T-Craft

WITH ALL WOOD CONSTRUCTION

INSTRUCTION MANUAL

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

READ THROUGH THIS INSTRUCTION MANUAL FIRST. IT CONTAINS IMPORTANT INSTRUCTIONS AND WARNINGS CONCERNING THE ASSEMBLY AND USE OF THIS MODEL.

TABLE OF CONTENTS

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

Your T-Craft 20 is not a toy, but rather a sophisticated, working model that functions very much like an actual airplane. Because of its realistic performance, the T-Craft 20, if not assembled and operated correctly, could possibly cause injury to yourself or spectators and damage property.

To make your R/C modeling experience totally enjoyable, we recommend that you get experienced, knowledgeable help with assembly and during your first flights. You'll learn faster and avoid risking your model before you're truly ready to solo. Your local hobby shop has information about flying clubs in your area whose membership includes qualified instructors.

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

Contact the AMA at the address or toll-free phone number below:

Academy of Model Aeronautics
5151 East Memorial Drive
Muncie, IN 47302-9252
Tele. (800) 435-9262
Fax (765) 741-0057
or via the Internet at http://www.modelaircraft.org

INTRODUCTION

Since its introduction in the late 1930's, there have been 100's if not 1000's of the full size T-Craft sold in the U.S.A. They have come in many versions. Some are very stable, while others are very aerobatic, like the clipped wing T-Craft. Great Planes has taken the aerobatic qualities of the full size Clipped Wing T-Craft and designed them into this .20 sized scale model. This plane loops, rolls and flies knife edge but still has the stability of a high wing airplane. So if you're ready for an easy building, fun to fly airplane, let's finish reading this introduction and start building.

While the T-Craft 20 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 seek out the assistance of an experienced R/C pilot who will be able to check out your construction and help you with your first flights. On the other hand, if you have already learned the basics of R/C flying, and you are able to safely handle a low wing airplane, the T-Craft 20 is an excellent choice to improve your flying skills.

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

Please inspect all parts carefully before starting to build. If any parts are missing, broken or defective, or if you have any questions about building or flying this airplane, please give us a call at (217) 398-8970 or e-mail us at productsupport@greatplanes.com and we'll be glad to help. If you are calling for replacement parts, please reference the part numbers and have them ready when calling.

PRECAUTIONS

1. Build the plane according to the plans and 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 plans and written instructions should be considered as correct.

2. Take time to build straight, true and strong.

3. Use an R/C radio system that is in first-class condition. We highly recommend the use of micro servos on the ailerons and standard servos on the rudder, elevator and throttle.

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

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

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

DECISIONS YOU MUST MAKE

ENGINE SELECTION

Recommended engine size:
.25 to .32 cu. in. 2-stroke
.26 to .30 cu. in. 4-stroke

Your Great Planes T-Craft 20 will perform well with any of the engines within the recommended range.

PREPARATIONS

Required Accessories

Items in parentheses (GPMQ4243) are suggested part numbers recognized by most distributors and hobby shops and are listed for your ordering convenience. **GPM** is the Great Planes brand, **TOP** is the Top Flite® brand, **HCA** is the Hobbico® brand and **COV** is the Coverite™ brand.

❏ 4 Channel radio with 3 standard servos and 2 micro servos
❏ (2) 24" extension for aileron servos (HCAM2200)
❏ Y-Harness for aileron servos (HCAM2500)
❏ Engine - See **Engine Selection** above
❏ Propeller (Top Flite Power Point®); Refer to your engine's instructions for proper size
❏ Fuelproof paint - see **Painting** section
❏ Medium fuel tubing 2' (GPMQ4131)
❏ 1/4" Latex foam rubber padding (HCAQ1000)
❏ 6 oz. Fuel tank (GPMQ4102)
❏ Easy Fueler™ fuel filling valve (GPMQ4160)
❏ (2) 2-1/2" Wheels (GPMQ4223)
❏ (1) 1" Tail wheel (GPMQ4241)
❏ (2) 3/32" Wheel collars (GPMQ4302)
❏ (4) 5/32" Wheel collar (GPMQ4306)
❏ Pilot (Williams Bros. #18400 1/6 scale sportsman pilot used in prototype)
❏ (2) Rolls covering film
❏ Aluminum spinner nut (GPMQ4630)

Building Supplies

These are the building supplies that are required. *We recommended Great Planes Pro™ CA and Epoxy glue.*

❏ 1 oz. Thin Pro CA (GPMR6002)
❏ 1 oz. Medium Pro CA (GPMR6008)
❏ 6-Minute Pro Epoxy (GPMR6045)
❏ 30-Minute Pro Epoxy (GPMR6047)
❏ Thread locking compound (GPMR6060)
❏ Balsa filler (HCAR3401)
❏ Canopy Glue
❏ Plan protector (GPMR6167)
❏ Isopropyl rubbing alcohol (70%)
❏ Paper towels

Tools

❏ Sanding block and sandpaper (coarse, medium, fine)
❏ Hobby knife (HCAR0105)
❏ #11 blades (HCAR0211)
❏ Single-edge razor blades (HCAR0212)
❏ Razor saw
❏ Razor plane (MASR1510)
❏ Electric drill
❏ Drill bits - 1/16",3/32", 5/32", 3/16", 13/64", 7/32", 1/4"
❏ Small Phillips and flat blade screwdrivers
❏ Pliers with wire cutter (HCAR0630)
❏ Sealing Iron (TOPR2100)
❏ Heat gun (TOPR2000)
❏ T-Pins (HCAR5150)
❏ Straightedge with scale (HCAR0475)
❏ Cutting mat (HCAR0456)
❏ Builder's triangle (HCAR0480)
❏ 1/4-20 Tap and Drill set (GPMR8105, drill bit included)
❏ Tap handle (GPMR8120)
❏ Masking Tape (TOPR8018)
❏ Monofilament string for aligning the wing and stabilizer
❏ Panel line pen (TOPQ2510)
❏ Groove Tube (GPMR8140)
❏ Dead Center Hole Locator (GPMR8130)
❏ Precision Hinge Marking Tool (GPMR4005)
❏ Microballoons (TOPR1090)

Optional Supplies and Tools

❏ CG Machine™ (GPMR2400)
❏ Accu Throw® Deflection Meter (GPMR2405)
❏ CA Applicator tips (HCAR3780)
❏ CA Debonder (GPMR6039)
❏ Clevis installation tool (GPMR8030)
❏ Hot Sock™ (TOPR2175)
❏ Curved-Tip canopy scissors (HCAR0667)
❏ Top Flite Precision Magnetic Prop Balancer™ (TOPQ5700)
❏ Slot Machine™ motorized hinge slotting tool (GPMR4010)

EXPERT TIP

On our workbench, we have three 11" Great Planes Easy-Touch™ Bar Sanders, equipped with #80, #150 and #220-grit sandpaper. This setup is all that is required for almost any sanding task. We also keep some #320-grit wet-or-dry sandpaper handy for finish sanding before covering.


Great Planes **Easy-Touch Bar Sanders** are made from lightweight extruded aluminum and can be found at most hobby shops. They are available in five sizes – 5-1/2" (GPMR6169) for those tight, hard-to-reach spots; 11" (GPMR6170) for most general purpose sanding; and 22" (GPMR6172), 33" (GPMR6174) and 44" (GPMR6176) for long surfaces such as wing leading edges. The **Easy-Touch Adhesive-Backed Sandpaper** comes in 2" x 12' rolls of 80-grit (GPMR6180), 150-grit (GPMR6183) and 220-grit (GPMR6185) and an assortment of 5-1/2" long strips (GPMR6189) for the short bar sander. The adhesive-backed sandpaper is easy to apply and remove from your sanding bar when it's time for replacement.

This setup is all that is required for almost any sanding task. Custom sanding blocks can be made from balsa or hardwood blocks and dowels for sanding difficult-to-reach spots.

Common Abbreviations

Fuse = Fuselage
LE = Leading Edge (front)
TE = Trailing Edge (rear)
Stab = Stabilizer
" = Inches
Elev = Elevator
LG = Landing Gear
Ply = Plywood

Types of Wood
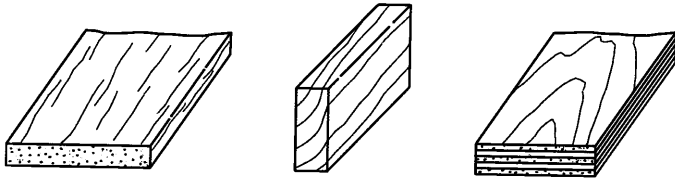
IMPORTANT BUILDING NOTES

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

2. Sort through the sticks and sheets, grouping them by size. Masking tape can be used to bundle matching sheets and sticks. Using a felt tip or ballpoint pen, lightly write the part **name** or **size** on each piece or bundle. Refer to the parts list and plans for sizes and quantities. Use the die-cut patterns shown on page 6 to identify the die-cut parts and mark them **before** removing them from the die sheet. Save all leftovers. If any of the die-cut parts are difficult to remove, do not force them! Instead, cut around the parts with a hobby knife or lightly sand the back of the sheet. After removing the die-cut parts, use your sanding block to **lightly** sand the edges to remove any die-cutting irregularities.

3. As you identify and mark the parts, separate them into groups, such as **fuse** (fuselage), **wing**, **fin**, **stab** (stabilizer) and **hardware**.
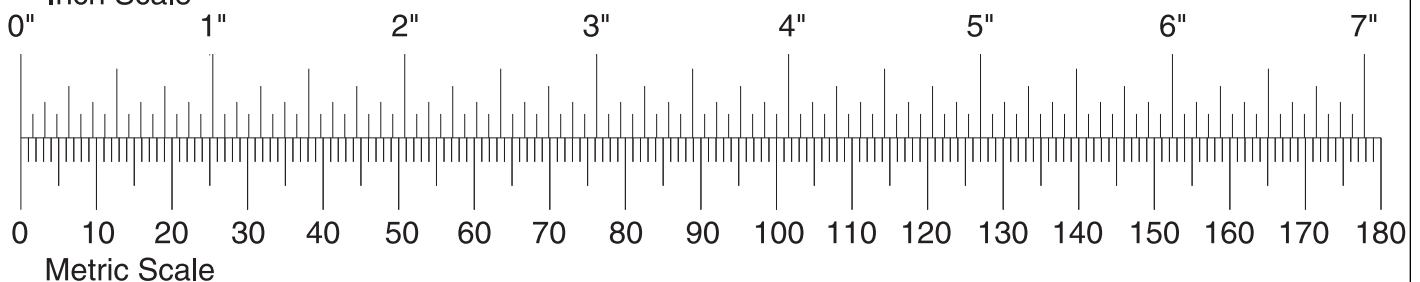
4. Work on a flat surface. Cover the plans with waxed paper or Great Planes Plan Protector to prevent glue from sticking to the plan.

5. When instructed to **test fit** parts, this means **DO NOT USE GLUE** until you are satisfied that everything fits properly -- **THEN** glue the parts together if instructed to do so.

6. Whenever the instructions tell you to **glue** pieces together, use CA. When a **specific** type of glue is required, the instructions will state the type of glue that is **highly recommended**. When 30-minute epoxy is **specified**, it is highly recommended that you use only 30-minute (or slower) epoxy because you will need either the working time and/or the additional strength.

7. The easiest way to cut balsa sticks is with a single-edge razor blade or razor saw. Position the stick over the plan, mark its size, then cut the part on a cutting mat. A modeling miter box works well for cutting square corners and 45-degree gussets.

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

Inch Scale

0"   1"   2"   3"   4"   5"   6"   7"

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180
Metric Scale

DIE-CUT PATTERNS

TYL2F01 ... **2 PER KIT**

3/32" X 3" X 30" BALSA

TYL2F02 ... **2 PER KIT**

LANDING GEAR FAIRING

1/8" X 3" X 30" BALSA

TYL2W03 ... **2 PER KIT**

3/32" X 3" X 30" BALSA

TYL2F03 ... **2 PER KIT**

1/8" X 3" X 24" BALSA

TYL2W04 ... **2 PER KIT**

3/32" X 4" X 24" BALSA

OUTER WING JOINER

TYL2W02 ... **1 PER KIT**

SPAR SPACER

WING BOLT PLATE

1/16" X 4-3/4" X 11-3/4" BALSA

OUTER WING JOINER

TYL2F04 ... **1 PER KIT**

1/8" X 5-3/4" X 23-3/4" PLYWOOD

WHEEL PANT RETAINER — WHEEL PANT MOUNT

TYL2F06 ... **1 PER KIT**

1/8" X 5-3/4" X 15-3/4" PLYWOOD

LANDING GEAR RAIL SUPPORT

TYL2F05 ... **1 PER KIT**

1/8" X 5-3/4" X 23-3/4" PLYWOOD

ELEVATOR COUNTER BALANCE

TYL2S01 ... **1 PER KIT**

3/16" X 3" X 12" BALSA

ELEVATOR COUNTER BALANCE

FUSE STRUT MOUNTING PLATE

AILERON TRAY

CRUTCH FEET

TYL2W01 ... **1 PER KIT**

CENTER WING JOINER

AILERON HORN BASE

1/8" X 3-1/2" X 19" PLYWOOD

STRUT PLATE

AILERON BASE

TYL2W05 ... **2 PER KIT**

1/8" X 3" X 18" BALSA

WING GUSSET

BUILD THE TAIL SURFACES

Build the Fin & Rudder

❏ 1. Cover the fin/rudder portion of the plan with wax paper or Great Planes Plan Protector.

❏ 2. Pin the die-cut 3/16" balsa **fin frame V-1** in position on the fuse plan.

❏ 3. From one of the 3/16" x 3/8" x 30" balsa sticks, cut and glue the fin frame together. Note that there are two pieces along the bottom of the fin and that the TE ends at the bottom of the stabilizer.

❏ 4. From the 1/8" x 3/16" x 30" balsa stick, cut and glue the fin **cross braces** to the frame.

❏ 5. Remove the fin 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.

❏ 6. Build the rudder frame from the die-cut 3/16" balsa **R-1** and **R-2** frame pieces and leftover 3/16" x 3/8" balsa stick.

❏ 7. From the leftover 1/8" x 3/16" balsa stick, cut and glue the **rudder ribs** and **cross brace** to the frame.

❏ 8. Remove the rudder from your building board. Inspect all the glue joints and add CA to any joints that don't look strong. First, sand both sides of the rudder and fin flat and even. Then, sand the rudder and fin to shape using the fuse plan as a guide. Be careful that you don't sand any area too thin.

Build the Stabilizer & Elevators

❏ 1. Cover the stabilizer/elevator portion of the plan with waxed paper or Plan Protector.

❏ 2. From one of the 3/16" x 3/8" x 30" balsa sticks, cut the **stabilizer trailing edge** and **trailing edge doubler** to match the stabilizer plan. Glue the TE doubler to the TE and pin them over the plan.

❏ 3. Pin the die-cut 3/16" balsa **leading edge doubler S-1** and **stab center S-2** in position. Glue S-2 to S-1 and to the front of the stab TE doubler.
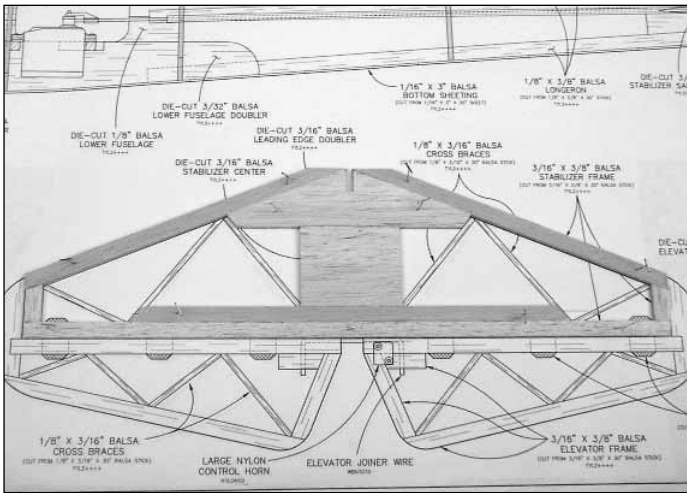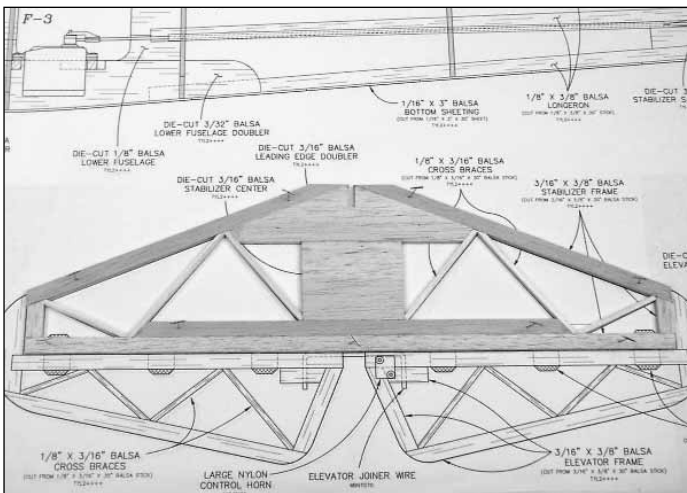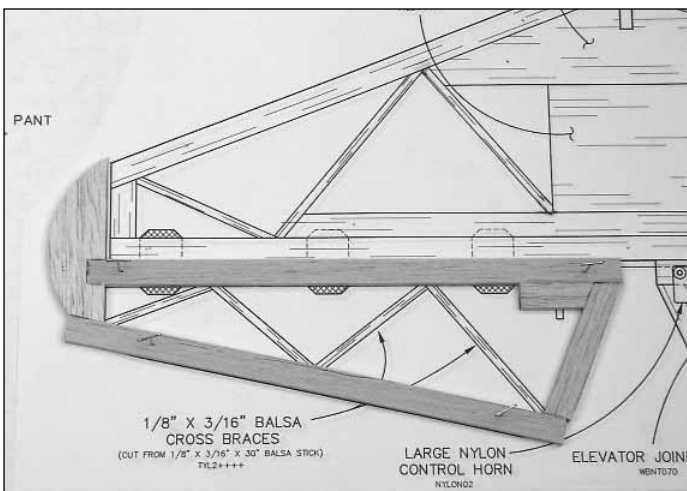
❏ 4. Finish constructing the stab frame from a 3/16" x 3/8" x 30" balsa stick.

❏ 5. From the 1/8" x 3/16" x 30" balsa stick, cut and glue the **stab braces** to the stab frame.

❏ 6. Remove the stab from your building board. Inspect, glue and sand as you did with the fin.


❏ ❏ 7. From a 3/16" x 3/8" x 30" balsa stick, cut the **elevator leading edge** to length and pin it over the elevator plan. Pin and glue the die-cut 3/16" balsa **elevator counter balance**

to the LE. Construct the remaining elevator frame from a 3/16" x 3/8" x 30" balsa stick.

❏ ❏ 8. From the 1/8" x 3/16" x 30" balsa stick, cut and glue the **elevator cross braces** to the frame.

❏ 9. Repeat steps 7 and 8 to build the second elevator half.

❏ 10. Remove the elevators from your building board. Inspect, glue and sand as you did with the fin.
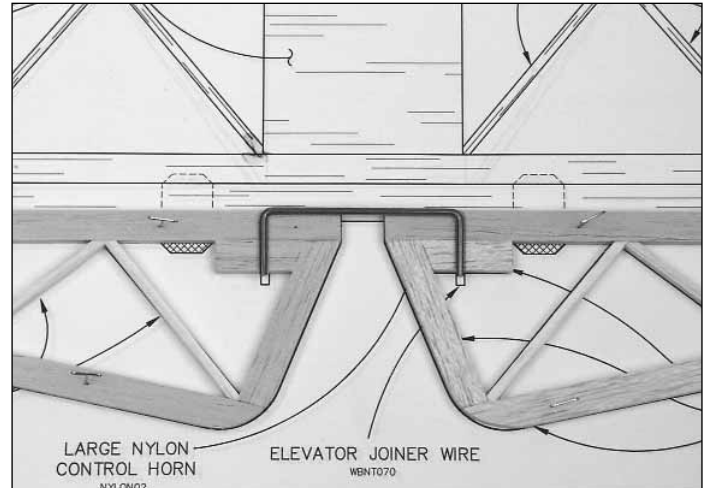
❏ 11. Pin both elevators in position over the plan. Lay the 3/32" **elevator joiner wire** on top of the elevators in the position shown on the plan. Use a pencil to lightly mark the outline of the joiner wire on the elevators.
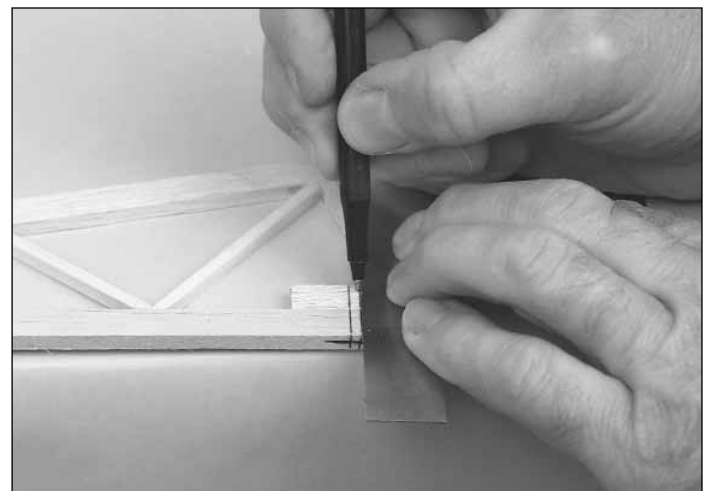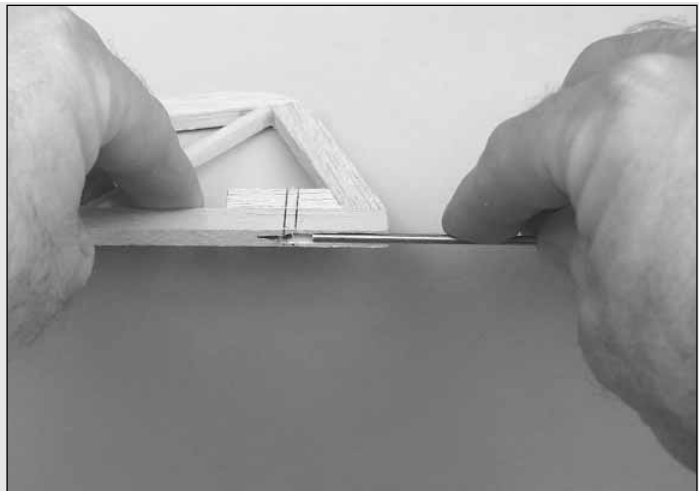

❏ 12. Using a straightedge, extend the sidelines of the elevator joiner outline forward to the leading edge. Also, use a **Precision Hinge Marking Tool** to draw a **centerline on the leading edge**. Using these lines, you can determine exactly where to drill the holes for the elevator joiner wire.
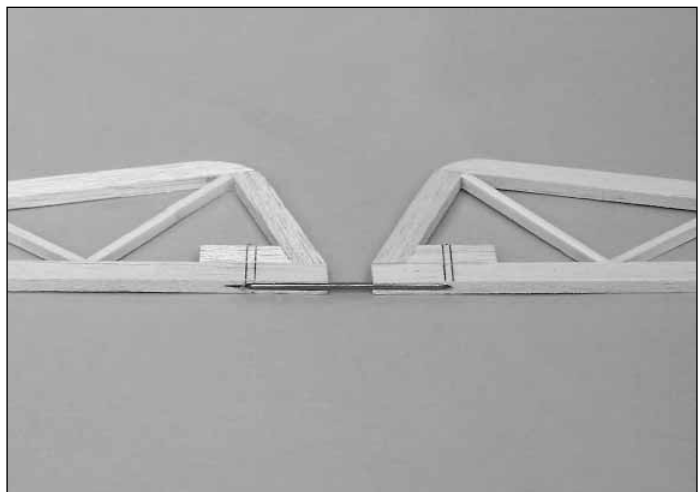
❏ 13. Drill a 3/32" hole into the leading edge of both elevators. As you drill each hole, keep the drill aligned with the top and bottom surface of the elevator and reference lines you made in the previous steps.
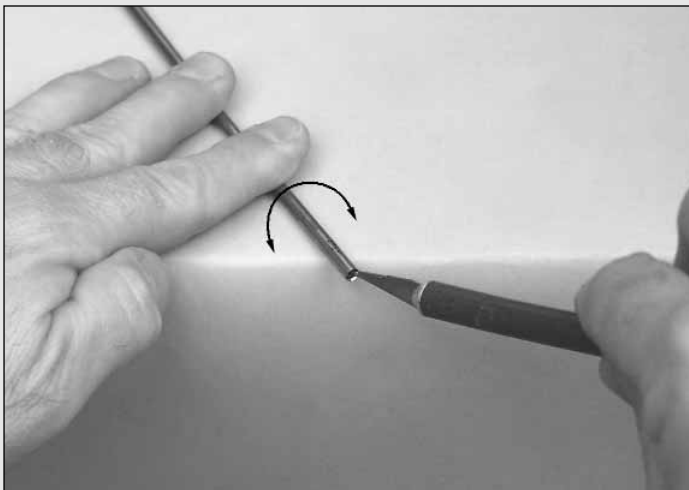
❏ 14. Use the **Great Planes Groove Tube** to cut a 3/32" groove in the leading edge of both elevators to recess the joiner wire. **Note:** If you do not have a Groove Tube, refer to the Following Expert Tip.

EXPERT TIP

HOW TO CUT A GROOVE FOR A JOINER WIRE

A. Use a #11 knife blade to sharpen the inside of a piece of 3/32" brass tube. Roll the tube as you carve the end.

B. Use the sharpened tube to carefully gouge the leading edge of the elevators. You'll have to make several shallow passes to make the recess deep enough for the joiner wire.

❏ 15. Temporarily join the elevators with the joiner wire. The joiner wire will be easier to install if you chamfer (bevel) the ends a little. If necessary, "tweak" the joiner wire so the elevators are parallel and lay flat on your building table when the joiner wire is installed. If you found it necessary to "tweak" the joiner wire, use a felt-tip pen to mark it so you can install the joiner wire in the same orientation when you permanently join the elevators.

❏ 16. Lay the elevators and stab over the plan and lightly mark the hinge locations on the LE of the elevators and the TE of the stab. Repeat the process to mark the hinge locations on the LE of the rudder and TE of the fin.

We have simplified the task of cutting hinge slots with the introduction of the **Great Planes Slot Machine**™. This electric tool easily cuts a perfect width slot for use with CA hinges every time.

❏ 17. To cut the hinge slot, place the blades onto 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.

If you choose not to purchase a Slot Machine, refer to the Expert Tip that follows to make hinge slots.

CUT HINGE SLOT
WITH HOBBY KNIFE
AND #11 BLADE
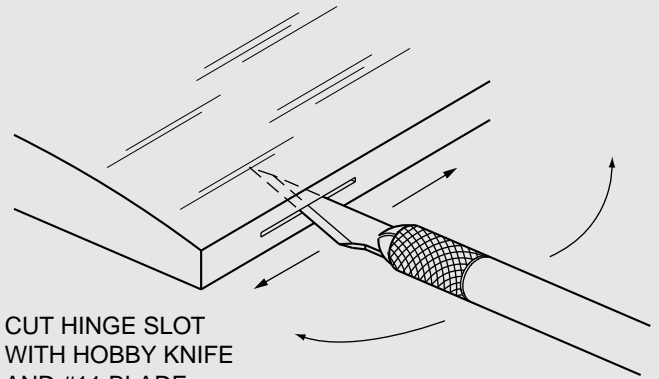
Cut the hinge slots in the elevators, stabilizer, fin and rudder using a Hobby Knife with a #11 blade. Begin by carefully cutting a very shallow slit at the hinge location to accurately establish the hinge slot. Make three or four more cuts, going a little deeper each time. As you cut, slide the knife from side to side until the slot has reached the proper depth and width for the hinge.

