

SUPER SKYBOLT

AEROBATIC SPORT-SCALE BIPLANE



WARRANTY

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

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

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

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



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Metric Conversion Chart

Inches x 25.4 = mm (conversion factor)

1/64"	=	.4mm
1/32"	=	.8mm
1/16"	=	1.6mm
3/32"	=	2.4mm
1/8"	=	3.2 mm
5/32"	=	4 mm
3/16"	=	4.8mm
1/4"	=	6.4 mm
3/8"	=	9.5 mm
1/2"	=	12.7mm
5/8"	=	15.9mm
3/4"	=	19mm
1"	=	25.4mm
2"	=	50.8 mm
3"	=	76.2 mm
6"	=	152.4mm
12"	=	304.8mm
15"	=	381 mm
18"	=	457.2mm
21"	=	533.4mm
24"	=	609.6 mm
30"	=	762 mm
36"	=	914.4mm

WARNING! THIS IS NOT A TOY! **THIS IS NOT A BEGINNER'S AIRPLANE!**

This R/C kit and the model you will build is not a toy! It is capable of serious bodily harm and property damage **IT IS YOUR RESPONSIBILITY AND YOURS ALONE** — to build this kit correctly, to properly install all R/C components and flying gear (engine, tank, pushrods, etc) and to test the model and fly it only with experienced, competent help, using common sense and in accordance with all safety standards as set down in the Academy of Model Aeronautics Safety Code. It is suggested that you join the AMA and become properly insured before you attempt to fly this model. **IF YOU ARE JUST STARTING R/C MODELING, CONSULT YOUR LOCAL HOBBY SHOP OR WRITE TO THE ACADEMY OF MODEL AERONAUTICS TO FIND AN EXPERIENCED INSTRUCTOR IN YOUR AREA.**

**Academy of Model Aeronautics
1810 Samuel Morse Dr.
Reston, VA 22090 (703)435-0750**

INTRODUCTION

Congratulations and thank you for purchasing the Great Planes **SUPER SKYBOLT**! The skybolt incorporates several new design features never before found in a biplane kit. The revolutionary wing attachment system makes it incredibly easy to assemble and disassemble at the field using only a screwdriver. It also features several new construction techniques that make it the easiest and straightest building biplane ever!

The Great Planes Super Skybolt is a high performance biplane that is modeled after the full size Skybolt. It not only looks beautiful, but it is also the smoothest and most predictable flying biplane we have ever flown. However, **this is not a beginner's airplane!** While the Super Skybolt is not difficult to build and flies great, we must discourage you from selecting this kit as your **first** R/C airplane. It is highly maneuverable, and lacks the self-recovery characteristics of a good **basic trainer** such as the Great Planes **PT Series** airplanes. On the other hand, if you are confident with your flying skill and can safely handle aileron airplanes such as the Great Planes **Ultra-Sport Series** or **Big Stick Series**, the Super Skybolt is an excellent choice. If you currently fly an aileron airplane, but you are unsure about your ability to handle the Super Skybolt, we recommend that you build and fly a low-wing sport plane first.

Please inspect all parts carefully before starting to build! If any parts are missing, broken or defective, or if you have any questions about building or flying this airplane, please call us at (217) 367-2069 and we'll be glad to help. If you are calling for replacement parts, please look up the part numbers and the kit identification number (stamped on the end of the carton) and have them ready when calling.

PRECAUTIONS

1 You must 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 plans and instructions may differ slightly from the photos. In those instances you should assume the plans and written instructions are correct. Also, you may notice a slight difference in length between longer parts and the plans. This is normal and is caused by the plans expanding and shrinking with the changing moisture content in the air. Do not modify the parts to fit the plan.

2 You must take time to **build** straight, true and strong **IMPORTANT** - Glue should never be substituted for a good-fitting joint. Take a little extra time to get a good fitting joint and glue it properly. It will be stronger, neater, and much lighter than a bad joint held together with a glob of glue!

3 You must use a proper R/C **radio** that is in first class condition and meets the current AMA and FCC requirements and the requirements of your local flying club, the correct sized **engine** and correct **components** (fuel tank, wheels, etc.).

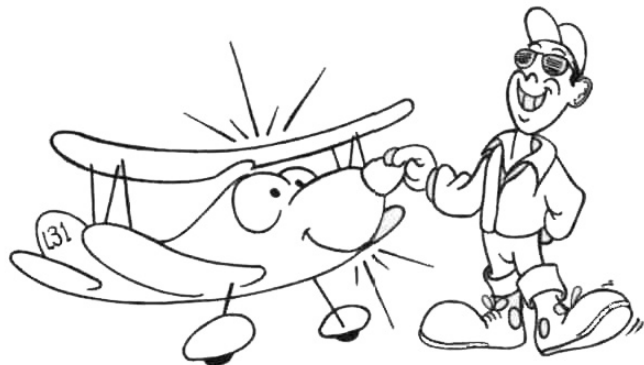
4 You must properly **install** all R/C and other components so that the model operates properly on the ground and in the air.

5. You must **test** the operation of the model before the first and each successive flight to insure that all equipment is operating, and you must make certain that the model has remained structurally sound.

6 You must **fly** the model **only with the competent help** of a well experienced R/C pilot if you are not already an experienced and knowledgeable R/C pilot at this time.

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.



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

OTHER ITEMS REQUIRED

- D Four-channel radio with 4 or 5 servos
- D Propellers (Top Flite® Power Point™ recommended - see engine instructions for recommended sizes)
- D 2-1/2" (63.5mm) Spinner
- D 14 oz Fuel Tank
- D Iron-on Covering Material (**Top Flite MonoKote®** recommended)
- D Fuelproof Paint for wheel pants and **cowl**
NOTE Top Flite has paint available that matches Super MonoKote, and is available in convenient spray cans
- D Silicone Fuel Tubing
- D 1/16" (1.5mm) thick Wing Seating Tape
- D Latex Foam Rubber Padding (Hobbico® 1/4" recommended)
- D Plastic Pilot: Williams Bros. #185 Sport 2-1/2" Scale
- D 2-3/4" (70mm) Main Wheels
- D 1-1/4" (32mm) Tail Wheel
- D 22 Hinges*
- D 2 - Servo extensions (each 24" long) req. for ailerons on both wings
- D 3/32" (2.5mm) Wheel Collars - 2 required for tail wheel
- D #64 Rubber Bands

***NOTE: There are many types of good hinges on the market, and everyone has their personal preferences; therefore, hinges have not been included in this kit. The current favorite of many modelers is the laminated hinge that permits hinge slotting with a hobby knife, and gluing with thin CA adhesive.**

SUPPLIES AND TOOLS NEEDED

- D 2 oz Thin CA Adhesive
- D 2 oz Medium or Thick **CA Adhesive**
- D 2.5 oz 15-Minute Epoxy
- D Hand or Electric Drill
- D Drill Bits 1/16, 3/32", 5/32", 3/16", 1/4", & 19/64"
- D Sealing Iron (Hobbico or Top Flite recommended)
- D Heat Gun (Hobbico or Top Flite recommended)
- D Razor Saw
- D Hobby Knife, #11 Blades
- D Pliers
- D Screw Drivers
- D T-Pins
- D Straightedge
- D Masking and/or Strapping Tape (Required for construction)
- D Sandpaper (coarse, medium, fine grit)*
- D T-Bar Sanding Block (or similar)
- D Waxed Paper
- D Lightweight Balsa Filler (**Hobbico HobbyLite™** recommended)
- D Petroleum Jelly (Vaseline)
- D Isopropyl Rubbing Alcohol (70%)
- D Spray Adhesive (optional) (3M "77")
- D Dremel Moto Tool or similar (optional)

***NOTE: On our workbench, we have four 11" T-Bar sanders, equipped with #50, #80, #700 and #150-grit**

We also keep some #320-grit wet-or-dry sandpaper handy for finish sanding before covering.

DECISIONS YOU MUST MAKE NOW

ENGINE AND MOUNT

The recommended engine for the **SUPER SKYBOLT** is a 61* - 90 cubic inch (10 - 15cc) displacement **2-cycle** or a 90 - 120 cubic inch (15-20cc) displacement **4-cycle**. The instructions and plans show an OS Max 61(10cc) SF and an OS Max 120 (20cc) Surpass being installed. If you are using an engine other than one of these, be sure to double check all measurements before gluing or cutting things that have to do with the engine.

***NOTE:** Performance may be marginal if a non-Schnuerle-ported .60 cu.in. 2-Cycle engine is used.

This kit includes a new Great Planes **adjustable .40 - .70 engine mount (EM4070)** that fits most 40 - 61 (2-Cycle) engines and 40 - 70 (4-cycle) engines. If the supplied mount does not fit your engine, it may be necessary to purchase a different mount (check with your hobby dealer).

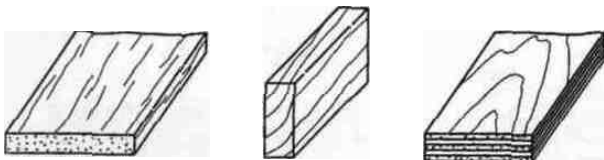
POSSIBLE RADIO INSTALLATIONS

The Super Skybolt can utilize either one or two aileron servos. We recommend that you use two aileron servos and build the top wing with ailerons. This is the most maneuverable configuration and you can always reduce the control throws to achieve the sensitivity you desire. When using two aileron servos, the servos are mounted in the bottom wing, directly in front of the ailerons and control slop is virtually eliminated. If you prefer to use only one aileron servo, we suggest that you do not put ailerons on the top wing due to the inherent top aileron sloppiness. The plans show both methods of construction.

COMMON ABBREVIATIONS USED IN THIS BOOK AND ON THE PLANS:

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

TYPES OF WOOD



BALSA

BASSWOOD

PLYWOOD

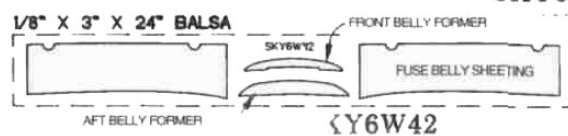
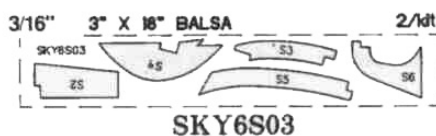
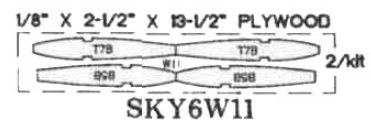
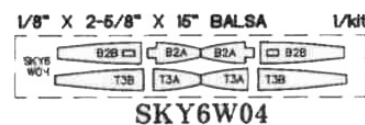
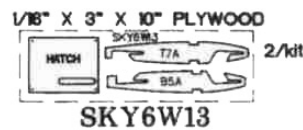
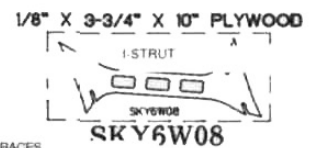
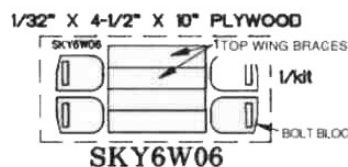
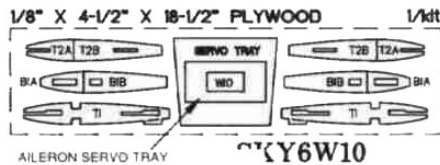
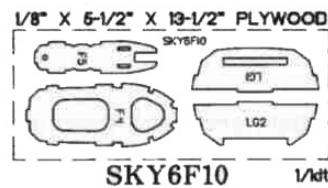
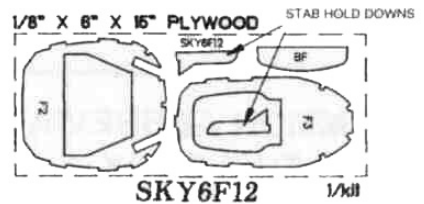
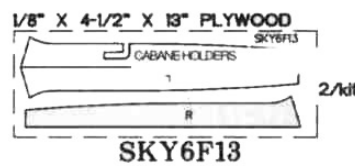
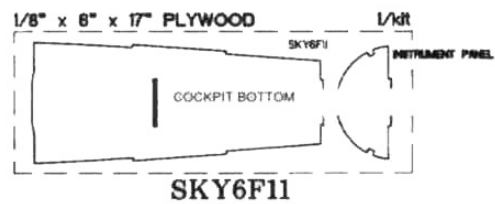
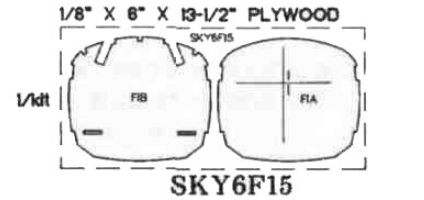
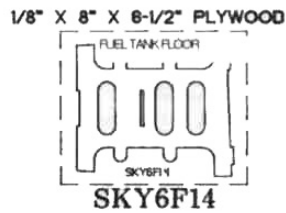
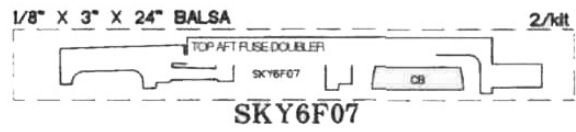
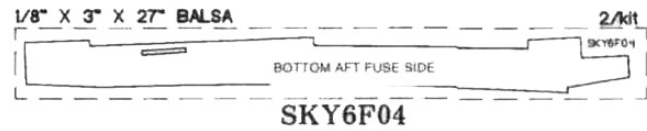
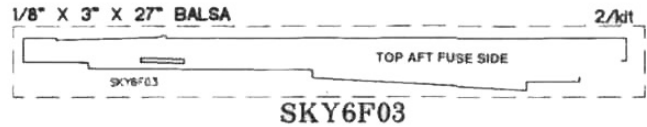
GET READY TO BUILD

D 1 Unroll the plan sheets and reroll them inside out to help them lie flat.

D 2 Remove all parts from the box. As you do, determine the name of each part by comparing it with the plan and the parts list at the back of this book. Using a felt tip pen, write the part **name** or **size** on each piece to avoid confusion later. Use the die-cut part patterns shown on page 6 to identify the die-cut parts and mark them **before** punching out. **Save all leftover pieces.** If any of the die-cut parts are difficult to punch out, do not force them! Instead, first cut around the parts with a hobby knife. After punching out the die-cut parts, use your T-Bar or sanding block to **lightly** sand the edges to remove any die-cutting irregularities.

D 3 As you identify and mark the parts, separate them into groups, such as **fuse** (fuselage), **wing**, **fin** and **stab** (stabilizer), and **hardware**.

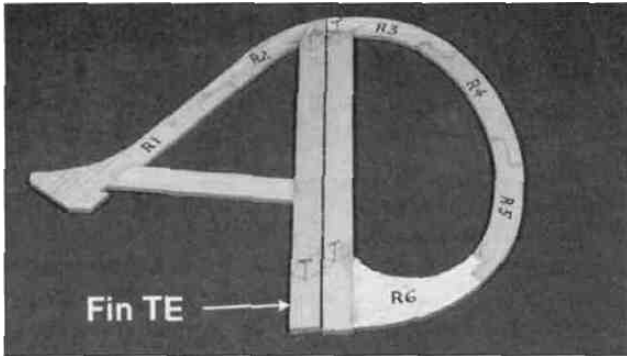
DIE-CUT PATTERNS



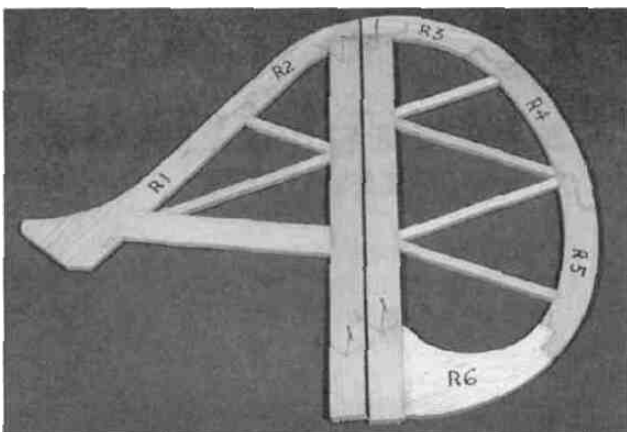
TAIL FEATHERS

BUILD THE FIN AND RUDDER

D 1. Tape the **fuselage side view** portion of the plan down onto your flat work surface. Tape a piece of waxed paper over the fin and rudder portion of the plan.

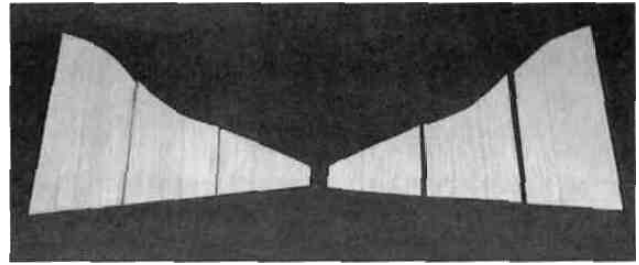


D 2 Working over the plan, cut and assemble the **fin** and **rudder framework** using the die-cut 3/16" balsa **fin and rudder parts** (SKY6S01 and SKY6S02) and the 3/16" x 3/4" x 24" balsa sticks (SKY6S05) as shown in the photo. Sort through the 3/16" x 3/4" x 24" balsa sticks and pick the **hardest two**. Use the hardest one later for the stab trailing edge and use the next hardest one here for the fin trailing edge. Pin the parts in place over the plan as you assemble them, but be careful you don't glue the rudder to the fin.



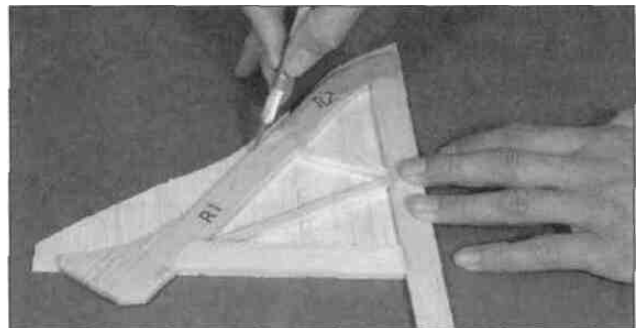
D 3. Cut the fin and rudder "**ribs**" from the 3/16" x 1/4" x 24" balsa sticks (SKY6S04). Glue these in place with CA.

D 4. Sand **both sides** of the fin and rudder smooth with a fine grit sanding block.



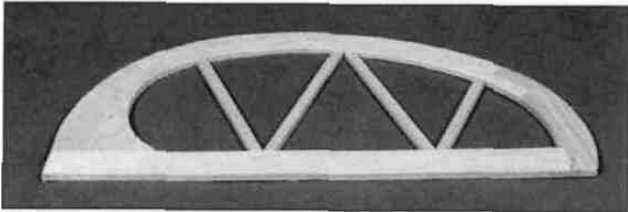
D 5 Using the plan as a guide, cut 3 pieces of 1/16" x 3" balsa from a 1/16" x 3" x 24" balsa sheet (SKY6S06) to form the fin sheeting as shown in the photo. Glue these together and quickly wipe off any excess glue with a paper towel before it cures. Sand both sides smooth and then cut and sand the correct angle into the bottom of the sheeting so you don't have to cut it after it's installed on the fin. Make sheeting for both sides of the fin.

HINT: Use new, sharp sandpaper when sanding wood with glue joints in it. The sharper grit will cut through the glue much easier and produce better results than worn out sandpaper.

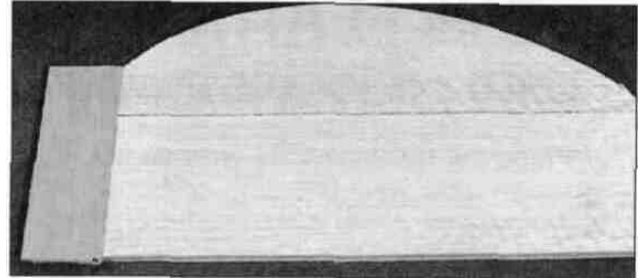


D 6 Glue the sheeting to one side of the fin. **Notice that the grain runs vertical on the fin.** Keep the fin flat while attaching the sheeting. After the side sheeting is installed, trim it flush with the leading and trailing edges of the fin. **NOTE: Do not cut through the sheeting and into the framework.** Always cut into the work surface!

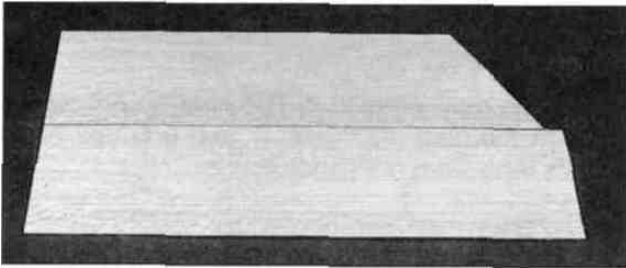
D 7 Glue the other side sheeting in place. Be sure the fin is kept flat until the glue cures. Trim and sand the sheeting flush with the leading and trailing edges of the framework. Carve and sand the leading edge to a nice rounded shape as shown on the plans, **but keep the trailing edge square.**



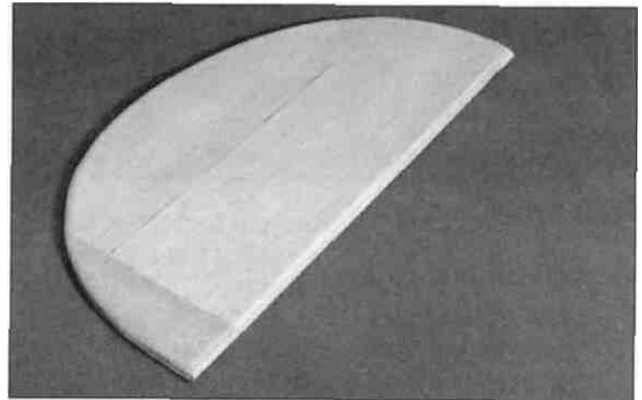
D 8. Draw a centerline all around the edges of the **rudder**. Sand the rudder to a taper as shown on the fuselage top view. The framework should end up approximately $\frac{3}{32}$ " thick at the trailing edge. Refer to the centerline you drew to keep the rudder symmetrical.



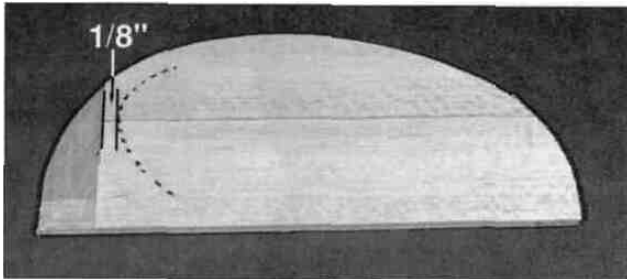
D 12. Cut two 4" long pieces of $\frac{1}{16}$ " x $1\frac{3}{8}$ " hard balsa sheeting from the $\frac{1}{16}$ " x $1\frac{3}{8}$ " x 24" hard balsa sheeting (SKY6S07). Glue these to both sides of the rudder next to the sheeting on R6.



D 9. Using the plan as a guide, cut a $\frac{1}{16}$ " x 3" x 24" balsa sheet (SKY6S06) in half to form the **rudder sheeting** as shown in the photo. Glue these together and sand both sides smooth. Make sheeting for both sides of the rudder. Cut one end of the sheeting perpendicular to a long edge.



D 13. Use a sanding block with medium (150) grit sandpaper to sand both sides of the rudder smooth. Carve and sand the rudder trailing edge to a nice rounded shape and the leading edge to a "V" shape as shown on the plan.

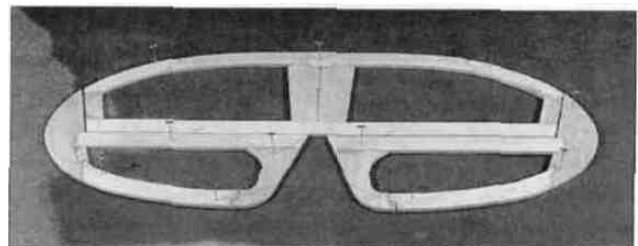


D 10. Glue the sheeting to one side of the rudder so the **perpendicular edge overlaps onto R6 approximately $\frac{1}{8}$ "**. The rest of R6 is not sheeted until later. Keep the rudder flat while attaching the sheeting. After the sheeting is installed, trim it flush with the outside edges of the framework.

D 11. Glue the other side sheeting in place so that it too only overlaps approximately $\frac{1}{8}$ " onto R6. Be sure the rudder is kept flat until the glue cures. Trim and sand the sheeting flush with the leading and trailing edges of the framework.

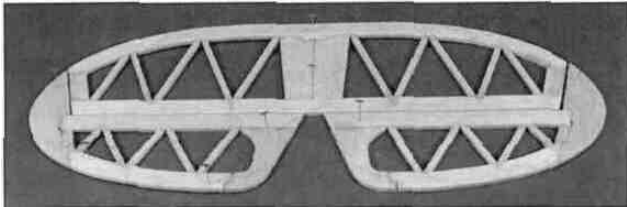
BUILD THE STABILIZER AND ELEVATORS

D 1. Tape the **fuselage top view** portion of the plan down onto your flat work surface, and cover the stabilizer portion of the fuselage top view with wax paper.



D 2. Assemble the stab and elevator framework over the plan, using the die-cut $\frac{3}{16}$ " balsa **stab**

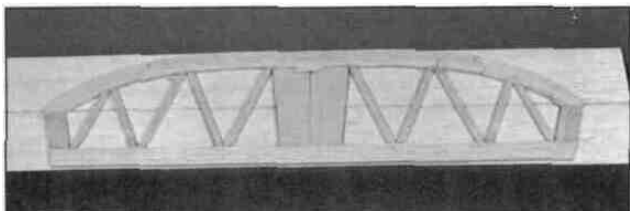
parts (SKY6S02 and SKY6S03) and the $3/16"$ x $3/4"$ x $24"$ balsa sticks (SKY6S05) Use the **hardest** $3/16"$ x $3/4"$ stick for the stab trailing edge Pin the parts in place over the plan as you assemble them but be careful not to glue the elevator to the stab



D 3 Cut the stab and elevator "**ribs**" from the $3/16"$ x $1/4"$ x $24"$ balsa sticks (SKY6S04) Glue these in place with CA.

D 4 Use a sanding block with medium (150) grit sandpaper to sand the **edges** and **both sides** of the stab and elevator smooth Carefully draw a **centerline** all around the edges of the stab and elevator This will make it easier to maintain symmetry when sanding later.

D 5 Glue two $1/16"$ x $3"$ x $24"$ balsa sheets (SKY6S06) together (edge to edge) to form one piece of **stab sheeting** Sand or trim the edge of the sheets before gluing to obtain a good joint between the two, without any gaps After the glue is cured, sand both sides of the sheeting with a fine grit sanding block Make sheeting for both sides of the stab.

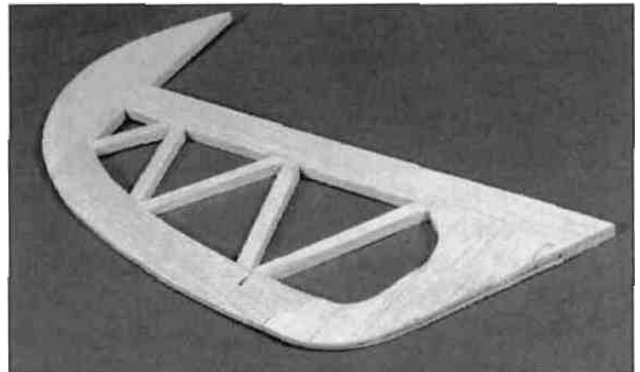


D 6 Thoroughly glue the sheeting to one side of the stab Keep the stab flat while attaching the sheeting After the sheeting is installed, trim it flush with the edges of the stab.

D 7 Glue the other side sheeting in place Be sure the stab is kept flat until the glue cures Trim and sand the sheeting flush with the leading and trailing edges of the framework **NOTE: It is essential to get a strong and complete bond between the stab sheeting and the stab framework, especially in the center**, therefore, we recommend using 30 minute epoxy when you apply the last piece of sheeting Spread the epoxy evenly but sparingly on the structure, to avoid excess weight

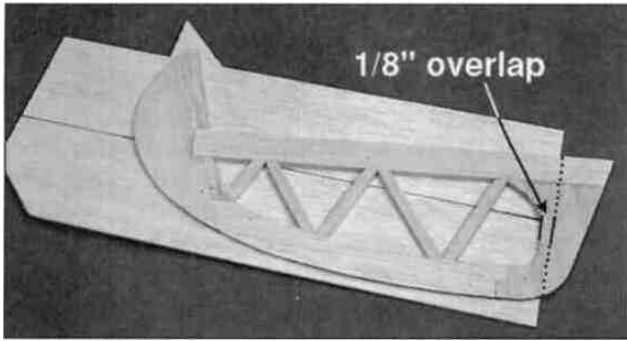


D 8 Carve and sand the leading edge to a nice rounded shape as shown on the plans, but keep the trailing edge and the tips square



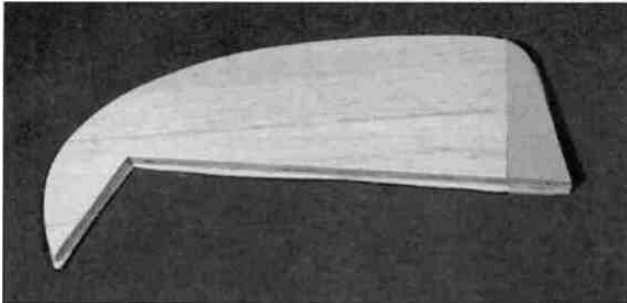
D 9 Using a sanding block and **coarse** (80-grit) sandpaper, sand both sides of the elevators to a **taper** (see cross section on plans) The trailing edge should end up approximately $3/32"$ wide

D 10 Cut four $1/16"$ x $2-5/8"$ x $24"$ balsa sheets (SKY6S08) in half to form **eight** $12"$ long pieces Glue these 12 sheets together to form **four** $5-1/4"$ wide sheets Cut one end of each sheet so it is perpendicular to the long edges Sand both sides of these sheets smooth.

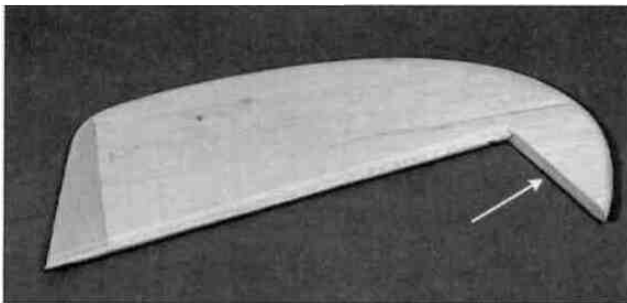


D 11 Glue one **5-1/4"** sheet to each elevator at the angle shown on the plans and in the photo so it overlaps onto S-6 approximately **1/8"** Cut a corner off the unused end of the sheet, and glue it at the front tip of the elevator Trim the sheeting flush with the edges of each elevator.

D 12 Glue the remaining sheeting in place on the other side of each elevator so that it too overlaps only approximately **1/8"** onto S-6 Be sure the elevator is kept flat until the glue cures Trim and sand the sheeting flush with the edges of the framework



D 13 Cut four 4" long pieces of **1/16" x 1-3/8"** balsa sheeting from what is left of the **1/16" x 1-3/8" x 24"** hard balsa sheeting (SKY6S07) Glue these to both sides of each elevator, next to the sheeting that stops at S-6

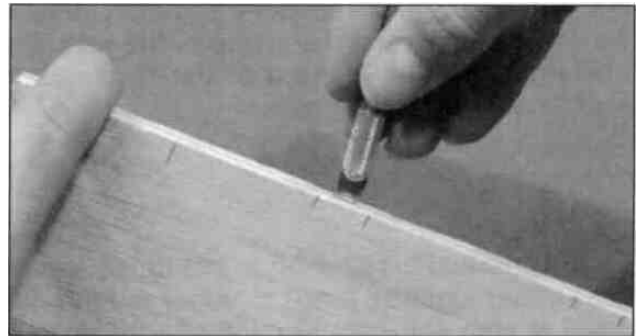


D 14 Sand the leading edge of the **elevators** to a **"V-shape"** as shown on the plan Round off the tips and the trailing edge, but keep the inside edge (marked with an arrow) square

TEMPORARILY INSTALL HINGES

D 1 Using the plan as a guide, mark the hinge locations on the stab, elevators, fin and rudder Designate one side of the stab as being the **top** and one elevator as being **"right"** and the other as **"left"**.

CAUTION!!!: You must use extreme care when cutting hinge slots with a hobby knife, to avoid cutting yourself! If the balsa part breaks while you are pushing on the knife, the blade could go into your hand before you know it! A good precaution is to wear leather gloves while performing the following steps.



D 2 Cut the hinge slots on the centerlines you drew earlier Our recommended hinge slotting method is described below.

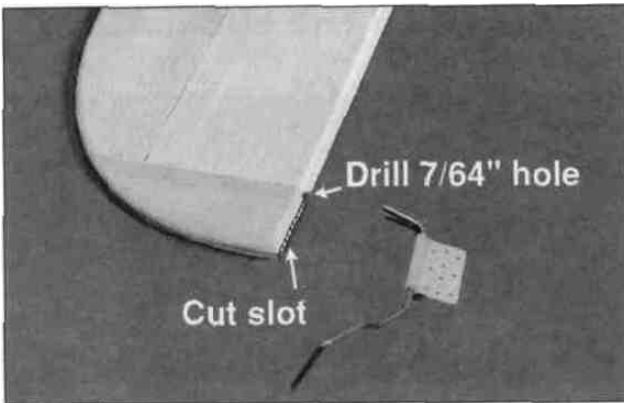
A Begin by carefully cutting a **very shallow slit** at the hinge location The first cut is to establish your cut in the right place, so concentrate on staying on the line and **don't cut too deeply**.

B Make three or four more cuts in the same line, **going slightly deeper each time**. As you make these additional cuts, work on going straight into the wood Continue this process while **"wiggling"** the knife handle forward and backward until the blade has reached the proper depth for the hinge

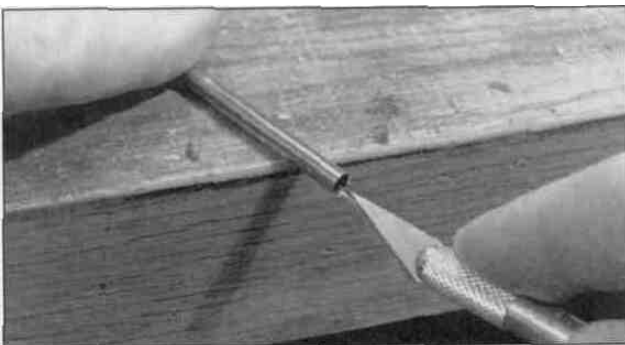
C. Trial fit the hinge into the slot If the hinge is difficult to push in, re-insert the knife and move it back and forth in the slot a few times to enlarge the slot **Do not glue the hinges yet**.

FUSELAGE ASSEMBLY

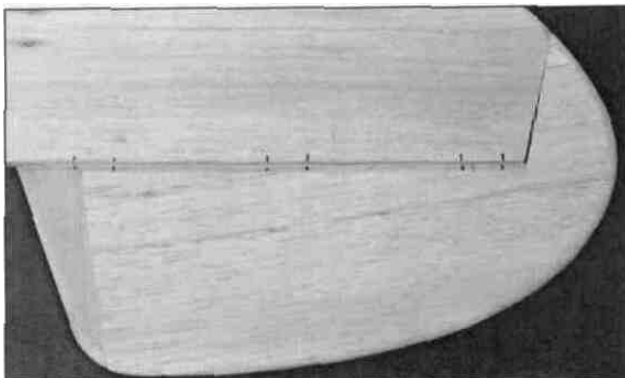
PREPARE FUSE SIDES



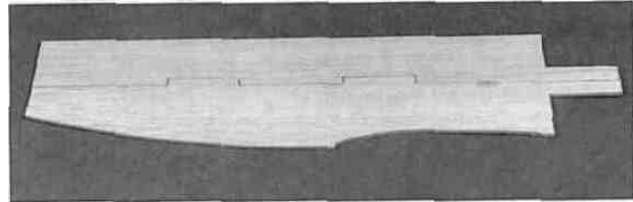
D 3 Refer to the plans and mark the location of the **tailgear** (WBNT128) on the rudder. Drill a 7/64" hole in the rudder (the hole is drilled slightly oversized to allow for positioning, and to create a hard epoxy sleeve" around the wire). Then groove the rudder leading edge to accept the tailgear wire and the nylon bearing. Mark the location of nylon bearing on the fin and cut a slot for it.



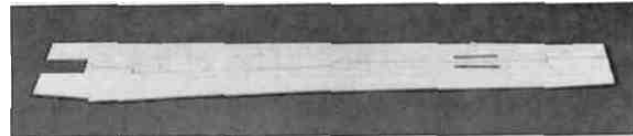
HINT: Using a hobby knife, sharpen the inside of one end of a 1/8" diameter tube, and use it to cut the groove in the leading edge of the rudder (and ailerons if applicable)



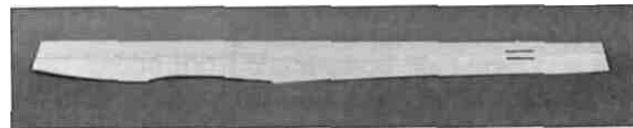
D 4. Trial fit all these parts together using the hinges. Sand the aerodynamic balance" part of the elevators to get them to match up with the stab. **Do not glue the hinges until after covering the surfaces.**



D D 1 Working over the fuselage side view covered with waxed paper, trial fit a die-cut 1/8" balsa **top front fuse side** (SKY6F01), and **bottom front fuse side** (SKY6F02) together, sanding **slightly** if necessary for a good fit. Make sure they line up with the plans, and glue them together.



D D 2 Trial fit a die-cut 1/8" balsa **top aft fuse side** (SKY6F03) and a die-cut 1/8" balsa **bottom aft fuse side** (SKY6F04) together. Sand them **slightly** if necessary to achieve a good fit, and glue them together.

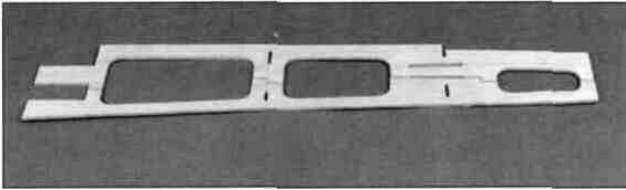


D D 3 Test fit the **aft** fuse side half in place behind the **front** fuse side half. Sand the two halves if needed to get them to fit together tightly **and match up with the plans**. Glue them together with CA. Then sand both sides smooth with a sanding block.

