to the torque rod horn on the left rudder. Attach the solder clevis to the torque rod horn on the right rudder. With both rudders centered, mark and cut the pushrod to fit the solder clevis.

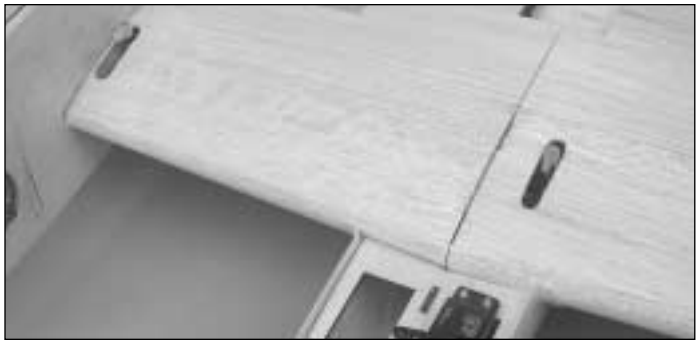
❑ 6. Slide a second silicone clevis retainer onto the pushrod. Remove the solder clevis from the torque rod horn and silver solder the solder clevis on the end of the pushrod. Once the solder clevis has cooled, wipe off the excess flux with denatured alcohol. To prevent rust from forming, put a light coat of oil on the solder clevis and pushrod.



❑ 7. Slide the second silicone clevis retainer over the solder clevis. Attach the clevis to the torque rod horn on the right rudder.

Install the Throttle Servo

❑ 1. Install the throttle servo as shown on the plan.

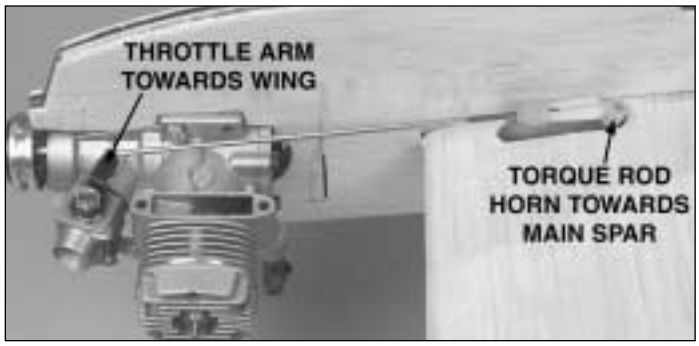


❑ 2. Trim the slots for the linkage exits in the wing. Make sure the wing sheeting does not interfere with the torque rod horns.

❑ 3. Thread a nylon clevis approximately 14 full turns onto the threaded end of a 2-56 x 4" [102mm] pushrod. Slide a silicone clevis retainer over the clevis. Attach the clevis to the torque rod horn at the center of the wing.

❑ 4. Temporarily install both engines, using only two screws to hold the engines in position. The throttle linkage needs to be installed at this time to check that the slots are large enough before the wing is covered.

❑ 5. Thread a nylon clevis approximately 14 full turns onto the threaded ends of two 2-56 x 12" [305mm] pushrods. Slide a silicone clevis retainer over the clevis. Attach the clevises to the two torque rod horns next to the main booms.



❑ 6. Position the torque rod horns so that they are toward the main spar. Rotate the throttle arms on both engines toward the wing. Mark the pushrods where they cross the throttle arm. Make a Z-bend at the mark and install the pushrods in the throttle arms. Re-attach the clevises to the torque rod horns.

❑ 7. Connect the throttle servo to the receiver. Switch on the transmitter and then the receiver, and center the throttle trim.

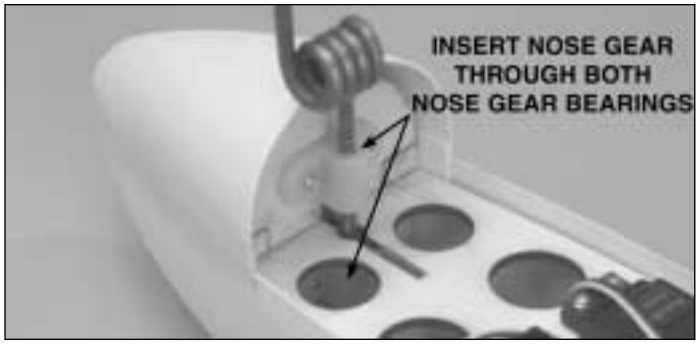
❑ 8. Center the throttle stick. Rotate the throttle arms on the engines so the throttle is half open on the engine. Mark the throttle pushrod where it crosses the servo arm.

❏ 9. Make an L-bend at the mark and attach the throttle pushrod to the throttle servo arm with a Faslink.

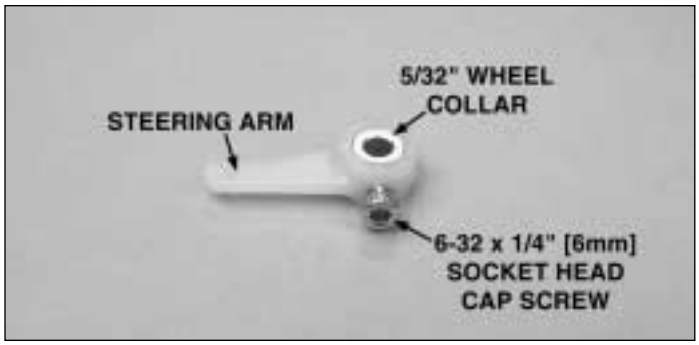
❏ 10. Move the throttle stick, checking the linkage to make sure it does not bind anywhere. Check that both throttles are adjusted the same. Once the airplane is completed and ready to fly, you may need to make small adjustments to the pushrods so that both engines operate the same.

Install the Nose Steering

❏ 1. Install the nose steering servo as shown on the fuse plan.

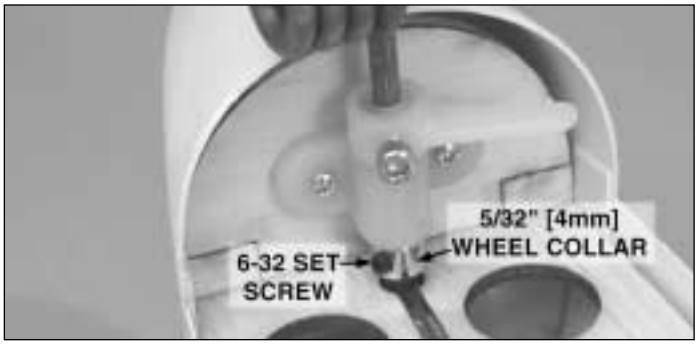


❏ 2. Insert the nose gear in the nose gear bearings. Make sure it rotates smoothly. The canopy bottom will require trimming to allow the nose gear to fit in the bearings.



❏ 3. Trim off the outer two holes on the nylon **steering arm**. Insert a **5/32" [4mm] wheel collar** in the steering arm and secure it with a **6-32 x 1/4" [6mm] socket head cap screw**.

❏ 4. Insert a **6-32 set screw** into a second 5/32" [4mm] wheel collar.



❏ 5. Slide the steering arm on the nose gear and insert the nose gear in the bottom nose gear bearing. Install the 5/32" [4mm] wheel collar between the servo tray and the nose gear bearing while sliding the nose gear through the wheel collar and into the top nose gear bearing. The coil on the nose gear should be approximately 1/4" [6mm] from the bottom canopy.

❏ 6. Rotate the nose gear so the axle is perpendicular to the centerline of the wing. Offset the steering arm 3 or 4 degrees towards the steering servo and mark the location of the steering arm on the nose gear. Remove the nose gear and file a flat at the steering arm location. Reinstall the nose gear.

❏ 7. Thread a nylon clevis approximately 14 full turns onto the threaded end of a 2-56 x 4" [102mm] pushrod. Slide a silicone clevis retainer over the clevis. Attach the clevises to the steering arm.