❏ 18. Cut the 3/4" x 1" hinges for the elevator and rudder from the supplied 2" x 9" **hinge material**, then snip off the corners. **Temporarily** join the elevators to the stab and 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.**
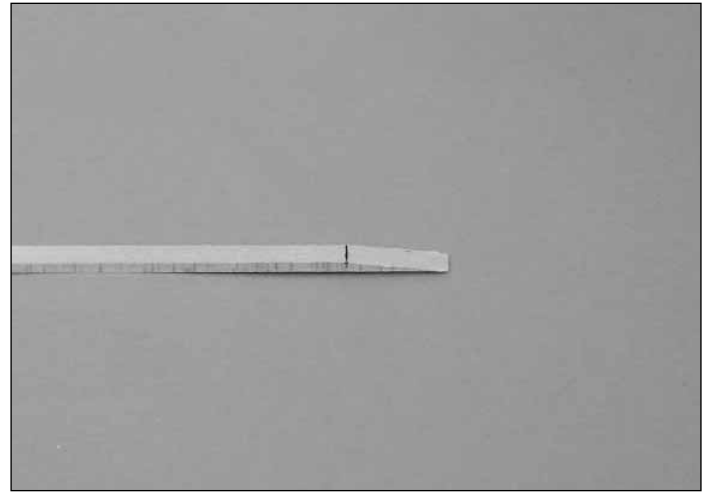
Finish the Tail Surfaces
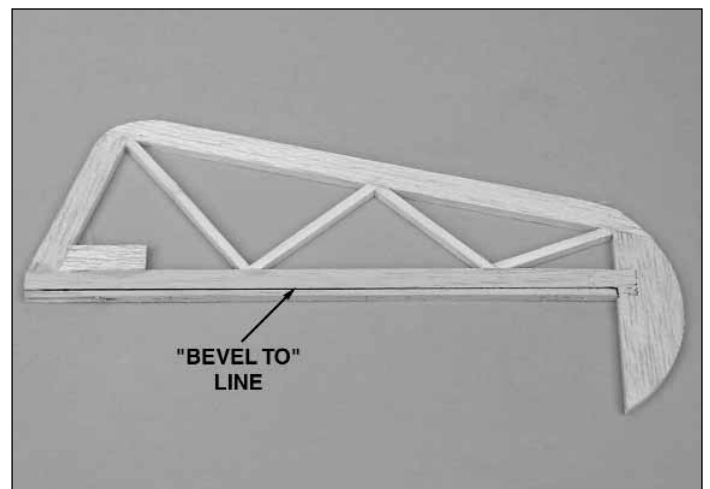
"BEVEL TO"
LINE

❏ 1.Use a Precision Hinge Marking Tool to mark the centerline on the LE of the elevator. Mark a "bevel to" line on both sides of the elevator LE, about 3/32" from the LE.
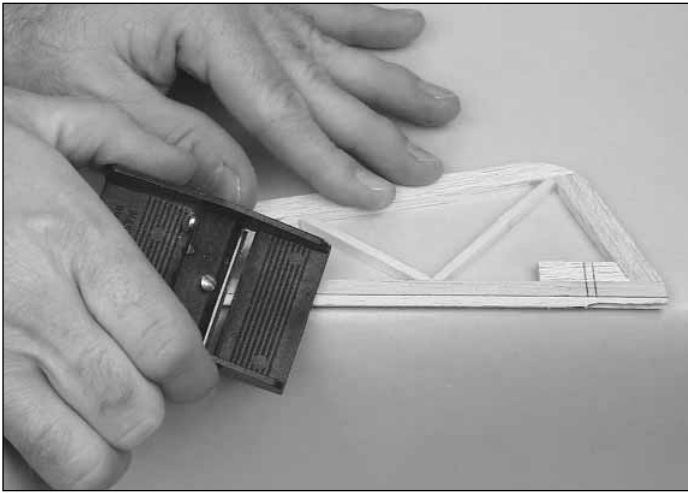
❏ 2. Using the "bevel to" lines and the centerline as a guide, make the "V" on the leading edge of the elevators with a razor plane or your bar sander with 150-grit sandpaper.

❏ 3. Use the same procedure to bevel the leading edge of the rudder.

❏ 4. Temporarily attach the elevators to the stab and the rudder to the fin. Use your bar sander to round the perimeter of the elevator, stab, rudder and fin (do not round the bottom edge of the fin where it will be glued to the stab and fuse).

BUILD THE WING

Build the Wing Panels

*Start by building the **right** wing panel right side up over the right wing panel plan so your progress matches the photos.*

TWO WARPED SPARS INSTALLED THIS WAY WILL RESULT IN A STRAIGHT WING

**TWO WARPED SPARS INSTALLED THIS WAY WILL RESULT IN A WARPED WING**

❏ 1. Match the six 1/8" x 1/4" x 30" basswood **main spars** so any warps will counteract each other.

❏ 2. Cut two of the main spars in half. Draw a line 1" from one end of each of the 15" half spars and bevel the end of the spars to the line.

❏ 3. Use epoxy to glue the four 15" main spars onto the four 30" main spars, as shown on the plans. Make sure the sides and ends of the spars are flush with each other. Wipe off any excess epoxy before it cures.
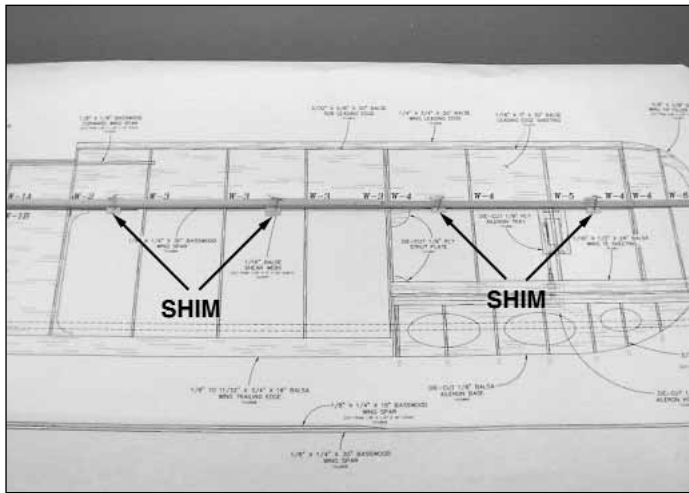
❏ ❏ 4. Cover the wing panel plan with waxed paper or Great Planes Plan Protector.
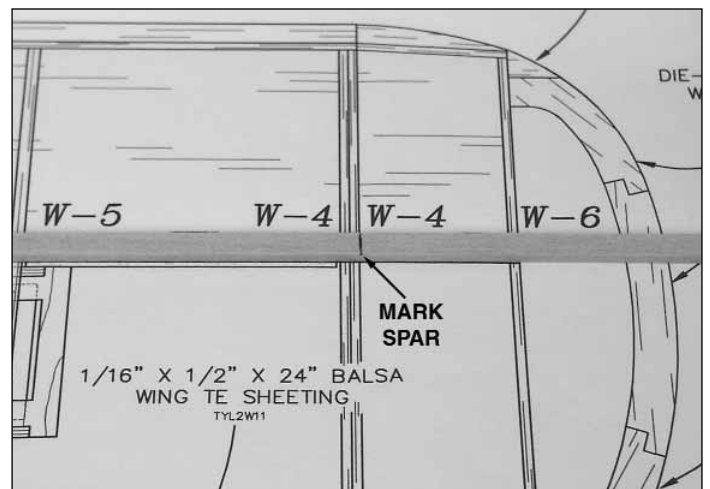
❏ ❏ 5.Position one of the main spars over the plan, aligning the double spar end of the main spar with the outboard edge of the root rib W-1. Mark the spar at the tip side of ribs W-4.

W4 | | **W4**

1/8" X 1/4" MAIN SPAR
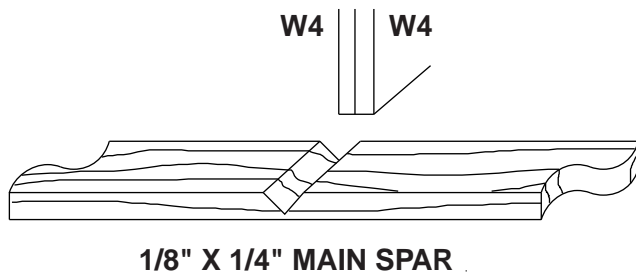
❏ ❏ 6. Cut a V-notch part way through the spar, at the mark, so that the spar can bend at W-4.


SHIM   SHIM

❏ ❏ 7. From one of the 1/16" x 3" x 30" balsa sheets, cut four 1/2" x 3/4" shims. Place the shims over the spar location on the plan, starting between ribs W-2 and W-3 and alternating every other rib bay. Pin the main spar, cut in step 6, over the shims, aligned with the wing plan at the wing root.

❏ ❏ 8. Glue two of the die-cut 3/32" balsa **W-4** ribs together to make the W-4 outer rib.


TRIM THE RIB TO
THE SPACER
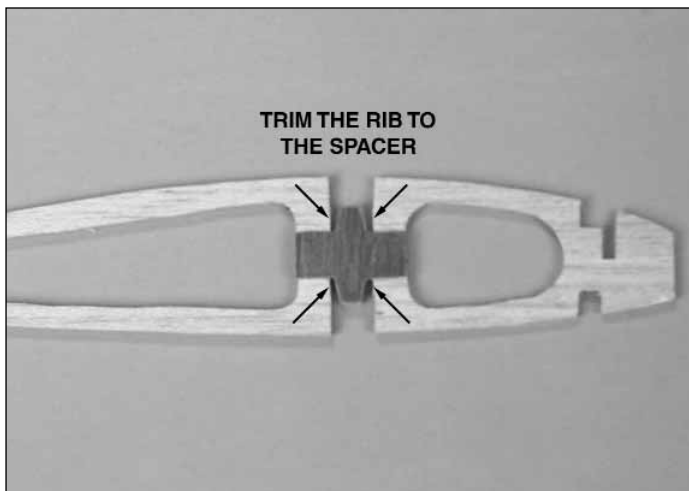
❏ ❏ 9. Glue the die-cut 1/16" ply **W-2 spar spacer** to the tip side of rib W-2, centered between the main spar notches and the lightening holes. Trim the main spar notches for the 1/16" plywood wing joiner.
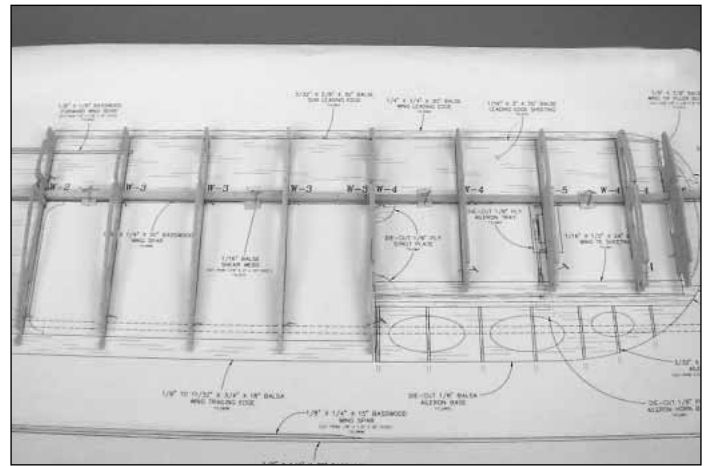
❏ ❏ 10. Pin and glue the die-cut 3/32" balsa **W-2, W-3, W-4** and **W-6** ribs and the die-cut 1/8" balsa **W-5** rib onto the main spar, perpendicular to the building board. **Note:** There is a W-3 and W-4 rib glued together at the root of the aileron bay. The main spar will need to be bent upward to contact the W-6 rib.

TE FLUSH WITH OUTSIDE EDGE OF W3 RIB
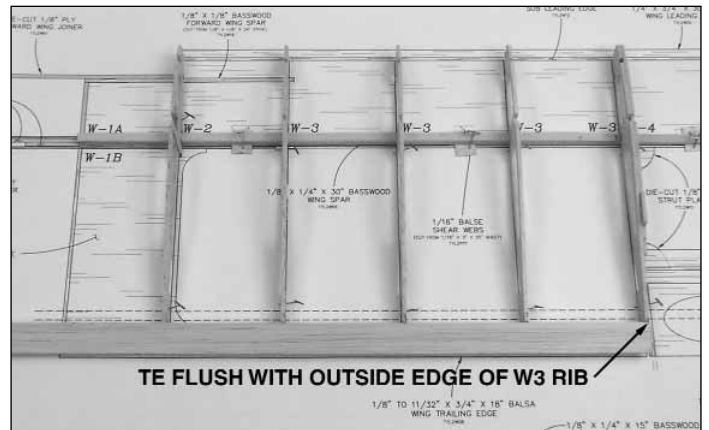
❏ ❏ 11. Position the 1/8" to 11/32" x 3/4" x 18" shaped balsa **trailing edge** on the jig tabs of the W-2 and W-3 ribs, flush with the outside of rib W-3. Use a straight edge to align the top of the TE with the top of the ribs. When satisfied with the fit, glue the TE to the ribs. **Note:** The TE extends 1/16" above rib W-2 to allow for the 1/16" center sheeting.
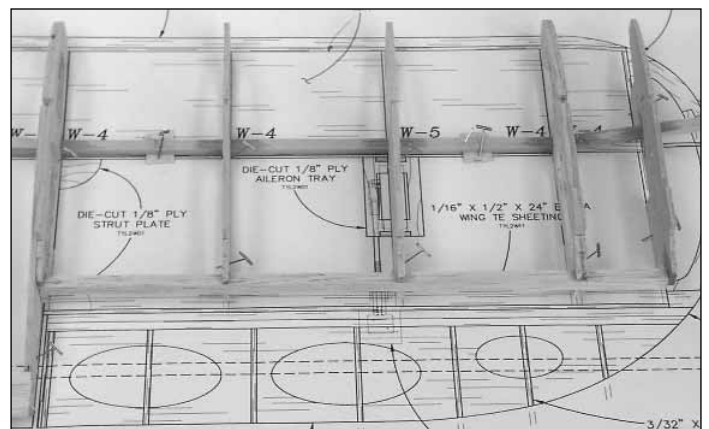
❏ ❏ 12. Fit and glue the 1/4" x 1/4" x 30" balsa **sub TE** in the notches at the rear of the W-4 and W-5 ribs. Butt glue the sub TE to rib W-6.

SPARS AGAINST DIHEDRAL GAUGE
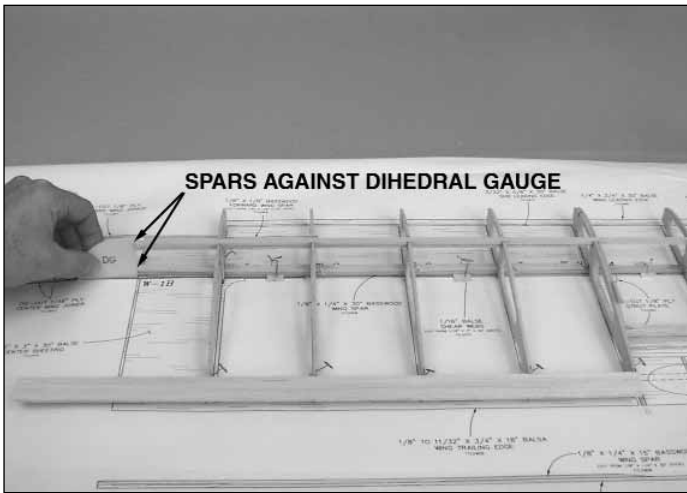
❏ ❏ 13. Hold the die-cut 1/8" plywood **dihedral gauge** against the root end of the bottom main spar. With the root end of the top main spar against the dihedral gauge, insert and glue the spar into the notches in the top of the ribs.
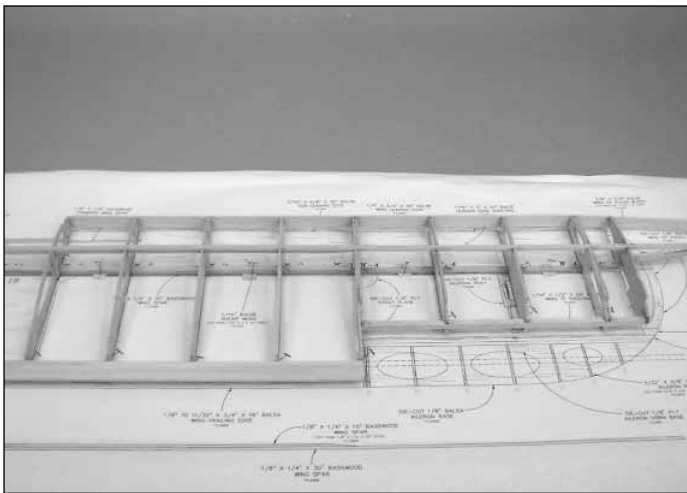
❏ ❏ 14. Center the 3/32" x 5/8" x 30" balsa **sub LE** on the front of the ribs. Check that the jig tabs at the aft end of the ribs are against the building board. Then, glue the sub LE in position.

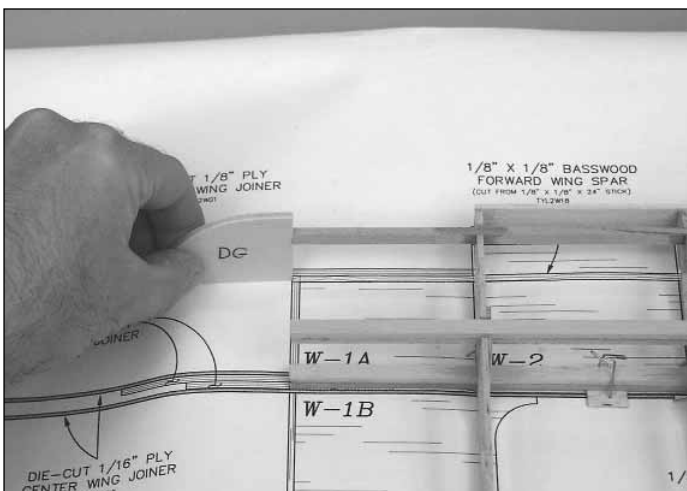❏ ❏ 15. From the 3/16" x 3/16" x 24" basswood stick, cut two **forward spars** 6" long. Align the dihedral gauge with the centerline of the wing. Glue the forward spars in the top and

bottom of ribs W-2 and W-3 with the root ends against the dihedral gauge. Make sure that these forward spars are against the back edge of the slot in W-2.
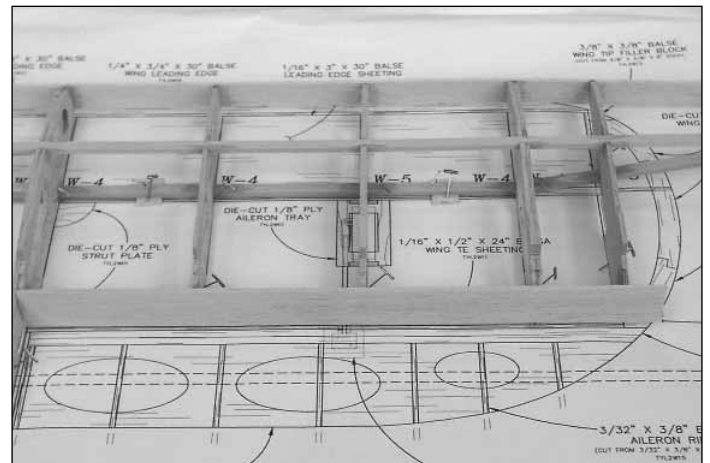
❏ ❏ 16. Cut the 3/32" x 7/8" x 24" balsa stick in half to make the **aileron bay TE**. Glue one of the TE pieces, centered, on the aft end of the W-4 through W-6 ribs and the sub TE.
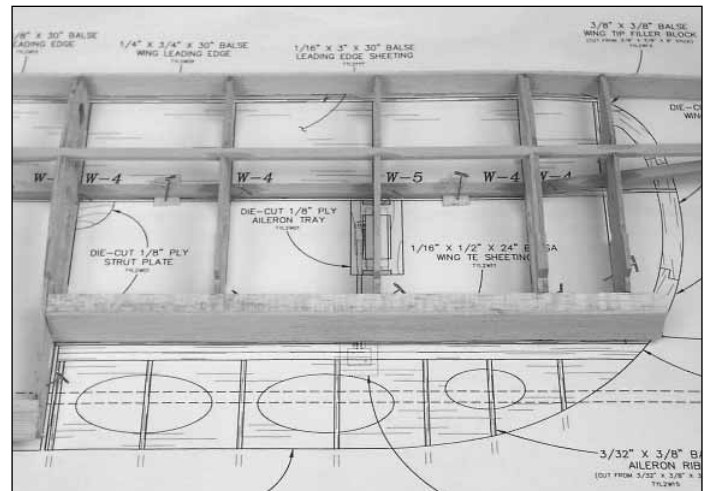
❏ ❏ 17. Cut one of the 1/16" x 1/2" x 24" balsa TE sheets in half. Test fit the TE sheet in the recess at the aft end of the W-4 through W-6 ribs and trim as necessary.

DO NOT PUT SHEAR WEBS IN THESE BAYS
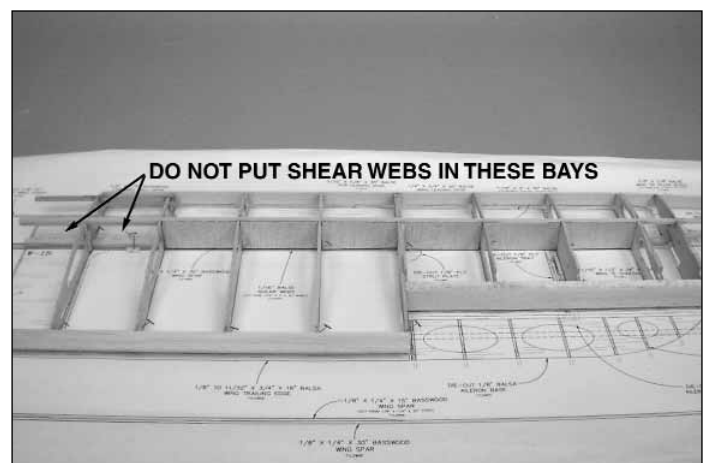
❏ ❏ 18. From the 1/16" x 3" x 30" balsa sheet, cut and glue vertical grain **shear webs** to the spars in the locations

13

shown on the plan. It is not necessary for the shear webs to be glued to the ribs. Make sure they are glued securely to the wing spars. **Do not install shear webs in the rib bays between ribs W-1 and W-3.**

❏ ❏ 19. Use the dihedral gauge to mark the TE at the wing center. Trim the TE along the line.

❏ ❏ 20. Remove the wing from your building board and install the second piece of 1/16" x 1/2" TE sheet on the bottom of the wing. **Note:** The TE sheet will need to be bent to meet rib W-6.

❏ 21. Return to step 4 and build the left wing panel.

Join the Wing Panels
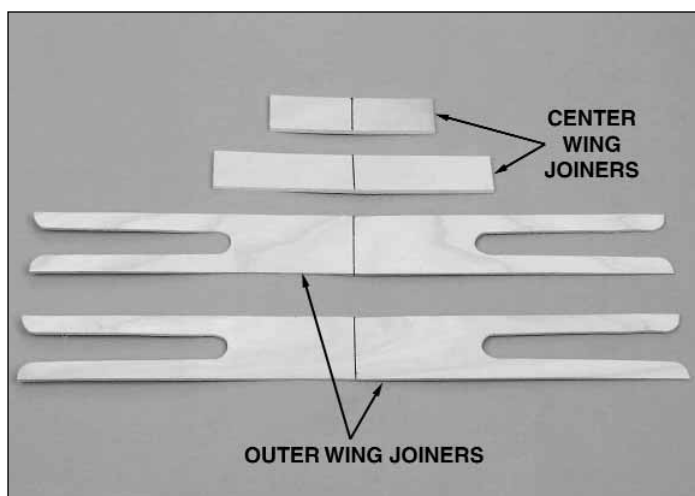
❏ 1. Draw a centerline on the two die-cut 1/8" plywood **center wing joiners** and the two die-cut 1/16" plywood **outer wing joiners**.
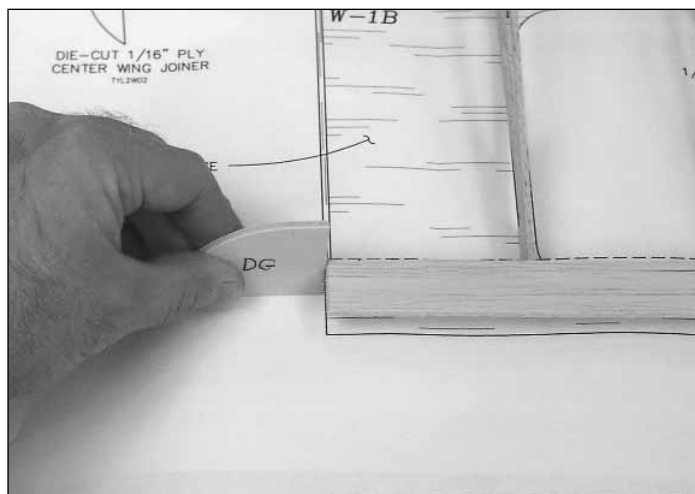
❏ 2. Use epoxy to glue the two center wing joiners together, aligning the centerlines and the edges.
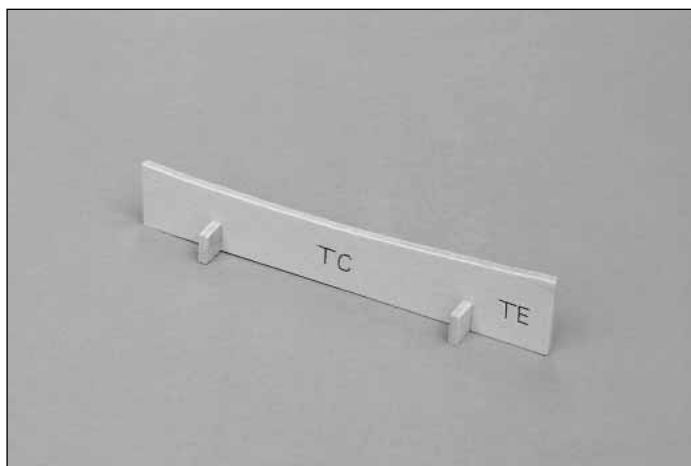
❏ 3. Assemble the die-cut 1/8" plywood **wing tip crutch** and **crutch feet**. **Do not** glue the feet to the tip crutch.

❏ 4. Trim the jig tabs off the bottom of the double W-4 ribs on the left wing panel. Sand the bottom of the ribs, TE sheet and aileron bay TE flush on the left wing panel.
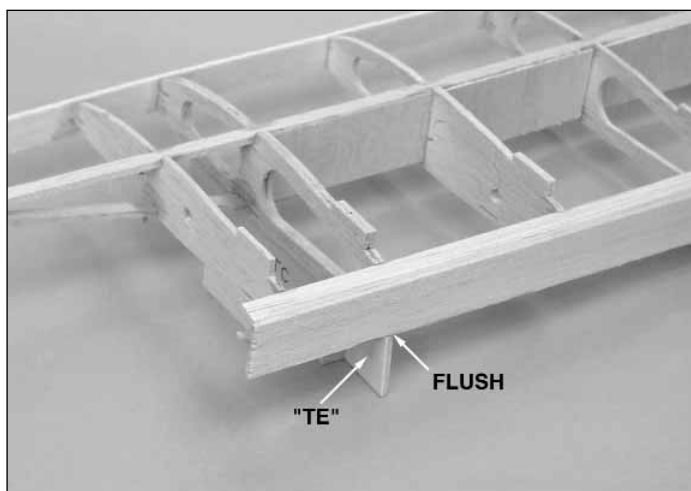
❏ 5. Position the left wing panel on your flat building board. Place the wing tip crutch under the double W-4 ribs. The **"TE"** on the tip crutch should be toward the TE and the crutch should be flush with the TE.
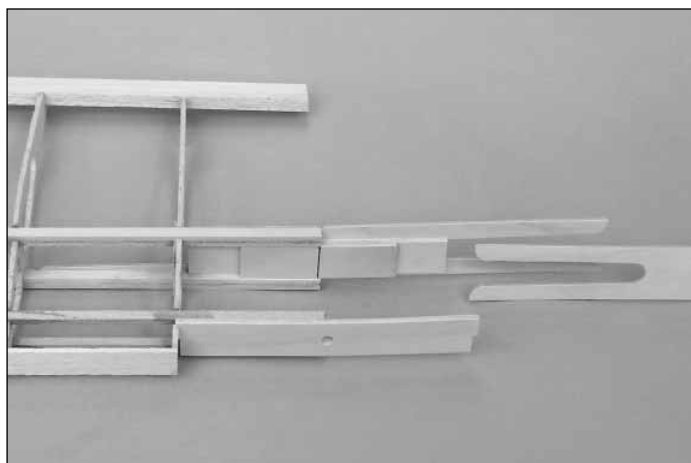
❏ 6. Insert the center wing joiners between the main spars, the outer wing joiners on the front and back of the main wing

spars and the die-cut 1/8" plywood **forward joiner** in the right wing. Slide the right wing half with the joiners into the left wing half, checking the fit. The main spars, forward spars and TE on both wing halves should meet. Make sure the left wing half is positioned on the tip crutch and the right wing half is flat against your building board. Sight down the wing from the wing tip, checking that the main spar, sub LE and TE are straight. If they are not, lightly sand the ends of the spars or TE to achieve a straight wing. **Caution:** Remove only a small amount at a time. You can always remove more wood, but cannot add more wood once it's removed.

