

FREEDOM 20



Instructions

Whether you are just learning to fly an R/C model or you are a seasoned flier with the desire to build a classic sport aircraft, then Carl Goldberg Products has your ticket to "freedom."

The success of the construction starts here with this booklet. Take time to familiarize yourself with this manual and the plans before you start to glue parts together. The whole experience will be much more enjoyable if you can anticipate the next step. Remember to take your time. Follow the instructions in the sequence presented, and check off each step as you progress.

WARNING

A radio-controlled model is not a toy and is not intended for persons under 16 years old. Keep this kit out of the reach of younger children, as it contains parts that could be dangerous. A radio-controlled model is capable of causing serious bodily injury and property damage. It is the buyer's responsibility to assemble this aircraft correctly and to properly install the motor, radio, and all other equipment. Test and fly the finished model only in the presence and with the assistance of another experienced R/C flyer. The model must always be operated and flown using great care and common sense, as well as in accordance with the Safety Code of the Academy of Model Aeronautics (5151 Memorial Drive, Muncie, IN 47302, 1-800-435-9262). We suggest you join the AMA and become properly insured prior to flying this model. Also, consult with the AMA or your local hobby dealer to find an experienced instructor in your area. Per the Federal Communications Commission, you are required to use only those radio frequencies specified "for Model Aircraft."

LIMITED WARRANTY

Carl Goldberg Products has inspected and certified the components of this aircraft. The company urges the buyer to perform his own inspection, prior to assembly, and to immediately request a replacement of any parts he believes to be defective for their intended use. The company warrants replacement of any such components, provided the buyer requests such replacement within a period of one year from the date of purchase and provided the defective part is returned, if so requested by the company.

No other warranty, expressed or implied, is made by the company with respect to this kit. The buyer acknowledges and understands that it is his responsibility to carefully assemble the finished flying model airplane and to fly it safely. The buyer hereby assumes full responsibility for the risk and all liability for personal or property damage or injury arising out of the buyer's use of the components of this kit.

CARL GOLDBERG PRODUCTS, LTD.

P.O. Box 88 Oakwood GA 30566 Phone #678-450-0085 Fax # 770-53-63 www.carlgoldbergproducts.com

GLOSSARY

of common modeling terms

AMA: the national organization for people who build and fly model airplanes, open to everyone.

ARF: Almost Ready to Fly.

AILERON: the control surface on the wing that rolls the plane.

AIRFOIL: the shape of the wing as seen from the end.

ANGLE OF ATTACK: the angle at which the wing meets the air flow.

BEVEL: to sand to an angle shape.

BURR: the rough edges on a piece of wood or metal after it is cut.

CAP STRIP: a thin strip glued to the edges of the ribs to shape the wing.

CONTROL HORN: a device attached to each control surface to provide an attachment point for the pushrod.

COWL (COWLING): the nose section of the fuselage that encloses the engine.

DECALAGE: the difference between the incidence of wing and stabilizer.

DIHEDRAL: the upward angle of the wings as seen from the front.

ELEVATOR: the moveable part of the horizontal tail which controls pitch.

EMPENNAGE: the tail of the plane.

FIN: the fixed vertical part of the tail.

FIREWALL: the hard wooden former at the front of the fuselage to which the engine is mounted.

FORMER: a piece which shapes the fuselage; the sides are attached to them.

FUSELAGE: the body of the airplane that contains the fuel tank and radio.

GUSSET: a small triangular piece glued into a corner to strengthen it.

INCIDENCE: the angle of the wing or the tail in relation to the thrustline.

LAMINATE: to glue two thin sheets of material together to form a thick sheet.

LEADING EDGE (L.E.): the edge of the wing that first meets the airflow.

LONGERON: a stringer that runs the length of the fuselage.

OUTPUT ARM: the piece that attaches to the servo and connects it to the pushrod.

PITCH: an up-and-down movement of the nose of the plane; controlled by the elevator.

PROTOTYPE: the full-scale airplane from which the model design was taken.

PUSHROD: the long, stiff dowel or plastic piece that connects the servo with the control horn.

RTF: Ready to Fly.

RIB: the airfoil-shaped piece that connects the leading edge, spars and trailing edge of the wing together and holds them in shape.

RETRACTS: devices for extending and retracting the wheels on command.

ROLL: tilting the plane as viewed from the front; controlled by the ailerons.

RUDDER: the moveable vertical tail of the plane, which controls yaw.

SERVO: the part of the airborne radio system that moves the control surfaces.

SHEAR WEB: wood sheeting that connects the top and bottom spars to stiffen the wing.

SHIM: a thin piece inserted between two pieces to improve their fit.

SPAR: a wooden stick running lengthwise through the wing that serves as its backbone.

SPINNER: the rounded cone that fits over the propeller hub.

STABILIZER (STAB): the fixed horizontal part of the tail.

STALL: a situation where the plane is flying too slowly to move sufficient air across the wing to produce lift.

STRINGER: a long piece of wood attached to the formers to shape the fuselage.

THRUSTLINE: a line drawn from the center of the propeller hub straight through the airplane.

TORQUE: a rolling tendency caused by the spinning propeller.

TRAILING EDGE (T.E.): the edge of the wing that faces the rear of the plane.

TRIM: small adjustments made to the control surfaces to cause the plane to fly straight and level by itself.

WASHIN: a twist in the wing that makes the trailing edge lower than normal.

WASHOUT: a twist in the wing that makes the trailing edge higher than normal.

WING SADDLE: the shaped part of the fuselage in which the wing rests.

WHEEL COLLAR: a metal ring that holds the wheel on the axle.

YAW: a right-to-left movement of the nose, controlled by the rudder.

The instructions for this kit are contained in two volumes. Book number 1 deals with the sequence of steps required to build the Freedom 20. Book number 2 is a general information booklet that deals with generic information common to all Carl Goldberg kits. Items such as flying, covering, hinge installation and radio selection are typical to all model aircraft. So, anything not covered in book 1 will be addressed in book 2. Check the contents for information needed.

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I. INTRODUCTION

USING THIS INSTRUCTION MANUAL

Like a full-size airplane, the Freedom .20 is built from basic structures; stabilizer, fin, wing, etc. which are then assembled into the complete airplane.

Special procedures or comments will usually be explained before a step so you will be prepared. If a step begins with a statement like "Note," "Warning," or "Important," it is a good idea to read through the step before doing it.

A check-off box appears at the beginning of each step. Check these boxes as you build so you can tell at a glance what steps you have completed.

Some steps require you to repeat them, as in the case of the left and right wing panel. When this occurs circle the check box as you go.

9. ☒ Select 10 precut 1/16" webbing (clear wrap)
- ☒ Prefit between ribs #1 between ribs #4 between ribs #2
- example step*

Some of the instructions deal with general procedures. Boxes are not needed for these sections.

HOW TO READ THE PLANS

There is one plan sheet included with your Freedom .20. It shows the Fuselage (Body), the Wing and Tail Parts. Everything on the plan is drawn full-size and shape, and how the finished parts all fit together.

The plan is drawn to show the model completely assembled. But this covers up the parts inside or underneath and makes it hard to understand how things fit together. So for clarity, we have drawn some parts as hidden lines, breakaway views, or removed parts entirely.

For example, on the fuselage, we have removed part of the left side of the completed model to show the details inside the fuselage.

Sometimes we will "break away" a surface to reveal a detail behind or underneath.

Dashed (hidden) lines show details that are hidden behind or under another part or surface.

The model is made from four kinds of wood: balsa, bass, birch, and various plywoods. Each of these woods has its own characteristic End Grain Pattern (as viewed from the end) which has been drawn on the plans. You can easily use these end grain patterns to identify what kind of wood is shown for a part if you are in doubt.

IDENTIFYING PARTS

Parts for the wing are bundled together, likewise, parts for the tail assembly are also grouped. Die-cut plywood and balsa sheets of common sizes are bundled together so they are less likely to be damaged during shipping and handling.

The various screws, hinges, and fittings are packaged in two plastic bags. To avoid losing parts, remove parts only as needed.

HOW TO USE THE PLANS

The plans are used in several ways. The wings, stabilizer, and fin are assembled directly over the plans. Each wood part is matched over its corresponding location printed on the plan and pinned in place. To prevent ruining your plans from gluing your wings, etc. to them, cover the area you are working on with wax paper or plastic kitchen wrap.

Because the Freedom .20 fuselage plugs together and is self-aligning, it is not built directly over the plans. As you assemble the fuselage, you will find the plans helpful in identifying parts and how things fit together.

The plans also show how we installed a typical radio, battery and all remaining equipment and hardware needed to complete the model. By referring to the examples shown on the plan you should be able to install your own radio, etc. even if not the same as what is shown on the plan.

PREPARING FOR ASSEMBLY

Set a flat warp-free pinning board on your work bench. Any material that accepts pins such as insulation board, soft plywood, or even dry-wall (sheet rock) will work for this. Important; any warps or bends in the pinning board will result in wings or tail surfaces that are also warped or bent, making your Freedom .20 more difficult to fly. Make sure that the pinning board is flat. Lay a straight edge across the board to check flatness, you may be able to correct a warped board by shimming low areas of the board.

Position the area of the plan you are going to build (stabilizer for example) over the pinning board and tape it in place so plan is flat and wrinkle free.

Lay a sheet of waxpaper or plastic "kitchen" wrap over the stabilizer area to prevent glue from sticking and ruining your plans.

Then follow the instructions to assemble the stabilizer, fin and wing.

CONSTRUCTION TIPS

If you never assembled a built-up wood model before, this section describes what the plans and instructions are all about and offers some helpful building tips.

Probably the most helpful tip is to always read a few steps ahead. This will help you to plan ahead, and to be aware of what's coming up.

You may find it helpful to empty all of the small parts from the hardware bags into a common container, such as a margarine tub. This will help to quickly find the items at a glance.

When drilling the 1/16" hinge holes into balsa, you may find it easier to twist the drill between your thumb and index finger. This procedure allows more control in positioning the drill on the centermark.

Punch out only the D.C. parts you need as you proceed. This will help you to keep track of parts, especially the small ones.

ITEMS MARKED  ARE "NOT INCLUDED IN THE KIT"

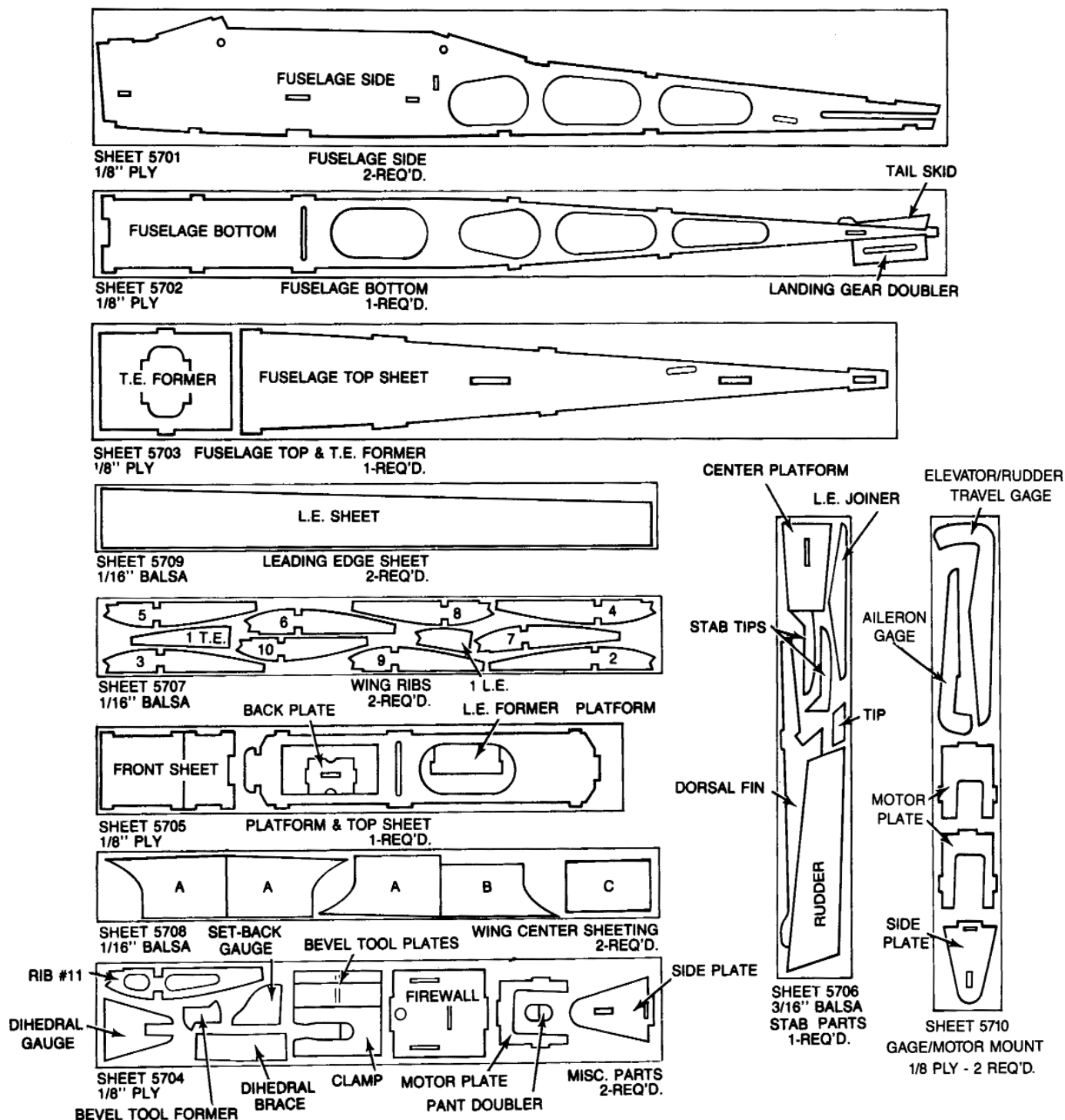
II. PARTS IDENTIFICATION

WOOD PARTS

Be careful when removing parts (such as fuselage sides) from die-cut sheets. Long parts are fragile until glued into a structural unit. If necessary, use a razor knife or razor saw to assist in the removal of parts from sheet. Sometimes a little trimming and sanding can improve parts where desired. Save scrap until model is completed, in case you should miss a part. Scrap is used also in some building steps on the plan. Other easily recognized parts, such as motor bearers are not shown here.

ABOUT THE WOOD IN THE KIT

We strive to supply good quality materials in your kit. Wood parts are inspected with regard to the function they will serve. If an imperfection is spotted in a scrap corner of a die-cut sheet and doesn't affect actual parts, the sheet is considered acceptable. Also, internal stresses in wood are relieved as it is cut into parts. These relieved stresses may cause some parts to bow. Bows in wood parts (such as leading edges) readily straighten out as they are glued into a structural unit.





SHAPED L.E.
2 REQ'D.



NOTCHED T.E.
2 REQ'D.



T.E. CENTER SECTION
2 REQ'D.



AILERON/TIP STOCK
2 REQ'D.



1/4"x1/4" BASSWOOD
4 REQ'D.



1/16"x1/2"
4 REQ'D.



1/16"x3/16"
3 REQ'D.



1/4" DOWEL
2 REQ'D.



1/8"x1/4"
1 REQ'D.



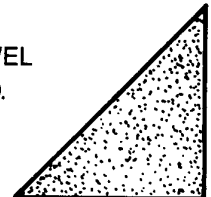
3/16"x1/2"
4 REQ'D.



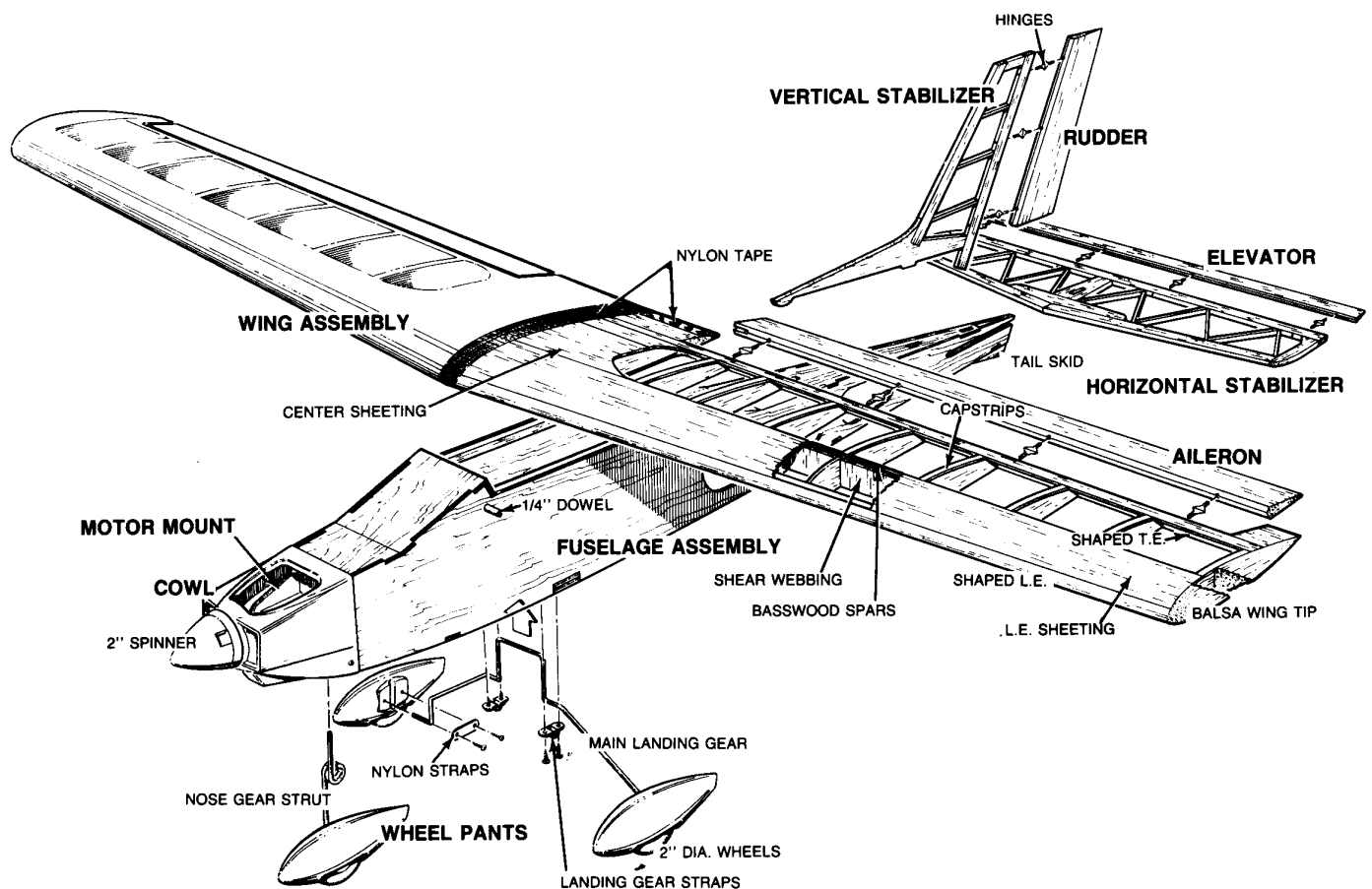
1/8"x3/16"
5 REQ'D.



ELEVATOR STOCK
1 REQ'D.



1-1/16" TRI
2 REQ'D.



#2x5/16"



#2x3/8"
SCREWS



#4x3/8"



4-40x3/16"
SOCKET HEADS



4-40x1/2"



4-40
BLIND
NUT



#2
#4
WASHERS



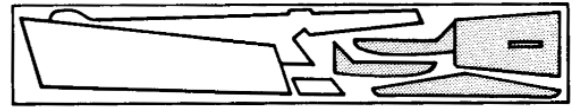
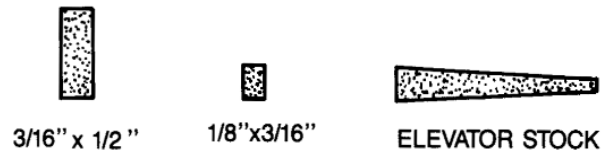
2-56x1/2"

III. CONSTRUCTION OF THE HORIZONTAL STABILIZER (16 Steps)

1. Find all the parts that you will need to build the HORIZONTAL STABILIZER.

THEY INCLUDE:

- (2) 3/16" x 1/2" x 20" BALSA
- (2) 1/8" x 3/16" x 18" BALSA
- (1) 3/16" BALSA CENTER PLATFORM (D.C.)
- (1) 3/16" BALSA L.E. JOINER (D.C.)
- (2) 3/16" BALSA TIPS (D.C.)
- (1) "C.G. CENTERLINE MARKER"



SHEET 5706

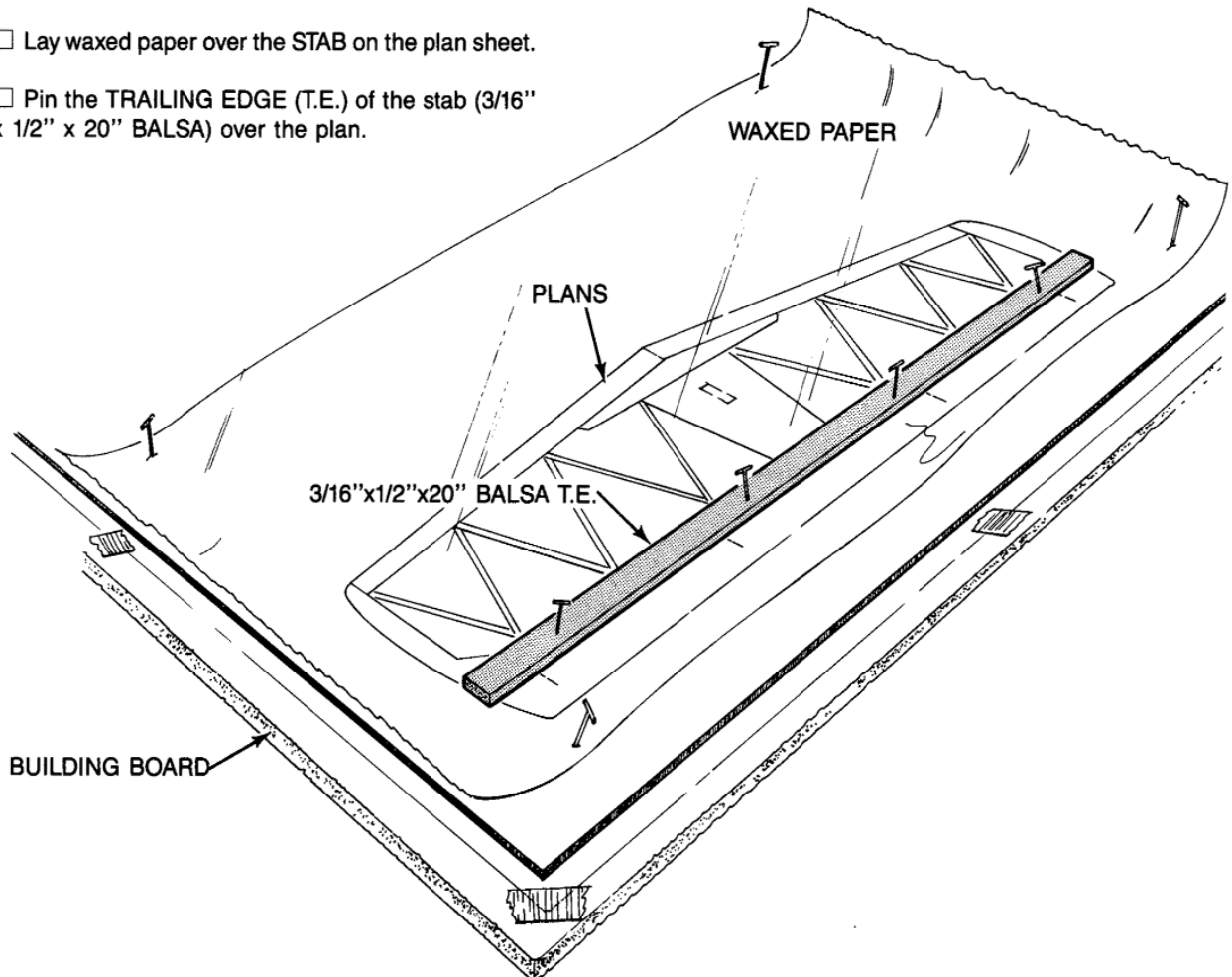
2. Items needed to construct the HORIZONTAL STABILIZER include:

- (1) SHEET OF WAXED PAPER APPROX. 20" LONG
- (30) "T" PINS
- (1) CA glue
- (1) X-ACTO KNIFE W/#11 BLADE
- (1) SANDING BLOCK W/FINE SANDPAPER
- (1) 1/16" DIA. DRILL BIT

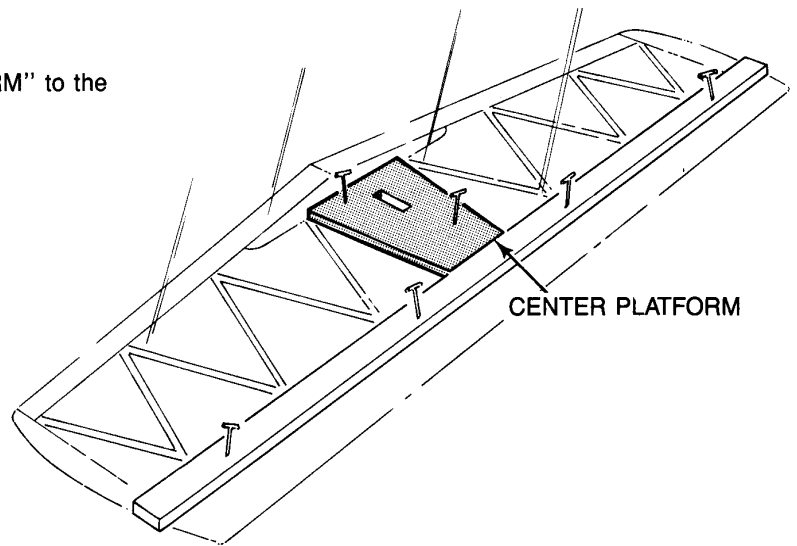
3. ☐ Lay the STAB portion of the plan over your building board.

☐ Lay waxed paper over the STAB on the plan sheet.

☐ Pin the TRAILING EDGE (T.E.) of the stab (3/16" x 1/2" x 20" BALSA) over the plan.

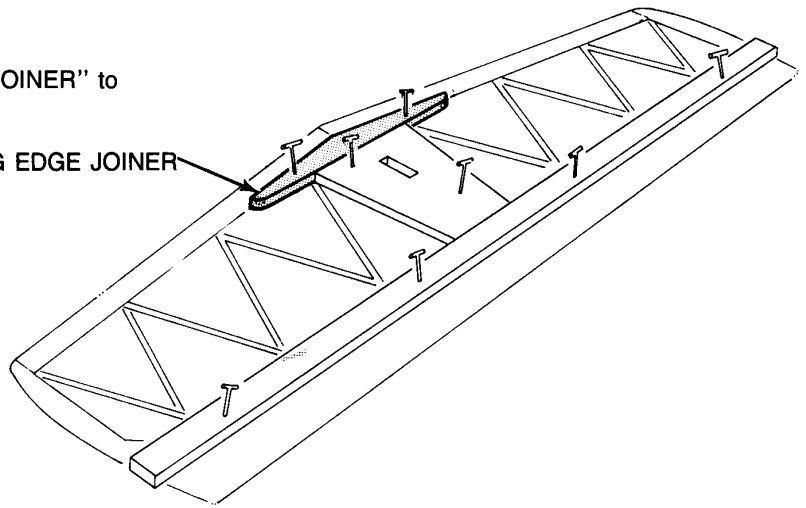


4. ☐ Glue and pin the "CENTER PLATFORM" to the T.E. over the plan.



5. ☐ Glue and pin the "LEADING EDGE JOINER" to the CENTER PLATFORM.