❏ 8. Plug the steering servo into the receiver and center the steering servo. The servo can also be connected to the rudder servo with a Y-harness. Position the nose gear axle perpendicular to the centerline of the wing. Mark the steering pushrod where it crosses the steering servo arm. Make an L-bend at the mark and attach the pushrod to the servo arm with a Faslink.

❏ 9. Test fit the bottom canopy over the servo tray, trimming a cutout for the nose gear.

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.

Now that you have the basic airframe completed, this is a good time to balance the airplane laterally (side-to-side). Here is how to do it:

❑ 1. With the servos, canopy and engines installed, level the wing. Then, lift the model by the nose of the canopy and the center of the trailing edge. Do this several times.

❑ 2. If one wing tip consistently drops when you lift the plane, it means that side is heavy. Balance the airplane by gluing 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.

FINISHING

Final Sanding

Remove the engines, canopy and radio gear from the plane. Fill any scuffs and dings with balsa filler or by the "expansion" method described earlier. After the filler has dried, use progressively finer grades of sandpaper to even and smooth all the edges, seams and surfaces. Remove all the balsa dust from the model with compressed air, a tack cloth or a vacuum with a brush.

Cover the Model with MonoKote® Film

The technique described here is how the model pictured on the box was finished using Top Flite MonoKote film and LustreKote® high quality paint. The use of a Top Flite MonoKote Hot Sock™ on your covering iron will prevent scratching the MonoKote film.

Before covering the fuselage, first apply 1/4" [6mm] wide strips of Aluminum MonoKote film in the corners where the stabilizer, fin and booms meet. Also apply 1/4" [6mm] wide strips of Aluminum MonoKote film along the joint between the wing and the booms. **Do not, under any circumstances, attempt to cut the covering on the stabilizer or wing after it has been applied except around the leading and trailing edges and the tips.** Modelers who do this may cut through the covering and into the stabilizer or wing. This will weaken the structure to a point where it may fail during flight.

We suggest covering the larger areas first, such as the wing and stabilizer center sections. Then, use the smaller leftover pieces of film to finish the stabilizer and wing tips and the fin and boom.

The black and white invasion stripes on the wing can be applied using several different methods. The first method is to cover the wing completely with aluminum MonoKote film. Then, the white and blacks strips are ironed on at a lower temperature. The problem with this method is that air bubbles can get trapped under the covering. This becomes a bigger problem when covering over an open structure.

The second method is to use Top Flite MonoKote Trim Solvent to apply the black and white stripes. This method will give you a smooth, bubble-free finish, but requires 24 hours to dry.

A third method, as explained in the following ***Expert Tip***, is to iron the black, white and aluminum films on a piece of glass overlapping the colors by 1/4" [6mm]. Then, iron the film on as one big piece.

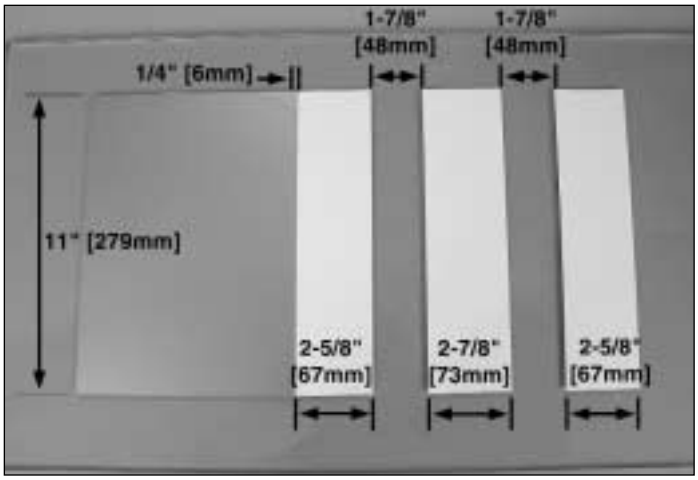
EXPERT TIP

Covering An Open Structure With More Than One Color Of MonoKote Film

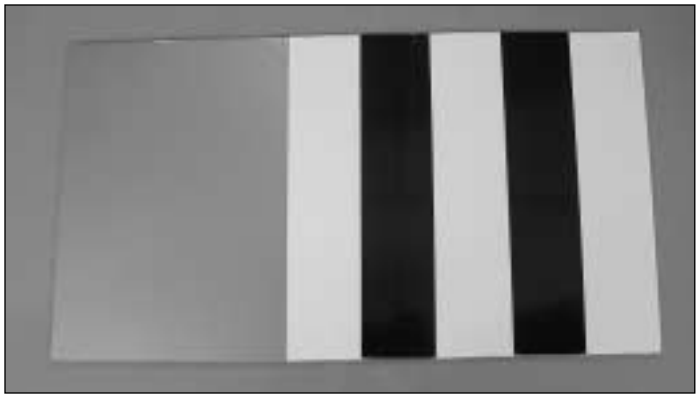
Cut a piece of aluminum MonoKote film 8" wide by 11" long [203mm x 279mm]. Place marks 1/4" [6mm] in along one of the 11" [279mm] sides. Lay the aluminum film on a piece of glass that has been lightly wetted with a glass cleaner such a Windex™. Use a squeegee wrapped with a paper towel to remove the glass cleaner from under the film. The film must lay flat on the glass.

Cut two white stripes 2-5/8" wide by 11" long [67mm x 279mm]. Again, lightly wet the glass and align one of the white stripes with the marks on the aluminum film.

Cut a third white stripe 2-7/8" wide by 11" long [73mm x 279mm]. Position this stripe 1-7/8" [48mm] from the edge of the first white stripe.



Position the third white stripe 1-7/8" [48mm] from the edge of the second white stripe. Make sure all three white stripes are parallel. Use a squeegee and paper towel to remove the glass cleaner from under the covering.



Cut two black stripes 2-3/8" wide by 11" long [60mm x 279mm]. Lightly wet the glass between the white stripes and position the black stripes overlapping the white stripes by 1/4" [6mm]. Use a squeegee and paper towel to remove the glass cleaner from under the black stripes.

With your covering iron set close to high, iron down the seams between the stripes. Allow the covering to cool for a minute and carefully start lifting one end of the white covering. The black and white strips and the aluminum film should be connected along the seams. If they are not, increase the heat of the covering iron and move it slower over the seams, repeating the process. It may require more heat than normal for the film to seal, because the glass absorbs some of the heat.

After removing the film from the glass, position the film on the wing with the white stripe against the boom. Use your covering iron to tack the film down every few inches. Then, go back and seal the covering to the wood all over.

A heat gun can be used to carefully shrink the covering, but care must be taken to not pull the seams apart. Avoid heating the overlapping seams at the same time as heating the rest of the covering; otherwise, the seam may pull apart.

Suggested Covering Sequence

- ❑ 1. 1/4" [6mm] strips at fin, stabilizer and wing joints
- ❑ 2. Bottom of wing center section
- ❑ 3. Top of wing center section
- ❑ 4. Bottom of stabilizer center section
- ❑ 5. Top of stabilizer center section
- ❑ 6. Bottom of outer wing panels
- ❑ 7. Top of outer wing panels
- ❑ 8. Top of fins
- ❑ 9. Stabilizer tips bottom
- ❑ 10. Stabilizer tips top
- ❑ 11. Bottom of fins
- ❑ 12. Booms

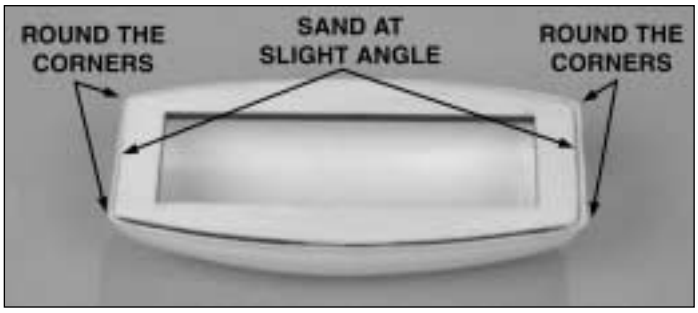
Painting Your Model

Top Flite LustreKote high quality paint perfectly matches Top Flite MonoKote film. The paint is well suited to putting a high quality finish on ABS (canopy and radiator housing), but does have a tendency to curl materials such as styrene and butyrate.