❏ 7. When satisfied with the fit of the wing halves, remove the joiners. Use 30-minute epoxy to glue the two wing halves together. Apply epoxy to the top and bottom of the center wing joiners, the front and back sides of the main spars, the front of the forward spars, the ends of the forward joiner and the TE's. Slide everything back together. Wipe off any excess epoxy with a paper towel dampened with rubbing alcohol. Check that the tip crutch is in position, the right wing panel is flat against your building board and the main spar is straight. Use clamps to hold the joiners in position until the epoxy cures.
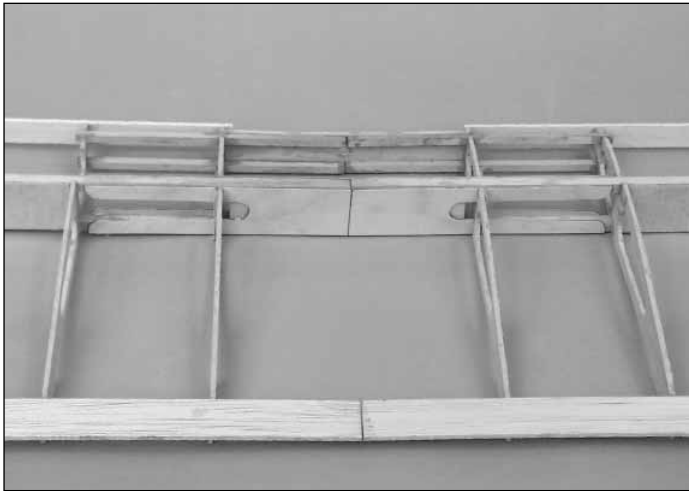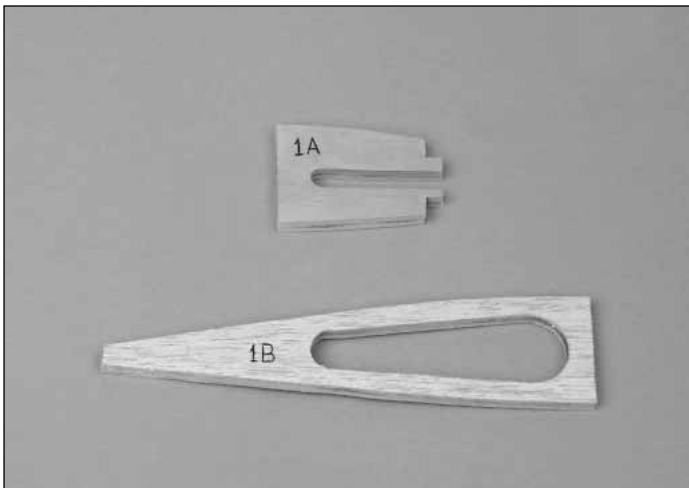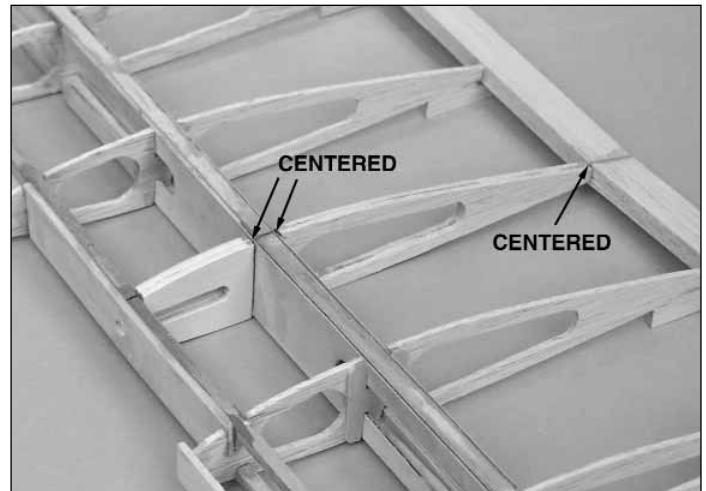

❏ 8. Glue together the two die-cut 1/8" plywood ribs **W-1A** and the two die-cut 3/32" balsa ribs **W-1B**.

❏ 9. Use epoxy to glue the W-1A ribs to the forward spars and forward joiner, centered on the ply wing joiner. Glue W-1B, centered on the ply wing joiner and the TE.

❏ 10. Glue shear webs to the aft side of the ply wing joiner between ribs W-2 and W-3.

❏ 11. Sand the balsa sub LE flush with the top of the ribs.
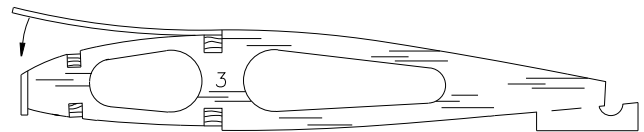
❏ 12. Support one wing panel with the wing tip crutch and weight the other panel flat on your building board. On the weighted panel, fit a 1/16" x 3" x 30" balsa sheet in place, against the notch in the ribs and on top of the main spar and over one of the W-1A ribs. Glue the balsa sheet to the main spar and notches. When the glue has cured, apply a bead of glue to the top of each rib, along the sub LE and forward spar and joiner. Pull the sheeting down, making sure it contacts the surface of each rib, sub LE and forward spar and joiner. Hold it in place until the glue has cured.

❏ 13. After the glue has cured, switch the tip crutch to the other wing panel and repeat the sheeting process.
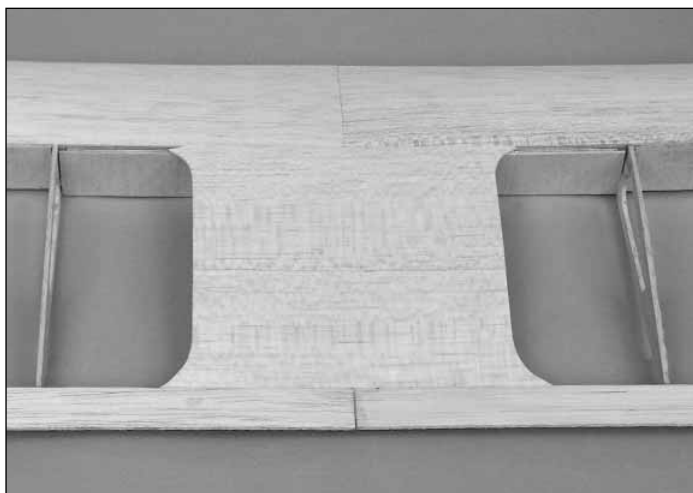
❏ 14. Sheet the center section using a 1/16" x 3" x 30" balsa sheet.

❏ 15. Trim and sand the sub LE, top wing sheeting, main spars and TE sheeting flush with the W-6 rib. Trim the wing sheeting flush with the forward joiner.

❏ 16. Sand the balsa sub LE flush with the bottom of the ribs and remove the bottom jig tabs from the **bottom** of all the ribs. **Note:** The sub LE tapers at rib W-6.

❏ 17. Remove the crutch feet from the wing tip crutch and install them on the die-cut 1/8" plywood **center crutch (CC)**.
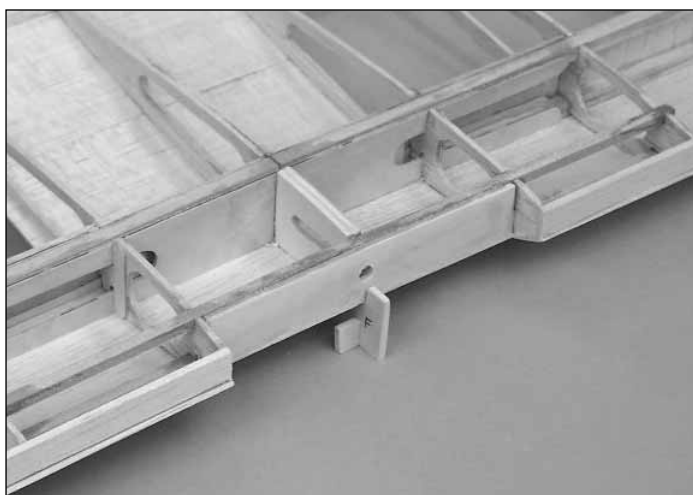
❏ 18. Position the wing upside down on your building board, supported by the jig tabs on ribs W-6 and the center crutch at the center of the wing. The "F" on the center crutch goes to the front.
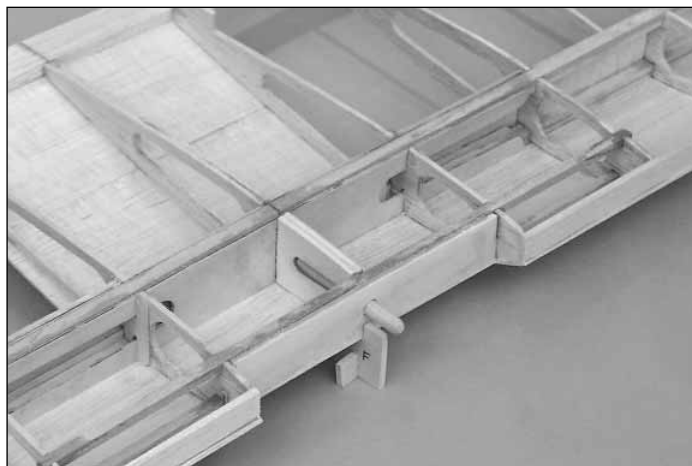
❏ 19. Locate the 1/4" x 2-1/4" hardwood **wing dowel**. Round both ends of the dowel for ease of insertion. Test fit the 1/4" dowel in the forward wing joiner and rib W-1A. Use a 1/4" drill bit to clean out the hole if needed. Use epoxy to glue the dowel in the forward wing joiner and W-1A as shown on the plans.

SEPARATE SHEETING

❏ 20. Sheet the bottom of the wing following the same procedure used to sheet the top of the wing. **Note:** A separate piece of 1/16" balsa sheeting is used to sheet between the double W-4 ribs and rib W-6.

❏ 21. Trim and sand the 1/16" bottom wing sheeting flush with rib W-6, the forward wing joiner and the sub TE.

❏ 22. Glue the 1/4" x 3/4" x 30" balsa **leading edge** to the sub LE and wing sheeting.

❏ 23. Use a razor plane and sanding bar to shape the LE to the shape shown on the wing plan.

❏ 24. Remove the jig tabs from the top of the ribs. Use a sanding bar to sand the entire wing smooth.
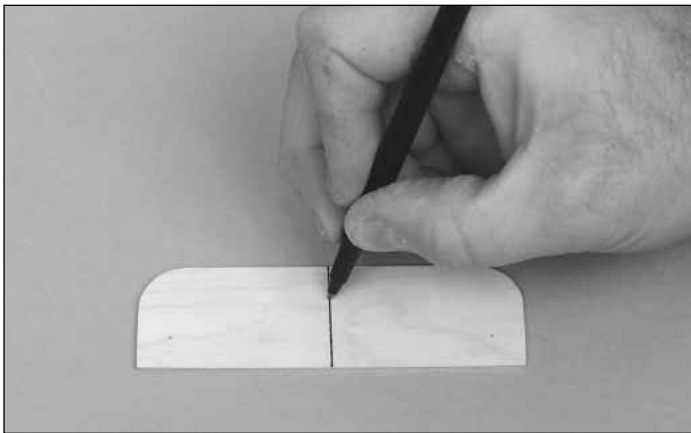
❏ 25. Draw a centerline on the die-cut 1/16" plywood **wing bolt plate**.
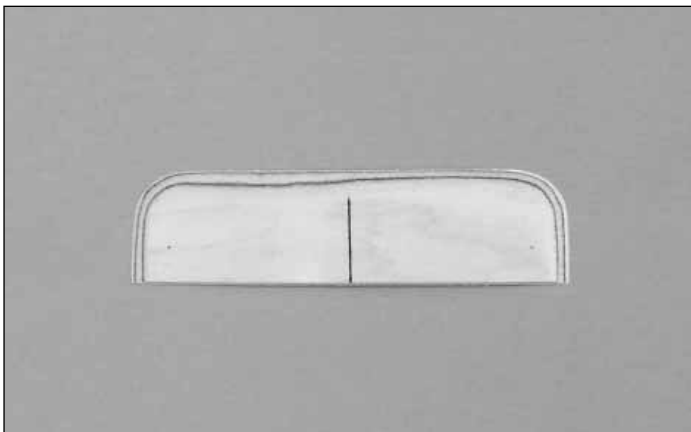
❏ 26. Use a sanding bar to bevel the front and sides of the wing bolt plate to a sharp edge.
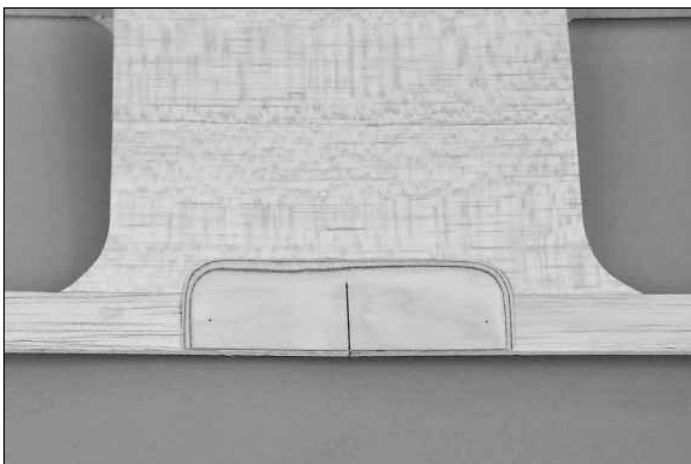
❏ 27. Use 6-minute epoxy to glue the wing bolt plate on the **top** of the wing, aligning the centerline on the plate with the centerline of the wing and flush with the TE. Use masking tape or clamps to hold it tight against the wing sheeting until the epoxy cures.
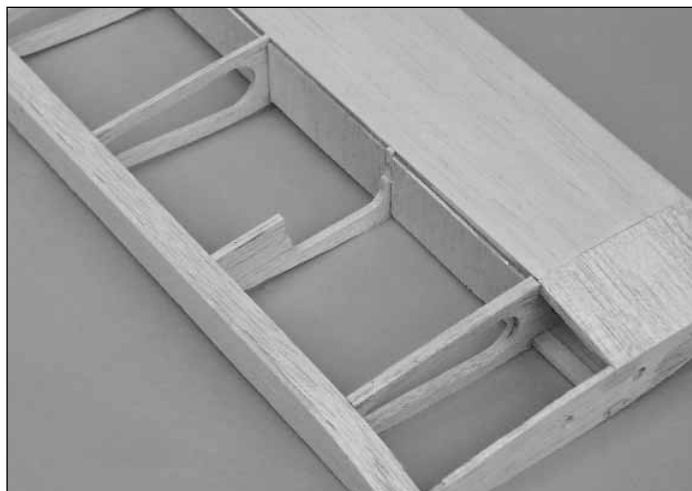
❏ ❏ 28. Complete the partial die-cutting of the aileron servo bay in rib W-5.
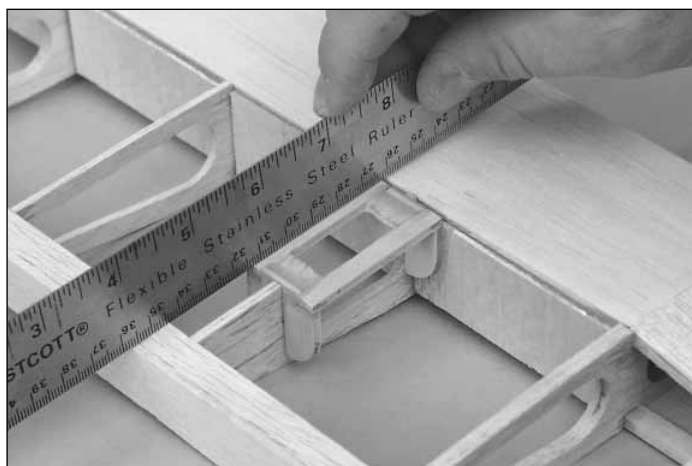
❏ ❏ 29. Test fit the die-cut 1/8" plywood **aileron servo tray sides** and **top** in the aileron servo bay. Lay a straightedge across the top of the servo tray from the forward wing sheeting to the TE sheeting. Position the aileron servo tray so that it is flush with the forward and TE sheeting. When positioned correctly, glue the servo tray sides to W-5 and shear webs and the top of the tray to the sides of the tray.
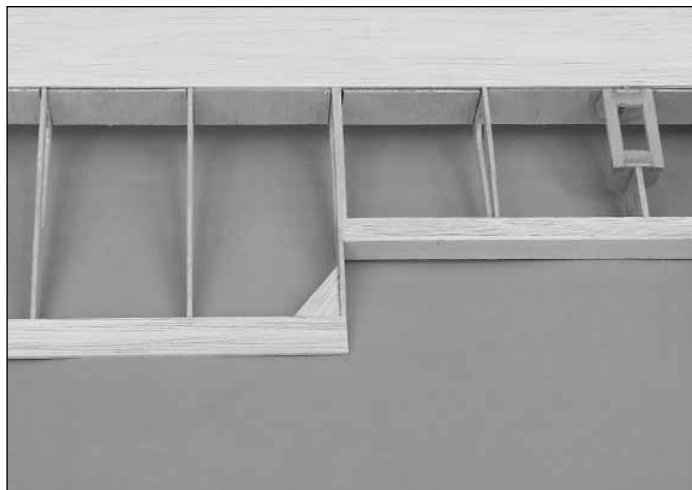
❏ ❏ 30. Glue the die-cut 1/8" balsa **gusset** in the corner of the outside rib W-3 and the shaped TE.

❏ ❏ 31. Glue the two die-cut 1/8" ply wing strut plates to the W-4 ribs, main spar and aileron TE sheet in position. The wing strut plates must be flush with the bottom of the wing.

❏ 32. Go back and repeat steps 28 through 30 on the other wing half.

Assemble the Ailerons
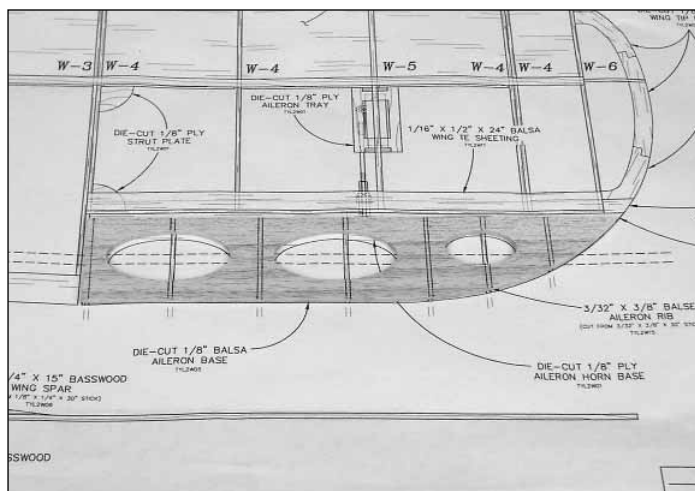
❏ ❏ 1. Position the die-cut 1/8" balsa **aileron base** over the plan. Mark the aileron rib locations on both sides of the aileron base.

❏ ❏ 2. Cut the 3/8" x 1" x 24" balsa **aileron LE** in half. Draw a centerline lengthwise on the 1" x 12" side.
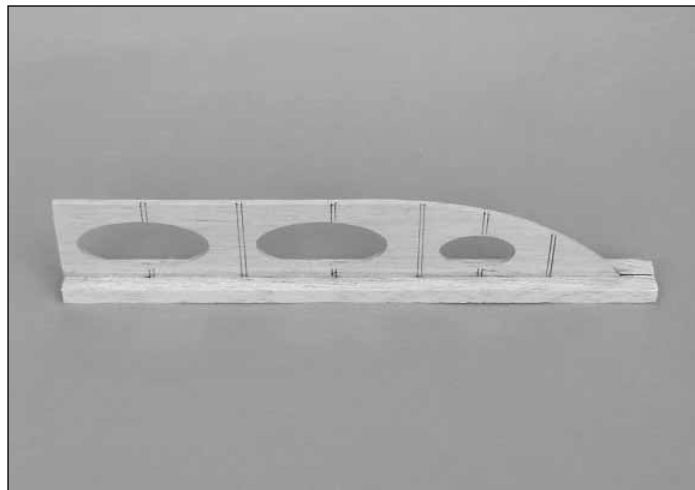
❏ ❏ 3. Glue the aileron base on the aileron LE along the centerline and perpendicular to the face of the LE.
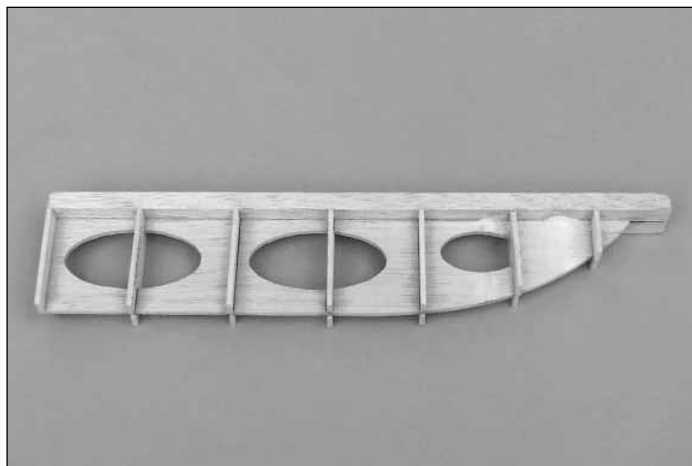
❏ ❏ 4. From the 3/32" x 3/8" x 30" balsa sticks, cut and glue **aileron ribs** to both sides of the aileron base, perpendicular to the base.

❏ ❏ 5. Trim the ends of the aileron LE flush with the aileron base.
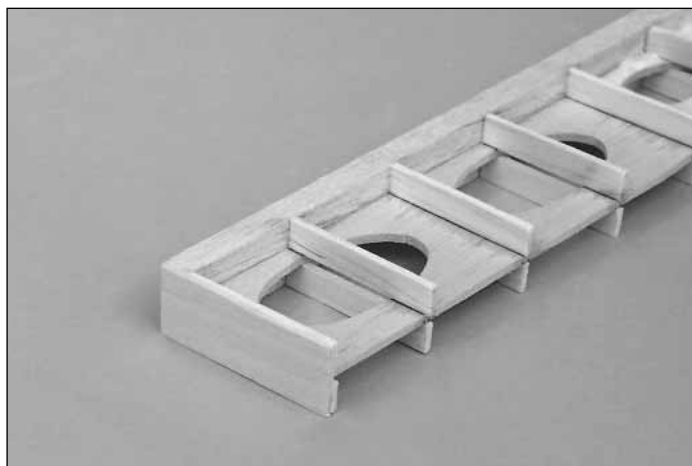
❏ ❏ 6. From a leftover piece of 1/16" sheeting, cut and glue a root rib to the root of the aileron.
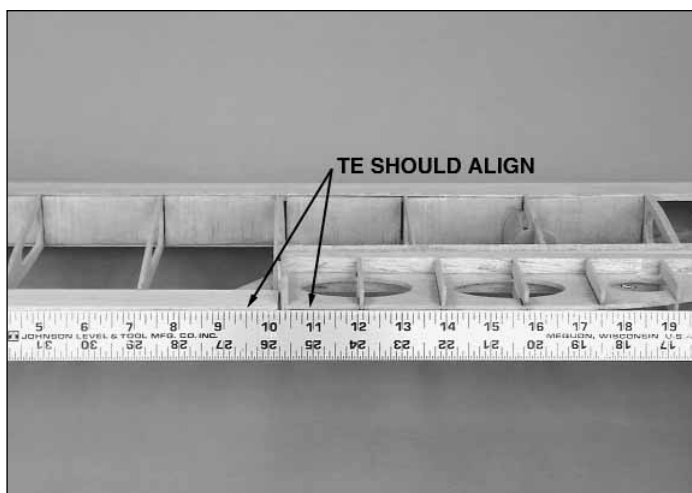
❏ ❏ 7. Place a piece of leftover 1/16" balsa between the root rib of the aileron and the outside W-3 rib. Use a straightedge to align the TE of the wing with the TE of the aileron. Then, securely pin the aileron to the wing.
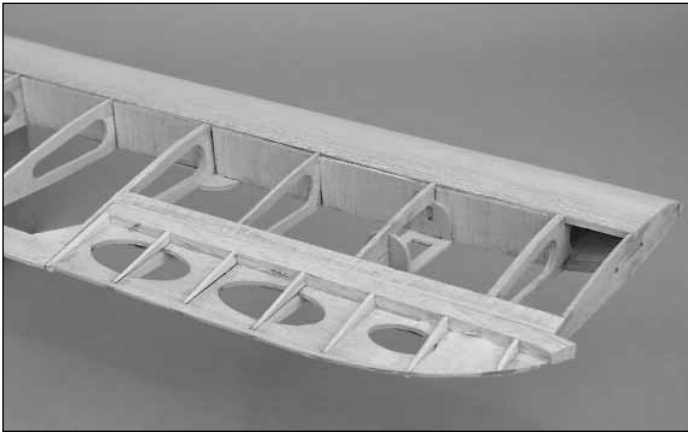
❏ ❏ 8. Use a razor plane and sanding bar to shape the aileron ribs and LE to shape.

❏ ❏ 9. From the leftover 1/4" x 1/4" balsa stick, cut and glue an aileron LE doubler behind the aileron LE, between the ribs that are in line with the aileron servo tray.
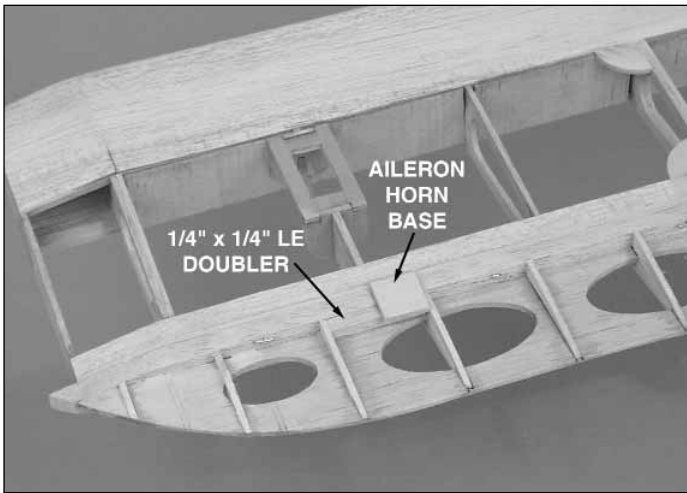
❏ ❏ 10. Position the die-cut 1/8" plywood **aileron horn base** on the aileron LE and LE doubler. Mark the outline of the base on the LE and doubler.

❏ ❏ 11. Mark the location of the hinges on the aileron and wing.
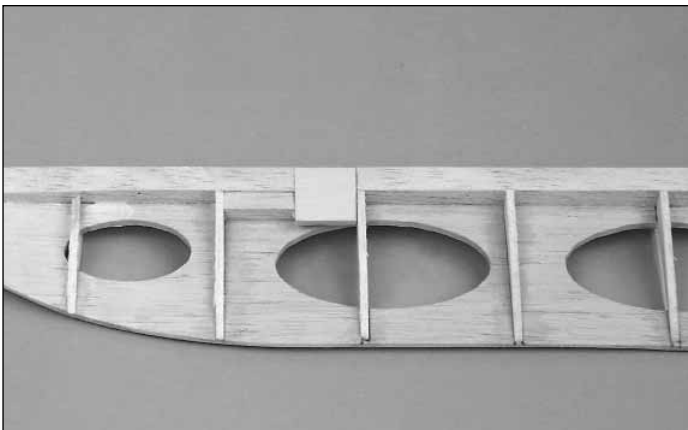
❏ ❏ 12. Remove the aileron from the wing and trim the aileron LE and LE doubler to recess the aileron horn base flush with the top of the aileron ribs and LE. When satisfied

with the fit, glue the aileron horn base to the LE, LE doubler and aileron rib.
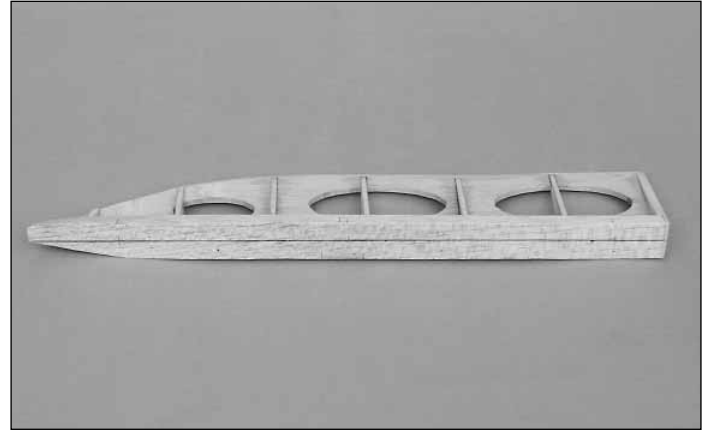
❏ ❏ 13. Draw a centerline on the LE of the aileron and the TE of the aileron bay. **Note:** The centerline is not centered at the tip of the aileron.

❏ ❏ 14. Cut the hinge slots in the aileron and the wing. Cut three 3/4" wide hinges from the supplied hinge strip and trim the corners. Insert the hinges in the aileron and fit the aileron to the wing. Do no glue until told to do so.
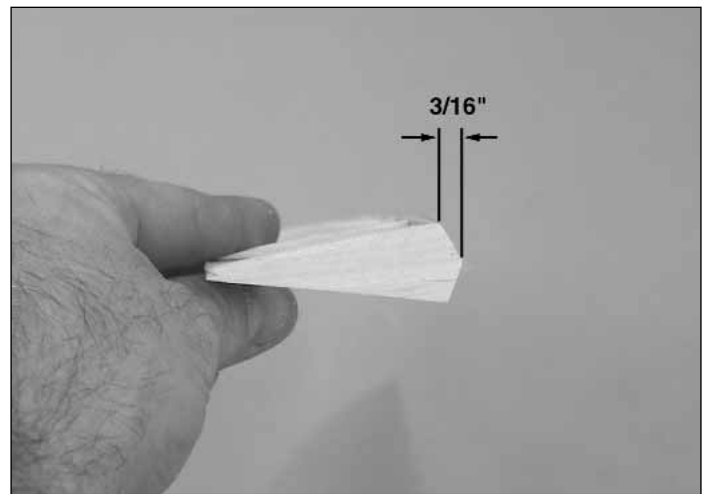
❏ ❏ 15. Remove the aileron from the wing. Mark the "bevel to" lines on both sides of the aileron, 3/16" from the LE. Shape the LE of the aileron to a "V" as shown on the plan.