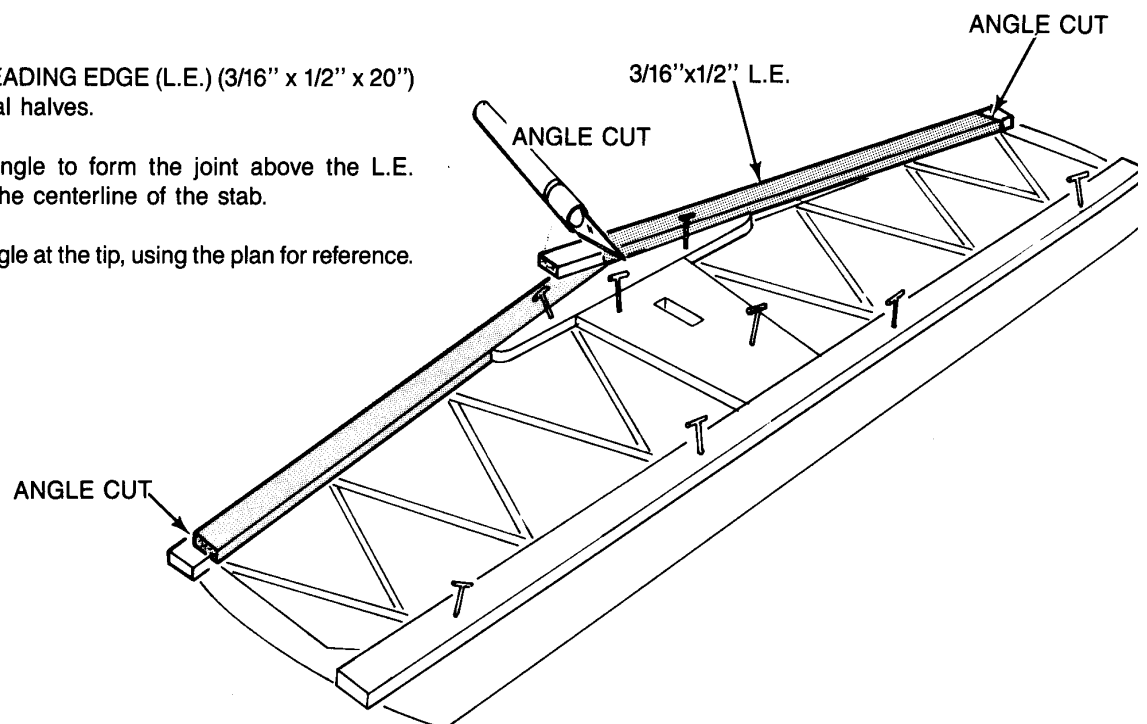
LEADING EDGE JOINER



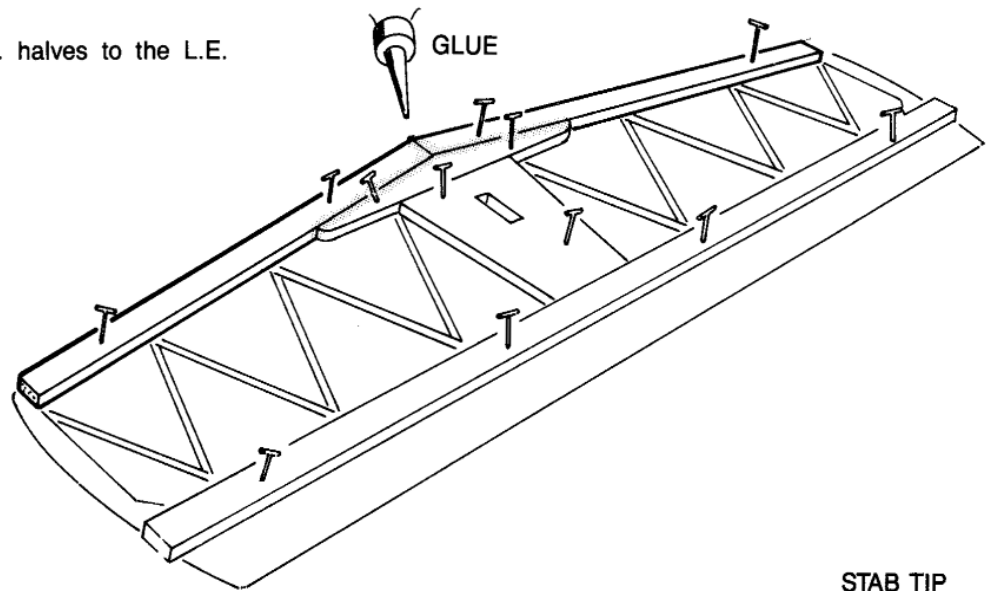
6. ☐ Cut the LEADING EDGE (L.E.) (3/16" x 1/2" x 20") into two equal halves.

☐ Cut the angle to form the joint above the L.E. JOINER on the centerline of the stab.

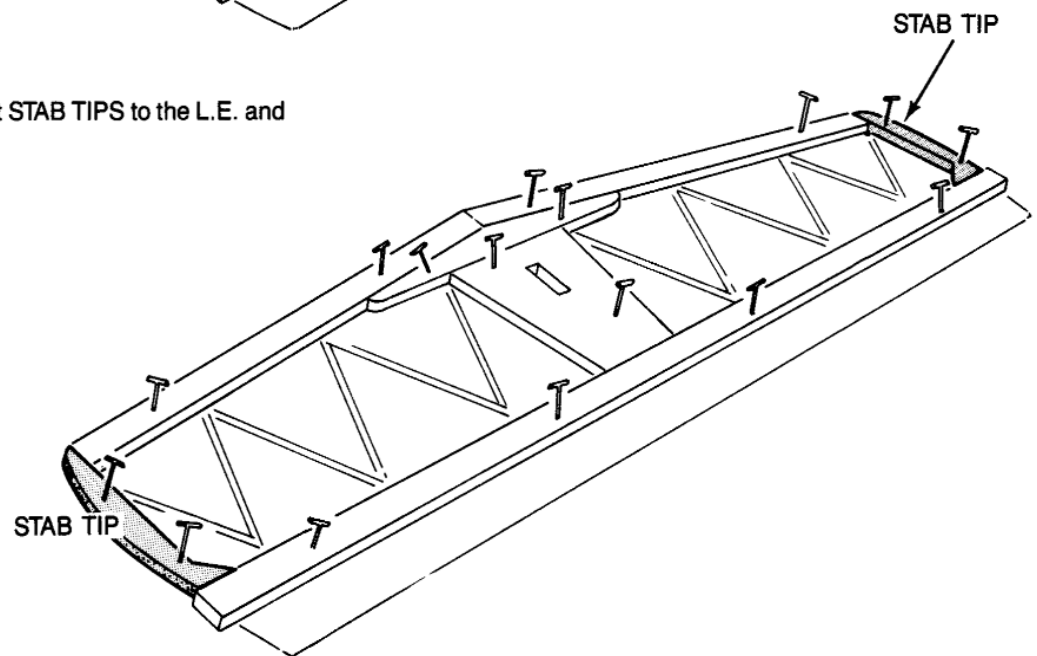
☐ Cut the angle at the tip, using the plan for reference.



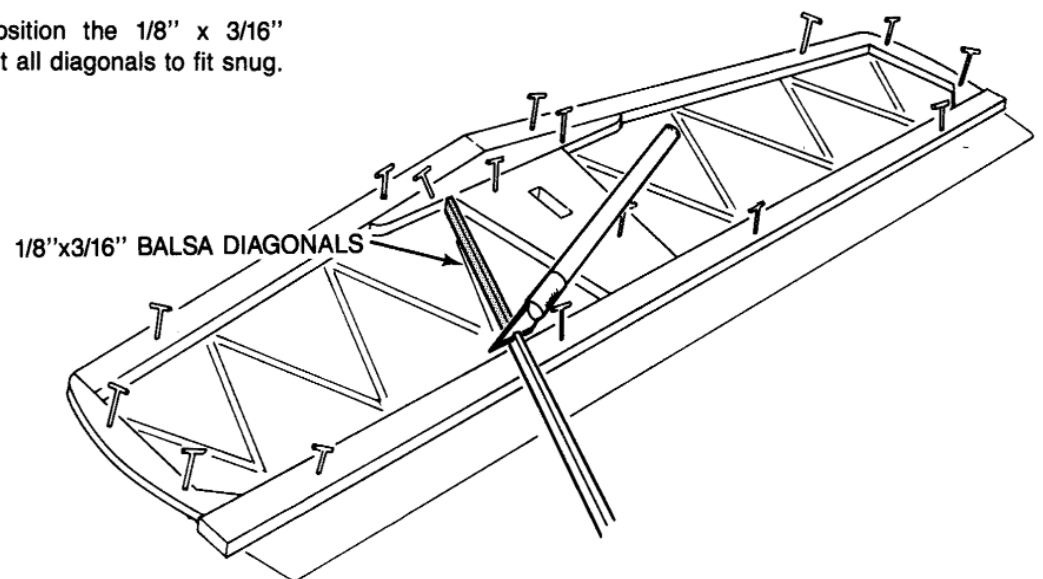
7. ☐ Glue and pin the two L.E. halves to the L.E. JOINER.



8. ☐ Glue and pin the die-cut STAB TIPS to the L.E. and T.E.



9. ☐ Using the plan to position the 1/8" x 3/16" DIAGONAL BRACING, cut all diagonals to fit snug.



10. ☐ Make sure the diagonals are even with the top of the L.E. and T.E.

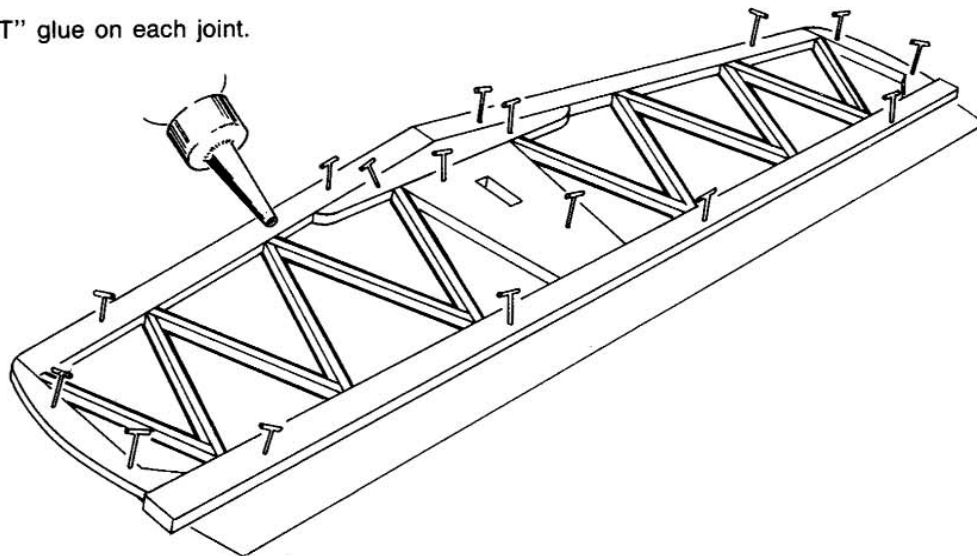


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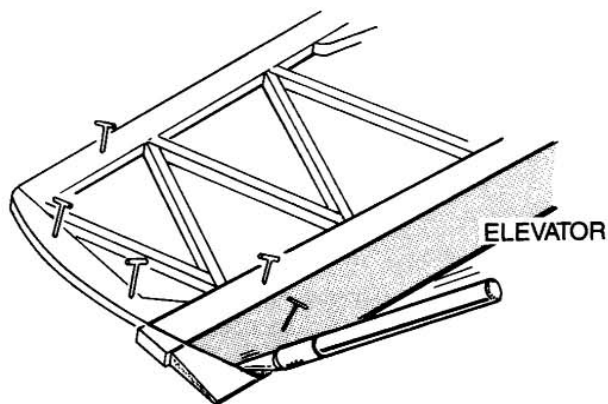
NOT THIS

- ☐ Place a large drop of "JET" glue on each joint.



11. ☐ Pin the WIDE END of the TAPERED ELEVATOR STOCK tight against the T.E. of the stab.

- ☐ Trim the T.E. and the ELEVATOR, to blend with the tip's profile.



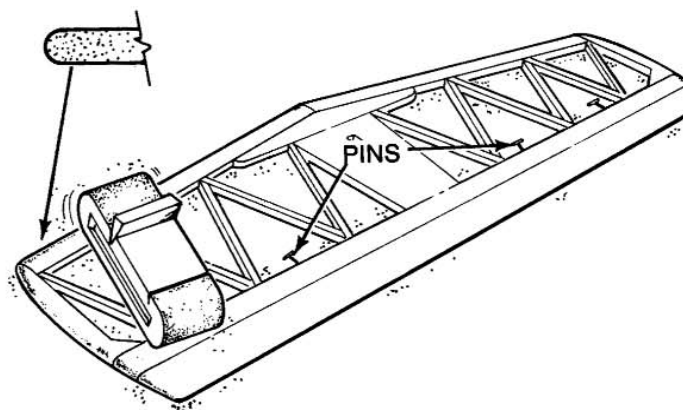
12. ☐ Remove the stab and elevator from the board.

- ☐ Pin the elevator to the stab.

- ☐ With the stab on a flat surface, use a sanding block to even all joints. Do this to both sides.

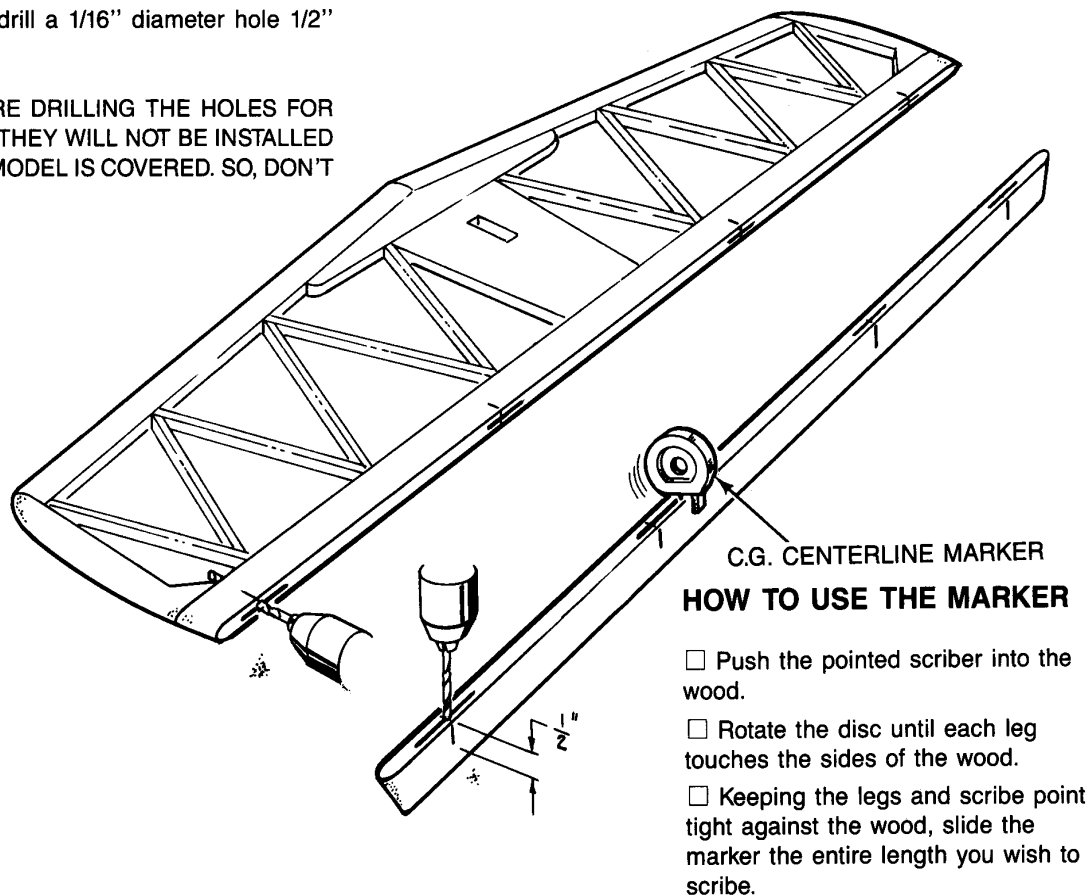
- ☐ Round the L.E. and the tips to form a full radius over the entire thickness of the stab.

- ☐ Blend the stab tips into the elevator tips.

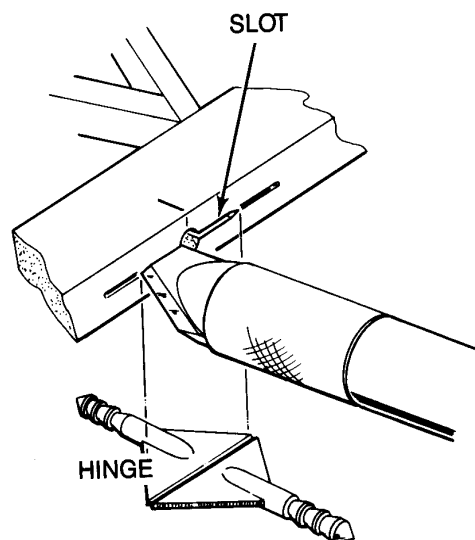


13. ☐ Mark the four hinge locations on the stab and elevator. Refer to the plan for locations.
- ☐ Separate the stab and elevator.
- ☐ Use the "C.G. CENTERLINE MARKER" to mark the center at each of the eight hinge hole locations.
- ☐ At each location drill a 1/16" diameter hole 1/2" deep.

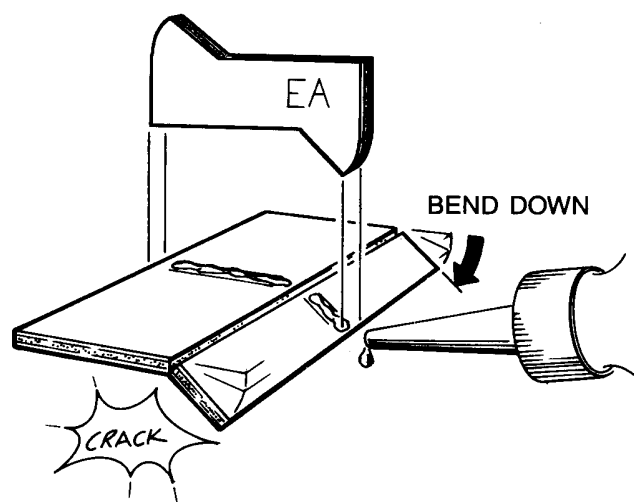
Note: ALTHOUGH YOU ARE DRILLING THE HOLES FOR THE HINGES NOW, THEY WILL NOT BE INSTALLED UNTIL AFTER THE MODEL IS COVERED. SO, DON'T WORRY BE HAPPY!



14. ☐ Use an X-acto knife to slot each hole for hinge clearance.

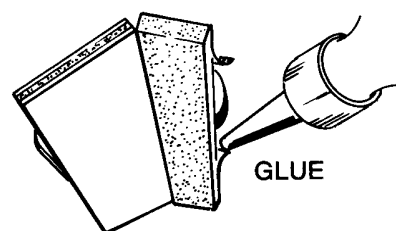


15. ☐ Assemble the ELEVATOR/AILERON BEVELING TOOL.

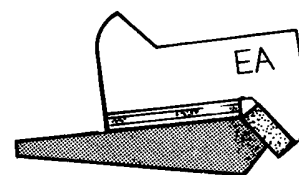
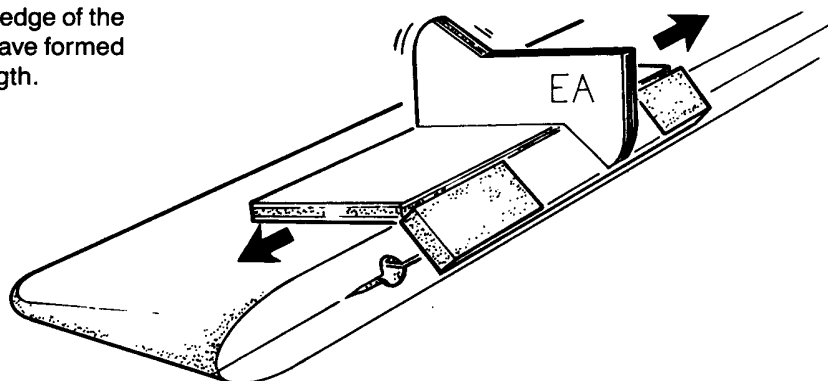


- ☐ Cut a strip of FINE sandpaper to fit the narrow panel and glue as shown.

Note: DO NOT THROW AWAY WHEN FINISHED, IT IS USED AGAIN TO BEVEL THE AILERONS.



17. ☐ Using the BEVEL TOOL, sand the wide edge of the T.E. on both the top and bottom until you have formed a symmetrical bevel along the entire length.



LIKE THIS

THIS COMPLETES THE HORIZONTAL STABILIZER AND ELEVATOR. YOU WILL NOT NEED THESE PARTS UNTIL YOU ARE READY FOR COVERING. SEE HOW EASY THIS WAS! NOW LET'S GO ON TO THE VERTICAL STAB AND RUDDER.

IV. CONSTRUCTION OF THE VERTICAL STABILIZER (13 Steps)

1. Find all the parts that you will need to build the VERTICAL STABILIZER AND RUDDER.

THEY INCLUDE:

- (1) 3/16" x 1/2" x 20" BALSA
- (1) 1/8" x 3/16" x 18" BALSA
- (1) 3/16" BALSA D.C. "DORSAL"
- (1) 3/16" BALSA D.C. "FIN TIP"
- (1) 3/16" BALSA D.C. "RUDDER"
- (1) "C.G. CENTERLINE MARKER"



3/16"x1/2"



1/8"x 3/16"



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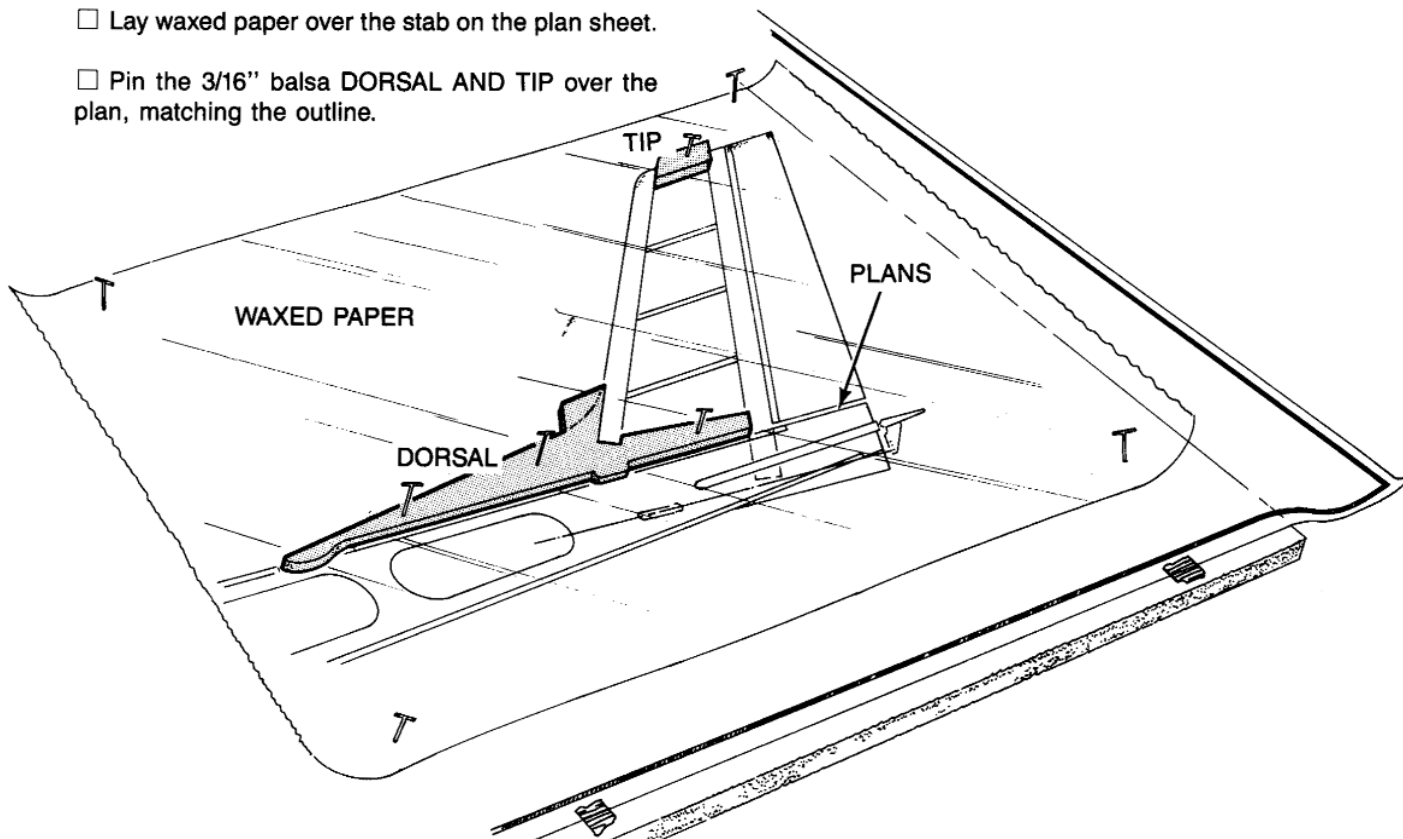
2. Items needed to construct the VERTICAL STABILIZER AND RUDDER include:

- (1) SHEET OF WAXED PAPER, APPROX. 12" LONG
- (10) "T" PINS
- (1) CA glue
- (1) SANDING BLOCK W/FINE SANDPAPER
- (1) 1/16" DIA. DRILL BIT
- (1) X-ACTO KNIFE w/#11 BLADE

3. ☐ Lay the VERT. STAB portion of the plan over your building board.

☐ Lay waxed paper over the stab on the plan sheet.

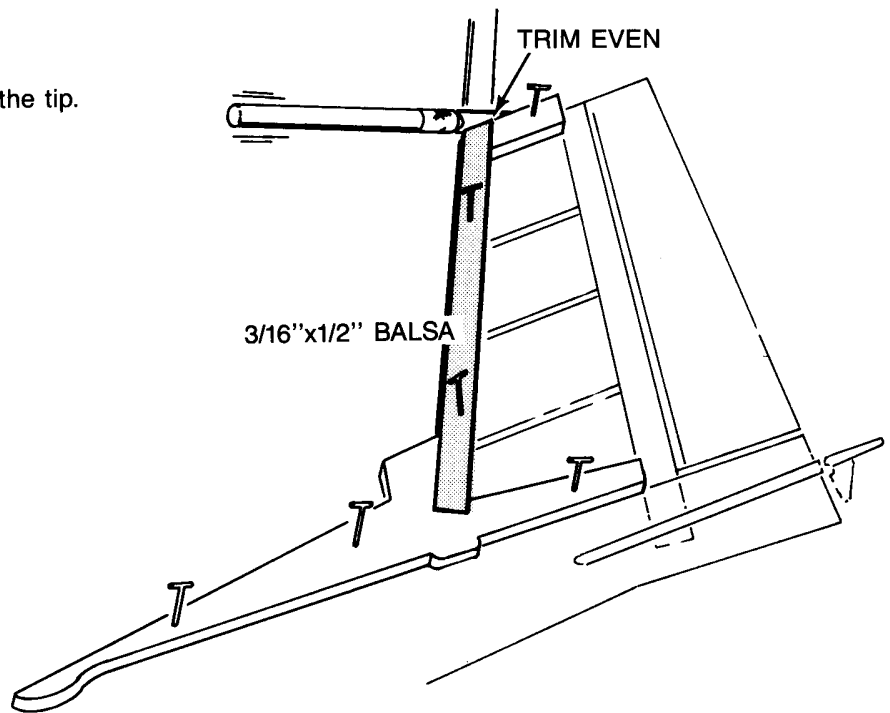
☐ Pin the 3/16" balsa DORSAL AND TIP over the plan, matching the outline.



4. ☐ Carefully insert an end of the 3/16" x 1/2" x 20" balsa into the notch in the DORSAL.

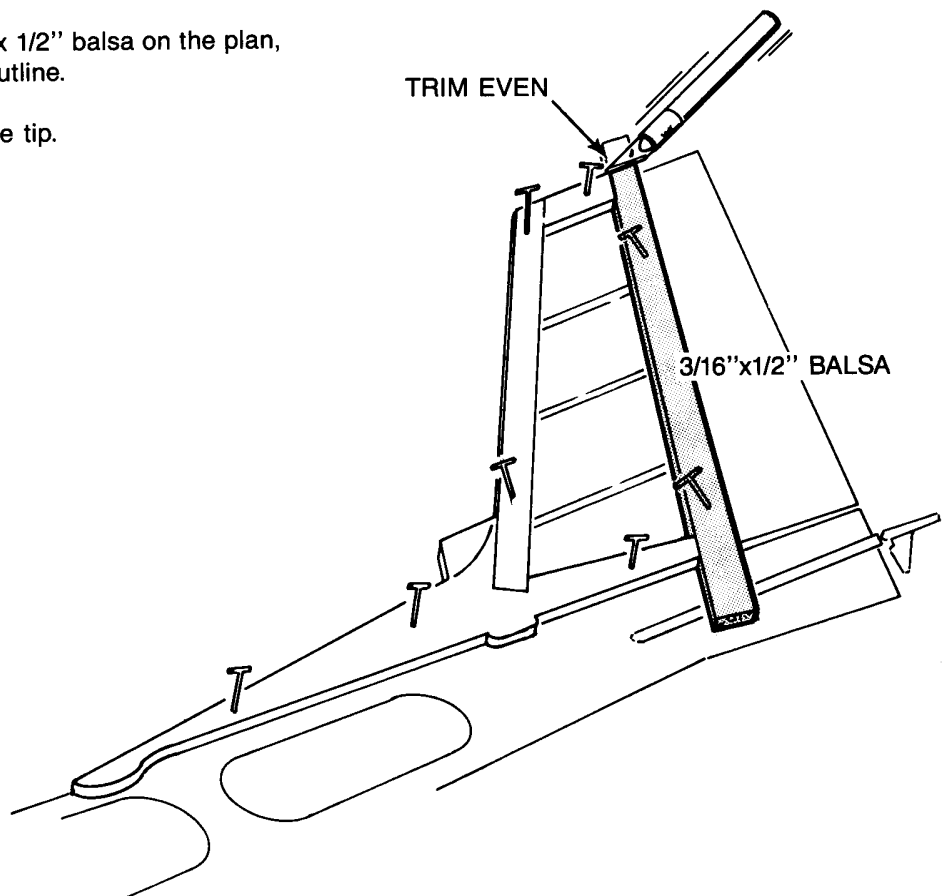
☐ Pin the L.E. over the plan.