If you have any doubt about the material you are painting, we suggest painting on a small piece of leftover material. Monitor it for a few days to be sure it is compatible with the paint.

We used LustreKote White (TOPR7204), Black (TOPR7509), Aluminum (TOPR7205), Cub Yellow (TOPR7220) and Insignia Blue (TOPR7207)

Installing & Painting the Radiators

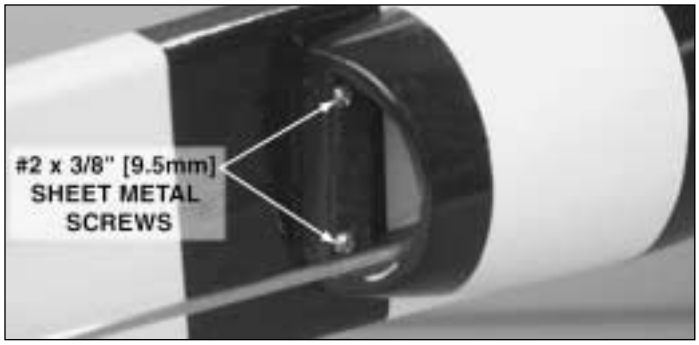


❑ 1. Trim the ABS radiators along the bottom. Sand the 3-ply radiator housing mounts flush with the bottom of the radiators. The end of the housing mounts may need to be sanded at a slight angle and the corners rounded.

❑ 2. Use CA to glue the housing mounts to the housings. Sand the housing mounts and the radiators flush.

❑ 3. Two of the radiator housings are glued to the outside of the main booms, one on each boom, over the rudder and elevator servos. Position the radiator housings centered over the servos and mark the outline of the housing. Remove the radiator housing and trim the covering from inside the outline. Use epoxy to attach the housings to the main booms. Use a paper towel dampened with denatured alcohol to wipe off any excess epoxy before it hardens.

❑ 4. For the two radiator housings that are on the inside of the main booms, trim an opening on one end to allow the rudder and elevator pushrods to exit.



❏ 5. Center the inside radiator housings over the servos. Drill two 1/16" [1.6mm] pilot holes in the end of the radiator housing mounts and into the main booms. Do not drill completely through the main booms. Attach the radiator housings to the main booms with #2 x 3/8" sheet metal screws.

❏ 6. We found it is easy to paint the radiator housings with them installed on the plane. First mask off and paint the white stripes. After the paint dries, mask and paint the black stripes.

Apply the Decals

1. Use scissors or a sharp hobby knife to cut the decals from the sheet.

2. Be certain the model is clean and free from oily fingerprints and dust. Prepare a dishpan or small bucket with a mixture of liquid dish soap and warm water–about one teaspoon of soap per gallon of water. Submerse the decal in the soap and water and peel off the paper backing. **Note:** Even though the decals have a "sticky-back" and are not the water transfer type, submersing them in soap & water allows accurate positioning and reduces air bubbles underneath.

3. Position decal on the model where desired. Holding the decal down, use a paper towel to wipe most of the water away.

4. Use a piece of soft balsa or something similar to squeegee remaining water from under the decal. Apply the rest of the decals the same way.

5. After all the painting is done and the decals are applied, use a fine-tip panel line pen to draw the panel lines on the plane. Even if you are not doing a scale trim scheme, the panel lines enhance the look of the plane and are easy to apply.

FINAL HOOKUPS & CHECKS

Install the Hinges

❏ 1. Cut the covering from the hinge slots in the elevator and stabilizer.

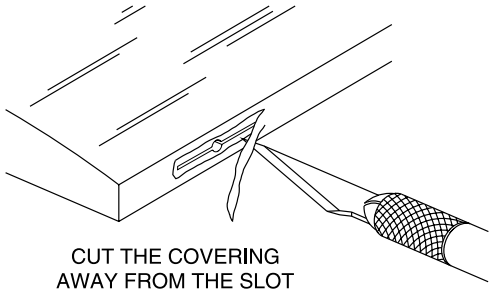
❏ 2. Reinstall the CA hinges in the elevator without glue.

EXPERT TIP

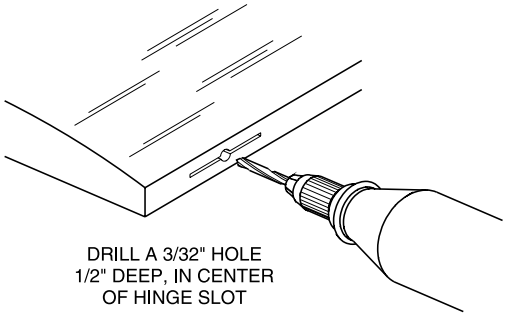
Installing CA Hinges

The hinge material supplied in this kit consists of a 3-layer lamination of mylar and polyester. It is specially made for the purpose of hinging model airplane control surfaces. Properly installed, this type of hinge provides the best combination of strength, durability and ease of installation. We trust even our best show models to these hinges, but it is essential to install them correctly. Please read the following instructions and follow them carefully to obtain the best results. These instructions may be used to effectively install any of the various brands of CA hinges.

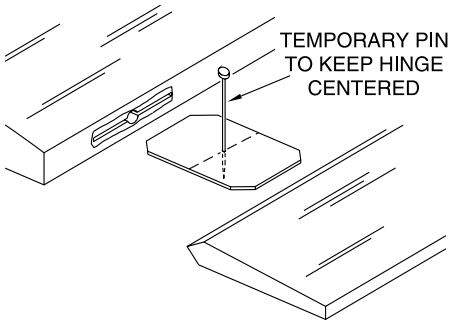
The most common mistake made by modelers when installing this type of hinge is not applying a sufficient amount of glue to fully secure the hinge over its entire surface area; or, the hinge slots are very tight, restricting the flow of CA to the back of the hinges. This results in hinges that are only "tack glued" approximately 1/8" to 1/4" (3.2mm to 6.4mm) into the hinge slots. The following technique has been developed to help ensure thorough and secure gluing.



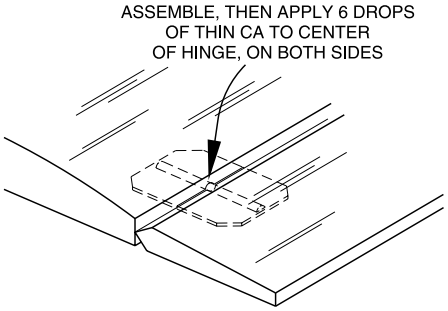
A. Cut the covering from the hinge slots–don't just slit the covering but remove a small strip the size of the hinge.

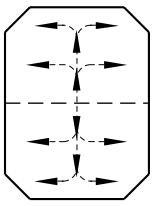


B. **If you used a Slot Machine to make the hinge slots, this step is not necessary.** Otherwise, drill a 3/32" (2.4mm) hole 1/2" (12.7mm) deep in the center of each hinge slot. A high speed Dremel® Tool works best for this. If you use a regular drill, clean the hinge slots with your hobby knife after drilling.



C. It is best to leave a slight hinge gap, rather than closing it up tight, to help prevent the CA from wicking along the hinge line. The gap is large enough if you can just start to see light through it. Make sure the control surfaces will deflect to the recommended throws without binding. If you have cut your hinge slots too deep, the hinges may slide in too far, leaving only a small portion of the hinges in the control surface. To avoid this, insert a small pin through the center of each hinge before installing. This pin will keep the hinge centered while you install the control surfaces.