❏ ❏ 16. Check the fit of the aileron on the wing. The aileron should have 3/4" to 1" of throw each way.

❏ 17. Return to step 1 of *Assemble the Ailerons* and build the second aileron.

Assemble & Install the Wing Tips

❏ ❏ 1. Cover the wing tip portion of the wing plan with waxed paper or Great Planes Plan Protector.

❏ ❏ 2. Assemble one **wing tip** from one of each of the die-cut 1/8" balsa parts **T-1, T-2** and **T-3**. There are two of each part (one for each wing tip). Position the wing tip parts over the plan and glue them together. Fill any gaps with medium CA, then sand smooth.

❏ ❏ 3. Glue the wing tip perpendicular to rib W-6. The TE of the wing tip should be centered on the LE of the aileron. The LE of the wing tip should be centered on the LE of the wing.

❏ ❏ 4. Glue the die-cut 3/32" balsa **wing tip support (TS)** to W-6, the ends of the main spar and T-2. Sand the end of the tip support flush with the wing tip and sand the top and bottom edges of the tip support to blend into the wing tip.

❏ ❏ 5. From the 3/8" x 3/8" x 8" balsa stick, cut and glue **tip blocks** to the top of the wing tip TE and the top and bottom of the wing tip LE.
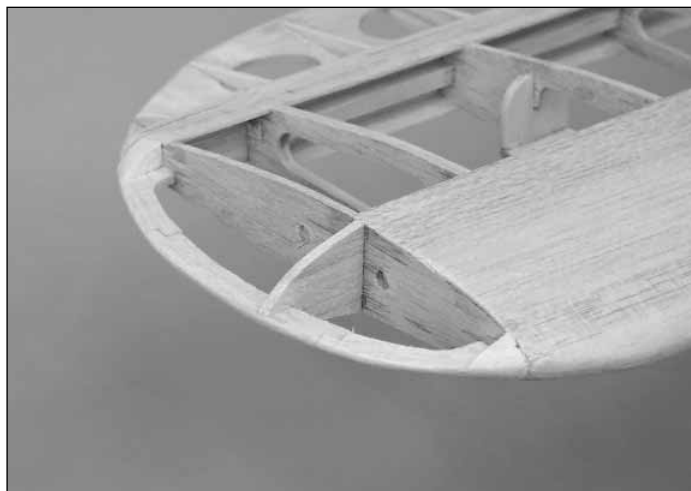
❏ ❏ 6. Shape the tip blocks to blend in to the edge of the wing tip, LE and TE. Sand a radius on the edge of the wing tip.

❏ ❏ 7. Return to step 1 of *Assemble and Install the Wing Tips* and build the second wing tip.

BUILD THE FUSELAGE

Assemble the Fuselage Sides
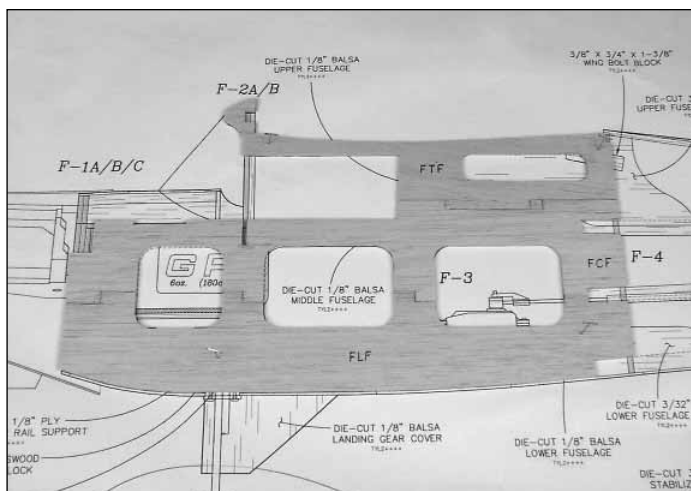
❏ ❏ 1. With waxed paper or Plan Protector positioned over the fuse plan, pin the die-cut 1/8" balsa **forward lower fuselage (FLF)**, **forward center fuselage (FCF)** and **forward top fuselage (FTF)** in position over the plan and glue together. **Important:** Save the leftover balsa from the 1/8" die sheets for use later when making wing shims.
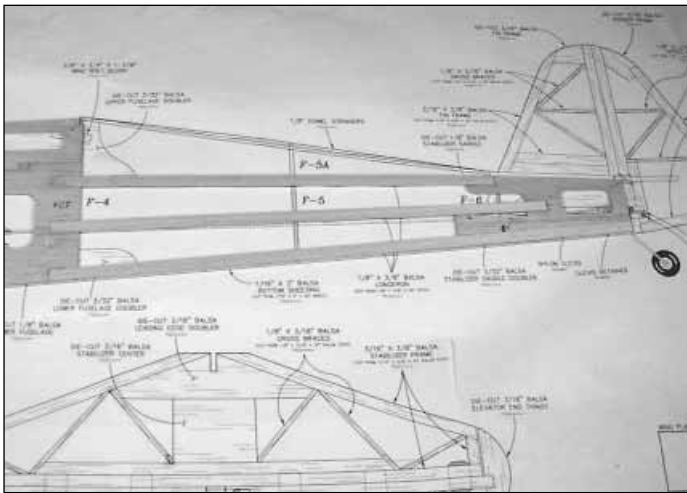
❏ ❏ 2. Pin the 1/8" die-cut balsa **aft fuse side (AFS)** in position over the plan. From the 1/8" x 3/8" x 30" balsa sticks, fit and glue three **longerons** to fit between the forward fuse and the aft fuse side.
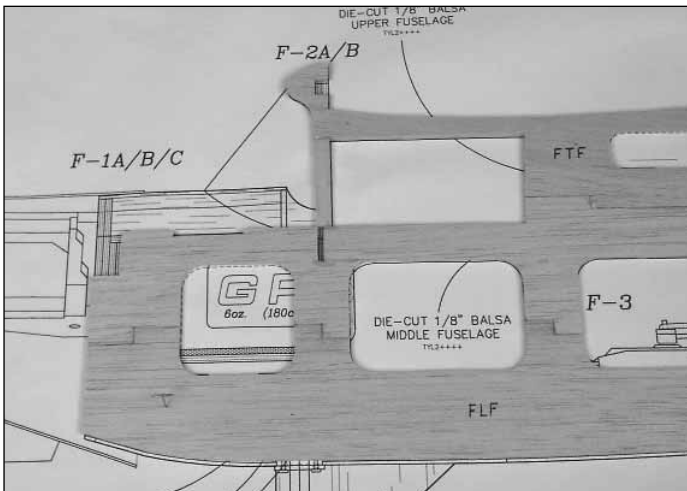
❏ ❏ 3. From the 1/8" x 1/4" x 12" balsa stick, cut and glue the **side window frame** to the forward center and forward top fuselage sides.

❏ ❏ 4. Use a pen to mark the location of former F-5 on the longerons.

❏ 5. Remove the fuselage side from the plans. Return to step 1 and build the second fuselage side.

❏ 6. Place the two fuse sides together and check that they match up all the way around. If they are not identical, pin them together and use a sanding bar to make them match.

❏ 7. Lightly sand both sides of each fuselage side to remove any excess glue.
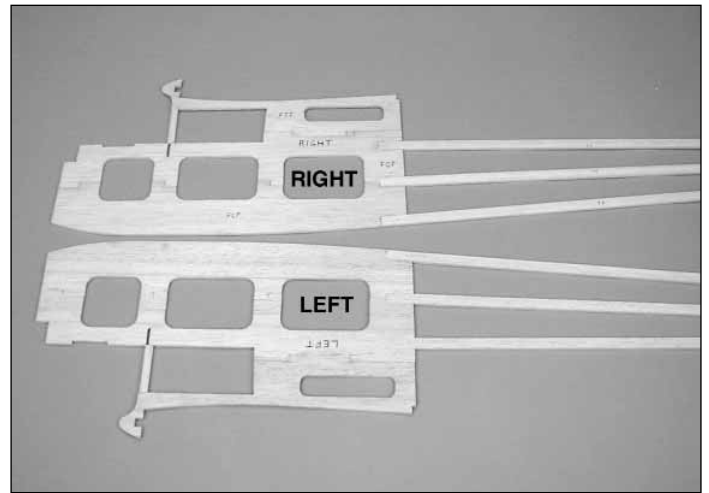
❏ 8. Lay the fuse sides next to each other so they mirror each other. Mark one fuse side **left side** and one **right side**.
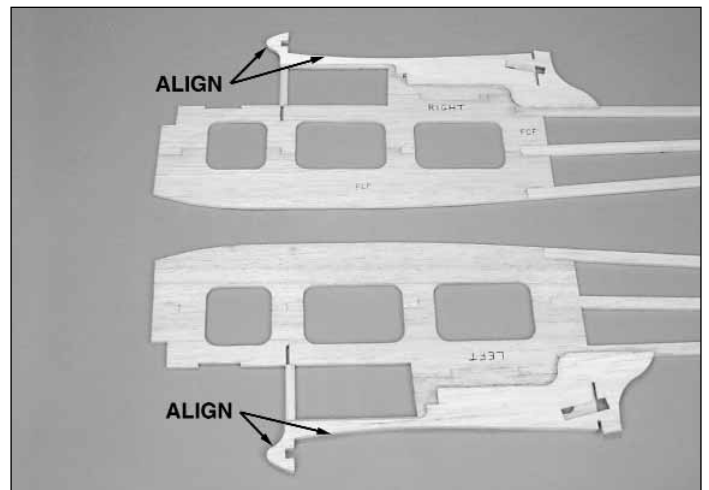
❏ 9. Glue the die-cut 3/32" balsa **wing saddle doublers** to the inside of both fuse sides. Align the top and front of the doubler with the top and front of the fuse side.
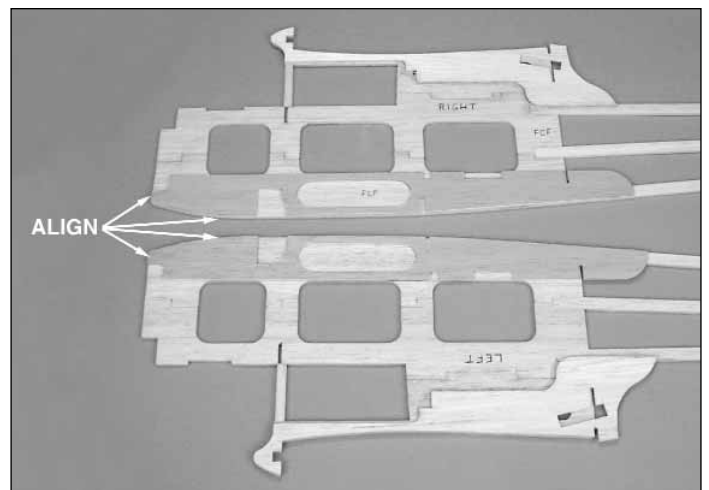
❏ 10. Glue the die-cut 3/32" balsa **lower fuse doublers** to the inside of both fuse sides. Align the bottom and front of the doubler with the bottom and front of the fuse sides.
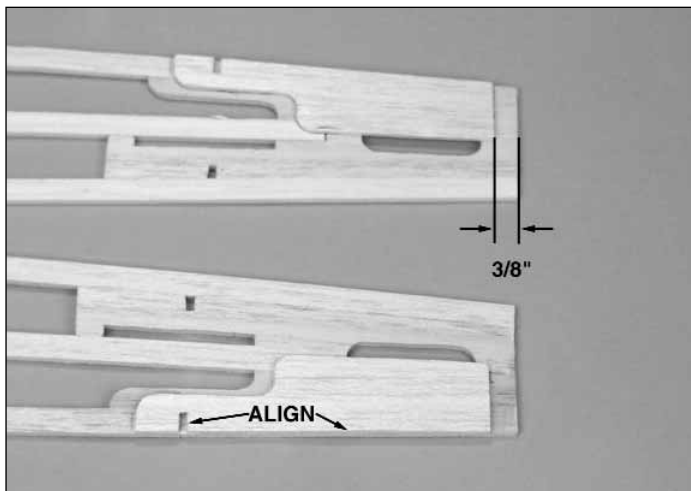
❏ 11. Glue the die-cut 3/32" balsa **aft stabilizer doublers** to the inside of both fuse sides. Align the top of the doubler with the top of the fuse side and the front edge of the notch in the doubler with the aft edge of the top longeron. The aft edge of the doubler will be approximately 3/8" forward of the aft edge of the fuse side.
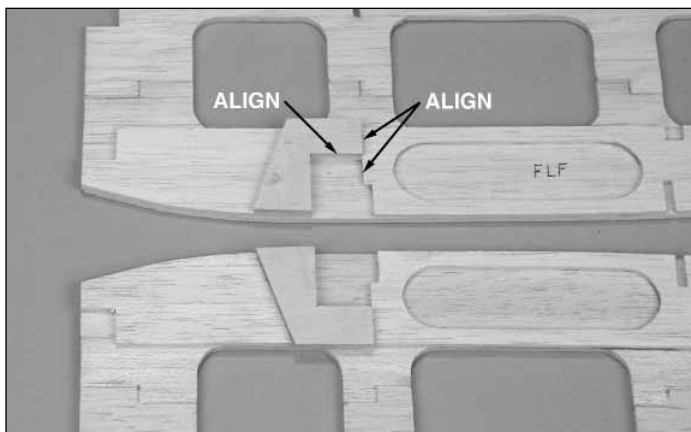
❏ 12. Glue the die-cut 1/8" plywood **landing gear supports** to the lower fuse doublers. Align the landing gear support with the top and front of the notch for the landing gear rail.
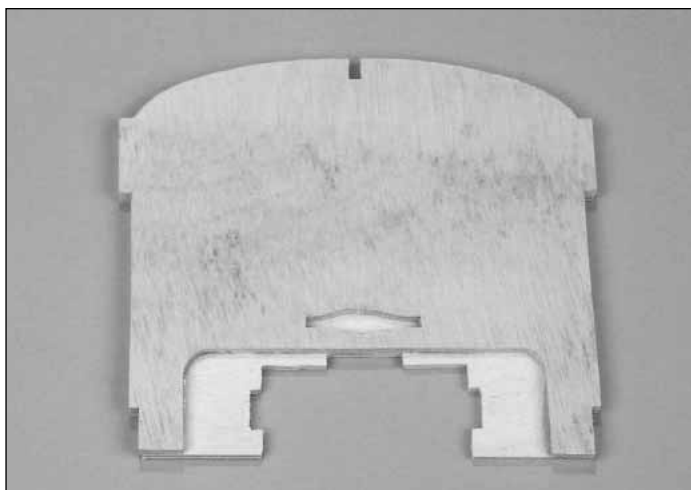
❏ 13. Use 6-minute epoxy to glue the front of die-cut plywood **firewall former F-1B** to the back of **former F-1A**. **Note:** The side with the embossed lettering on it is the front of the formers.
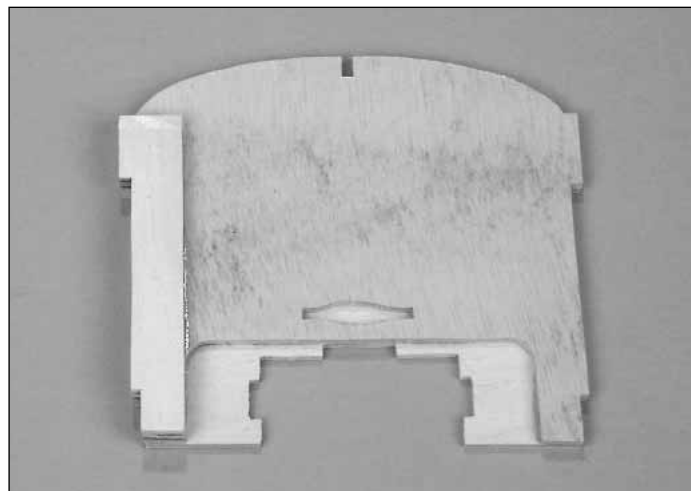
❏ 14. Use 6-minute epoxy to glue the two die-cut 1/8" plywood **firewall spacers** to the back of F-1B on the left side. The spacers will set the right thrust in the firewall when the firewall is installed in the fuselage.

IF USING GREAT PLANES ENGINE MOUNT, DRILL 5/32" HOLES FOR BLIND NUTS
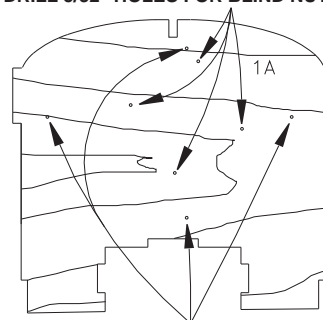
IF NOT INSTALLING THE GREAT PLANES ENGINE MOUNT, CONNECT THE OUTER PUNCH MARKS TO CENTER THE ENGINE MOUNT

❏ 15. After the epoxy has cured, drill 5/32" holes at the four engine mount punch marks. **NOTE:** If you will be using an engine mount other than the Great Planes engine mount, draw centerlines connecting the outer punch marks. Use the centerlines to align your engine mount on the firewall. Drill 5/32" holes at the appropriate locations.

❏ 16. Press four 6-32 blind nuts into the holes from the back of the firewall. Tap the blind nuts with a hammer to fully seat them. Apply a few drops of thin CA around each blind nut to secure them in position. Avoid getting CA on the threads of the blind nuts.
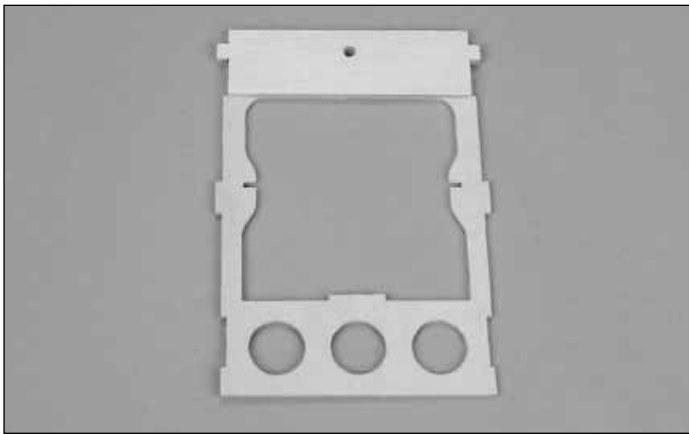
❏ 17. Glue the die-cut 1/8" plywood **former F-2B** to the back of **former F-2A**.
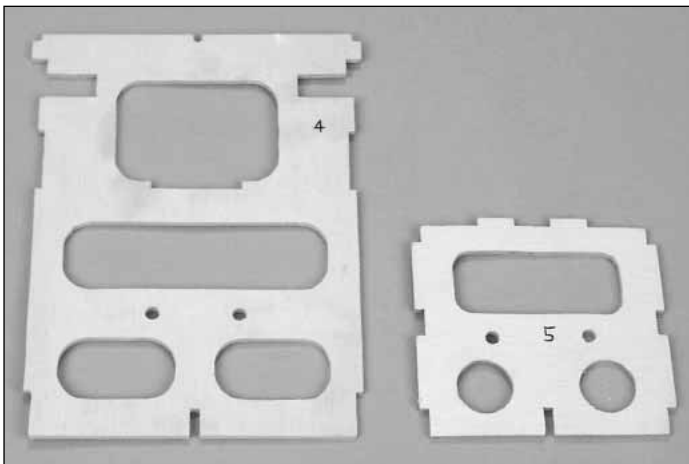
❏ 18. Drill 3/16" holes through the punch marks at the locations shown on the die-cut 1/8" plywood **formers F-4** and **F-5**. These holes are for mounting the outer pushrod tubes.

Join the Fuselage Sides
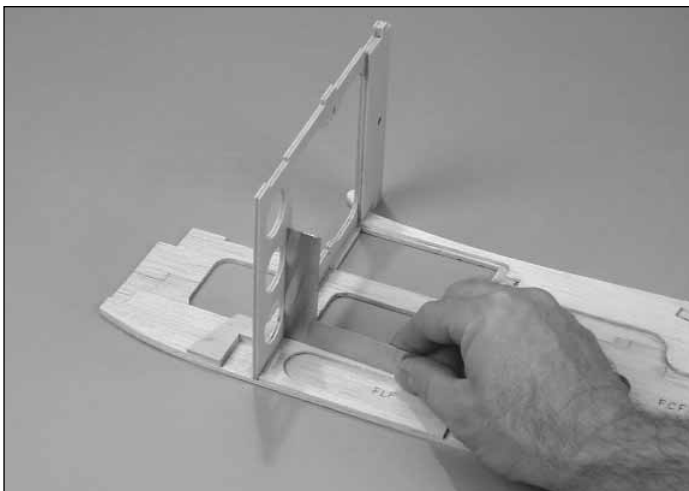
❏ 1. Install former F-2A on the right fuse side so that the embossed F-2A faces forward. With F-2A inserted into the notches, perpendicular to the fuse side, use thin CA to glue the former in place.
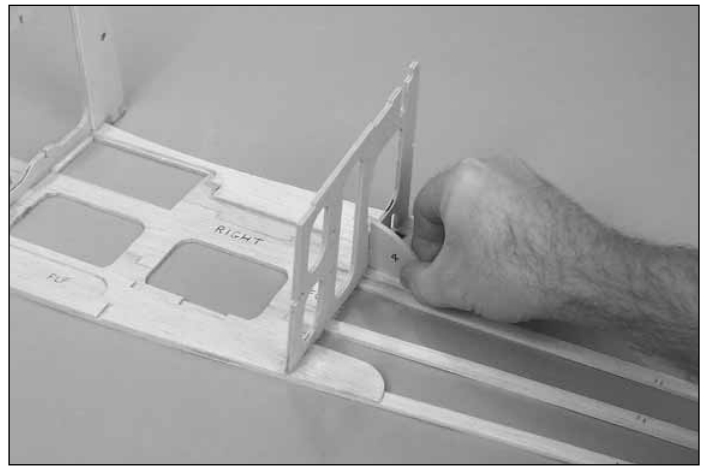
❏ 2. Use the die-cut 1/8" plywood **former gauge #4** to hold the die-cut 1/8" plywood **former F-4** at the proper angle to the fuse side while gluing the former in place.
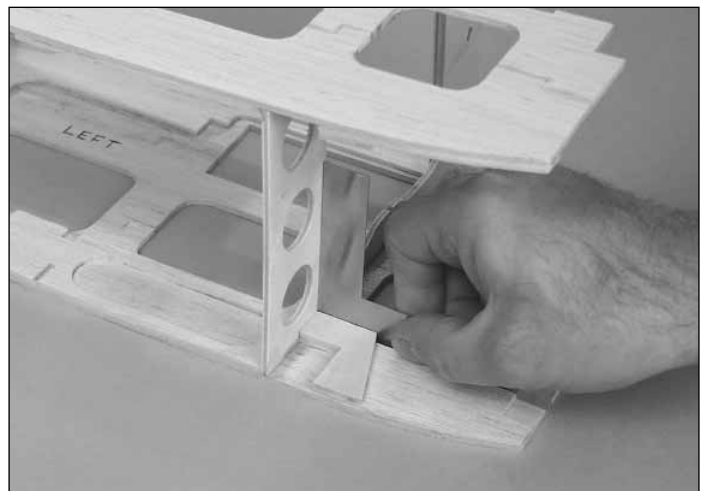
❏ 3. Lay the fuse on its left side and insert former F-2A into the notches on the left side. With F-2A perpendicular to the to the left fuse side, glue the former to the fuse side.

❏ 4. Install the die-cut 1/8" plywood **former F-3** into the notches in the left and right fuse sides. **Do not** glue the former to the fuse sides.
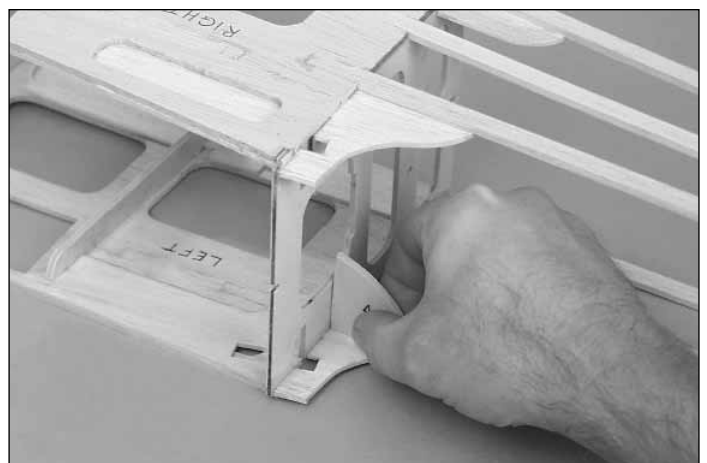
❏ 5. Lay the fuse on its left side. Use former gauge #4 to hold F-4 in position while gluing it to the fuse side.

3/16"
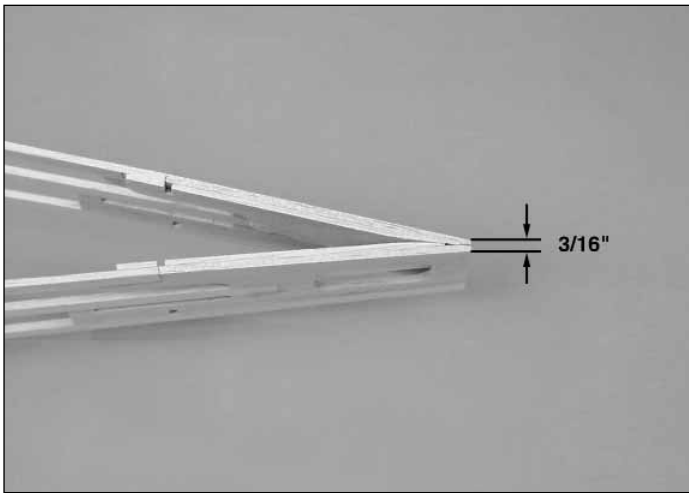
❏ 6. Use a sanding bar to taper the inside of the aft end of the fuse sides so that when the aft fuse sides are brought together the two ends are approximately 3/16" wide.
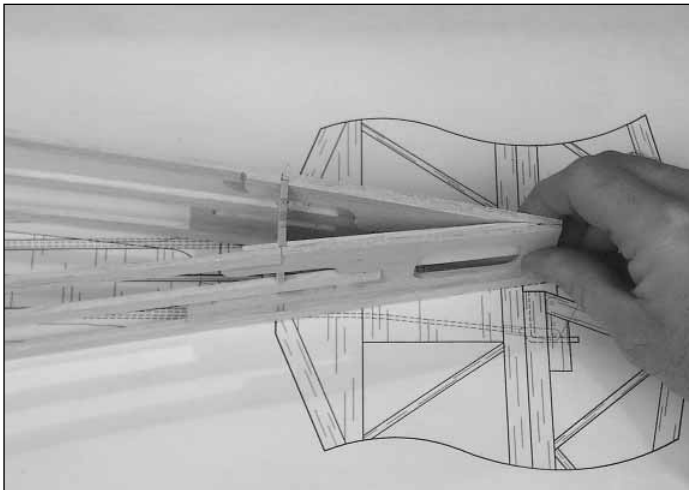
❏ 7. Test fit the die-cut 1/8" plywood **former F-6** at the aft end of the fuselage. Position the fuselage right side up over the plan top view with formers F-3 and F-4 aligned with the plan. Pull the aft end of the fuselage together, checking the fit between the sides and sanding if necessary.

❏ 8. Pin the fuse over the fuselage top view. Carefully line up the aft end. Use a building square to make sure the fuse sides are perpendicular to the building board. Then, glue the aft end of the fuse together and former F-6 to the fuse sides.