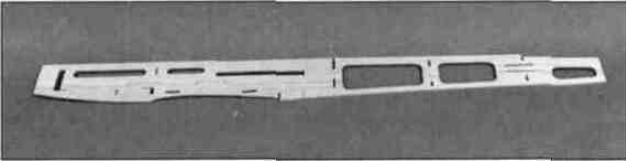


D D 4 Working over the fuselage side view still covered with waxed paper, trial fit a die-cut 1/8" balsa **top front fuse doubler** (SKY6F05), and **bottom front fuse doubler** (SKY6F06) together, sanding **slightly** if necessary for a good fit. Make sure they line up with the plans, and glue them together.

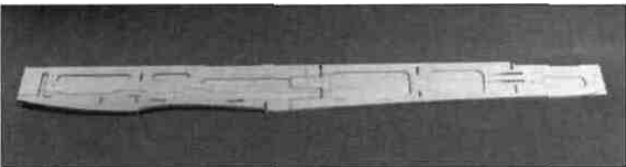
ASSEMBLE THE FUSELAGE



D D 5. Trial fit a die-cut 1/8" balsa **top aft fuse doubler** (SKY6F07) and a die-cut 1/8" balsa **bottom aft fuse doubler** (SKY6F08) together. Sand them **slightly** if necessary to achieve a good fit, and glue them together.



D D 6. Test fit the **aft** fuse doubler half in place behind the **front** fuse doubler half. Sand the two halves if needed to get them to fit together tightly **and match up with the plans**. Glue them together with CA, and sand both sides of the doubler smooth with a sanding block.

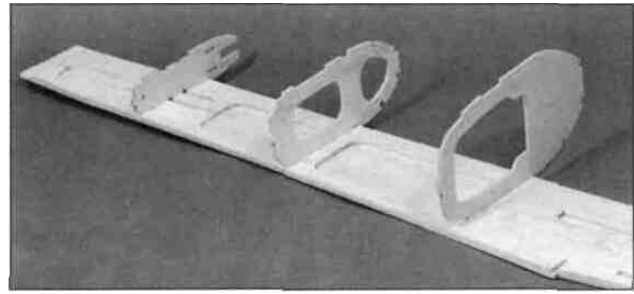


D D 7. Position the doubler on top of the fuse side and align their **bottom** and **front** edges. Glue the doubler to the fuse side by applying **thin** CA around **all** edges of the doubler, including the lightning holes. Use plenty of thin CA to allow it to wick into the joints as far as possible.

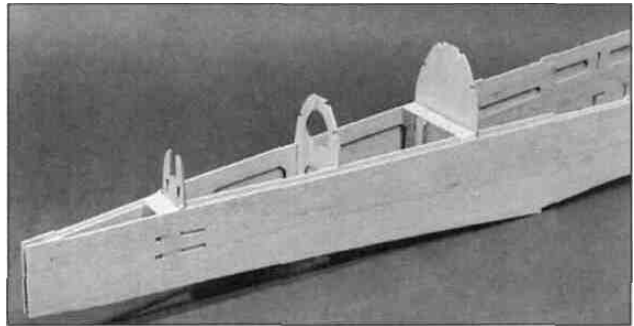
D D 8. Inspect all glue joints for gaps and add thick CA if necessary to strengthen the joints.

D 9. Repeat the above steps to make another fuse side and doubler. **When gluing the doubler to the fuse side, make sure you assemble a RIGHT and a LEFT set of sides!**

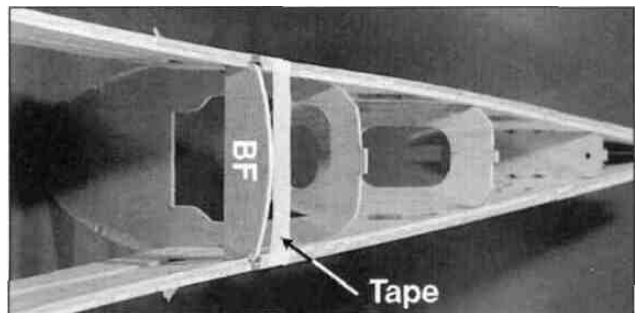
D 10. Place the two assembled fuse sides together. Sand the edges as necessary to make the two sides **identical**. Also sand the sides of each assembly smooth with a fine sanding block.



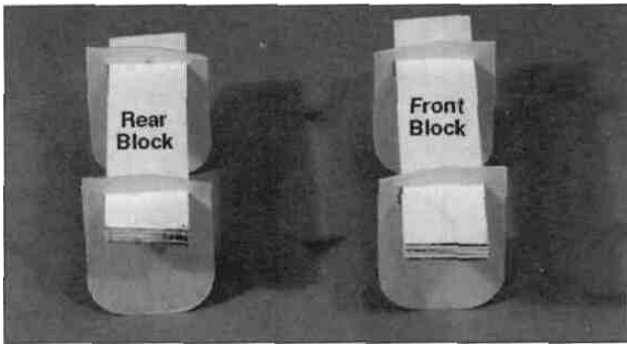
D 1. Trial fit the die-cut 1/8" ply formers **F3**, **F4** and **F5** (SKY6F10 and SKY6F12) to make sure they fit into the appropriate slots in both fuselage sides. If there is any excess glue in any of the fuse doubler slots, clean it out with a hobby knife. If it is necessary to trim any of the formers, be sure to trim both sides of the formers the same amount to keep them symmetrical.



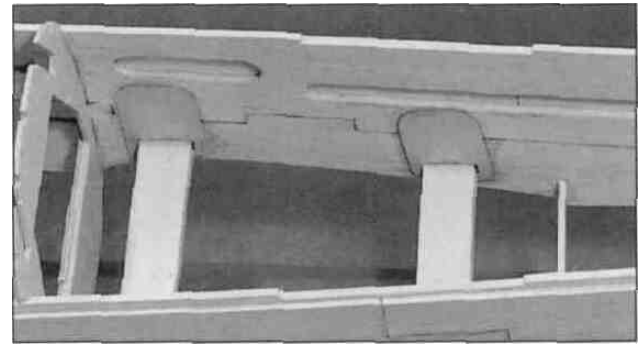
D 2. Assemble formers **F3**, **F4** and **F5** between the two fuse sides and use masking tape to pull the fuse sides together. Make sure all the tabs are seated in their notches, and add a drop or two of **thin** CA to the top notches of each former. Use only as much glue as required to tack things together. We will come back and securely glue everything in a few steps.



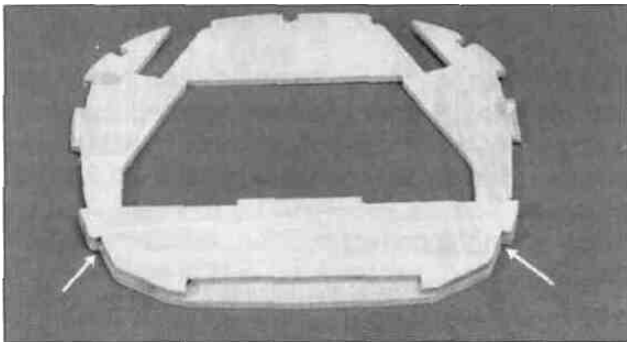
D 3. Fit the die-cut 1/8" ply **belly** former (BF) (SKY6F12) into its notches to make sure it seats all the way into the notches. Pull the fuse sides together and glue the belly former into place. Masking tape can be used to hold the fuselage together while the glue cures.



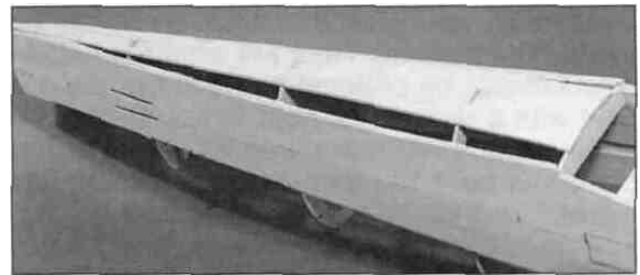
D 4. Slide two die-cut 1/32" ply **bolt block braces** (SKY6W06) onto both the 1/4" ply **front** and **rear wing bolt blocks** (SKY6F20 and SKY6F21). Notice that the *slant* on the braces is at the **front** of the **rear** block and the **rear** of the **front** block to clear the wing saddle. The photo clearly illustrates this.



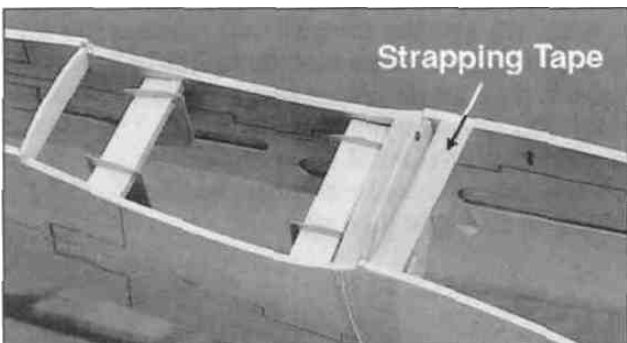
D 7. Slide the 1/32" ply braces out against the fuse sides and securely glue them in place with thick CA or epoxy.



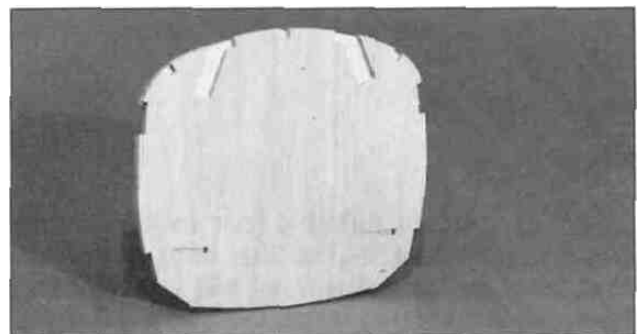
D 5. Glue die-cut 1/8" ply former **LG2** (SKY6F10) to one side of the die-cut 1/8" ply former **F2** (SKY6F12) with thick CA. The **bottom** of the interlocking tabs on both formers should line up as shown in the photo.



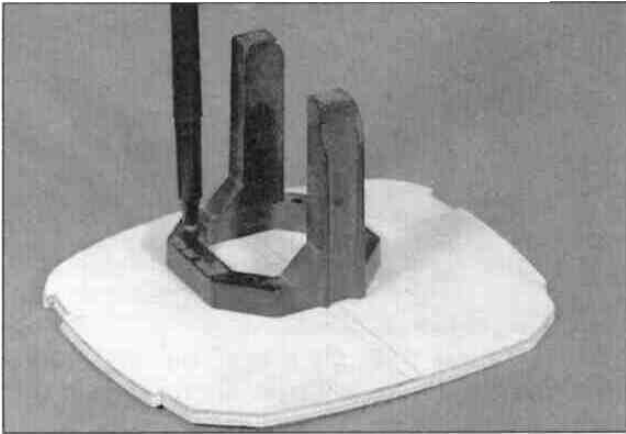
D 8. Glue the die-cut 1/8" balsa **aft fuselage bottom** (SKY6F09) in place with thin CA. The aft tip of the bottom should be centered on the fuselage sides and glued in place. The bottom will automatically keep the aft portion of the fuselage straight. Go over all the glue joints at formers F3, F4 and F5 and securely glue the fuse sides to the formers with thin and then thick CA.



D 6. Position former F2 into place and apply CA near the **top** notches. Carefully slide both wing bolt blocks into their respective slots. Pull the fuse sides together at the bottom of the former and use **strapping** tape to hold them tightly against the former. Make sure the bolt blocks are seated in their notches, and apply thin CA around the blocks and the former notches.



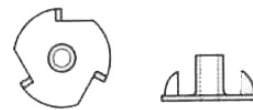
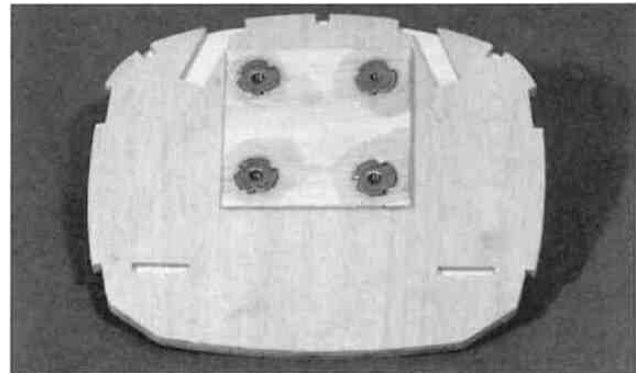
D 9. Use thick CA or epoxy to glue the die-cut 1/8" ply formers **F1A** and **F1B** (SKY6F15) together to form the **firewall**. **NOTE:** The embossed centerlines must be showing on F1A. The interlocking tabs on both formers should line up. . . but former F1B is slightly larger than F1A, so just center it on F1A. Wipe off any excess glue before it cures.



D 10 F1A has four lines embossed on it. The two short lines are the actual horizontal center of the former. The two crossing lines are offset to the left (as viewed from the pilot's seat) of the horizontal center to automatically put the spinner in the center of the cowl when right thrust is built into the plane. The crossing lines are what the engine mount should be centered on since this plane is built with 2 degrees of right thrust. Center the **engine mount** on these lines as shown on the plan, and mark the bolt locations through the mount. Drill **5/32"** holes at the bolt locations.

NOTE: This kit includes the new Great Planes EM4070 Adjustable Engine Mount. To properly position the mount, just slide the mounting beams together and center the beams over the embossed lines when marking the mounting holes. There are "tick" marks on the side of the mount to help you position it vertically.

D 11. If you are using a four cycle or other engine/mount combination that does not require **four** 9mm engine spacers but **will** use 6-32 blind nuts, you will need to install the 1/8" x 2-3/4" x 2-3/4" plywood **back plate** (SKY6F31) on F1B. Center it over the 5/32" holes and glue it in place. Drill 5/32" holes through the back plate using the holes you drilled earlier as guides. **NOTE** If you are using another engine mounting system, such as vibration isolation type mounts, you may not need the back plate. The photos show a typical .60-size glass filled mount being used.



6-32 Blind Nut



6-32 X 2-1/2" Machine Screw

D 12 Press the four **6-32 blind nuts** (NUTS003) into the firewall from the back and tap them into place with a hammer. Temporarily attach the engine mount to the firewall with the **6-32 x 2-1/2" machine screws** (SCRW071) to make sure the holes are in the correct position. Adjust the holes if necessary, and glue the blind nuts in place.

D 13. Wet the outside of the fuselage sides from F2 forward with water to help it bend around the formers. Test fit the die-cut 1/8" ply **fuel tank floor** (SKY6F14), die-cut 1/8" ply former **LG-1** (SKY6F10) and the **firewall** into place in the front of the fuselage. Notice that the fuel tank floor helps set the right thrust and appears to be cut crooked until you get everything assembled. The firewall should touch the **front** edge of the fuse side notch on the left fuse side and the **back** edge of the notch on the **right** fuse side.

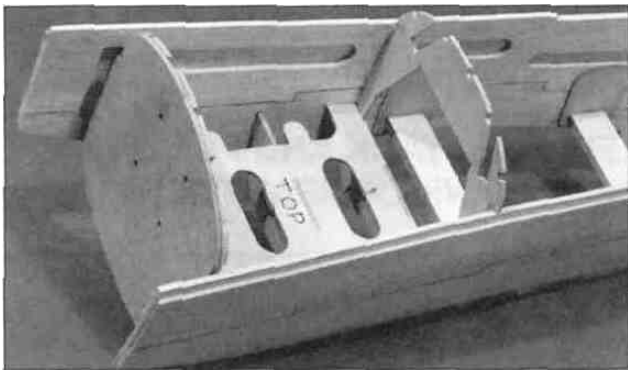
The easiest way to assemble these parts is as follows

D A Snap the **back** of the fuel tank floor into its notches

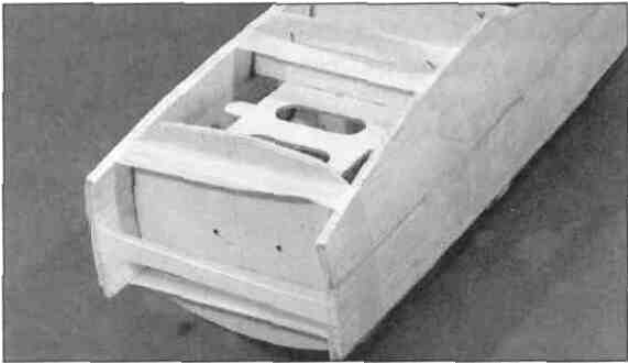
NOTE: The tank floor when in position correctly, should cause the firewall to slant to the **RIGHT**.



D B Tack glue the tab on the top of **LG1** into the fuel tank floor.

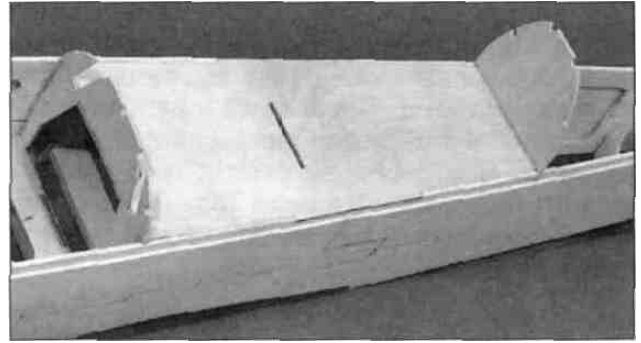


D C Tack glue the firewall onto the front of the fuel tank floor



D D Pull the fuse sides together and use strapping tape to hold everything together. Securely glue everything in place with either epoxy or CA. If you are going to use CA, you can tape everything first and thoroughly saturate the joints with thin CA. Then apply a generous bead of thick CA around each joint.

D E Included you will find a piece of 1/4" balsa triangle for you to install on the back of the firewall. It should be pressed into the corners formed by the fuse sides and the firewall.

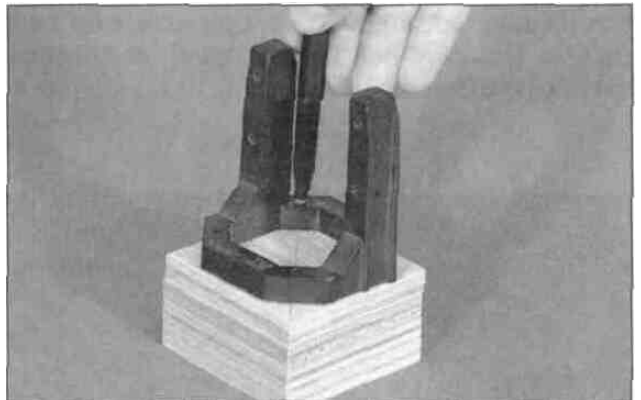


D 14 Snap the die-cut 1/8" ply **cockpit bottom** (SKY6F11) in place by inserting the rear tab into F3 and carefully sliding the front tab down into place in F2. Glue the cockpit bottom to the fuse sides and the formers.

Note: The engine mount shown in the following photos may not be the mount supplied in this kit.

D 15 Glue the required number of 9mm (3/8") **engine mount spacers** (SKY6F27) together as shown in the next photo. You can lay your engine/mount combination over the plans and determine where the engine should be placed on the mount and how many spacers should be used. We have determined that the following engines usually require

- The OS 61 SF requires 3 spacers
- The OS 91 Surpass requires 1 spacer
- The OS 1.20 Surpass requires no spacers



D 16 Center the engine mount on the face of the spacers and mark where to drill the mounting holes. Drill 3/16" holes **straight** through all the spacers you glued together (a drill press will be helpful for this, if you have access to one).

D 17. Mount your engine to your mount following the manufacturer's recommendations. Refer to the plans to make sure you get the engine positioned far enough forward. The distance from the front of the firewall to the front of the engine thrust plate should be approximately 6-1/16" for a spinner without overhang. Remove the engine. The following instructions explain how to work with the mount supplied.

DRILL ENGINE MOUNT

(Great Planes EM4070 or similar glass-filled mounts)

D 1. Hold the engine pointing straight ahead on the mount (in the approximate location shown on the plans) and mark the mounting hole locations on the mount. At the marked locations, accurately drill **7/64"** (or #36) holes. **NOTE:** If you have access to a drill press, use it for drilling these holes to insure that they are drilled vertically.

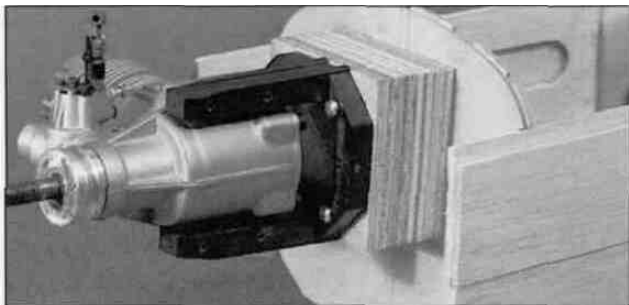
D 2. Now you may use one of the following methods to attach your engine to the mount:



#6 X 3/4" Sheet Metal Screw

Method 1: Screw the **#6 x 3/4" sheet metal screws** (provided in the kit) through the engine mounting flange and into the mount. When first installing these screws, put a drop of oil into each screw hole.

Method 2: Cut threads into the holes you just drilled using a 6-32 tap and tap wrench. If you use this method, you'll have to supply your own bolts (6-32 x 1" socket head cap screws) for attaching the engine to the mount.



D 3. Attach the engine mount to the firewall using the **6-32 x 2-1/2" machine screws** (SCRW071)

and the required number of spacers. Glue the spacers to the firewall and screw your engine to the mount. If the 2-1/2" screws protrude into the fuel tank compartment, cut them off flush with the blind nuts.

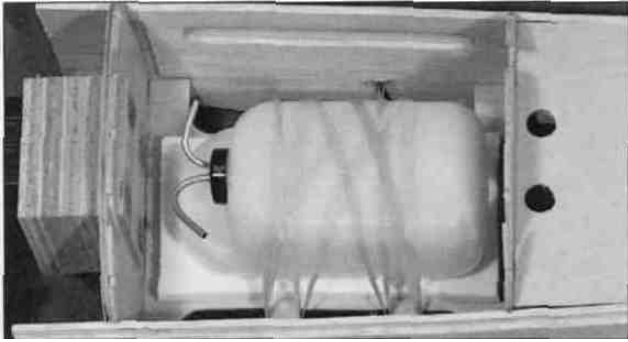
FIT FUEL TANK AND FUELPROOF TANK COMPARTMENT



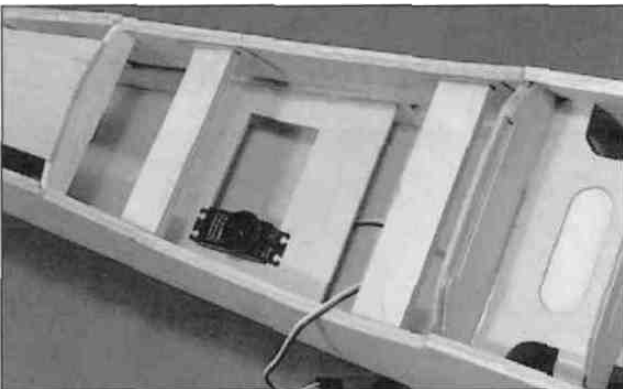
D 1. Cut a piece of 1/4" thick latex foam (not included) into a 3" x 6" rectangle. Glue it to the ply tank floor to help keep the fuel tank from vibrating excessively.



D 2. Assemble your **14 oz. fuel tank** according to the tank and engine manufacturer's instructions. **HINT:** To avoid kinking the tubes when bending, use **K&S Tubing Bending Springs**. We routed the fuel and vent tubes as shown in the photo. This helps keep the fuel tubing from getting kinked.



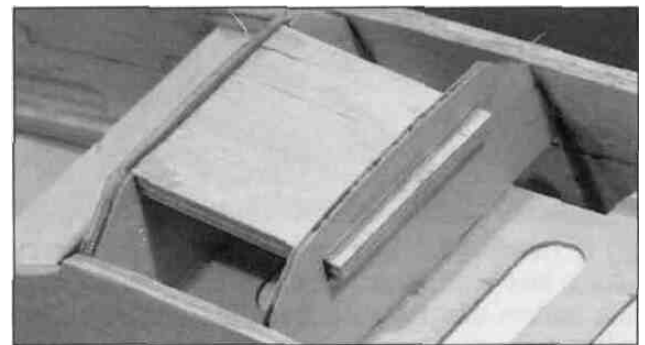
D 3. Install the fuel tank using four #64 rubber bands (not included) as shown in the photo. Determine where the fuel and vent tubes should pass through the firewall to match up with your particular engine. Drill a $\frac{1}{4}$ " hole for each tube to pass through the firewall. The larger holes will allow you to seal around the tubes with silicone bathtub sealer. Install the fuel tubing, but be sure to leave a couple extra inches for good measure. Mark on the front of the firewall which tube is fuel and which is the vent.



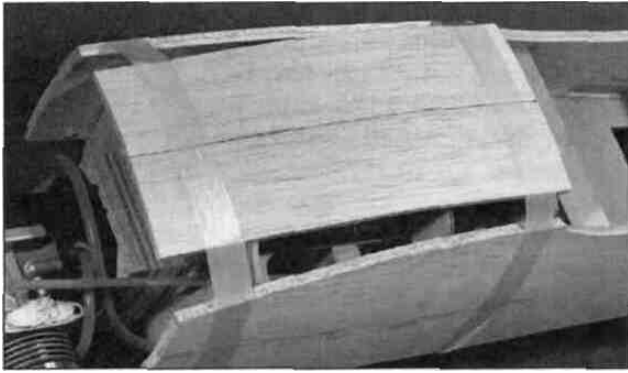
D 4. Determine where your servos should be mounted. If you are using a lighter engine (.61 - .75 2-cycle) the servos should go as far forward as practical. If you are using a heavy engine (1.20 4-cycle) the servos should go as far back as

possible. Make sure you will still be able to install and work on the servo linkages. These servo positions are not critical, but will help you balance the plane without using extra weight. The die-cut $\frac{1}{8}$ " ply **servo tray** (SKY6W10) is designed to fit in the doubler lightening hole for most installations, but will have to be cut down in width to fit towards the rear of the plane. It can be glued just **below** the lightening hole when it needs to be installed farther forward as shown in the photo. Check your servos to make sure they will fit into the tray and are not held off the tray by the cockpit bottom. Securely glue the tray in place.

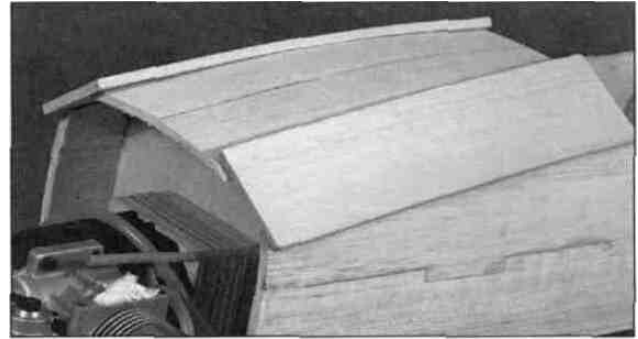
D 5. Determine the location where the **throttle pushrod** (not included) will pass through F1. Normally, a solid wire pushrod will work fine for the throttle pushrod. Drill a $\frac{3}{16}$ " hole (or whatever size you need) in the firewall for the throttle pushrod guide tube. Cut the outer guide tube to length and roughen the outside of the tube with medium grit sandpaper. Slide the tube into place and glue it with thin and then thick CA. Refer to the plans to get an idea of how to route the pushrod.



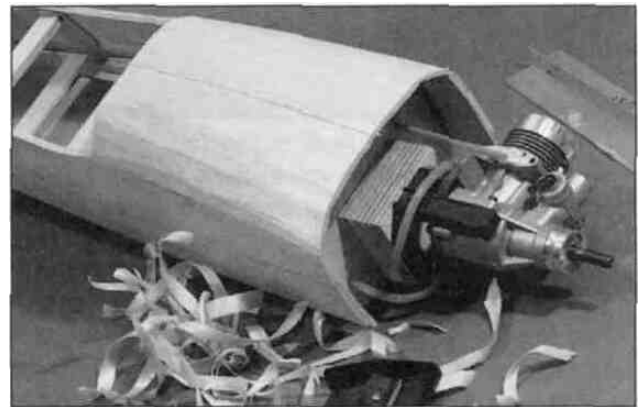
D 6. Locate the $\frac{1}{4}$ " x $2\frac{3}{4}$ " x 3" ply **landing gear plate** (SKY6F30) and test fit it in place between LG-1 and LG-2. **NOTE: The grain should run from LG-1 to LG-2.** Enlarge the slots if necessary to get the plate to fit. When satisfied with the fit, securely epoxy the plate in place.



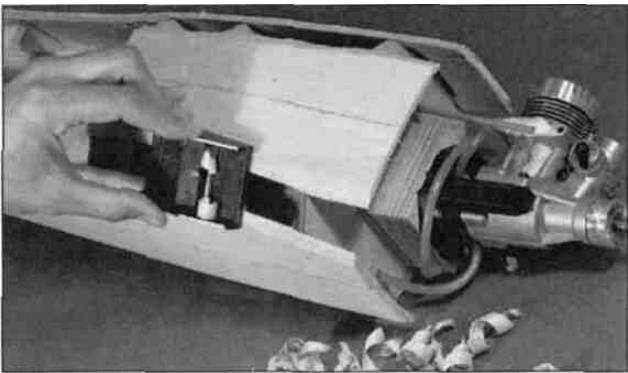
D 7. Cut the **3/16" x 2" x 18"** balsa sheet (SKY6F24) in half and glue the two 9" pieces together to form a 4" wide **bottom nose sheet**. Center the 4" wide sheet over the bottom of the fuselage nose and glue it to formers **F2** and **LG1** first. It should extend 1/16" behind F2 and the rest should extend forward of the firewall. Use a piece of strapping tape to hold it in place while the glue cures. Wet the outside surface of the nose bottom and allow it to soak in for 5 minutes or so to help it bend easier. Apply a generous bead of thick CA to the bottom edge of the firewall. Then bend the sheeting into place and hold it with another strip of strapping tape. Apply thin CA and then another bead of thick CA around each former before removing the tape. This gluing process makes very strong joints because the thin CA soaks in and holds the wood together and the thick CA forms fillets for extra strength.



D 9. Cut the **1/4" x 1-3/4" x 18"** balsa **bottom nose corner** (SKY6F25) sheet in half to make two 9" long pieces. Glue these pieces in place on each side of the nose as shown in the photo.

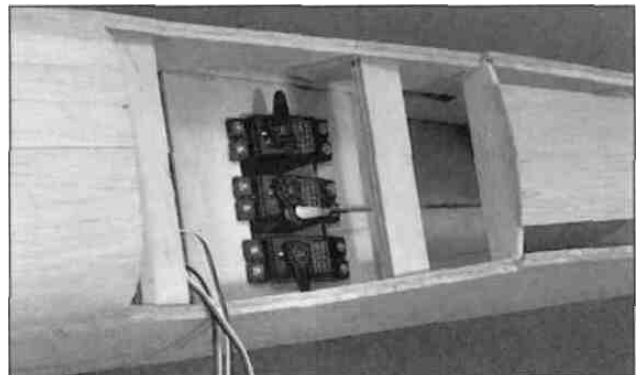


D 10. Use your razor plane and a sanding block to rough carve the corners to shape. Refer to the cross sections on the fuselage plan during this step. Cut the fuselage bottom and the corners off even with the front edge of the fuse sides and the wing saddle.

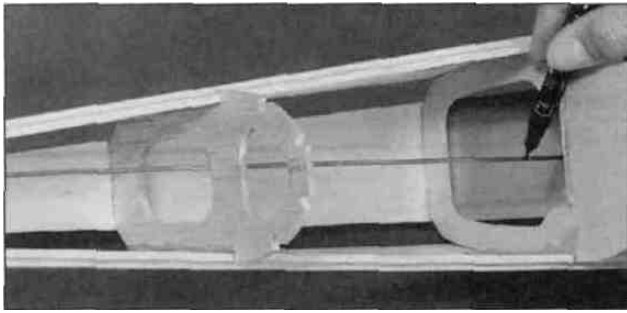


D 8. Remove the strapping tape and use a razor plane and a sanding block to shape the edges of the bottom and the fuse sides to match the bevel of the formers.

INSTALL TAIL PUSHRODS

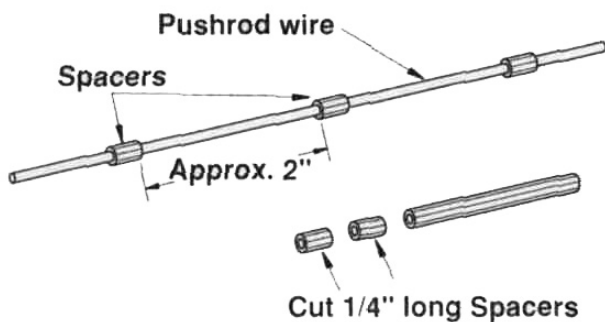


D 1. Install the elevator, rudder and throttle servos using the screws that came with the servos. Screw

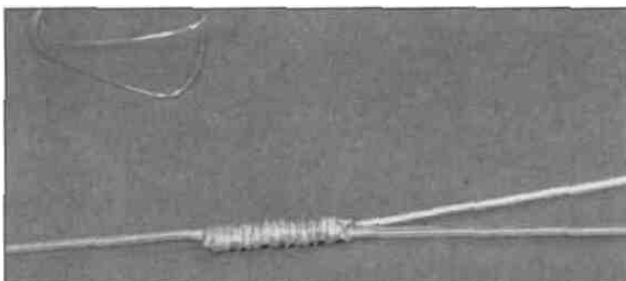


Nylon Clevis

a nylon clevis (NYLON17) about 1/2" onto one of the 34" threaded wires (WIRES17) Hook up the clevis to the elevator servo and, with the servo arm in its neutral position, use a fine tip permanent marker to accurately mark where the pushrod wire goes through formers F3 and F4.



D 2 Lay the 34" wire down over the fuselage top view and line up the marks you made with the F3 and F4 formers on the plan Cut the 34" wire off where the plans show it ending, to make the forward part of the elevator pushrod Cut four 1/4" long yellow pushrod spacers from the 6-1/2" long inner pushrod piece (PLTB004) Slide these spacers onto the pushrod wire and position them near the threaded end until after the soldering operation.

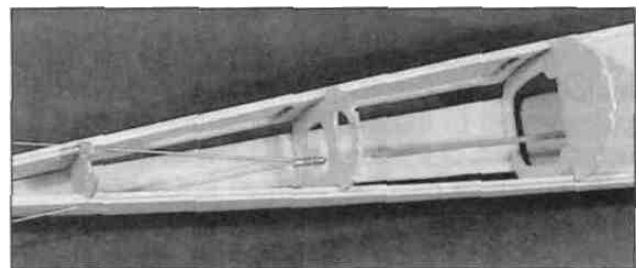


D 3 Bend two 12" pushrod wires (WIRES16) 1" from the unthreaded end to the angle shown on

the plan These will make the "Y" part of the elevator pushrod. Lay the two 12" wires on the plan so they are lined up with the ones drawn Lay the forward pushrod wire on **top** of the two 12" rods and **tack** glue the three together with a **drop** of CA Wrap the pushrod junction with the **silver wrapping wire** (WIRES15) provided in the kit and securely solder the three pushrod wires together A good solder joint is necessary here, so follow the hints given below.

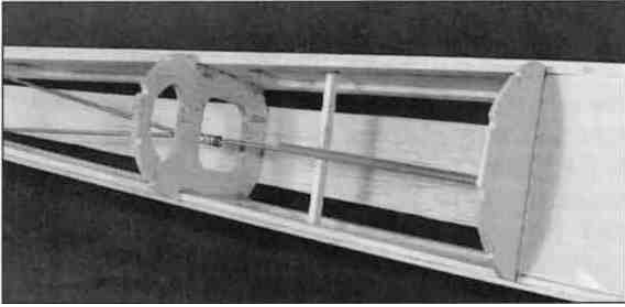
SOLDERING HINTS

- A Roughen the area to be soldered with fine sandpaper Then thoroughly clean the items to **be** soldered with alcohol or degreasing solvent.
- B. Apply a small dab of soldering flux.
- C Heat the metal with a soldering gun or iron, and apply the solder to the metal, not the iron The metal must get hot enough to melt the solder, and the solder must freely flow into the joint.
- D. Do not move the parts until the solder has cooled
- E. Clean off the excess flux with alcohol or solvent and test the joint for strength.

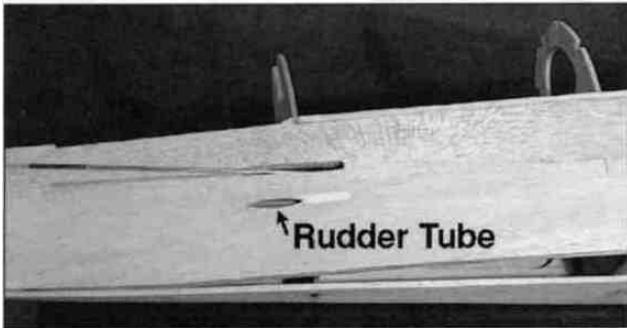


D 4 Cut a piece of **pushrod outer tube** (PLTB002) 10" long and scuff the outside of the tube with sandpaper Slide the 1/4" inner spacers near the middle of the elevator pushrod wire and space them about 2" apart Remove the nylon clevis from the servo end of the elevator pushrod and slide the 10" long outer tube onto the pushrod. Install the pushrod in the fuselage by inserting the servo end through former F4 and sliding it forward until the "Y" will slip down into the fuselage Then back the pushrod out the **top** set of exit slots. Screw the nylon clevis back onto the servo end of the pushrod and hook it up the servo arm.

ASSEMBLE THE CABANES

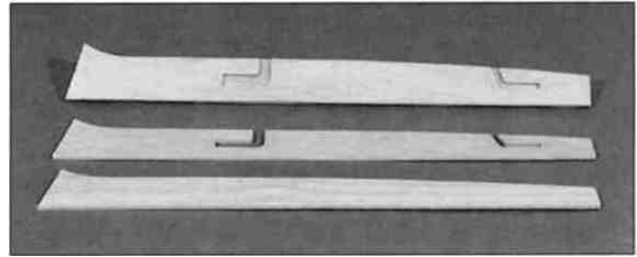


D 5 Cut a scrap piece of balsa to fit about 2" in front of the pushrod "Y" junction and glue it in place. This will be a **pushrod brace** and both the elevator and rudder pushrod outer tubes will be glued to it. Glue the elevator pushrod guide tube to the top of the brace so the end of the guide tube is approximately 1-1/2" away from the solder joint. Operate the servo horn by hand to make sure all the inner spacers stay inside the guide tube throughout the elevator operation range. Make another balsa brace to go near the servo end of the guide tubes and glue it in place.