❏ 3. Apply 6 drops of thin CA to both sides of each hinge. Allow a few seconds between drops for the CA to wick into the slot. Use a paper towel to wipe off any excess CA that may have gotten onto the covering.

Do not use accelerator on any of the hinges. Do not glue the hinges with anything but thin CA and do not attempt to glue one half of the hinge at a time with medium or thick CA. They will not be properly secured and the controls could separate while the model is in flight.

❏ 4. Install the rudders and ailerons with their hinges, repeating the gluing technique described previously.

❏ 5. Reinstall the servos, control horns and pushrods. Wrap the receiver and receiver battery in foam rubber. Mount the receiver battery on the receiver battery tray with rubber bands.

❏ 6. Plug the servos into the receiver. Route the rudder and elevator servo leads under the wing. Make a small hole in the bottom wing sheeting to route the servo leads through the wing ribs. A piece of trim sheet can be used to cover the hole and servo leads.

❏ 7. Glue the two pushrod guides in the slots of the main boom.

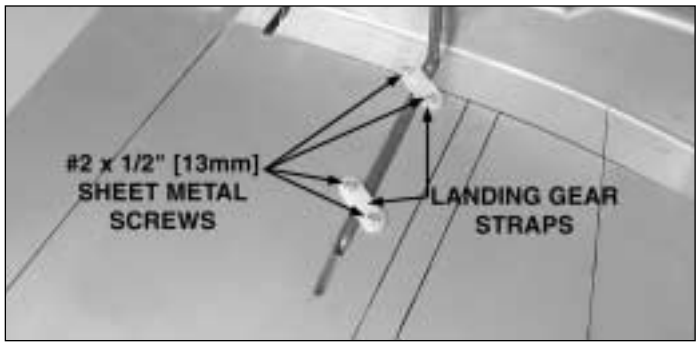
Install the Landing Gear

❏ 1. Reinstall the nose gear. Use threadlocker on the set screw and socket head cap screw.

❏ 2. Install a 5/32" [4mm] wheel collar, then the 2" [50mm] wheel and a second 5/32" [4mm] wheel collar on the nose gear axle. Secure the wheel collars to the axle with 6-32 set screws and threadlocker. **Note:** We recommend that flat spots be filed on the axles, to tighten the set screw on.

❏ 3. Insert the main landing gear in the landing gear rails. Position two nylon **landing gear straps** over the main landing gear as shown on the plan. Mark the screw hole locations on the landing gear rail.

❏ 4. Drill a 1/16" [1.6mm] diameter pilot hole at each mark.

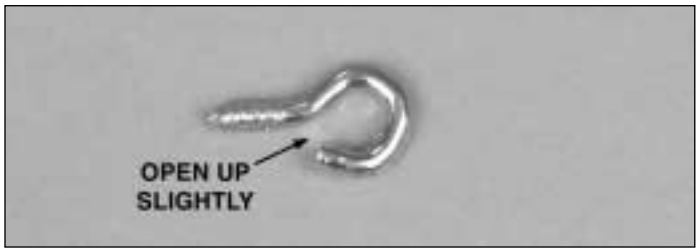


❏ 5. Secure the main landing gear to the landing gear rail with the landing gear straps and four #2 x 1/2" sheet metal screws.

❏ 6. Slide a 5/32" [4mm] wheel collar over the main landing gear axle, followed by a 2-1/2" [64mm] wheel and a second wheel collar. Again file a flat on the axle, under the wheel collars, and secure the wheel collars to the axles with a 6-32 set screw and threadlocker.

Install the Engines & Fuel Tanks

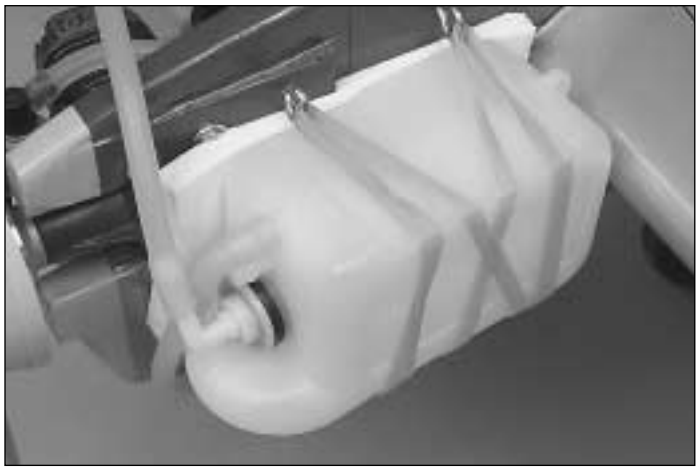
❏ 1. Reinstall the engines. Remember that the mounting screws are installed from the back and that the lock washer and nut are on the engine side. Use threadlocker on the engine mounting screws to prevent them from coming loose from engine vibration.



❏ 2. Use pliers to open the loop of the eight **I-hooks** so that a rubber band can be inserted in the hook.

❏ ❏ 3. Hold the 4oz [120cc] fuel tank in position on the main boom. Mark the location for the four I-hooks and drill a 1/16" [1.6mm] pilot hole at each mark.

❏ ❏ 4. Install the four I-hooks in the pilot holes.

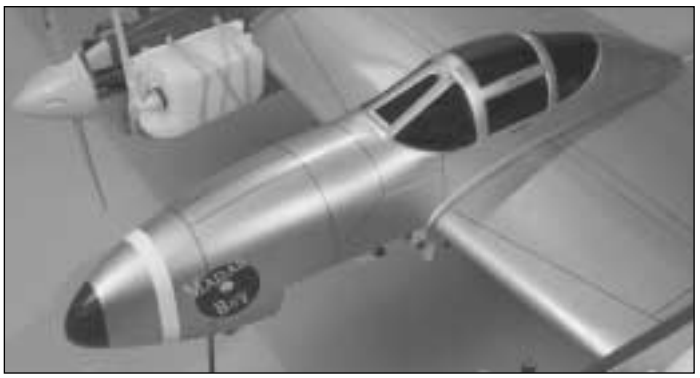


❏ ❏ 5. Place a piece of foam rubber between the I-hooks. Secure the fuel tank on top of the foam rubber with two #64 rubber bands. Connect fuel tubing from the fuel tank to the carburetor and the pressure tap on the muffler.

❏ 6. Return to step 3 and install the second fuel tank.

Install the Canopy

❏ 1. Fit the top canopy on the canopy frame. Mark the outline of the canopy on the wing. To help the glue adhere to the wing, use a T-pin to poke small holes through the covering, just inside the outline. If you prefer to remove a strip of covering in the outline, do not use a hobby knife to cut the film. A better method is to use a hot soldering iron as a knife and melt the covering. This does not cut the balsa sheeting which may weaken the wing.



❏ 2. Glue the top canopy to the wing and canopy frame with epoxy. Wipe off any excess epoxy with a paper towel dampened with denatured alcohol.

❏ 3. Glue two of the 1/2" x 1/2" x 1/2" [13mm x 13mm x 13mm] hardwood **canopy mounting blocks** to the servo tray and the leading edge of the wing.

❏ 4. Position the bottom canopy on the wing. Align the front of the bottom canopy with the previously glued top canopy. Hold the bottom canopy against the bottom of the wing. Drill a 1/16" [1.6mm] pilot hole through the bottom canopy, into the canopy mounting blocks. Remove the bottom canopy and use a 3/32" [2mm] drill bit to enlarge the mounting holes in the bottom canopy. Secure the bottom canopy to the mounting blocks with two #2 x 1/2" [13mm] sheet metal screws and #2 washers.