Note: A small misalignment here will throw the aft end out of line, so double-check before gluing.
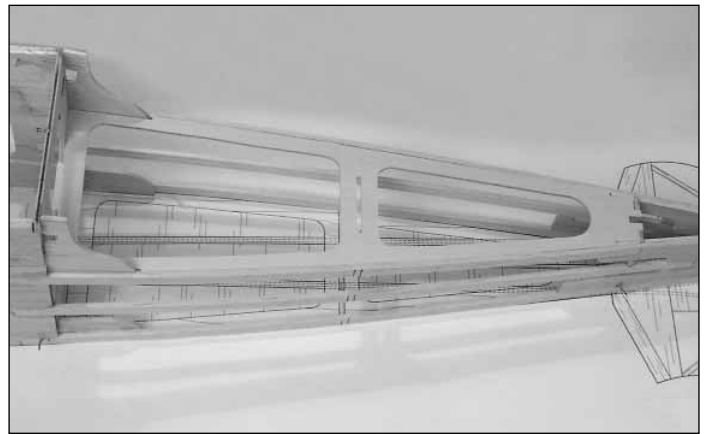
❏ 9. Test fit the die-cut 1/8" plywood **aft deck base** between the top longerons, F-4 and F-6. Check that the fuse sides are perpendicular to the building board. Then, glue the aft deck base to the top longerons, F-4 and F-6.
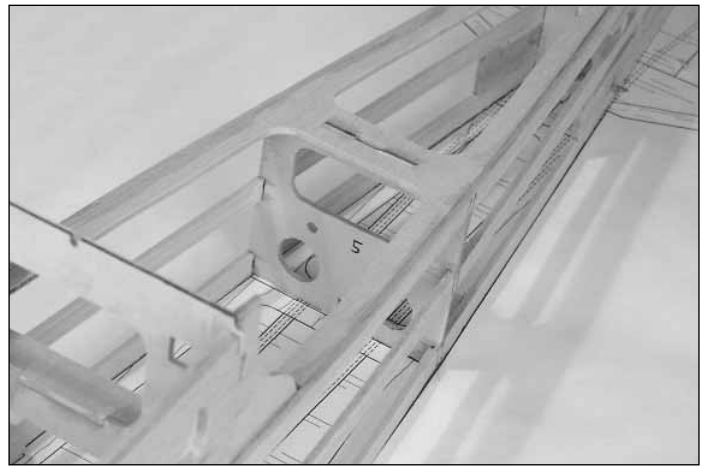
❏ 10. Position the die-cut 1/8" plywood **former F-5** between the longerons. Insert the tab on the top of F-5 into the slot in the aft deck base. Align the former with the lines you put on the longerons. Glue the former to the longerons and the aft deck base.

❏ 11. **Now**, glue former F-3 to the fuse sides.
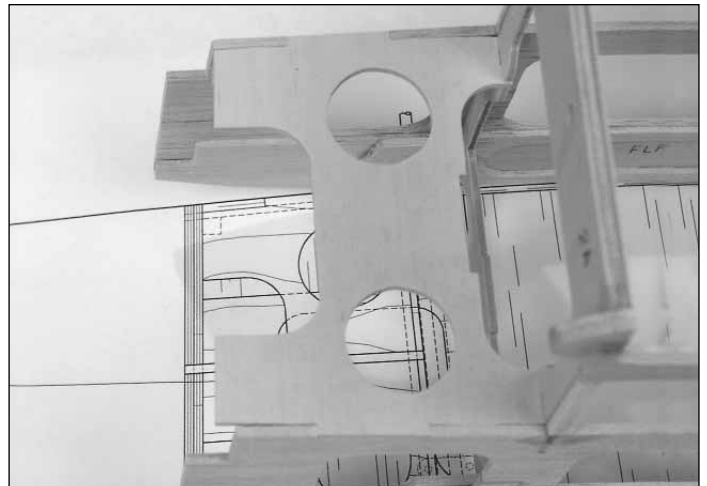
❏ 12. Temporarily install the die-cut 1/8" plywood **front deck**. The shorter side of the deck is positioned on the right side.
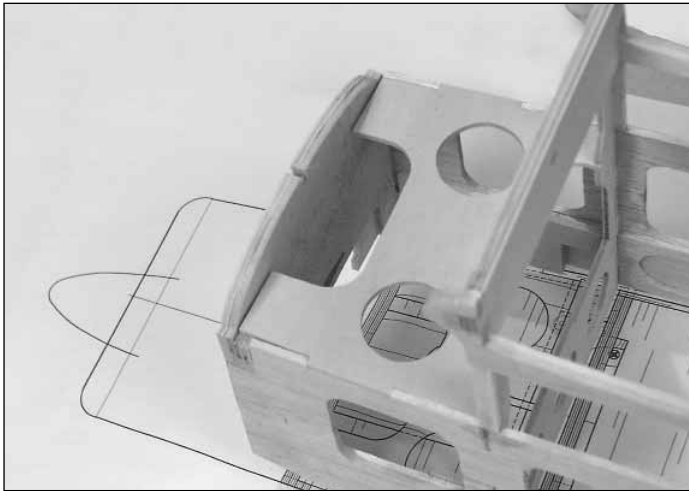
❏ 13. Test fit the firewall on the front of the fuse. The spacers on the back of the firewall are positioned on the left side. The firewall fits against the front deck and the lower fuse doubler.

❏ 14. When satisfied with the fit of the firewall, use CA to glue the front deck to the fuse sides and former F-2. **Do not** glue the front deck to the firewall yet.

❏ 15. Use 30-minute epoxy to glue the firewall to the fuse sides and front deck. Before the epoxy cures, wipe off any excess epoxy using a paper towel dampened with rubbing alcohol. Use clamps to hold the fuse sides tight against the firewall until the epoxy cures.

BOTTOM VIEW
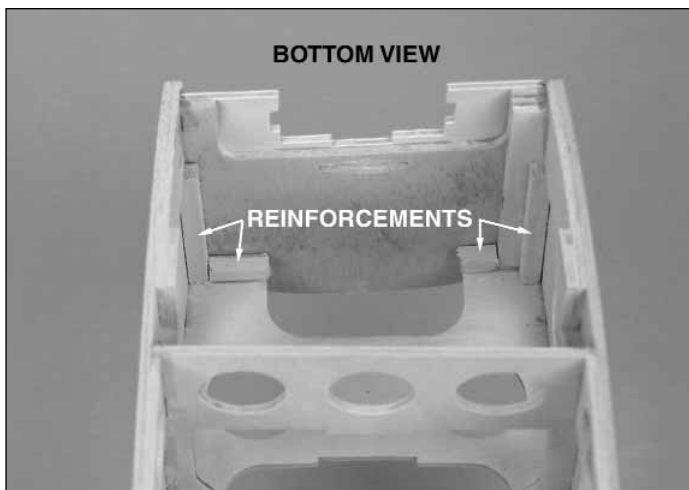
REINFORCEMENTS

❏ 16. From the **1/4" x 1/4" x 24" basswood stick**, cut and glue firewall reinforcements in the joint between the firewall and fuselage sides and the firewall and front deck.

FUEL TANK TRAY

1/4" x 1/4" x 1/2" BASSWOOD STICKS
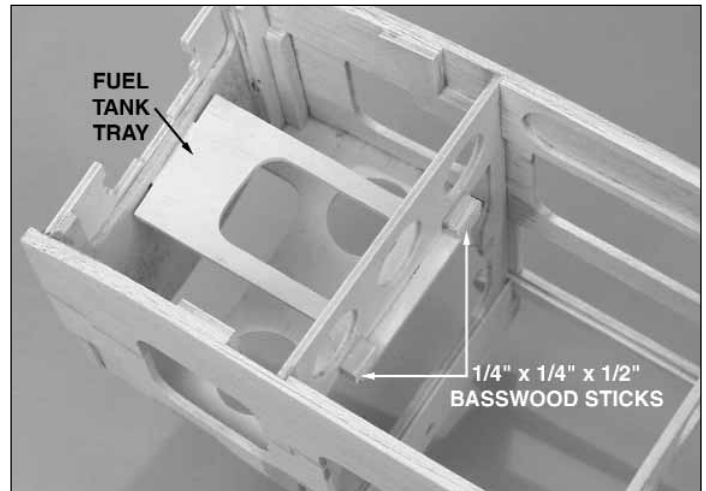
❏ 17. Temporarily install the die-cut 1/8" plywood **fuel tank tray**. Note that the front of the tank tray is angled to match the right thrust of the firewall. The fuel tank tray may be permanently glued to the firewall and former F-2 at this time, or two 1/2" long sticks may be cut from the remaining 1/4" x 1/4" basswood stick and glued to the aft edge of former F-2, flush with the bottom of the fuel tank tray. Do not glue the tank tray to the 1/2" sticks. The tank tray can then be installed with two #2 x 3/8" sheet metal screws threaded into the 1/2" sticks.
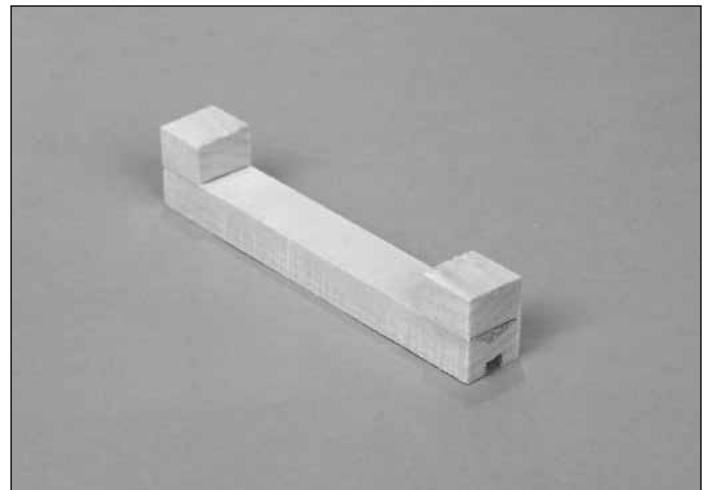
❏ 18. Use epoxy to glue the 1/2" x 5/8" x 3/4" basswood torque blocks to the bottom of the 1/2" x 3/4" x 4-13/16" basswood landing gear rail.
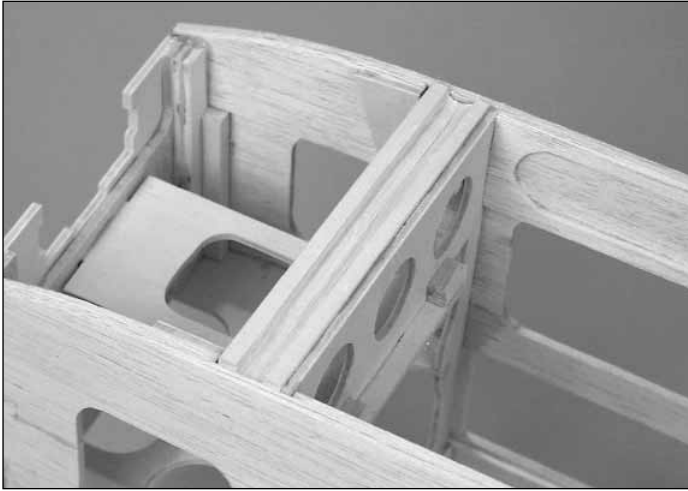
❏ 19. Use epoxy to glue the landing gear rail to the front of former F-2, the fuse sides and the landing gear supports. Make sure the landing gear rail protrudes 1/16" above the bottom of F-2. This will allow the 1/16" balsa bottom sheeting to butt up against the side of the landing gear rail.
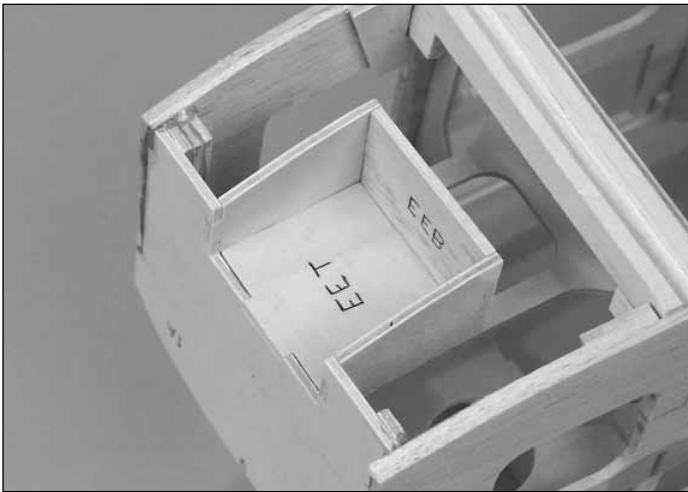
❏ 20. Fit and glue the die-cut 1/8" plywood **exhaust exit side (EES)**, **exhaust exit top (EET)** and **exhaust exit back (EEB)** on the back of the firewall.
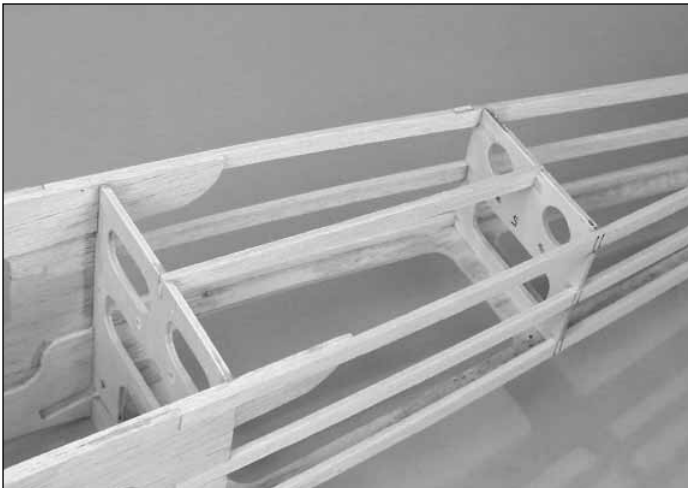
❏ 21. From a leftover 1/8" x 3/8" balsa stick, cut and glue a **bottom sheeting support** between formers F-4 and F-5.

❏ 22. Cut the 36" gray **outer pushrod tube** in half. Carefully sand the outside of the tubes with coarse sandpaper so the glue will stick better.
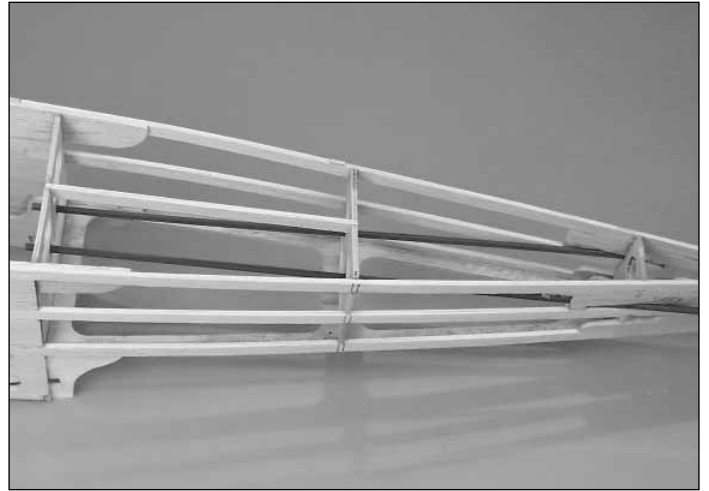
❏ 23. Insert the outer pushrod tubes through the 3/16" holes in formers F-4, F-5 and out the exits next to F-6. Leave about 1/2" of the pushrod tubes in front of former F-4. Glue the tubes to the formers and fuse sides. The slots in the side of the fuse for the pushrod tube exit can be filled with Hobbico balsa filler or a 50/50 mixture of microballoons and epoxy.

❏ 24. After the filler has cured, use a sanding bar to sand the pushrod tubes and filler flush with the side of the fuselage.

❏ 25. Position the fuse upside-down on your building board. Check that the aft end of the fuse is perpendicular to the building board (when viewed from the rear). Sand the bottom of the fuse sides and formers flush. Sheet the bottom of the fuse with 1/16" x 3" x 30" balsa sheet, applied cross-grain, starting at the rear edge of the landing gear rail and proceeding to the aft end of the fuse and from the front of the landing gear rail to the firewall. **Note:** A good way to do this is to lay the sheet across the fuselage and mark the edge of the longerons on the bottom of the sheet. Then remove the sheet and cut along the mark with a hobby knife, allowing a little extra that will be sanded off later.

❏ 26. Use a sanding block to sand the bottom sheeting flush with the side of the fuse.

Install the Engine

❏ 1. Cut the "spreader bar" from the supplied **Great Planes engine mount** and trim off any flashing. Slide the two halves together. Make sure the do not bind.

❏ 2. Temporarily mount the engine mount to the firewall with four **6-32 x 3/4" phillips head machine screws** and **#6 washers**. Note that the engine will be mounted with the cylinder head positioned at the lower right side. Do not tighten the screws completely.

❏ 3. Place your engine on the engine mount and adjust the mount until the engine fits between the mounting rails. When the engine mount is adjusted, tighten the mounting screws.
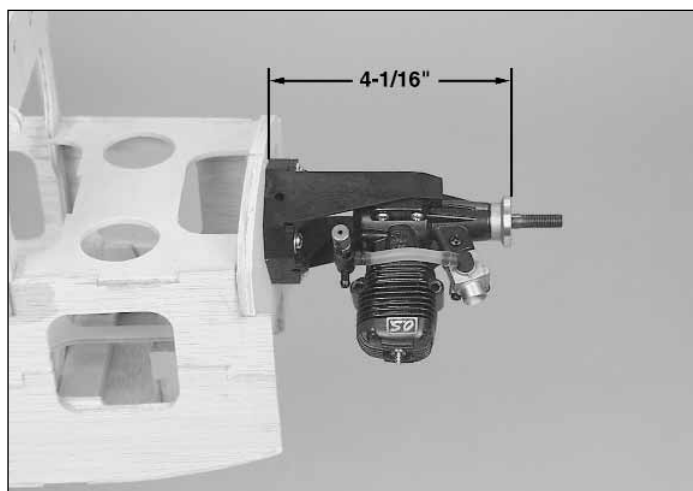
❏ 4. Position the engine on the engine mount with the front of the engine drive washer 4-1/16" from the front of the firewall. Carefully mark the engine mounting holes on the rails. A great method for marking the engine mounting holes is to use the **Great Planes Dead Center Engine Mount Hole Locator**. With the engine positioned on the mounting rails, insert the self-centering cone in the mounting hole. Twist the shaft, and the drill bit inside will mark the spot with a small starter hole.

❏ 5. Remove the engine from the engine mount. Drill a **3/32"** diameter hole at each mark. If you have access to a drill press, it is the best tool for the job. However, if you are using a hand held electric drill, try to keep the drill bit perpendicular to the rails.

❏ 6. Install the engine on the engine mount with four **#4 x 5/8" sheet metal screws**. **Hint:** The sheet metal screw will be easier to install if you wipe the threads across a bar of soap before installing them.
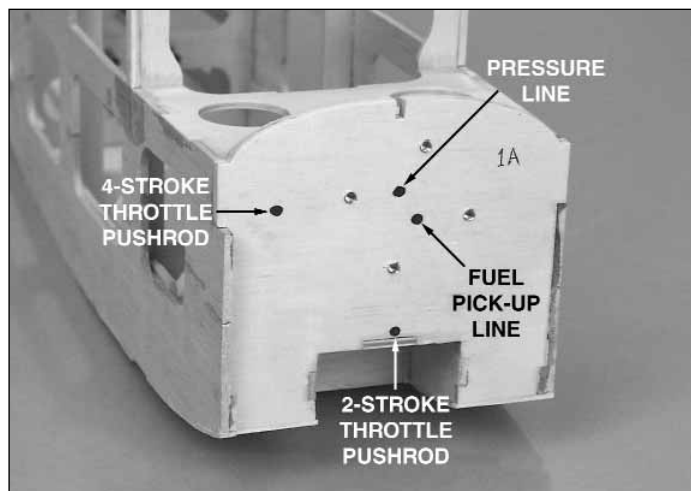
❏ 7. Mark the location for the throttle pushrod exit, fuel pick up line and fuel tank pressure line. The best location for the throttle pushrod exit when installing an O.S. 2-stroke engine is centered just above the exhaust exit top. For the four-stroke engine the upper left corner will work. A good location for the fuel pick up and pressure line exits are through the middle of the engine mount.

❏ 8. Drill a 3/16" hole at the mark for the throttle pushrod exit. If a 2-stroke engine is being installed and the throttle pushrod may need to be routed under the fuel tank tray, drill a 3/16" hole through former F-2, centered under the fuel tank tray. Drill 7/32" holes for the fuel and pressure line.

Sheet the Front Deck

❏ 1. Glue the die-cut 3/32" balsa **instrument panel (IP)** perpendicular to the top of the front deck.

❏ 2. From a remaining 1/8" x 1/4" balsa stick, glue a **top stringer** between the firewall and the instrument panel.
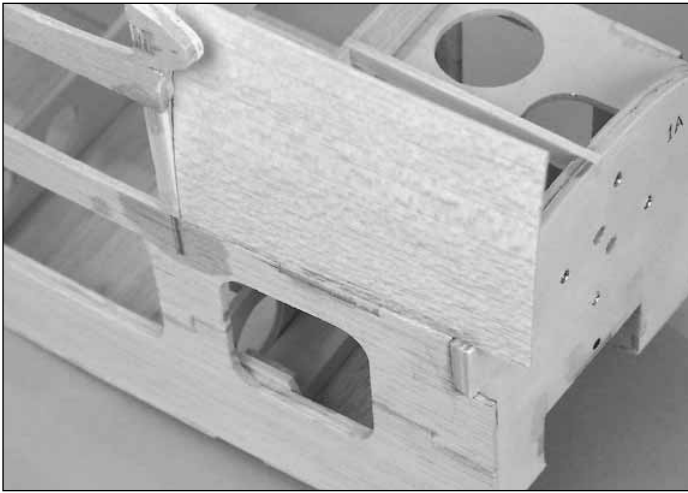
❏ 3. From the remaining 1/16" x 3" balsa sheet, cut two **forward top deck sheets** 4-1/4" long. Sand a slight angle on one of the long edges and glue it flush with the cabin frame at the aft end and angled toward the firewall.

❏ ❏ 4. Wet the outside of the forward top deck sheet with warm water. Carefully bend the sheet around the instrument panel and firewall. With the sheet tight against the instrument panel and firewall, trim the edge to the center of the top stringer.

❏ ❏ 5. Glue the top sheet to the instrument panel and firewall.

❏ 6. Repeat steps 4 and 5 for the other top deck sheet half.
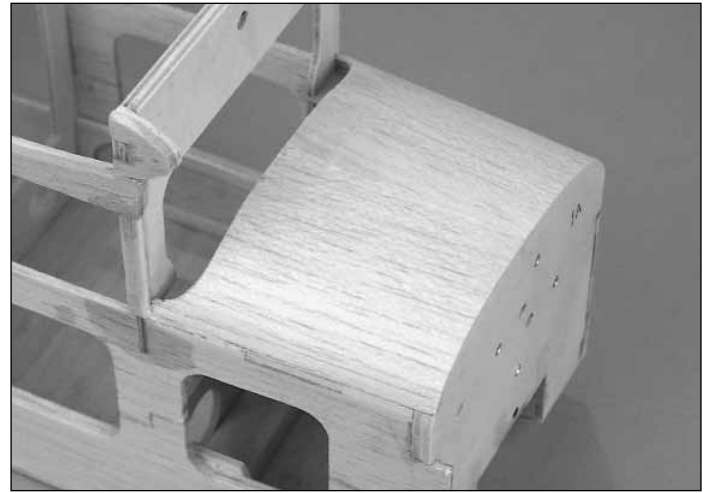
❏ 7. Trim and sand the forward edge of the top deck sheets flush with the front of the firewall and the aft edge to the instrument panel as shown. Sand the fuse sides to blend into the top deck sheet.

❏ 8. Test fit the 3/8" x 3/4" x 1-3/8" maple **wing mounting blocks** into the slots in the fuse top doublers, former F-4 and the fuse sides, sanding as necessary to provide a good fit. When satisfied with the fit, use epoxy to glue the wing mounting blocks to the fuse.

Sand the Fuselage

❏ 1. Fill any small gaps in the fuselage with balsa filler.

❏ 2. Use a sanding bar to sand the fuse sides and bottom smooth.

❏ 3. Sand the lower corners of the landing gear rail and bottom sheeting to a slightly rounded shape as shown on the plan.

❏ 4. Sand the wing saddle area slightly to remove any excess glue.

Mount the Wing to the Fuselage

❏ 1. Position the wing in the wing saddle and visually align it with the fuselage. The center joint of the wing should align with the slot in former F-4.

A = A
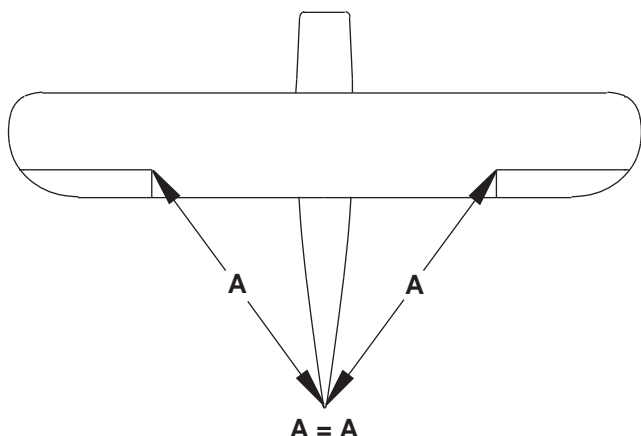
❏ 2. Use a tape measure to measure the distance from the corner of the aileron bay to the center of the tail. Then, measure the distance from the other aileron bay and check if the distances are the same. Adjust the wing until both distances are equal. When the wing is **perfectly aligned**, make reference marks on the wing trailing edge and former F-4 to help keep the parts aligned during the next step.

❏ 3. Tape the wing in position so that it cannot move. Use a 13/64" (or #10) drill bit to drill a hole through the wing at the two punch marks on the wing bolt plate. Two small 90-degree triangles will help you to align the drill perpendicular to the top surface of the wing. **Important: Do not allow the wing to shift during this procedure.**

❏ 4. Remove the wing and use a 1/4" drill bit to enlarge the holes in the **wing only**.
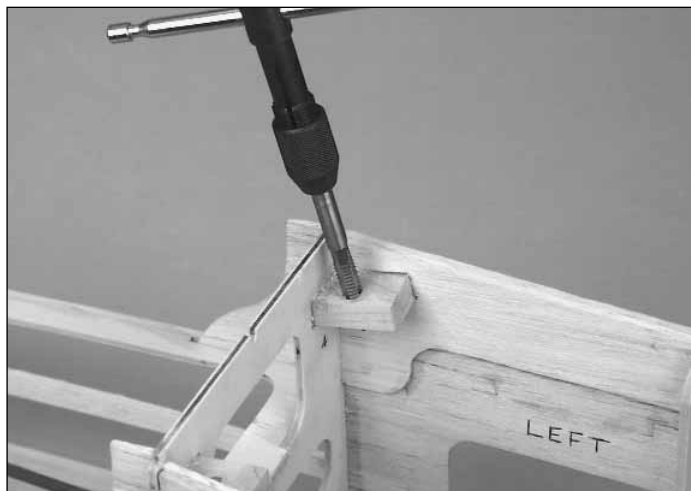
❏ 5. Use a #1/4"-20 tap to cut threads into the wing bolt blocks. After cutting the threads, put a couple of drops of thin CA on the threads in the wing bolt block. Allow the CA to cure before threading the tap back through the holes to clean up the threads. Bolt the wing to the fuse with two nylon **1/4"-20 wing bolts**, checking the fit.

Mount the Stabilizer & Fin

❏ 1. To aid in alignment, draw an **accurate centerline** on one side of the stabilizer. This centerline should be in the middle of S-2 and perpendicular to the TE.

SLOT FOR ELEVATOR JOINER WIRE

❏ 3. Set the fin in position on the stab. The fin TE must line up with the aft edge of the fuse. The bottom of the fin TE may need to be sanded slightly to allow the fin to seat on the stab. Cut a slot in the forward edge of the TE so that the joiner wire will fit between the fin and the stab TE.

A

A

A = A

A   A

A=A

❏ 4. Sight down the fin, checking that it is in line with the centerline of the fuselage. It is very important that the fin be aligned with the centerline of the fuse and perpendicular to the stab. If it is not, the plane will be difficult to trim. Use 30-minute epoxy to glue the fin to the stab, aft deck base and former F-6.