☐ Cut-off in line with the top of the tip.



5. ☐ Pin the remaining 3/16" x 1/2" balsa on the plan, matching the square end outline.

☐ Cut in-line with top of the tip.



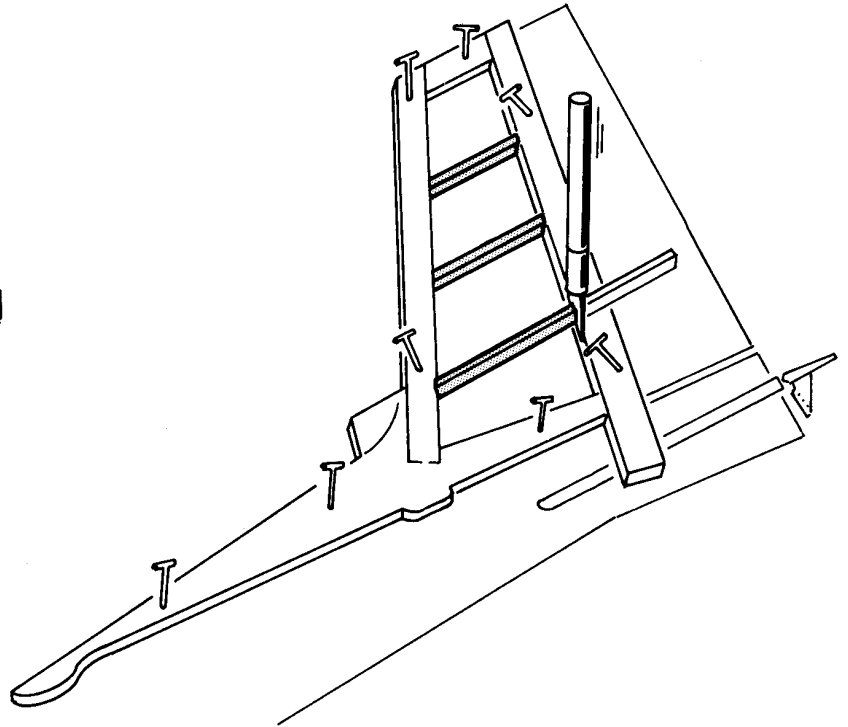
6. ☐ Using the plan for reference, cut the 1/8" x 3/16" balsa ribs to fit snug.
- ☐ Check that all joints are even.



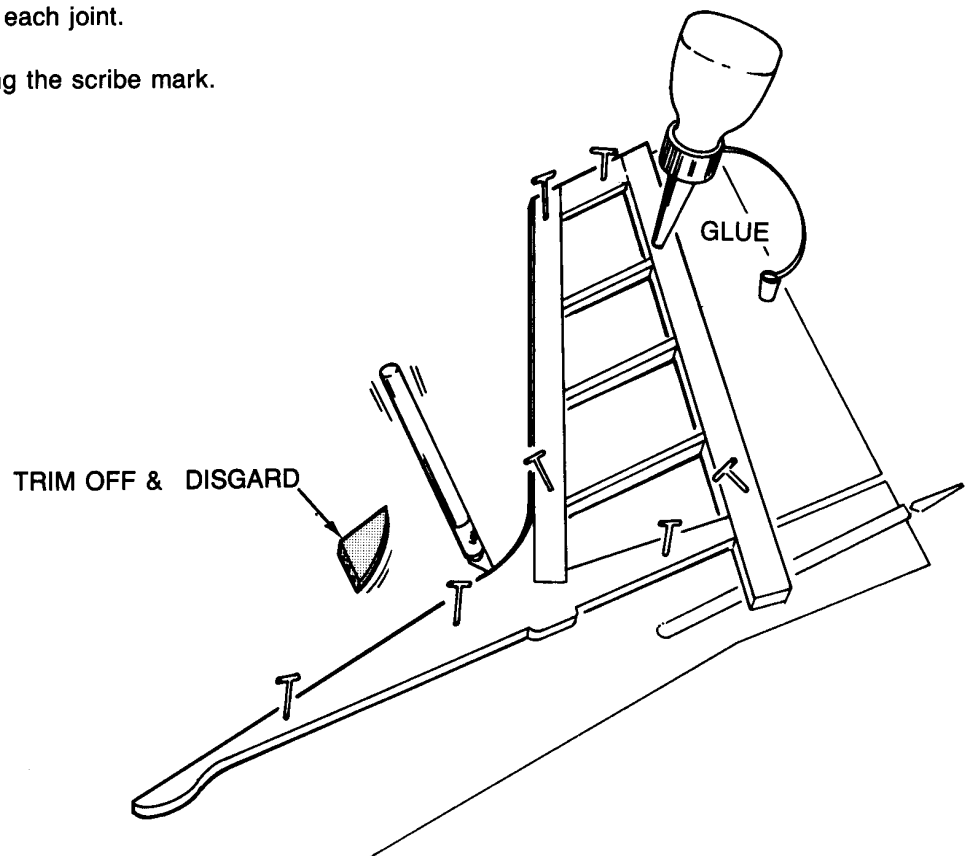
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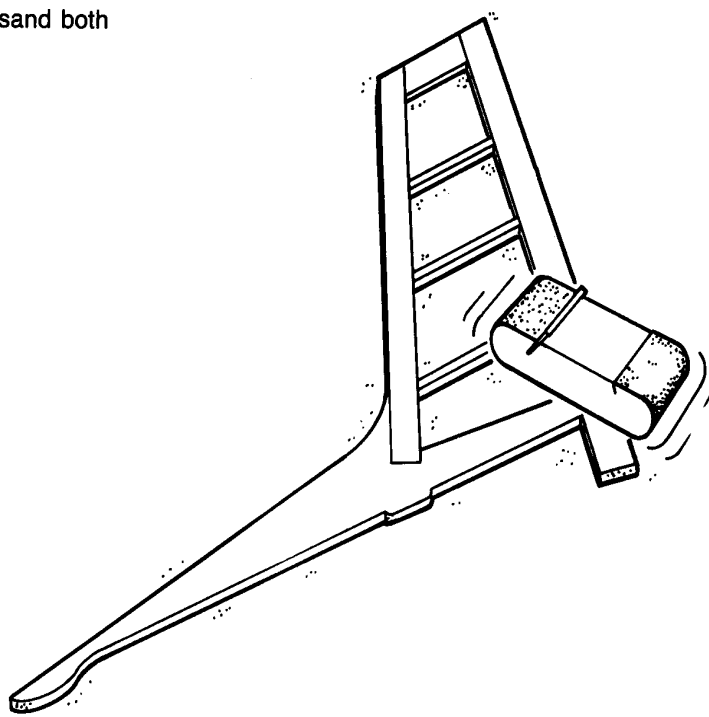
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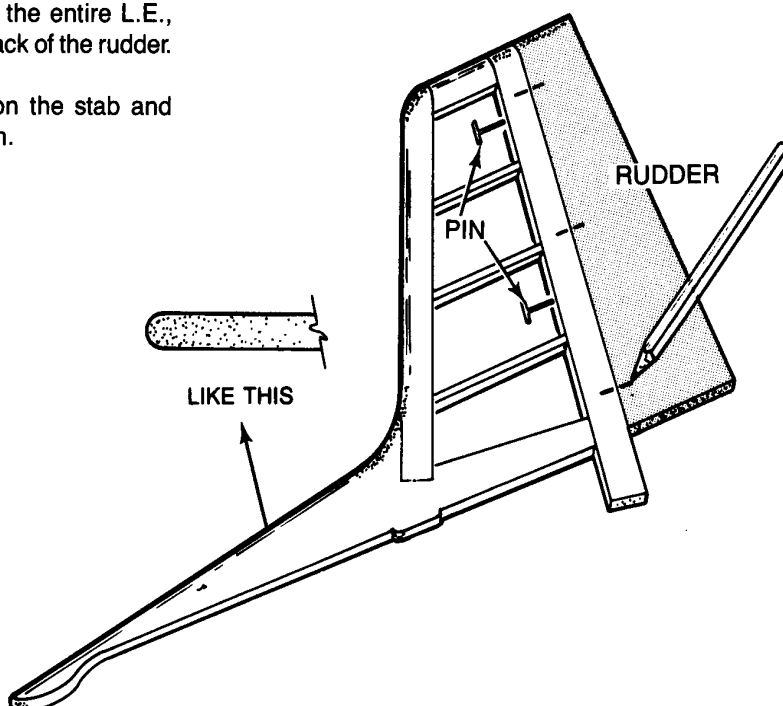
7. ☐ Place a drop of glue at each joint.
- ☐ Cut off the die lobe along the scribe mark.



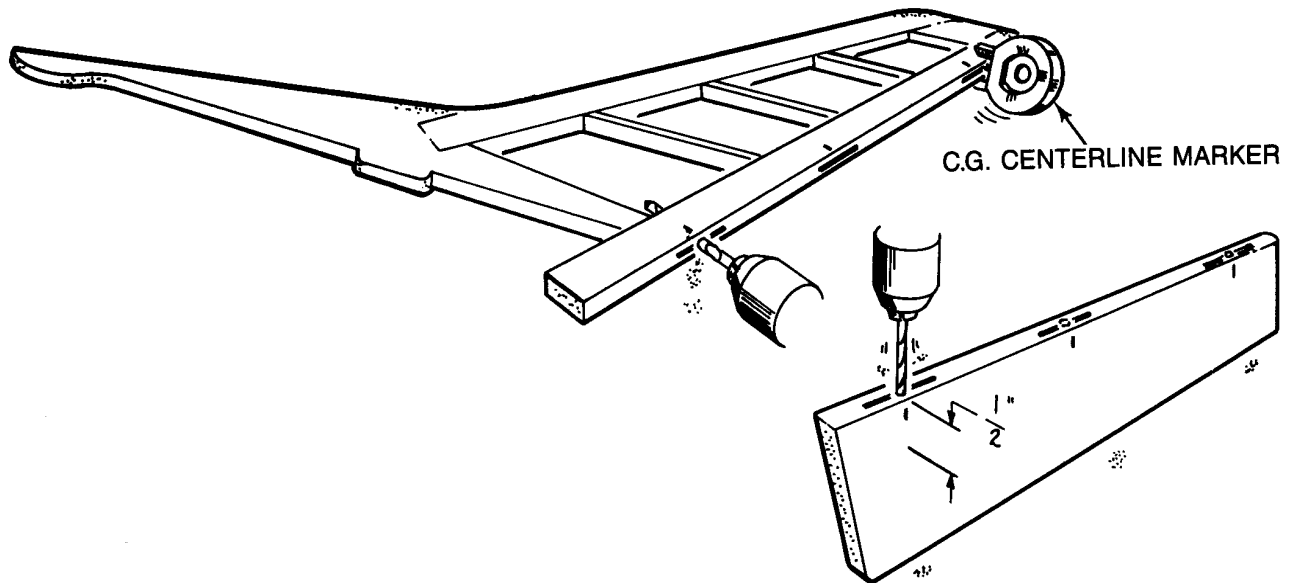
8. ☐ Remove the stab from the building board.
- ☐ With the stab on a flat surface, lightly sand both sides to even all joints.



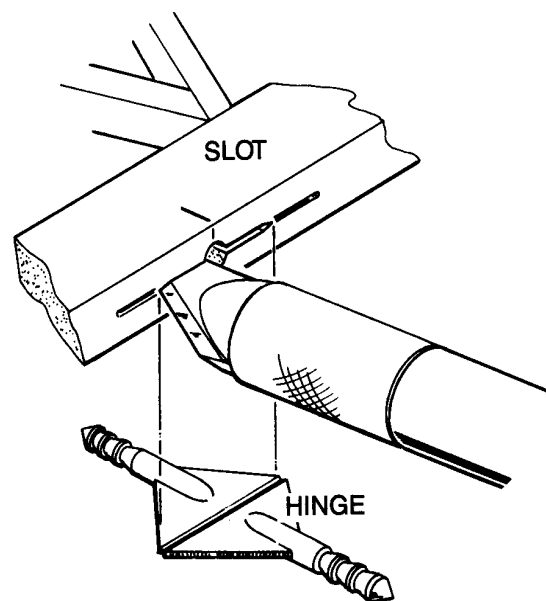
9. ☐ Pin the D.C. RUDDER to the stab.
- ☐ Using FINE sandpaper round-off the entire L.E., from the front of the DORSAL to the back of the rudder.
- ☐ Mark the three hinge locations on the stab and rudder. Refer to the plan for location.



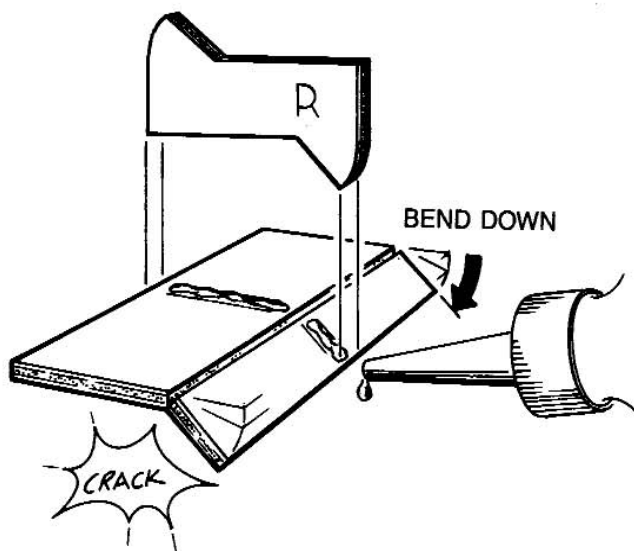
10. ☐ Separate the rudder from the stab.
- ☐ Use the "C.G. CENTERLINE MARKER" to scribe the centerline at each of the six hinge locations.
- ☐ At each location drill a $\frac{1}{16}$ " diameter hole $\frac{1}{2}$ " deep.



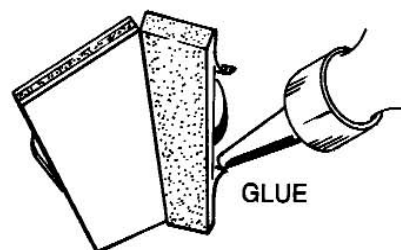
11. ☐ Use an X-acto knife to slot each hole for hinge clearance.



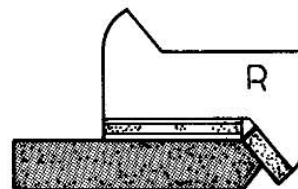
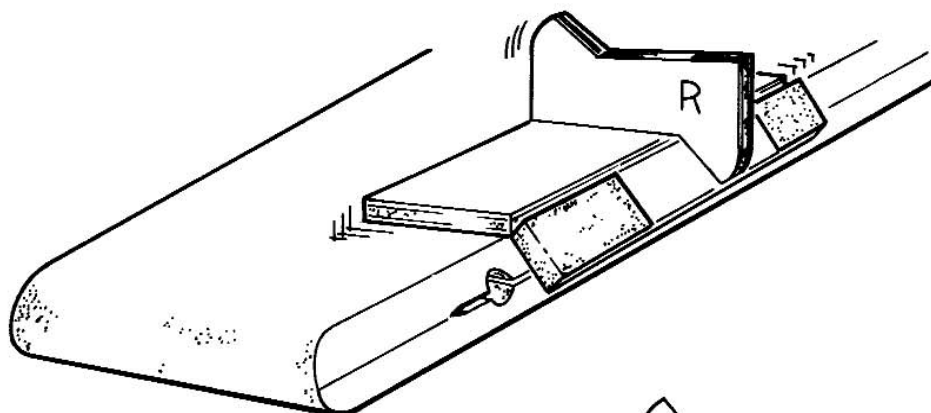
12. ☐ Assemble the RUDDER BEVELING TOOL (D.C. PLY).



- ☐ Cut a strip of FINE sandpaper and glue to the narrow panel of the bevel tool.



13. ☐ Use the BEVEL TOOL, to sand the hinge side of the rudder. Sand both sides until a symmetrical bevel is formed along the entire length.



LIKE THIS

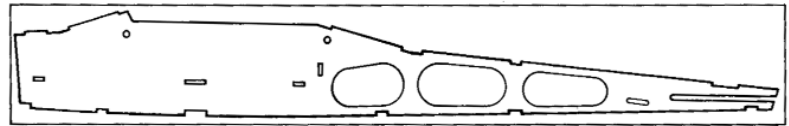
THIS COMPLETES THE VERTICAL STABILIZER AND RUDDER. YOU WILL NOT NEED THESE PARTS AGAIN UNTIL YOU ARE READY FOR COVERING.

V. CONSTRUCTION OF THE FUSELAGE (17 Steps)

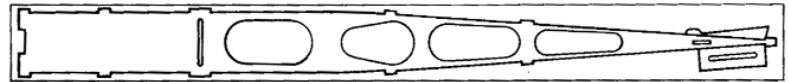
1. These are all the parts you will need to build the FUSELAGE.

THEY INCLUDE:

- (2) D.C. 1/8" PLY SIDE #5701
- (1) D.C. 1/8" PLY BOTTOM
- (1) D.C. 1/8" PLY TOP/FORMER #5703
- (2) D.C. 1/8" PLY FIREWALL/MOTOR MOUNT #5704
- (1) D.C. 1/8" PLY PLATFORM #5705
- (1) 1/8" x 1/4" x 24" BALSA
- (2) 1/4" x 4" DOWEL
- (1) 1/8" WIRE MAIN LANDING GEAR
- (1) 1/8" WIRE NOSEGEAR
- (1) NYLON NOSEGEAR BEARING
- (1) NYLON STEERING ARM
- (1) 1/8" WHEEL COLLAR
- (8) #4 x 1/2" SCREWS
- (4) #8 WASHERS
- (2) 1/8" LANDING GEAR CLAMPS
- (2) 1/8" x 20 NYLON PUSHROD GUIDE



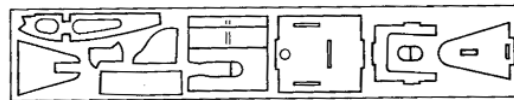
SHEET 5701



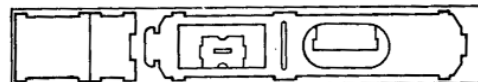
SHEET 5702



SHEET 5703



SHEET 5704



SHEET 5705



1/4" DOWEL

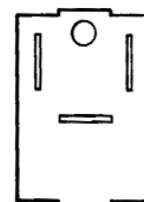
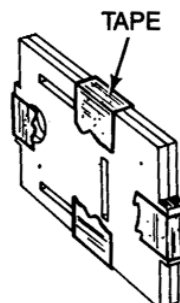
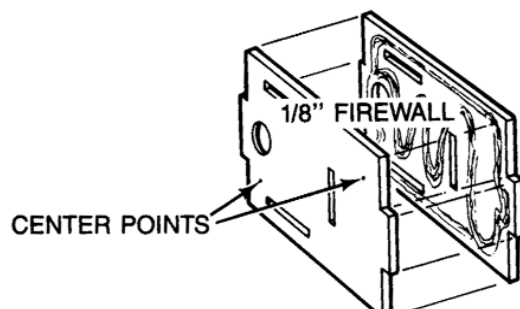


1/8"x1/4"

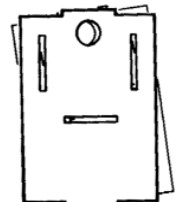
2. ITEMS NEEDED TO CONSTRUCT THE FUSELAGE INCLUDE:

- (1) BUILDING BOARD
- (1) CA glue
- (1) SANDING BLOCK w/MED. AND FINE SANPAPER
- (1) X-ACTO KNIFE w/#11 BLADE
- (1) SMALL STD. SCREWDRIVER
- (8) MEDIUM SIZED RUBBER BANDS
- (1) ROLL OF MASKING TAPE
- (1) DRAFTING TRI-ANGLE
- (1) 1/8" DRILL BIT

3. ☐ glue the two 1/8" D.C. PLY FIREWALL parts together, keeping the center points to the outside. You will locate control rods on these later in this booklet. Tape on all four sides to keep the parts from shifting, causing the locating slots to become misaligned. Allow to dry flat. Use a weight if necessary.



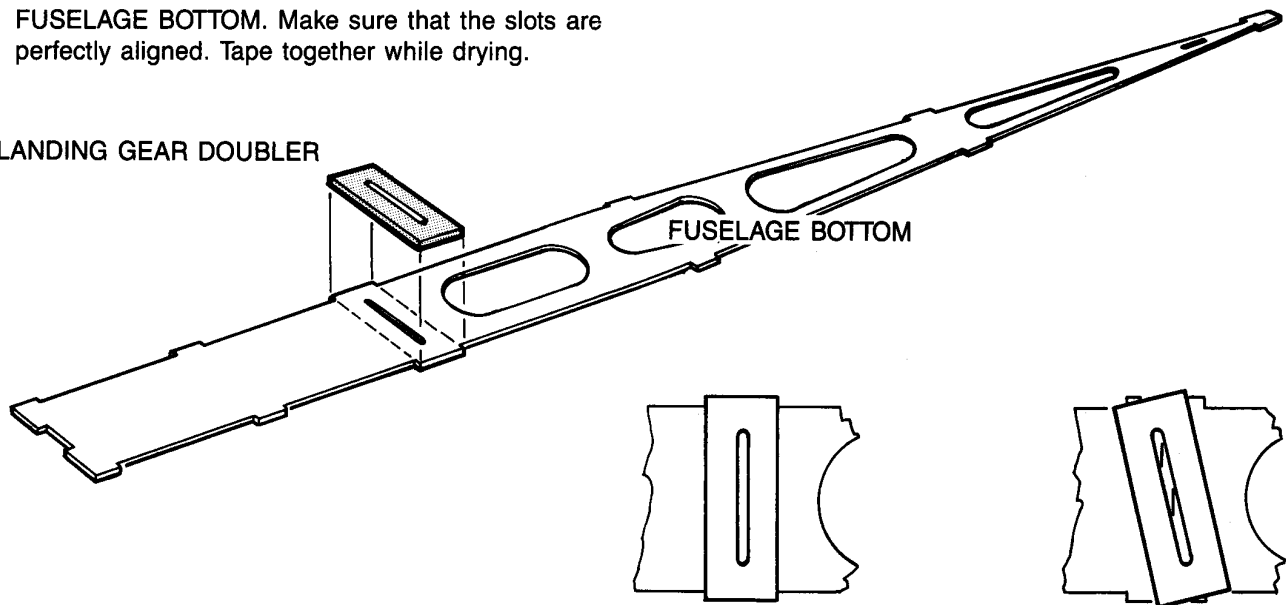
LIKE THIS



NOT THIS

4. ☐ Glue the LANDING GEAR DOUBLER to the FUSELAGE BOTTOM. Make sure that the slots are perfectly aligned. Tape together while drying.

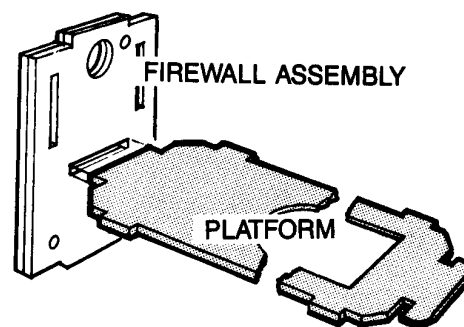
LANDING GEAR DOUBLER



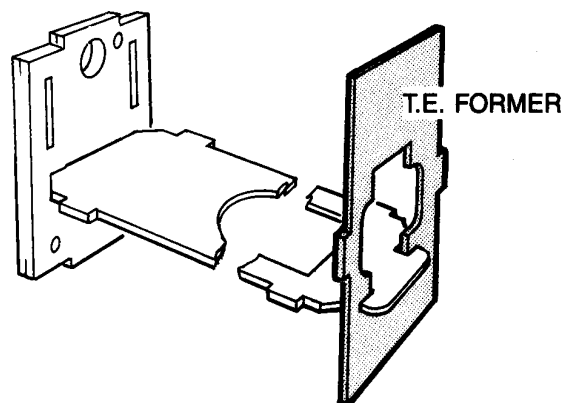
LIKE THIS

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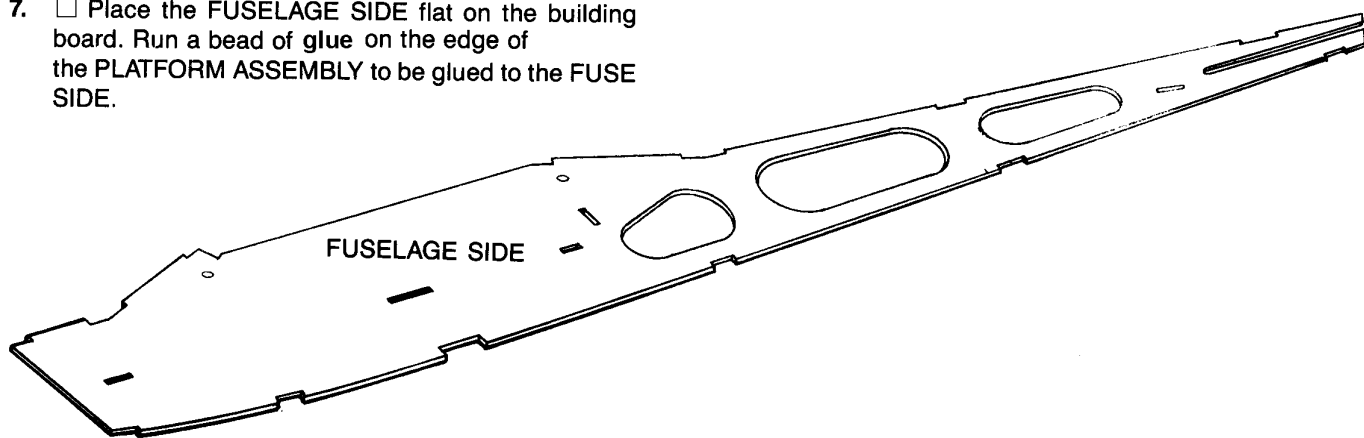
5. ☐ Fit the tab at the front of the PLATFORM into the single horizontal slot in the FIREWALL ASSEMBLY.



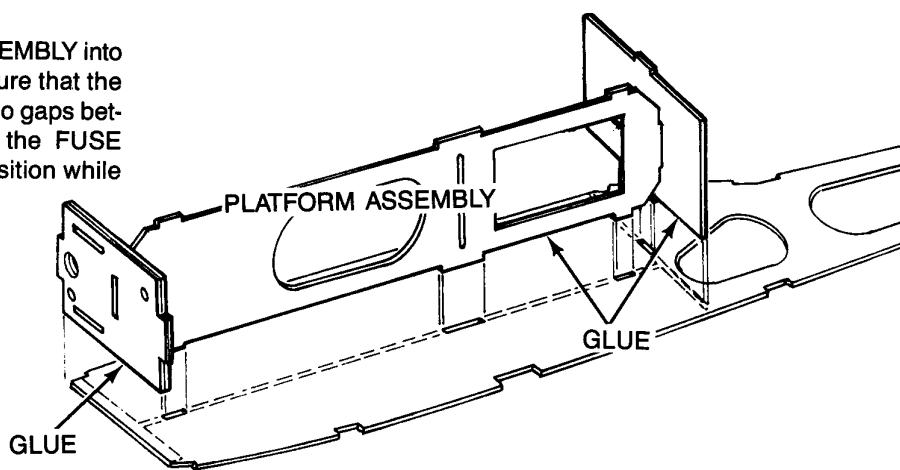
6. ☐ Loosely fit the back tab into either notch in the T.E. FORMER. (FORMER is symmetrical so you can't install it backwards or upside-down.)



7. ☐ Place the FUSELAGE SIDE flat on the building board. Run a bead of glue on the edge of the PLATFORM ASSEMBLY to be glued to the FUSE SIDE.