❏ 5. Mark the outline of the bottom canopy on the wing. Position the two canopy mounting blocks approximately 1-1/2" [38mm] from the trailing edge of the wing and inset the thickness of the bottom canopy and the lip around the canopy. Mark the outline of the blocks and remove the covering from under the blocks. Glue the blocks to the bottom of the wing.

❏ 6. Chamfer the top of the mounting blocks to accommodate the rounded shape of the bottom canopy. Position the bottom canopy on the wing and drill pilot holes through the canopy and into the mounting blocks. Enlarge the holes in the **bottom canopy only** with a 3/32" [2mm] drill bit. Attach the canopy to the wing with #2 x 1/2" [13mm] sheet metal screws and #2 washers.

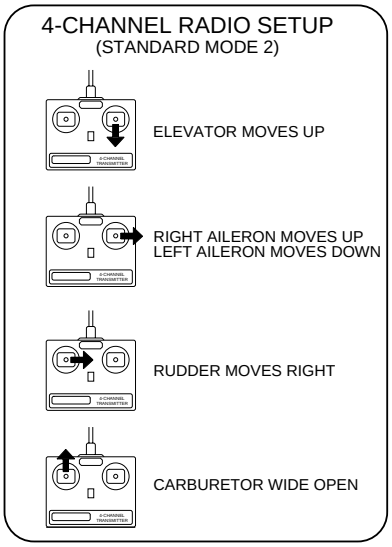
❏ 7. On our models, we routed the receiver antenna out the back of the bottom canopy. We also put the receiver on/off switch and charge jack in the bottom canopy.

GET THE MODEL READY TO FLY

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 carburetors 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 accurately 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 high rate setting.

Note: The throws are measured at the **widest part** of the elevator, rudders and ailerons.

These are the recommended control surface throws:

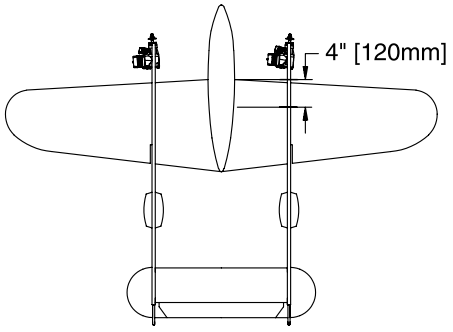
	High Rate	Low Rate
ELEVATOR:	3/8" [10mm] up	1/4" [6mm] up
	3/8" [10mm] down	1/4" [6mm] down
RUDDER:	5/8" [16mm] right	1/2" [13mm] right
	5/8" [16mm] left	1/2" [13mm] left
AILERONS:	3/8" [10mm] up	1/4" [6mm] up
	3/8" [10mm] down	1/4" [6mm] down

IMPORTANT: The Profile 38 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 Profile 38 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.)

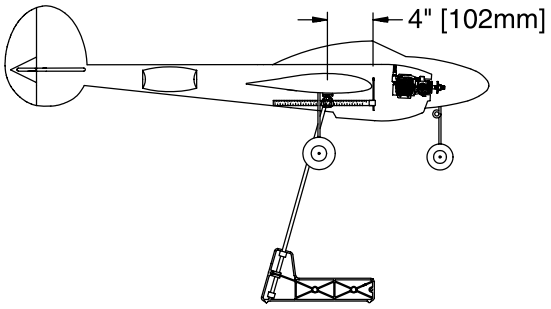
More than any other factor, the **C.G.** (balance point) can have the **greatest** effect on how a model flies, and may determine whether or not your first flight will be successful. If you value this model and wish to enjoy it for many flights, **DO NOT OVERLOOK THIS IMPORTANT PROCEDURE.** A model that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



❏ 1. Use a felt-tip pen or 1/8" [3mm] wide tape to accurately mark the C.G. on the bottom of the wing on **both sides of the canopy**. The C.G. is located **4" [102mm]** 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 upright on a Great Planes CG Machine, **next to the canopy**, or lift it upright at the balance point you marked.

❏ 3. When the Profile 38 is properly balanced, the stabilizer will be level. 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 weight must be added to the tail to balance. If additional weight is required, nose weight may be easily added by using a "spinner weight" (GPMQ4645 for the 1 oz. weight, or GPMQ4646 for the 2 oz. weight). Be sure to add the same amount of weight to both spinners. 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 at the front of the servo tray. Begin by placing incrementally increasing amounts of weight on the top of the canopy over the forward former F1 until the model balances. Once you have determined the amount of weight required, it can be permanently attached to the front of the servo tray. Make sure it does not interfere with the movement of the steering arm.

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.

PREFLIGHT

Identify Your Model

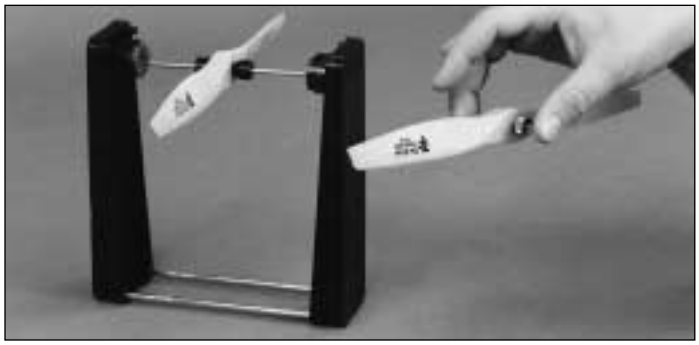
No matter if you fly at an AMA sanctioned R/C club site or if you fly somewhere on your own, you should always have your name, address, telephone number and AMA number on or inside your model. It is **required** at all AMA R/C club flying sites and AMA sanctioned flying events. Fill out the identification tag on page 46 of the instruction manual 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.

Note: Checking the condition of your receiver battery pack is **highly recommended**. All battery packs, whether it's a trusty pack you've just taken out of another model, or a new battery pack you just purchased, should be cycled, noting the discharge capacity. Oftentimes, a weak battery pack can be identified (and a valuable model saved!) by comparing its actual capacity to its rated capacity. Refer to the instructions and recommendations that come with your battery cycler. If you don't own a battery cycler, perhaps you can have a friend cycle your pack and note the capacity for you.

Balance the Propellers



Carefully balance your propellers 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 engines are new, follow the engine manufacturer's instructions to break-in the engines. After break-in, confirm that the engines idle reliably, transition smoothly and rapidly to full power and maintain full power–indefinitely. Because the Profile 38 is a twin engine plane, it is important that both engines operate the same. Both engines should accelerate the same and have the same top RPM. After you run the engines on the model, inspect the model closely to make sure all screws remained tight, the hinges, pushrod and connectors are secure and the props have not come loose.

Range Check

You should always check the operational range of your radio before the first flight of the day and after any hard landings. Follow the radio manufacturer's instructions to properly range check your radio. If no instructions have been provided, the follow procedure will work with most radio systems. 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 engines 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. Sometimes metal-to-metal contact can cause radio problems. Look for a metal pushrod hitting a screw or possibly vibrating against the engine.

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, scarves, 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 rotating propeller.

Make all engine adjustments from behind the rotating propeller.

The engines get hot! Do not touch them 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, if your transmitter has an engine cut switch, set it to fully close the carburetor barrel, or follow the engine manufacturer’s recommendations. Do not use hands, fingers or any other body part to try to stop the engine. Do not throw anything into the propeller of a running engine.

AMA SAFETY CODE (excerpt)

Read and abide by the following Academy of Model Aeronautics Official Safety Code:

GENERAL

1. I will not fly my model aircraft in sanctioned events, air shows, or model flying demonstrations until it has been proven to be airworthy by having been previously successfully flight tested.

2. I will not fly my model aircraft higher than approximately 400 feet within 3 miles of an airport without notifying the airport operator. I will give right of way to, and avoid flying in the proximity of full-scale aircraft. Where necessary an observer shall be used to supervise flying to avoid having models fly in the proximity of full-scale aircraft.