❏ 2. With the wing mounted on the fuse, center the stabilizer on the stab saddle, aligning the centerline of the stab with the centerline of the fuse and the notch in the LE of the stab with the notch at the aft end of the aft deck base. Align the stab so that the TE corners are equal distance from the center of the fuselage The LE of the stab should be flush with the forward edge of former F-6 and the TE approximately 3/8" from the aft end of the fuse. From a few feet behind the fuselage, view the stabilizer, checking that the stabilizer is parallel with the wing. If not, remove the stabilizer and sand the saddle slightly. When satisfied with the fit, use 30-minute epoxy to glue the stab to the fuse. **Double-check the stab alignment while the epoxy is curing.**

❏ 5. Mark the location of the tailgear wire on the rudder and the nylon tailgear bearing on the fuselage.
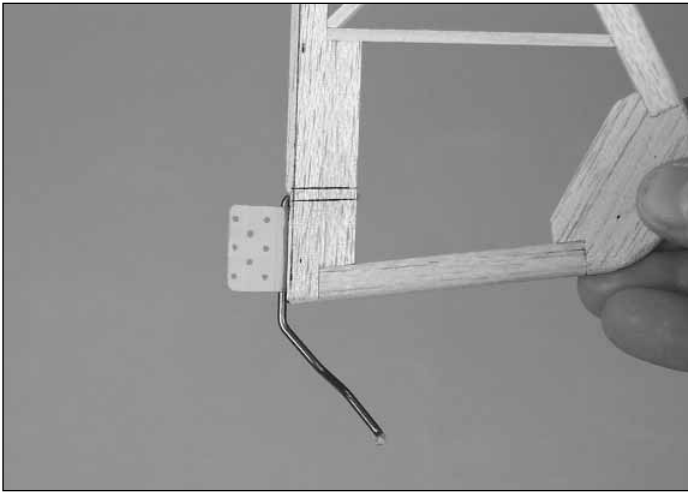
❏ 6. Drill a 3/32" hole in the leading edge of the rudder at the mark you made for the tailgear wire. Then, cut a groove for the nylon tailgear bearing. Test fit the tailgear wire in the rudder.
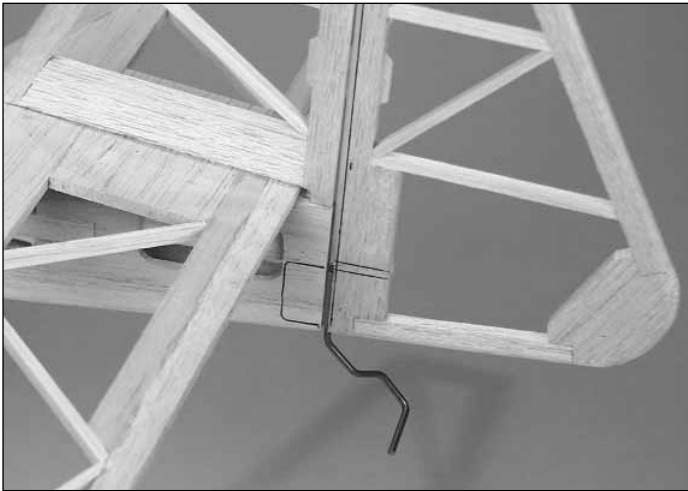
❏ 7. Cut a slot in the aft edge of the fuse at the marks you made for the tailgear bearing and the lower hinge. Without using any glue, join the rudder to the fuse.
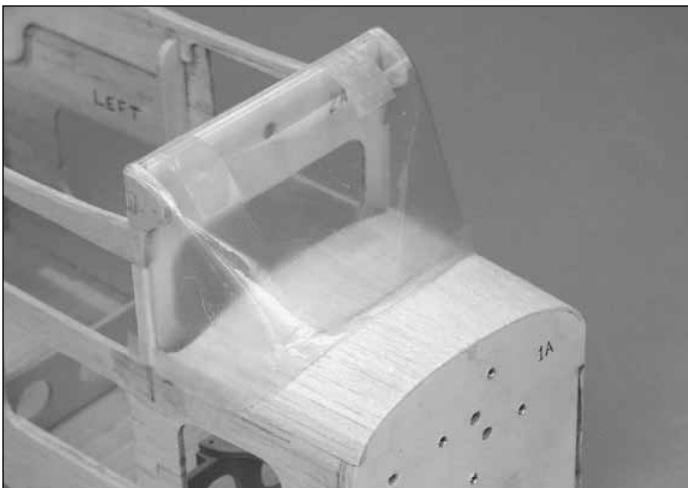
❏ 8. Trim the clear **windshield** along the embossed "cut lines." Then tape it in position on the front of the cabin.
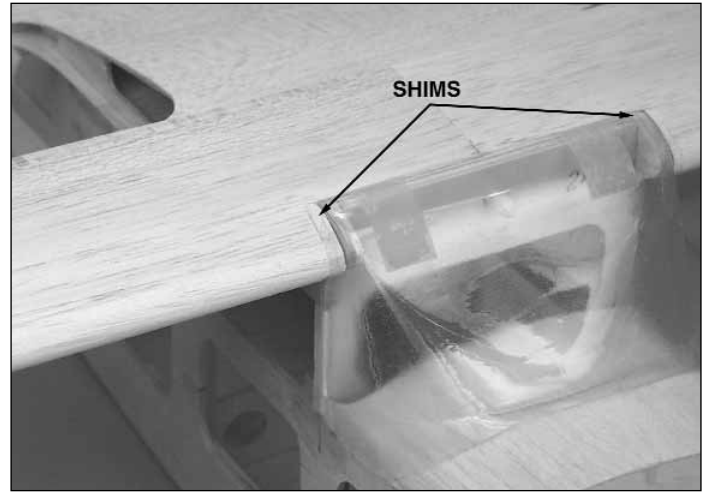
❏ 9. With the wing installed, note the gap between the LE of the wing and the windshield. Install shims made from 1/8" balsa leftover from the die sheets to reduce the gap to approximately 1/32" on each side.

Install the Dowel Stringers
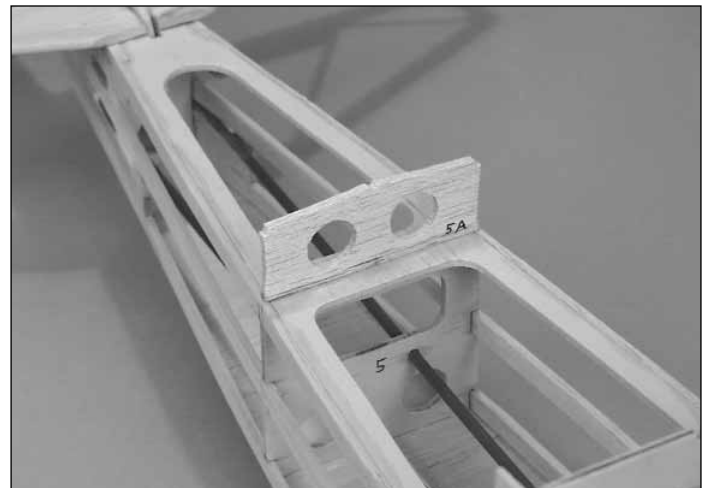
❏ 1. Glue the die-cut 1/8" balsa **former F-5A** perpendicular to the top of the aft deck.

TOP OF DOWEL FLUSH WITH TOP OF STAB
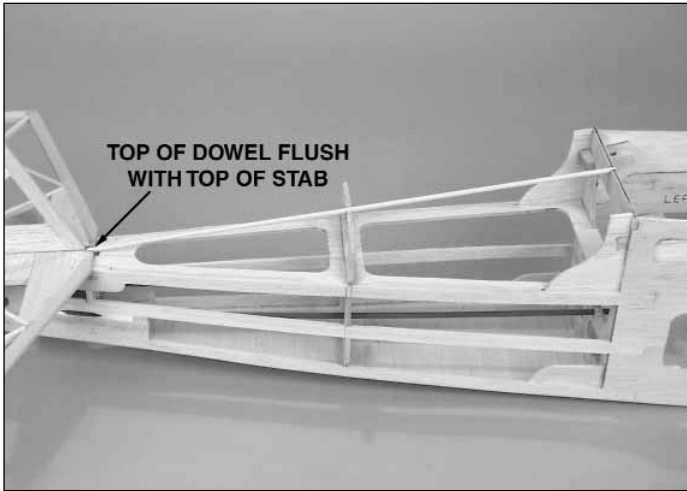
❏ 2. Position one of the 1/8" diameter **dowels** in the center notch of F-4 and F-5A. Sand the aft end of the dowel at an angle to match the angle of the fin LE. Glue the dowel in place so that it is flush with the top of the stab. Then, cut off the forward end of the dowel flush with the front of F-4.
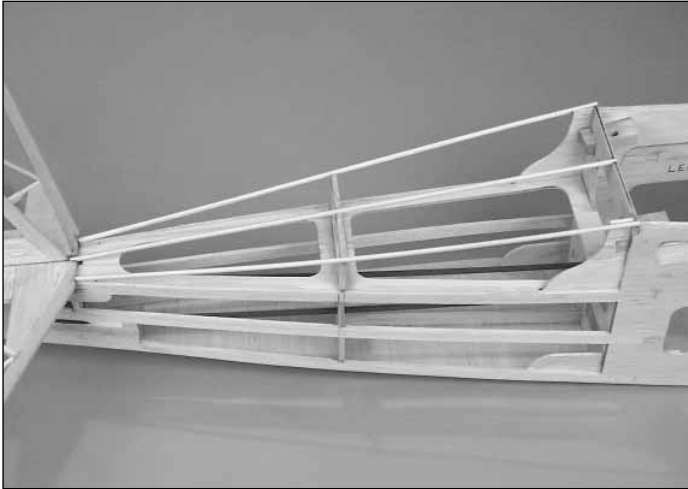
❏ 3. In a similar manner, cut and glue the two 1/8" side dowels in position. The aft end of the dowels should be flush with the top of the stab and aligned with the fuse sides.
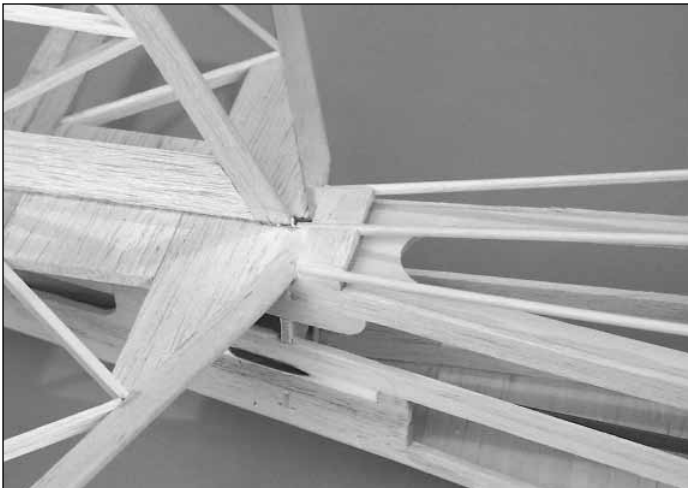
❏ 4. From leftover 1/8" balsa, fit and glue **filler pieces** between the dowel stringers and fin, and the dowel stringers

and aft deck base. Apply balsa filler to any gaps and sand smooth. The purpose of these pieces is to make the fuse easier to cover and enhance the scale appearance.
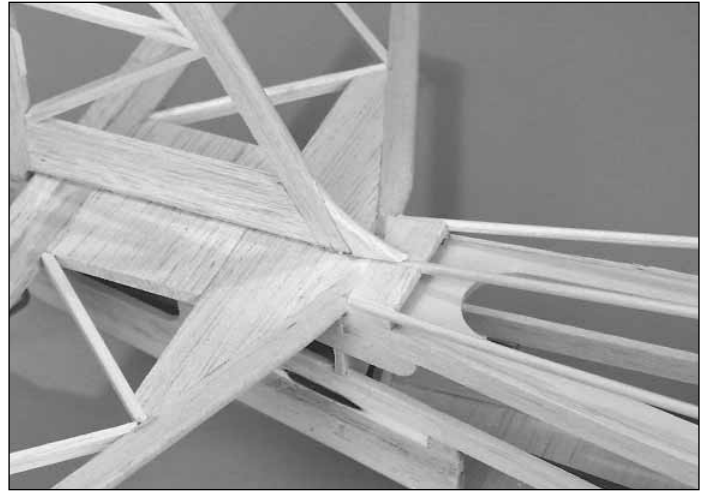
❏ 5. From a leftover piece of 3/16" balsa, cut a fillet to fit between the fin LE and the top dowel stringer. Glue it in place and sand the top edge to a rounded shape to blend in to the fin LE.

❏ 6. From leftover 1/8" balsa, make **gussets** to fit at the joint between the outside dowel stringers and former F-4.

Mount the Landing Gear
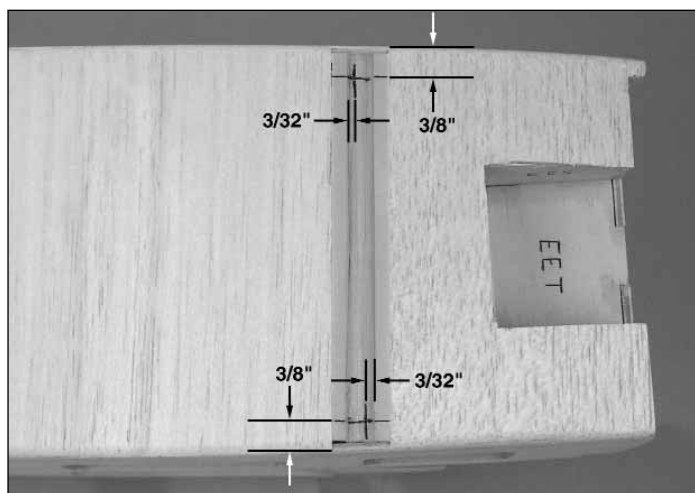
❏ 1. Turn the fuse upside-down. On one end of the landing gear rail place, in the groove, a mark 3/8" in from the fuse side and 3/32" aft from the forward edge of the landing gear slot. At the other end of the rail place a mark 3/8" in from the fuse side and 3/32" forward of the aft edge of the slot.
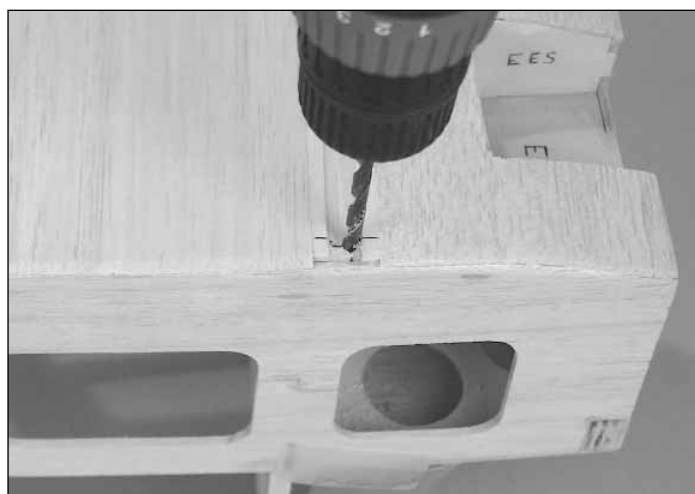
❏ 2. At both marks drill a 5/32" diameter hole through the landing gear rail and torque rod block, perpendicular to the rail.

❏ 3. Insert the 5/32" **main landing gear** in the slot of the landing gear rail.

❏ 4. Position the two nylon **landing gear straps** over the main landing gear as shown on the plan. Mark the screw hole locations on the landing gear plate.

❏ 5. Drill a 1/16" diameter pilot hole at each mark.
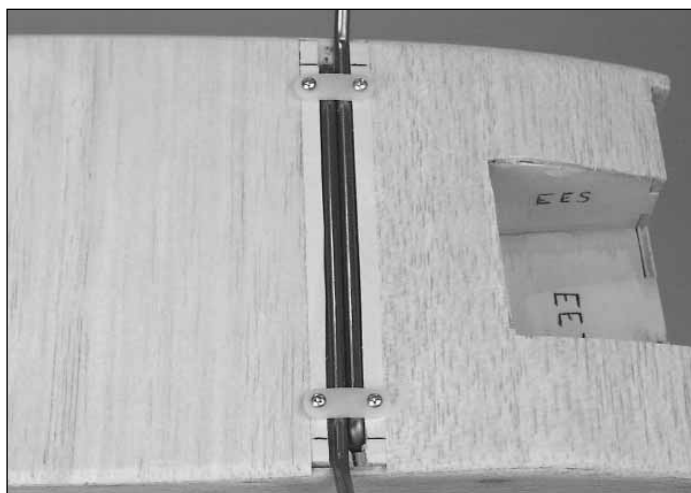
❏ 6. Temporarily secure the main landing gear to the landing gear rail with the landing gear straps and four **#2 x 3/8" screws**.

Assemble the Wheel Pants

❏ ❏ 1. Trim one matching set of **wheel pant halves** along the molded cut lines. You can use a hobby knife to **carefully** score along the cut lines and flex the plastic until the excess breaks free, or use Hobbico Curved-tip Canopy Scissors to cut along the lines. Save the leftover ABS cut from the pant halves. For now, don't worry about accurately cutting out the opening in each wheel pant half - just cut an approximate opening for the wheels.

❏ ❏ 2. Use your bar sanders to carefully true the edges of the wheel pant halves so that when you glue them together the seam will be as small and straight as possible. Use 150 or 220-grit sandpaper to remove the flashing and thoroughly roughen the inside of the wheel pant halves.

❏ ❏ 3. Test fit the wheel pant halves and make adjustments where necessary for the best possible fit.

❏ ❏ 4. Glue the die-cut 1/8" plywood wheel pant mount around the indentation on the inside of the wheel pant.
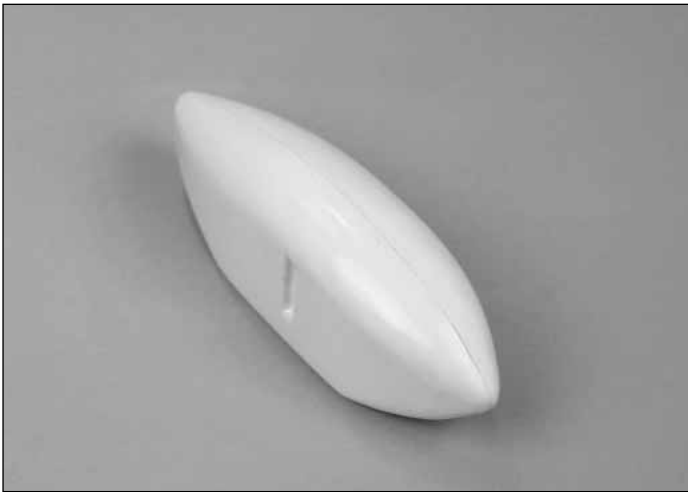
❏ ❏ 5. Use masking tape to join the two wheel pant halves. Carefully spot glue them together in just a few places with thin CA. Start by spot gluing the top, then the front and rear. After the halves are joined, securely glue them along all seams with thin CA.

Note: Do not use CA accelerator on the ABS plastic as it may develop cracks and/or keep the paint from adhering.

❏ ❏ 5. From the leftover ABS, trim and glue strips to the inside of the wheel pant along the seams.

❏ ❏ 6. To reinforce the wheel pant, use epoxy to glue the fiberglass tape over the seam on the inside of the wheel pant.
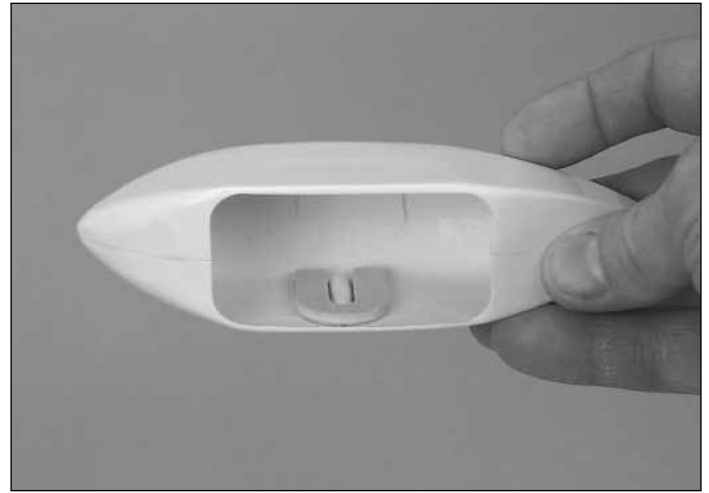
❏ ❏ 7. Use your hobby knife or a Dremel® Multipro™ with a sanding drum to finish cutting the wheel openings.

Hint: Make the wheel openings as wide as possible. This will make installing the wheels and axles easier and cause less interference with the wheels upon landing and taking off.
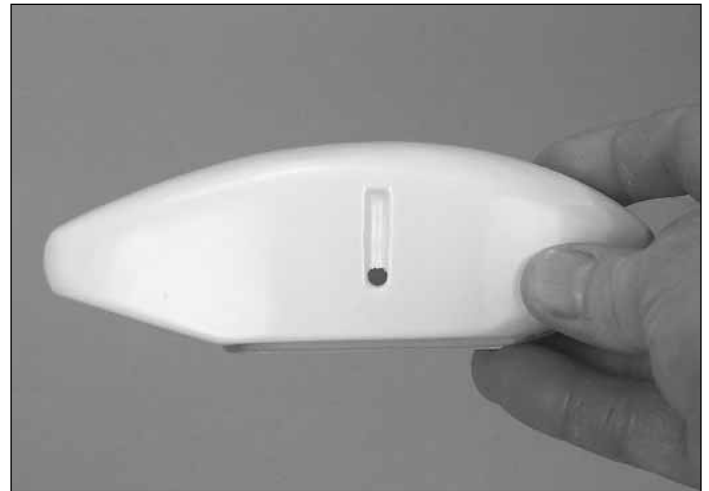
❏ ❏ 8. Drill a 5/32" hole in the wheel pant at the bottom of the slot for the landing gear wire.
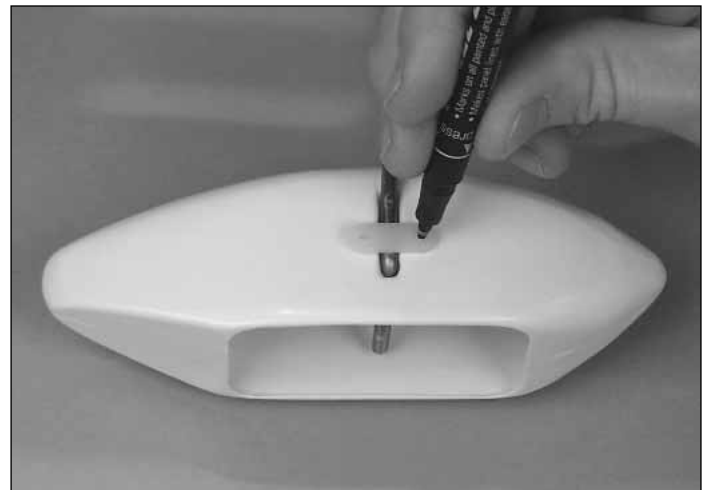
❏ ❏ 9. Slide the wheel pant over the landing gear wire so that the wire is recessed into the slot in the wheel pant.

Center a nylon landing gear strap centered over the slot in the wheel pant. Mark the mounting holes, remove the strap and drill a 1/16" pilot hole at both marks.

❏ ❏ 10. Drill a 5/32" hole in the center of the die-cut 1/8" plywood wheel pant retainer. Slide the die-cut 1/8" plywood wheel pant retainer over the landing gear. Then, securely attach the wheel pant to the landing gear with the nylon landing gear strap and two #2 x 3/8" sheet metal screws.
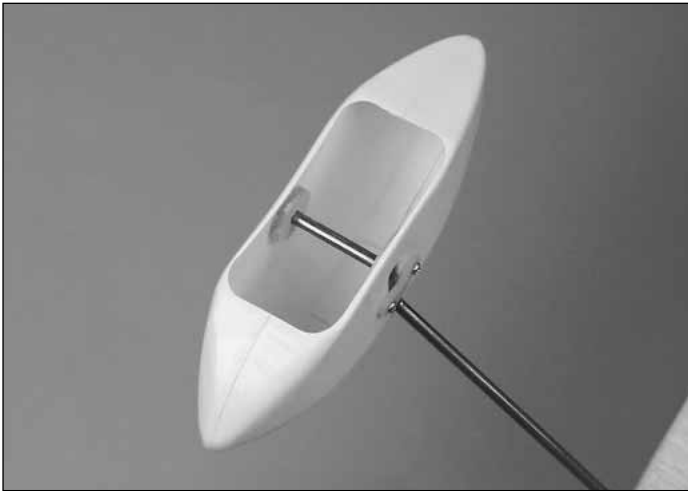
❏ ❏ 11. Adjust the position of the wheel pant so that the axle part of the landing gear is perpendicular to the centerline of the wheel pant. Stand back a few feet from the plane and view the wheel pant from the front and side, making sure it is positioned correctly. When satisfied with the position use epoxy to glue the wheel pant retainer to the side of the wheel pant. By using epoxy to glue the retainer on, you can re-adjust the position of the wheel pant before the glue cures.

❏ ❏ 12. Remove the two screws holding the nylon landing gear strap on the wheel pant. Slide the wheel pant partially off of the landing gear. Slide a 5/32" wheel collar, a 2-1/2" wheel followed by a second 5/32" wheel collar onto the landing gear. Reinstall the wheel pant to the landing gear with the nylon landing gear strap. Refer to the fuse plan for a detailed view of the wheel pant assembly.

❏ ❏ 13. Adjust and tighten the wheel collars on the landing gear so that the wheel rotates freely.

❏ 14. Return to step 1 of **Assemble the Wheel Pants** and assemble the other wheel pant.
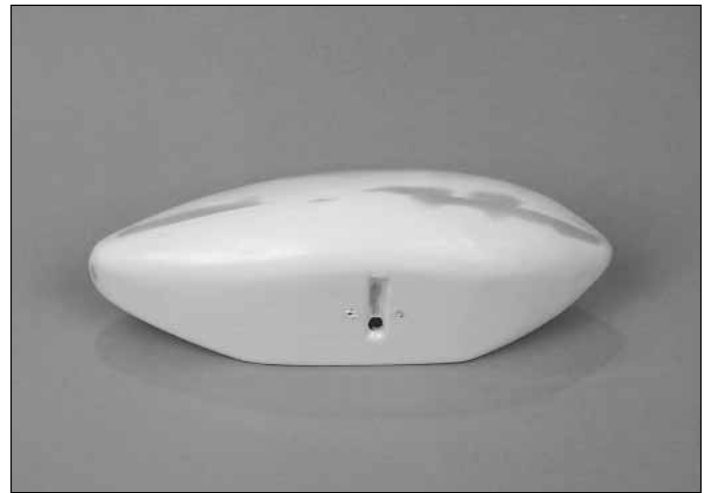
❏ 15. Before painting the wheel pants, fill the seams with a filler such as Bondo® Auto Body Filler or an automotive scratch and dent glazing compound. We use Bondo most of the time as it cures quickly and sands easily, but it is normally sold in large quantities. Automotive glazing compound usually comes in small tubes, dries quickly and sands easily, but for proper drying can only be applied in thin layers.

❏ 16. After the filler cures, wet sand the wheel pants with 400-grit sandpaper to prepare them for primer.

Assemble the Cowl

❏ 1. The cowl is assembled the same as the wheel pants. Cut the cowl along the cut lines, use a bar sander to true the edges. Roughly cut out the openings in the front of the cowl and roughen the inside of the cowl along all the seams.

Note: The top and bottom cowl halves use a butt joint to join the two halves. On the front of the two halves is a lip that the front cowl is glued over.

❏ 2. Tape the top and bottom cowl halves together. Wick thin CA along the joints. Then, reinforce the joint by gluing leftover ABS along the inside of the joints.

❏ 3. Tape the front of the cowl to the top and bottom cowl halves and wick CA along the joint.

❏ 4. Use a sharp hobby knife or Dremel MultiPro with a sanding drum to accurately trim the openings in the front of the cowl.