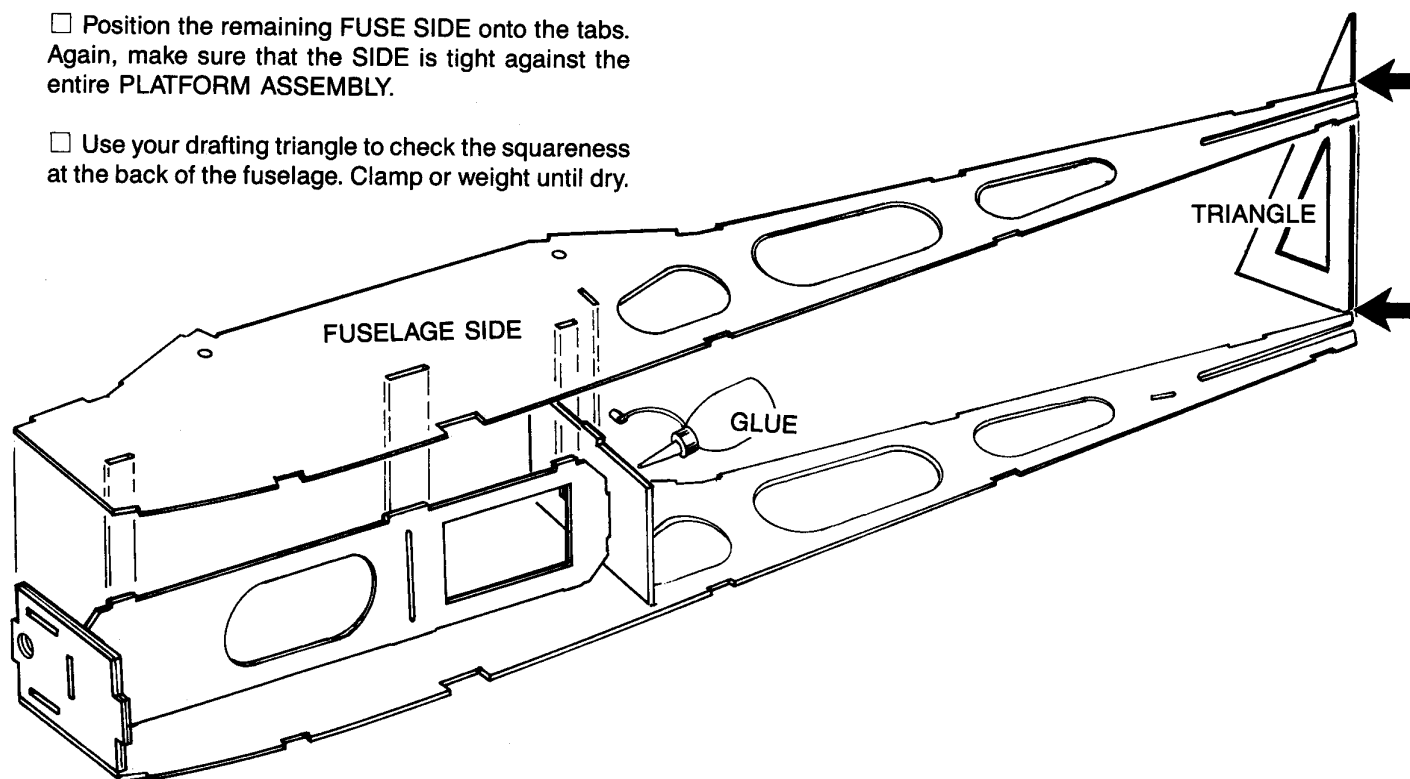
- ☐ Insert the 4 tabs of the PLATFORM ASSEMBLY into the slots in the FUSELAGE SIDE. Make sure that the tabs are fully inserted, and that there are no gaps between the PLATFORM ASSEMBLY and the FUSE SIDE. Clamp or use weights to hold in position while drying.



8. ☐ Run a bead of glue on the edge of the PLATFORM ASSEMBLY.

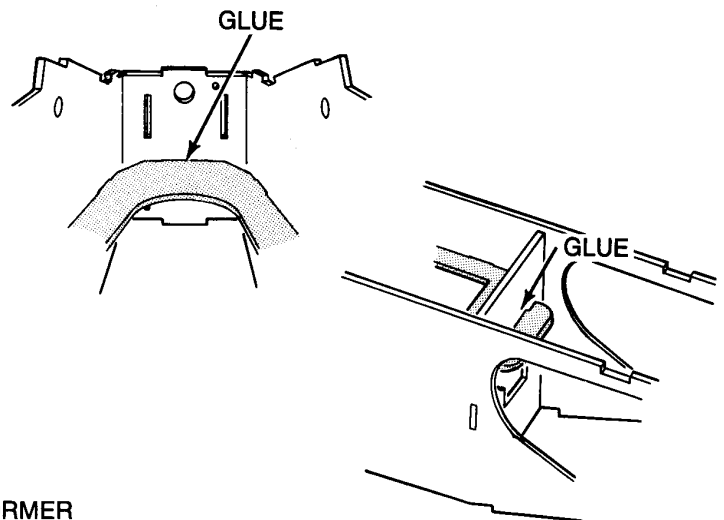
- ☐ Position the remaining FUSE SIDE onto the tabs. Again, make sure that the SIDE is tight against the entire PLATFORM ASSEMBLY.

- ☐ Use your drafting triangle to check the squareness at the back of the fuselage. Clamp or weight until dry.

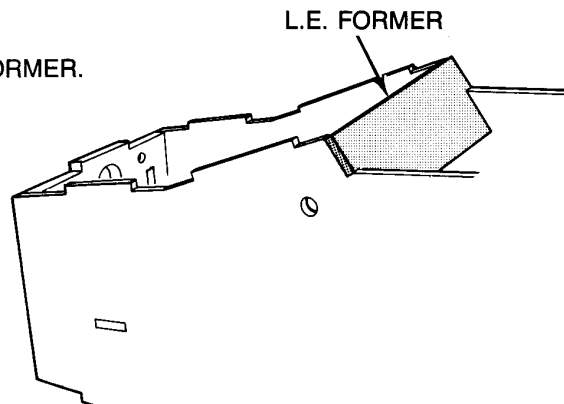


9. ☐ Run a generous bead of glue around the PLATFORM tabs that insert into the FIREWALL and the T.E. FORMER.

- ☐ Run a large glue fillet along the firewall and fuse side joints.



10. ☐ Install the L.E. FORMER.



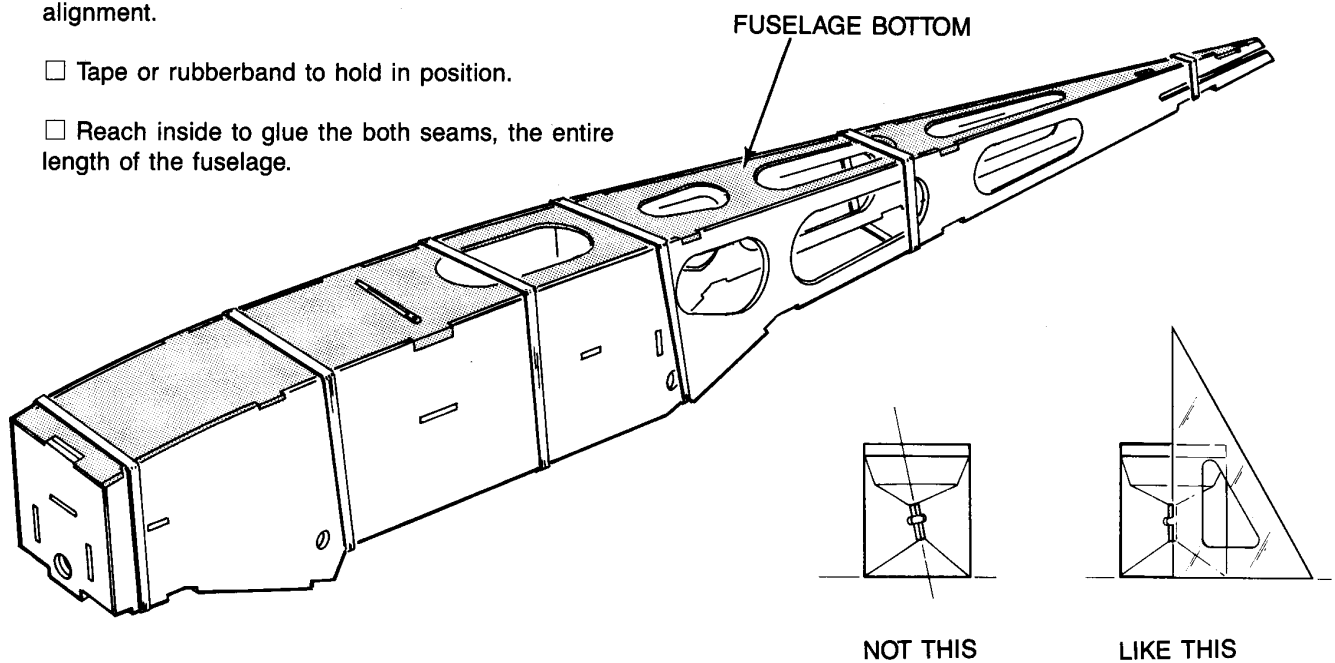
11. ☐ Position the FUSELAGE BOTTOM into the FUSE ASSEMBLY.

- ☐ Insert all tabs tightly into the slots.

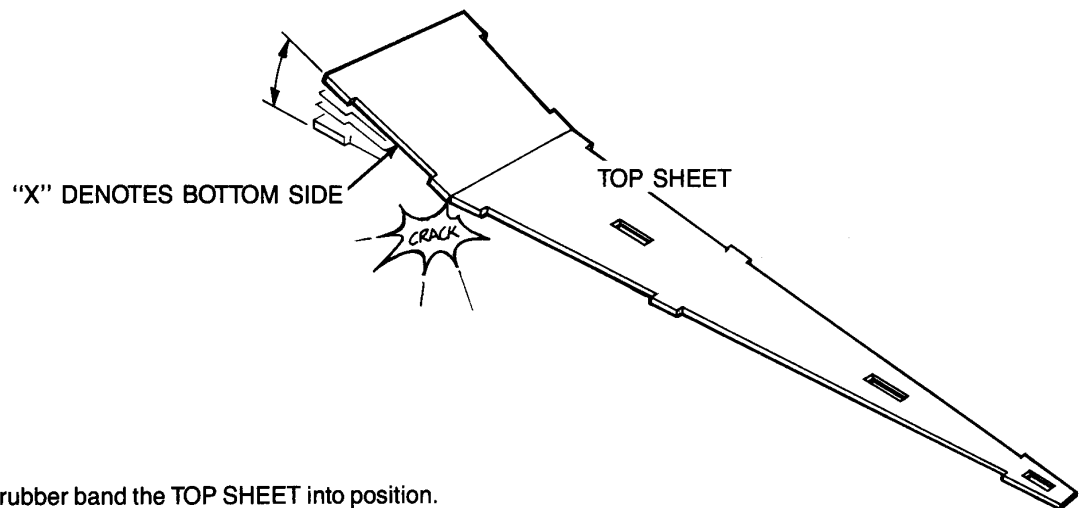
- ☐ Sight down the length of the fuselage to check the alignment.

- ☐ Tape or rubberband to hold in position.

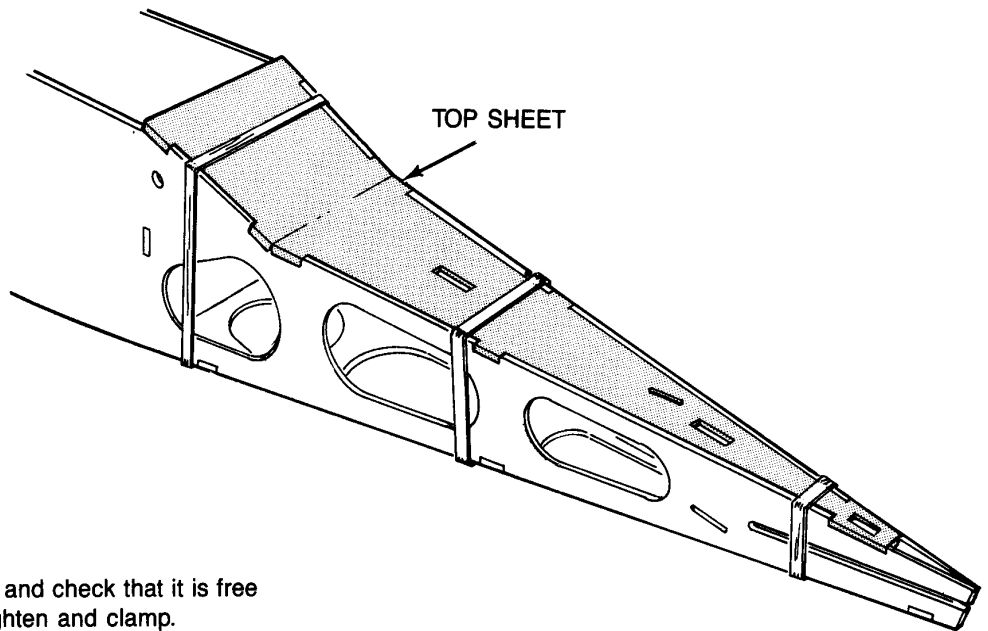
- ☐ Reach inside to glue the both seams, the entire length of the fuselage.



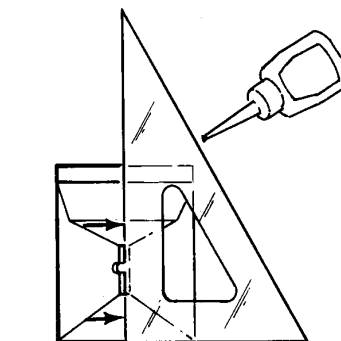
12. ☐ Prepare the TOP SHEET by gently cracking the rear window segment up to approximately match the angle on the fuselage.



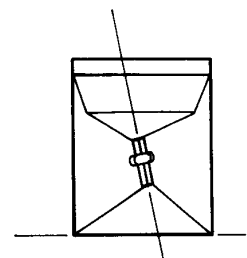
- ☐ Tape or rubber band the TOP SHEET into position. Make sure that the tabs fit tightly into the slots.



- ☐ Sight along the fuselage and check that it is free of twists. If not gently straighten and clamp.
- ☐ Run a bead of glue along the seams and let it dry.

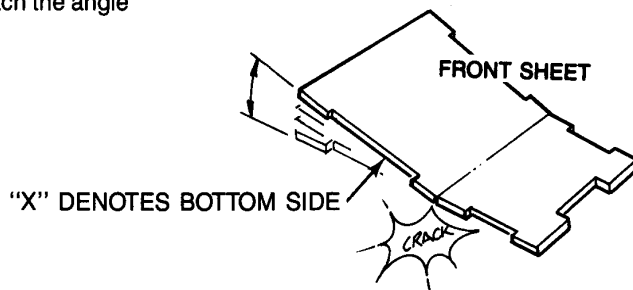


LIKE THIS



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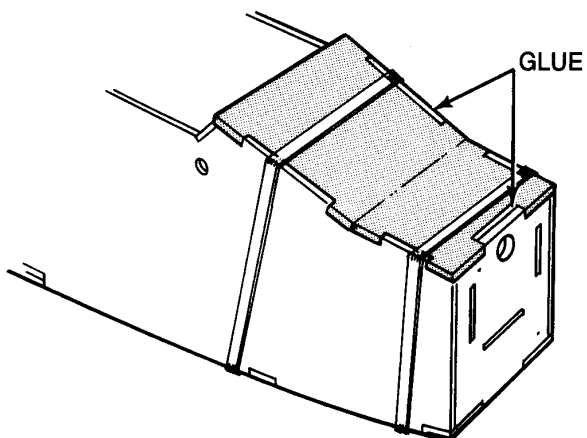
13. ☐ Prepare the FRONT SHEET, by gently cracking the windshield segment to approximately match the angle on the fuselage.



- ☐ Run a bead of glue on the top of the FIREWALL AND L.E. FORMER.

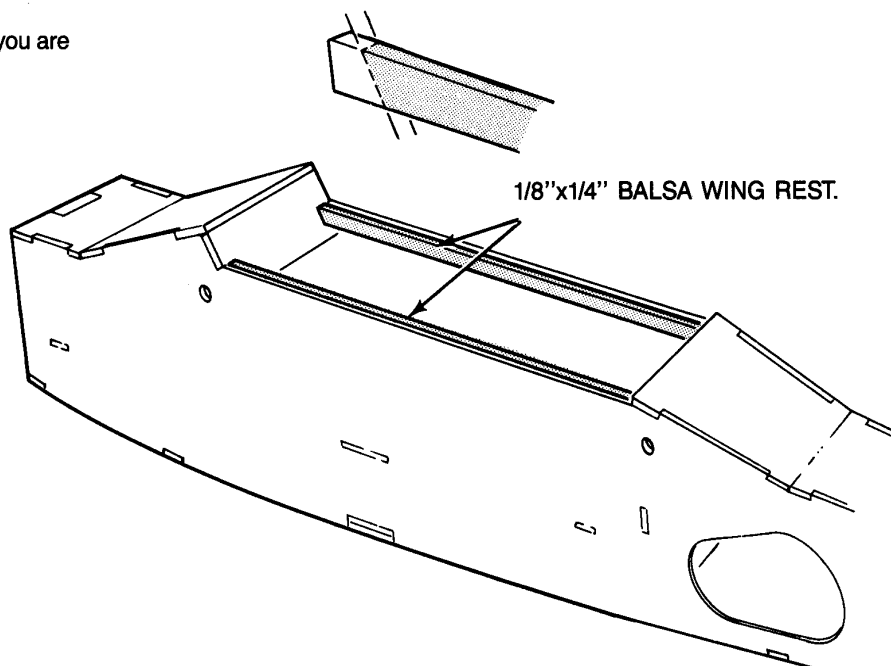
- ☐ Tape or rubberband the FRONT SHEET into position. Make sure that the tabs fit tightly into the slots.

- ☐ Run a small bead of glue along the seams, and let it dry.

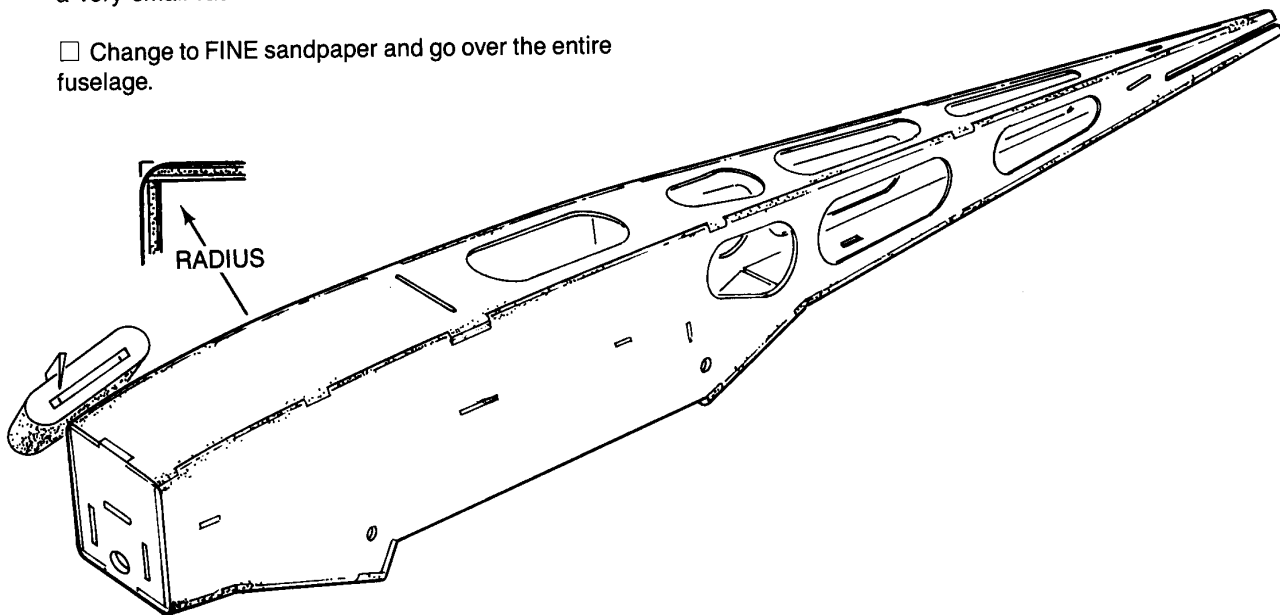


14. ☐ Fit the 1/8" x 1/4" BALSA WING RESTS along the top-inside of the fuselage.

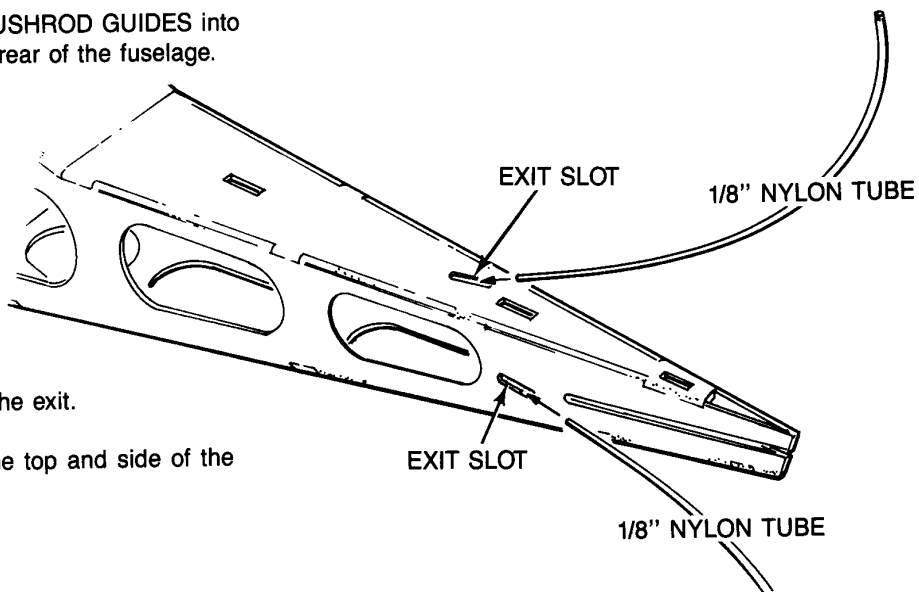
- ☐ glue the WING RESTS when you are satisfied with the fit.



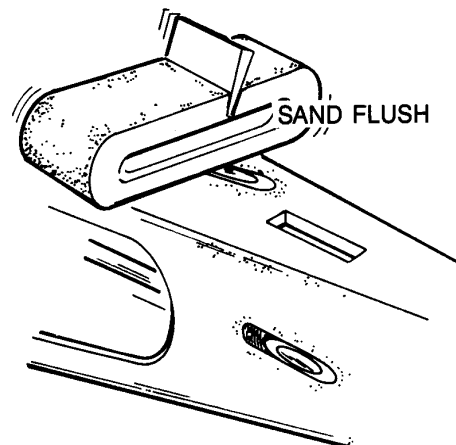
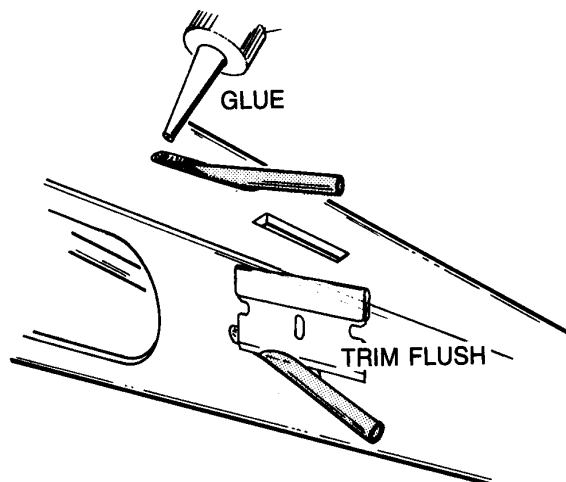
15. ☐ Using a sanding block with medium paper, sand a very small radius on the corners of the fuselage.
- ☐ Change to FINE sandpaper and go over the entire fuselage.



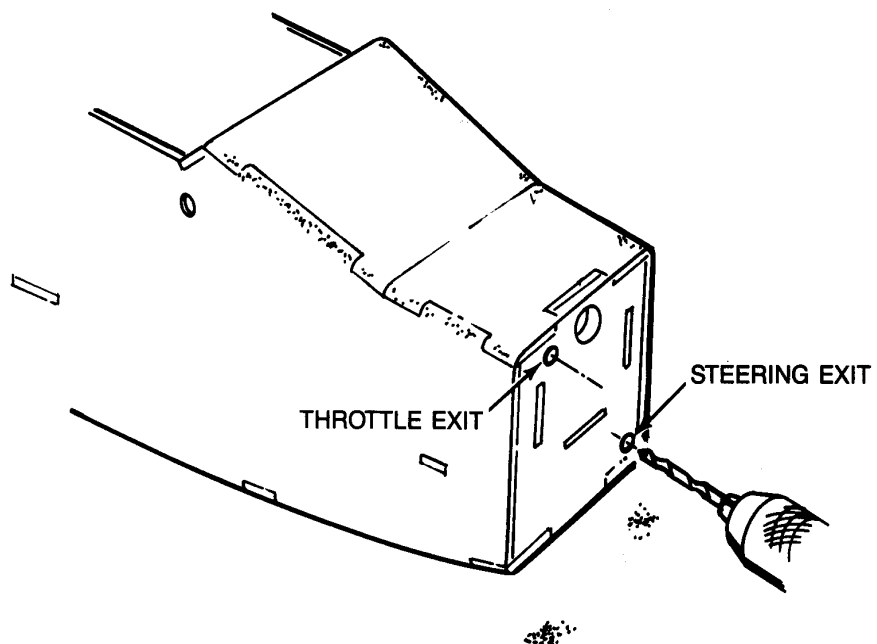
16. ☐ Install the 1/8" NYLON PUSHROD GUIDES into the pushrod exit slots at the rear of the fuselage.



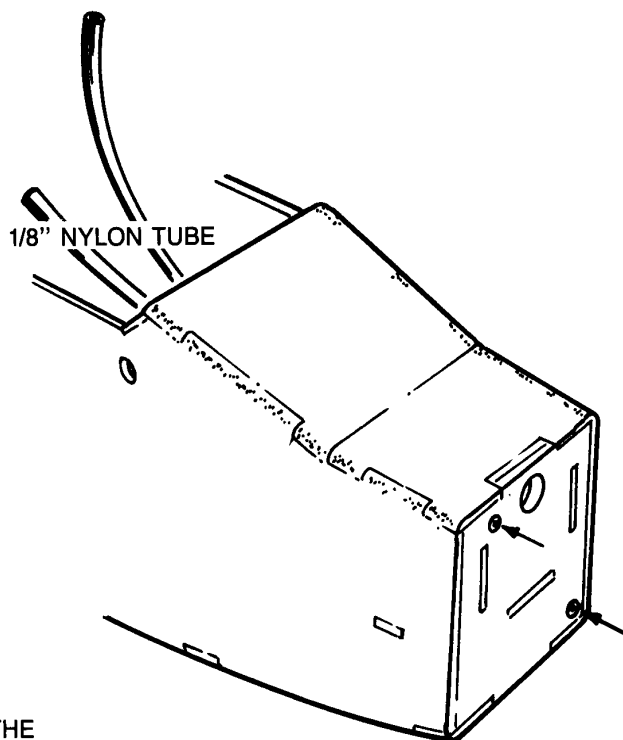
- ☐ Apply glue to the tube at the exit.
- ☐ Trim the tube even with the top and side of the fuselage.



17. ☐ Drill a 1/8" hole at the center points for the THROTTLE CONTROL GUIDE AND STEERING CONTROL GUIDE.



- ☐ Install the 1/8" NYLON CONTROL GUIDES and glue.



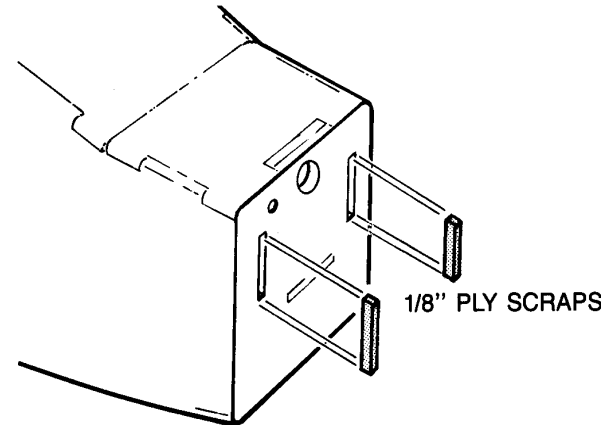
THIS COMPLETES THE CONSTRUCTION OF THE FUSELAGE. NOW LET'S GO ON TO BUILD THE MOTOR MOUNT.

VI. BUILDING THE MOTOR MOUNT (12 Steps)

You may wish to use a manufactured motor mount, not an included optional item in this kit.

If so, you will not need to construct this component. When purchasing a motor mount, make sure that it will accommodate the engine you will be using.

The Freedom .20 kit contains 3 optional motor mounts, depending on the motor you choose to install. Before you construct a motor mount, decide what motor you will use, and fit the mount that best matches. The construction sequence is identical no matter which mount you will be using. All mounts "key" into the firewall to incorporate the correct thrust offsets and to accommodate cowl and spinner position.



IMPORTANT: IF YOU CHOOSE A MANUFACTURED MOTOR MOUNT GLUE A SCRAP PIECE OF 1/8"PLY TO FILL-IN EACH OF THE LOCATING SLOTS ON THE FIREWALL.

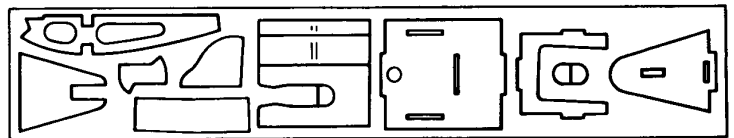
1. Find all the parts you will need to construct the MOTOR MOUNT.