3. Where established, I will abide by the safety rules for the flying site I use, and I will not willfully and deliberately fly my models in a careless, reckless and/or dangerous manner.

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

9. I will not operate models with pyrotechnics (any device that explodes, burns, or propels a projectile 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. I will perform my initial turn after takeoff away from the pit or spectator areas, and I will not thereafter fly over pit or spectator areas, unless beyond my control.

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

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. Fuelproof all areas exposed to fuel or exhaust residue such as the engine mounts.
- ❏ 2. Check the C.G. according to the measurements provided in the manual.
- ❏ 3 Be certain the battery and receiver are securely mounted in the canopy. Simply stuffing them into place with foam rubber is not sufficient.
- ❏ 4. Extend your receiver antenna and make sure it has a strain relief inside the canopy to keep tension off the solder joint inside the receiver.
- ❏ 5. Balance your model *laterally* as explained in the instructions.
- ❏ 6. Use thread locking compound to secure critical fasteners such as the set screws that hold the wheel collars, screws that hold the carburetor arm (if applicable), engine mounting screws, throttle linkage, etc.
- ❏ 7. Add a drop of oil to the axles so the wheels will turn freely.
- ❏ 8. Make sure all hinges are **securely** glued in place.
- ❏ 9. Reinforce holes for wood screws with thin CA where appropriate (servo mounting screws, canopy mounting screws, etc.).
- ❏ 10. Confirm that all controls operate in the correct direction and the throws are set up according to the manual.
- ❏ 11. Make sure there are silicone retainers on all the clevises and that all servo arms are secured to the servos with the screws included with your radio.
- ❏ 12. Secure connections between servo wires and Y-connectors or servo extensions, and the connection between your battery pack and the on/off switch with vinyl tape, heat shrink tubing or special clips suitable for that purpose.

❑ 13. Make sure any servo extension cords you may have used do not interfere with other systems (servo arms, pushrods, etc.).
❑ 14. Secure the pressure tap (if used) to the muffler with high temp RTV silicone, thread locking compound or J.B. Weld.
❑ 15. Make sure the fuel lines are connected and are not kinked.
❑ 16. Use an incidence meter to check the wing for twists and attempt to correct before flying.
❑ 17. Balance your propeller (and spare propellers).
❑ 18. Tighten the propeller nut and spinner.
❑ 19. Place your name, address, AMA number and telephone number on or inside your model.
❑ 20. Cycle your receiver battery pack (if necessary) and make sure it is fully charged.
❑ 21. If you wish to photograph your model, do so before your first flight.
❑ 22. Range check your radio when you get to the flying field.

FLYING

The Profile 38 is a great-flying model that flies smoothly and predictably. The Profile 38 does not, however, possess the self-recovery characteristics of a primary R/C trainer and should be flown only by experienced R/C pilots.

CAUTION (THIS APPLIES TO ALL R/C AIRPLANES): If, while flying, you notice any unusual sounds, such as a low-pitched "buzz," this may indicate control surface *flutter*. This means that the control surface is moving back and forth very rapidly. Because flutter can quickly destroy components of your airplane, any time you detect flutter you must **immediately** cut the throttle and land the airplane! Check all servo grommets for deterioration (this may indicate which surface fluttered), and make sure all pushrod linkages are secure and free of play. If the control surface fluttered once, it probably will flutter again under similar circumstances unless you can eliminate the free-play or flexing in the linkages. Here are some things which can cause flutter: Excessive hinge gap; Not mounting control horns solidly; Poor fit of clevis pin in horn; Side-play of pushrod in guide tube caused by tight bends; Poor fit of Z-bend in servo arm; Excessive *play* or *backlash* in servo gears; and Insecure servo mounting.

Engine Setup

For the Profile 38 to fly straight at all throttle settings, the engines must be synchronized (the props turning close to the same rpm at idle and at full throttle). This will require adjustments of the throttle linkage and the needle settings on the engines. We try to get our engines within 200 rpm. It is also a good idea to run a full tank of fuel through the engines while the plane is on the ground to make sure both engines remain running at different throttle settings and remain synchronized. If the engines get out of synch in the air, some rudder trim can be added to compensate for the difference.

Takeoff

Before you get ready to takeoff, see how the model handles on the ground by doing a few practice runs at **low speeds** on the runway. If necessary, adjust the nose wheel so the model will roll straight down the runway. If you need to calm your nerves before the maiden flight, shut the engines down and bring the model back into the pits. Top off the fuel, then check all fasteners and control linkages for peace of mind.

Remember to takeoff into the wind. When you're ready, point the model straight down the runway, then gradually advance the throttle. Gain as much speed as your runway and flying site will practically allow before gently applying up elevator, lifting the model into the air. At this moment it is likely that you will need to apply more right rudder to counteract engine torque. Be smooth on the elevator stick, allowing the model to establish a **gentle** climb to a safe altitude before turning into the traffic pattern.

Flight

For reassurance and to keep an eye on other traffic, it is a good idea to have an assistant on the flight line with you. Tell him to remind you to throttle back once the plane gets to a comfortable altitude. While full throttle is usually desirable for takeoff, most models fly more smoothly at reduced speeds.

Take it easy with the Profile 38 for the first few flights, gradually getting acquainted with it as you gain confidence. Adjust the trims to maintain straight and level flight. After flying around for a while, and while still at a safe altitude with plenty of fuel, practice slow flight and execute practice landing approaches by reducing the throttle to see how the model handles at slower speeds. Add power to see how she climbs as well. Continue to fly around, executing various maneuvers and making mental notes (or having your assistant write them down) of what trim or C.G. changes may be required to fine tune the model so it flies the way you like. Mind your fuel level, but use this first flight to become familiar with your model before landing.

What to Do if One Engine Quits

If you installed two .25-size engines on your plane, and one engine quits, the plane can maintain altitude with only one engine running. You may need to apply a small amount of rudder to continue flying straight. Try to keep the plane flat in turns and don't turn into the dead engine. Keep your airspeed up. If the nose does drop because of lack of airspeed, don't fight it. Let the nose drop and gain speed. Land the plane as soon as possible.

If you installed two .15-size engines on your plane, and one engine quits, the plane will not be able to maintain altitude on one engine. Be careful to maintain your airspeed so that the wing does not stall. Decide where you are going to land and don't try to stretch the landing. It is better to land with a little extra speed than to stall the plane on the landing approach.

Landing

To initiate a landing approach, lower the throttle while on the downwind leg. Allow the nose of the model to pitch downward to gradually bleed off altitude. Continue to lose altitude, but maintain airspeed by keeping the nose down as you turn onto the crosswind leg. Make your final turn toward the runway (into the wind) keeping the nose down to maintain airspeed and control. Level the attitude when the model reaches the runway threshold, modulating the throttle as necessary to maintain your glide path and airspeed. If you are going to overshoot, smoothly advance the throttle (always ready on the right rudder to counteract torque) and climb out to make another attempt. When you're ready to make your landing flare and the model is a foot or so off the deck, smoothly increase up elevator until it gently touches down.