❏ 5. Use coarse sandpaper to thoroughly scuff the inside of the cowl along all the seams. Use 30-minute epoxy to glue strips of fiberglass cloth over the joints on the inside of the cowl.
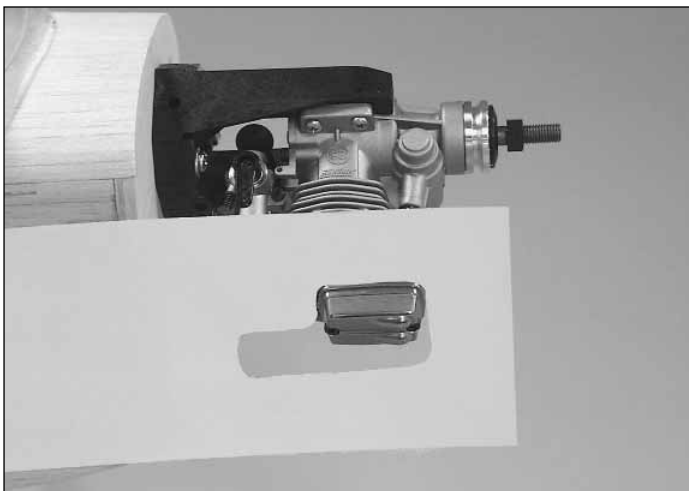
❏ 6. If you have removed the engine, reinstall it. Use a piece of thin cardboard or plastic as a template to locate the cowl for the head of the engine, muffler, needle valve and any other accessories that may protrude from the cowl (example: fuel fill valve, engine, choke, etc.). Tape the template to the fuselage side, accurately indicating the position of the accessories.
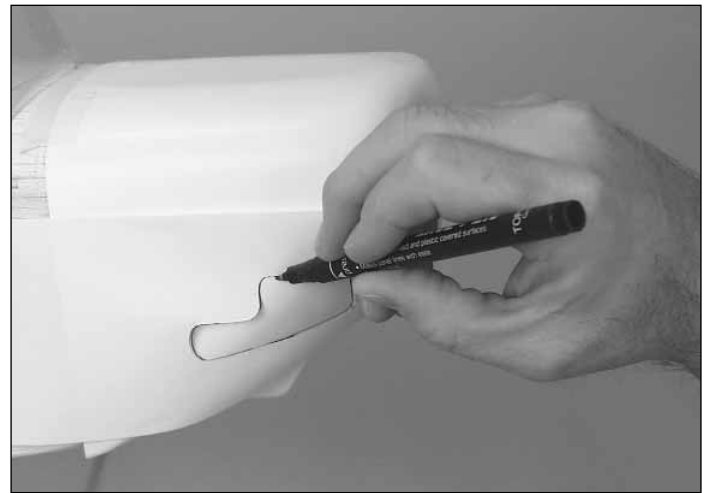
❏ 7. Measure the distance from the front of the firewall to the front of the drive washer on the engine. Remove the engine from the engine mount and position the cowl on the front of the fuselage so that the forward edge of the cowl is 1/8" **aft** of the measurement you just made. Use a felt tip marker to transfer the location of the engine and accessories onto the outside of the cowl.
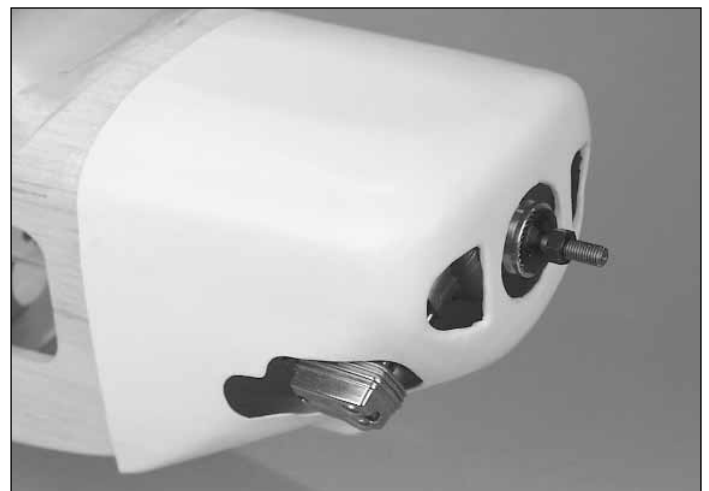
❏ 8. Remove the cowl and template and mount the engine on the engine mount. Cut out the holes marked in the last step slightly smaller than drawn. Test fit the cowl over the engine, adjusting the size and position of the holes as needed.
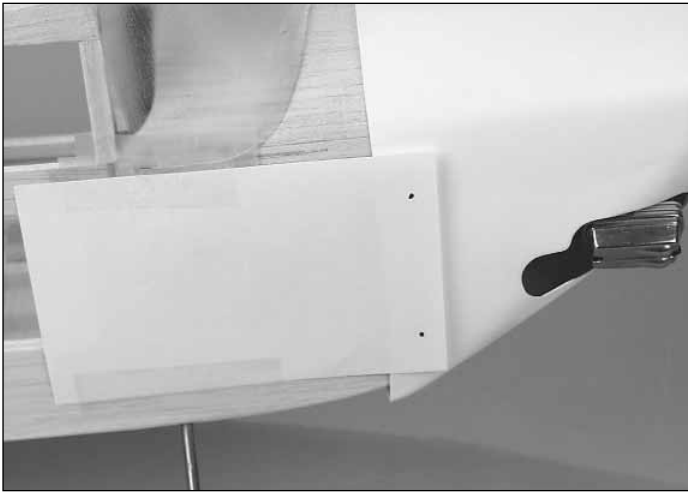
❏ 9. Using the template method, locate the four cowl mounting screw holes. The mounting screws must screw into the sides of the firewall. With the cowl in position mark and drill a 1/16" pilot hole at each mark. Enlarge the holes in the cowl to 3/32". Use **#2 washers** and #2 x 3/8" sheet metal screws to attach the cowl to the fuse.

Construct the Wing Struts

Note: The wing struts are for scale like appearance only. Built according to the plan and instructions, the airframe has sufficient strength for normal aerobatic flying without the struts. We suggest that the wing struts be removed if the plane will be flown fast. If not, the struts may flutter at high speeds. Before proceeding, make sure that you have the wing seated and installed on the fuselage in its final position.

❏ ❏ 1. Cut a 3/16" x 1/2" x 30" balsa stick in half to make two **wing struts**.

❏ ❏ 2. Taper and round the LE and TE of the wing struts to an airfoil shape as shown on the wing plan.

❏ ❏ 3. Cut three CA hinge pieces 1/4" x 1".
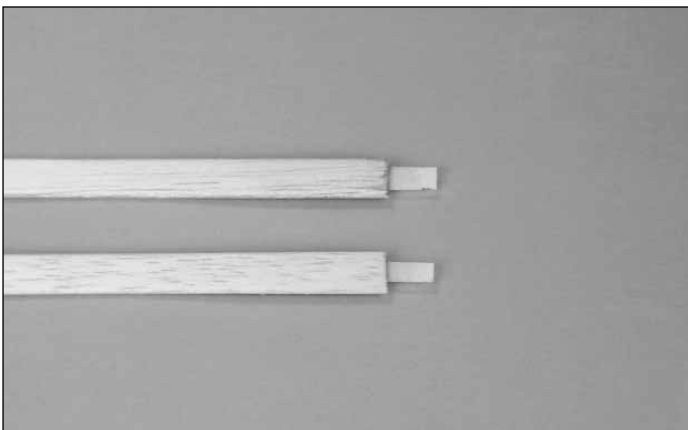
❏ ❏ 4. Cut a slot 1/2" deep in one end of each wing strut. Insert a CA hinge into each slot and glue them in place with thin CA. Drill a 1/16" hole through the center of the protruding CA hinges.
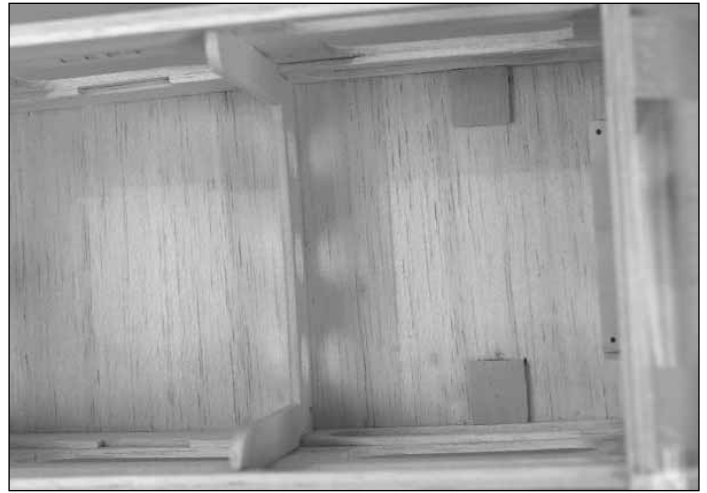
❏ ❏ 5. Glue a die-cut 1/8" plywood **fuselage strut mounting plate** to the inside of the fuselage floor at the location shown on the plan.

#2 x 3/8" SHEET METAL SCREWS
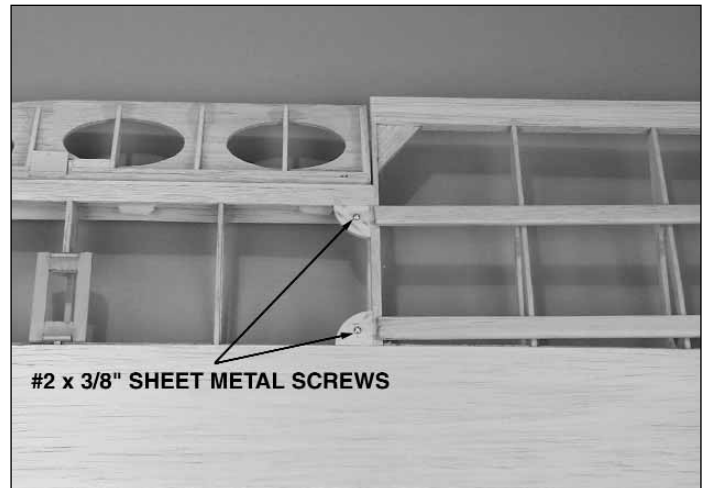
❏ ❏ 6. Drill a 1/16" hole in the center of both left wing strut mounting plates in the wing. Attach the struts to the strut mounting plates with #2 x 3/8" sheet metal screws.

❏ ❏ 7. Lay the wing struts so that they are positioned across the fuselage at the fuselage strut mounting plate location. Mark where the wing struts cross the edge of the fuselage. Cut the wing struts off at the marks and check their fit.
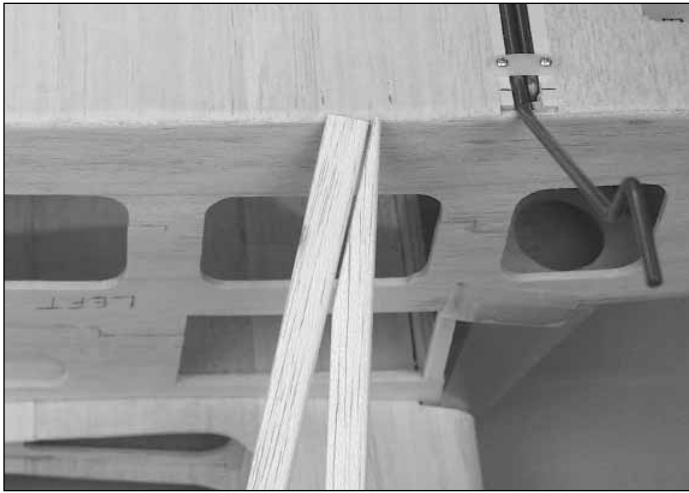
❏ ❏ 8. Position the unfinished end of the forward strut at the fuselage strut mounting plate. With the aft strut positioned on top, draw a line on the forward strut where the aft strut crosses it. Remove the front strut and cut away the balsa behind the line you drew.

❏ ❏ 9. Carefully cut a slit 1/2" deep in the end of the aft wing strut. Install a 1/4" x 1" CA hinge in the slit and secure it to the wing strut with thin CA. Center the CA hinge from the aft strut over the fuselage strut mounting plate on the fuselage. Drill a 1/16" hole through the center of the CA hinge and the fuselage strut mounting plate. Attach the strut to the fuselage with a #2 x 3/8" sheet metal screw.
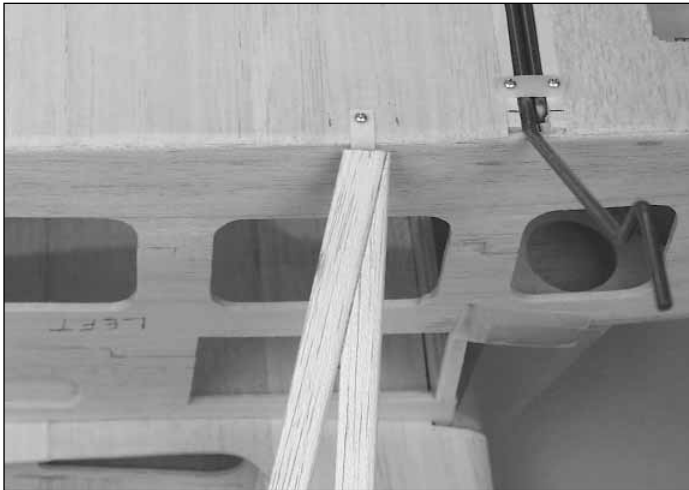
❏ ❏ 10. Reinstall the forward strut on the wing. Test fit the forward wing strut against the aft strut. Trim the forward strut as needed to achieve a good fit. Glue the struts together with thick CA.

❏ ❏ 11. Apply balsa filler in the joint between the two struts to blend them together.

❏ 12. Repeat the process to assemble the wing struts on the other side. **Note:** You may leave the struts permanently attached to the wing. When you remove the wing from the fuse, just remove the two screws which attach the struts to the fuse. For storage the struts may be folded down onto the wing and held in place with rubber bands.

Mount the Servos

❏ 1. Prepare the servos by installing the rubber grommets and brass eyelets into each servo.

❏ 2. From the leftover 1/4" x 1/4" x 24" basswood stick, cut two **servo rails** to fit in the notches in the lower fuse doubler. Glue the forward servo rail in the notches in the lower fuse doubler and to the back of former F-3. Use the servos to position the aft servo rail and glue it to the lower fuse doublers.

❏ 3. From the 11-3/4" white nylon inner pushrod, cut eight 1/8" long bushings.

❏ 4. Cut the two 2-56 x 36" pushrods so that they are 24" long measured from the threaded end.

❏ 5. Slide four bushings evenly spaced onto each pushrod. Adjust the bushings nearest the ends of the rods so they will not interfere with the ends of the outer pushrod tubes and possibly become jammed during flight. If the bushings slide onto the rods without much resistance, use a drop of thin CA to hold them in position.

Hint: Before installing the bushings, wipe off the pushrods with a paper towel dampened with rubbing alcohol to remove any oil left on the rods during manufacturing.

❏ 6. Thread a nylon clevis approximately 14 turns onto one end of each pushrod. Remove the backing plate from two large nylon control horns and connect the horns to the clevises in the outer hole.

HINGE LINE

CORRECT   INCORRECT
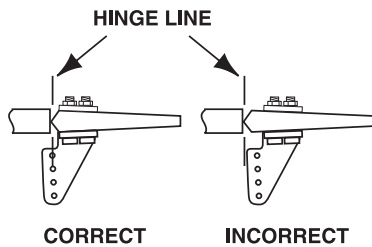
❏ 7. Insert the pushrods into the outer pushrod tubes. Position the control horns on the elevator and rudder as shown on the plans. Mark the location of the control horn mounting holes and drill 3/32" holes at the marks. Temporarily mount the control horns to the elevator and rudder with the backing plates and 2-56 x 1/2" machine screws.

❏ 8. Mount the receiver switch on the side of the fuse. We use a Great Planes Switch & Charge Jack Mounting Set on all of our planes. This allows you to check and charge the receiver battery without removing the wing.

❏ 9. Wrap the receiver and receiver battery in 1/4" foam rubber.

❏ 10. Temporarily position the receiver and receiver battery on the fuse bottom, in front of former F-3. Later, the receiver battery may be moved forward or aft to balance the plane. Plug the receiver battery into the receiver switch.

LOCATION FOR 4-STROKE THROTTLE SERVO

LOCATION FOR 2-STROKE THROTTLE SERVO
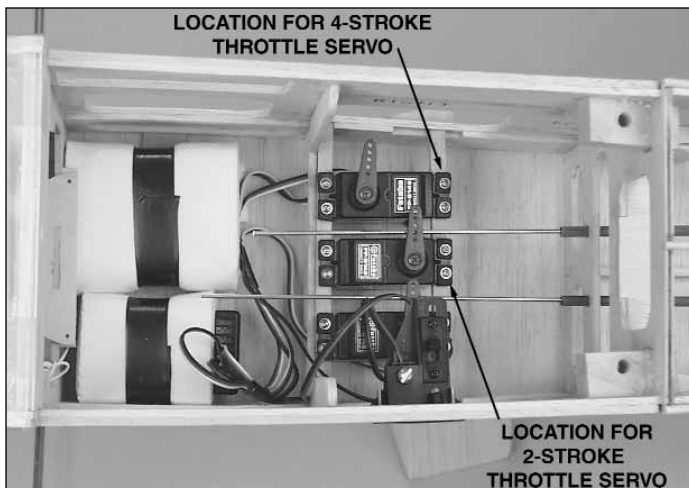
❏ 11. Mount the elevator, rudder and throttle servos, using the hardware that came with your radio, on the 1/4" x 1/4"

servo rail. **Note:** If a 2-stroke engine is being installed, the throttle pushrod will possibly need to be routed down the center of the fuse, requiring the throttle servo to be mounted in the center of the servo rails. If a 4-stroke engine is installed, the throttle servo may need to be mounted next to the fuse side.

❏ 12. With the servos centered and the control surfaces in neutral position, use a felt-tip pen to mark where the elevator and rudder pushrods cross the mounting holes in the servo arms. **Note:** The servo arms have been painted for clarity.

❏ 13. Disconnect the clevises from the control horns. Make a 90 degree bend at the marks you made. Temporarily install a nylon FasLink™ on each pushrod and cut the wire so it slightly protrudes out of the FasLink. **Hint:** If you prefer to bend and cut the pushrods **out of the fuselage**, remove the clevis, pull the pushrod out, make the 90 degree bends at the marks and cut the rods. Reinstall the pushrods in the guide tubes from the front and screw the clevises back on.

Note: If necessary, enlarge the holes in the servo arms with a 5/64" drill bit (or a #48 drill for precision).

Install the Throttle Pushrod

❏ 1. Remove the cowl from the fuse. Use coarse sandpaper to roughen the outside of the **24" outer pushrod tube**. Insert the outer pushrod tube through the throttle pushrod exit hole in the firewall. With the aft end of the outer pushrod tube approximately 1-1/2" from the throttle servo arm, glue the outer pushrod tube to the firewall. Cut the pushrod tube flush with the firewall.
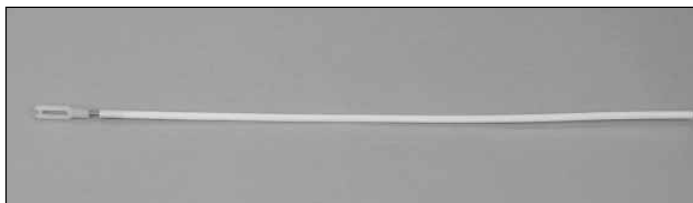
❏ 2. Thread the 2-56 x 1" stud into one end of the leftover white nylon inner pushrod. Thread a nylon clevis 14 turns onto the 1" stud.

❏ 3. Insert the throttle pushrod in the throttle outer pushrod tube from the inside of the fuse.

❏ 4. Position the throttle servo arm so that it is adjusted to the aft position. Measure and cut the white inner pushrod 1/2" forward of the firewall.

❏ 5. Cut off 1/2" of the thread from the **2-56 x 6" pushrod**. Thread the pushrod into the white inner pushrod forward of the firewall. **Hint:** Make a small 90 degree bend at the non-threaded end of the pushrod to hold on to. Carefully hold the white inner pushrod with a pliers while threading the pushrod into the inner pushrod.
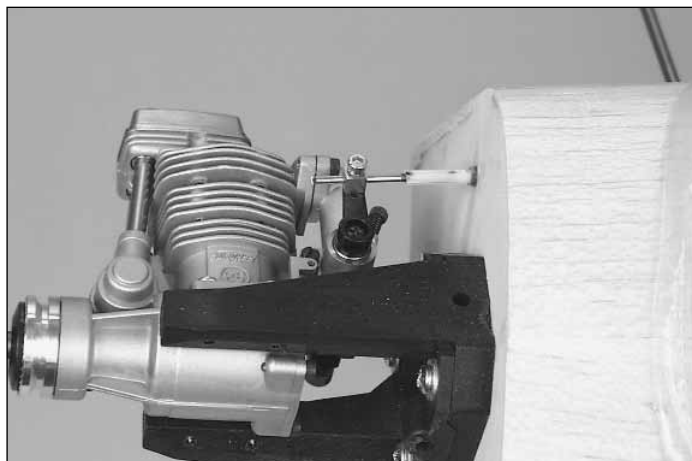
❏ 6. Attach the screw-lock pushrod connector to the throttle arm of the engine. Insert the pushrod through the pushrod connector and adjust the throttle.

Install the Aileron Pushrods

❏ ❏ 1. Install the grommets and brass eyelets in one of the aileron micro servos and install the servo in the wing using the hardware from your radio system.

❏ ❏ 2. Thread a nylon clevis approximately 14 turns onto the end of a 2-56 x 12" metal pushrod. Remove the backing plate from a small nylon control horn and connect the clevis to the horn in the outer hole.
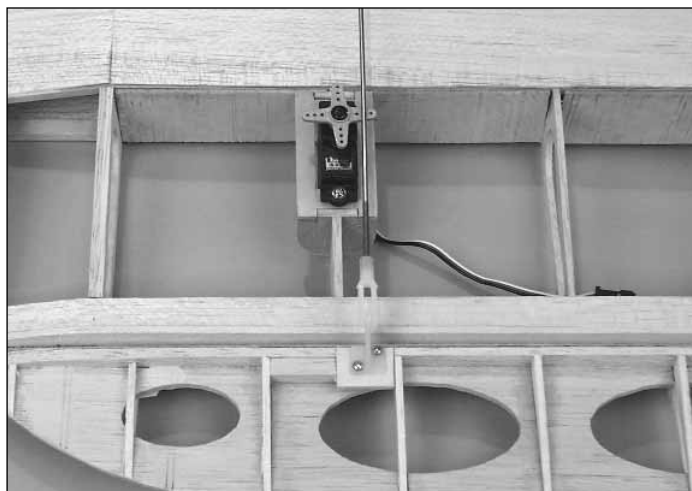
❏ ❏ 3. Position the control horn (refering to the sketch in step 7 on page 39) on the aileron as shown on the plans. Mark the location of the control horn mounting holes and drill 1/16" pilot holes at the marks. Temporarily mount the control horn to the aileron with #2 x 3/8" sheet metal screws.

❏ ❏ 4. With the aileron servo centered and the aileron in the neutral position, use a felt-tip pen to mark where the aileron pushrod crosses the mounting holes in the servo arm.

❏ ❏ 5. Make a 90 degree bend at the mark you made. Temporarily install a nylon FasLink on the pushrod and cut the wire so it slightly protrudes out of the FasLink.

❏ ❏ 6. Remove the two #2 x 3/8" sheet metal screws from the control horn. Put a couple of drops of thin CA into both screw holes in the aileron to strengthen the wood. After the CA cures, reattach the control horn.

❏ 7. Return to step 1 of **Install the Aileron Pushrods** and install the other aileron servo and pushrod.

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 nearly completed, this is a good time to balance the airplane laterally (side-to-side). Here is how to do it:

❏ 1. Temporarily attach the wing and engine to the fuselage.

❏ 2. With the wing level, lift the model by the propeller shaft and the bottom of the rudder (this may require two people). Do this several times.

❏ 3. 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

Fill any scuffs and dings with balsa filler or by "expansion." See Expert Tip below. After the filler has dried, use progressively finer grades of sandpaper to even and smooth all the edges, seams and surfaces. Sand a radius along the bottom edge of the fuse. Remove all the balsa dust from the model with compressed air, a tack cloth or a vacuum with a brush.

EXPERT TIP

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.

Cover the Model with MonoKote® Film

The T-Craft does not require much painting to obtain the scheme shown on the box, as most of the finish is done with Top Flite MonoKote covering. The only painting required is the cowl, windshield frame and wheel pants.

The technique we will describe here is how the model pictured on the box was finished. Remove the engine, landing gear, windshield and control horns.

Cover the model with Top Flite MonoKote film, using the sequence that follows. The use of a Top Flite MonoKote Hot Sock™ on your covering iron will prevent scratching the MonoKote film.

Before you cover the fuselage, first apply 1/4" wide strips of white MonoKote film in the corners where the stab and fin meet the fuselage. Proceed to cover the stab with pre-cut pieces that meet in the corners and overlap the 1/4" strips. **Do not, under any circumstances, attempt to cut the covering on the stab 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 stab. This will weaken the structure to a point where it may fail during flight.

Some modelers prefer to cover the top and bottom of the ailerons with one strip of MonoKote film. This is done by covering the bottom first, then wrapping the MonoKote film up over the leading edge.

We used Top Flite MonoKote White (TOPQ0204) and True Red (TOPQ0227) to cover our T-Craft.

Suggested Covering Sequence
Fuselage and Tail:
❏ 1. 1/4" strips at fin and stab as described
❏ 2. Fin TE, followed by stab TE
❏ 3. Fuselage bottom
❏ 4. Fuselage right side
❏ 5. Fuselage left side
❏ 6. Fuselage top
❏ 7. Stab bottom, followed by top
❏ 8. Fin left side, followed by the right side
❏ 9. Elevator LE
❏ 10. Elevator bottoms, followed by the top
❏ 11. Rudder LE, right side followed by the left side
❏ 12. Die-cut 1/8" balsa Landing gear fairings

Wing:
❏ 1. Trailing edges of wing
❏ 2. Bottom right, followed by the left wing panel
❏ 3. Top right, followed by the left wing panel
❏ 4. Aileron LE, followed by the bottom and top
❏ 5. Wing struts

Painting Your Model

After the model is covered, use fuel proof model paint, 30-minute epoxy thinned with alcohol or finishing resin to coat areas that may be exposed to raw fuel or exhaust residue such as the firewall, wing saddle and fuel tank area. Top Flite LustreKote® is a high quality paint that is fuel proof and perfectly matches Top Flite MonoKote. The paint is well suited to putting a high quality finish on ABS (cowl and wheel pants), but does have a tendency to curl materials such as styrene and butyrate (windshield and side windows).

Do not paint the clear windshield with LustreKote directly from the can. It can cause the plastic to curl. We recommend Formula-U for painting the clear windshield directly from the can or the following procedure can be used for successful results with LustreKote.

The following procedure allows you to airbrush LustreKote with good results. The recommended procedure requires that the paint be sprayed into a jar or plastic mixing cup.

This is best done by spraying the paint through a small brass tube or straw into the jar. For best results spray no more than ½ oz. of paint into the jar at a time. As the propellant "boils off" it will cause the paint to foam slightly. Leave the paint in the open container, stirring every 15 minutes until no more foam appears on the surface of the paint and the paint has warmed to room temperature. This allows the propellant and some of the thinner to evaporate out of the paint. Depending on the amount of paint in the jar, this process may take about 1 hour.

After allowing the propellant to boil off, use an airbrush to spray paint the windshield. If the paint is too thick to spray properly, it can be thinned with a small amount of lacquer thinner. Do not thin with more than 40% thinner. In general, about 10% thinner will adequately thin the paint for airbrushing. The paint can also be brushed on, but brushing will not produce the high quality finish of spraying.

Allow the paint to dry overnight before gluing it on the plane. We recommend that the windshield be glued on within 48 hours of being painted.

If you have any doubt about the material you are painting, we suggest that you try painting on a small piece of leftover material and watch it for a few days to be sure that you are satisfied with the end results.

We used LustreKote White (TOPR7204) and True Red (TOPQ7227) to paint the cowl, wheel pants and windshield. The inside of the fuselage was brushed with flat black in the cabin area.

FINAL HOOKUPS AND CHECKS

Install the Hinges

❏ 1. Cut the covering from the hinge slots in the elevator and stab. Also cut the covering from the groove for the elevator joiner wire and the tailgear wire.

❏ 2. Clean the elevator joiner wire with alcohol and a paper towel to remove any oil residue.

❏ 3. Reinstall the CA hinges in the elevator without glue.
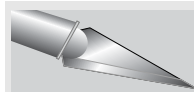
EXPERT TIP

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" into the hinge slots. The following technique has been developed to help ensure thorough and secure gluing.

TEMPORARY PIN TO KEEP HINGE CENTERED
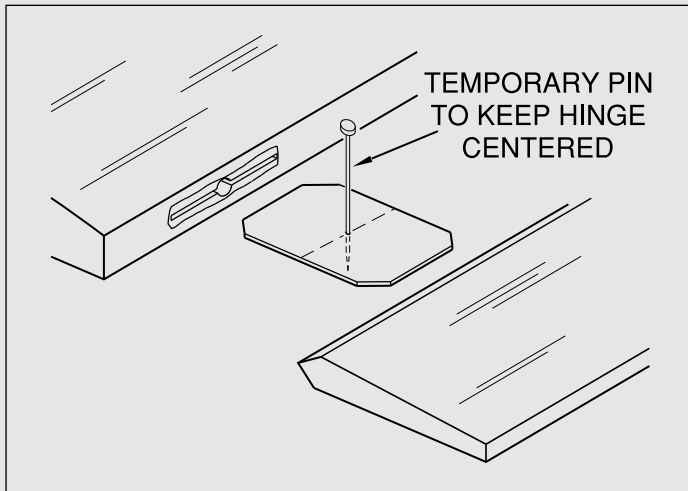
It is best to leave a very slight hinge gap, rather than closing it up tight, to help prevent the CA from wicking along the hinge line. Make sure the control surfaces will deflect to the recommended throws without binding. If you have cut your hinge slots too deep, the hinges may slide in too far, leaving only a small portion of the hinge in the control surface. To avoid this, you may 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.

ASSEMBLE, THEN APPLY 6 DROPS OF THIN CA TO CENTER OF HINGE, ON BOTH SIDES
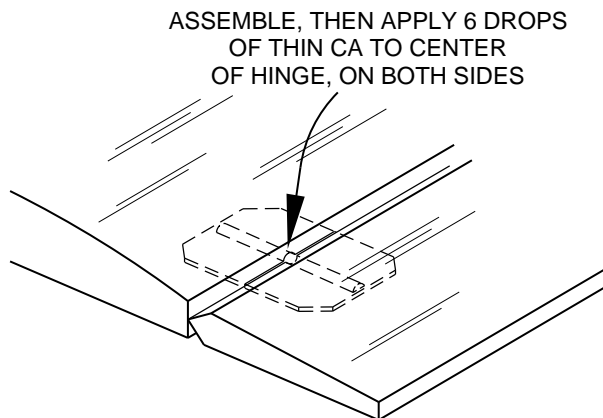
❏ 4. Insert the joiner wire through the fuse TE. Glue the joiner wire in the elevator halves with 6-minute epoxy. Before the epoxy cures, apply 6 drops of thin CA adhesive to both sides of each hinge. Allow a few seconds between drops for the CA to wick into the slot. Use a paper towel to wipe off any excess CA that may have gotten onto the covering.

❏ 5. Install the ailerons with their hinges, repeating the gluing technique described previously.