THEY INCLUDE:

- (1) 1/8" PLY BACKPLATE
- (2) 1/8" PLY SIDE PLATES
- (2) 1/8" PLY MOTOR PLATES
- (4) 4-40 BLIND MOUNTING NUTS



SHEET 5710

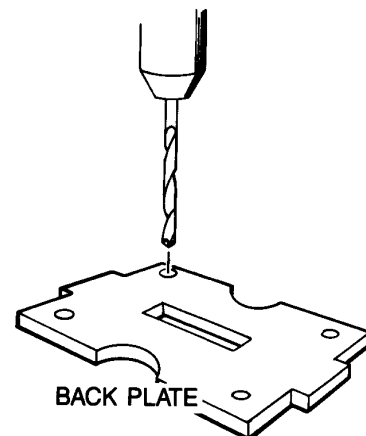


SHEET 5704

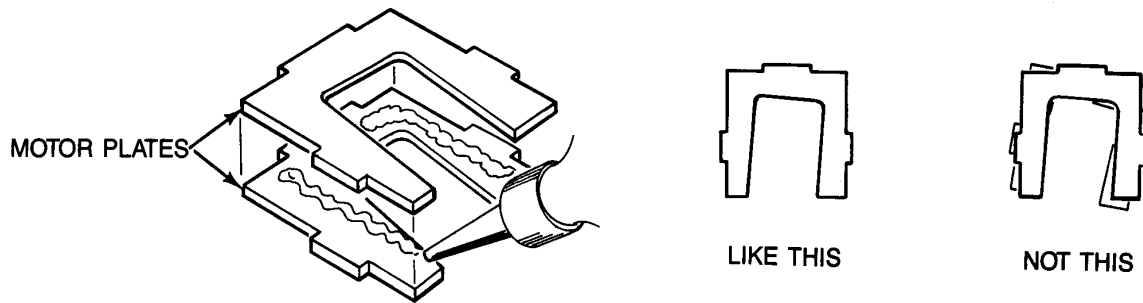
2. Items needed to construct the MOTOR MOUNT:

- (1) CA GLUE
- (5) MEDIUM SIZED RUBBER BANDS
- (1) 1/8" DRILL BIT
- (1) ELECTRIC OR MANUAL OPERATING DRILL

3. ☐ Drill a 1/8" hole through the BACKPLATE at the four center point locations.

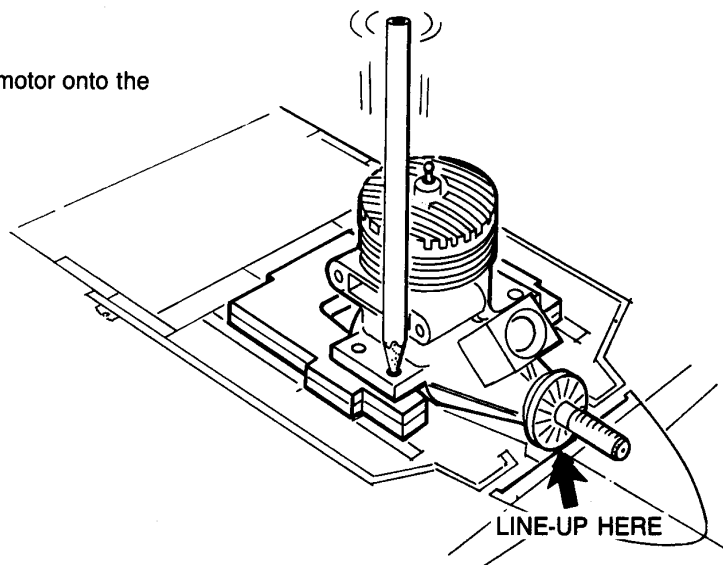


4. ☐ Laminate the two 1/8" PLY MOTOR PLATES. Take extra care in aligning these parts to insure that all edges match perfectly.

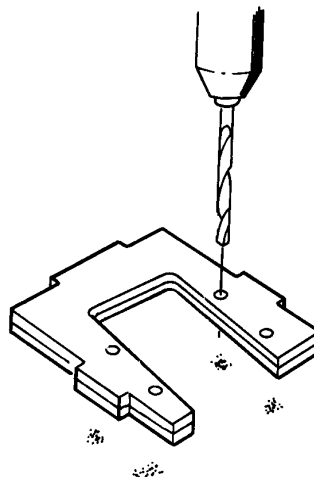


5. ☐ Position your motor over the plan with the front bearing in line with the spinner backplate. This will locate your motor on the motor plate.

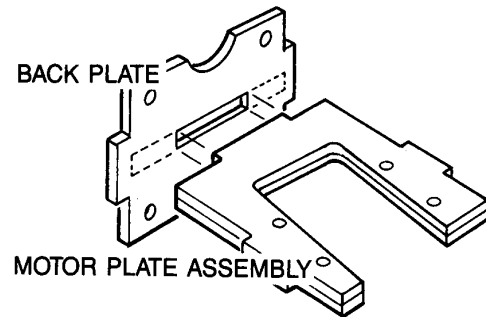
- ☐ Mark the hole locations from your motor onto the laminated motor plate.



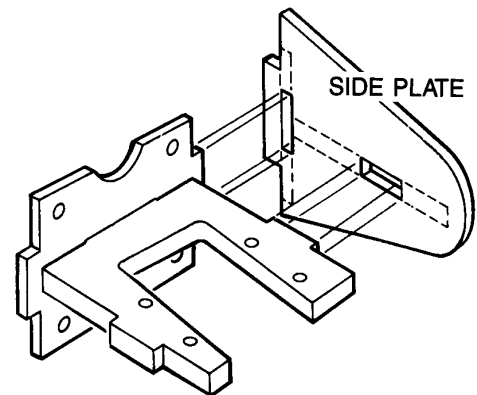
6. ☐ Drill a hole through the motor plate at each mark.



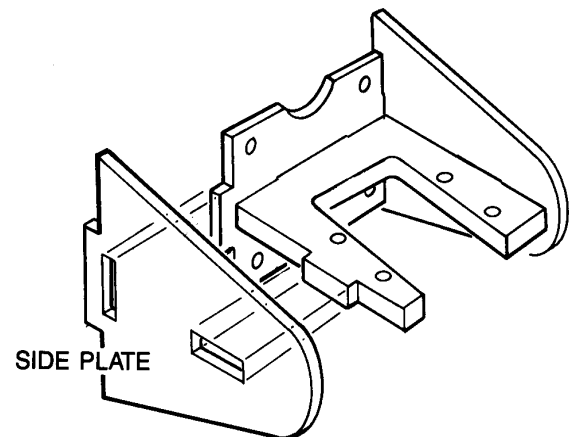
7. ☐ Insert the MOTOR PLATE tab into the slot in the BACKPLATE.



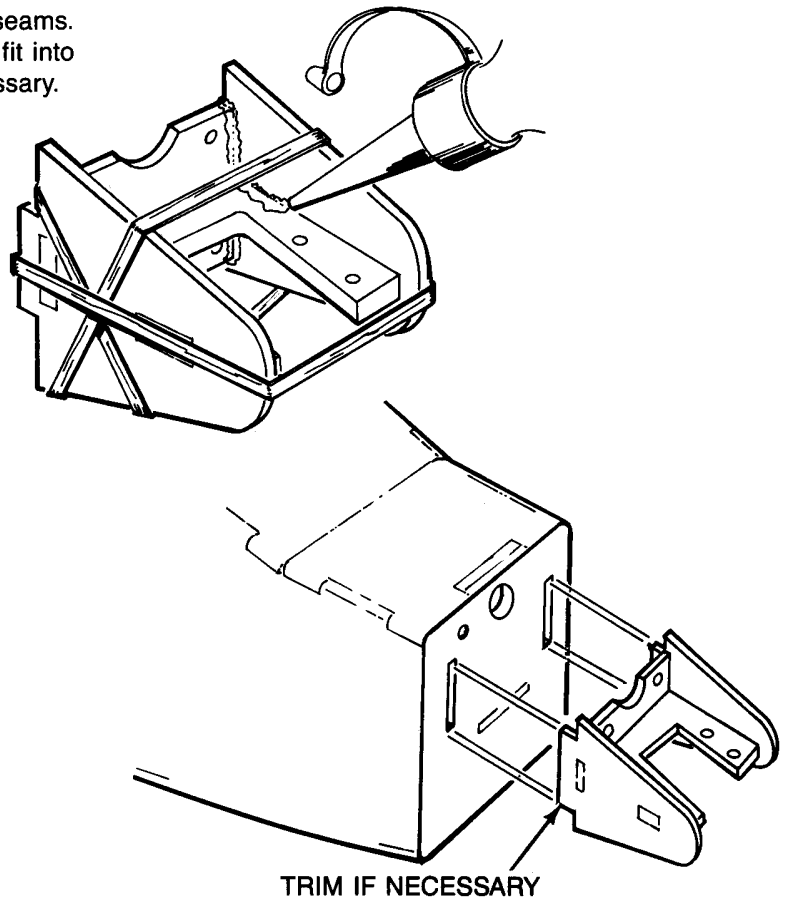
8. ☐ Insert a MOTOR PLATE AND BACKPLATE side tab into the slots in one of the SIDE PLATES.



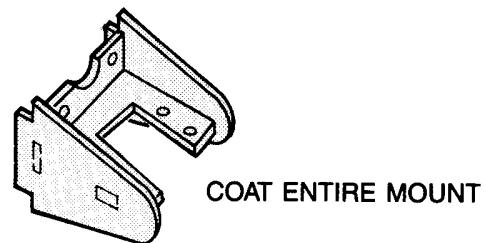
9. ☐ Repeat the process for the other SIDE PLATE and rubberband together. Make sure that the parts fit tightly together.



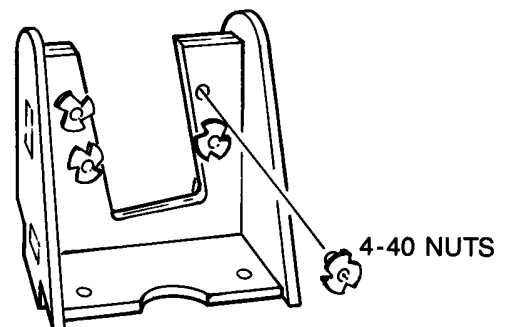
10. ☐ Liberally apply CA glue to all of the seams. When dry remove the rubber bands and test fit into the locating slots in the firewall. Trim if necessary.



11. ☐ With the motor mount removed from the firewall, coat the entire mount with CA glue. This will fuelproof the plywood.



12. ☐ Check the plan for the correct orientation. Install the 4-40 BLIND MOUNTING NUTS.
- ☐ Press-fit the blind nuts and apply glue around them. DO NOT ALLOW GLUE TO GET IN THE THREADS.

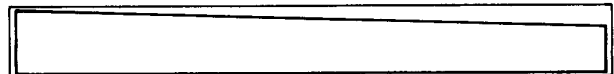


VII. CONSTRUCTION OF THE WING (39 Steps)

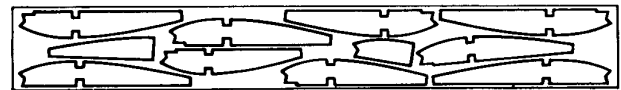
1. Find all the parts that you will need to build the entire WING.

THEY INCLUDE:

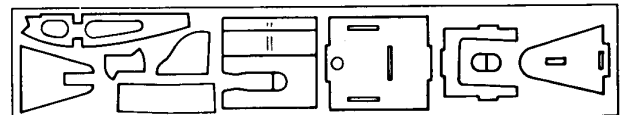
- (4) 1/4" x 1/4" x 26-3/8" BASS SPARS
- (2) SHAPED BALSA LEADING EDGE
- (4) 1/16" x 1/2" x 26-3/8" BALSA
- (2) 1/4" x 3/8" x 26-3/8" NOTCHED BALSA
- (2) TAPERED BALSA AILERON
- (2) INBOARD T.E.
- (2) OUTBOARD T.E.
- (2) 1-1/16" x 45 deg. x 7-1/8" TIP
- (2) 1/16" x 3" x 27" L.E. SHT. D.C. #5709
- (2) 1/16" x 2-7/8" x 24" RIBS. D.C. #5707
- (2) .10 PLY #11 RIB D.C. #5704
- (2) 1/16" x 2-3/4" x 24" CTR SHT. D.C. #5708
- (3) 1/16" x 3/16" x 18" CAP STRIPS
- (2) .10 D.C. PLY DIHEDRAL BRACE
- (20) 1/16" x 15/16" x 2-7/8" BALSA WEB
- (2) 3/8" x 1/2" x 1" BASS BLOCK
- (2) AILERON TORQUE RODS
- (2) AILERON CONNECTORS
- (1) 3/4" x 24" FIBERGLAS TAPE
- (1) .10 PLY DIHEDRAL GAGE SUPPORT
- (1) .10 PLY "SET BACK GAUGE"



SHEET 5709



SHEET 5707



SHEET 5704



SHEET 5708



SHAPED L.E.



1/4"x1/4"
BASSWOOD



NOTCHED T.E.



T.E. CENTER SECTION



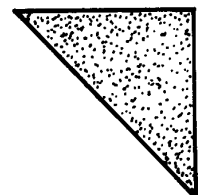
AILERON/TIP STOCK



1/16"x1/2"



1/16"x3/16"



1-1/16" TRI

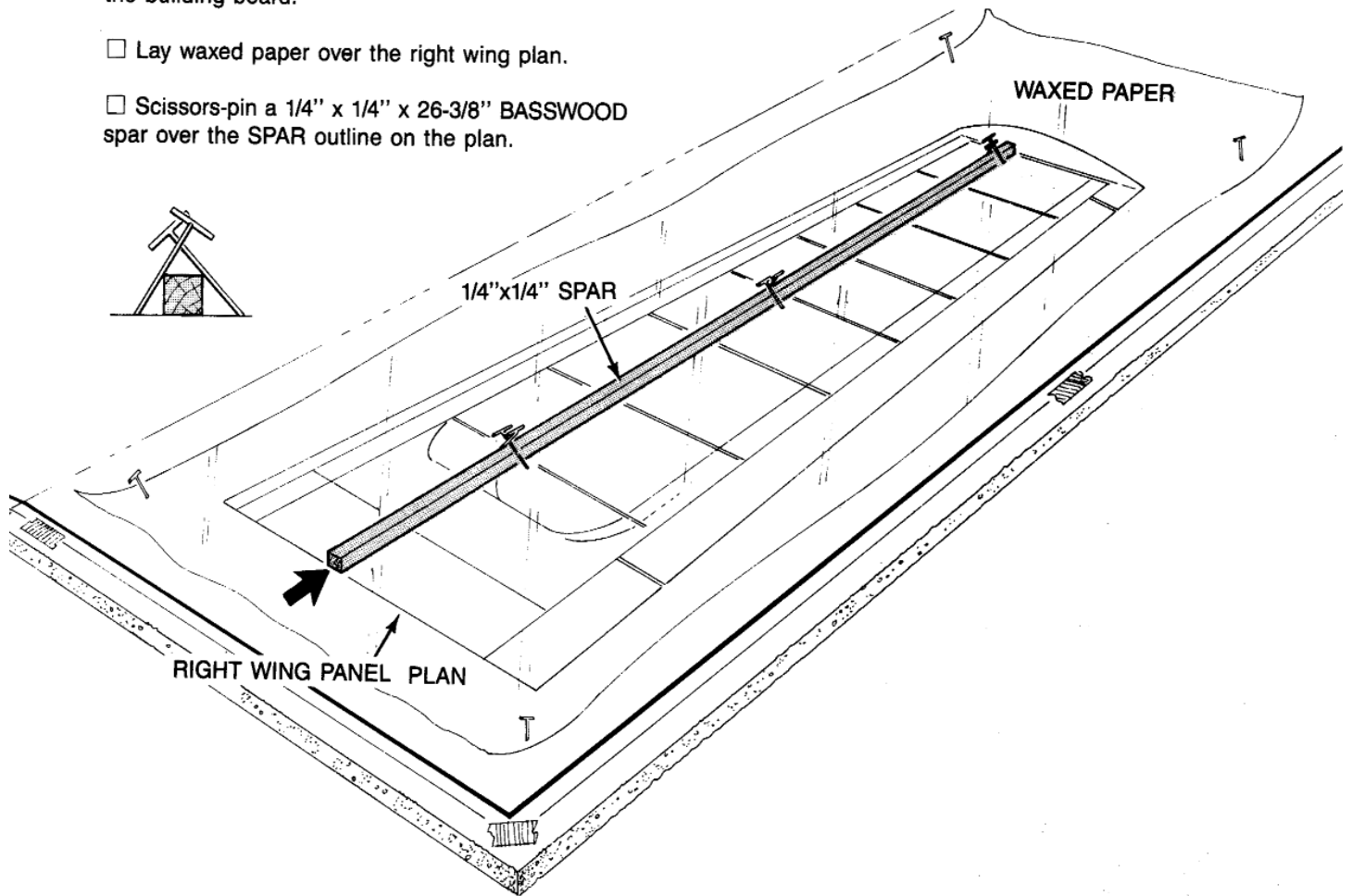
2. ITEMS NEEDED TO CONSTRUCT THE WING INCLUDE:

- (1) BUILDING BOARD
- (1) SHEET OF WAXED PAPER 30" LONG
- (70) "T"-PINS
- (1) CA GLUE
- (1) SANDING BLOCK W/MED. AND FINE PAPER
- (1) X-ACTO KNIFE W/#11 BLADE
- (1) 1/16" DRILL BIT
- (1) 3/32" DRILL BIT

3. ☐ Position the RIGHT WING portion of the plan over the building board.

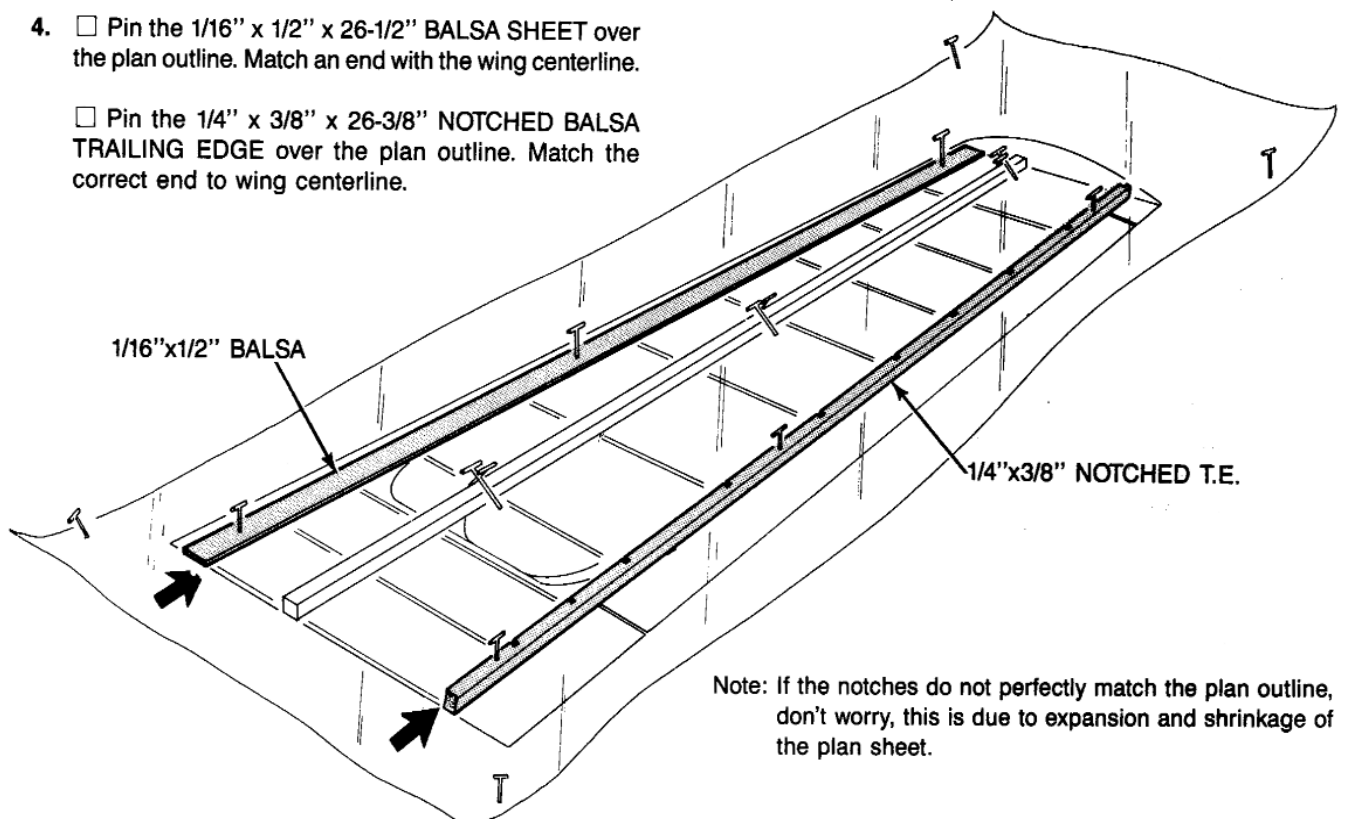
☐ Lay waxed paper over the right wing plan.

☐ Scissors-pin a $\frac{1}{4}" \times \frac{1}{4}" \times 26\text{-}3/8"$ BASSWOOD spar over the SPAR outline on the plan.



4. ☐ Pin the $\frac{1}{16}" \times \frac{1}{2}" \times 26\text{-}1/2"$ BALSA SHEET over the plan outline. Match an end with the wing centerline.

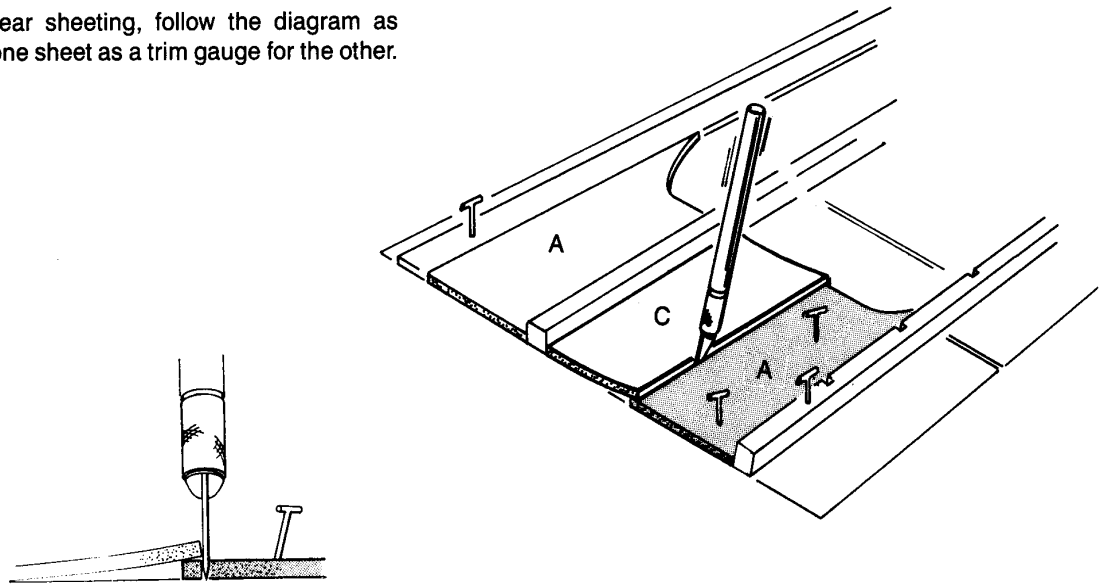
☐ Pin the $\frac{1}{4}" \times \frac{3}{8}" \times 26\text{-}3/8"$ NOTCHED BALSA TRAILING EDGE over the plan outline. Match the correct end to wing centerline.



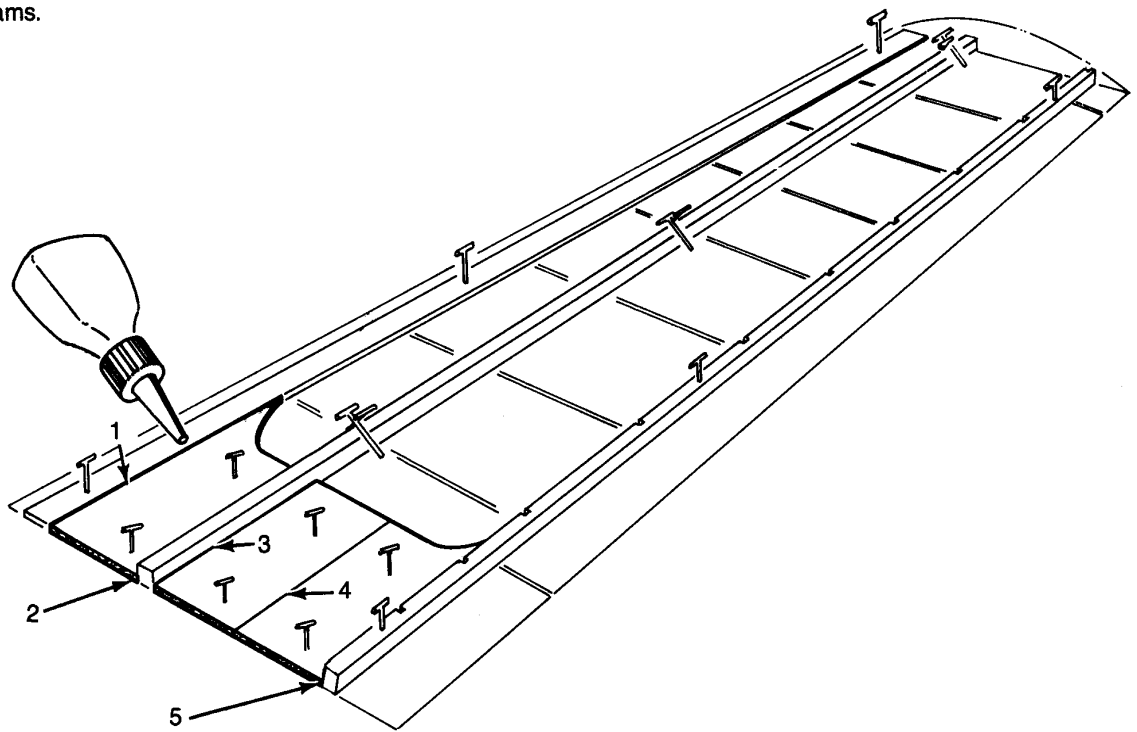
Note: If the notches do not perfectly match the plan outline, don't worry, this is due to expansion and shrinkage of the plan sheet.

5. ☐ Fit the front 1/16" D.C. BOTTOM CENTER SHEETING. It will be necessary to trim-to-fit the sheeting to obtain the desired fit. Match the edge with wing centerline.

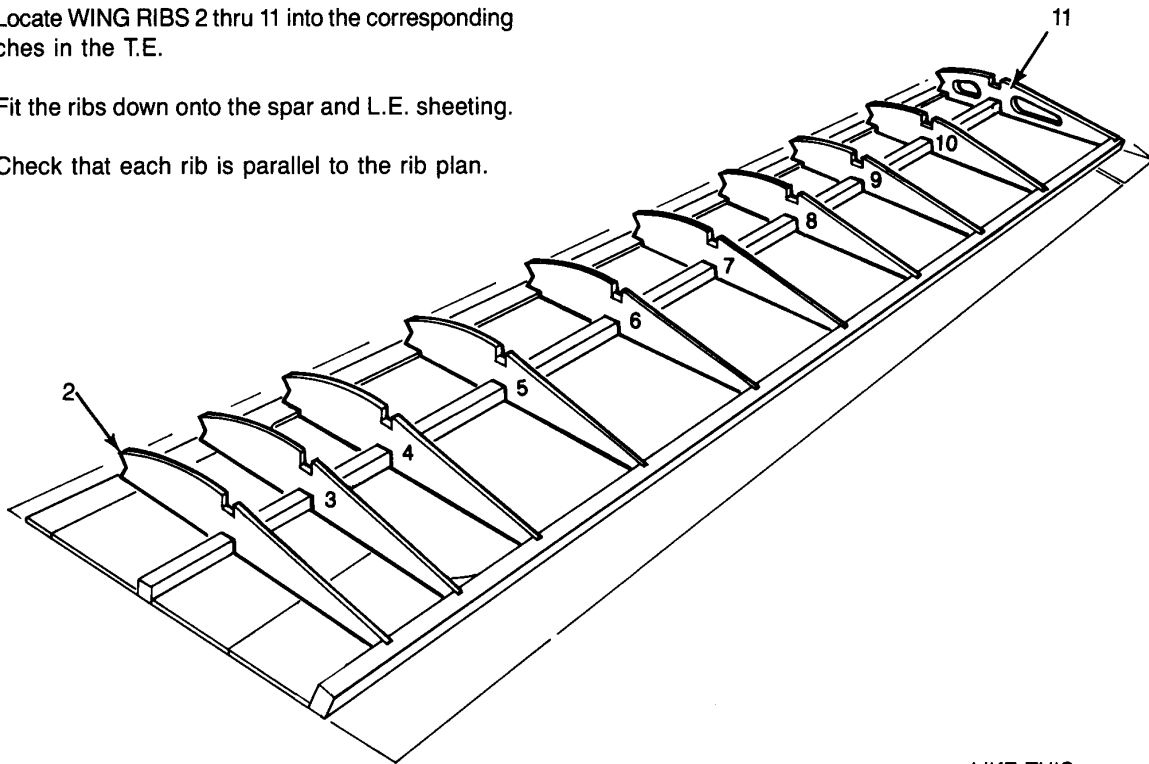
- ☐ To fit the rear sheeting, follow the diagram as shown, using one sheet as a trim gauge for the other.



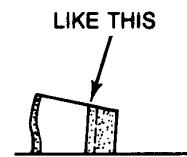
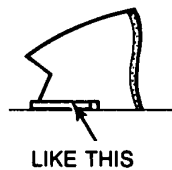
- ☐ Match the edge with the wing centerline, and glue all five seams.



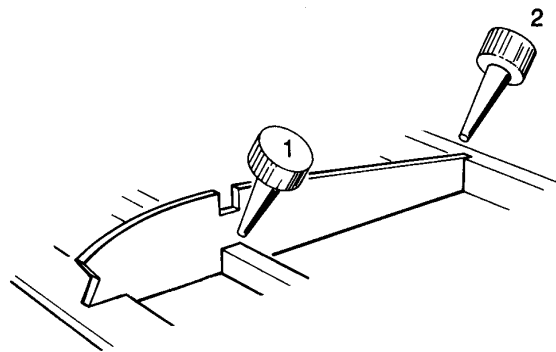
6. ☐ Locate WING RIBS 2 thru 11 into the corresponding notches in the T.E.
- ☐ Fit the ribs down onto the spar and L.E. sheeting.
- ☐ Check that each rib is parallel to the rib plan.