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, improving a maneuver 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

OTHER ITEMS AVAILABLE FROM GREAT PLANES

ElectriFly™ by Great Planes Triton™ Peak Charger
Imagine a charger so versatile it can be used with lithium-ion and lead-acid batteries as effectively as NiCd and NiMH cells. A unit that can peak charge tiny park flyer packs and 24V car batteries alike. A charger that can discharge as well as charge, cycle packs from 1 to 10 times automatically, memorize peak and average battery voltages for each cycle – and constantly display battery capacity, voltage, current and time as each cycle progresses. Then, imagine that the charger, which can do all this, is about the size of a thick paperback book, and weighs just over a pound. The advanced computer technology in the Triton Peak Charger makes it possible to accomplish all this and more, through controls and menus so simple that programming is a breeze. For more information, log on at ***www.electrifly.com*** – and be amazed. 1-year warranty. **GPMM3150**

Great Planes Master Caddy™ Prebuilt Field Box
Built to last, the sturdy ply, 90% assembled Master Caddy Prebuilt has a place for all of your important field accessories and tools. Within its 25" x 15.75" x 8.25" dimensions are three open top compartments, two roomy drawers with dividers and a shelf for a gallon can or jug of fuel. Cushioned cradles adjust to hold your model safely during maintenance or repair. In the detachable APS (Auxiliary Power Station), carry your standard power panel, 12V battery, starter, glow plug clip and tools – whatever you need for the flight line. **GPMP1001**