D 6 The **rudder pushrod guide tube** should be installed now. Cut it to fit from the lower right pushrod exit to the front pushrod brace. Scuff the outer surface of the tube with sandpaper. Allow the tube to extend past the pushrod exit a few inches and securely glue it in place. After the glue has cured, cut the tube off flush with the fuselage side. Use HobbyLite filler to fill around the rudder pushrod cut-out. You can also fill the other rudder cut-out on the left fuselage side. When the filler is dry, sand it and the pushrod flush with the fuse side.

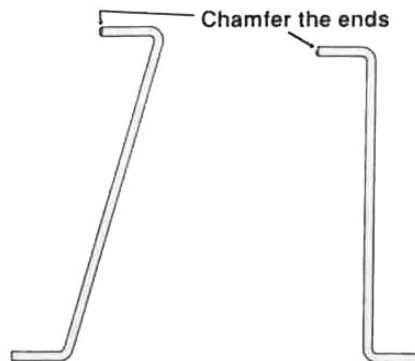
D 7 If you would like to install an extra pushrod tube in which to route the receiver antenna, now is a good time to do it. Just drill holes where necessary and securely glue it in place.



D 1 Punch out the die-cut 1/8" ply **cabane wire holders** (SKY6F13) and glue an "L" side to one of the center pieces. Glue an "R" side to the other center piece. Notice that the "L" (left) sides are 1/8" longer than the right side. This is to allow for the engine right thrust.

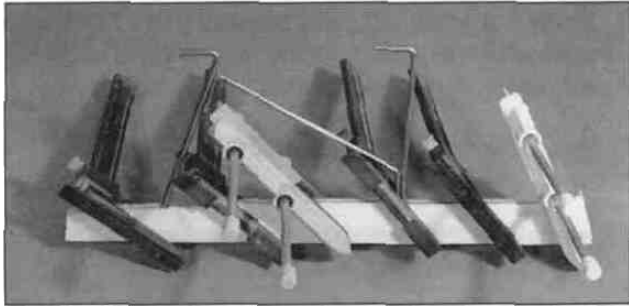
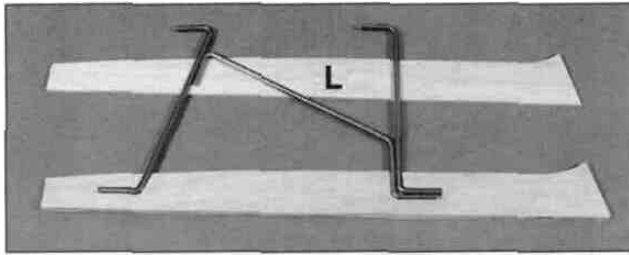


D 2. Use a hobby knife to chamfer the front end of each 5/32" OD x 3/4" **brass tube** (BRST021). If you have a hand drill with a relatively slow speed, you can chuck the tube in the drill to do this. Vary the angle of the knife blade during this process to obtain a nice rounded chamfer.

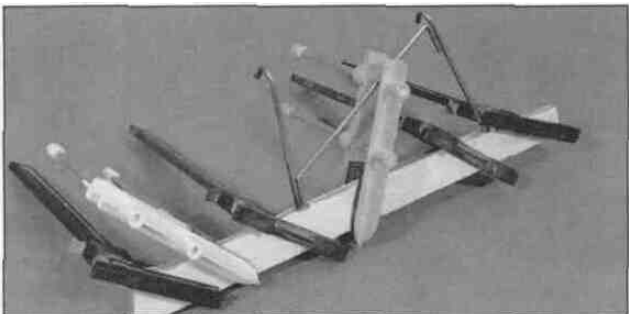


D 3 Locate the 1/8" **front** and **rear left side cabane wires** (WBNT177 and WBNT179). These are going to slide into the 5/32" OD brass tubes so their ends need to be smoothly chamfered. Use some very fine (600 grit) sandpaper to smooth out

the front of each wire so it will easily slide into the tube. Test fit the tubes onto the wires.



D 4. Test fit the two left side cabane wires and a 1/8" **middle cabane wire** (WBNT178) in place in the die-cut grooves of the **Left** holder to make sure they fit correctly. Remove the wires, scuff up the lower ends with sandpaper and clean them with alcohol to remove any oils. Spread epoxy in the grooves and replace the wires. Add more epoxy on top of the wires and on the center holder. Install the other "L" side and tightly clamp the assembly together until the epoxy cures. Make sure the wires stay properly oriented while the glue is curing. Do not worry about the bends being perfect. We will "tweak" them later. You may also notice that the wires are slightly thicker than the wood. This is due to manufacturing tolerances in the wood. If this is the case, just make sure you use enough epoxy to fill the gaps. Wipe any excess epoxy off the assembly with a paper towel and alcohol.



D 5. Build the **right** side cabane assembly using the same procedure outlined above. When both the right and left cabane assemblies are cured, carefully sand the edges to remove any excess glue. Sand the center piece of the right

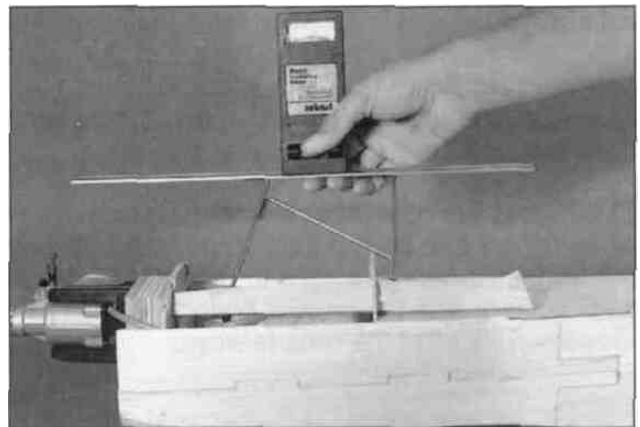
assembly to the same length as the sides. Do not sand into the wood on the bottom of the assemblies, though, as they are designed to automatically set the top wing incidence.

SETTING THE TOP WING INCIDENCE

D 1. You need to check the top wing incidence before gluing the cabane holders in place. To do this, temporarily install the left cabane strut. You will need an incidence meter or a level.

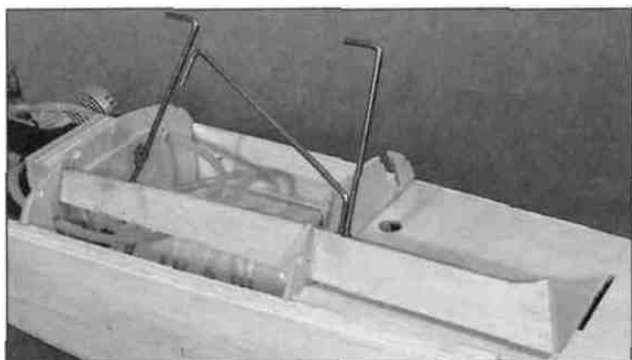


D 2. Block the fuselage up until the **cockpit sides are level**.



D 3. With the cabane holder fully seated in its notches, check to make sure the horizontal parts of the cabane wires are directly over the center of the fuselage. If necessary, **tack** glue the holder in place and carefully put a level or incidence meter across the cabane wires. The top wing should have 1 degree of **NEGATIVE** incidence (front wire 1/16" lower). Adjust the position of the holder in its slots, if necessary, until the incidence is correct. You can do this by cutting the notch in F1B lower

to allow the front end of the holders to drop. If you have to raise the aft end of the holders off the cockpit bottom to set the incidence, you should glue scrap wood in the space between the holder and the cockpit bottom. When you have it correctly positioned, make a mark on the formers and the holder so it can be accurately replaced. Normally, the incidence will be correct when the holder is bottomed out in both the notches. **If it does not seem to be correct, start over and re-check everything before continuing.** **NOTE:** When using a level, the incidence is correct if you put a scrap of 1/16" balsa between the level and the front cabane wire and the level is level.



D 4. Epoxy the **left** cabane holder in place, making sure any marks you made are lined up. Be sure to glue the holder to both the formers and the cockpit bottom.

D 5. Test fit the **right** holder in place and insert the die-cut 1/8" ply **instrument panel** (SKY6F11) in its slot to make sure it will fit. If the aft end of the cabane holders get in the way, sand them until the panel will fit. Also check the bends of the **right** front and **right** rear cabane wires to make sure they will be tangent to the left wires. If not, bend them with pliers until they are.

D 6. Epoxy the right cabane holder in place. Don't worry if the wires don't match up perfectly, as they will be joined later. Be sure to glue the holder to both formers and the cockpit bottom. Scrape any excess epoxy off of the cabane wires.

SOLDERING THE CABANE WIRES TOGETHER

D 1. First, clean all the wires with alcohol to remove any oil. Attach the wires to each other in the following order by wrapping the joint with the silver wire provided and soldering the joint with **acid core solder**. **NOTE:** It is easier to get a good looking solder joint if the wire is wrapped tightly and uniformly around the wire.



A. Wrap the **front right** joint first.

B. Wrap the front left joint second. The right wire goes on the right side of the left front wire, and the left middle wire goes **behind** the left front wire.

C. Wrap the rear wires together.

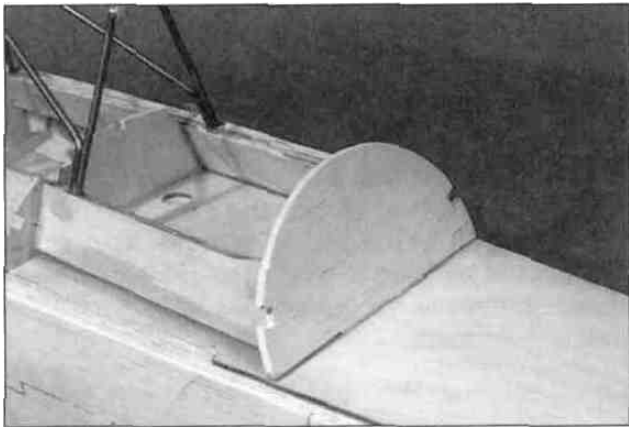


D. Temporarily slide the fin into place on the fuselage. Sight down the two horizontal wires and check to make sure they are in line with each other and the fin. If not, adjust the wrappings or bend the wires if necessary to get them straight (wrap the wire with a cloth first to prevent scratching).

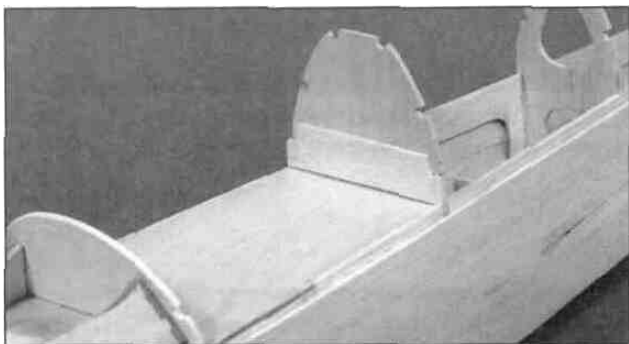


D 2. Solder all three joints together. You will need at least a 250 watt soldering iron or preferably a propane torch. Make sure you get good solder flow on all three joints.

INSTALL TOP SHEETING



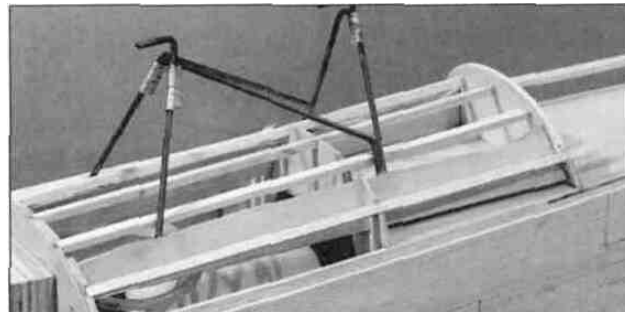
D 1. Glue the die-cut 1/8" ply **instrument panel** (SKY6F11) in place against the cabane holders.



D 2. Glue the die-cut 1/8" balsa **cockpit back** (SKY6F07) in place against former F3. Sand the edges flush with the sides of the former.



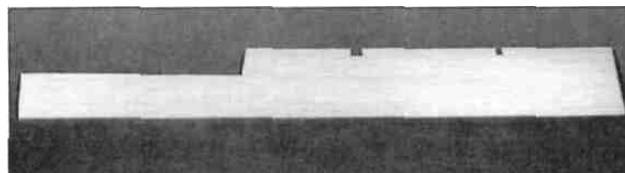
D 3. Install the two **outer** 3/16" sq. stringers by cutting two 3/16" sq. x 24" balsa sticks (SKY6F26) to fit between F1 and F3 and gluing them in place.



D 4. Cut the three remaining stringers from the 3/16" sq. x 24" balsa sticks to fit between the instrument panel and the firewall. Glue them in place.



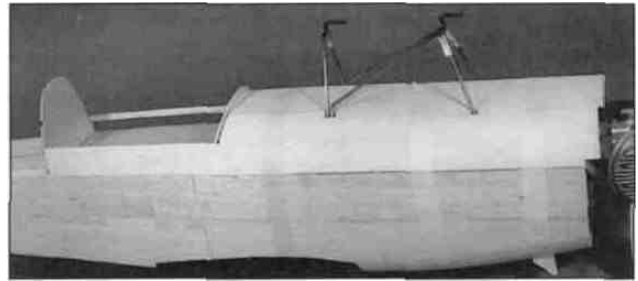
D 5. Test fit the 3/32" x 2-3/8" x 14" balsa **top center sheet** (SKY6F22) in place between the cabane wires. It should fit from the **center** of one middle stringer to the **center** of the other middle stringer. Sand it if necessary to fit between the cabane wires. Glue it in place with CA.



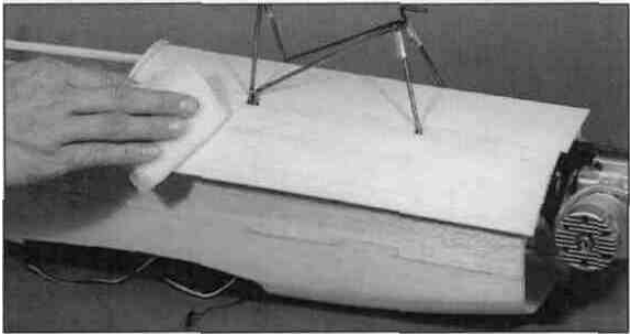
D 6. Cut two 3/32" x 2-5/8" x 24" balsa **nose side sheets** (SKY6F23) to fit around the cabane wires and instrument panel. A pattern is provided on the plans to give you a starting place. **Note:** When using this pattern please leave 3/8" extending past the slanted edge where the instrument panel will be. You may have to modify the sheets of balsa to get them to fit your particular model nicely. A good method to cut parts from patterns is to use spray adhesive (3M 77 spray adhesive works well) to attach the pattern to the wood and then pin the required number of parts underneath the sheet with the pattern on it. You can then cut the parts out with a hobby knife or a jig saw. Naphtha (lighter fluid) works well to remove the spray adhesive from the parts.



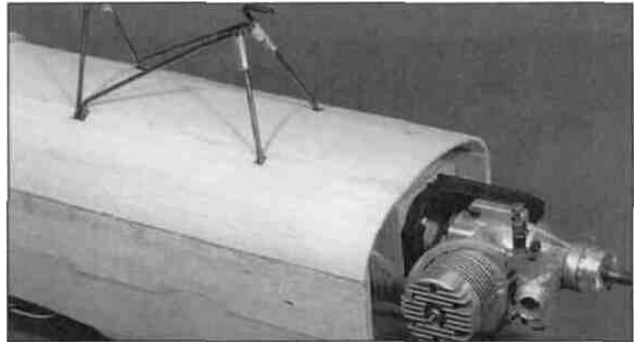
D 7. Test fit the nose side sheets in place and sand them if required to get a good fit. Glue the top edge of the side sheet to the middle stringer and the center sheet. Do not attempt to bend the sheeting into place yet.



D 11. The sheeting around the cockpit should be trimmed even with the side stringers and model filler should be used to fill in around the instrument panel so dirt will not get into the canopy after the model is finished.

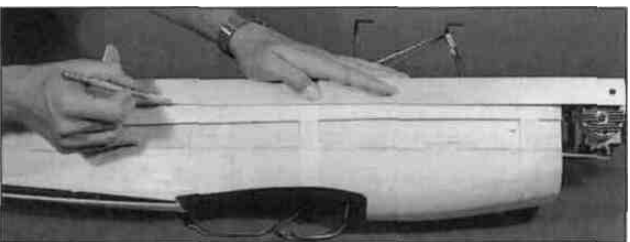


D 8. Thoroughly dampen the outside of the nose sheeting with water and allow it to soak in for about 5 minutes or so before proceeding.

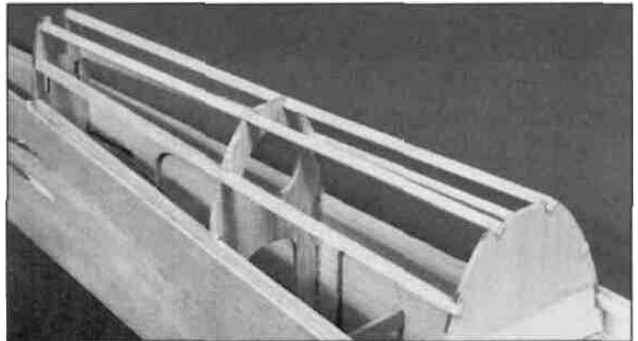


D 12. Trim and sand the front of the three nose sheets even with the front of the fuse sides.

D 9. Use several strips of tape to hold the sheeting down into place against the fuse side. Trim the front of the nose side sheeting even with the end of the fuse side.

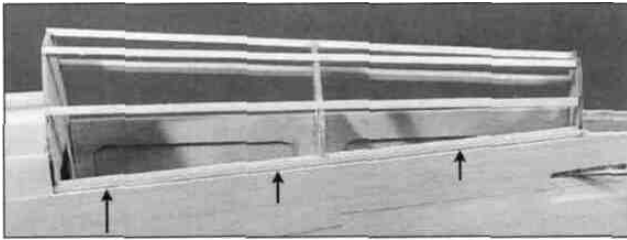


D 10. Line up a metal straight edge with the top of the fuse side (not the doubler) at both the front and aft ends of the side sheeting. Carefully trim the sheeting so it will sit neatly against the fuselage doubler. Trim the **aft** end of the side sheeting even with the **front** of F3. Gently lift the sheeting up and apply a bead of thick CA along the side stringer, the firewall, former F2 and the fuse doubler, and press the sheeting down into place. Use plenty of tape to hold the sheeting while the glue cures.

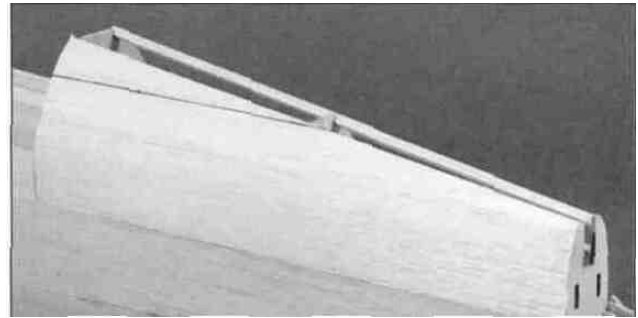


D 13. Install the $\frac{3}{16}$ " **turtle deck stringers** by cutting them from the $\frac{3}{16}$ " sq. x 24" balsa sticks (SKY6F26) and gluing them to formers F3, F4 and F5.

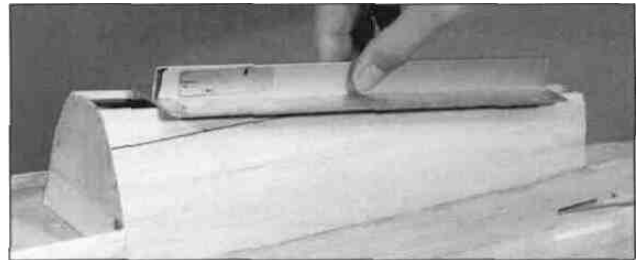
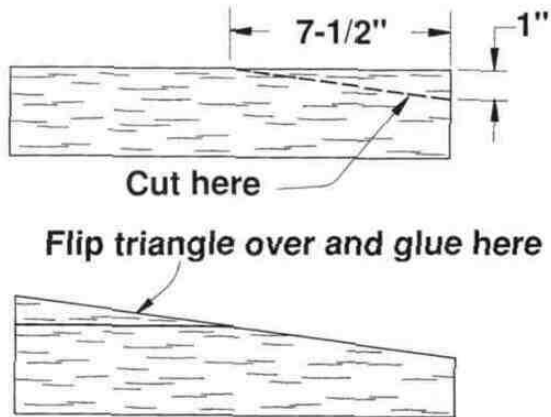
D 14. Cut a piece of $\frac{1}{16}$ " x $\frac{3}{8}$ " x 30" balsa stick (SKY6W24) to fit between the formers F3 and F5. Now cut this strip down the middle to form two pieces approximately $\frac{1}{16}$ " x $\frac{3}{16}$ " x 13- $\frac{1}{4}$ ". These are "**shims**" and are used to correctly position the turtle deck sheeting. Sand one end of each shim until it is approximately $\frac{1}{32}$ " thick. The **thin** end will be the **front** of each shim.



D 15. Glue these "shims" to the fuselage **doubler** between formers F3 and F5 with the thin end near F3. Refer to the F3, F4 and F5 cross sectional views on the plans to help clarify where the shims are positioned.

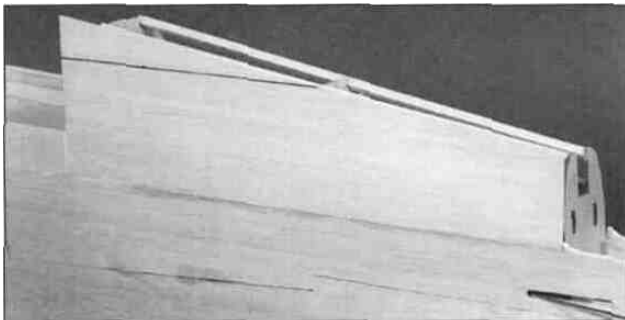


D 18. Apply a bead of CA to the stringers and the formers and hold the sheeting in place with tape while the glue cures. Trim the ends of the sheeting flush with formers F3 and F5. Do this to both sides of the turtle deck.



D 19. Sand the top of the turtle deck sheeting with a sanding block to obtain a flat surface on which to mount the top block.

D 16. Make the **turtle deck sheeting** by cutting a 1" x 7-1/2" triangle off one corner of the 1/16" x 3" x 14-7/8" balsa sheet (SKY6F17). Flip the triangle over and glue it to the rest of the sheet as shown in the sketch above. Sand both sides of the sheeting smooth.

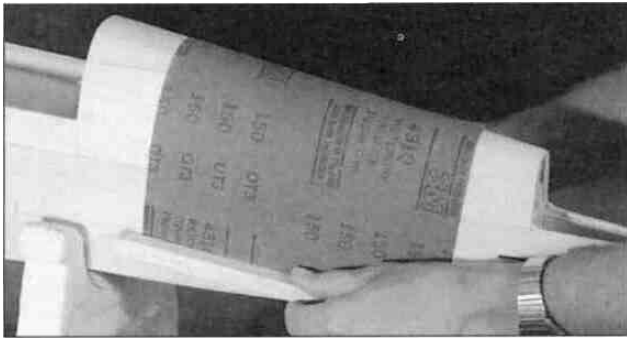


D 17. Position the wide end of the turtle deck sheeting against the front sheeting at former F3 and glue it to the shim with thin CA.

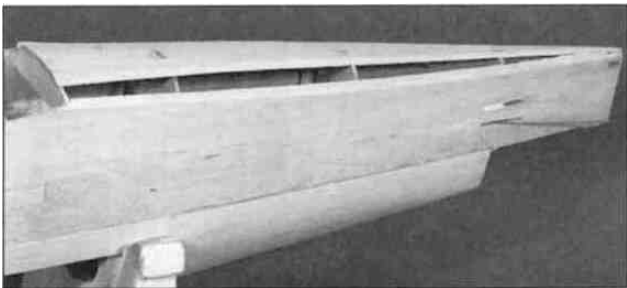


D 20. Glue the 3/16" x 1-1/2" x 14" balsa **turtle deck top** (SKY6F16) in place.

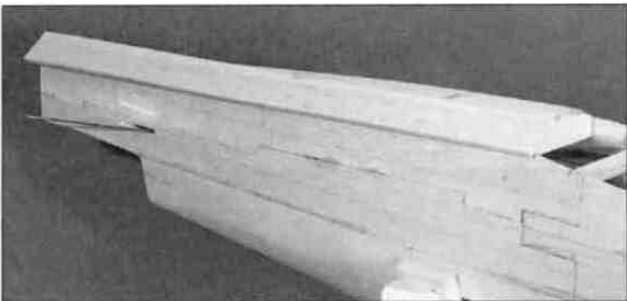
D 21. Use a razor plane and a sanding block to rough shape the turtle deck top to the cross sections shown on the plans.



D 22. For a very smooth turtle deck, pull a full sheet of 150 or 220 grit sandpaper around a corner of your work table. This helps "break in" the sheet. Then glue a 1/2" sq. stick of wood to each end of the sheet. Sand the turtle deck with long strokes while pulling down on the sticks as shown in the photo.



D 23. Use a razor plane and a coarse sanding block to bevel the aft bottom fuse corners until they are flush with the formers.

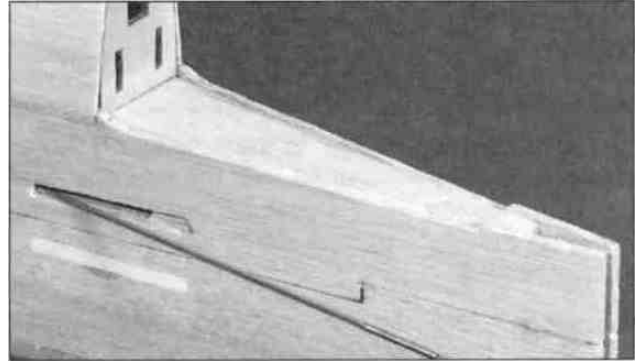


D 24. Shake or blow all the wood dust out of the fuselage, and glue the 3/16" x 1-3/8" x 24" balsa **aft fuse corners** (SKY6F19) to the fuselage as shown in the photo.



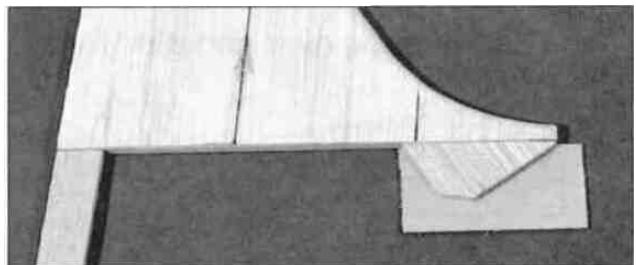
D 25. Use a razor plane and a coarse sanding block to rough shape the bottom fuse corners. You

can also use the full sheet of sandpaper trick to smooth out the corners.

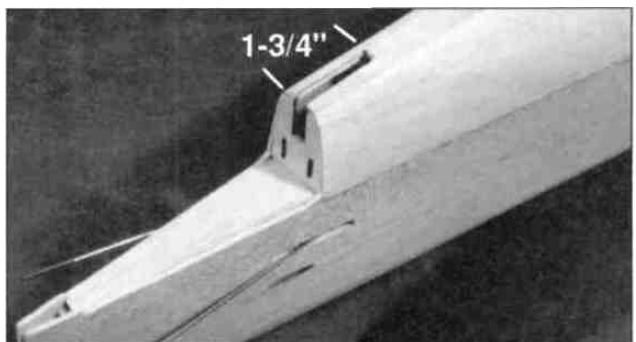


D 26. Securely glue the die-cut 1/8" balsa **stab base** (SKY6F09) in place at the rear of the fuselage. Sand the stab base after it is installed to remove any bumps and give the stab a flat gluing surface.

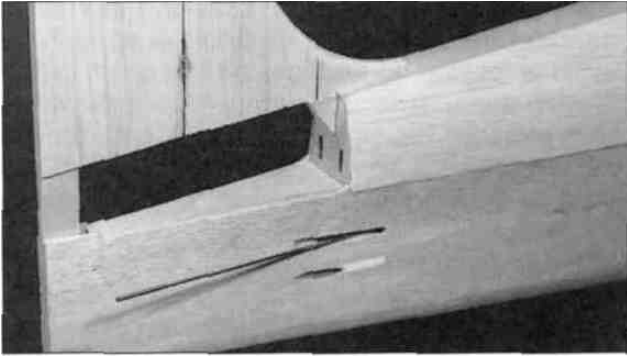
ATTACH THE TAIL SURFACES TO THE FUSELAGE



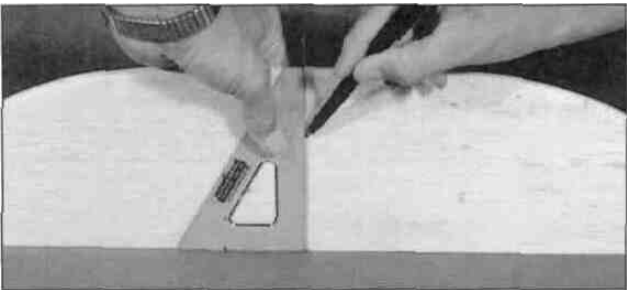
D 1. Use the remaining 1/16" x 1-3/8" x 24" hard balsa sheet to cover both sides of the tab on the bottom front of the fin. The grain should run longways (front-to-back) as shown in the photo. Trim and sand the sheeting to match the shape of the tab.



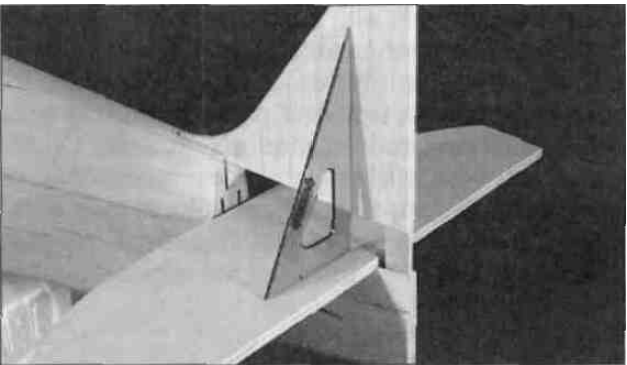
D 2. Cut a notch in the turtle deck top that is as wide as the notch in former F5 (approx. 5/16") and 1-3/4" long. Make sure it is directly over the former notch and pointing straight forward along the fuse centerline.



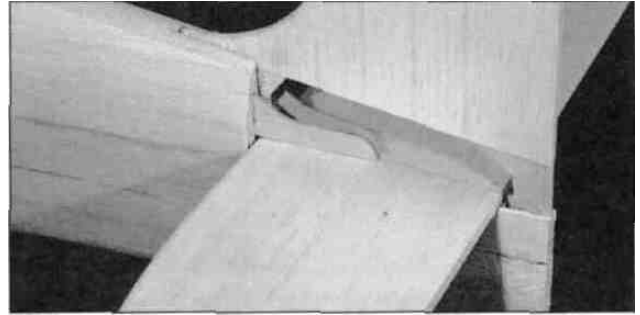
D 3. Test fit the fin in place. The fin post should butt up against the fuse bottom **and** the fuse doublers. Enlarge the notch if necessary to get the fin to fit properly. When satisfied with its fit, securely glue it in place.



D 4. Measure to the middle of the stab trailing edge and make a line perpendicular to the TE using a triangle.



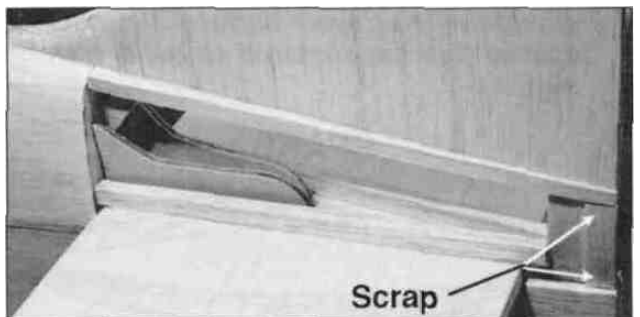
D 5. Position the stab in place to see how it fits against the fuse sides. Sand the stab "saddle" and/or the stab leading edge if necessary to allow the stab to fit **flat** against the balsa stab base. Use the triangle to make sure the stab is **perpendicular to the fin**. If it's not, sand the stab base until it is. When satisfied with the fit, securely glue the stab in place with epoxy. The line you drew earlier should be centered between the fuse sides and pointing **directly** forward. Use the triangle to keep the stab perpendicular to the fin while the glue cures.



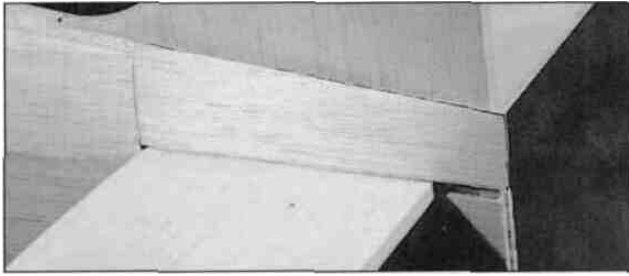
D 6. Install the die-cut 1/8" ply **stab hold downs** (SKY6F12) by gluing them to the stab and former F5. Slant them in towards the centerline as shown in the photo. Hold them tightly in place while the glue cures.



D 7. Make two fin fillet tops by drawing a line 6" from one end of a 3/16" x 1/4" x 24" balsa stick (SKY6S04) and tapering that 6" from 1/4" thick at the 6" mark to zero at the end. Glue these along the base of the fin so the top edge is even with the top of the turtle deck and continues along the same slope.



D 8. Cut two scraps of 1/16" balsa sheeting approximately 1/4" wide and 1-1/8" long. Glue one piece to each side of the fin post near the trailing edge. Cut two pieces of 3/16" x 1/4" stick approximately 5-5/16" long to fit between F5 and the fin post along the top surface of the stab. Glue them to the stab so the outside edge of each forms a straight line between the outside edge of F5 and the outside surface of the 1/16" scrap piece of sheeting. Carefully examine the photo on the previous page to get these positioned correctly.



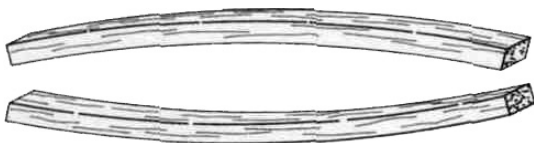
D 9 Cut two pieces of 1/16" balsa sheeting, from the scrap 1/16" sheeting you used on the tail surfaces, to fit on each side of the fin. They should be approximately **1-3/4"** on the front edge, **6-1/4"** long and **1-1/4"** tall at the rear. Sand the front edge so it will butt up against the turtle deck sheeting. Glue it first to the stringer on the stab, then to the edge of the turtle deck sheeting. Try to keep it even with the turtle deck sheeting so the fillet will not require a lot of filler later. Glue the sheeting to the fin post and the fillet top.

D 10. Carve and sand the fillet to smooth it out and blend it in with the turtle deck. Put a strip of masking tape along the fin to keep the sandpaper from sanding the fin. Use HobbyLite model filler if needed to obtain a smooth looking fillet.

WING

NOTE: *The following instructions explain how to build the wing on a flat surface, directly over the plans. The jig tabs will enable you to build a wing as straight as your work surface. No other special jigs are required to build your Skybolt.*

SPARS



Two warped spars installed this way will result in a straight wing

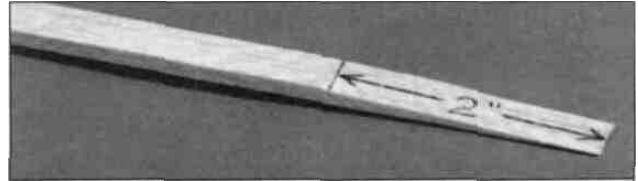
Two warped spars installed this way will result in a warped wing



D 1 Before using the hard balsa **spars**, examine them carefully for possible imperfections. Look for

knots, soft spots, diagonal grain and any other imperfections. If possible, position each spar so the imperfections (if any) are on the outer half of the wing panel (toward the tip), where they will be least affected by high stress. If the spars are warped slightly, try to balance them out by installing the warped spars in opposite directions (see sketch).

NOTICE: If you feel that any of the wing parts are unusable due to severe warps or other defects, give us a call and we'll replace the parts.



D 2 Sand one end of each 1/8" x 3/8" x 18" balsa **spar dabler** (SKY6W14) to a 2" taper as shown in the photo (8 spar doublers total).



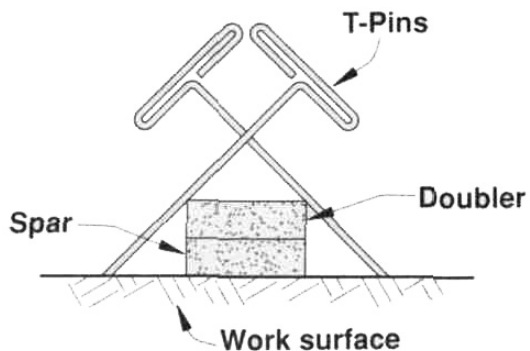
D 3 Glue one spar dabler to each of the eight 1/8" x 3/8" x 28" balsa **spars** (SKY6W12) with thick CA. Refer to the plans and align the spar and the doublers root ends with each other. Take your time and press the spar assembly flat against the work surface while the glue is curing. Also rotate the assembly onto its side and press it down to keep the dabler and spar aligned and straight. Do this on a flat work surface and most warps can be eliminated. Quickly wipe off any excess glue with a paper towel before it cures. Assemble all eight spars in this manner and sand the edges smooth.

BUILD THE BOTTOM WING

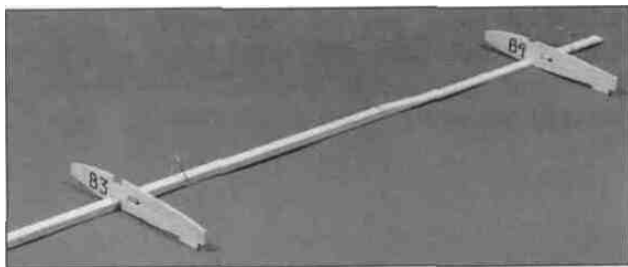
NOTE: It will be helpful to build the wing on a piece of "Celotex"* or other semi-soft (and flat) surface, into which you may easily stick pins to firmly hold down the wing parts while building, to avoid warps. *Available from lumber companies and home centers. The back surface of some 2' x 4' ceiling tiles may also work very well.