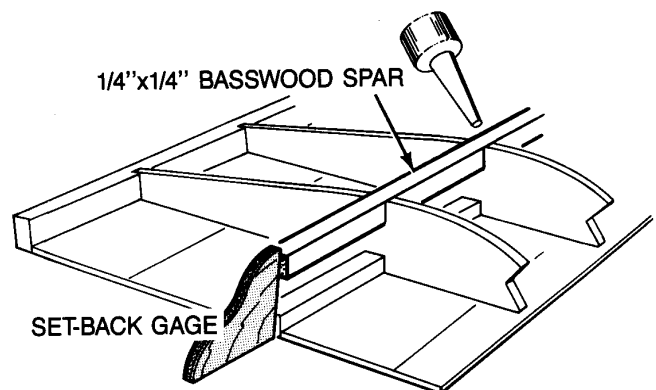
- ☐ Make sure that the ribs are even with the top of the T.E., and fit tight against the L.E. sheet.



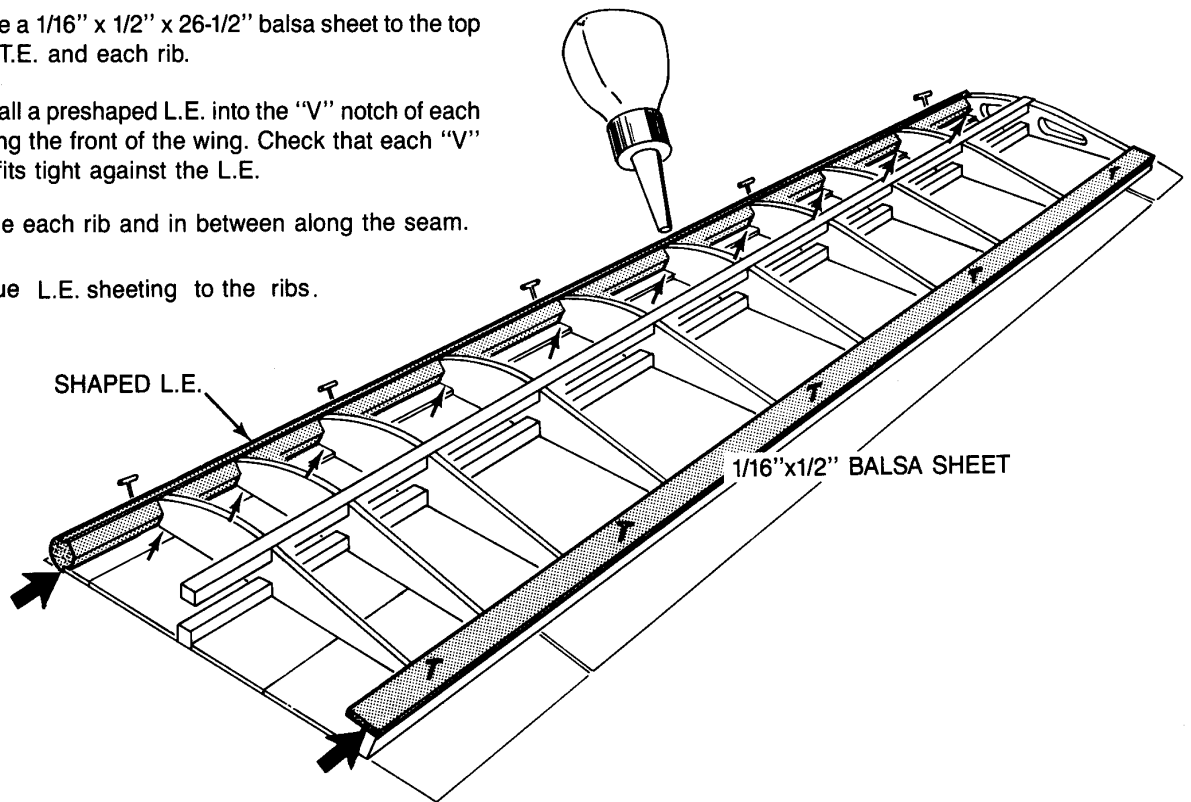
- ☐ Apply glue to each rib at these two points.



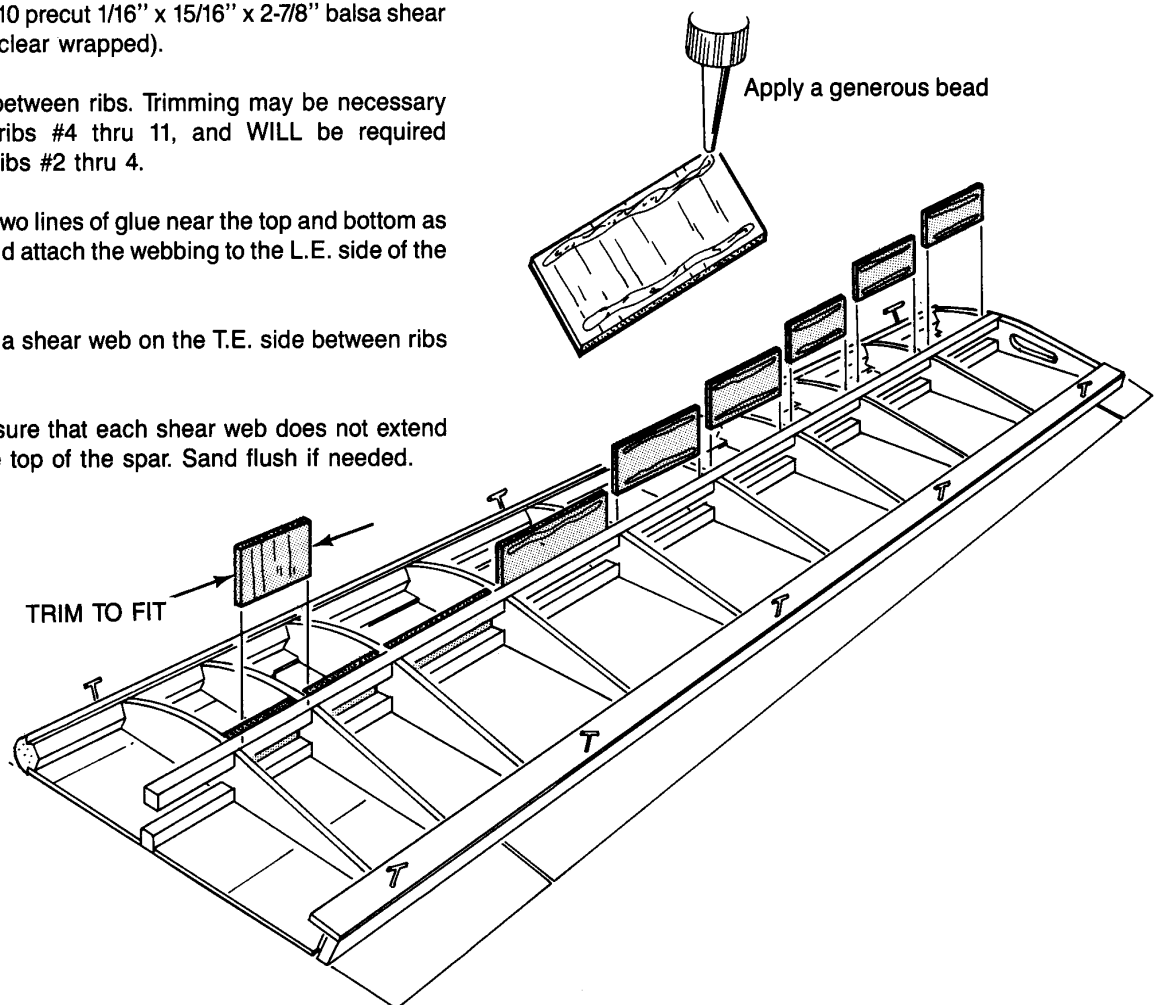
7. ☐ Bump the "SET-BACK GAUGE" against the bottom spar.
- ☐ Position an end of a 1/4" x 1/4" x 26-3/8" BASSWOOD spar against the gauge and slide the spar into the top notch of each rib.
- ☐ Be sure that the top of the spar is even with the top of each rib.
- ☐ Place a drop of glue on both sides of the spar at each rib.



8. ☐ Glue a 1/16" x 1/2" x 26-1/2" balsa sheet to the top of the T.E. and each rib.
- ☐ Install a preshaped L.E. into the "V" notch of each rib along the front of the wing. Check that each "V" notch fits tight against the L.E.
- ☐ Glue each rib and in between along the seam.
- ☐ Glue L.E. sheeting to the ribs.



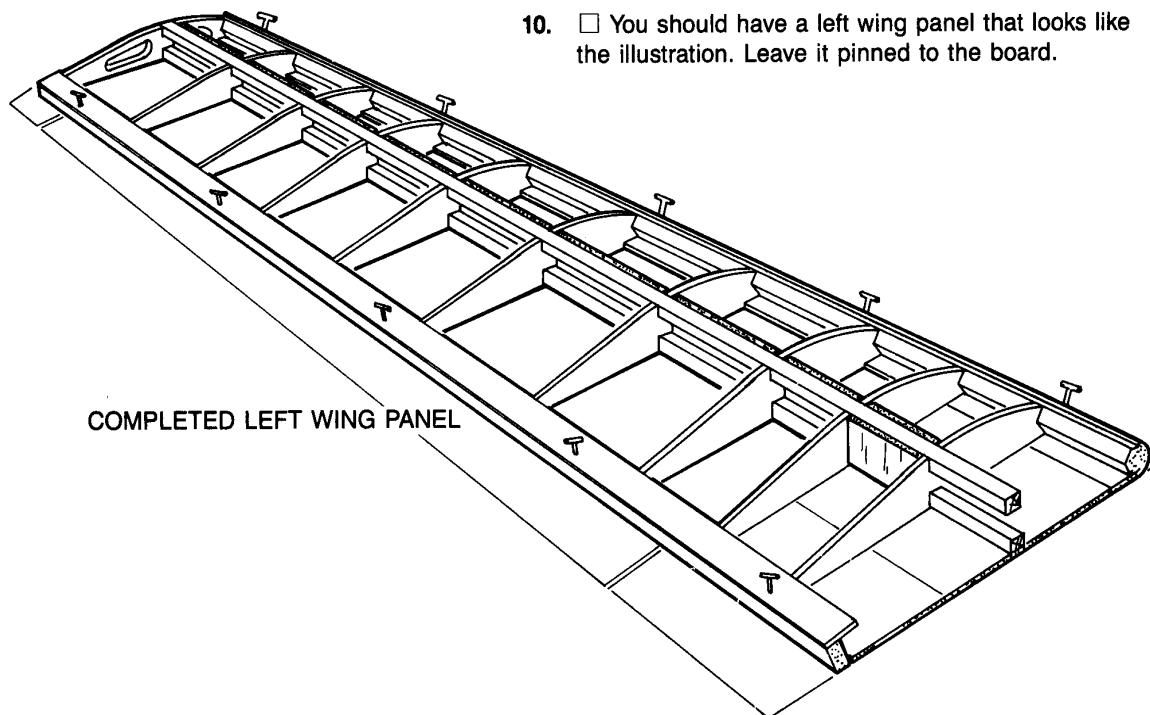
9. ☐ Select 10 precut 1/16" x 15/16" x 2-7/8" balsa shear webbing (clear wrapped).
- ☐ Prefit between ribs. Trimming may be necessary between ribs #4 thru 11, and WILL be required between ribs #2 thru 4.
- ☐ Apply two lines of glue near the top and bottom as shown, and attach the webbing to the L.E. side of the spars.
- ☐ Attach a shear web on the T.E. side between ribs #2 and 3.
- ☐ Make sure that each shear web does not extend above the top of the spar. Sand flush if needed.



THIS COMPLETES THE RIGHT WING PANEL. YOU WILL NOT NEED THIS COMPONENT UNTIL YOU ARE READY TO JOIN THE WING HALVES. GO BACK TO STEP 3 AND REPEAT THE CONSTRUCTION PROCESS, THIS TIME BUILDING THE LEFT WING PANEL.

IF THIS IS YOUR SECOND TIME THROUGH THE SEQUENCE, YOU HAVE NOW COMPLETED A LEFT WING PANEL. YOU ARE NOW READY TO JOIN THE WING HALVES. GO ON TO STEP 10.

10. ☐ You should have a left wing panel that looks like the illustration. Leave it pinned to the board.

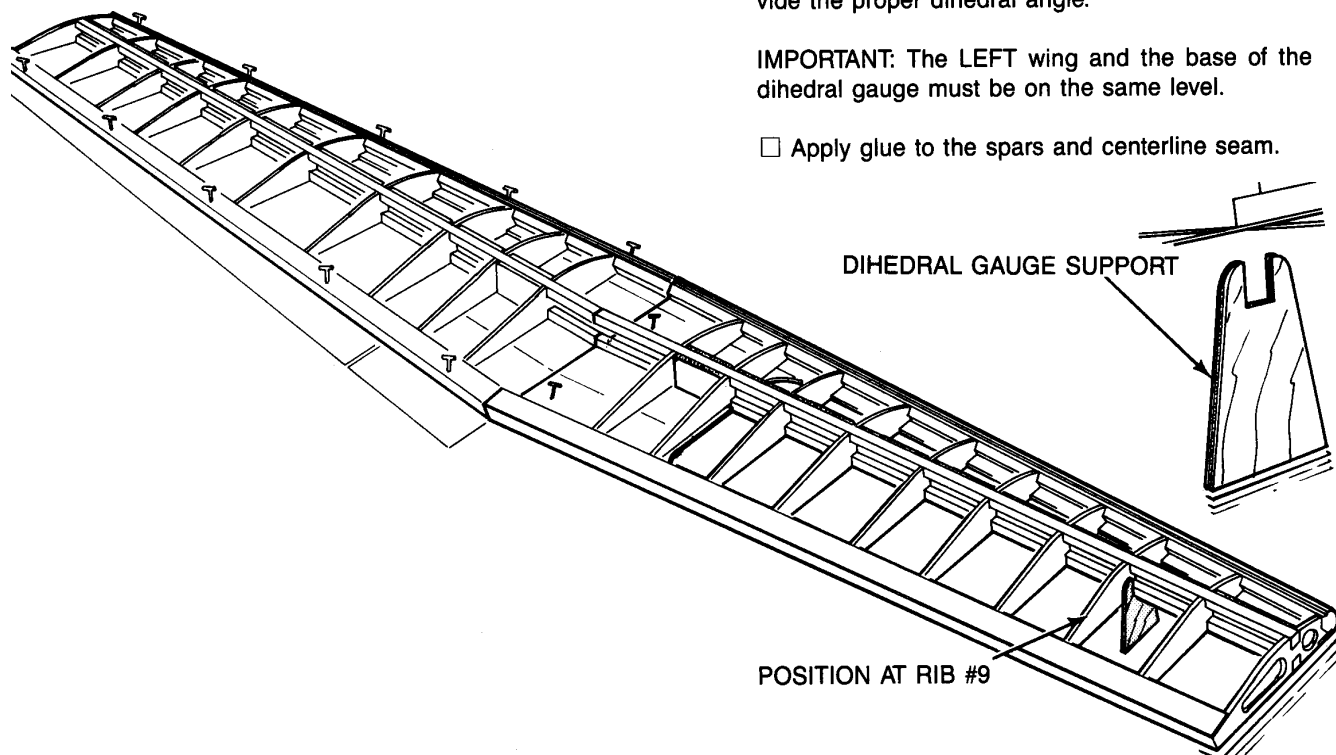


11. ☐ Position the RIGHT panel tight against the LEFT and pin as shown. Sand to fit if needed.

☐ Raise the RIGHT wing tip and support it at rib #9 using the "DIHEDRAL GAUGE SUPPORT." This support will fit around the spar and shear web to provide the proper dihedral angle.

IMPORTANT: The LEFT wing and the base of the dihedral gauge must be on the same level.

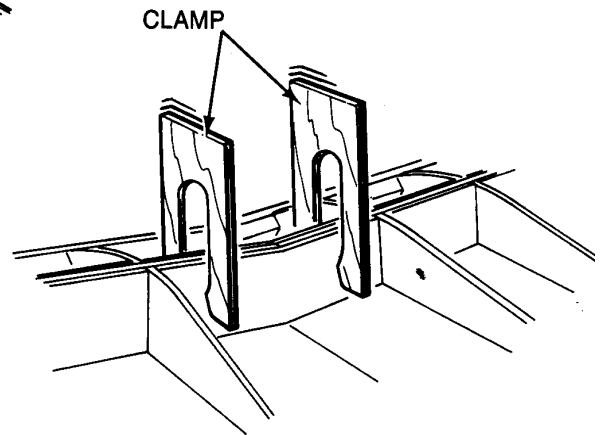
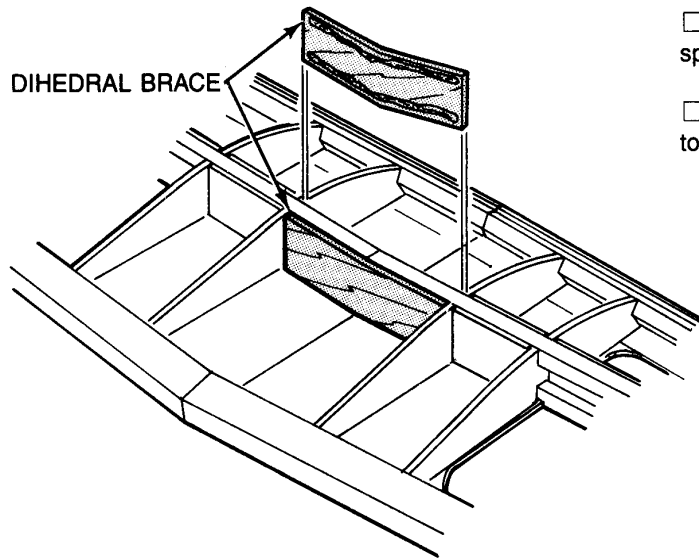
- ☐ Apply glue to the spars and centerline seam.



12. ☐ Apply two beads of glue to one side of both DIHEDRAL BRACES.

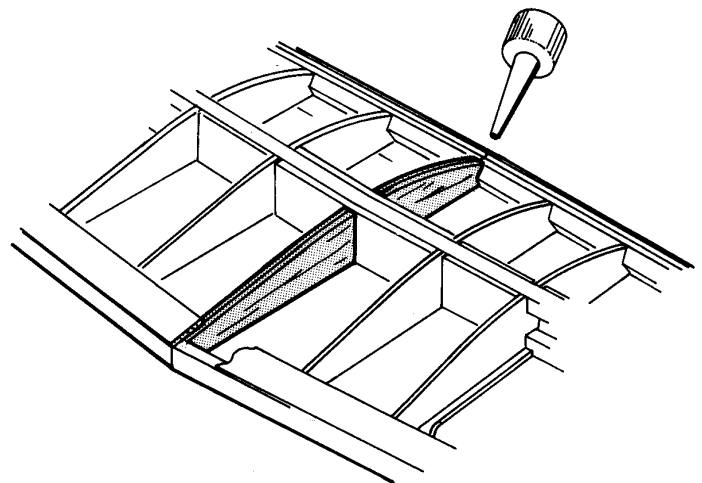
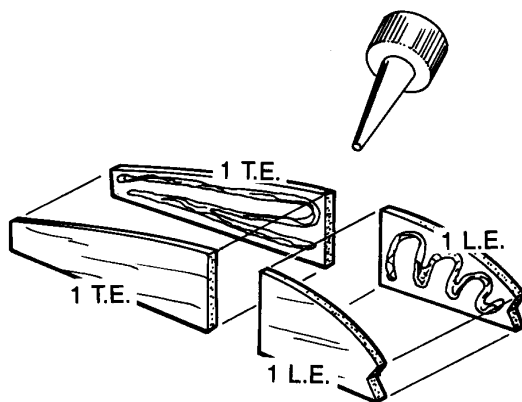
☐ Install the dihedral braces one on each side of the spars.

☐ Use the D.C. clamps provided to hold the assembly together until the glue is dried.



13. ☐ Glue the two L.E. and T.E. halves of rib #1 together.

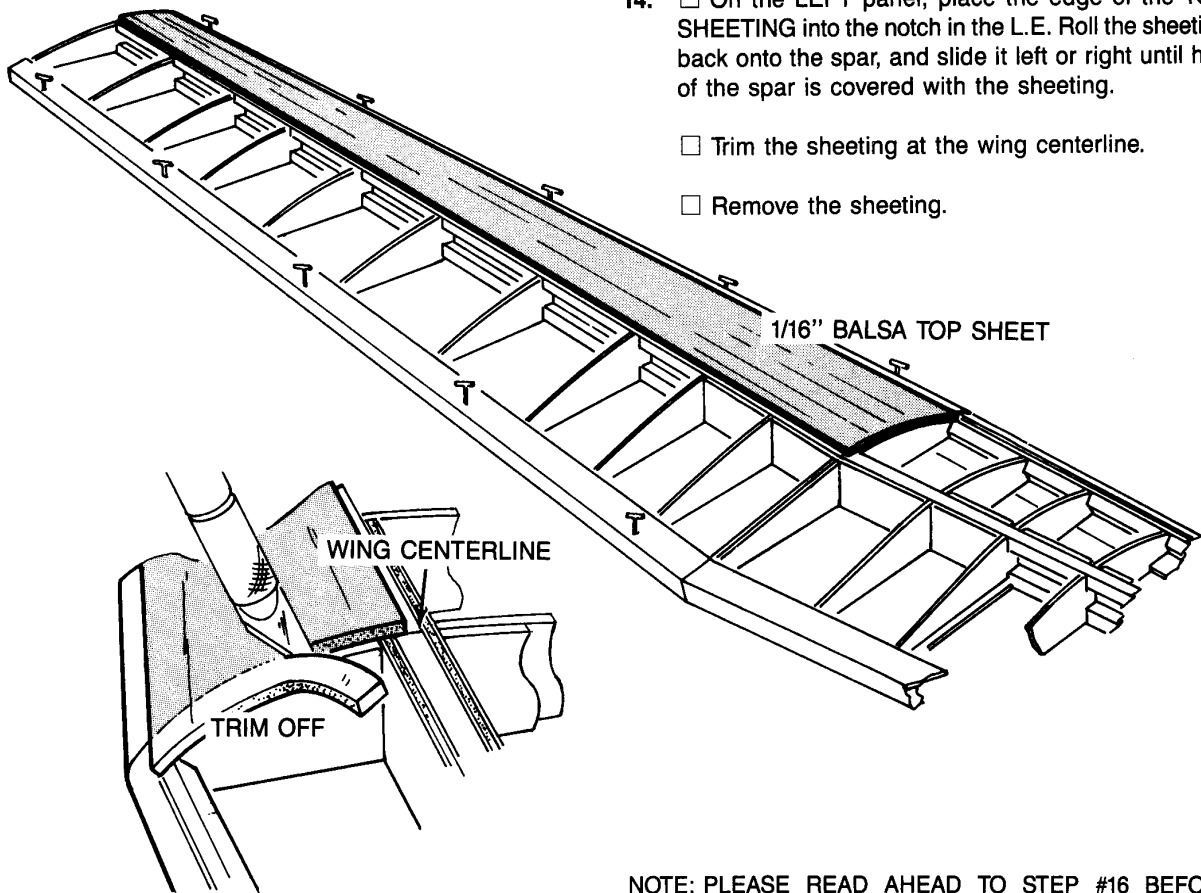
☐ Fit and glue both parts of rib #1 to the centerline joint of the wing.



14. ☐ On the LEFT panel, place the edge of the TOP SHEETING into the notch in the L.E. Roll the sheeting back onto the spar, and slide it left or right until half of the spar is covered with the sheeting.

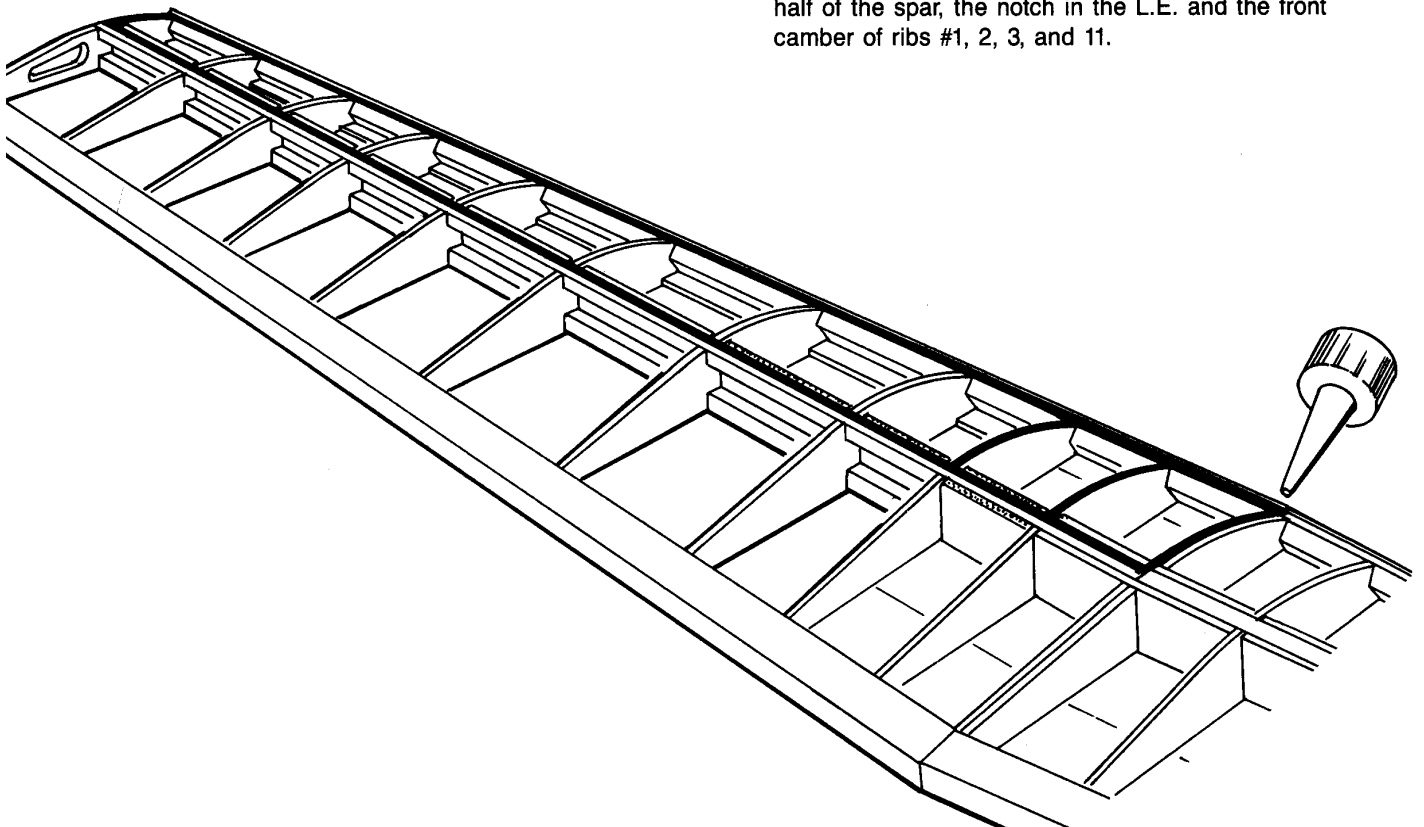
☐ Trim the sheeting at the wing centerline.

☐ Remove the sheeting.



NOTE: PLEASE READ AHEAD TO STEP #16 BEFORE PROCEEDING ON.