BUILDING NOTES

Kit Purchased Date: _____

Where Purchased:_____

Date Construction Started: _____

Date Construction Finished: _____

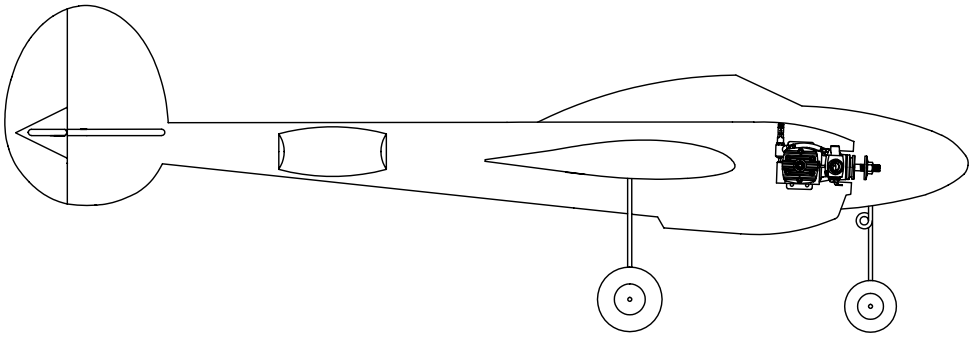
Finished Weight: _____

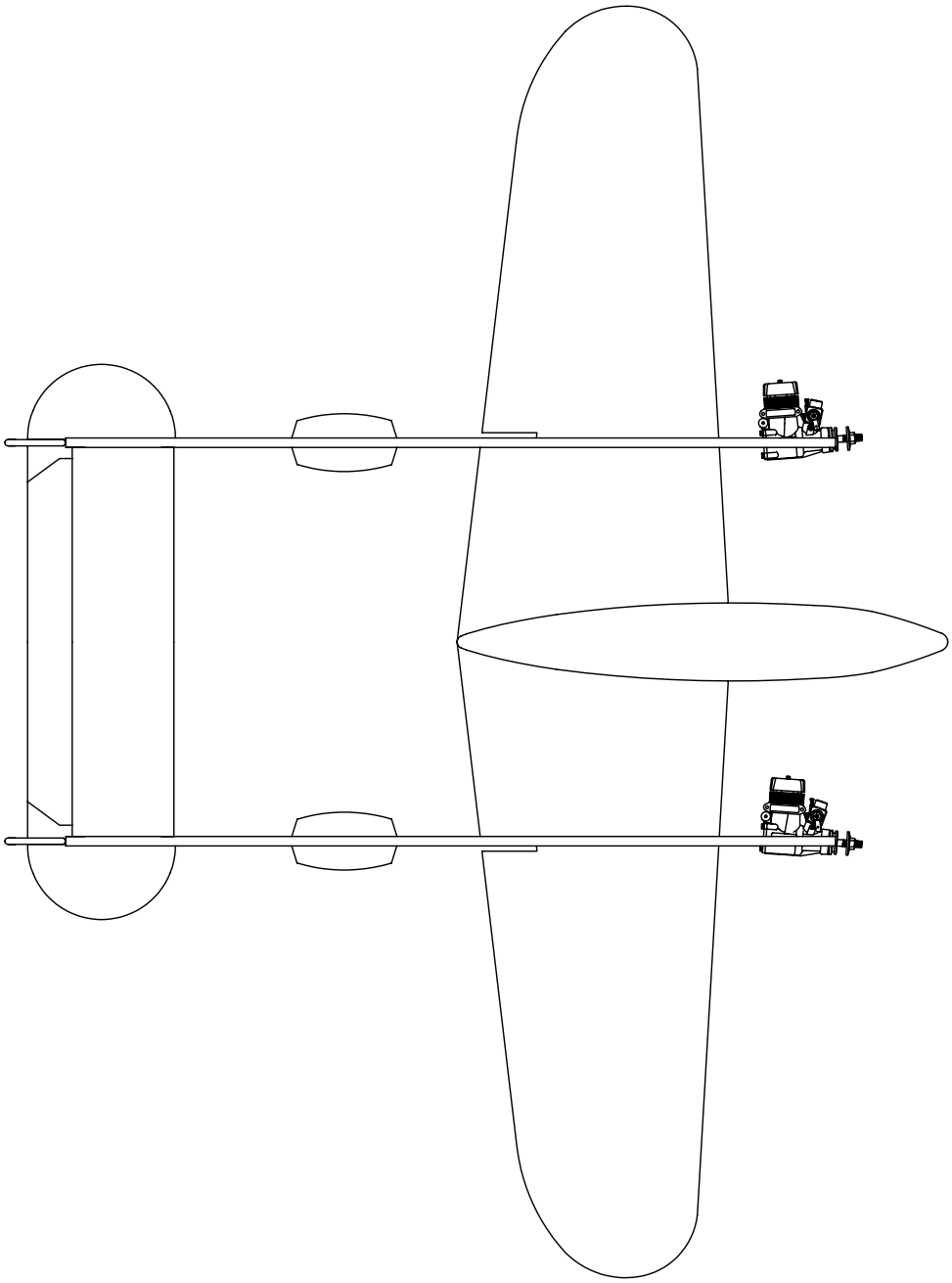
Date of First Flight: _____

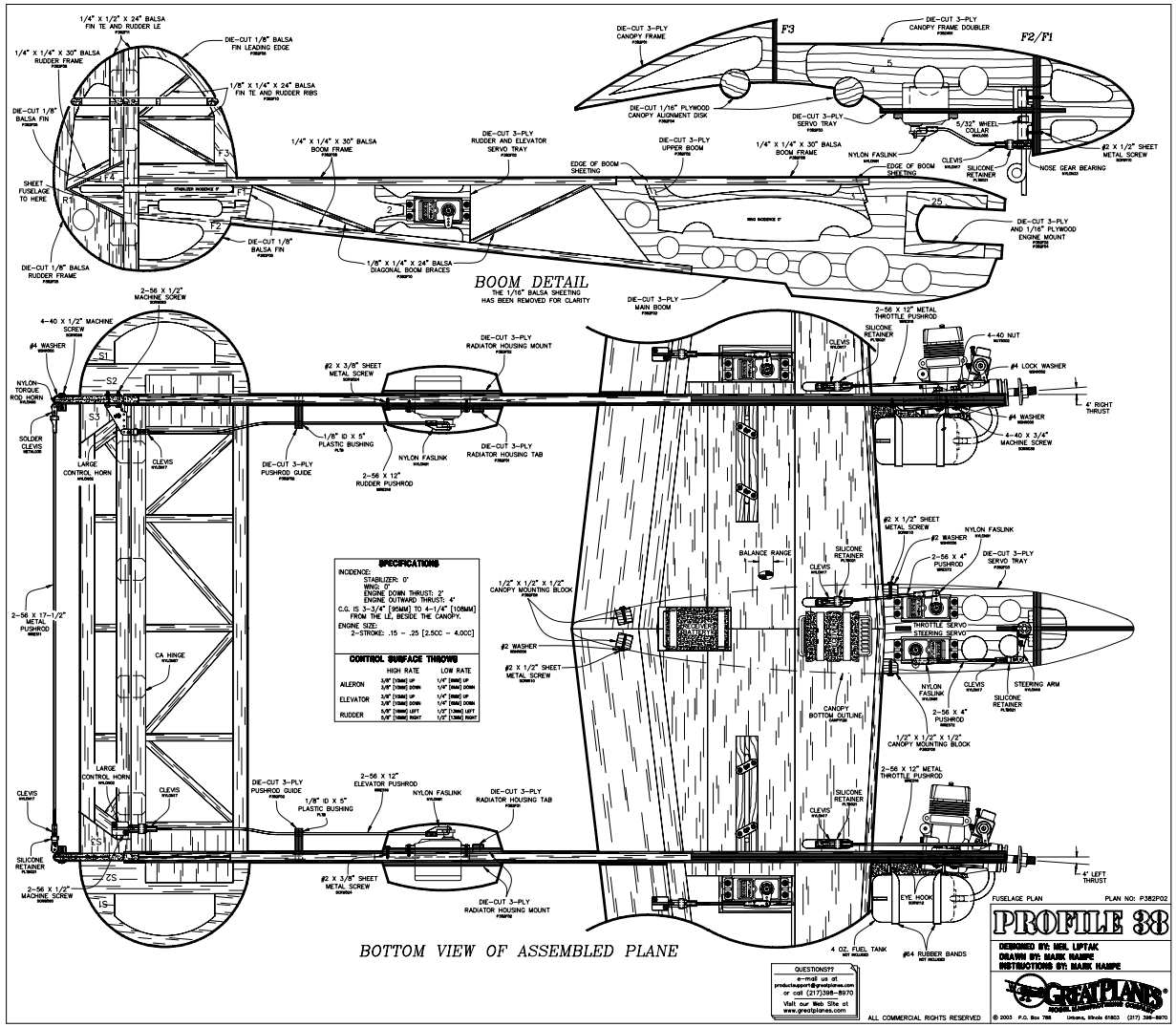
FLIGHT LOG

TWO VIEW DRAWING

Use copies of this page to plan your trim scheme






BOOM DETAIL
THE 1/16" BALSA SHEETING HAS BEEN REMOVED FOR CLARITY
BOTTOM VIEW OF ASSEMBLED PLANE
SPECIFICATIONS
INCIDENCE:
STABILIZER: 0°
WING: 0°
ENGINE DOWN THRUST: 2°
ENGINE OUTWARD THRUST: 4°
C.G. IS 3-3/4" [95MM] TO 4-1/4" [108MM] FROM THE LE, BESIDE THE CANOPY.
ENGINE SIZE:
2-STROKE: .15 – .25 [2.5CC – 4.0CC]
CONTROL SURFACE THROWS
HIGH RATE
LOW RATE
AILERON
ELEVATOR
RUDDER
FUSELAGE PLAN
PLAN NO: PJ382P02
PROFILE 38
DESIGNED BY: NEIL LIPTAK
DRAWN BY: MARK HANPE
INSTRUCTIONS BY: MARK HANPE
QUESTIONS??
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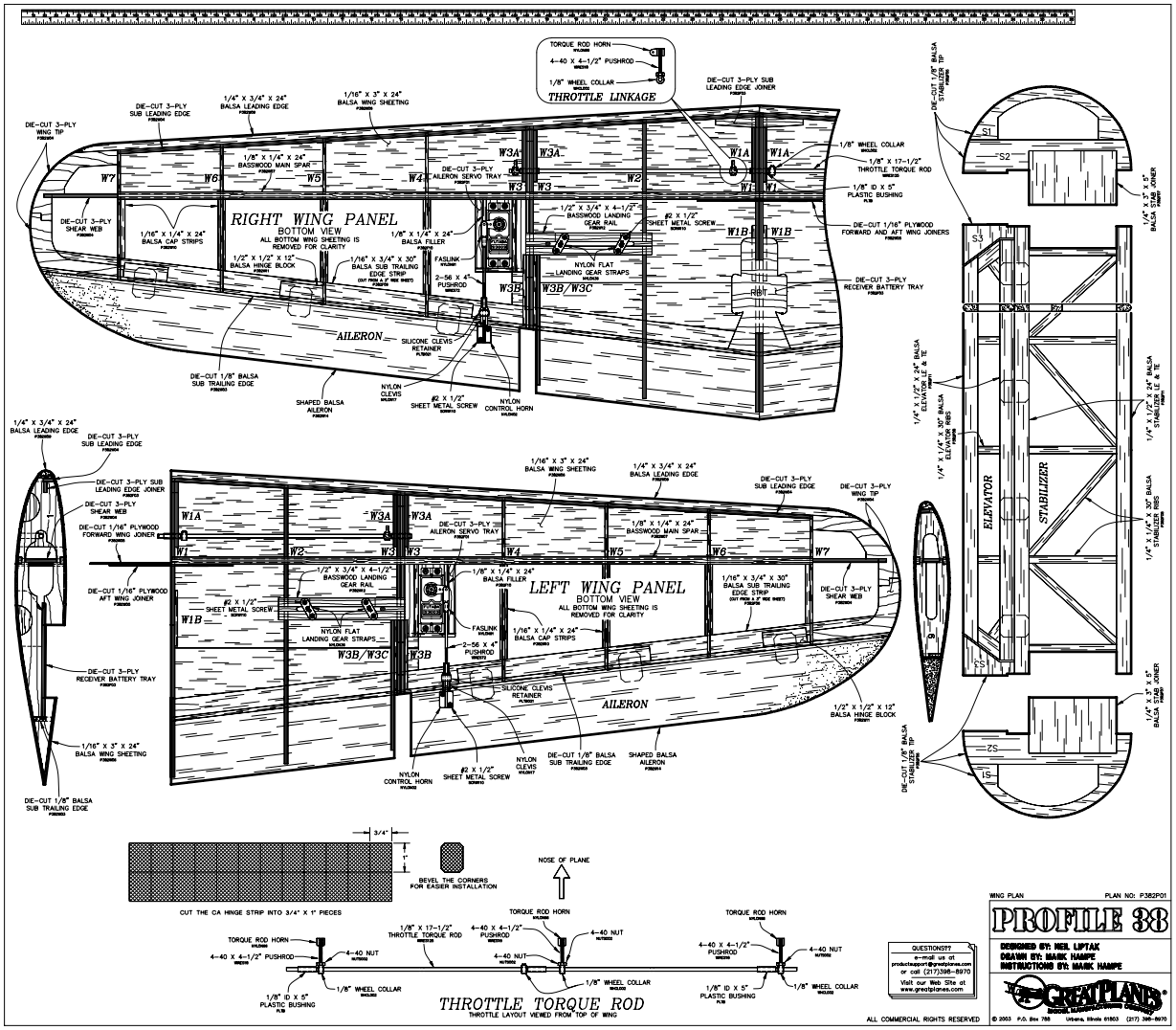
THROTTLE LINKAGE
TORQUE ROD HORN
4-40 X 4-1/2" PUSHROD
1/8" WHEEL COLLAR
RIGHT WING PANEL
BOTTOM VIEW
ALL BOTTOM WING SHEETING IS REMOVED FOR CLARITY
AILERON
LEFT WING PANEL
BOTTOM VIEW
ALL BOTTOM WING SHEETING IS REMOVED FOR CLARITY
AILERON
ELEVATOR
STABILIZER
THROTTLE TORQUE ROD
THROTTLE LAYOUT VIEWED FROM TOP OF WING
CUT THE CA HINGE STRIP INTO 3/4" X 1" PIECES
BEVEL THE CORNERS FOR EASIER INSTALLATION
NOSE OF PLANE
WING PLAN
PLAN NO: P382P01
PROFILE 38
DESIGNED BY: NEIL LIPTAK
DRAWN BY: MARK HAMPE
INSTRUCTIONS BY: MARK HAMPE
QUESTIONS??
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