D D 1. Tape the BOTTOM wing plan to your flat work surface, and cover the wing drawing with waxed paper (so you won't glue the wing to the plan')

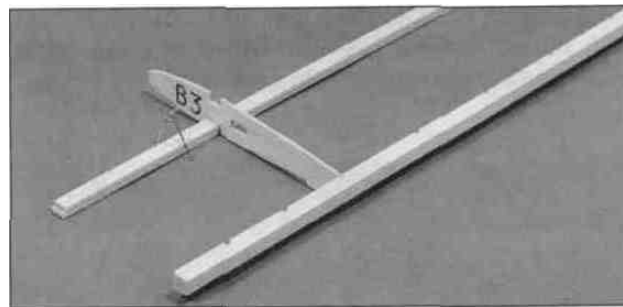
D D 2 Carefully punch out all the die-cut 3/32" and 1/8" balsa **BOTTOM wing ribs** (SKY6W01 and SKY6W03) Sand the edges **slightly** to remove any die-cutting irregularities or 'fuzz'.



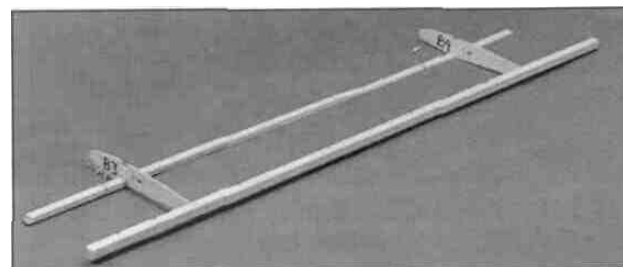
D D 3 Cross-pin one of the spars to the plan with the spar down and the doubler **up** and **near the root**. The tapered end of the spar doubler should be between the last B3 rib and the first B4 rib.



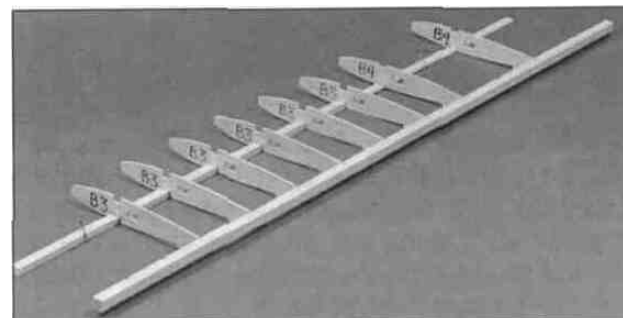
D D 4 Glue the first B3 rib onto the spar and **place** (do not glue) the outer B4 rib on the spar in its correct position. Use a 90-degree triangle to keep the ribs vertical.



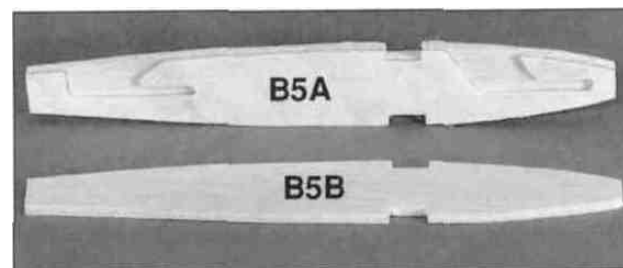
D D 5 The shaped and notched wing **trailing edges** (SKY6W17) are fastened together by a thin strip of balsa. Separate them by **cutting** with a hobby knife. Position a trailing edge (TE) in place by working the rear end of the B3 rib into the first 3/32" wide notch in the TE. Refer to the plans to help you correctly position the TE. Center (vertically) the TE on the B3 rib and glue it in place with thin CA.



D D 6 Use the notched TE to accurately position the outer B4 rib, and glue it to the spar and the TE.

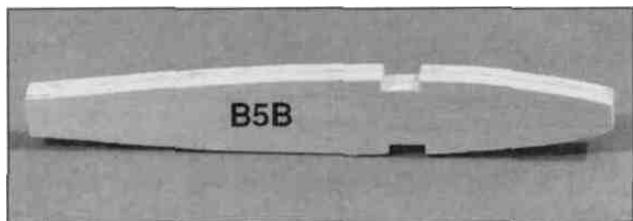


D D 7 Install the remaining B3 and B4 ribs. Glue them to the spar and the TE with thin CA. Make sure they are fully seated on the spar.

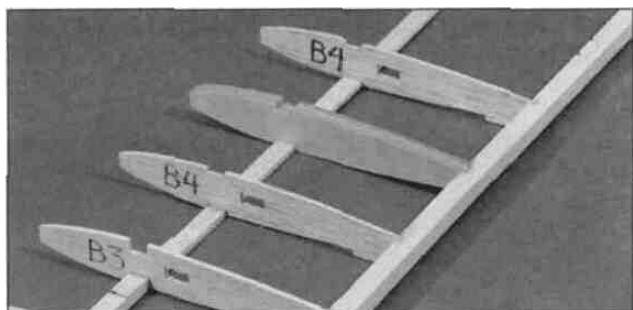


D D 8 Punch out the two die-cut 1/16" ply **B5A** ribs (SKY6W13) and the four die-cut 1/8" ply **B5B**

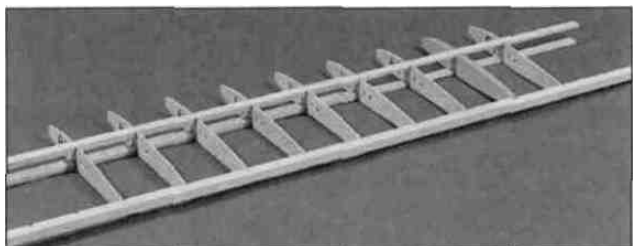
ribs (SKY6W11) Carefully glue **one** B5B rib to each B5A rib using thick CA. Use the glue sparingly to avoid getting glue in the I-strut cut-outs



D D 9 Carefully glue a B5B in place on the other side of each B5A. Again be careful with the CA to avoid getting it in the I-strut cut-outs

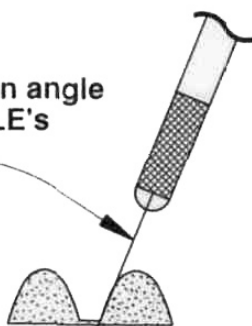


D D 10 Glue a B5 assembly in place on the spar with the cut-outs (slots) **on top**



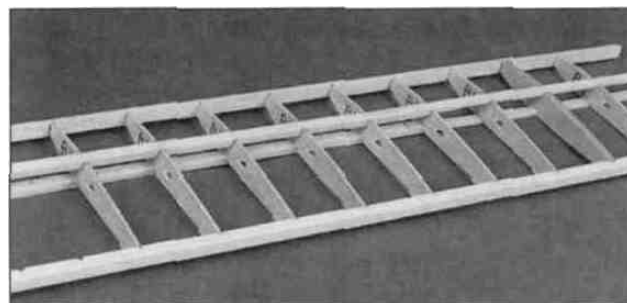
D D 11 Glue the **top spar** in place (with the doubler down). Make sure it is fully seated in the notches so it does not protrude above the top surface of the ribs. Remember, the spar doubler stops just before the first B4 rib

Hold the knife at an angle when cutting the LE's apart



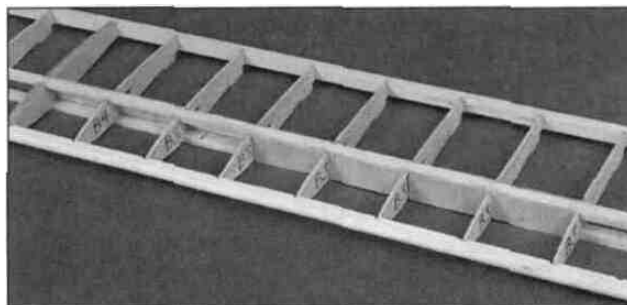
D D 12 The shaped balsa **Leading Edges** (SKY6W15) are connected by a thin strip of balsa. Cut the two LE'S apart and carefully trim the

"flashing" off the edges. Be careful to cut at the angle shown so you don't change the width of the leading edges during this step



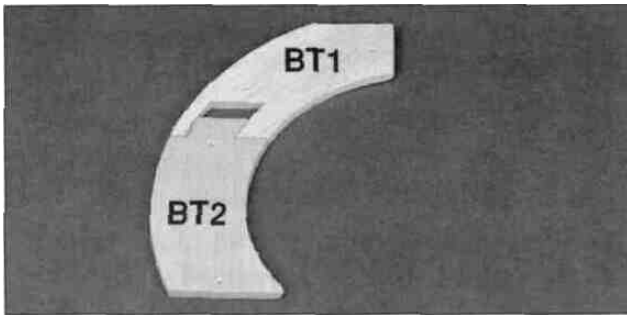
D D 13 Line up the 3/8" wide notch in the LE with the B5 rib assembly and test fit the leading edge in place. Center (vertically) the LE on each rib and glue it with CA.

NOTE: In the following steps you'll find it necessary to remove some of the pins holding the wing down to your building board. As you do, take other steps as necessary to continue holding the wing down, such as by applying weight to the top of the wing, or by relocating the pins.

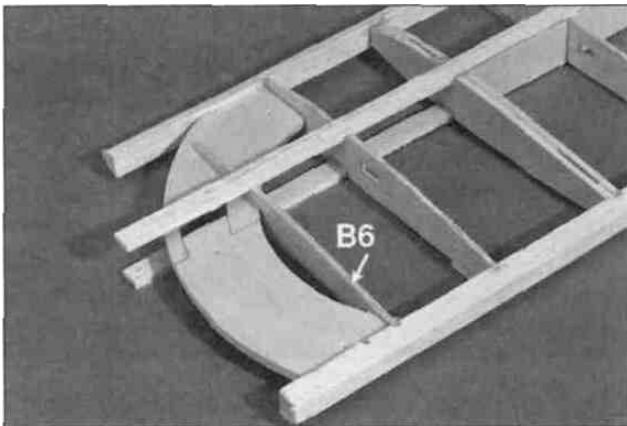


D D 14 Glue the pre-cut 1/16" balsa vertical grain **shear webs** (SKY6W27) to the **rear edge** of the spars in the first 7 rib bays (from B3 to B5). Also glue shear webs onto the **front edge** of the spars in the first 4 rib bays. **NOTE:** You may wish to trial fit and trim each web before gluing it in. **The webs must be securely glued to the spars**

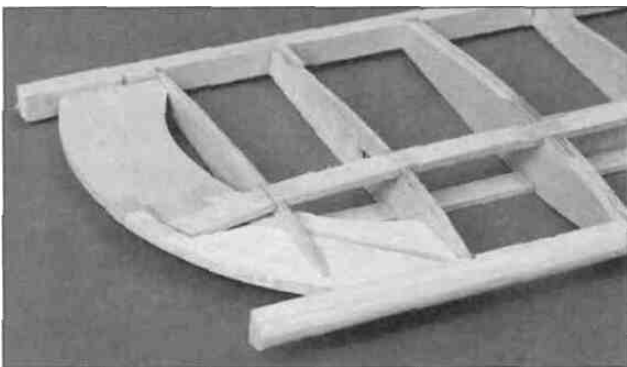
D D 15 Trim off the **root** end of the spars and TE **slightly** longer than their correct length (approx 1/64" longer). Later, when the two wing halves are joined together, they will be sanded to the correct length.



D D 16 Assemble a **bottom wing tip** by gluing a **BT1** to a **BT2** (SKY6W05) as shown in the photo. Sand both sides of the wing tip smooth.



D D 17 Set rib **B6** (SKY6W01) in place but do not glue it yet. Slide the wing tip into place through rib B6 to check its fit. When satisfied with the fit, glue the wing tip to the leading and trailing edges and to rib B4. Glue rib B6 in place, but **do not glue it to the spars yet**. Make sure the wing tip is centered vertically on the leading and trailing edges.



D D 18 Use a razor saw to make a cut about **halfway** through each spar near the outside edge of rib **B6**. This will allow the spars to bend there without affecting the rest of the wing. Cut the spars to the correct length so they will fit down into the wing tip cut-out. Glue the spars to one another, rib B6 and the wing tip so they are centered in the

wing tip cut-out. After this glue has cured, add thick CA to each spar in the razor saw slit to reinforce the joint there.

D D 19 Cut the leading and trailing edges off to match the contour of the wing tip. Do not sand or shape them yet.

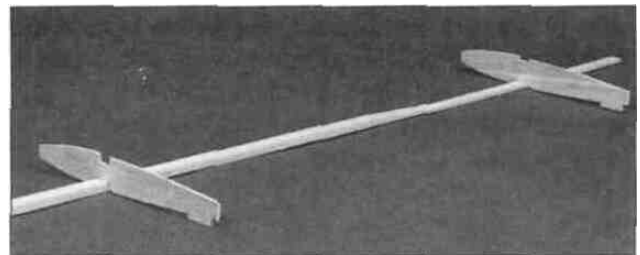
D D 20. Go back to step 1 and assemble the other wing half. **Be sure to build a right and a left wing panel!** This is all we will do to the bottom wing until later.

BUILD THE TOP WING

D D 1 Tape the **TOP** wing plan to your flat work surface, and cover the wing drawing with waxed paper (so you won't glue the wing to the plan!) **IMPORTANT: Do not cut the left and right wing panel drawings apart. The wing halves are joined over the plans to achieve the correct sweep.**

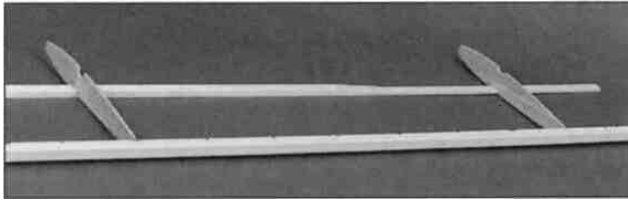
D D 2 Carefully punch out all the die-cut 3/32" and 1/8" balsa **TOP wing ribs** (SKY6W01 and SKY6W02). Sand the edges **slightly** to remove any die-cutting irregularities or "fuzz".

D D 3 Cross-pin one of the spars you assembled earlier to the plan with the spar down, and the doubler up and near the root. The tapered end of the spar doubler should end between the last T5 rib and the first T6 rib.

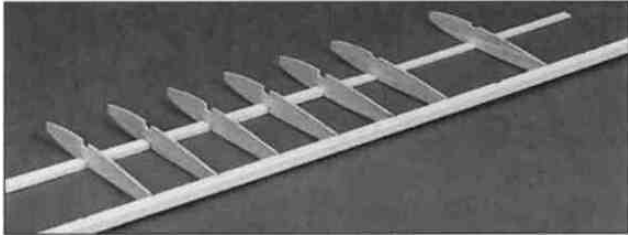


D D 4 Glue the first **T5** rib onto the spar and **place** (do not glue) the outer **T6** rib on the spar in its correct position. Use a 90-degree triangle to keep the ribs vertical.

D D 5 Position a TE in place by working the rear end of the T5 rib into the second 3/32" wide notch in the TE. Refer to the plans to help you correctly position the TE. Center (vertically) the TE on the T5 rib and glue it in place with thin CA.



D D 6. Use the notched TE to accurately position the outer T6 rib and glue it to the spar and the TE.

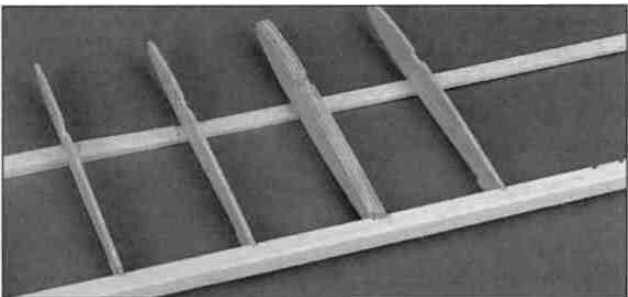


D D 7. Install the remaining T5 and T6 ribs. Glue them to the spar and the TE with thin CA.

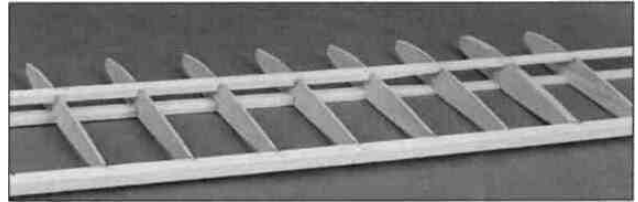


D D 8. Punch out the two 1/16" ply **T7A** ribs (SKY6W13) and the four 1/8" ply **T7B** (SKY6W11) ribs. Carefully glue **one** T7B rib to each T7A rib using thick CA just as you did earlier for the bottom wing. Apply the glue to the T7A ribs and use the glue sparingly to avoid getting glue in the I-strut cut-outs.

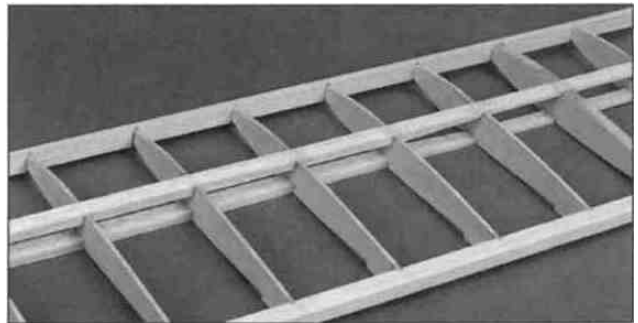
D D 9. Carefully glue a T7B in place on the other side of each T7A's. Again, apply the glue to the T7A rib and be careful with the CA to avoid getting it in the cut-outs. Apply thin CA around the edges of the rib assembly but do not get it in the slots.



D D 10. Glue a T7 assembly in place with the cut-outs (slots) **on the bottom**.

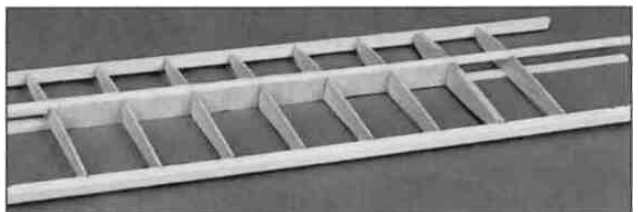


D D 11. Glue the **top spar** in place (with the doubler on the bottom). Make sure it is fully seated in the notches so it does not protrude above the top surface of the ribs. Remember, the spar doubler stops just before the first T6 rib.

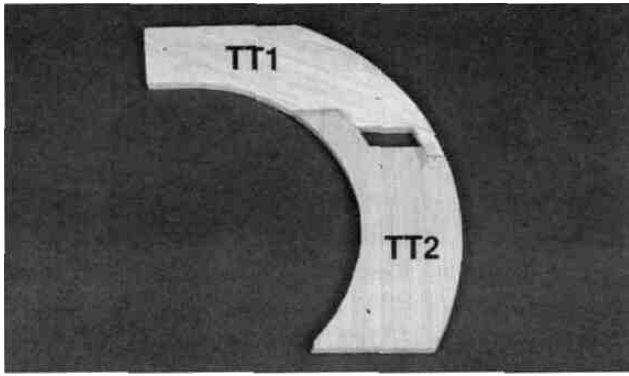


U U 12. Test fit a leading edge in place. Center it vertically on each rib and glue it with CA.

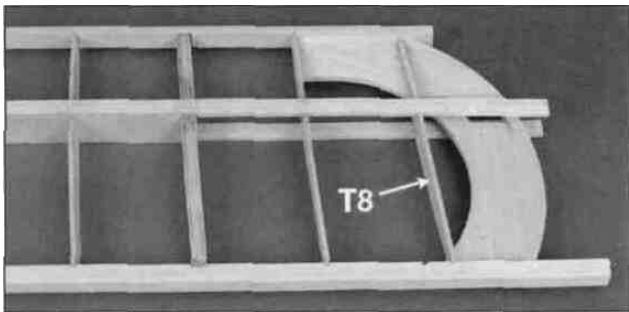
NOTE: In the following steps you'll find it necessary to remove some of the pins holding the wing down to your building board. As you do, take other steps as necessary to continue holding the wing down, such as by applying weight to the top of the wing, or by relocating the pins.



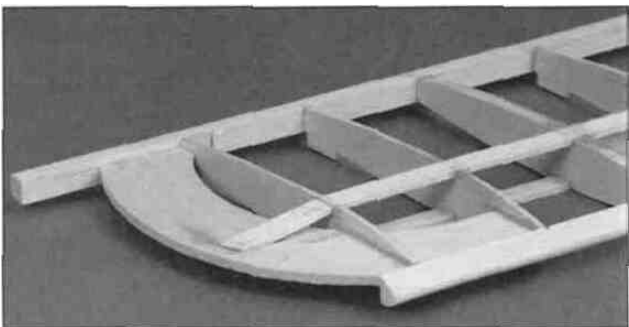
D D 13. Glue the pre-cut 1/16" balsa vertical grain **shear webs** to the **rear edge** of the spars in the first 6 rib bays (from T5 to T7). Also glue shear webs on the **front edge** of the spars in the first 4 rib bays. **NOTE: You may wish to trial fit and trim each web before gluing it in. The webs must be securely glued to the spars.**



D D 14. Assemble a **top wing tip** by gluing a **TT1** to a **TT2** (SKY6W05) as shown in the photo. Sand both sides of the wing tip smooth.



D D 15 Remove the wing from the work surface and set rib **T8** (SKY6W01) in place but **do not glue it yet**. Slide the wing tip into place through rib T8 to check its fit. When satisfied with the fit, glue the **wing tip** to the leading and trailing edges and rib T6. Make sure the wing tip is centered on the leading and trailing edges. Glue rib T8 to the wing tip, the spars, the leading edge and the trailing edge.

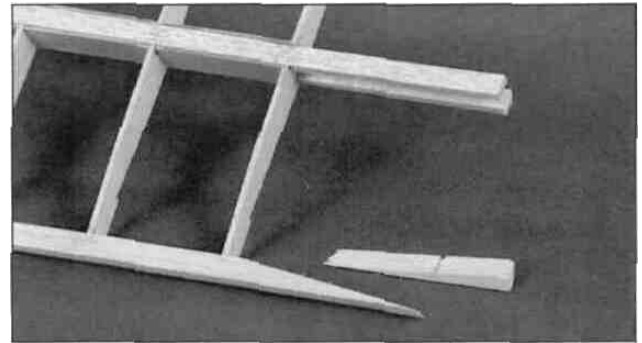


D D 16. Use a razor saw to make a cut about **halfway** through each spar near the outside edge of rib **T8**. This will allow the spars to bend there without affecting the rest of the wing. Cut the spars to the correct length so they will fit down into the wing tip cut-out. Glue the spars to one another and the wing tip so they are centered in the wing tip cut-out. After this glue has cured, add thick CA to each razor saw slit to reinforce the joint there.

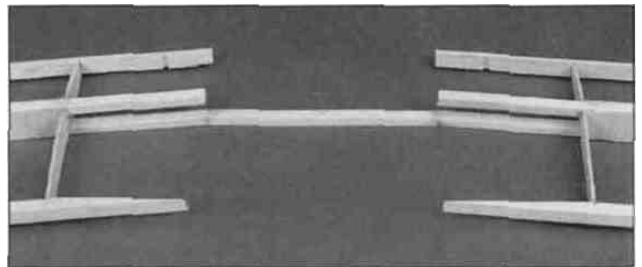
D D 17 Cut the leading and trailing edges off to match the contour of the wing tip. Do not sand or shape them yet. Cut the root end of the LE, the TE and the spars to the correct length.

D 18. Go back to step 1 and assemble the other wing half. **Be sure to build a right and a left wing panel!**

JOIN THE TWO TOP WING HALVES

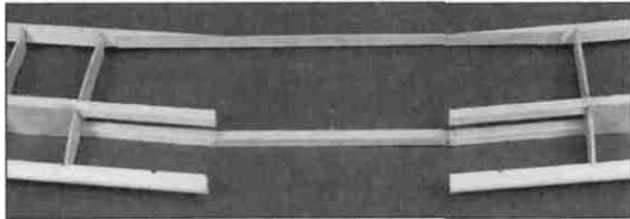


D 1. Pin the top left wing panel in place over the plans. Cut and/or sand the front edge of the trailing edge to a taper as shown on the plans so it will accept the 1/16" ply rear brace. Do this to the right wing panel also. Remove the wing panels from the plans.

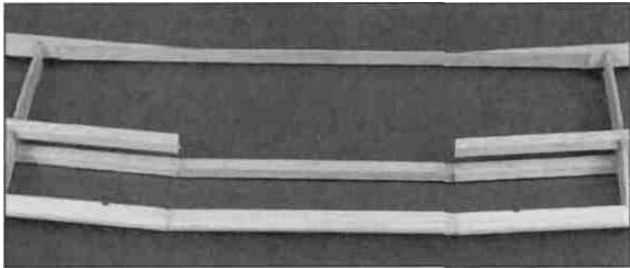


D 2. Locate the 1/4" x 3/8" x 6-1/4" **balsa center spars** (SKY6W36) Pin one of the center spars in place over the plans. Position both wing panels so they butt against the center spar and **accurately** line up with the plans. Securely glue the center spar to each wing panel.

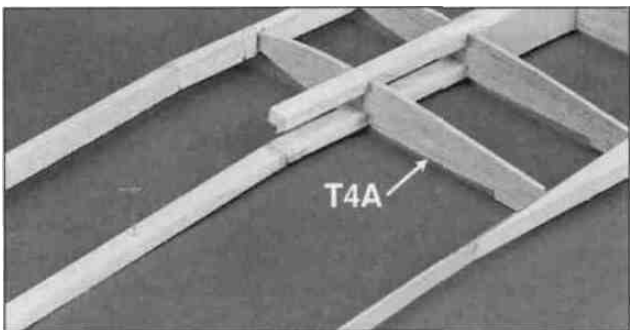
IMPORTANT - keep both wing panels flat on the work surface during the following steps.



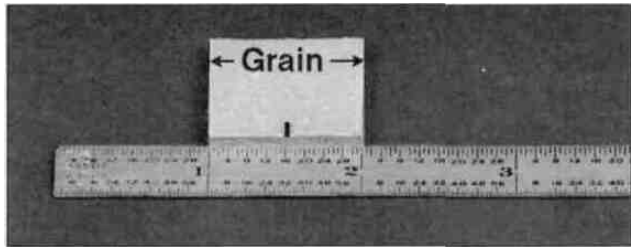
D 3 Test fit the 1/16" x 3/8" x 12-3/4" ply **rear brace** (SKY6W29) in place against the trailing edges. Sand the trailing edges if necessary to achieve a good fit here. Glue the rear brace in place so it is centered vertically on the trailing edges.



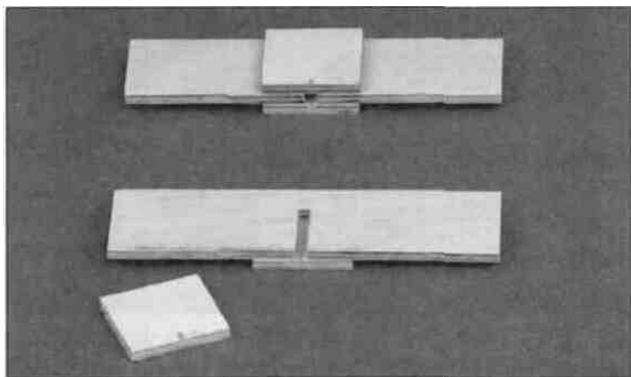
D 4 Trial fit the shaped balsa **center leading edge** (SKY6W16) in place between the wing panels. It is cut slightly long so trim it until it fits between the wing panels. Make sure the wing panels are lined up with the plans to achieve the proper sweep and glue the center leading edge in place.



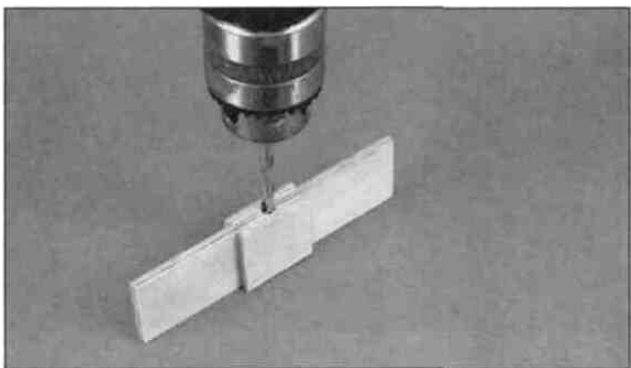
D 5. Test fit the die-cut 3/32" balsa **T4A** ribs (SKY6W01) in place. You may cut the ribs in half between the spar notches if needed to make them easier to install. Sand them if needed to get a good fit, and glue them in place with CA.



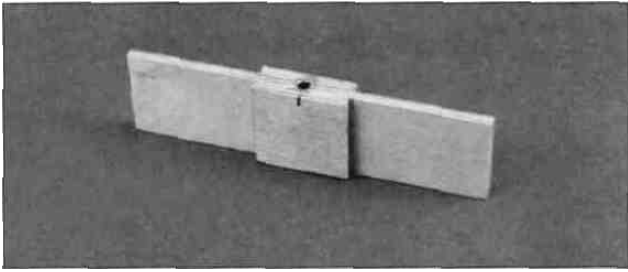
D 6. Locate the four 1/8" x 1" x 1" ply **top plate doublers** (SKY6W32) and mark the middle of one side of each one. Make the mark on a side that the grain runs along.



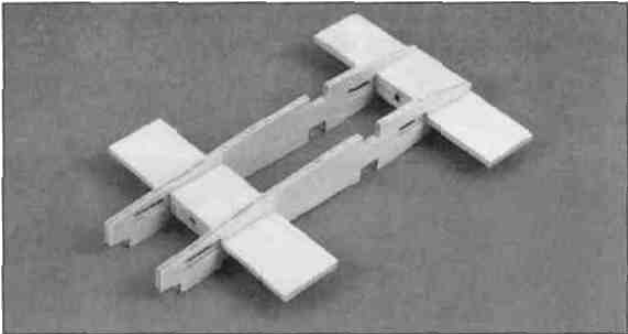
D 7. Securely glue a top plate doubler to each side of both 1/8" x 1" x 3-7/8" ply **top plates** (SKY6W31) so the marks are centered in the slot in each holder.



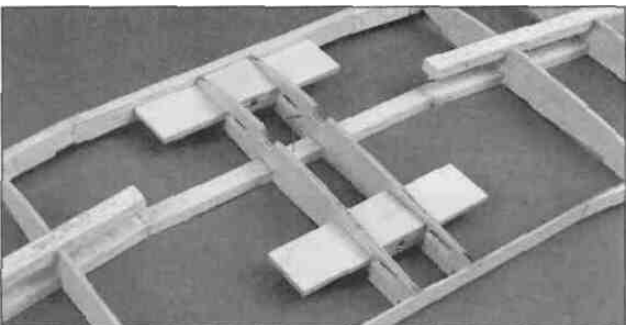
D 8. Drill a 5/32" hole in the edge of the assembled plate using the slot to guide the drill bit. Try to keep the drill perpendicular to the plate during this step. **NOTE:** A drill press is helpful during this step. Measure the depth of the hole (using the drill bit) to make sure it is between 3/4" and 7/8" deep. **Caution: Do not drill all the way through the plate!**



D 9 Scuff up the outside of each 5/32" brass tube with sandpaper. Clean out the inside of the tube. Apply a small amount of 15-minute epoxy to the **outside** of the **unchamfered** end of the tube and insert this end in the 5/32" hole. Press the tube **completely** into the hole. If part of the tube is still sticking out of the plate, just sand or cut it off with a razor saw and chamfer it by hand.



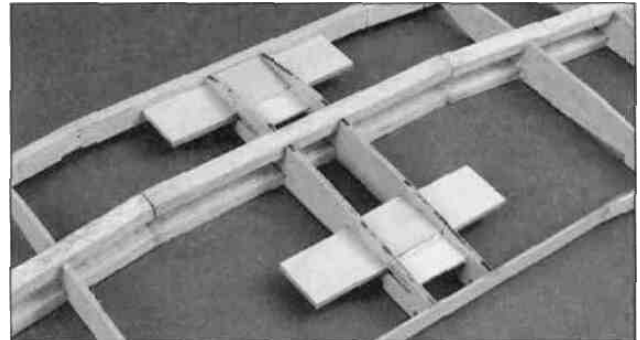
D 10 Slide the 1/8" die-cut ply **T1** ribs (SKY6W10) onto both plates as shown in the photo. Notice that the brass tubes are open towards the TE of the ribs.



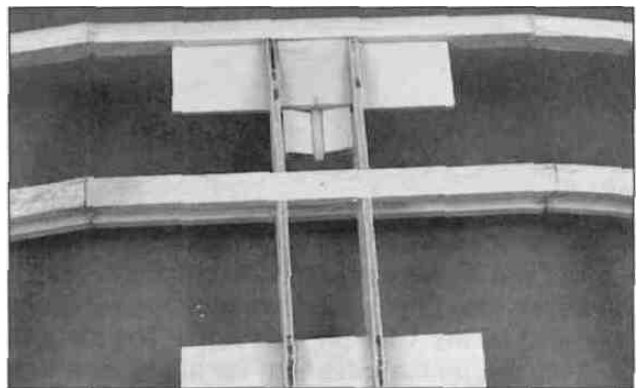
D 11. Place the T1/plate assembly on the bottom center spar, and adjust it so the ribs and brass tubes are correctly positioned with respect to the plans. Position the front plate so it is centered (up and down) on the leading edge, and glue it to the leading edge. **NOTE:** When it is correctly positioned, it will be level and there will be a 1/16" "ledge" for the wing sheeting on the top and the

bottom of the T1 ribs. Correctly position the TE of the T1 ribs and glue them to the TE brace and the bottom spar. Slide the rear plate all the way forward in its slot and securely glue it to the T1 ribs. Glue the ribs to the front plate.

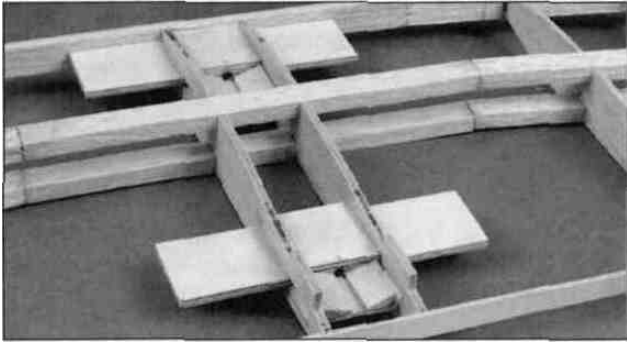
D 12. Test fit the 1/4" x 3/8" x 6-1/4" **top center spar** (SKY6W36) in place. Sand it if needed to make it fit nicely and glue it in place.



D 13. Slide the two 1/16" x 5/8" x 1-1/4" ply **wire stops** (SKY6W33) in place. Notice that they are glued to the **top** of their slots so their **bottom surfaces are level with the top of the brass tubes**. They will help guide the wires into the tubes. Securely glue them in place.

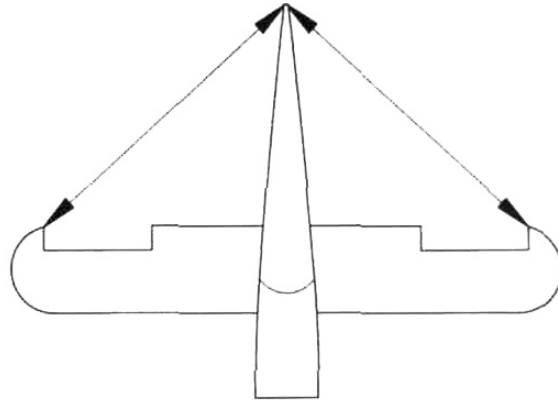


D 14. Cut a piece of inner pushrod tubing 1-1/2" long from the remainder of the 6-1/2" long piece supplied (PLTB004). Flip the wing over and temporarily insert the 1/2" long piece into the front brass tube. The two front 1/4" x 3/8" x 1/2" basswood triangle **wire guides** (SKY6W37) need to be installed now. They are glued to the bottom of the wire stops so they are approximately 1/64" away from the inner pushrod tube. Be careful so you don't glue the inner tube into the brass tube. **NOTE:** Make sure the plastic pushrod tube is straight during this step.

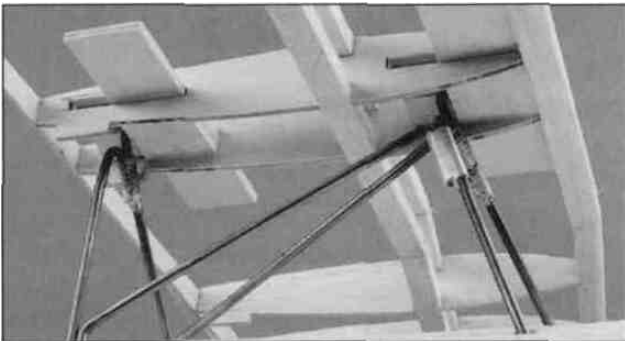


D 15 Insert the inner tube in the rear holder (you'll have to bend it to do so) and install the rear 1/4" basswood triangle wire guides. Make sure the inner tube is straight during this step. Remove the inner tube.

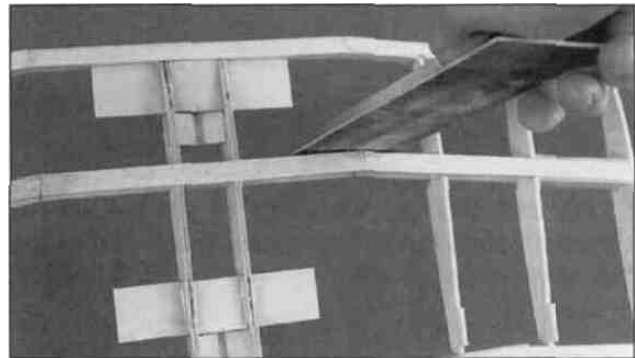
These measurements must be equal!



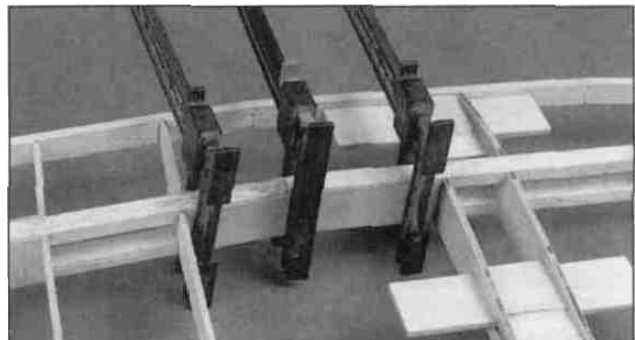
D 17. Check the alignment of the top wing by measuring from the aft end of the fuselage to each wing tip as shown in the sketch. If you are not satisfied with the alignment of the wing (the measurements must be within 1/4" of being equal), you may cut the TE of the T1 ribs loose, adjust the wing, and re-glue the ribs.



D 16 Test fit the wing onto the cabane wires. To do so, just drop the wing down onto the wires until the wires hit the 1/16" ply wire stops. The triangles will help line up the wires with the tubes. Now slide the wing backwards until it will go no further. Look at the cabane wires from underneath the wing to see if they are fully inserted into the brass tubes as shown in the photo. If the wing does not easily slide onto the cabane wires, it is usually because the wires are not correctly aligned. Follow the guidelines outlined in the last step to adjust the wires until the wing will slide all the way on. Bend the wires a little at a time and frequently check the fit of the wing as you go. The easiest way to remove the wing is to wrap your fingers around the rear cabane wires and gently push on the trailing edge of the wing.