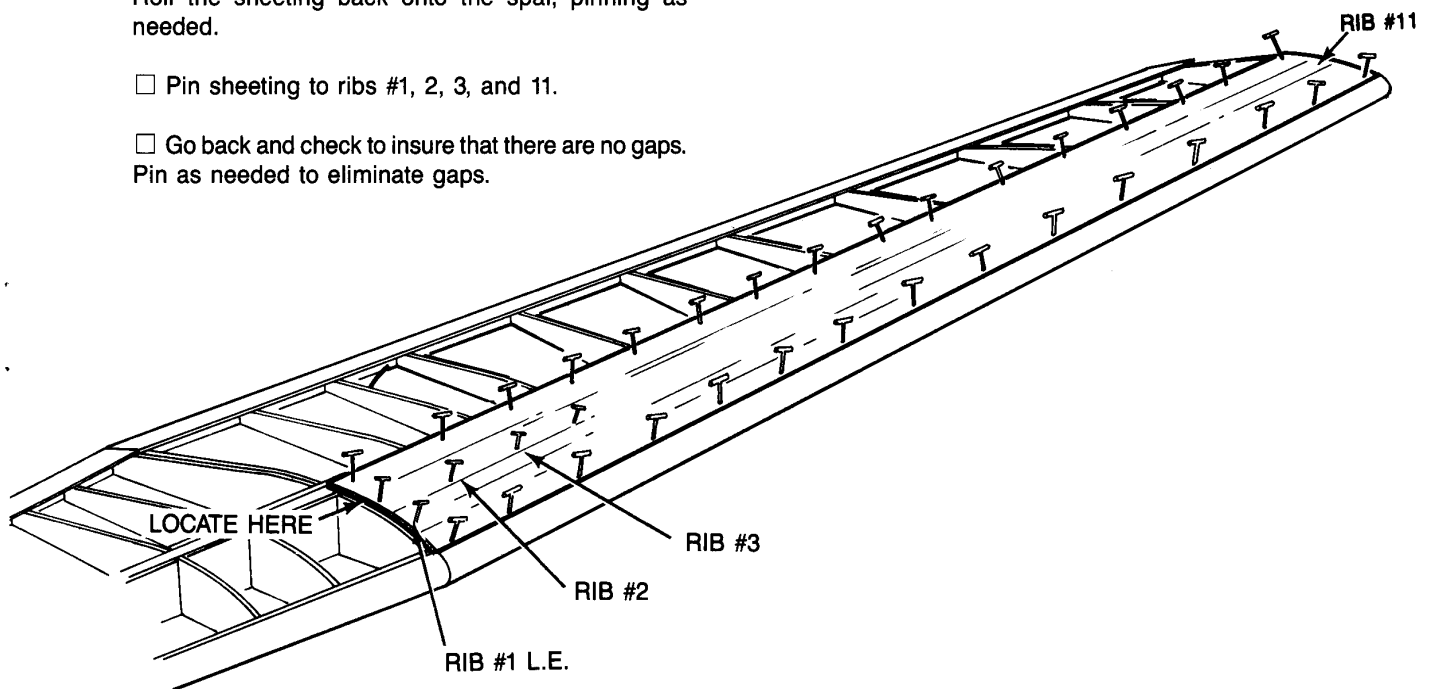
15. ☐ Apply a generous bead of glue to the L.E. half of the spar, the notch in the L.E. and the front camber of ribs #1, 2, 3, and 11.



16. ☐ Quickly, locate the top sheeting at the wing centerline and into the L.E. notch. Spot pin as needed. Roll the sheeting back onto the spar, pinning as needed.

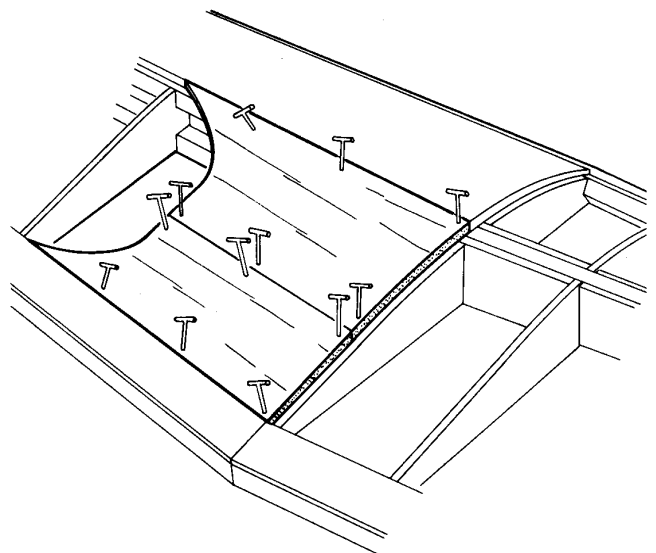
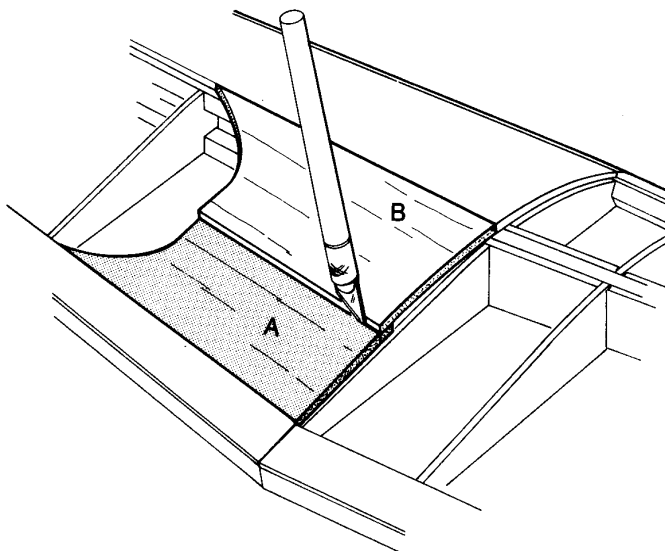
☐ Pin sheeting to ribs #1, 2, 3, and 11.

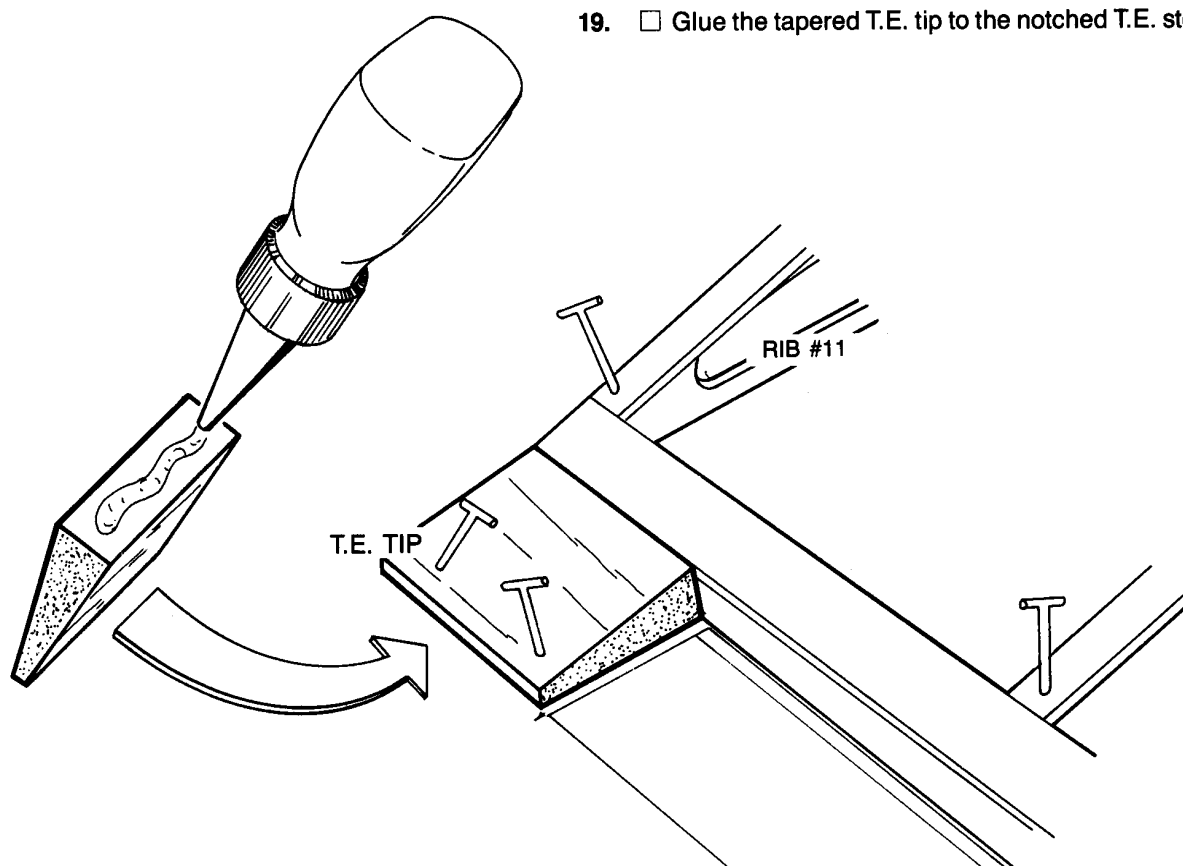
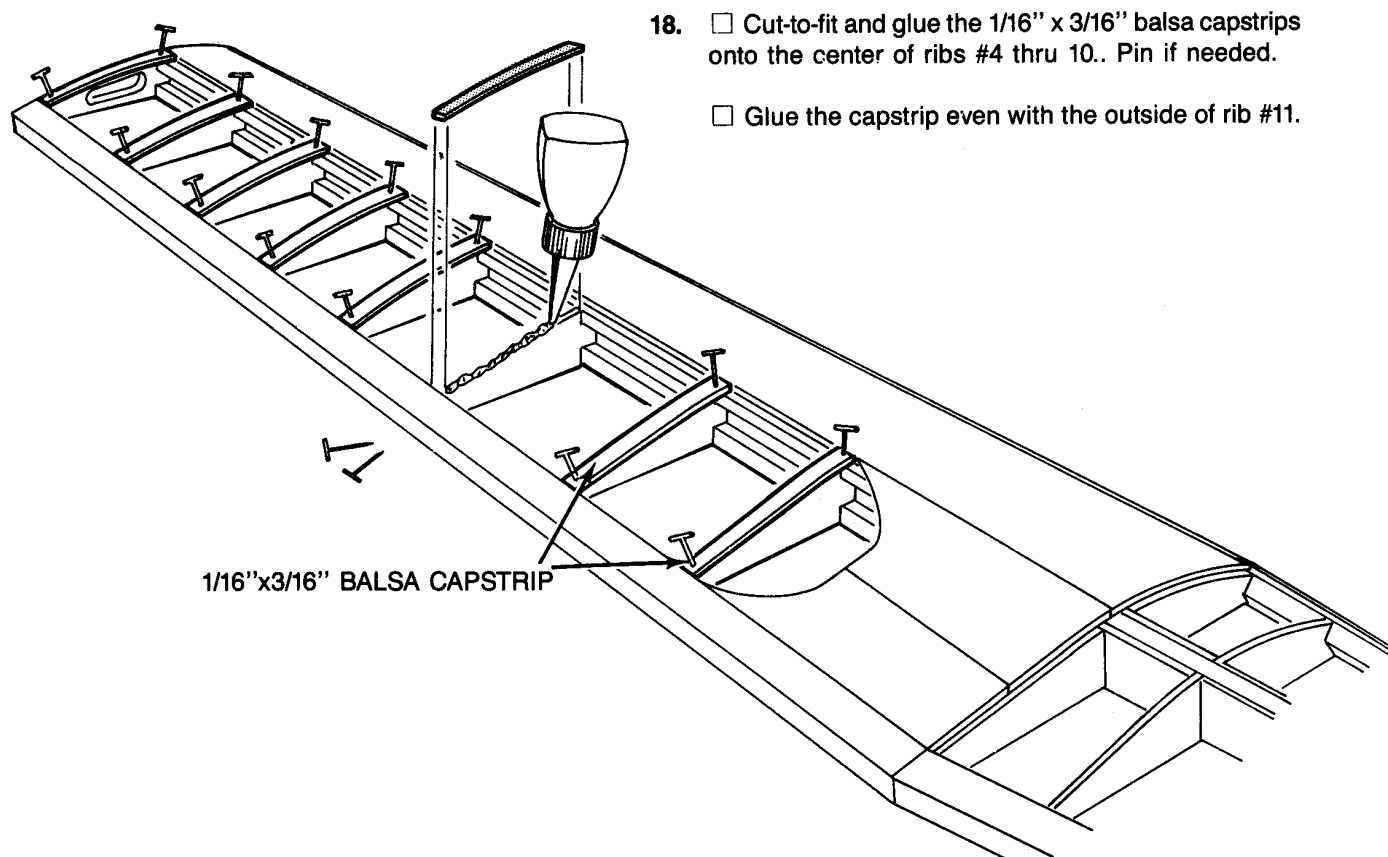
☐ Go back and check to insure that there are no gaps. Pin as needed to eliminate gaps.



17. ☐ Position the TOP CENTER SHEETING using one section as a trimming guide for the other as shown.

☐ When you are satisfied with the fit, glue the sections to the ribs below and the three seams.

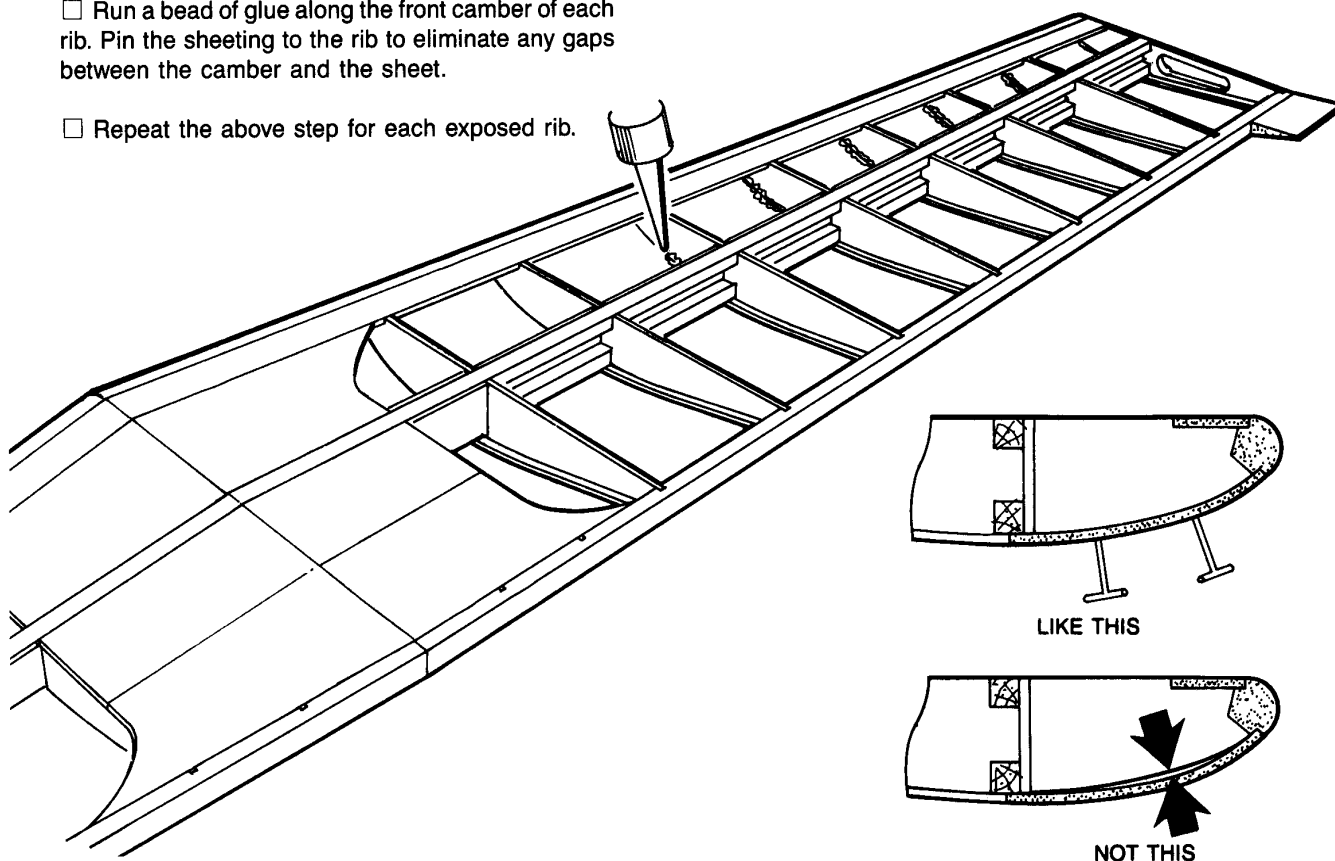




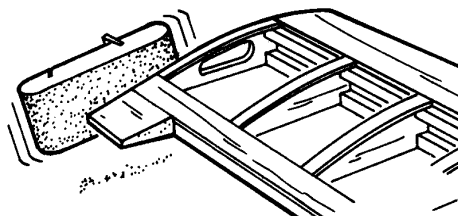
20. ☐ Remove the wing from the building board and flip it upside-down.

☐ Run a bead of glue along the front camber of each rib. Pin the sheeting to the rib to eliminate any gaps between the camber and the sheet.

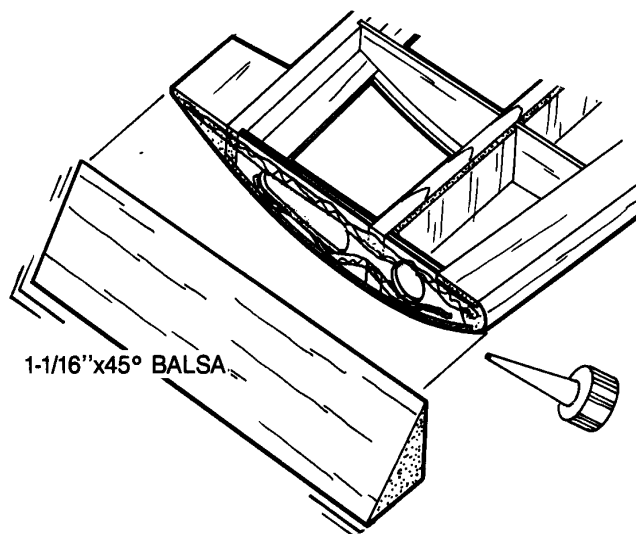
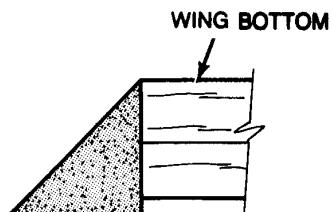
- ☐ Repeat the above step for each exposed rib.



21. ☐ Use a sanding block with FINE paper, sand the tip flat in the plane with rib #11.



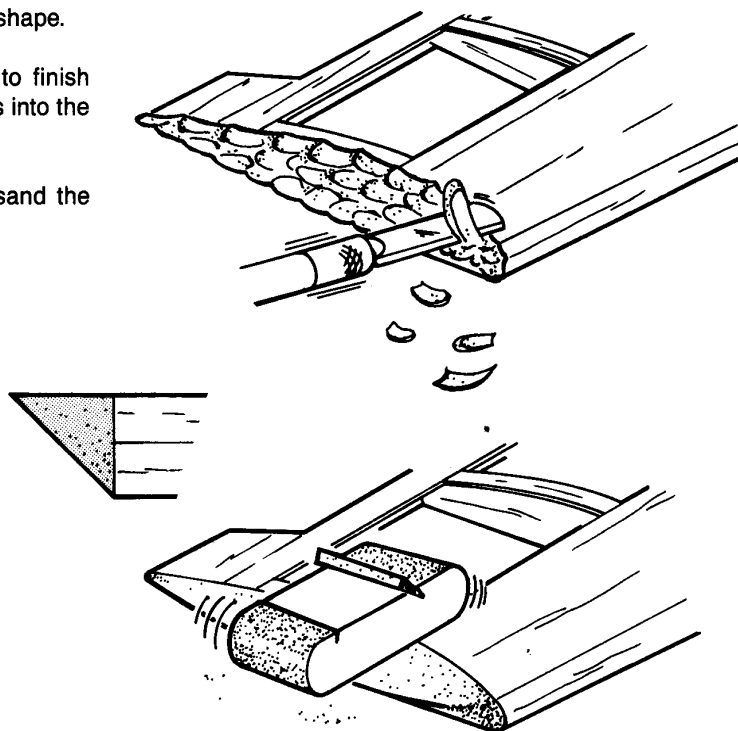
- ☐ Glue the 1-1/16" x 45 deg. x 7-1/16" BALSA WING TIP TO RIB #11. Match bottom of rib with bottom of the block angle.



22. ☐ Use a knife to "rough-carve" the tip to shape.

☐ Use a sanding block with FINE paper to finish shape the tip. Blend the L.E. and T.E. radius into the contour of the tip.

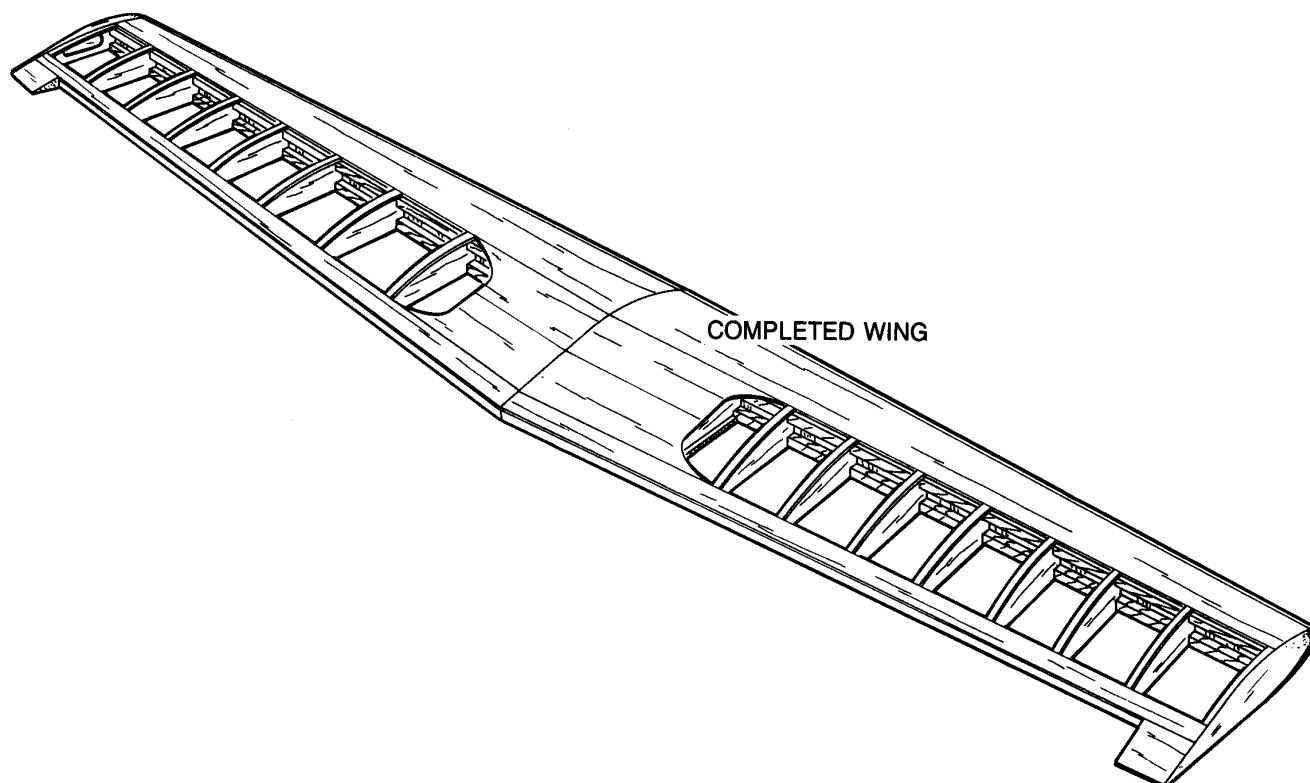
☐ Using the same sanding block, lightly sand the entire wing half.



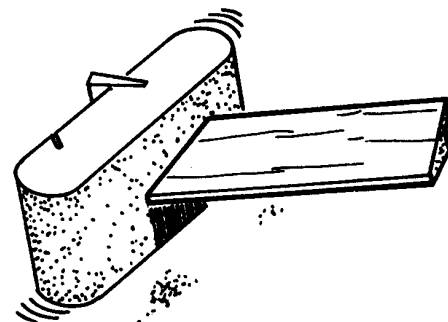
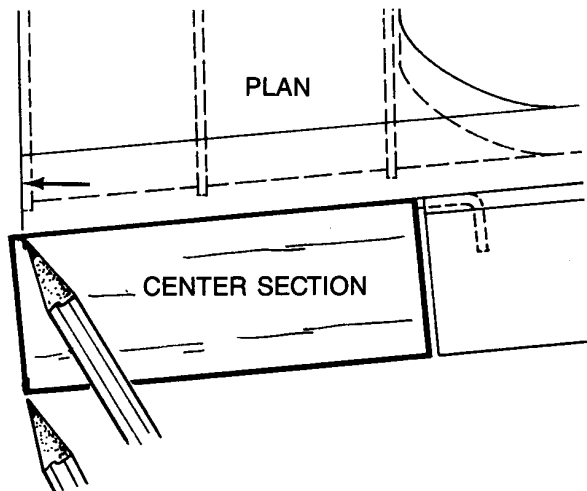
23. ☐ Pin the RIGHT wing to the building board.

☐ Go back to step #14 and repeat the construction process for the right wing panel.

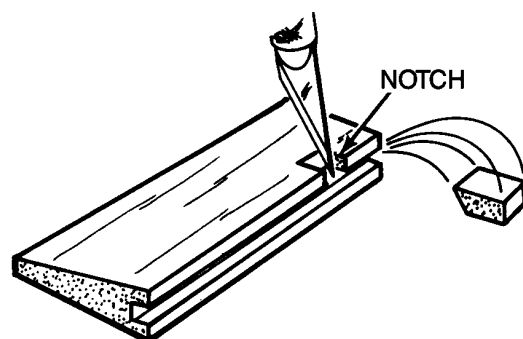
IF THIS IS YOUR SECOND TIME THROUGH THE SEQUENCE YOU ARE READY TO INSTALL THE AILERON TORQUE RODS. GO ON TO STEP #24.



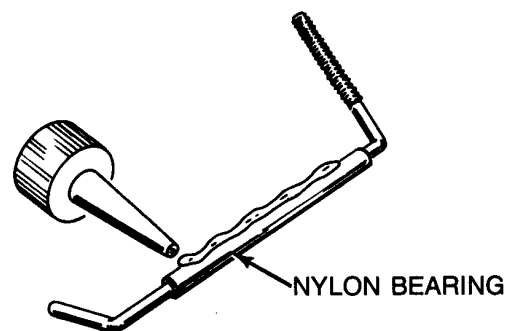
24. ☐ Position a TORQUE ROD BEARING CENTER SECTION over the plan and mark the angle as shown.
- ☐ Use a sanding block to bevel the angle to the marks.



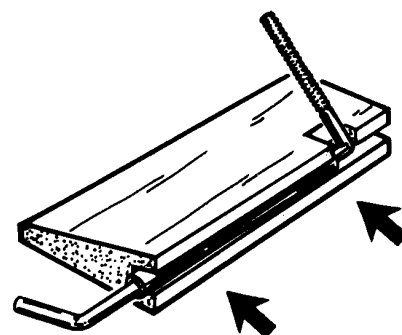
25. ☐ From the plan locate the aileron horn notch, and mark it on the BEARING SECTION.
- ☐ Cut out to provide an aileron horn clearance notch.



- ☐ Lightly glue the NYLON BEARING on the aileron torque rod assembly. CAUTION: DO NOT GLUE THE NYLON BEARING TO THE TORQUE ROD.

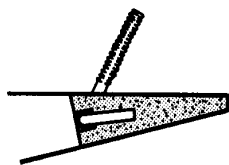


- ☐ Install the aileron torque rod assembly into the center section. Be careful to allow clearance for the aileron horn travel.

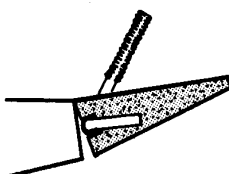


26. ☐ Glue the bearing assembly to the wing. Make sure that the notched side is on the bottom, and toward the wing centerline.

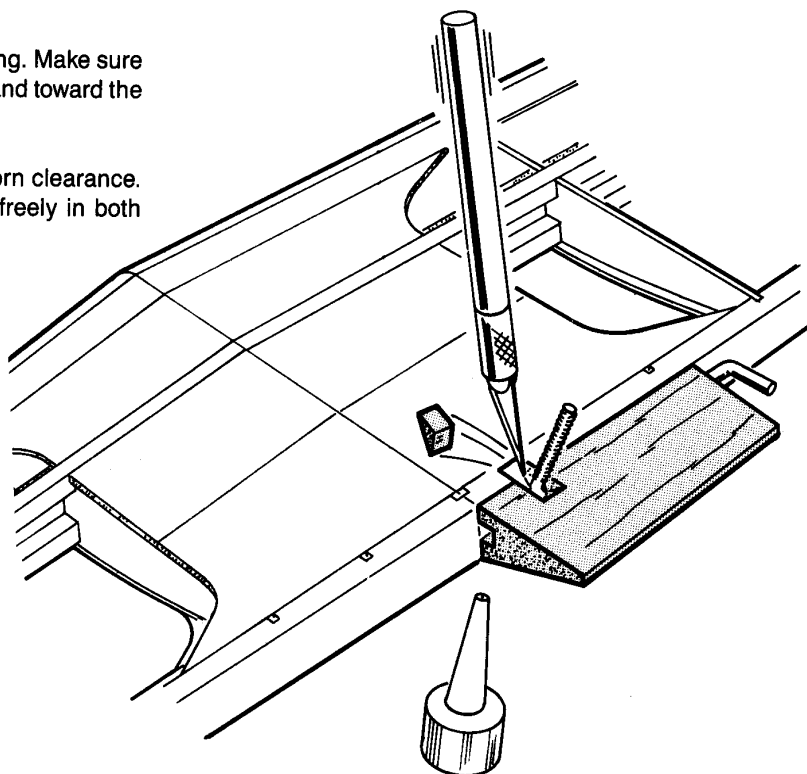
☐ Notch the wing to provide aileron horn clearance. Make sure that the torque rod moves freely in both directions.