❏ 6. Wipe off the nylon tailwheel bearing with a paper towel dampened with rubbing alcohol. Use 6-minute epoxy to glue the tailwheel bearing in the aft end of the fuse. After the

epoxy has cured, pack the tailwheel wire hole in the rudder with 6-minute epoxy. Install the rudder with its hinges. Repeat the gluing technique described previously and allow the epoxy to cure.

Hint: Apply a little petroleum jelly to the tail gear wire where it passes through the nylon bearing. This will prevent the wire from being glued to the bearing.

Install the Wheels

❏ 1. Install a 3/32" wheel collar (not included), a 1" tail wheel (not included) and a second 3/32" wheel collar on the tailwheel wire. Secure the wheel collars to the tailwheel wire with 4-40 set screws (not included). Use thread locking compound on the set screws to prevent them from loosening.

❏ 2. Reinstall the landing gear on the fuse and the wheel and wheel pants on the landing gear.

Finish the Model
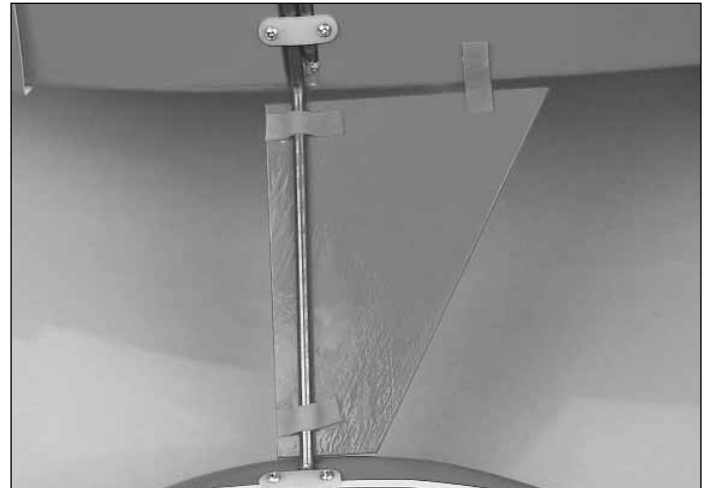
❏ 1. Cut one of the #64 rubber bands into six 3/4" long pieces. Hold the landing gear fairing to the landing gear, pull the rubber band "straps" around the landing gear and glue them to the covering on the bottom with thin CA. The top forward rubber band strap goes over the landing gear and the aft strap attaches to the fuse.

❏ 2. Reinstall the engine and cowl.

❏ 3. Assemble the fuel tank per the manufacturer's instructions. Connect approximately 1' of fuel tubing to the fuel pick-up fitting on the fuel tank and 1' of fuel tubing to the pressure fitting on the tank. Wrap the fuel tank in 1/4" foam rubber. If you are installing the fuel tank so it can be

removed, use a vinyl tape to attach the fuel tank to the fuel tank tray. As you insert the fuel tank into the fuel tank compartment, route the fuel tubing out of the firewall. If the tank is to be removable, attach the fuel tank tray to former F-2 with two #2 x 3/8" screws. Attach the proper fuel tubes to the engine and muffler.

❏ 4. Lightly sand a strip approximately 1/8" wide along the inside of the windshield (around the perimeter). **Note:** To avoid sanding more than you want, it is helpful to first apply strips of masking tape on the inside of the windshield, 1/8" in from the edge.

❏ 5. Hold the windshield in place on the fuselage. Use a fine tip marker to trace the outline of the windshield onto the covering. Remove the windshield and use a sharp #11 blade to cut a 1/8" strip from the covering just inside the line you drew. A sharp blade is important so you do not have to use much pressure. It will allow you to cut only the covering and not the underlying wood.

❏ 6. Carefully glue the windshield in place with a "canopy glue," such as Pacer Formula 560 Canopy Glue. We do not recommend CA, as it may fog the plastic. Use masking tape to hold it in place while the glue dries.

❏ 7. The side windows are cut from the 4" x 4" butyrate sheet. Trim the windows to fit along the inside of the cabin side. After the windows have been trimmed to fit, glue them in place with a glue compatible with butyrate.

❏ 8. The T-Craft kit contains a decal sheet including the small emblems and the checkerboard on the tail which would be difficult to reproduce otherwise. These decals are the "peel-and-stick" type. Cut around the individual decal emblems, peel off the protective backing, and apply them to your airplane.

Reinstall the Radio System

❏ 1. Reinstall the rudder and elevator control horns, pushrods, receiver, receiver battery, servos and receiver switch. **Important:** Slide the silicone clevis retainers over all the clevises before connecting the clevises to the control horns.

❏ 2. Make a strain relief from a cut-off servo arm and place it on the antenna where the antenna exits the fuse. Route the receiver antenna out of the fuse. Anchor the antenna to the top of the fin with a rubber band and T-pin.

Note: Do not shorten the antenna! Leave any excess trailing behind the model.

BALANCE YOUR MODEL

Note: This section is VERY important and must NOT be omitted! A model that is not properly balanced will be unstable and possibly unflyable.
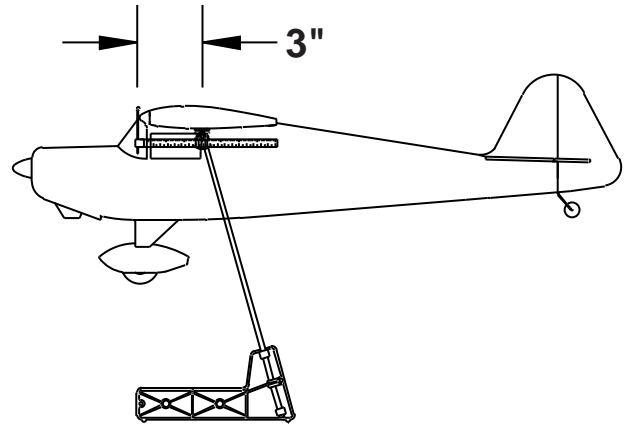
❏ 1. Accurately mark the balance point on the bottom of the wing on both sides of the fuselage. The Great Planes **C.G. Machine**™ Airplane Balancer makes balancing your plane easy and exact. The **balance point (C.G.)** is shown on the fuse plan, and is located **3" back from the leading edge of the wing**. This is the balance point at which your model should balance for your first flights. After initial trim flights and when you become more acquainted with your T-Craft, you may wish to experiment by shifting the balance up to **1/4" forward** or **backward** to change its flying characteristics. Moving the balance **forward** may improve the smoothness and stability, but the model may then require more speed for takeoff and may become more difficult to slow down for landing. Moving the balance **aft** makes the model more agile with a lighter, snappier "feel." In any case, **please start at the location we recommend. Do not at any time balance your model outside the recommended range.**

❏ 2. With all parts of the model installed (ready to fly) and the fuel tank empty, lift the model at the balance point. If the tail drops, the model is "tail heavy" and you may want to move the receiver battery forward to balance the model. If the nose drops, it is "nose heavy" and you may want to move the receiver battery toward the tail to balance the model. It is best to try balancing the plane by moving the receiver and receiver battery.

* If you are unable to obtain good balance by moving the receiver and receiver battery, then it will be necessary to add weight to the nose or tail to achieve the proper balance point.

SET THE CONTROL THROWS

4-CHANNEL RADIO SETUP
(STANDARD MODE 2)
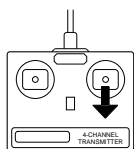
ELEVATOR MOVES UP
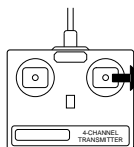
RIGHT AILERON MOVES UP

LEFT AILERON MOVES DOWN
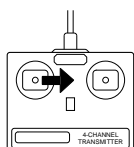
RUDDER MOVES RIGHT
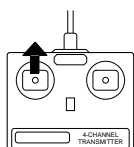
CARBURETOR WIDE OPEN

The throws are measured at the widest part of the elevators, rudder and ailerons. Adjust the position of the pushrods at the servo horns and the nylon control horns to change the amount of throw. You may also use the ATV's if your transmitter has them.

We recommend the following control surface throws:

	High rate	Low rate
Elevator:	1/2" up	5/16" up
	1/2" down	5/16" down
Rudder:	1" right	1/2" right
	1" left	1/2" left
Ailerons:	5/8" up	7/16" up
	5/8" down	7/16" down

Note: If your radio does not have dual rates, we recommend setting the throws between the low and high rate amount.

Note: The balance and control throws for the T-Craft have been extensively tested. This chart indicates the settings at which the T-Craft flies best. Please set up your model to the specifications listed above. If, after you become comfortable with your T-Craft, you would like to adjust the throws to suit your tastes, that's fine. Too much throw can make the plane harder to handle or force it into a stall or snap roll, so remember, "more is not always better."

PREFLIGHT

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

Charge the Radio Batteries

Follow the battery charging procedures in your radio instruction manual. You should always charge your transmitter and receiver batteries the night before you go flying and at other times as recommended by the radio manufacturer.

Balance the Propeller

Carefully balance your propellers before flying. An unbalanced prop is the single most significant cause of vibration. Not only may the engine mounting screws vibrate loose, possibly with disastrous effect, but vibration may also damage your radio receiver and battery. Vibration may cause your fuel to foam, which will, in turn, cause your engine to run lean or quit.
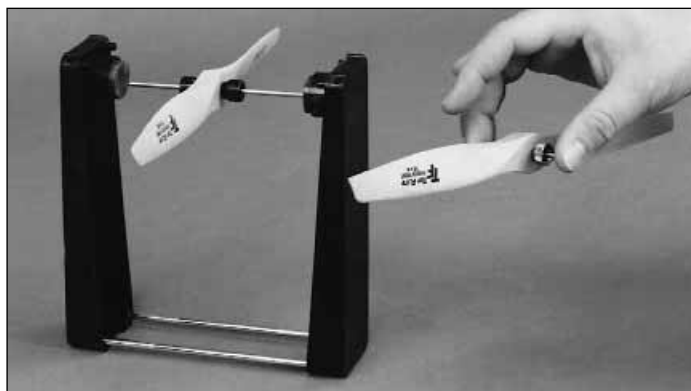
We use a Top Flite **Precision Magnetic Prop Balancer**™ (TOPQ5700) in the workshop and keep a Great Planes **Fingertip Balancer** (GPMQ5000) in our flight box.

Find a Safe Place to Fly

The best place to fly your T-Craft is at an AMA chartered club field. Ask the AMA or your local hobby shop dealer if there is a club in your area and join. Club fields are set up for R/C flying and that makes your outing safer and more enjoyable. The AMA also can tell you the name of a club in your area. We recommend that you join AMA and a local club so you can have a save place to fly and have insurance to cover you in case of a flying accident. The AMA address and telephone number are in the front of this manual.

If a club and flying site are not available, find a large, grassy area at least 6 miles away from houses, buildings and streets and any other R/C radio operation like R/C boats and R/C cars. A schoolyard may look inviting but is too close to people, power lines and possible radio interference.

Ground Check the Model

Inspect your radio installation and confirm that all the control surfaces respond correctly to the transmitter inputs. The engine operation must also be checked by confirming that the engine idles reliably and transitions smoothly and rapidly to full power and maintains full power indefinitely. The engine must be "broken-in" on the ground by running it for at least two tanks of fuel following the engine manufacturer's recommendations for break-in. Make sure all screws remain tight, that the hinges are secure and that the prop is on tight.

Range Check Your Radio

Whenever you go to the flying field, check the operational range of the radio before the first flight of the day. First, make sure no one else is on your frequency (channel). With your transmitter on and the transmitter antenna collapsed, you should be able to walk at least 100 feet away from the model and still have control. While you work the controls, have a helper stand by your model and tell you what the control surfaces are doing. Repeat this test with the engine running at various speeds with a helper holding the model. If the control surfaces are not always responding correctly, do not fly! Find and correct the problem first. Look for loose servo connections or corrosion, loose bolts that may cause vibration, a defective on/off switch, low battery voltage or a defective receiver battery, a damaged receiver antenna, or a receiver crystal that may have been damaged from a previous crash. If the radio appears to only be affected when the engine is running, try moving your receiver and receiver antenna farther away from the engine.

Engine Safety Precautions

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

Keep all engine fuel in a safe place, away from high heat, sparks or flames, as fuel is very flammable. Do not smoke near the engine or fuel; and remember that the engine exhaust gives off a great deal of deadly carbon monoxide. 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 items such as these away from the prop: loose clothing, shirt sleeves, ties, scarfs, long hair or loose objects (pencils, screw drivers) that may fall out of shirt or jacket pockets into the prop.

Use a "chicken stick" device or electric starter; follow instructions supplied with the starter or stick. Make certain the glow plug clip or connector is secure so that it will not pop off or otherwise get into the running propeller.

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

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

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

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 safely rules for the flying site I use and I will not willfully and deliberately fly my models in a careless, reckless and/or dangerous manner.

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

9. I will not operate models with pyrotechnics (any device that explodes, burns, or propels a projectile or any kind).

Radio Control

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

2. I will not fly my model aircraft in the presence of spectators until I become a qualified flier, unless assisted by an experienced helper.

3. I will perform my initial turn after takeoff away from the pit or spectator areas and I will not thereafter fly over pit or spectator areas, unless beyond my control.

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

FLYING

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

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

Takeoff

Takeoff on "high" rates if you have dual rates on your transmitter - especially if you are taking off into a crosswind. For all models it is good practice to gain as much speed as the length of the runway will permit before lifting off. This will give you a safety margin in case the engine quits. As the plane accelerates the tail will begin to lift and the plane will turn left (a characteristic of all taildraggers). Be ready for this, and correct by applying sufficient right rudder to hold the plane straight down the runway. The left-turning tendency will go away as soon as the tail is up and the plane's speed increases. Be sure to allow the tail to come up. Do not hold the tail on the ground with up elevator, as the T-Craft will become airborne prematurely and possibly stall. For all models it is good practice to gain as much speed as the length of the runway will permit before lifting off. When the plane has gained enough flying speed to safely lift off, gradually and smoothly apply up elevator and allow the model to climb at a shallow angle (do not yank the model off the ground into a steep climb!)

Flight

We recommend that you take it easy with your T-Craft for the first several flights, gradually "getting acquainted" with this great model. Add and practice one maneuver at a time, learning how the T-Craft behaves in each. Try to stay within a sensible and realistic scale-like flight envelope. If you feel as though you have your hands full, keep this in mind: **pull back on the throttle stick to slow the model down**. This will make everything happen a little slower and allow yourself time to think and react.

Sometime well before it's time to land, you should climb your T-Craft to a safe altitude, reduce the throttle and check out the model's low speed characteristics. Do this a few times so you know what to expect upon landing and how the T-Craft handles stalls.

Landing

When it is time to land, fly a normal landing pattern and approach. Keep a few clicks of power on until you are over the runway threshold. Then, reduce power and the T-Craft will naturally bleed off speed. Keep the nose down slightly, then level off just before touchdown. For your first few landings, plan to land slightly faster than stall speed and on the main wheels.

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

2-View

Use the 2-view or photocopy it and use the copy to design your trim scheme.

FUSELAGE TOP VIEW

SCREW-LOCK PUSHROD CONNECTOR
.074" X 6" WIRE PUSHROD
DIE-CUT 1/8" PLY FRONT DECK
DIE-CUT 1/8" PLY FUSE STRUT MOUNTING PLATE
OUTER PUSHROD TUBE
NYLON INNER PUSHROD TUBE
.074" X 1" THREADED ROD
NYLON CLEVIS
.074" X 36" WIRE PUSHROD
1/8" DOWEL STRINGERS
DIE-CUT 1/8" PLYWOOD AFT DECK BASE

F-1 F-2A F-3 F-4 F-5 F-6

DIE-CUT 1/8" PLY FUEL TANK TRAY
THROTTLE SERVO LOCATION
ELEVATOR SERVO
2-STROKE THROTTLE SERVO LOCATION
RUDDER SERVO
#2 X 3/8" SHEET METAL SCREW
#2 WASHER
#2 X 3/8" SHEET METAL SCREW
1/8" X 1/4" BALSA TOP STRINGER & WINDOW FRAME
1/4" X 1/4" BASSWOOD SERVO RAILS
NYLON FASLINK
OUTER PUSHROD TUBE
3/8" X 3/4" X 1-3/8" WING BOLT BLOCK
1/8" DOWEL STRINGERS
COVERING FILM
1/8" DOWEL STRINGERS

DIE-CUT 3/32" BALSA AFT FUSELAGE DOUBLER
1/8" X 3/8" BALSA LONGERONS
1/16" X 3" BALSA BOTTOM SHEETING
1/8" X 3/8" BALSA BOTTOM SHEETING SUPPORT AND LONGERONS

Cross sections

1/8" X 1/4" BALSA TOP STRINGER
1/8" X 1/4" BALSA TOP STRINGER & WINDOW FRAME
1/16" X 3" BALSA TOP DECK SHEET
THROTTLE PUSHROD EXIT LOCATION FOR A 4-STROKE ENGINE
DIE-CUT 1/8" BALSA FORWARD CENTER FUSE (FCF)
FUEL AND PRESSURE TUBING EXIT
6-32 X 1" MACHINE SCREW
#6 WASHER
THROTTLE PUSHROD EXIT LOCATION FOR A 2-STROKE ENGINE
#2 X 3/8" SHEET METAL SCREW
DIE-CUT 1/8" BALSA FORWARD LOWER FUSE (FLF)
DIE-CUT 3/32" BALSA LOWER FUSELAGE DOUBLER
1/16" X 3" BALSA BOTTOM SHEETING

F-1   1A   2A
F-2A
DIE-CUT 3/32" BALSA UPPER FUSELAGE DOUBLER
DIE-CUT 1/8" BALSA FORWARD TOP FUSE (FTF)
DIE-CUT 1/8" BALSA FORWARD CENTER FUSE (FCF)
DIE-CUT 3/32" BALSA LOWER FUSELAGE DOUBLER
1/16" X 3" BALSA BOTTOM SHEETING
DIE-CUT 1/8" BALSA FORWARD LOWER FUSE (FLF)

F-3   3
DIE-CUT 3/32" BALSA UPPER FUSELAGE DOUBLER
DIE-CUT 3/32" BALSA LOWER FUSELAGE DOUBLER
1/8" X 3/8" BALSA LONGERON
1/16" X 3" BALSA BOTTOM SHEETING

F-4   4
DIE-CUT 1/8" PLYWOOD AFT DECK BASE
DIE-CUT 3/32" BALSA UPPER FUSELAGE DOUBLER
DIE-CUT 1/8" BALSA FORWARD TOP FUSE (FTF)
DIE-CUT 3/32" BALSA LOWER FUSELAGE DOUBLER
DIE-CUT 1/8" BALSA FORWARD CENTER FUSE (FOF)
DIE-CUT 1/8" BALSA FORWARD LOWER FUSE (FLF)
1/8" X 3/8" BALSA BOTTOM SHEETING SUPPORT

F-5   5A   5
DIE-CUT 3/16" BALSA FIN FRAME
1/16" X 3" BALSA BOTTOM SHEETING

F-6
DIE-CUT 1/8" BALSA AFT FUSE SIDE (AFS)
1/8" X 3/8" BALSA LONGERONS
1/16" X 3" BALSA BOTTOM SHEETING

ALL CROSS-SECTIONS ARE VIEWED FROM THE FRONT

FUSELAGE LEFT SIDE VIEW
SHOWN WITH THE FUSELAGE LEFT SIDE REMOVED FOR CLARITY

WINDSHIELD
6-32 X 1" MACHINE SCREW
#6 WASHER
1/8" X 1/4" BALSA TOP STRINGER & WINDOW FRAME
COWL TOP
.20 - .48 ADJUSTABLE ENGINE MOUNT
ALUMINUM SPINNER NUT
+2° THRUST
COWL FRONT
COWL BOTTOM
DIE-CUT 1/8" PLY EXHAUST EXIT SIDE (EES)
DIE-CUT 1/8" PLY LANDING GEAR RAIL SUPPORT
1/2" X 3/4" X 5/8" BASSWOOD LANDING GEAR TORQUE BLOCK
1/2" X 3/4" X 4-13/16" BASSWOOD LANDING GEAR RAIL
5/32" MAIN LANDING GEAR
#2 X 3/8" SHEET METAL SCREW
2-1/2" WHEEL

F-2A/B
F-1A/B/C
GP 8oz. (240cc)
DIE-CUT 1/8" BALSA FORWARD CENTER FUSE (FCF)
NYLON FASLINK
.074" X 36" WIRE PUSHROD
F-3
F-4
F-5
F-5A
F-6
BALANCE RANGE
DIE-CUT 1/8" BALSA FORWARD TOP FUSE (FTF)
+2° WING INCIDENCE
NYLON 1/4-20 X 2" WING BOLT
DIE-CUT 3/32" BALSA UPPER FUSELAGE DOUBLER
3/8" X 3/4" X 1-3/8" WING BOLT BLOCK
DIE-CUT 1/8" PLYWOOD AFT DECK BASE
1/8" DOWEL STRINGERS
1/8" X 3/8" BALSA LONGERON
OUTER PUSHROD TUBE

DIE-CUT 1/8" PLY FUSE STRUT MOUNTING PLATE
NYLON LANDING GEAR STRAP
1/4" X 1/4" BASSWOOD SERVO RAILS
DIE-CUT 3/32" BALSA LOWER FUSELAGE DOUBLER
DIE-CUT 1/8" BALSA FORWARD LOWER FUSE (FLF)
DIE-CUT 1/8" BALSA LANDING GEAR COVER
ABS WHEEL PANT

V-1   R-1
FIN   RUDDER
DIE-CUT 3/16" BALSA RUDDER FRAME
1/8" X 3/16" BALSA CROSS BRACES (CUT FROM 1/8" X 3/16" X 30" BALSA STICK)
1/8" X 3/16" BALSA CROSS BRACES (CUT FROM 1/8" X 3/16" X 30" BALSA STICK)
3/16" X 3/8" BALSA FIN FRAME (CUT FROM 3/16" X 3/8" X 30" BALSA STICK)
3/16" X 3/8" BALSA RUDDER FRAME (CUT FROM 3/16" X 3/8" X 30" BALSA STICK)
DIE-CUT 1/8" BALSA STABILIZER SADDLE
DIE-CUT 3/16" BALSA RUDDER FRAME
R-2
NYLON CLEVIS
CLEVIS RETAINER
LARGE NYLON CONTROL HORN
2-56 X 1/2" MACHINE SCREW
TAILGEAR WIRE
3/32" WHEEL COLLAR (NOT INCLUDED)
1" TAILWHEEL
DIE-CUT 3/32" BALSA STABILIZER SADDLE DOUBLER
1/16" X 3" BALSA BOTTOM SHEETING

WHEEL PANT CROSS SECTION

5/32" MAIN LANDING GEAR
#2 X 3/8" SHEET METAL SCREW
NYLON LANDING GEAR STRAP
DIE-CUT 1/8" PLY WHEEL PANT MOUNT
DIE-CUT 1/8" PLY WHEEL PANT RETAINER
5/32" WHEEL COLLAR
2-1/2" WHEEL
2-1/2" WHEEL
NYLON LANDING GEAR STRAP

STABILIZER

S1   S2
DIE-CUT 3/16" BALSA STABILIZER CENTER
1/8" X 3/16" BALSA CROSS BRACES
3/16" X 3/8" BALSA STABILIZER FRAME
ELEVATOR   ELEVATOR
1/8" X 3/16" BALSA CROSS BRACES
DIE-CUT 3/16" BALSA ELEVATOR COUNTERBALANCE
LARGE NYLON CONTROL HORN
ELEVATOR JOINER WIRE
CA HINGE
3/16" X 3/8" BALSA ELEVATOR FRAME
DIE-CUT 3/16" BALSA LEADING EDGE DOUBLER

3/4"
BEVEL THE CORNERS FOR EASIER INSTALLATION
CUT THE CA HINGE STRIP INTO 3/4" X 1" PIECES

FUSE PLAN
PLAN NO: TYL2P02

T-Craft

DESIGNED, DRAWN AND INSTRUCTIONS BY: MARK HAMPE

B   C

LEFT WING PANEL
TOP VIEW
LEADING EDGE AND CENTER SHEETING
ARE REMOVED FOR CLARITY

AILERON

RIGHT WING PANEL
TOP VIEW
LEADING EDGE AND CENTER SHEETING
ARE REMOVED FOR CLARITY

AILERON

WING SPAR DOUBLER

CROSS SECTION AT W-5

VIEW OF STRUT MOUNTING

DIE-CUT 1/16" PLY WING BOLT PLATE
WING BOLT PLATE
SHAPED 1/8" TO 11/32" X 3/4" X 18" BALSA
WING TRAILING EDGE
DIE-CUT 1/8" PLY AILERON BASE
AILERON BASE
DIE-CUT 1/8" PLY AILERON HORN BASE
AILERON HORN BASE
3/32" X 3/8" BALSA AILERON RIB
AILERON RIB
3/8" X 1" X 24" BALSA AILERON LEADING EDGE
AILERON LEADING EDGE
3/8" X 3/8" BALSA WING TIP FILLER BLOCK
WING TIP FILLER BLOCK
1/16" X 1/2" X 24" BALSA WING TE SHEETING
DIE-CUT 1/8" BALSA WING TIP PIECES
WING TIP PIECES
3/8" X 3/8" BALSA WING TIP FILLER BLOCK

DIE-CUT 1/16" PLY SPAR SPACER
SPAR SPACER
1/8" X 1/4" X 30" BASSWOOD WING SPAR
WING SPAR
1/8" BALSA SHEAR WEB
SHEAR WEB
DIE-CUT 1/8" BALSA WING GUSSET
WING GUSSET
DIE-CUT 1/8" PLY STRUT PLATE
STRUT PLATE
DIE-CUT 1/8" PLY AILERON TRAY
AILERON TRAY

1/4" X 2-1/4" HARDWOOD WING DOWEL
WING DOWEL
3/16" X 3/16" BASSWOOD FORWARD WING SPAR
FORWARD WING SPAR
1/16" X 3" X 30" BALSA SUB LEADING EDGE
SUB LEADING EDGE
1/4" X 3/4" X 30" BALSA WING LEADING EDGE
3/32" X 5/8" X 30" BALSA
1/16" X 1/16" X 30" BASSWOOD LEADING EDGE SHEETING
LEADING EDGE SHEETING
WING TIP FILLER BLOCK

1/8" X 1/4" X 15" BASSWOOD WING SPAR DOUBLER
1/8" X 1/4" X 30" BASSWOOD WING SPAR

1/4" X 2-1/4" HARDWOOD WING DOWEL
3/16" X 3/16" BASSWOOD FORWARD WING SPAR
DIE-CUT 1/8" PLY CENTER WING JOINER
3/16" X 3/16" BASSWOOD FORWARD WING SPAR
DIE-CUT 1/8" PLY FORWARD WING JOINER
DIE-CUT 1/16" PLY CENTER WING JOINER
3/32" X 5/8" X 30" BALSA SUB LEADING EDGE
1/4" X 3/4" X 30" BALSA WING LEADING EDGE
1/16" X 3" X 30" BALSA LEADING EDGE SHEETING
3/8" X 3/8" BALSA WING TIP FILLER BLOCK
DIE-CUT 1/8" BALSA WING TIP PIECES

NYLON FASLINK
.074" X 12" WIRE PUSHROD
NYLON CLEVIS
SILICONE CLEVIS RETAINER
SMALL NYLON CONTROL HORN
#2 X 3/8" SHEET METAL SCREW

W-1A
W-1B
W-2
W-3
W-3
W-3
W-3 W-4
W-4
W-5
W-4 W-4
W-6

1/16" X 3" X 30" BALSA CENTER SHEETING
DIE-CUT 1/16" PLY CENTER WING JOINER
1/8" X 1/4" X 30" BASSWOOD WING SPAR
DIE-CUT 1/16" PLY SPAR SPACER
1/16" BALSA SHEAR WEB
DIE-CUT 1/8" PLY STRUT PLATE
DIE-CUT 1/8" PLY AILERON TRAY
DIE-CUT 1/8" BALSA WING GUSSET
DIE-CUT 1/8" BALSA WING TIP FILLER BLOCK
3/8" X 3/8" BALSA WING TIP FILLER BLOCK
3/8" X 1" X 24" BALSA AILERON LEADING EDGE
3/32" X 3/8" BALSA AILERON RIB
DIE-CUT 1/8" PLY AILERON HORN BASE

SHAPED 1/8" TO 11/32" X 3/4" X 18" BALSA WING TRAILING EDGE
DIE-CUT 1/8" BALSA AILERON BASE

ROUND CORNERS
TYPICAL WING STRUT CROSS SECTION
DIE-CUT 3/32" BALSA RIB W-4
TYL2604
SHAPED BALSA WING STRUT
TYL2607
DIE-CUT 1/8" PLY FUSELAGE STRUT MOUNTING PLATE
TYL2605
FUSELAGE
CA HINGE MATERIAL CUT FROM TYL2607
WING
DIE-CUT 1/8" PLYWOOD AFT STRUT MOUNTING PLATE
TYL2601
#2 X 3/8" SHEET METAL SCREW
SOM634
#2 X 3/8" SHEET METAL SCREW
SOM634

CA HINGE
3/16" X 1/2" BALSA WING STRUTS
CA HINGE

WING PLAN
PLAN NO: TYL2P01

T-Craft
DESIGNED, DRAWN AND INSTRUCTIONS BY: MARK HAMPE

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