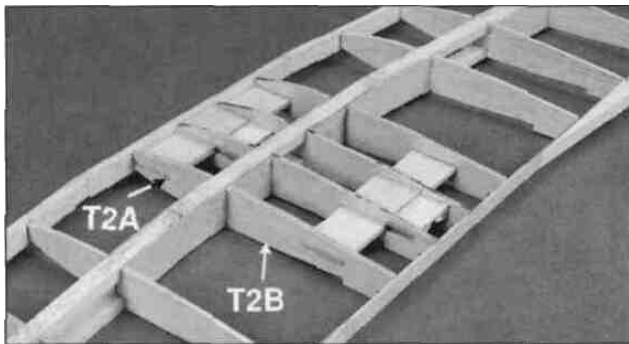


D 18 Sand the **front** corner of the center spar/spar junction to remove the sharp corner. Sand the front and rear surfaces of the spars to remove any bumps.

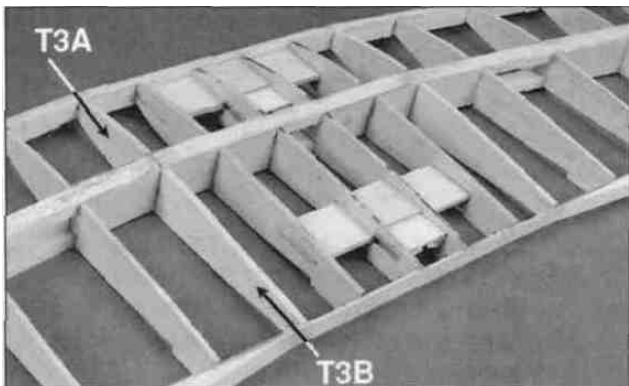


D 19. Test fit the die-cut 1/32" ply **top** wing joiners (SKY6W06) in place on the front and the

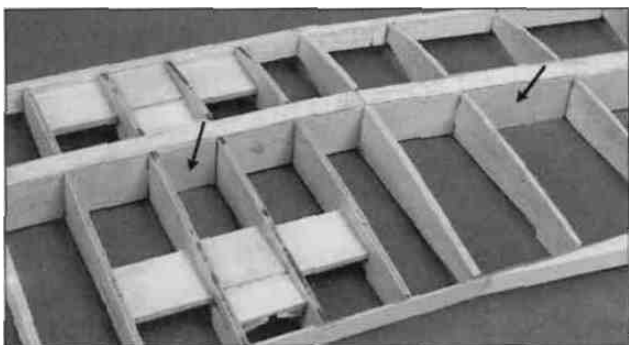
back of the spars. Sand them if needed to make them fit between ribs T1 and T4. Securely glue the braces in place with either thick CA or epoxy. Clamp the braces together until the glue cures.



D 20 Punch out the die-cut 1/8" ply **T2A** and **T2B** ribs (SKY6W10) and trial fit them in place. Sand them if necessary to get them to fit nicely. Do not let the T2B's bend the trailing edge brace. Glue these in place with CA.



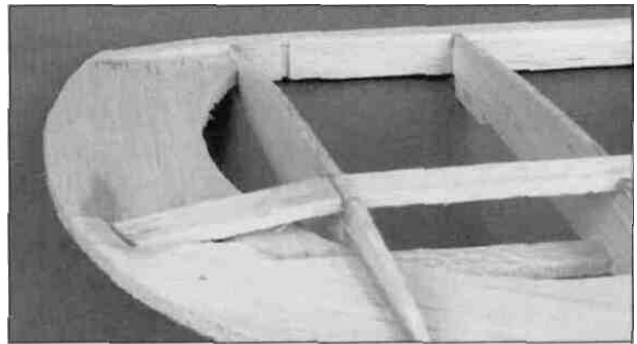
D 21 Trial fit the die-cut 1/8" balsa **T3A** and **T3B** ribs (SKY6W04) in place. Sand these if necessary to achieve a good fit and glue them in place.



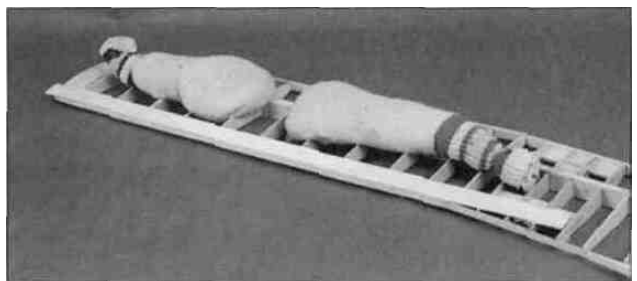
D 22 Install 1/16" balsa shear webs on the front and the back of the spars between the T1 ribs and in the bays between the T4 and T5 ribs.

D 23. Glue the 1/4" x 3/8" x 3/4" basswood **screw blocks** (SKY6W39) to the **outside** of each T1 rib. They should be located just behind the rear top plate as shown on the plans and flush with the **bottom** of the ribs.

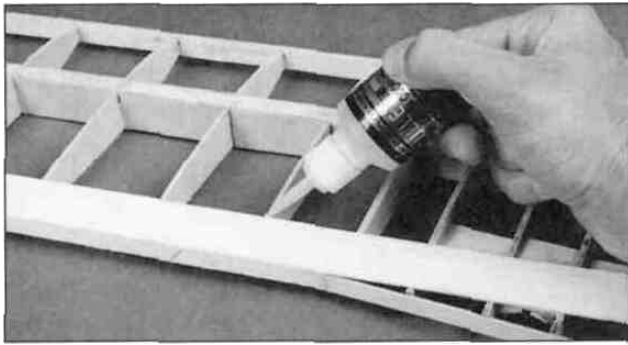
INSTALL THE TOP WING SHEETING



D 1 Sand the outer tip of the trailing edges to fair them in with the wing tips as shown in the photo.



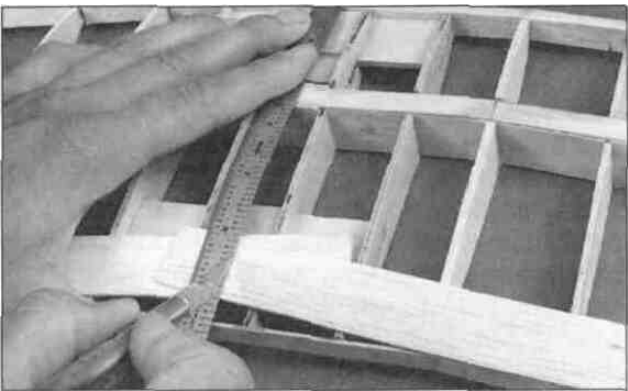
D 2 Lightly sand the tops of the ribs to blend with the notched trailing edge. The 1/16" x 7/8" x 29" balsa **trailing edge sheeting** (SKY6W20) is installed now. This has to be done on an absolutely flat surface or the wing will not end up straight. Apply thick CA to one of the TE'S (except on the tapered part past T7) and press a trailing edge sheet in place. Allow the tip end to slightly overlap the wing tip. Hold the sheeting in place until the glue cures. **NOTE:** The edge of the TE sheet may not be exactly straight, but just position the sheet so it slightly overlaps the TE, and any overlap can be sanded off flush with the TE later.



D 3. Now apply a drop of thin CA to each rib (except the center ribs) where the sheeting contacts it. Do not cut the sheeting off at the center or ends yet.

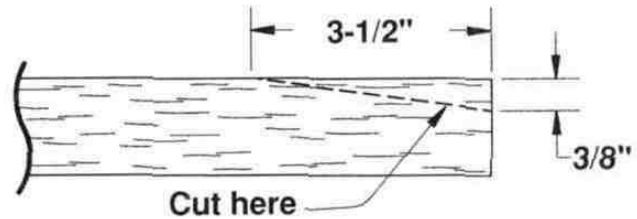


D 4. Install the trailing edge sheeting on the opposite wing panel. Allow the two pieces to overlap at the center for now.



D 5. Line up a metal straightedge with the center of the wing and cut (with a **sharp** blade) through both layers of trailing edge sheeting. Remove the excess and glue the two pieces together and to the ribs.

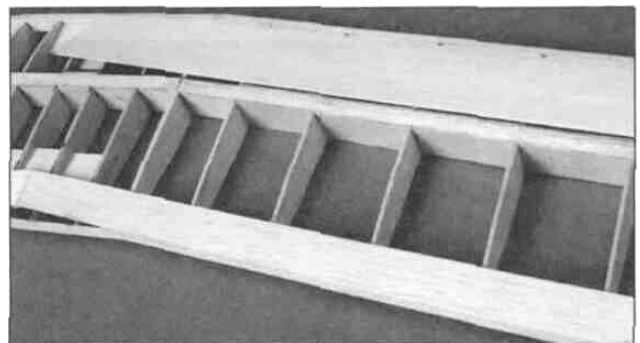
D 6. Before applying the leading edge sheeting in the next steps, use your sanding block to lightly sand off the edges of the shear webs and smoothly blend the ribs to the spar. Also, clean up the LE rib joints to remove any excess glue.



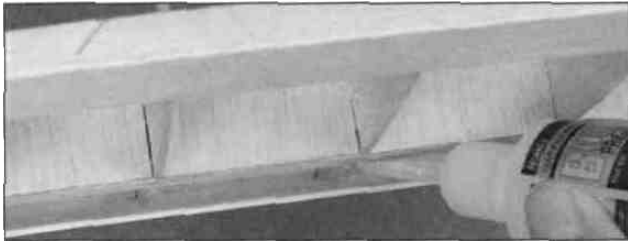
D 7. Make the leading edge sheeting by cutting a **3-1/2" x 3/8" triangle** off **one** end of each of the four 1/16" x **2-1/4"** x 29" balsa **top wing LE sheets** (SKY6W21) as shown in the sketch above.

D 8. Trial fit one of the LE sheets in place on the top of one wing panel. Trim or sand the sheet if necessary to make it fit nicely against the LE. Do not cut it to the correct length yet.

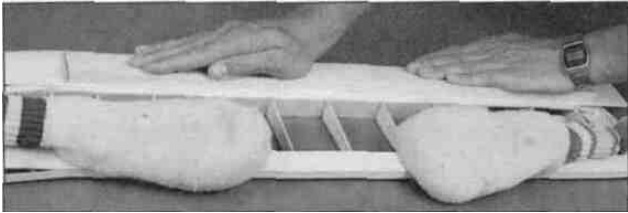
NOTE: It will be helpful to have the following items handy for the next steps . . . thin CA, thick (slow cure) CA, a straight piece of wood such as an aileron, and a wet cloth.



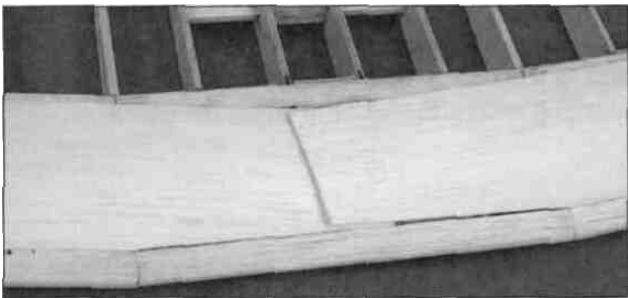
D 9. Hold the sheeting tightly against the LE at a slight angle so it rests down on the ribs at the LE. Use **thin CA** to glue the sheeting to the **LE only**. Do not glue it to the ribs, spars or center LE yet.



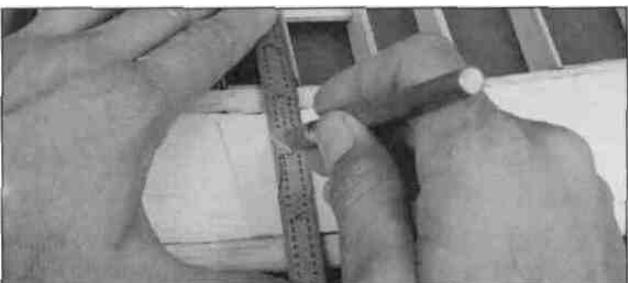
D 10. Tilt the wing up, with the **LE down**, and apply a drop or two of thick (slow curing) CA to each rib. Hold the wing at an angle so the glue will flow down and coat the edge of each rib. Apply a line of glue to the **front half** of the spar (except where the spar bends at the wing tip).



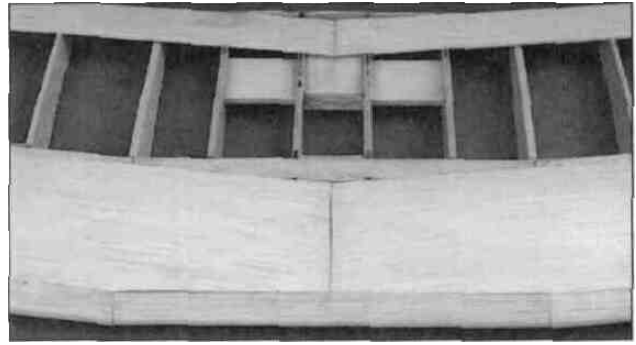
D 11. Immediately place the wing on your **flat** work surface and use a piece of wood (an aileron works OK) to hold the sheeting in place while the glue cures. It is important to keep the wing flat during this process as the LE sheeting will "lock" the wing together. We won't glue the sheeting to the wing tip until later.



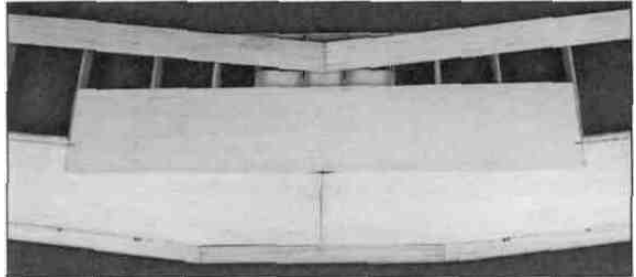
D 12. Install the opposite wing panel top sheeting following the same procedure. Allow the center end of the sheeting to overlap the LE sheeting already installed.



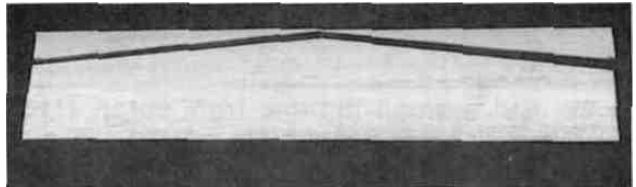
D 13. Trim the LE sheeting using a metal straightedge just as you did with the TE sheeting.



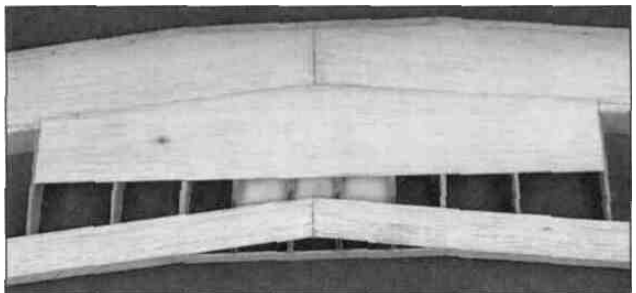
D 14. Glue the LE sheeting to the center LE, the center ribs and to each other.



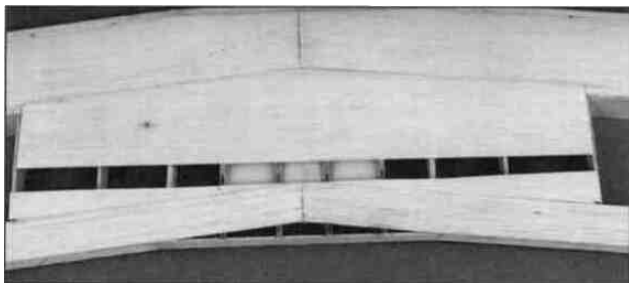
D 15. Position one of the 1/16" x 2-5/8" x 13-1/2" balsa **wing center sheets** as shown in the photo and mark where it intersects the LE sheeting. Also mark the front center of the sheet.



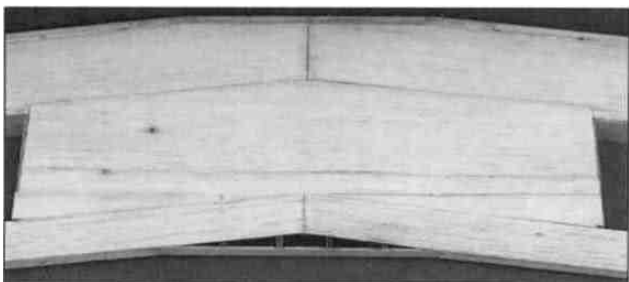
D 16. Cut the center sheet on the marks you just made. Save the two triangles.



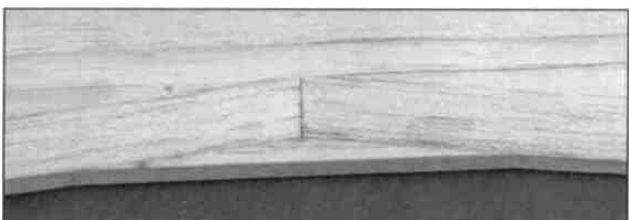
D 17. Glue the wing center sheet in place against the LE sheeting. Make sure the wing is flat during this step.



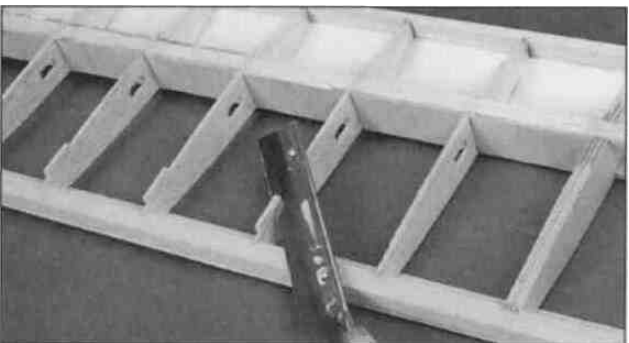
D 18. Glue the two triangles you cut off the center sheet to the trailing edge sheeting as shown in the photo. After the glue cures, use a metal straight edge as a guide to trim the **front edge** of the triangles straight and even with each other.



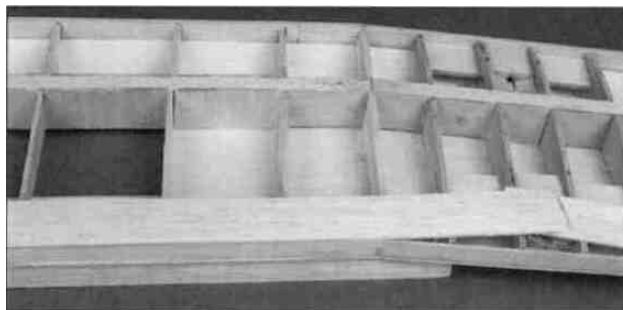
D 19. Cut a strip of balsa center sheeting to fit in the gap and glue it in place.



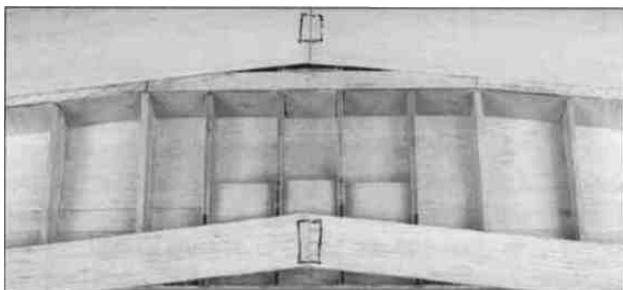
D 20. Cut a small triangle from scrap 1/16" sheeting to fit **behind** the trailing edge sheeting at the center. Glue it in place.



D 21. Flip the wing over and carefully trim off the **jig tabs** on the bottom of the wing. A razor saw works well for this. Use a sanding block with fine grit sandpaper to touch up where the tabs were and to blend the ribs into the TE. **Be careful not to change the shape of the ribs.**

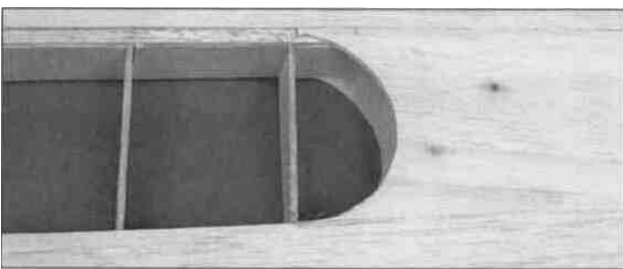


D 22. Add two 1/16" x 7/8" x 28" balsa **TE sheets** just as you did earlier on the top surface. Do one panel at a time and be careful to keep from warping the wing during these steps. **HINT: Do not get glue in the I-strut slot** when gluing the sheeting to rib T7. An aileron placed under the TE will keep it straight while the glue is curing.

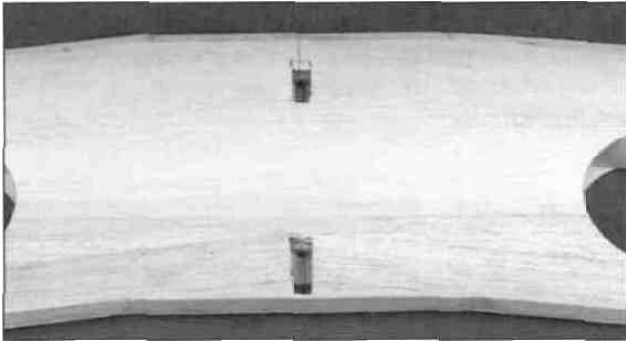


D 23. Install the remaining two 1/16" x 2-1/4" x 28" **top wing LE sheets**, using the same procedure outlined in steps 8 - 14. Be very careful when applying glue to the T7 ribs to avoid getting glue in the I-strut slots. Mark on the LE and the TE sheeting where the cabane wires will attach.

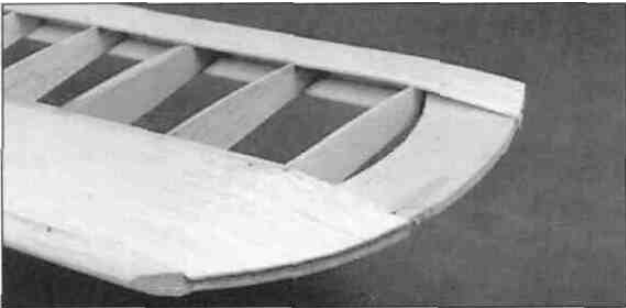
D 24. Install the bottom center sheeting just as you did on the top surface. Refer to steps 15 through 20 for instructions.



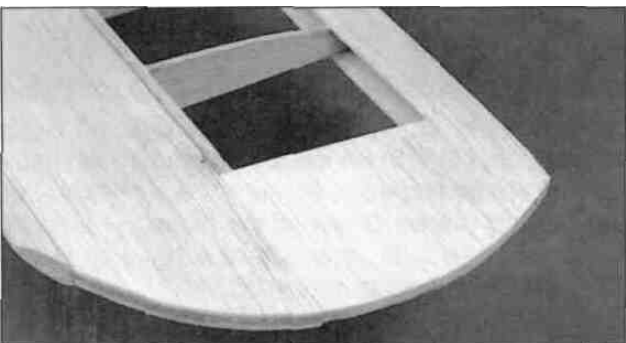
D 25. Cut a semi-circle or similar shape out of the sheeting between ribs T4 and T5 as shown in the photo. Do this on both the top and the bottom of the wing.



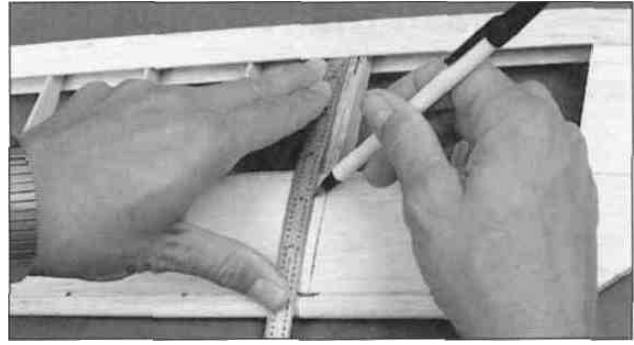
D 26. Cut a rectangle out for each cabane wire. Start the rectangle out small and gradually enlarge it to allow the wires to easily slip into place. When the rectangles are correctly sized so the wing will easily slip on and off without hitting the wood, soak the area around the rectangle with thin CA to reinforce the wood. A small strip of very light fiberglass cloth (3/4 oz. or so) can also be used to reinforce this area.



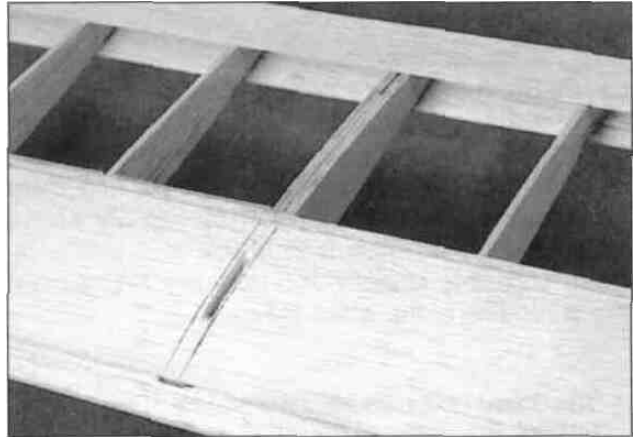
D 27. Wet the LE and the TE sheeting at each wing tip. Allow it to soak in for about 5 minutes. Then press the sheeting up against the wing tip and glue it in place with CA. Do the top and bottom sheeting at the same time to keep from bending the tip.



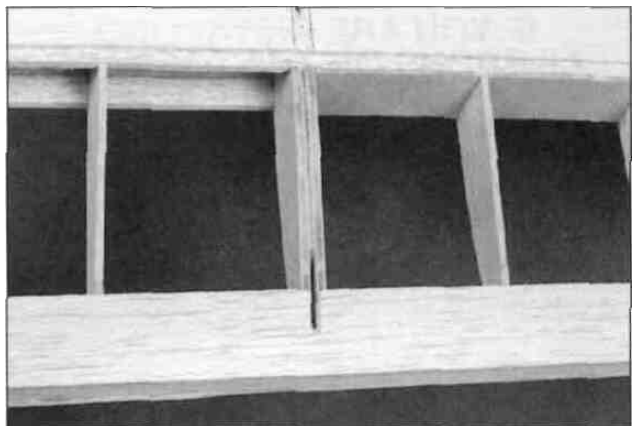
D 28. Use a 1/16" x 2-5/8" x 13-1/2" piece of balsa **wing center sheeting** to finish sheeting the wing tips. Cut a piece about **2-3/4"** long (to fit over rib T8) and glue it up against the LE sheeting. Then fill in the gap with some scrap 1/16" balsa. Trim the ends to the shape of the wing tip and sand the tip smooth. Do this to the top and the bottom of both wing tips.



D 29. Use a straightedge to draw lines on the LE sheeting along the edges of the T7 rib assemblies **as** shown in the photo.

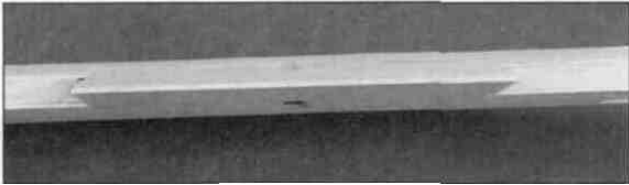
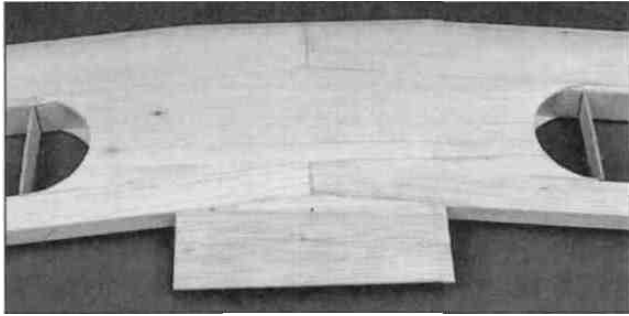


D 30. Carefully cut through the LE sheeting to expose the **front** I-strut slot. Take your time and cut a little at a time to end up with a neat looking slot similar to the one in the photo. Notice that the edges of the slot are tapered outward to make it easier to install the I-struts later.

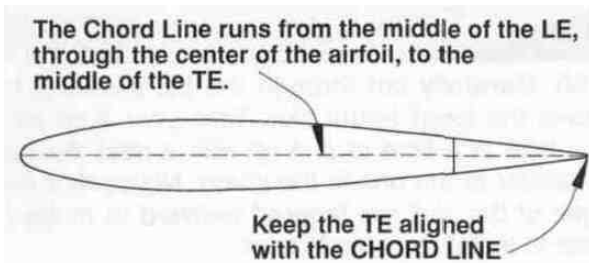


D 31. Cut through the TE sheeting to expose the rest of the **rear** I-strut slot. The front portion of the rear slot will be cut out later after the cap strips have been installed. Pick or blow all the balsa scraps out of the slots when you are done.

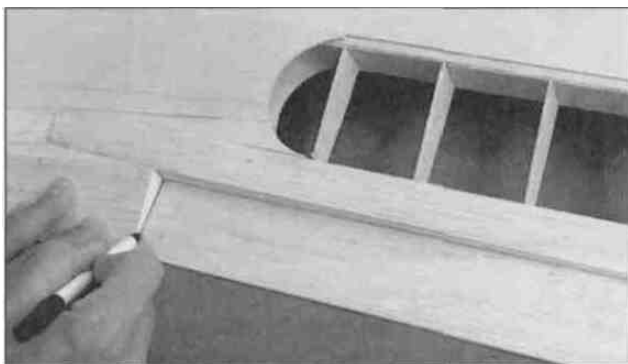
FINISH THE TOP WING



D 32. Sand the entire trailing edge of the wing to remove any overlapping sheeting. Measure and mark the center of the front edge of the 6-1/4" long balsa **center trailing edge** (SKY6W19) and make a mark there. Center this part on the ply trailing edge brace and glue it in place with thick CA. Make sure it is straight and perfectly aligned with the chord line of the airfoil (see sketch below).

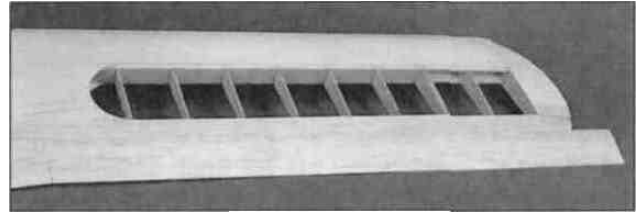


IF YOU ARE INSTALLING AILERONS ON THE TOP WING SKIP TO STEP 4

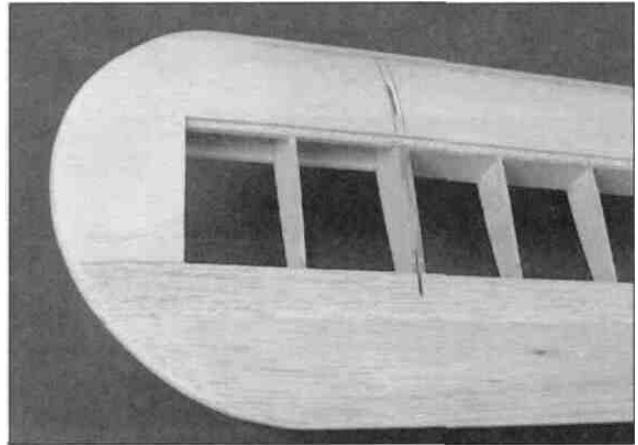


D 1. Hold a 17/32" x 2" x 28" tapered balsa **aileron** (SKY6W18) in place against the trailing edge

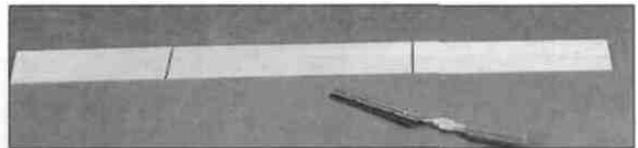
edge and mark where to cut it to fit next to the center trailing edge. **NOTE:** We are referring to this piece as an aileron even though it won't actually be an aileron.



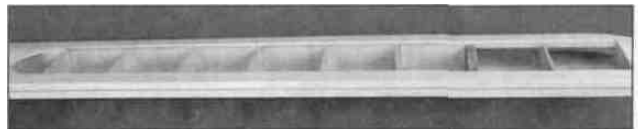
D 2. Cut the aileron off at this mark and test fit it in place. Sand the root end if necessary to achieve a good fit and glue it to the TE and the center TE. Make sure it is lined up perfectly with the chord line of the airfoil as you did earlier for the center TE.



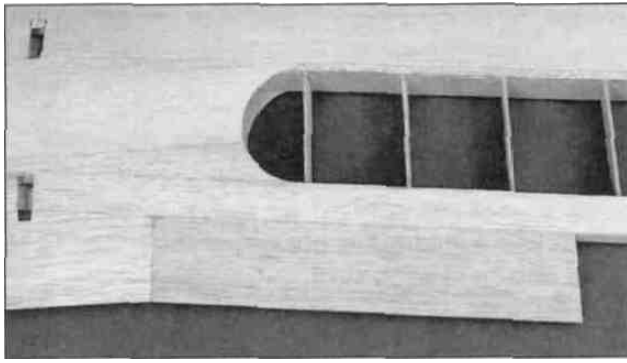
D 3. Cut the tip end of the aileron off following the contour of the wing tip, and sand the entire wing tip smooth. **Skip ahead to "Build the Interplane Struts."**



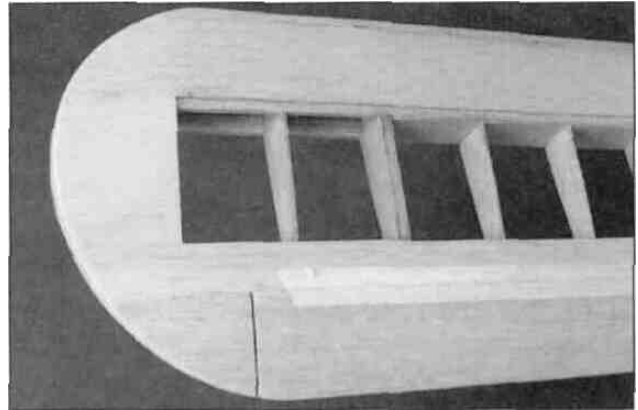
D 4. Position a 17/32" x 2" x 28" tapered balsa **aileron** (SKY6W18) on the top wing plan and line it up with the trailing edge on the left wing panel. Use the **cutting marks** drawn on the plans to make the three required cuts. You will now have an **inner TE**, an **aileron** and an **outer TE**.



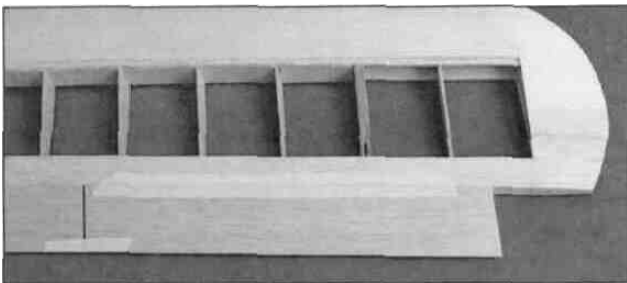
D 5. Draw a centerline along the **aft** edge of both trailing edges and the **leading edges** of both ailerons. This will help keep the hinges centered later.



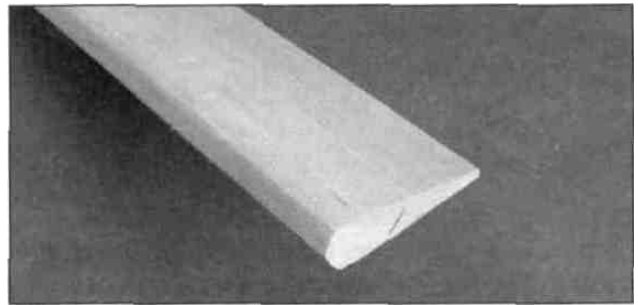
D 6 Trial fit the **inner TE** in place against the center TE. Sand it if necessary to achieve a good fit and glue it in place. Make sure it is aligned with the center TE **and** the chord line of the airfoil.



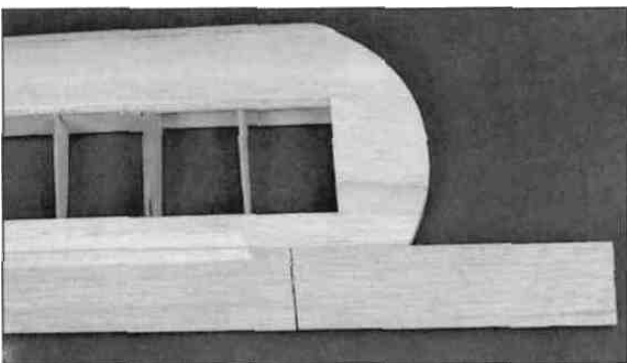
D 9 Cut and sand the tip of the wing to match the outline on the plans. Sand the entire wing tip smooth.



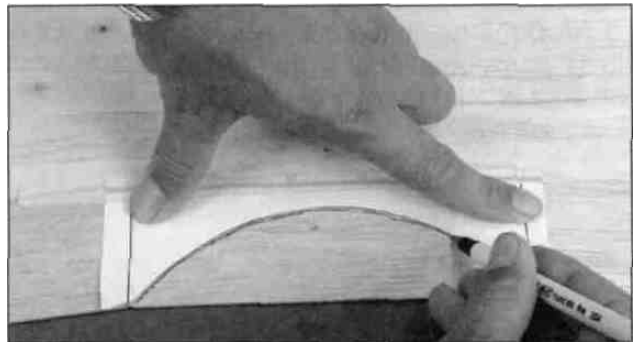
D 7 Securely **tape** the **aileron** in place approximately 1/16" away from the inner TE. Make sure it is aligned with the inner TE and the chord line of the airfoil.



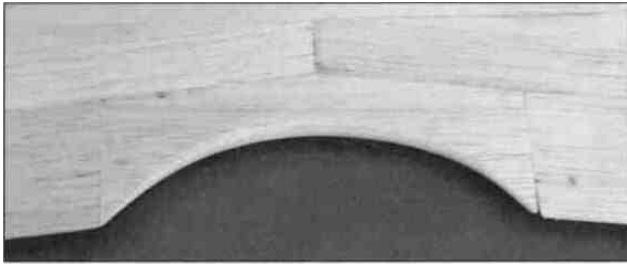
D 10 Remove the aileron and bevel the front edge to a "V" shape as shown on the cross section view of the plans. A razor plane and a coarse sanding block make this step quick and easy.



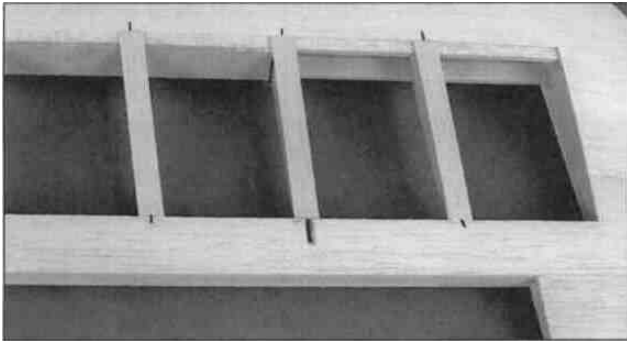
D 8 Glue the **outer TE** in place approximately 1/16" away from the aileron. Look down the trailing edge of all three pieces to make sure they are all aligned with each other.



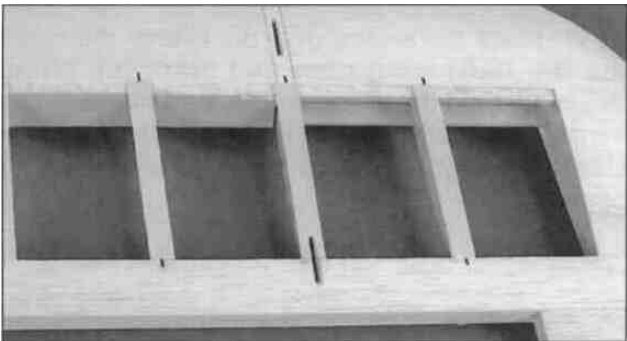
D 12 Cut the **top wing center TE template** out of the plans and tape it in place on the wing. Mark where the center trailing edge should be cut and remove the paper.



D 13. Cut and sand the center trailing edge to achieve a nice, smooth semi-circle. Also round off the edge as shown in the photo.



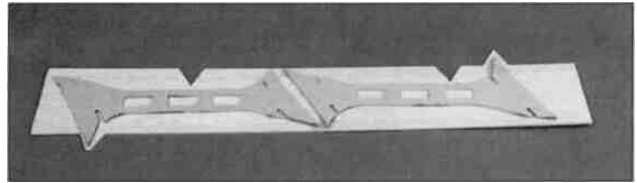
D 14. Make a mark on the LE and TE sheeting at **each** of the ribs. This will make it easier to install the cap strips. Cut the **cap strips** from the **1/16" x 3/8" x 30"** balsa sticks (SKY6W25) and glue them in place on the top and bottom of each rib. **When installing the cap strips on the T7 ribs, be careful to keep from getting glue in the I-strut slots.**



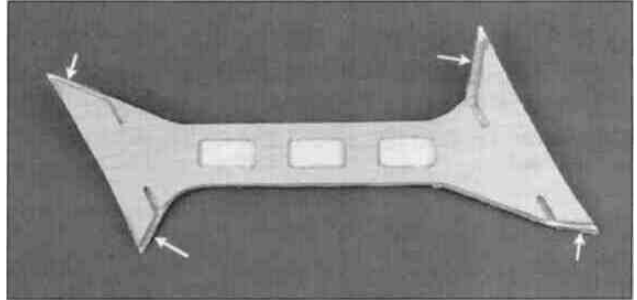
D 15. Cut through the cap strips on the bottom of rib T7 to expose the rest of the I-strut slot. Harden the area around the slot with thin CA or lightweight fiberglass cloth.

BUILD THE INTERPLANE STRUTS

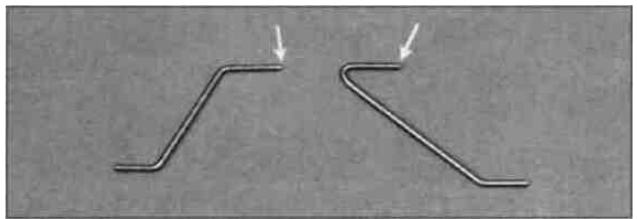
D 1. Punch out the two die-cut 1/8" ply **I-struts** (SKY6W08) and sand off any rough edges. Glue the I-struts to one of the 1/16" x 3 x 24" hard



balsa sheets (SKY6W25) as shown in the photo. Notice that a triangle is cut out of the sheeting to cover one tip of each strut.



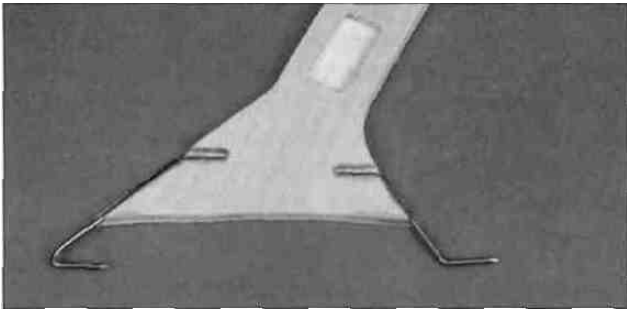
D 2. Trim the sheeting flush with the edges of the I-struts except where the wires will go. Leave about 1/8" extra at these points as shown in the photo.



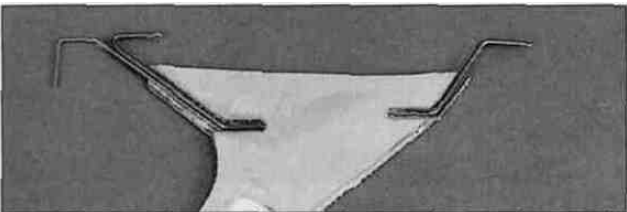
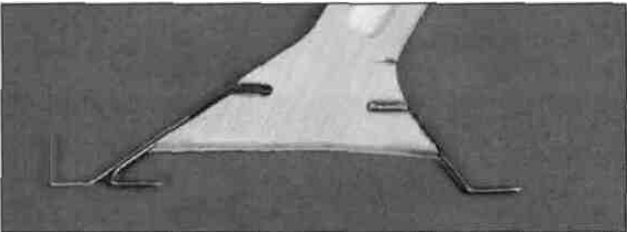
D 3. Use a small file, a grinding wheel or a Dremel Moto-Tool with a cut-off wheel to smoothly chamfer the **longer** ends of all the 1/16" wires (WBNT181 and WBNT182). These ends will slide into the wing rib assemblies so they need to be smooth. The photo above shows which ends to chamfer and what they should look like when they are done. It is important that you do a good job here so the I-strut interlocking system will work well.



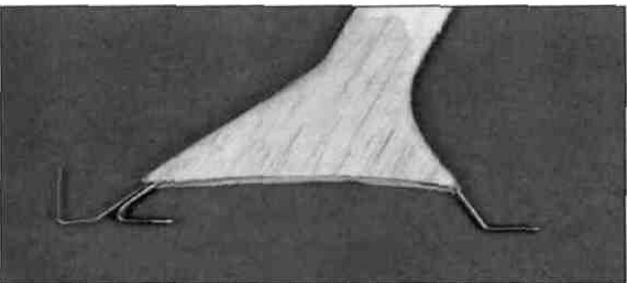
D 4. Position the I-struts over the I-strut detail drawing on the plan. Scuff the **short** end of each 1/16" wire with fine sandpaper and tack glue them into the I-struts with a drop of thin CA. There are only two different types of 1/16" wires,



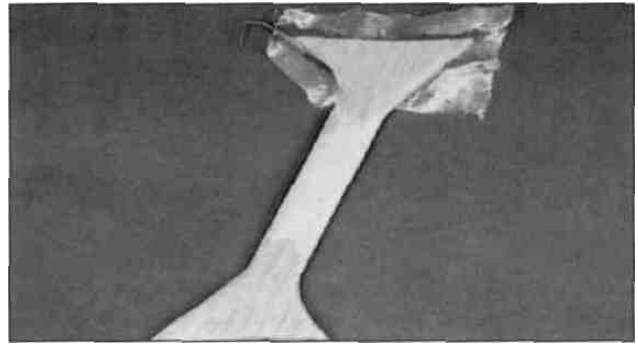
and one of each goes into each end of the I-struts. The wires should be positioned in the strut so the **top** parts of the top wires and the **bottom** parts of the bottom wires line up with the plan. This will set the correct -1 degree of incidence between the top and bottom wings. The photo shows how the wires should be installed. **IMPORTANT** Make sure both of the I-struts are exactly the same height and have the same incidence angle.



D 5 Glue the 1/32" **locking wires** (WBNT183) in place behind the rear wires as shown in the photo and on the plans. These locking wires should only be glued along the inner 1" because they have to bend out to unlock the I-struts. Add thick CA to all the wires to securely glue everything in place. Do not allow the glue to drip down and glue the 1/32" wires to the 1/16" wires below the balsa sheeting.

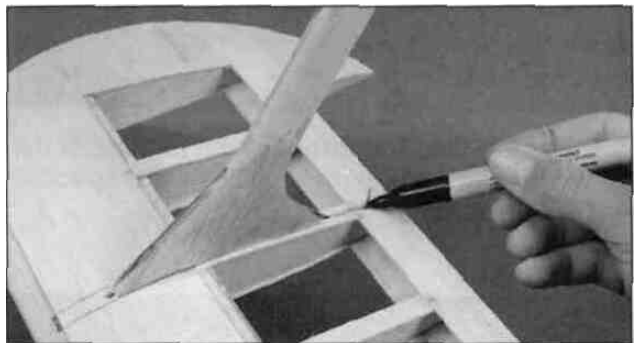


D 6 Sand the exposed plywood smooth to remove any glue bumps, and install the remaining 1/16" hard balsa sheeting. Sand the sheeting flush with the edges of the plywood. Then round off the edges to achieve a smooth, aerodynamic **cross** section on the entire strut.

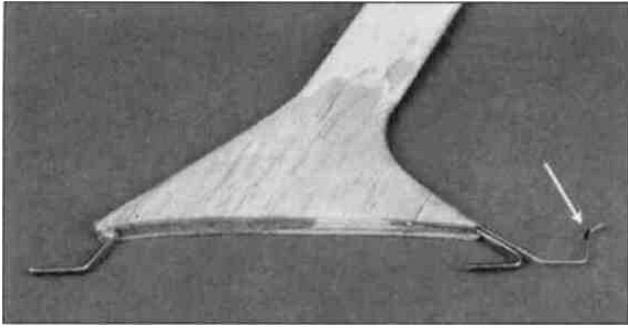


D 7 Fill the horizontal wire slots with thick CA by holding the I-struts up and allowing the CA to flow into each slot. The 1/16" wires should be glued in place as securely as possible. Apply some lightweight (3/4 oz) fiberglass cloth on both sides and both ends of each I-strut as shown in the photo.

D 8 Mark one strut "Left" and the other one "Right". Also mark the top and bottom of each one. Refer to the plans to determine the top and bottom.



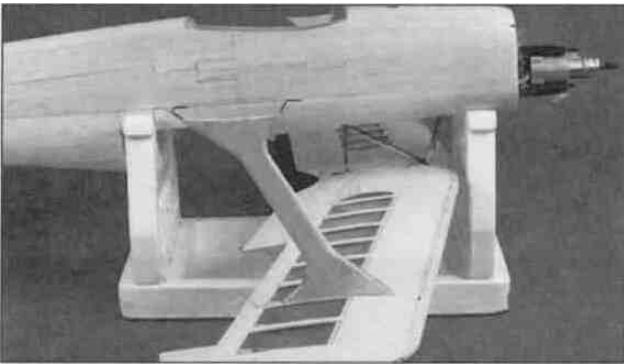
D 9 Sight down the wires on each end of the I-struts to make sure the horizontal parts of both wires are perfectly aligned with each other. If they are not, gently bend them until they are. Test fit the I-struts into the slots in both the top and bottom wings. The left strut should be fitted into the left wing panels and the right one into the right wing panels. The wires can be bent slightly if needed to get the smooth sliding action desired. Make sure the struts will slide far enough forward to allow the locking wires to snap down into place. With the locking wires snapped into position, mark on each locking wire where the surface of the wing is.



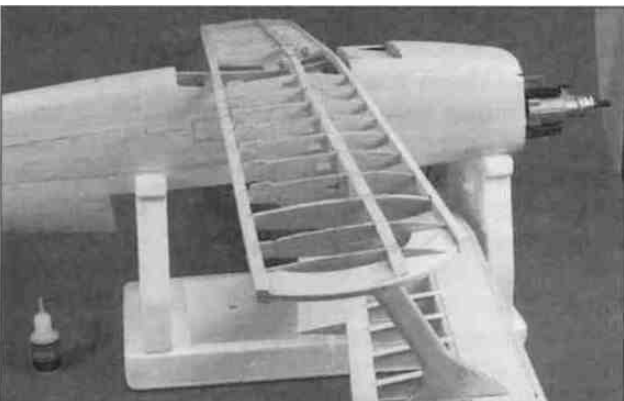
D 10. Remove the I-strut and bend the locking wire backwards about 45 degrees just **above** the marks you made. Do this to both ends of both struts.

D 11. Final sand the struts to prepare them for finishing. You can cover the struts with MonoKote or you can paint them. If you decide to paint them, first fill the wood grain with polyester finishing resin or something similar to obtain a smooth looking paint job.

JOIN AND SHEET THE BOTTOM WING



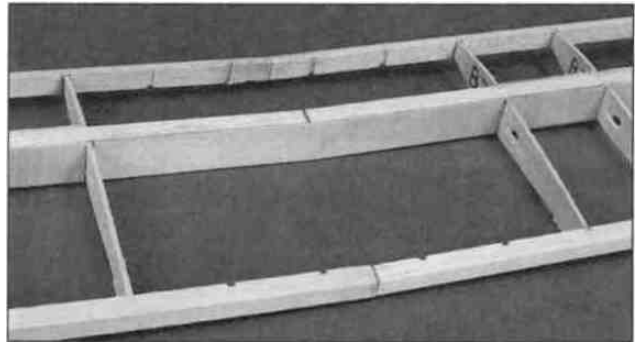
D 1. Flip the fuselage upside down and install the top wing. Insert the I-struts into their respective slots in the top wing.



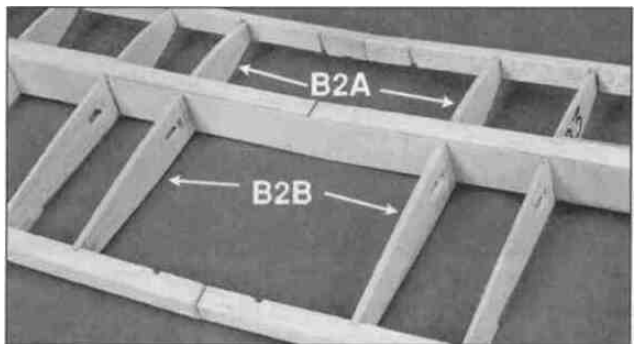
D 2. Insert the I-struts into the bottom wing panels and let the panels rest on the fuselage wing saddle.

Check the fit of the two panels. The spars, leading and trailing edges should all meet up nicely. If they don't, sand where needed and re-check the fit. When satisfied with the fit, glue the two panels together with thick CA or epoxy. Make sure the spars and leading and trailing edges line up with each other, and the wing is up against former F2.

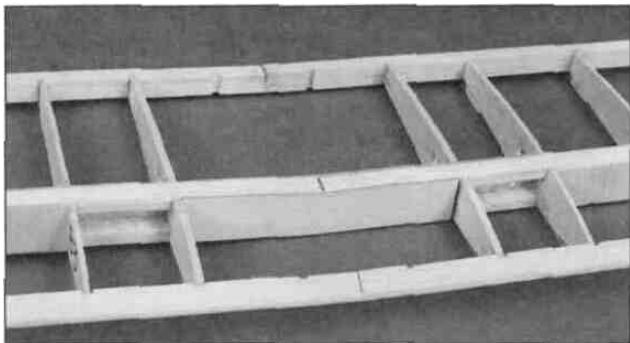
D 3. After the glue is completely cured, **carefully** remove the bottom wing from the I-struts and place it on your work surface with the leading edge down.



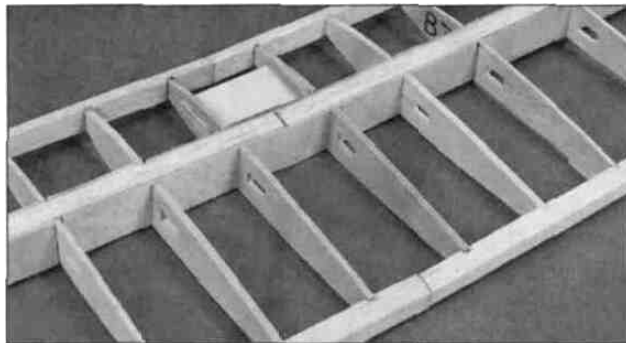
D 4. Trial fit the die-cut 1/16" ply **aft dihedral brace** (SKY6W07) in place. You may have to sand the ends to get it to fit in if you sanded much on the ends of the spars. Securely glue the brace to the back of the spars.



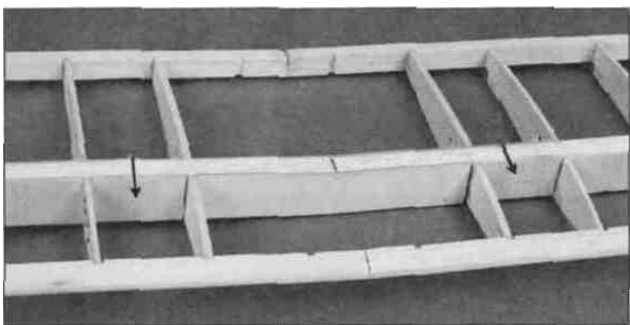
D 5. Install the die-cut 1/8" balsa **B2A** and **B2B** ribs (SKY6W04) as shown on the plans and in the photo.



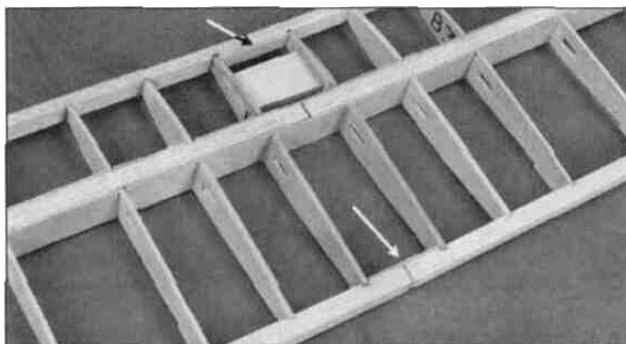
D 6. Trial fit the die-cut 1/16" ply **front dihedral brace** (SKY6W07) in place. Sand the ends of the brace if necessary to get it to fit between the **B2A** ribs. Securely glue the brace to the front of the spars.



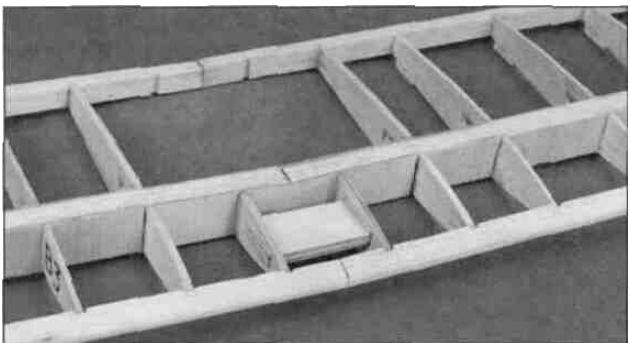
D 9. Glue the die-cut 1/8" ply **B1B** ribs (SKY6W10) in place.



D 7. Cut 1/16" balsa shear webs to fit between the B2 and B3 ribs, and securely glue them to the **front** of the spars.

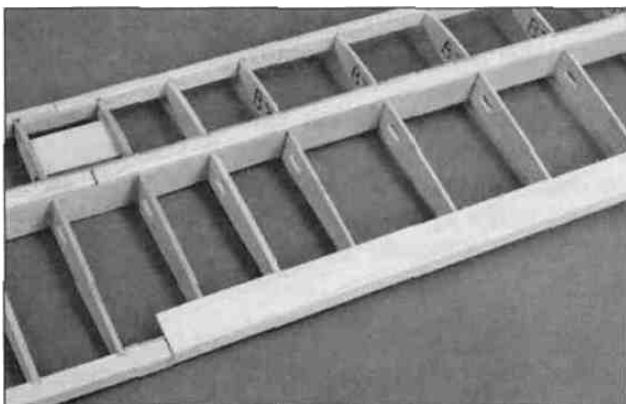


D 10. Trial fit the die-cut 1/16" ply **leading and trailing edge braces** (SKY6W07) in place between the B1A and B1B ribs. The LE brace should be centered on the LE to allow for the 1/16" LE sheeting which will be applied later. Sand them if necessary to get them to fit in, and glue them in place.



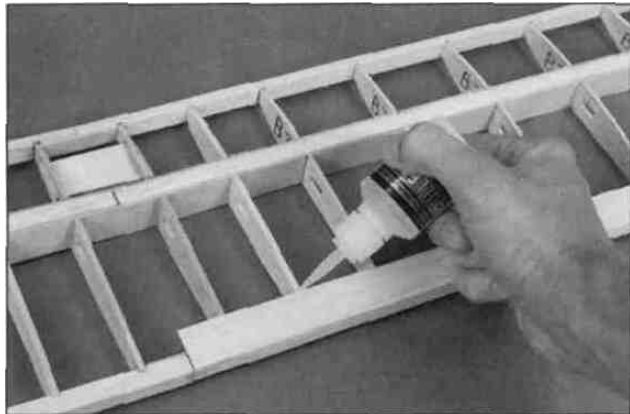
D 8. Test fit the 1/4" x 1" x 2" ply **front wing bolt plate** (SKY6W30) into the slots of the die-cut 1/8" ply **B1A** ribs (SKY6W10). Enlarge the slots if necessary for the bolt plate to fit. Position the ribs in place with the bolt plate still in the slots. Make sure the ribs are correctly lined up with the LE and spars, and securely glue them in place. Securely glue the wing bolt plate to the ribs.

D 11. Sand the outer tip of the trailing edges to fair them in with the wing tip as you did on the top wing earlier.

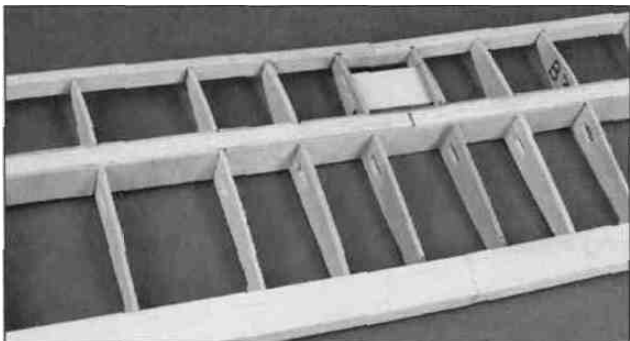


D 12. Lightly sand the tops of the ribs to blend with the notched trailing edge. Now install the 1/16"

x 7/8" x 28" balsa **trailing edge sheeting** (SKY6W20). This must be done on an absolutely flat surface or the wing will not end up straight. Apply thick CA to one of the TE'S (except on the tapered part past B6), and press a trailing edge sheet in place. Line up the root end of the sheeting with the center joint of the trailing edges. Hold the sheeting in place until the glue cures. **NOTE:** The edge of the TE sheet may not be exactly straight, but just position the sheet so it slightly overlaps past the TE, and any overlap can be sanded off flush with the TE later.



D 13. Now apply a drop of thin CA to each rib where the TE sheeting contacts it. Be careful not to get any glue in the B5 rib slots.

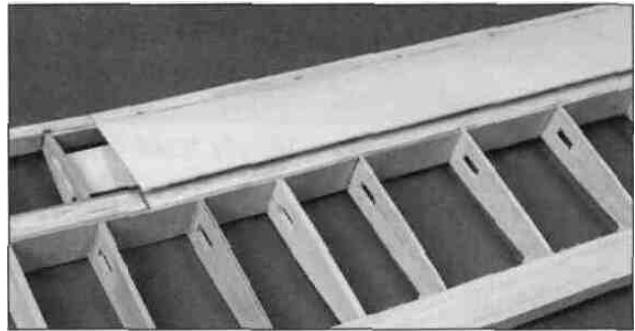


D 14. Install the trailing edge sheeting on the opposite wing panel. Butt the root end of this side against the TE sheeting already installed.

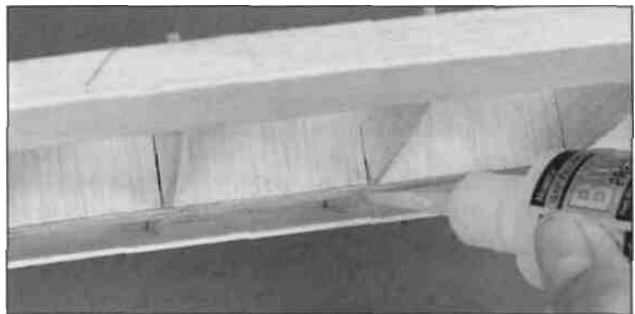
D 15. Before applying the leading edge sheeting in the next steps, use your T-bar to lightly sand off the edges of the shear webs, and smoothly blend the ribs to the spar. Also, clean up the LE/rib joints to remove any excess glue.

D 16. Trial fit one of the 1/16" x 2-1/8" x 28" balsa bottom wing LE sheets (SKY6W22) in place on the top of one wing panel. Trim or sand the front edge of the sheet if necessary to make it fit nicely against the LE. Do not cut it to the correct length yet.

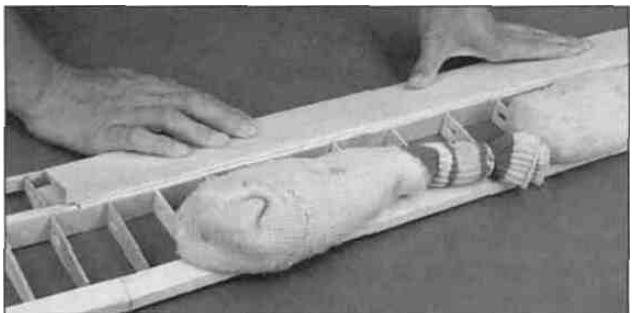
NOTE; It will be helpful to have the following items handy for the next steps . . . thin CA, thick (slow cure) CA, a straight piece of wood such as an aileron, and a wet cloth.



D 17. Hold the LE sheeting tightly against the LE at a slight angle so it rests on the LE of the ribs. The root end of the sheeting should be lined up with the LE joint at the wing centerline. Use **thin** CA to glue the sheeting to the LE only. Do not glue it to the ribs or spars yet.

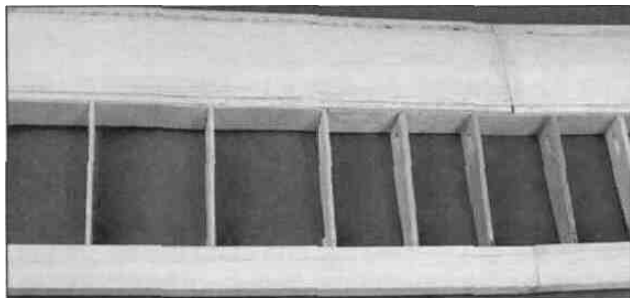


D 18. Tilt the wing up, with the LE down, and apply a drop or two of thick (slow curing) CA to each rib. Hold the wing at an angle so the glue will flow down and coat the edge of each rib. Apply a line of glue to the front half of the spar (except where the spar bends at the wing tip). **Be very careful not to get glue in the I-strut slots!**

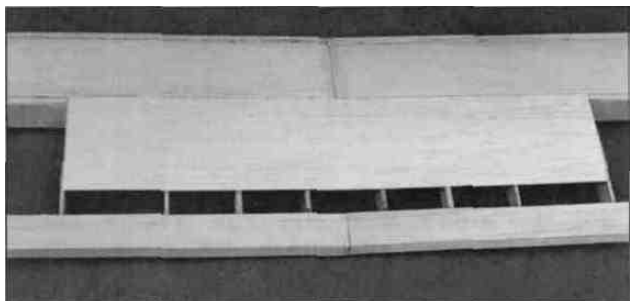


D 19. Immediately place the wing on your **flat** work surface, and use a piece of wood (an aileron

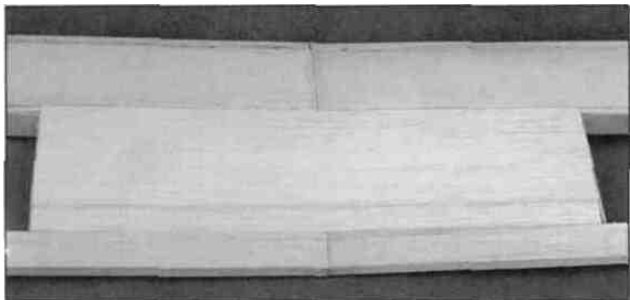
works OK) to hold the sheeting in place while the glue cures. It is important to keep the wing flat during this process as the LE sheeting will help "lock" the wing together. We won't glue the sheeting to the wing tip until later.



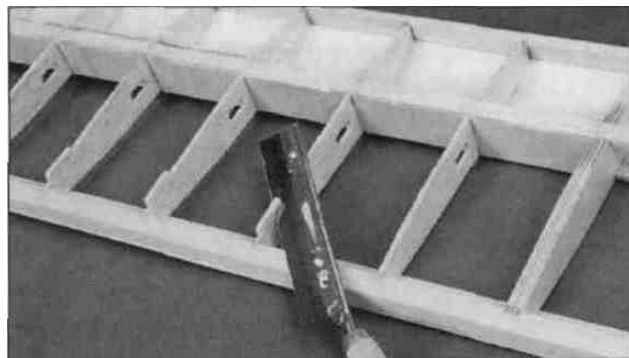
D 20. Install the opposite wing panel top sheeting following the same procedure. Cut and sand the root end of the sheeting to fit nicely against the LE sheeting already installed.



D 21. Position one of the 1/16" x 2-5/8" x 13-1/2" **wing center sheets** as shown in the photo, and glue it in place (against the LE sheeting). Allow the sheeting to gently bend between the B1 ribs.



D 22. Lay a 1/16" x 2-5/8" x 13-1/2" piece of balsa center sheeting in place over the gap. Mark where to cut it, trim it to fit, and glue it in place.

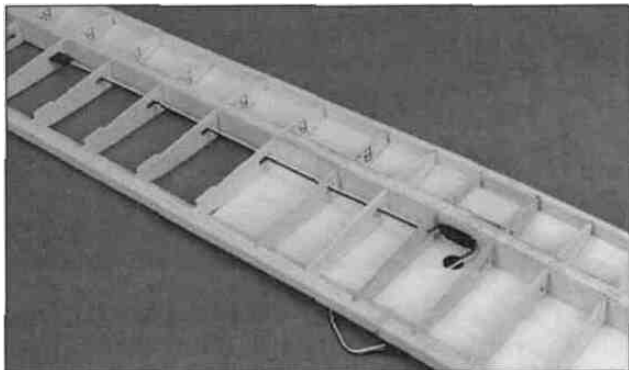


D 23. Flip the wing over, and carefully trim off the jig tabs on the bottom of the wing. A razor saw works well for this. Use a sanding block with fine grit sandpaper to touch up where the tabs were, and to blend the ribs into the TE. **Be careful not to change the shape of the ribs during this step.**

D 24. Add the two remaining 1/16" x 7/8" x 28" balsa **TE sheets** just as you did earlier on the top surface. Do one panel at a time, and be careful to keep from warping the wing during these steps. **HINT:** An aileron placed under the TE will keep it straight while the glue is curing.

D 25. Install the two remaining 1/16" x 2-1/8" x 28" **bottom wing LE sheets**, using the same procedure outlined in steps 15-20. Be sure to keep the wing absolutely flat during this step to avoid warps.

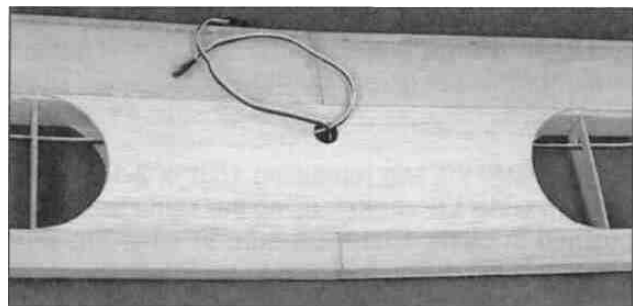
FINISH THE BOTTOM WING IF YOU ARE USING ONLY ONE AILERON SERVO SKIP TO STEP 2



D 1. The aileron servo extension cables need to be installed now. Approximately 24" of extensions are required for each aileron. We used one

400mm (16") and one **standard Futaba** extension. The extensions are glued into the wing, so when using two extensions per servo it is a good idea to **tack** glue or heat shrink the connectors together. Glue the **servo end** connector to the last B4 rib, and glue the extension to each rib as shown in the photo. Cut a hole in the **top** center sheeting, and route the servo extensions through the hole.

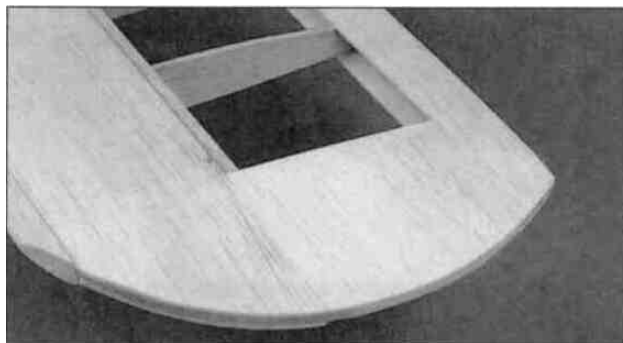
D 2. Install the **bottom** center sheeting just as you did on the top surface. Refer to steps 21 and 22 for instructions.



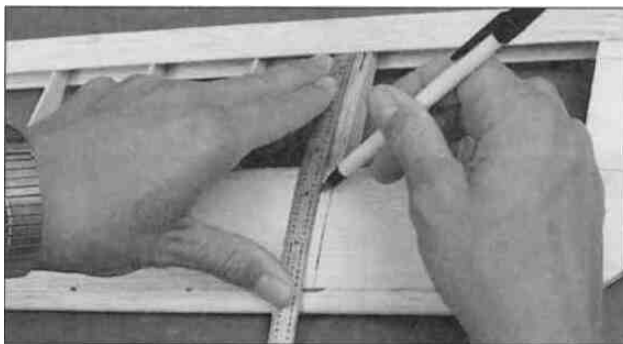
D 3. Cut a semi-circle, or similar shape, out of the sheeting between ribs **B2** and **B3** as shown in the photo above.



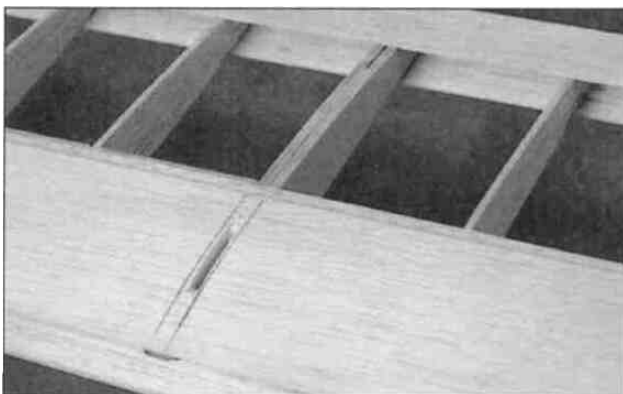
D 4. Wet the LE and the TE sheeting at each wing tip. Allow it to soak in for about 5 minutes. Then press the sheeting against the wing tip, and glue it in place with thin CA. Do the top and bottom sheeting at the same time, just as you did for the top wing.



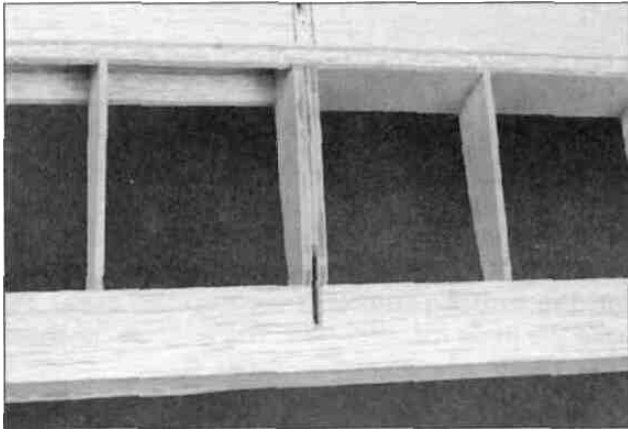
D 5. Use a $1/16"$ x $2-5/8"$ x $13-1/2"$ piece of balsa **wing center sheeting** to finish sheeting the wing tips. Cut a piece about $2-3/4"$ long (to fit over rib B6), and glue it against the LE sheeting. Then fill in the gap with scrap $1/16"$ balsa. Trim the ends to the shape of the wing tip, and sand the tip smooth. **Do** this to the top and the bottom of both wing tips **just** as you did on the top wing.



D 6. Use a straightedge to draw lines on the LE sheeting along the edges of the **B5** rib assemblies.

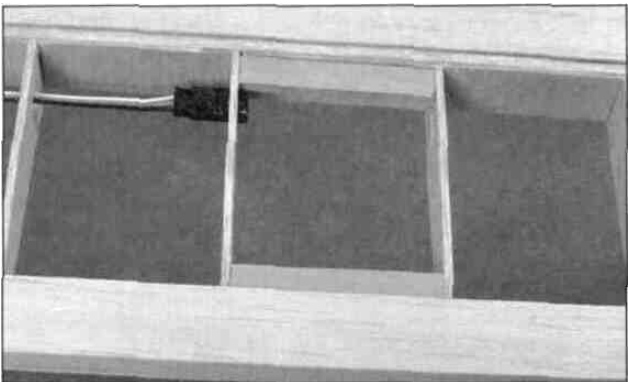


D 7. Carefully cut through the LE sheeting to expose the front I-strut slot. Take your time and cut a little at a time to end up with a neat looking slot similar to the one in the photo. Notice that the edges of the slot are tapered outward to make it easier to install the I-struts later.

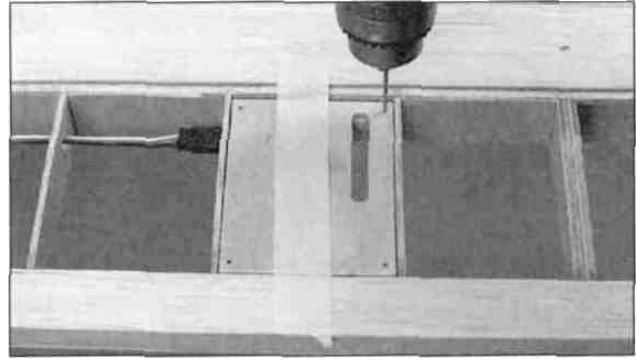


D 8. Cut through the TE sheeting to expose the rest of the rear I-strut slot. The front portion of the rear slot will be cut out later after the cap strips are installed. Pick or blow all the balsa scraps out of the slots when you are done.

D 9. Sand the entire trailing edge of the wing to remove any overlapping sheeting. **Skip ahead to the section entitled ONE AILERON SERVO if you are using only one aileron servo (on page 53).**

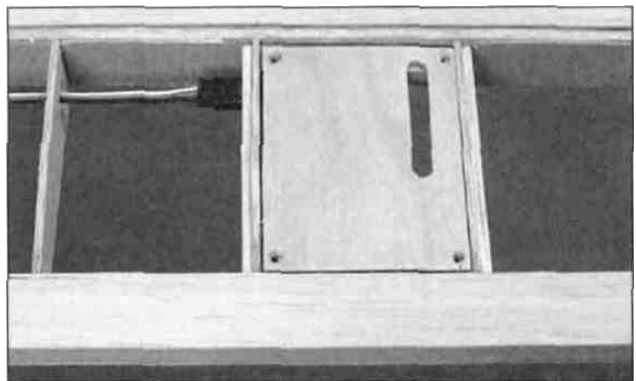


D 10. Cut the aileron **hatch rails** from the **3/16" x 3/8" x 12"** basswood stick (SKY6W28) to fit between the last B3 rib and the first B4 rib. Use a die-cut 1/16" ply **hatch** (SKY6W36) to help you space them. Glue the basswood rails to the ribs, flush with the top edge of the ribs. The TE sheeting should overlap the aft rail slightly. **NOTE:** When the rails are properly installed, the 1/16" ply hatch will be flush with the bottom surface of the wing.

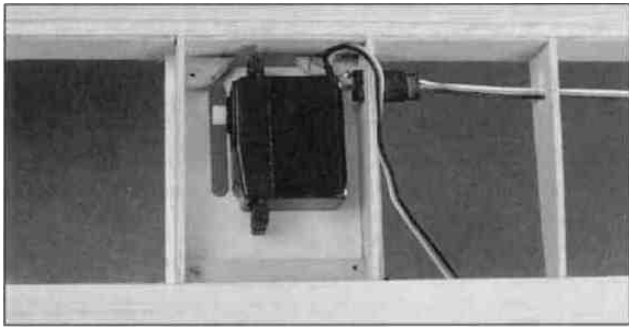


D 11. Tape the hatch cover in position, approximately 1/32" away from the **TE** sheeting, and add 1/16" balsa between the front of the hatch and the LE sheeting. Allow a 1/32" gap between the front of the hatch and the balsa sheet. Drill four 1/16" diameter holes through the hatch and the rails, at each punch mark.

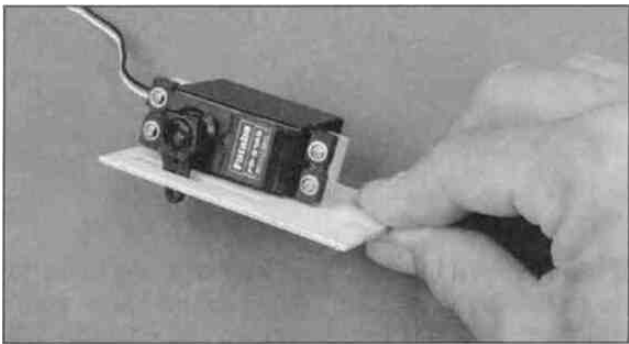
D 12. Remove the hatch, and enlarge the holes in the **hatch only** to **3/32"**. Then countersink each hole so the #2 **flat head screws** (SCRW069) will be flush with the bottom surface of the hatch.



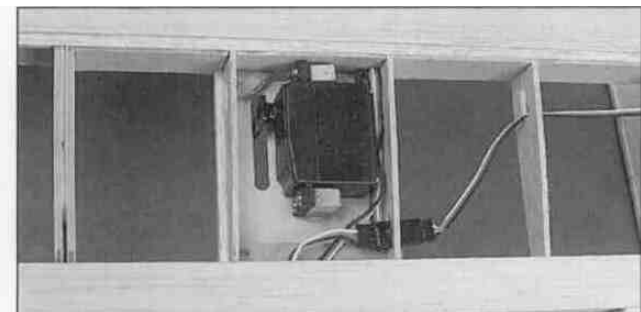
D 13. Cut two 3-1/4" long pieces of balsa from the **1/8" x 1/4" x 15"** balsa stick (SKY6W26) to fit next to the ribs bordering the hatch. These will help strengthen these ribs. Glue these in place so they will not interfere with the cap strips on these ribs. Refer to the plans to help you position these pieces.



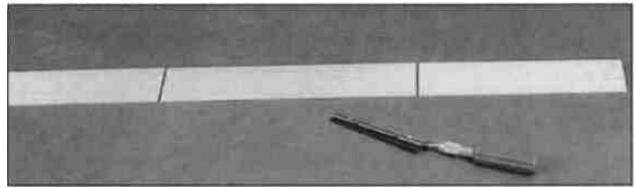
D 14. Install the hatch cover with four #2 flat head screws. Flip the wing over, and set your aileron servo on the hatch cover. Normally, the servo needs to be as far forward as possible so it will not protrude above the top surface of the wing. You may cut the front hatch rail if needed to move the servo up against the shear webs.



D 15. Mount the servo to the hatch using the 1/4" x 3/8" x 3/4" basswood **servo mounts** (SKY6W39) provided. Securely glue the mounts to the hatch. Then screw the servo to the mounts using the screws that came with the servos. Cut three arms off of a large 4-arm servo horn, and test fit the horn on the servo.



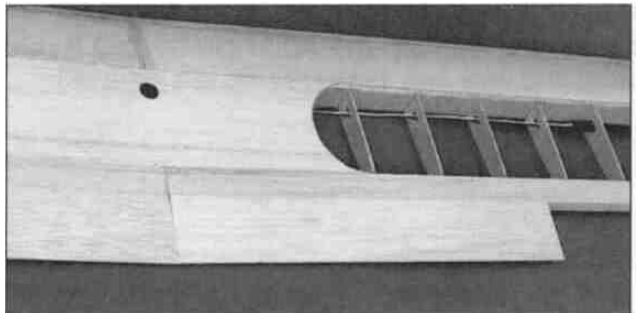
D 16. Test fit the hatch in place with the servo attached. Make sure you have enough room to place the excess cable where it won't interfere with the servo operation. **NOTE:** You may have to move the servo extension connector if the servo will get in its way. Tack glue the extension and connector to the ribs.



D 17. Position a 17/32" shaped balsa aileron (SKY6W18) on the **BOTTOM** wing plan, and line it up with the trailing edge on the **left** wing panel. Use the **cutting marks** drawn on the plans to make the three required cuts. You will now have an **inner TE**, an **aileron** and an **outer TE**.



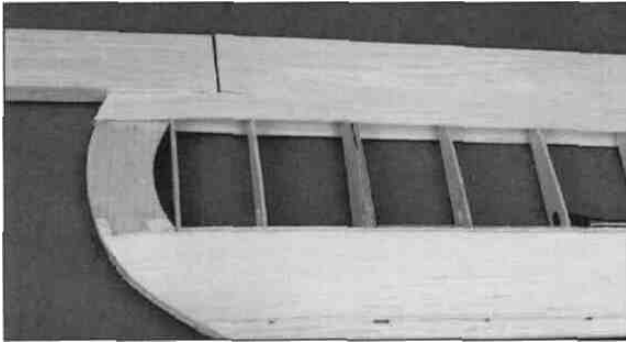
D 18. Draw a centerline along the aft edge of the trailing edge. This will help keep the hinges centered later.



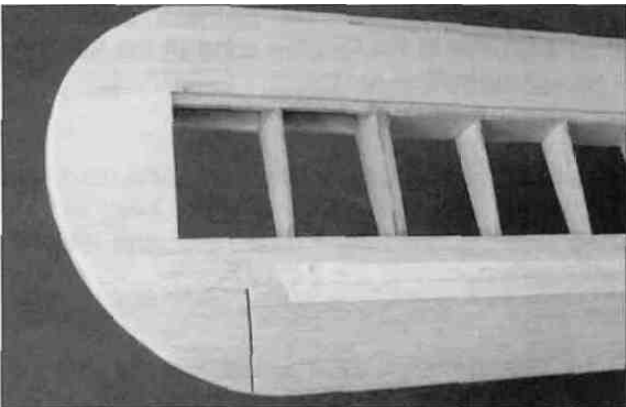
D 19. Trial fit the **inner TE** in place against the TE. Sand it if necessary to achieve a good fit, and glue it in place. Make sure it is aligned with the chord line of the airfoil.



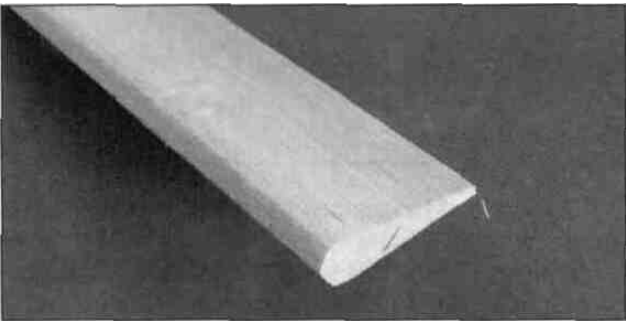
D 20. Securely tape the **aileron** in place approximately 1/16" away from the inner TE. Make sure it is aligned with the inner TE and the chord line of the airfoil.



D 21 Glue the **outer TE** in place approximately 1/16" away from the aileron. Look down the trailing edge of all three pieces to make sure they are all aligned with each other.



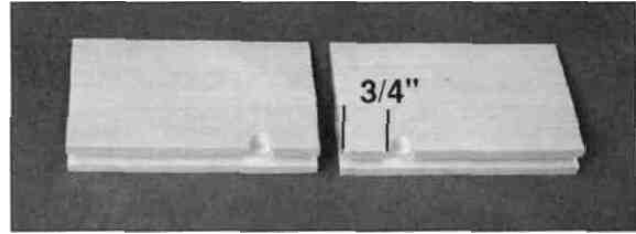
D 22 Cut and sand the tip of the wing to match the outline on the plans. Sand the entire wing tip smooth.



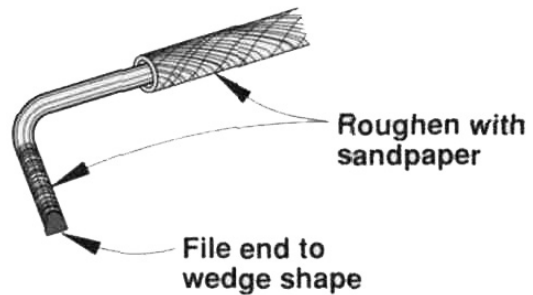
D 23 Remove the aileron, and bevel the front edge to a "V" shape as shown in the cross section view on the plans.

D 24 Place the aileron over the aileron drawing on the **bottom** wing plan, and mark where the hinges should go. Hold the aileron in place on the wing, and transfer the marks over to the wing. Cut the hinge slots following the hinge slotting guidelines on page 10. **Skip the next section (One Aileron Servo) if you are installing two aileron servos.**

ONE AILERON SERVO



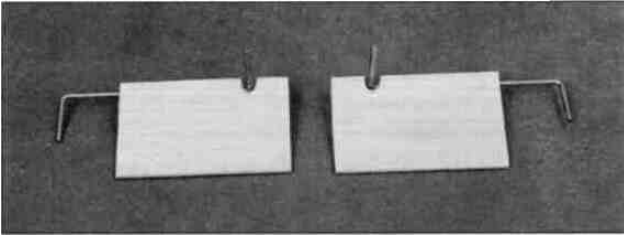
D 1 Cut a notch in each grooved balsa **bottom wing center TE** (SKY6W40). The notch should be 3/4" from one end, and only needs to be in the **top** side of the groove. Make a right and a left piece as shown in the photo.



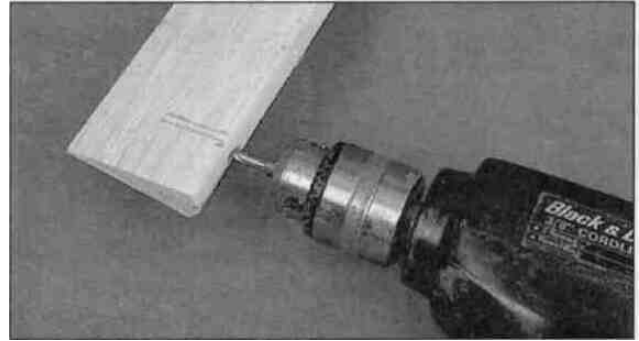
D 2 Roughen the short end of the aileron torque rods with 100-grit sandpaper, and file the same end to a wedge shape as shown in the sketch above. Also roughen the outer surface of the plastic bearing tubes.

D 3 Trial fit the torque rods into the center TE pieces, and hold or tape them against the wing TE. Mark on the wing TE where to cut notches to allow the torque rods to rotate forward. **The threaded portion of the torque rods should be on the top surface of the wing!** Sand the two TE pieces so they will join properly at the center of the wing.

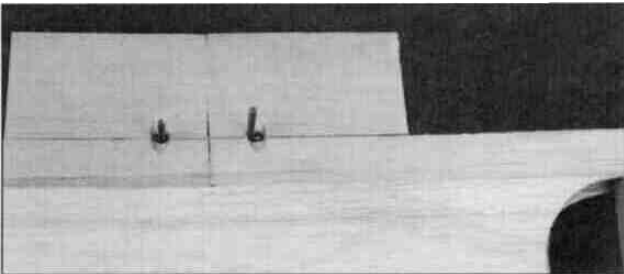
D 4 Clean the torque rods and bearing tubes with alcohol. Slide the plastic bearing tubes toward the threaded end of the torque rods. Then use a toothpick to apply Vaseline to both ends of the bearing to keep glue from getting inside the bearing.



D 5. Glue the torque rods into the grooves in the center TE pieces. **Make sure you install the left torque rod in the left TE piece.**



D 9. Drill a $\frac{7}{64}$ " hole in the ailerons at the torque rod locations, starting at the LE centerline and drilling straight in approximately $1\text{-}\frac{1}{8}$ ". The hole is drilled slightly oversize to allow for positioning, and to create a hard epoxy "sleeve" around the wire.

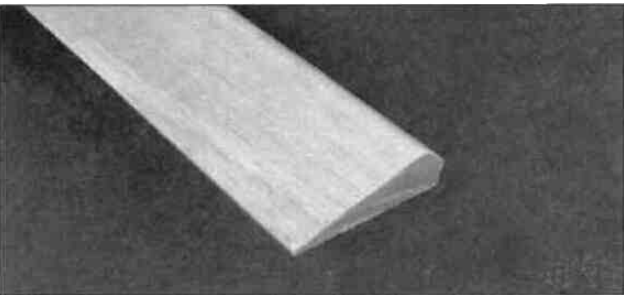


D 6. Glue the center TE'S to the wing. It is very important that they are aligned correctly with the chord line of the airfoil. Do not allow them to tilt up or down, and make sure the threaded part of the torque rods are on the **top** of the wing.

D 10. Use a sharpened $\frac{1}{8}$ " diameter brass tube to cut a groove in the leading edge of the ailerons to accept the torque rods.

D 11. Lay the ailerons on the plan, and mark the hinge locations on each aileron. Trial fit the ailerons in place on the torque rods, and transfer the hinge marks over the wing TE.

D 12. Cut the hinge slots in the ailerons and the wing TE following the hinge slotting guidelines on **page 10**.

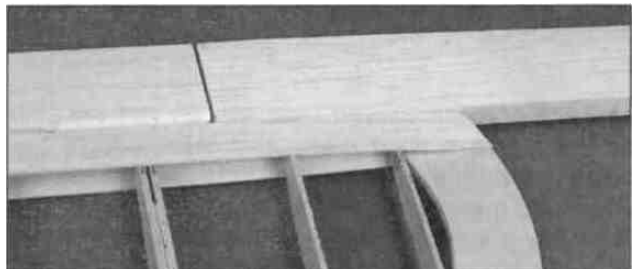


D 7. Cut the ailerons from the $\frac{17}{32}$ " shaped balsa aileron stock. They should be 21" long. Draw a center line down each aileron, and bevel the front edge to a "V" shape as shown on the plans.



D 13. Insert the hinges into the slots, and trial fit the ailerons in place on the wing. Do not glue the hinges in place until after the wing is covered. Tape the ailerons to the center TE pieces to keep them aligned.

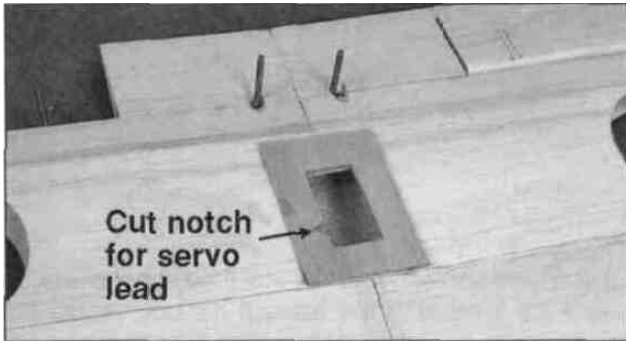
D 8. Hold the ailerons in place approximately $\frac{1}{16}$ " away from the center TE pieces with the torque rods resting on top of the ailerons. Mark the torque rod locations on the top of the ailerons.



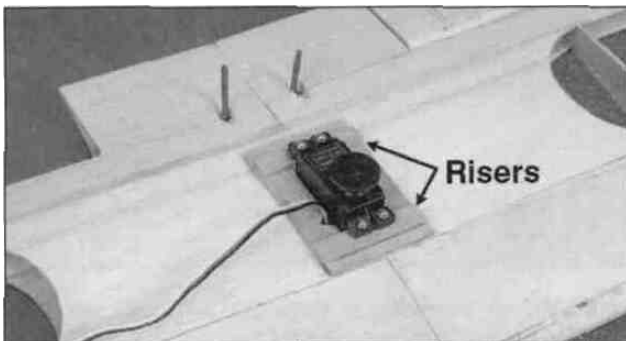
D 14. Glue on the remaining pieces of aileron stock at each tip. They should be positioned approximately

1/16" away from the ailerons, and line up with the ailerons and the chord line of the airfoil

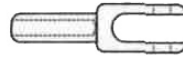
D 15 Cut off the excess tip stock following the contour of the wing tip, and sand the entire wing tip smooth



D 16 Test fit your servo in the die-cut 1/8" ply **aileron servo tray** (SKY6W10) Enlarge the tray opening if needed to fit the servo Glue the tray in position on the bottom wing The front edge of the tray should be even with the back edge of the LE sheeting Cut the balsa center sheeting out of the inside of the servo tray opening.



D 17 Insert the servo into the servo tray If the servo hits the bottom sheeting before the mounting lugs touch the tray, glue the 1/8" x 3/8" x 2" basswood **servo risers** (SKY6W41) in place. When satisfied with the fit of the servo, mount it using the screws provided with your radio.

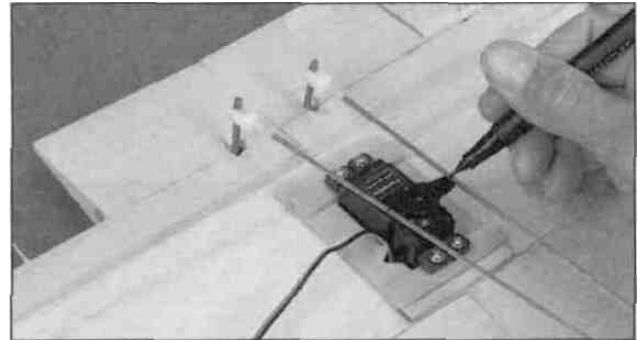


Nylon Swivel Clevis



Nylon Swivel

D 18 Thread the **nylon swivels** (NYLON20) onto the torque rods until the pins are approx 3/4" above the surface of the wing Screw a **12" threaded pushrod wire** (WIRES16) **all the way onto** each nylon swivel clevis Back the threaded wire out of each clevis approximately 4 turns and snap them onto the nylon swivels.

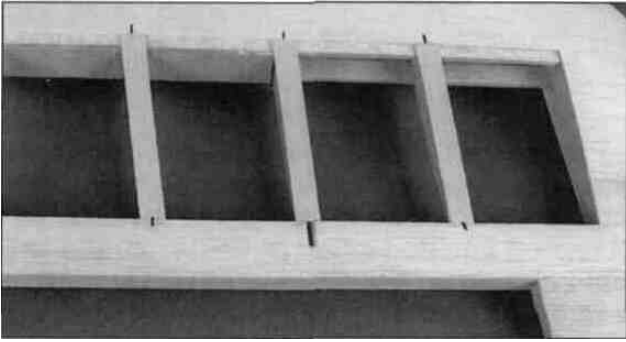


D 19 Cut two opposing arms off a large 4-arm servo horn, and drill out the outer holes to 5/64". Install the horn on the servo Rotate the horn to its neutral position, and lay the pushrod wires on top of the horn Mark on the wires where they cross the outer holes in the servo horn.

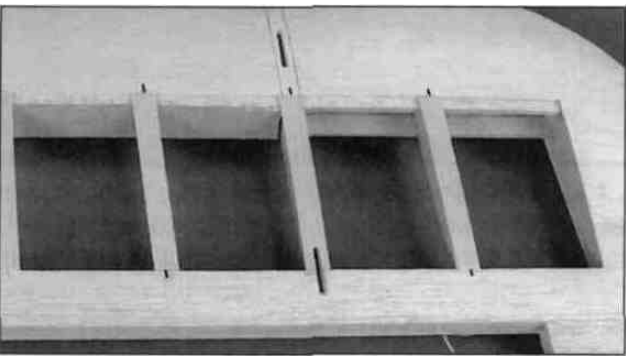


D 20 Make a Z-bend at each of the marks you just made, and test fit the wires into the servo horn. You may have to bend the pushrod wires slightly to allow the wires to rotate smoothly.

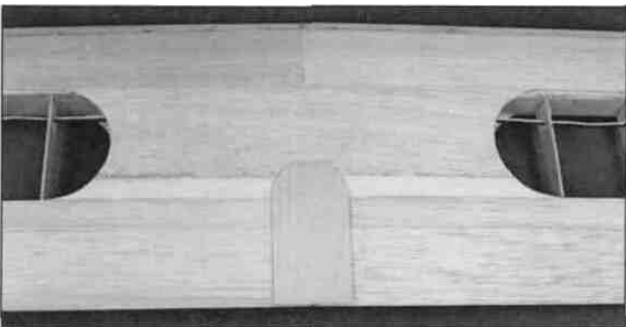
FINISH AND ATTACH THE WING



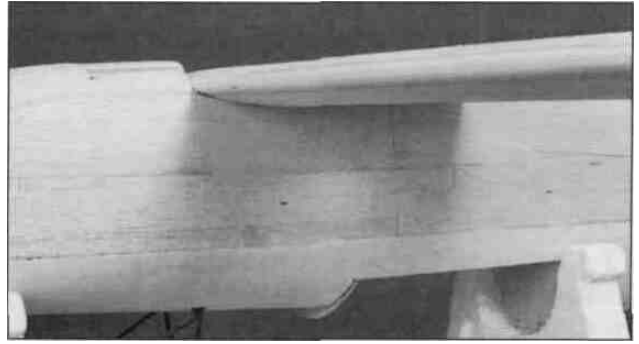
D 1. Make a mark on the LE and TE sheeting where **each** of the ribs are. This will make it easier to install the cap strips. Cut the **cap strips** from the **1/16" x 3/8" x 30"** balsa sticks (SKY6W24), and glue them in place on the top and bottom of each rib. **When installing the cap strips on the B5 ribs, be careful to avoid getting glue in the I-strut slots.**



D 2. Cut through the cap strips on the top of rib B5 to expose the rest of the I-strut slot. Harden the area around the slot with thin CA or lightweight fiberglass cloth.

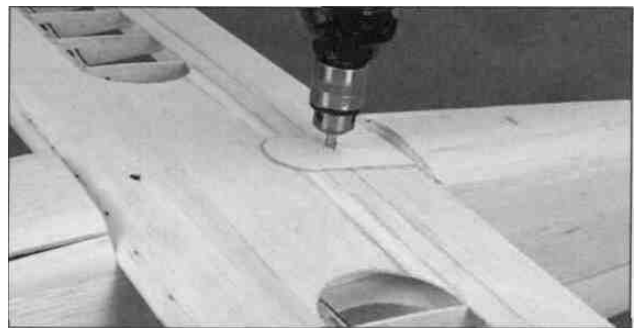


D 3. Flip the wing over, and glue the die-cut 1/16" ply **rear wing bolt plate** (SKY6W07) to the bottom of the wing with the punch mark showing.

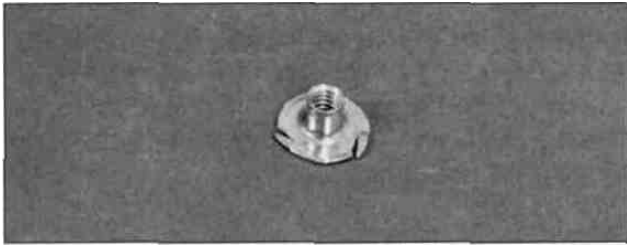


D 4. Sand the wing saddle smooth, and test fit the bottom wing in place. You may have to sand the wing saddle or the wing TE slightly to get a good fit between the two. It is very important that the wing sits nicely in the saddle. Do not sand the saddle so much that it changes the incidence of the wing.

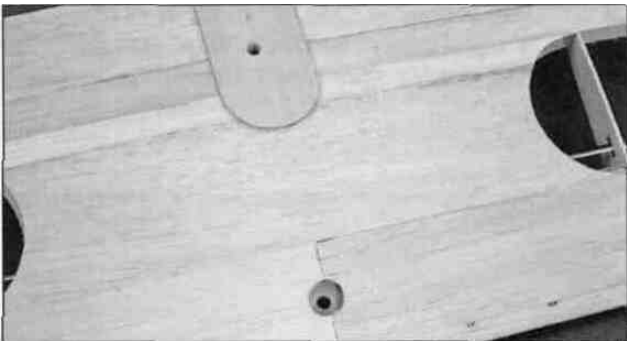
D 5. Position the wing on the fuse, and check to see if it's level with the stab. If it's not, adjust the wing saddle until it is. Also make sure it is straight in relation to the fuse. Use a string attached to the middle of the fin TE to measure to the wing tips as you did earlier for the top wing.



D 6. When the wing is correctly aligned, securely hold or tape it in place. Drill a 1/4" hole **1-3/8"** back from the front of the LE, down through the wing and through the wing bolt block in the fuse. **Without moving the wing**, drill another 1/4" hole at the punch mark on the rear wing bolt plate. When drilling these holes, keep the drill perpendicular to the **wing bolt plates**.

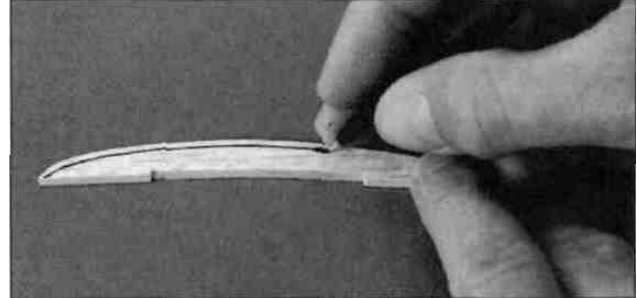


D 7 Remove the wing, and enlarge the holes in the fuselage **wing bolt blocks only** to 19/64" (5/16" will work) Flatten out or cut off the "teeth" on the two 1/4" blind nuts, and insert them into the bolt blocks They should be inserted from the **top** of the block and glued in place with thick CA or epoxy Be careful not to get glue on the threads



D 8 Enlarge the front wing bolt hole in the **wing bottom sheeting** to 1/2" diameter so the head of the bolt will fit through Test fit the wing in place with the two **1/4-20 nylon bolts** (NYLON13) **NOTE** You may cut approximately 3/4" off of each bolt to make them easier to install.

D 2 Tack glue the die-cut 3/32" balsa **rear belly former** (SKY642) in place against former F3 and the wing TE Sand it until it matches the contour of the fuse bottom.



D 3 Carefully remove the belly formers, and draw an arc **3/32" inside** the curved edge of both formers Cut and sand the former down to the new arc This will allow for the 3/32" belly sheeting to be installed flush with the fuse bottom

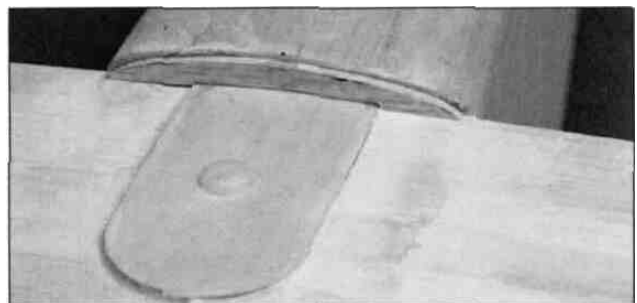


D 4 Glue the **front** belly former to the **wing LE** approximately 1/32" **behind** F2 **Do not glue the belly formers or the wing to the fuselage!**

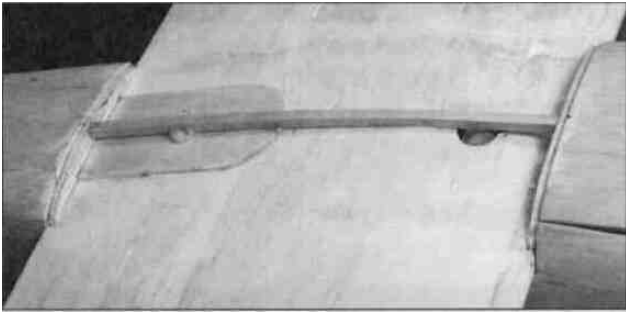
FINAL ASSEMBLY

BUILD THE BOTTOM WING FAIRING

D 1 Final sand the bottom nose of the fuselage to obtain the smooth shape shown on the fuselage cross sectional views Install the wing on the fuse, and **tack** glue the die-cut 3/32" balsa **front belly former** (SKY6W42) in place against former F2 and the wing LE Sand it until it matches the contour of the nose bottom

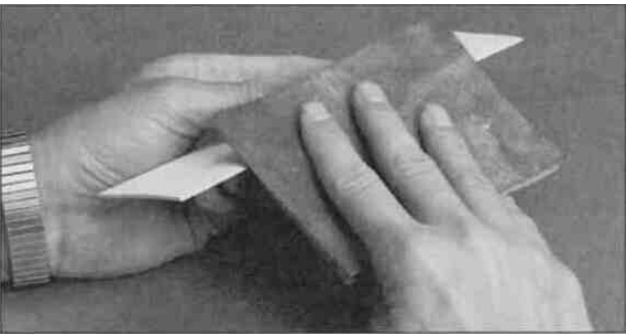


D 5 Glue the **rear** belly former to the **wing TE** approximately 1/32" in **front** of F3 **Do not glue the belly formers or the wing to the fuselage!**



D 6. Cut a piece of **3/16" sq.** balsa stick (SKY6F26) to fit between the two belly formers, and glue it to the formers and the wing where the wing touches it. You will have to cut a notch in the stick to clear the rear wing bolt.

D 7. Smoothly sand the 3/16" stick down until it is only **1/16"** thick at the low point of the wing (around the spar). The stick should smoothly taper from 3/16" to 1/16" and back to 3/16" to smoothly continue the bottom curve of the fuselage.

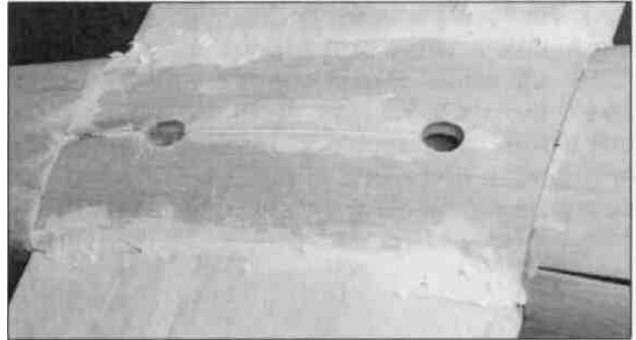


D 8. Sand the outside curved edges of the die-cut 3/32" balsa **belly sheeting** to "feather" the edge so it will lay down on the wing better. Do this to both pieces but make sure to make a **right** and a **left** piece!



D 9. Glue one piece of belly sheeting to the 3/16" stick and the front and rear belly formers.

NOTE: The sheeting should only lap onto the 3/16" stick halfway (3/32") to allow room for the other side to glue on. Try to center the die-cut semi-circles over the wing bolts

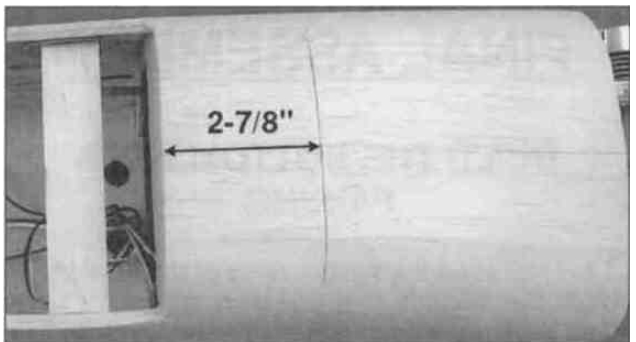


D 10. Glue the other side of sheeting in place. Fill any gaps with HobbyLite model filler, and sand the belly fairing to smoothly blend in with the fuselage and wing.

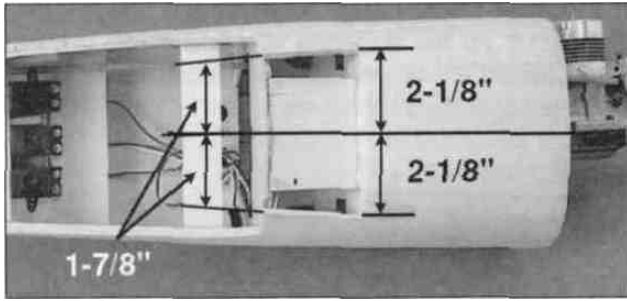


D 11. Cut through the 3/16" stick to get the wing bolts out. Smooth out the edges of the wing bolt holes, and harden the area around the wing bolt holes with thin CA or lightweight fiberglass cloth.

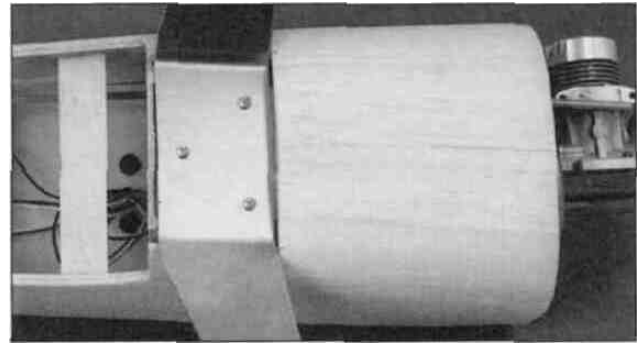
INSTALL THE LANDING GEAR



D 1. Measure forward **2-7/8"** from the back of **F2**, and draw a line. Use a razor saw to cut through the 3/16" balsa sheeting and the balsa fuse corners until the saw hits the landing gear plate.

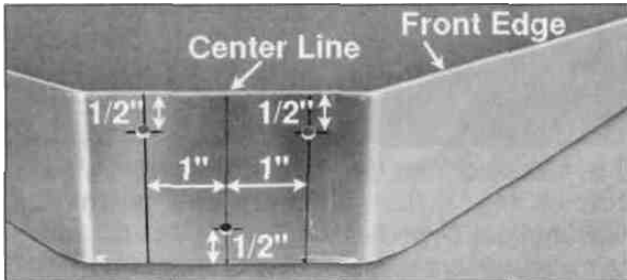


D 2. Now measure **2-1/8"** to each side of the center of the fuse bottom, and make a mark on the saw cut you just made. Measure **1-7/8"** to each side of the center at F2, and make a mark on the rear edge of the sheeting. Connect the marks on each side with straight lines. Then cut along these lines with a hobby knife. Remove the bottom piece by pulling it loose from F2. **Save this piece**, as it will be glued back on later.

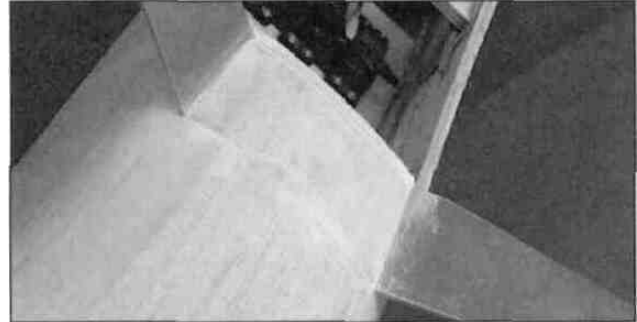


#6 x 3/4" Sheet Metal Screw

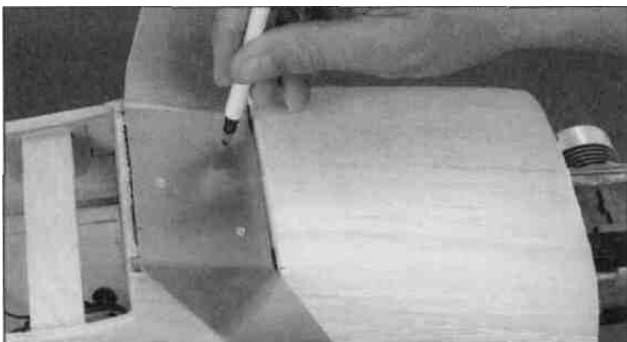
D 5. Securely mount the gear with the three #6 x **3/4" sheet metal screws** (SCRW018) provided. Put a drop of thin CA on each screw to keep them from coming loose.



D 3. Measure and mark the centerline of the **aluminum landing gear** (L4-U). Draw a line **1"** on both sides of the line you just drew. Now draw lines **1/2"** from the front and back edges of the gear. The photo above will help clarify this. Drill **5/32"** holes where shown on the photo above.



D 6. Trim the bottom piece you cut out earlier to fit back in, and glue it in place. Sand the bottom of the fuse smooth again, and fill in any gaps with HobbyLite model filler.

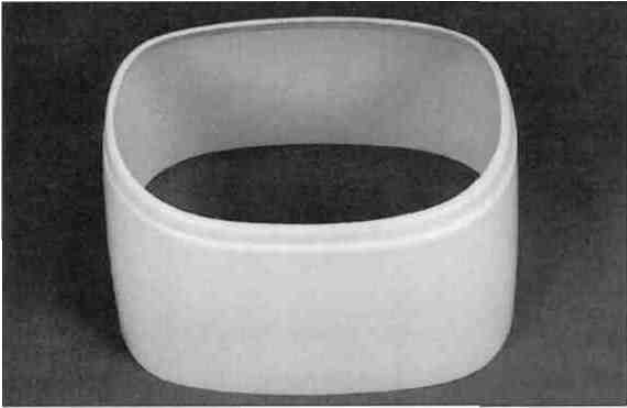


D 4. Test fit the landing gear on the 1/4" ply landing gear plate so it is centered on the plate and the straight edge of the gear legs is facing forward. Sand the balsa wood corners if needed to permit the gear to sit flat on the ply plate. Mark on the ply plate where to drill the mounting holes. Remove the gear, and drill **3/32"** holes through the landing gear plate.

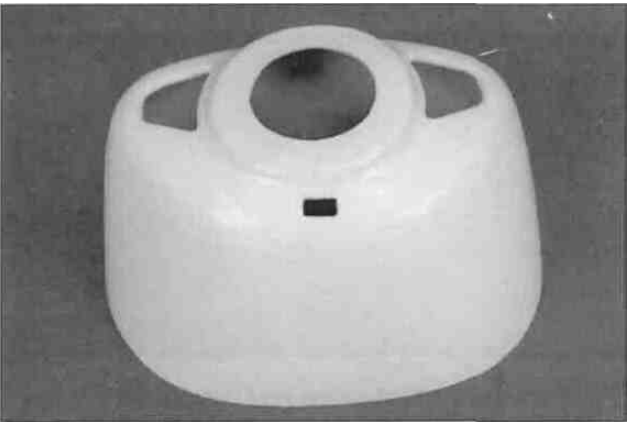
ASSEMBLE THE COWL



D 1. Trim the ABS **cowl front** (COWL009) and the ABS **cowl back** (COWL010) out of their bases by cutting **3/16"** below the molded-in scribe lines with a hobby knife. Sand the cut edges smooth.



D 2 Cut the center out of the **cowl back**. Leave a **1/8"** "lip" around the inside of the cowl back to give it some extra strength. Sand the inside edge of the lip smooth. You can make this cut with a hobby knife if you start out with a shallow cut and just go a little deeper on each pass, but a Dremel Moto-Tool with a conical pointed bit works much easier.



D 3 Cut out the center of the **cowl front**, leaving about a **1/2"** lip around the edge. Also cut out the air inlets. When cutting the air inlets, cut only the depressed surface away and leave the curved sides of the inlets on the cowl. They look better and add strength.



D 4 Test fit the cowl front onto the cowl back. Sand the **cowl front** if necessary until it fits tightly.

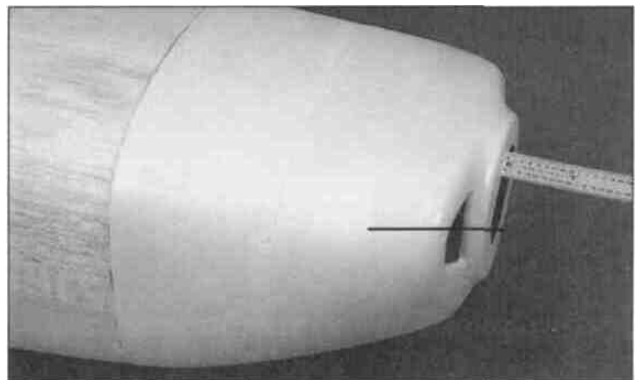
on the cowl back. Using medium grit sandpaper, lightly scuff up the surfaces where the two pieces will be joined for better glue adhesion. Make sure they are correctly aligned with each other (look at the cowl profile from the side and top) and glue them together with CA.

D 5 Lightly scuff the area around the joint line with fine grit sandpaper. Use HobbyLite model filler to fill the joint line. After the filler dries, sand the entire cowl smooth.



D 6. Measure from the front of the firewall to the face of the thrust washer, and write this measurement down here _____". In the photo the measurement reads 6-1/32".

D 7 Remove the engine, and final sand the nose of the plane smooth. The front 3/4" of the nose should **be** tapered in slightly to help the cowl slide **on**.



D 8 Test fit the cowl on the nose. You may have to sand the nose more to get the cowl to fit far enough onto the plane. Measure from the firewall to the front of the cowl. This measurement should be approximately 1/16" less than the measurement you wrote down above.

NOTE: If you are going to use a spinner that has a backplate that extends behind the face of the thrust washer, you will need to allow for the additional space required.

D 9. When satisfied with the fit of the cowl, re-mount the engine. Remove the needle valve and muffler, and stuff pieces of paper towels into the openings to keep dust out of the engine.

D 10 The cowl must now be cut out to clear the engine head and muffler. You also need to drill holes for the needle valve, idle adjustment and choke (if it's a 4-cycle). This is purely a "cut a little and test fit it" type of operation that requires patience. It may seem like an impossible task, but take your time and cut only a little at a time and you will end up with a nice looking cowl. A Dremel Moto-Tool with a conical pointed bit works well for this.



D 11 Once you get the cowl to fit over the engine, place the spinner backplate on the engine. The cowl is correctly positioned when the spinner backplate is centered in front of the cowl and there is approximately 1/16" between the backplate and the cowl.



D 12. Tape the cowl in position on the fuselage, and drill a 1/16" hole on the top, bottom and both sides

of the cowl, approximately 3/8" in front of the cowl aft edge. The holes should be somewhat centered on the sides and go through the balsa fuselage.

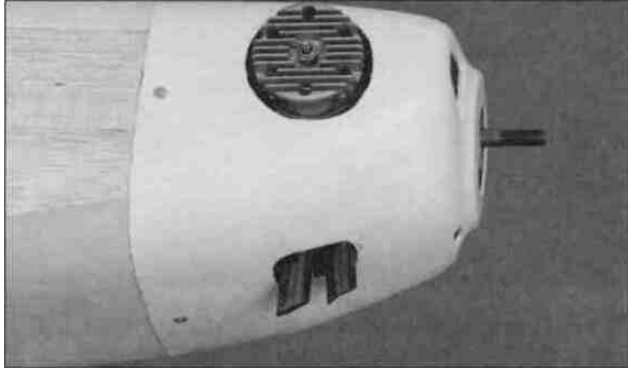
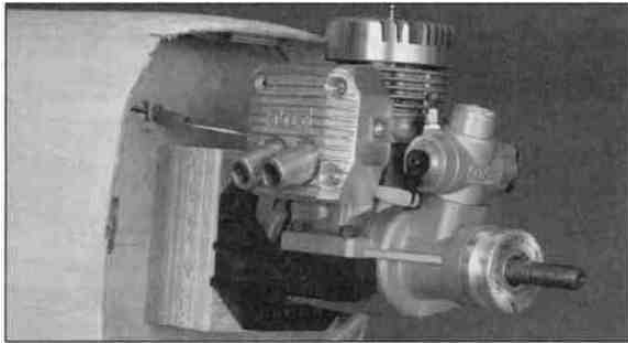


D 13. Remove the cowl, and locate the four 1/8" x 3/4" x 3/4" ply **screw plates** (SKY6F29). Center a screw plate over each 1/16" hole on the **inside** of the fuselage, and glue them in place.

D 14. Using the holes already in the fuselage as guides, drill 1/16" holes through the four 1/8" ply plates.

D 15. Enlarge the holes in the **cowl only** to 3/32", and glue a #2 **washer** (WSHR001) at each hole with CA (See photo at step 16).

NOTE: This step is purely a "cut-and-fit" step that will vary on every kit; therefore, we can only tell you what worked for us. Even if you use the same engine/mount combination, your particular installation may vary quite a bit.



D 16. Install your muffler, and determine where the cowl will need to be cut to clear it. A small Pitts-style muffler will work on most 2-cycle engines. The mufflers that come with most 4-cycles will also work fine, and they can usually be installed after the cowl is screwed on. The plans and photos show several different installations. Cut the cowl to clear the muffler. **IMPORTANT:** Provide at least a 1/8" gap between the muffler and the cowl, or the cowl may melt when the muffler gets hot.



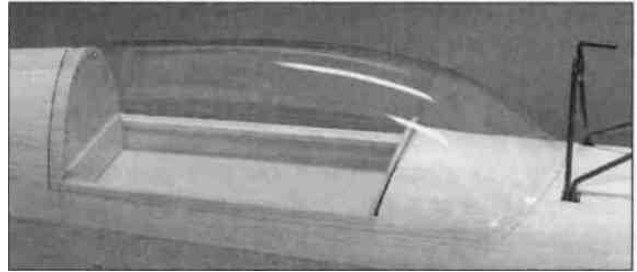
O.S. 120 4-cycle shown

PREPARE THE CANOPY

NOTE: You may tint your canopy by immersing it in a concentrated mixture of Rit Dye and hot tap water. Remove the canopy after 5 minutes and rinse it off to check the amount of tint. The hotter the water and the longer you

leave it in the dye solution, the darker it will tint. The powdered dye will produce a darker tint than will the liquid. **CAUTION:** Do not heat the dye water above hot tap water temperature, as this could deform the canopy.

D 1. Using a scissors, carefully cut the **canopy** (CANPY056) along the trim line. Sand the edges of the canopy to remove any nicks or burrs.

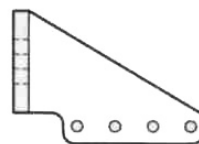


D 2. Trial fit the canopy onto the fuse, lightly pressing it into place. Refer to the plans to get an idea where the canopy should be positioned. Trim and sand as necessary for a good, even overlap.

D 3. Final sand the edges of the canopy with fine (320 grit) sandpaper. It is important that the canopy does not have any cracks along the edges, as the engine vibration could cause them to spread.

NOTE: Do not glue the canopy in place until after you have covered your model.

INSTALL THE CONTROL HORNS



Large Nylon Control Horn

D 1. Hold the **large nylon control horns** (NYLON02) on the elevators and the rudder in the positions shown on the plan, and mark the mounting hole locations. Drill 3/32" holes at these locations.



Small Nylon Control Horn

D 2 If you built your Skybolt with four ailerons, hold the six **small nylon control horns** (NYLON03) on the top and bottom wing ailerons in the positions shown on the plan, and mark the mounting hole locations. Drill 3/32" holes at these locations. The slave strut horns should be cut off as shown on the I-strut detail drawing.

D 3. **Harden the balsa** in the area of all the control horns by poking several holes with a pin (on both sides of the control surface), then applying thin CA glue. Allow the glue to soak in and cure. Then sand the surfaces smooth.



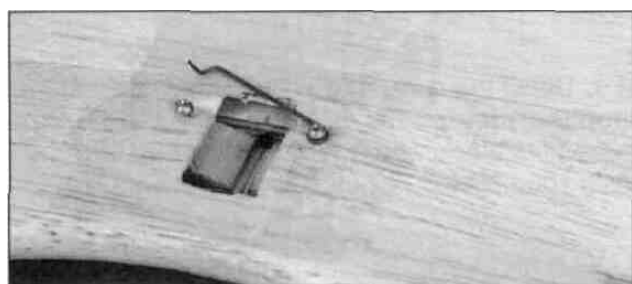
Nut Plate



2-56 x 5/8" Machine Screw

D 4. Test mount all the control horns with **2-56 x 5/8" machine screws** and the nylon **nutplates** which were attached to the horns. Remove the control horns until after the plane is covered.

MAKE THE TOP WING LOCK



#2 x 3/8" Screw

D 1. Drill a 1/16" hole for the top wing lock screw. It should be positioned 1/4" behind the aft edge of the rear top plate and 1/8" outboard of the T1 rib. Refer to the plans to help you position it. The main thing is to make sure the screw anchors into the basswood screw block. Bend the **top wing locking wire** (WBNT185) to match the drawing on the plan. Screw it in place with a #2 x 3/8 screw. Bend the last 3/16" of the wire up away from the surface of the wing so it will be easier to grab.



D 2 Install the top wing, and make sure it slides all the way onto the struts. Rotate the locking wire into place against the cabane wire. Mark where the second screw should be inserted. Set it up so you have to push the wire forward and over the head of the second screw to be able to remove it. The head of the second screw should hold the locking wire in place during flight. The locking wire can be bent slightly, if needed, to make things fit right.

BALANCE THE AIRPLANE LATERALLY

SPECIAL NOTE: Do not confuse this procedure with "checking the C.G." or "balancing the airplane fore and aft." This 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:

D 1. Temporarily attach the wing, tail feathers **and** the engine (with muffler) to the fuselage.

D 2. With the wing level, lift the model by the engine propeller shaft and at the centerline of the fin (this may require two people). Do this several times.

D 3. If one wing always drops when you lift, 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.

FINAL SANDING

Check over the entire structure carefully, inspecting for any poorly glued joints, gaps and "dings" Apply additional glue and/or balsa filler as necessary Then sand the entire fuselage and wing smooth using progressively finer grades of sandpaper.

COVERING

Because it is assumed that you have had some previous model building experience, we won't go into detail in regard to the covering procedure **Follow the instructions included with your covering material.**

NOTE: Top Flite MonoKote was used to cover and trim the prototype models and we highly recommend this covering for this model.

IMPORTANT: When covering the tail surfaces, cut the covering before applying it. DO NOT, under any circumstances, attempt to cut the covering material after it has been applied to the fin and stab, except around the leading and trailing edges and the tip. Modelers who do this often cut through the covering and partially into the balsa stab. This can weaken the stab to the point where it may fail in flight!

GLUE THE AILERON HINGES

D 1. Lay the ailerons on the plans, and mark on the leading edge of each part the locations of the hinges and torque rods Now use a sharp hobby knife to cut slits in the covering at the hinge locations Trial fit the hinges to make sure you have "found" the slots which you previously cut In the same manner, slit the covering at the hinge locations in the wing Also cut the covering away from the torque rod slots.

D 2 When building the plane with only one aileron servo, use a small stick to work a generous amount of **epoxy** into the aileron torque rod holes. Push the ailerons and aileron hinges into place and **wipe off all excess epoxy** Now carefully position the ailerons so they have the correct spacing at the root and tips, and glue the hinges with thin CA*

* This is assuming you are using the type of laminated hinges that are designed to be installed with CA glue.

GLUE ELEVATOR AND RUDDER HINGES

D 1. Lay the rudder and elevators on the plans, and mark on the leading edge of each part, the locations of the hinges and the tail wheel bearing Now use a sharp hobby knife to cut slits in the covering at the hinge locations Trial fit the hinges **to** make sure you have "found" the slots which you previously cut Transfer the hinge marks over to the fin and stab In the same manner, slit the covering at the hinge locations in the fin and stab Also cut the covering away from the tail wheel slot.

D 2 Using coarse sandpaper, roughen the part of the tail wheel torque rod that will be glued into the rudder Then clean off the sanded portion of the rod with alcohol or a degreasing solvent Using a toothpick, apply a small amount of Vaseline where the torque rod enters the nylon bearing (to prevent glue from getting inside and locking it up)

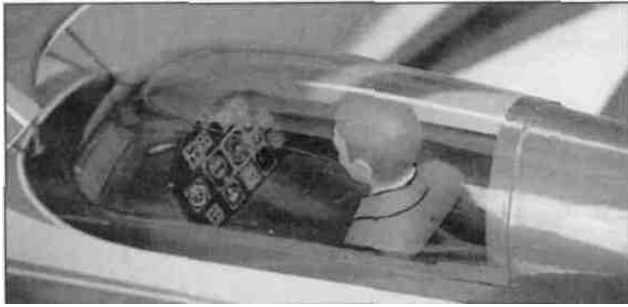
D 3 Using a small stick, work a generous amount of **epoxy** into the tail wheel hole and the nylon bearing slot Push the control surfaces and hinges into place, and **wipe off all excess epoxy** Now check the side-to-side positioning of the control surfaces, and glue the hinges in place with thin CA.

GLUE CANOPY IN PLACE

D 1 Detail the cockpit to your liking We used the supplied instrument decal, painted the entire cockpit flat black, and a Williams Bros #185 2-1/2" scale sport pilot.

D 2 Poke **pinholes** (1/8" apart) through the covering material in the area where the canopy will be glued to the fuselage Lightly sand a strip approximately 1/8" wide along the inside edge of the canopy to help the glue stick to it Carefully clean the canopy and the cockpit to remove any dust.

D 3 Glue the canopy in place on the fuselage **We** have had good luck using RC-56 glue when installing canopies It takes a few hours to dry, but it is very clear and looks good in the end



D 4. To hide the canopy glue joint, you can use 1/8" - 1/4" wide striping tape as a border around the canopy.

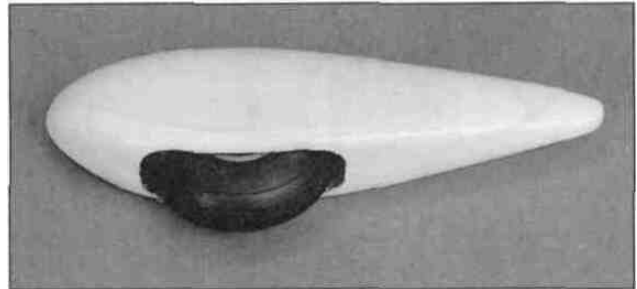


D 3. Use your wheel to determine the area to be cut out of the wheel pant for the wheel opening. This area should be at least 1/8" larger than the wheel to allow for flexing of the tire.

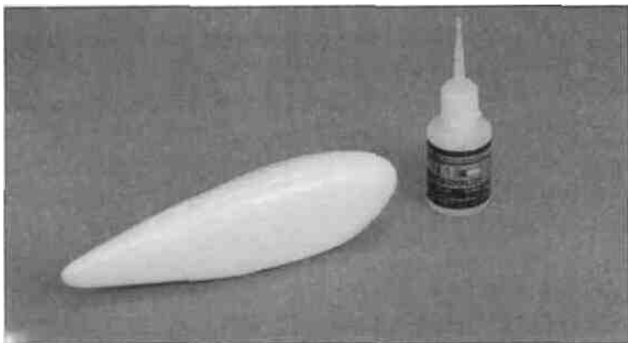
ASSEMBLE AND ATTACH WHEEL PANTS



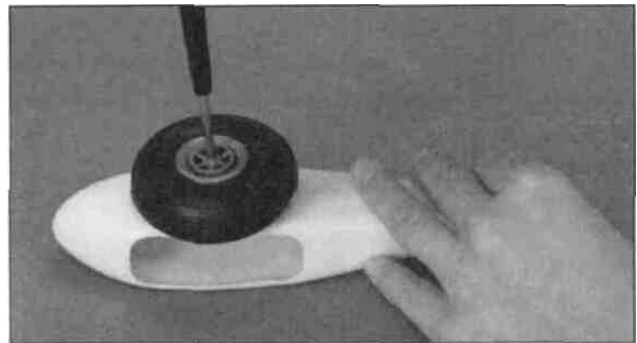
D 1. Cut and trim the ABS **wheel pant halves** (WPNT002) on the parting lines that you will find on the inside of the pants. Lay a full sheet of 150 grit sandpaper down on your flat work surface, and sand the edges of the pant halves smooth. The flatter the edges, the better!



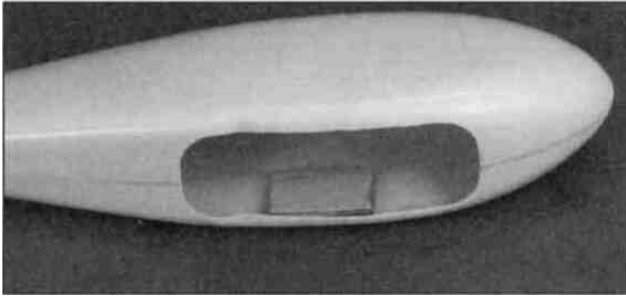
D 4. Cut the wheel opening. A Dremel Moto-Tool with a conical pointed bit is ideal for this operation. Keep the edges of the opening smooth so the wheel pant will not crack later.



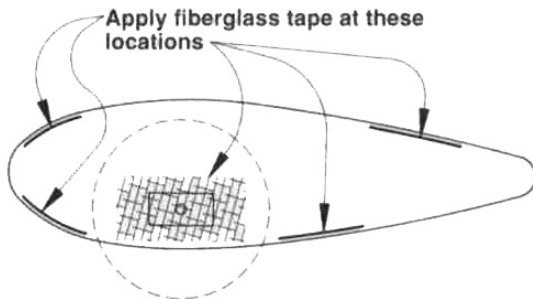
D 2. Hold two pant halves together with the edges lined up, and tack glue the halves together with thin CA. Do this to both sets of pants. Inspect the alignment of the pants, and go over the seam with more thin CA to securely glue the halves together.



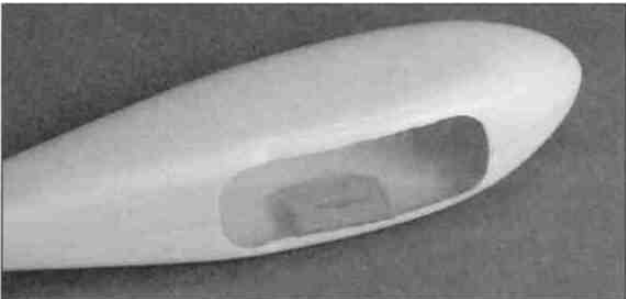
D 5. Determine where the axle hole should be cut in each pant, and drill a 5/32" hole there. The hole is drilled only in one side of the pant, so be sure to make a **right** and a **left** pant! We just centered the wheel on the side of the pant and used a small Phillips screwdriver to make a small dent where the axle should go.



D 6. Center the 1/8" x 1/2" x 1" ply **wheel pant plates** (PLY3013) over the 5/32" holes on the inside of the pants, and glue them in place.



D 7. Cut eight 1" long pieces of fiberglass tape from the 36" strip (GLTP016), and glue them across the seam as shown in the sketch above. Thin CA works well for this. Use a small piece of waxed paper to press the tape into place and smooth it out.

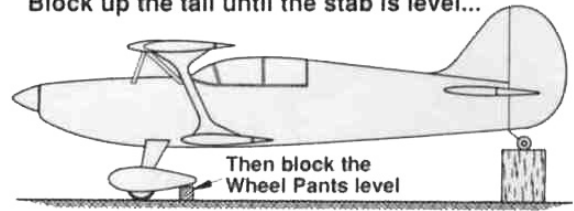


D 8. Cut two 2" long pieces of tape from the remainder of the 12" strip, and glue these over the 1/8" ply wheel pant plates.

D 9. Drill a **5/32"** hole through each 1/8" ply plate using the holes in the wheel pants as guides.

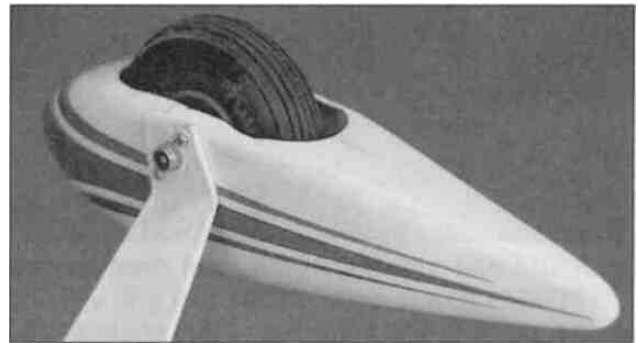
D 10. Slide the wheel and pant onto the axles. Then install them on the landing gear. The detail drawing on the fuse plan shows how to do this.

Block up the tail until the stab is level...



D 11. Use a 1-1/4" tall wood block at the rear of each pant to position the pants as shown in the sketch.

D 12. Hold the pants in the correct position, and carefully drill two 1/16" holes through the landing gear and into each 1/8" ply wheel pant plate. Remove the wheel and pant, and enlarge the holes in the **landing gear only to 3/32". Refer to the plans to determine where the holes are drilled.**

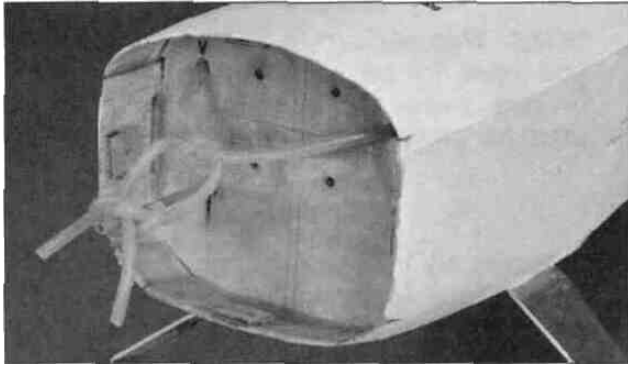


#2 x 3/8" sheet metal screw

D 13. Install the wheel and pant again, and secure each pant with two **#2 x 3/8" sheet metal screws** (SCRW024). Check to see if the screws will interfere with the wheel or tire. If they do, grind the tips off until they won't.

D 14. Remove the pants, and sand the seam to remove any high spots. Use HobbyLite model filler to smooth out any low spots. Final sand the wheel pants, and paint them with your favorite paint. Make sure the paint is compatible with ABS plastic before using it. You can also paint the landing gear if you desire. After the painting is done, re-attach the wheels and pants.

STRENGTHEN AND FUEL PROOF THE NOSE



D 1. Remove the engine and mount, and tie up the fuel tubes to keep them out of the way. Apply a liberal coat of polyester or epoxy resin to all the exposed wood surfaces. Also apply the remainder of the fiberglass tape around the **inside** of the nose. Apply more resin to thoroughly "wet" out the tape. This will greatly strengthen the nose overhang. You may also fuel proof the exposed wood around the inside of the wing saddle if you desire.

WING SEATING

D 1. Apply 1/16" thick x 1/4" wide foam **wing seating tape** to the wing saddle area to seal the wing/fuse Joints.*

**NOTE: An alternate method of sealing the wing/fuse joint is to use "silicone bathtub sealer." This is an excellent method, used by many experts because it results in a permanent and nearly perfect wing saddle joint. Briefly, the technique is as follows:*

1. Cover the top of the bottom wing center section with waxed paper or plastic kitchen wrap. Pull out all wrinkles, and tape it to the wing.

2. Squeeze out a bead of silicone sealer onto the wing saddle area.

3. Lay the wing in the saddle and push down gently. The excess silicone sealer will squeeze out.

4. Allow to dry without disturbing for at least 24 hours.

5. Remove the tape. Then remove the wing from the saddle (leaving the waxed paper or plastic wrap in place). 6. Gently pull the waxed paper or plastic wrap away from the sealer.

7. Using a new single-edge razor blade, trim the sealer along the inside and outside edges of the fuselage.

FINAL HOOK-UPS

D 1. Reinstall the engine, cowl, propeller, spinner, battery, receiver and the switch. Attach both wings to the fuselage. Screw the nylon control horns back onto all the control surfaces.



D 2. Hook up the throttle pushrod. Due to the tight space requirements when using a muffler inside the cowl, the throttle pushrod may need to be run around the muffler. The photo above shows a typical installation when using an OS .61 SF and a Pitts Style muffler.

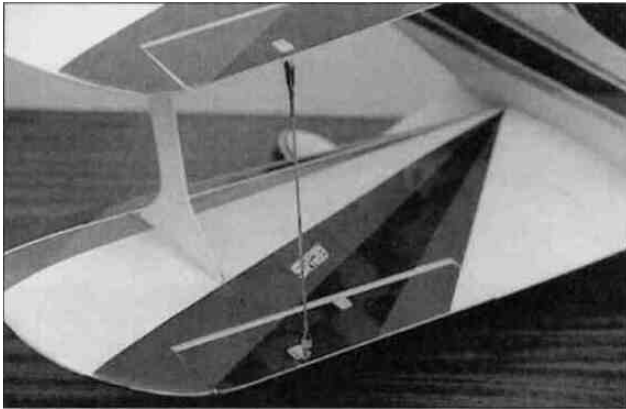
D 3. Make the rudder pushrod using the remaining **34" threaded wire (WIRES17)** and a **nylon clevis (NYLON17)**. Cut seven 1/4" long inner pushrod tube spacers, and slide them onto the wire. Space them about 2" apart along the middle part of the wire, and screw the nylon clevis onto the threaded end. Slide the wire into the outer tube that was installed earlier, and attach the clevis up to the rudder control horn. Mark where the pushrod wire crosses the rudder servo horn. Remove the pushrod, and make a Z-bend at the mark. Unscrew the nylon clevis, and slide the pushrod wire back into place from the servo end of the outer tube. Replace the clevis on the wire, and snap it onto the control horn. Check the rudder operation to make sure it is smooth.

D 4. Screw a nylon clevis onto each elevator pushrod, and hook up the elevators. Check their operation.

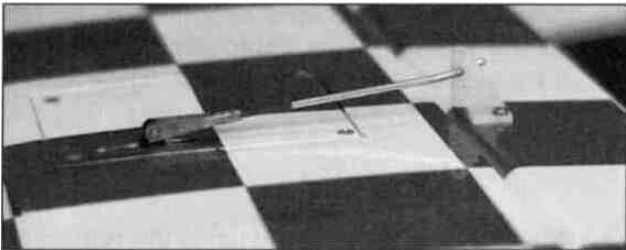
D 5. If you are using four ailerons, assemble the **slave struts** by screwing a **metal clevis (METAL013)** onto the threaded end of two **12" threaded wires**. Snap the metal clevis onto the top wing slave strut horns. Tape both the top and bottom wing ailerons in their **neutral** positions,

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.



and slide a **solder clevis** (METAL024) onto each wire. Hold the solder clevises along side each bottom wing control horn so the solder clevis pin is near the control horn hole. Mark where to cut off the wires. Remove the wires, cut them off, and solder the clevises into place.



D 6 If you are using two aileron servos, make the aileron pushrods by screwing a **nylon clevis** (a metal one is pictured) onto the remaining two 12" threaded rods. Hook up the clevises to the aileron horns and, with the aileron servos in their neutral positions, mark where the wires cross the holes in the control horns. Make a Z-bend at the marks, and cut the excess wire off. Test the operation of the ailerons to make sure they operate smoothly. Enlarge the slots in the hatch if necessary to achieve the proper control deflection (see chart below). Hook up the slave struts, and check the top wing aileron movement. Make sure they move smoothly, with no control "slop".

CONTROL THROWS

The following control throws are recommended for your first flights. They are measured at the widest part of the control surface.

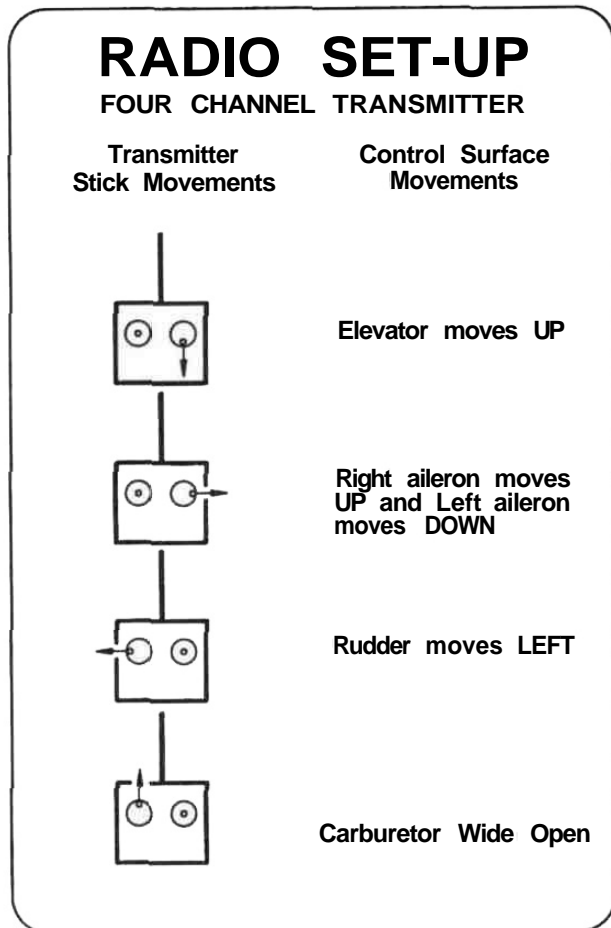
	Low Rate	High Rate
ELEVATOR:	7/8"	1-3/8"
RUDDER:	1-1/2"	As much as possible
AILERONS:	5/16"	1/2"

D 1 Accurately mark the balance point on the **BOTTOM** of the **top** wing. The balance point is shown on the plan (CG), and is located **2-3/4"** (70mm) behind the top wing leading edge at rib **T7**. This is the balance point at which your model should balance for your first flights. Later, you may wish to experiment by shifting the balance up to **3/8" (10mm) forward or back** to change the flying characteristics. Moving the balance **forward** may improve the smoothness and arrow-like tracking, but it may then require more speed for takeoff and make it more difficult to slow down for landing. Moving the balance **aft** makes the model more agile, with a lighter and snappier "feel". If you move the balance aft, the elevator will have more authority, possibly resulting in a plane that is too maneuverable. If this happens, you should reduce the maximum elevator throw slightly. In any case, **do not balance your model outside the recommended range.**

D 2 Balance the airplane with the fuel tank **empty**. If it balances outside the "balance range," you must either shift the location of radio components or add weight to the nose or tail until it balances within the range. **NOTE:** Nose weight may be easily installed by using a "Spinner Weight" (available in assorted weights, up to 2 ounces), or by gluing strips of lead into the engine compartment. Tail weight may be added by using "stick-on" lead weights, and, later, if the balance proves to be OK, you can open the fuse bottom and glue these in permanently.

FINAL CHECKS

D 1 Make sure the control surfaces move in the proper direction as illustrated in the following sketch.



D 2. Check for wing twist as follows:

NOTE: Even if you have built your wing on a perfectly flat surface and used utmost care, it is possible that your wing may have a twist due to uneven shrinking of the covering material. VERY IMPORTANT: You must check for this condition and correct it before the first flight.

If you do not own a **wing incidence meter**, we recommend that you purchase one from your local hobby dealer or borrow one from another modeler. With the wings attached to the fuselage and the I-struts in place, block up the fuselage until the stab shows exactly 1-1/2 degree of positive incidence (LE higher) Then use the incidence meter to check the angle of your wings at the root (next to the fuselage) and at the tips. The meter should read 0-degrees for the bottom wing and -1 degree for the top wing (this means that the trailing edge is higher than the leading edge) If the incidence

meter reveals a deviation of more than 1/4 degree from the desired readings, you must grasp the wing at the tip and twist it slightly, while reheating the covering material. Keep checking, twisting and reheating until the wing twist is removed. **NOTE:** If you have corrected a wing twist by this method, you should periodically re-check to make sure the correction has held.

PRE-FLIGHT

CHARGE THE BATTERIES

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

FIND A SAFE PLACE TO FLY

The best place to fly your R/C model is an AMA (Academy of Model Aeronautics) chartered club field. Ask your hobby shop dealer if there is such a club in your area and join. Club fields are set up for R/C flying which makes your outing safer and more enjoyable. The AMA can also 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 safe place to fly and also have insurance to cover you in case of a flying accident. (The AMA address is listed on the front cover of this instruction book).

If there is no flying club in your area, you need to find a large area, free of obstructions, with a smooth surface that can be used as a runway. It should be located at least 6 miles away from any other R/C airplane operation and away from houses, buildings and streets. A schoolyard may look inviting but it is too close to people, power lines and possible radio interference.

GROUND CHECK THE MODEL

If you are not thoroughly familiar with the operation of R/C models, ask an experienced modeler to check to see that you have the radio installed correctly and that all the control surfaces do what they are supposed to. The engine operation must also be checked and the engine "broken in" on the ground by running the engine for at least two tanks of fuel. **Follow the engine manufacturer's recommendations for break-in.** Check to make sure all screws remain tight, the hinges are secure and the prop is on tight.

RANGE CHECK YOUR RADIO

Check the operation of the radio before every time you fly. This means with the transmitter antenna collapsed and the receiver and transmitter on, you should be able to walk at least 100 feet away from the model and still have control. Have someone help you. Have them stand by your model and, while you work the controls, tell you what the various control surfaces are doing.

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

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. 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, as the propeller may throw such material in your face or eyes.

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

Keep items such as these away from the prop: loose clothing, shirt sleeves, ties, 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 is not leaked 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

Read and abide by the Academy of Model Aeronautics Official Safety Code, a portion of which is reprinted here.

GENERAL

1. I will not fly my model aircraft in competition or in the presence of spectators 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 and avoid flying in the proximity of full-scale aircraft. Where necessary, an observer shall be utilized to supervise flying to avoid having models fly in the proximity of full-scale aircraft.

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

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

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

RADIO CONTROL

1. I will have completed a successful radio equipment ground range 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 flyer, 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

The Great Planes Super Skybolt is a great flying sport scale airplane that flies smoothly and predictably, yet is highly maneuverable. It does **not** have the self-recovery characteristics of a primary trainer. Therefore you must either have mastered the basics of R/C flying or seek the assistance of a competent R/C pilot to help you with your first flights.

TAKEOFF: If you have dual rates on your transmitter, set the switches to "high rate" for takeoff, especially when taking off in a cross wind. Although the Skybolt has good low speed characteristics, you should always build up as much speed as your runway will permit before lifting off, as this will give you a safety margin in case of a "flame-out". When the plane has sufficient flying speed, lift off by **smoothly** applying a **little** up elevator (don't force it off into a vertical climb), and climb out gradually.

FLYING: We recommend that you take it easy with your Skybolt for the first several flights and gradually "get acquainted" with this fantastic ship as your engine gets fully broken-in. As you will quickly learn, the Skybolt behaves like a "dream ship". It is incredibly smooth and predictable, yet, still very maneuverable. Your confidence will grow to the point that aerobatics are more fun than ever. Just remember to take your time. Add and practice only one maneuver at a time, learning how she behaves during each one.

LANDING: When it's time to land, do a couple of slow fly by's at a safe altitude and get familiar with the plane's slow flying characteristics. The aerodynamic design of the Super Skybolt gives it stability not often found in R/C biplanes. She will really slow down for some of the smoothest landings you can imagine.

CAUTION (THIS APPLIES TO ALL R/C AIRPLANES) If, while flying, you notice any unusual sounds, such as a low-pitched "buzz", this may be an indication of control surface "flutter". Because flutter can quickly destroy components of your airplane, any time you detect flutter you must immediately cut the throttle and land the airplane. Check all servo grommets for deterioration (this will indicate which surface fluttered), and make sure all pushrod linkages are slop-free. If it fluttered once, it 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 Z-bend in servo arm, insufficient glue used when gluing the torque rods into the control surfaces, excessive flexing of aileron, caused by using too soft balsa aileron, excessive "play" or "backlash" in servo gears, and insecure servo mounting.

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

GOOD LUCK AND GREAT FLYING!

**SEE THE FULL LINE OF GREAT PLANES AIRPLANES AT YOUR HOBBY DEALER.
WE HOPE YOU WILL SELECT ANOTHER "GREAT PLANE" AS YOUR NEXT PROJECT.
THANK YOU!**

2-VIEW DRAWING