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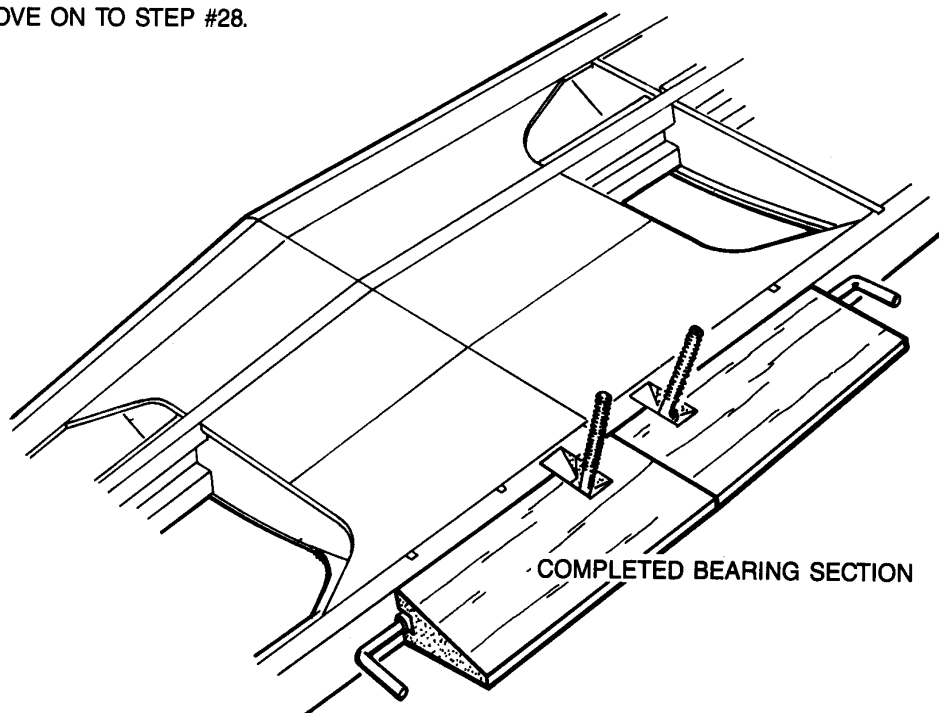


NOT THIS

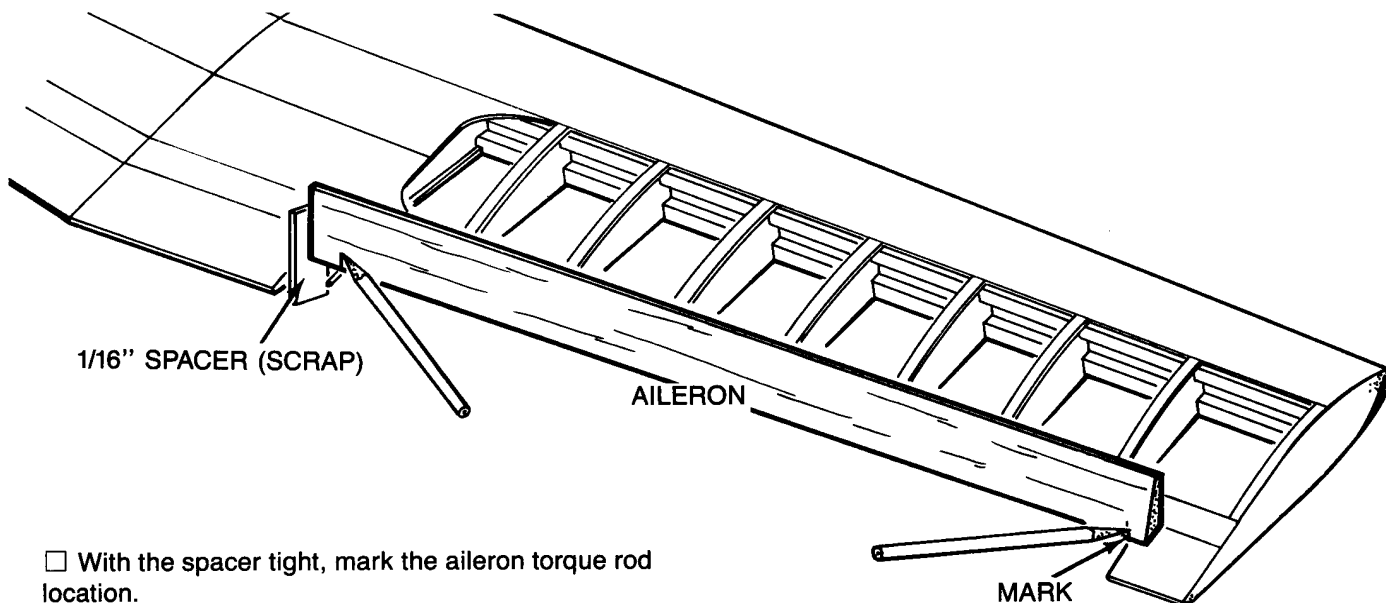


27. ☐ Go back to step #24 and repeat the construction sequence for the other wing half.

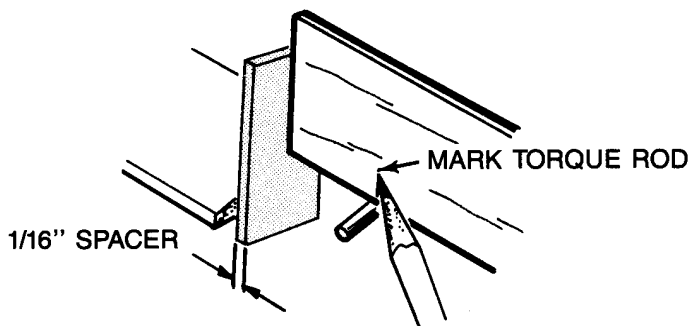
IF THIS IS YOUR SECOND TIME THROUGH THIS SEQUENCE YOU ARE NOW READY TO FIT THE AILERONS. SO LET'S MOVE ON TO STEP #28.



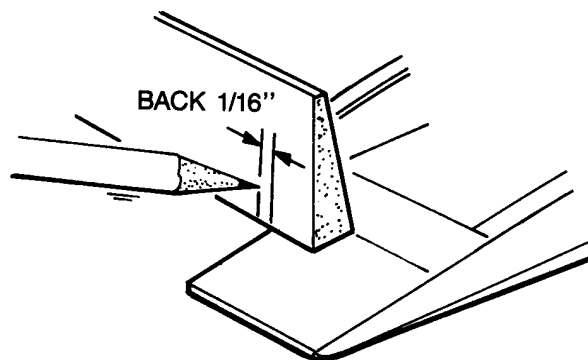
28. ☐ Find a scrap of 1/16" stock to use for a spacer.
- ☐ Position the spacer between the bearing section and the aileron stock.



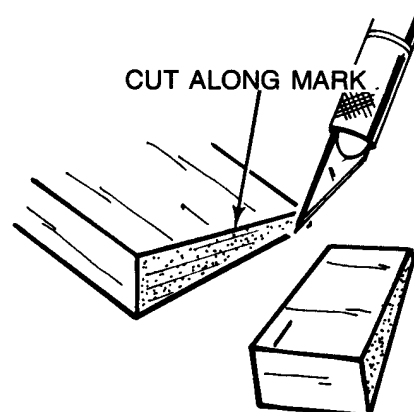
- ☐ With the spacer tight, mark the aileron torque rod location.



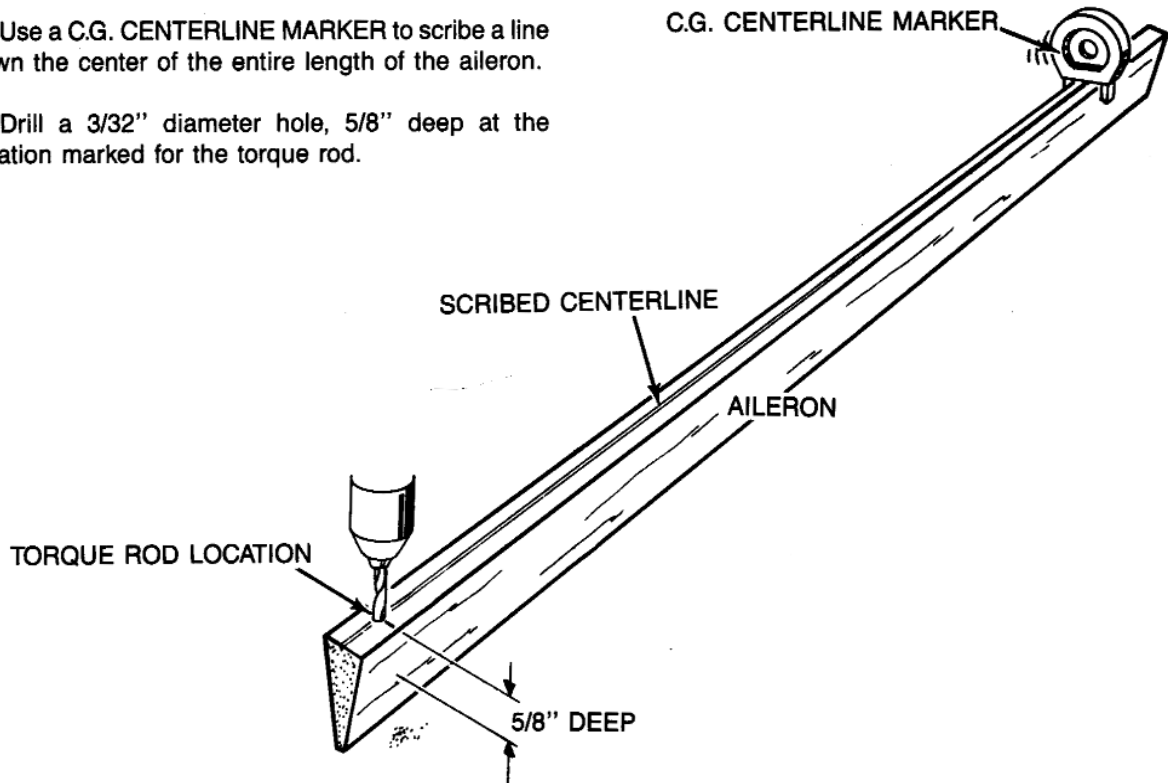
- ☐ Mark the "tip-end" of the aileron for the correct length.
- ☐ Measure back 1/16" from the "tip-end" mark.



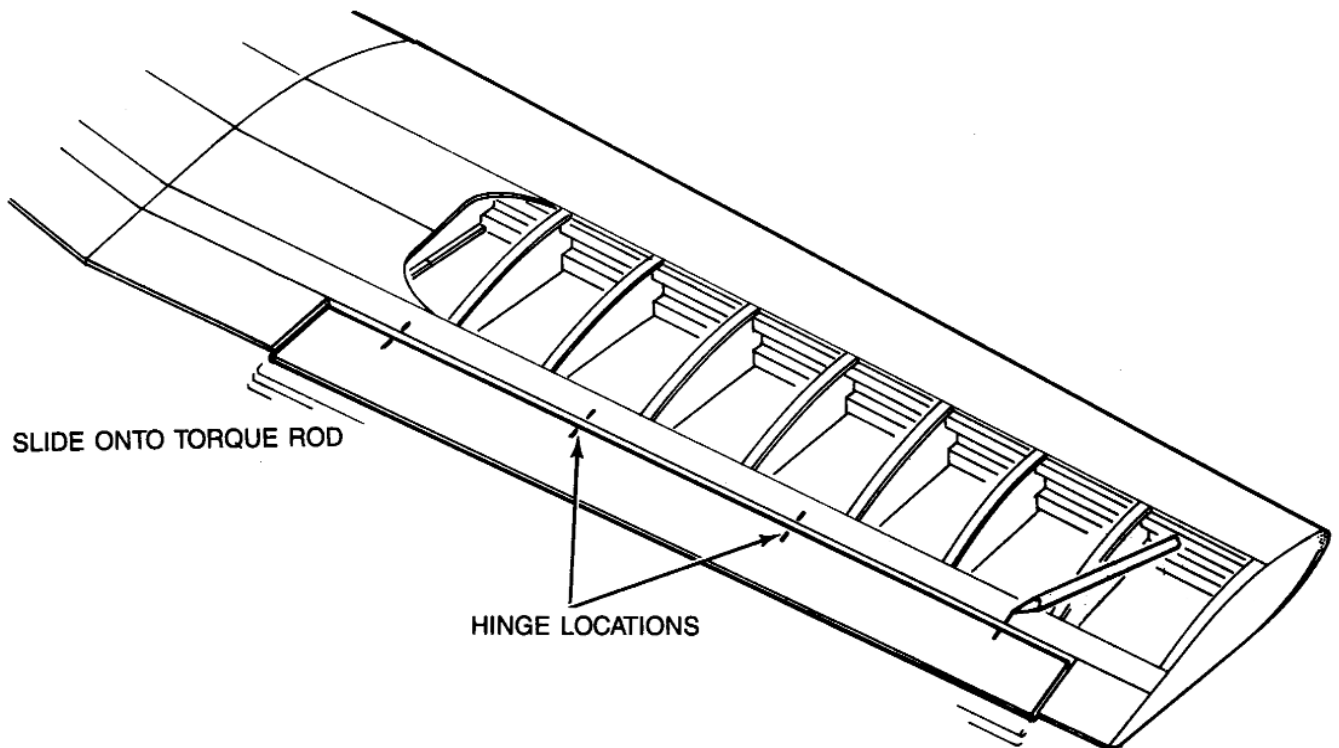
- ☐ Cut the aileron to the correct length. Remember; this aileron is fitted to this wing half, after you have cut the other half do not mix them.



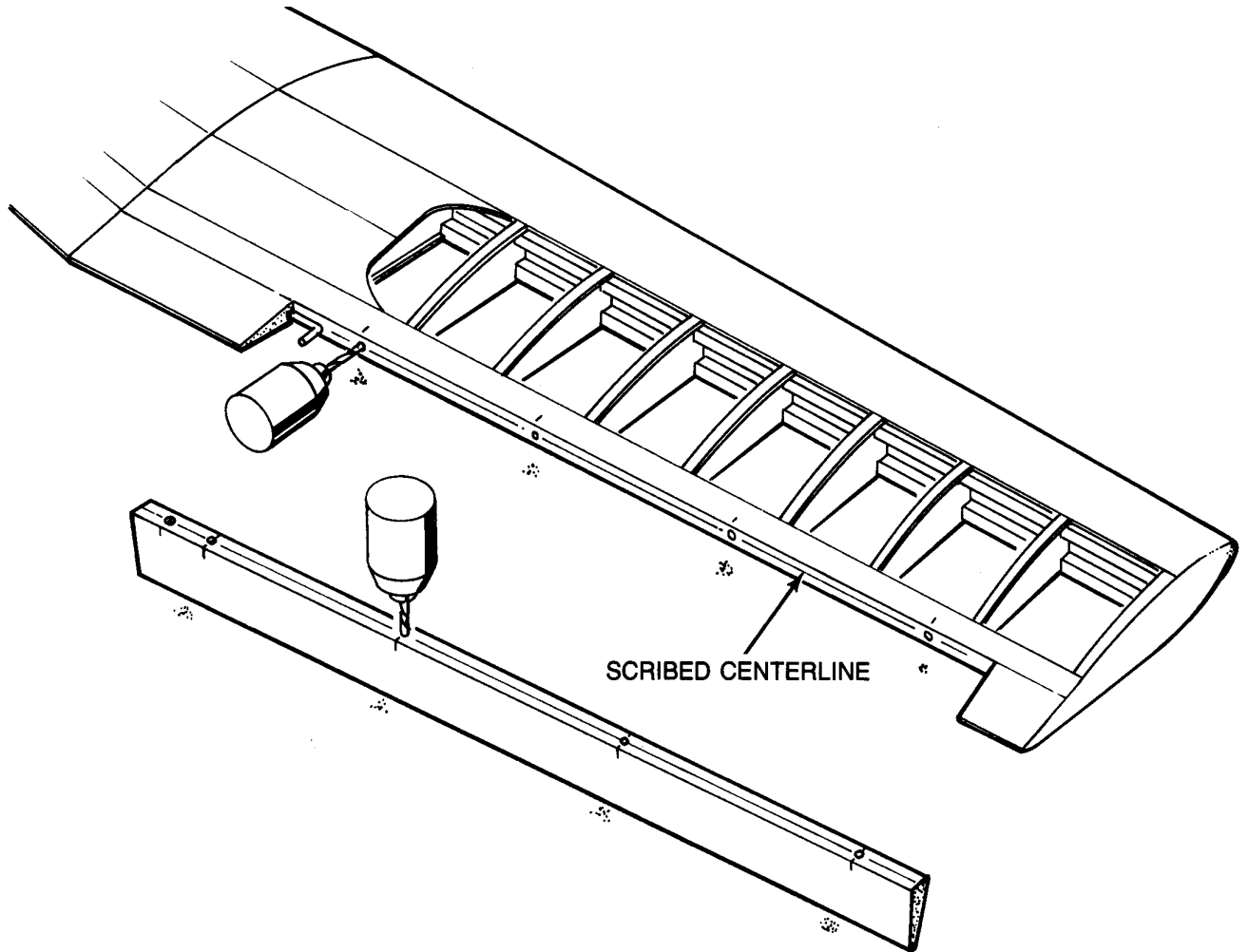
29. ☐ Use a C.G. CENTERLINE MARKER to scribe a line down the center of the entire length of the aileron.
- ☐ Drill a $\frac{3}{32}$ " diameter hole, $\frac{5}{8}$ " deep at the location marked for the torque rod.



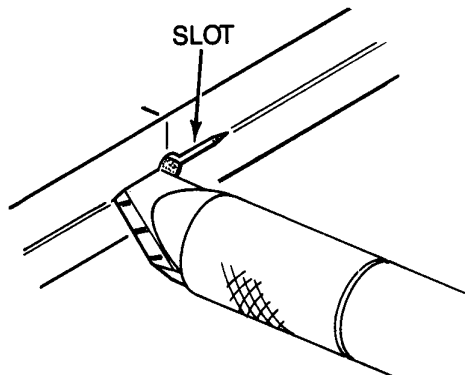
30. ☐ Transfer the hinge locations from the plan to the aileron.
- ☐ Slide the aileron onto the torque rod and transfer the hinge marks onto the wing.



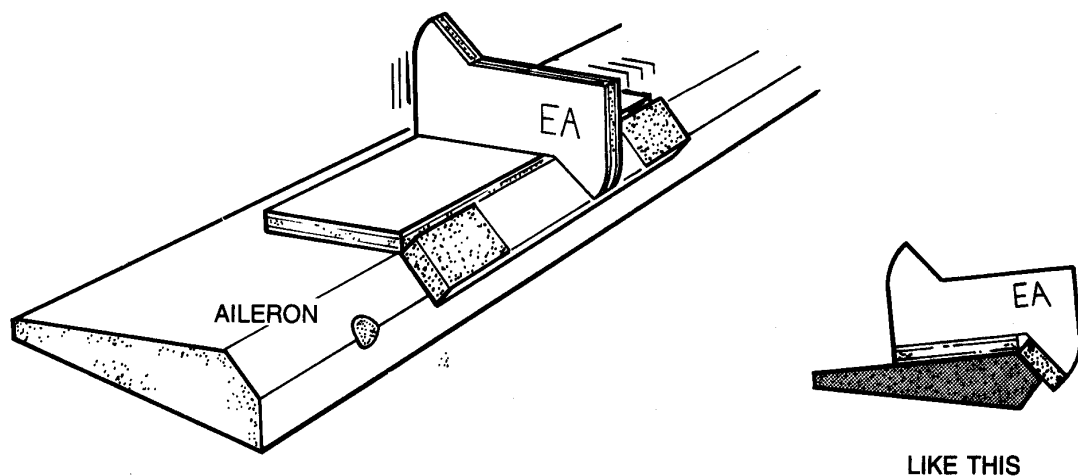
31. ☐ Use the CENTERLINE MARKER to scribe the center along the entire length.
- ☐ Drill a 1/16" diameter hole through the T.E. in wing, on the centerline at each hinge location.
- ☐ Drill a 1/16" diameter hole, 1/2" deep on the centerline at each hinge location in the aileron.



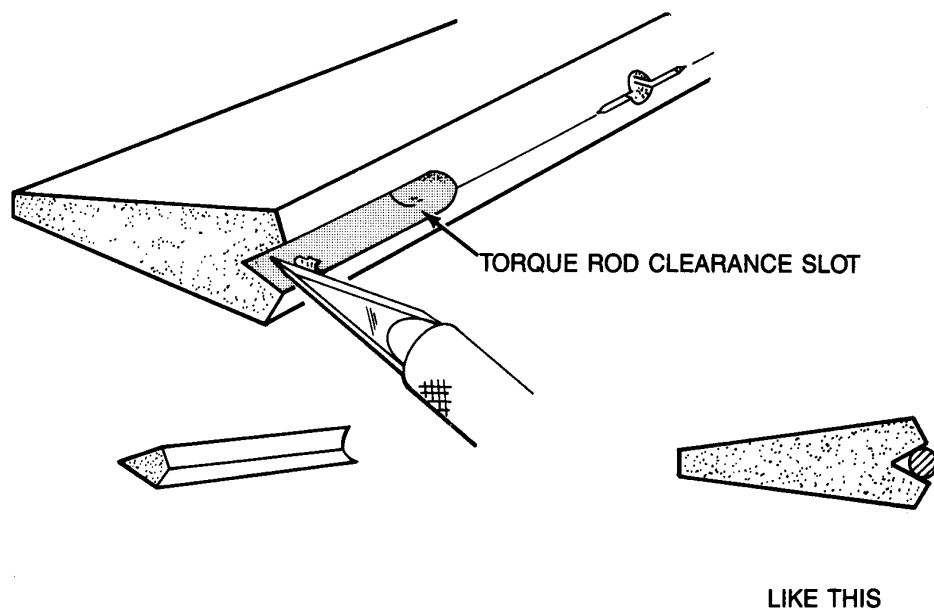
32. ☐ Slot each of the eight hinge holes as shown.
- ☐ Test fit the hinges as you go. You WILL NOT permanently install them until after the model is covered.



33. ☐ Bevel both sides of the aileron using the "EA" bevelling tool. I said you would need it again!



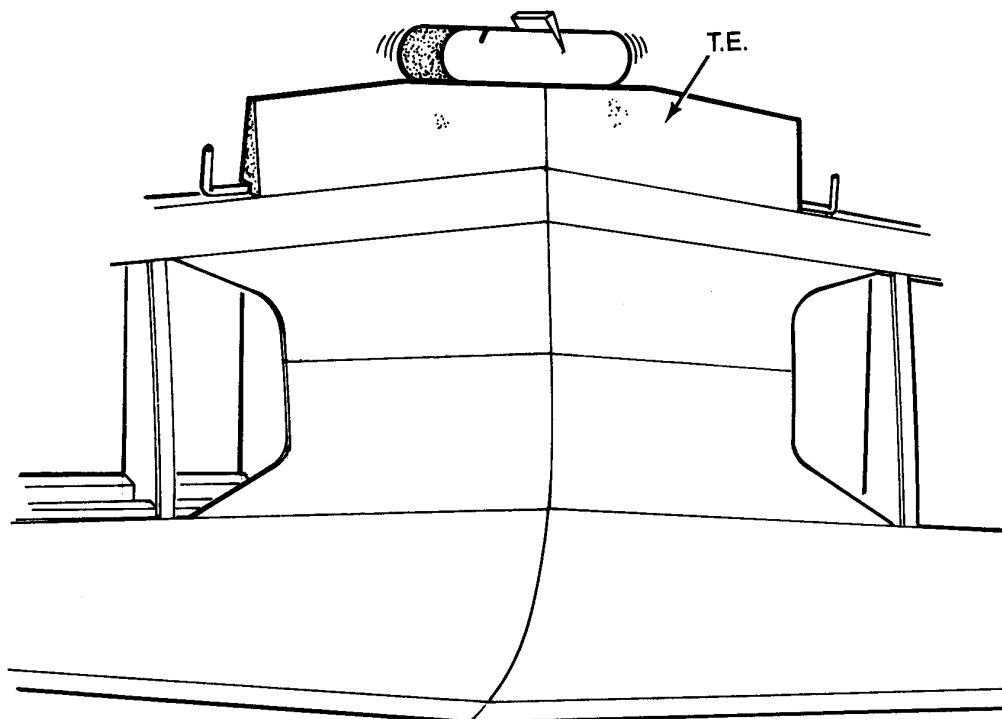
34. ☐ Carefully cut out the torque rod clearance slot.
- ☐ Test-fit the aileron until the torque rod fits as shown.



35. ☐ Go back to step #28 and repeat the construction sequence for the other aileron.

IF THIS IS YOUR SECOND TIME THROUGH THE SEQUENCE THEN YOU ARE READY TO FINISH-UP THE WING. SO, LET'S NOT WASTE ANY MORE TIME. GO ON TO STEP #36.

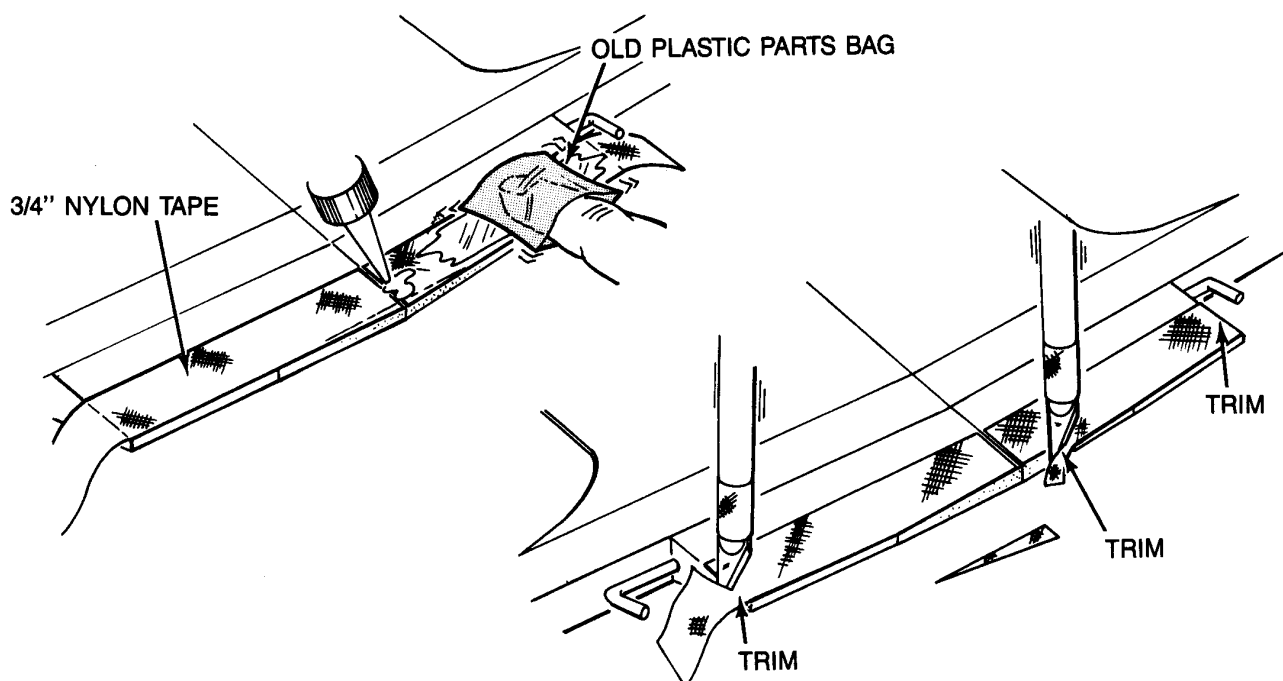
36. ☐ Sand the T.E. flat at a right angle to the centerline of the wing. Test fit the wing to the fuselage for correct match.



37. ☐ Glue 3/4" NYLON TAPE to the TOP of the wing at the T.E. as shown.

☐ Smear CA glue evenly over the nylon using a plastic parts bag to protect your finger from the glue.

- ☐ Trim nylon tape as shown.

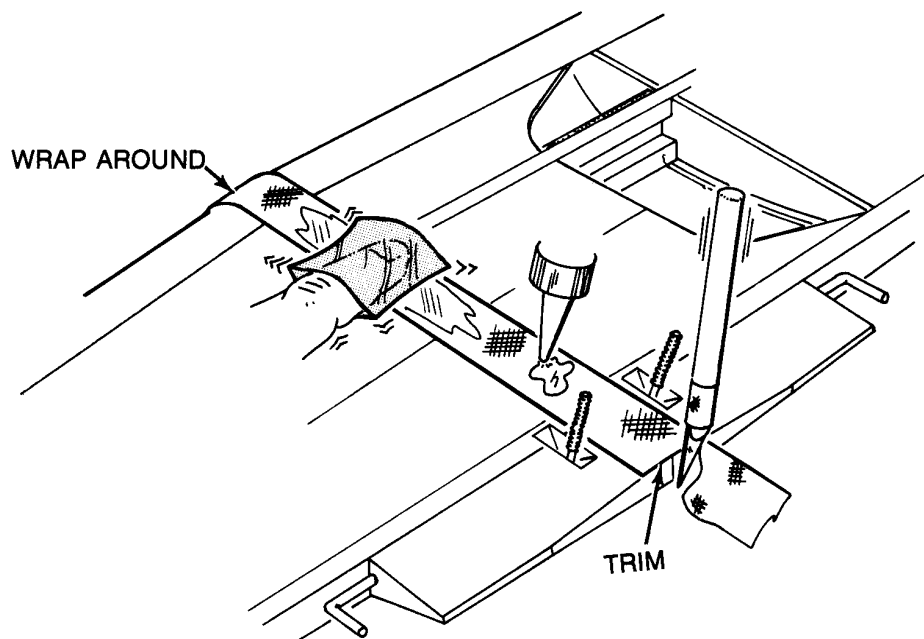
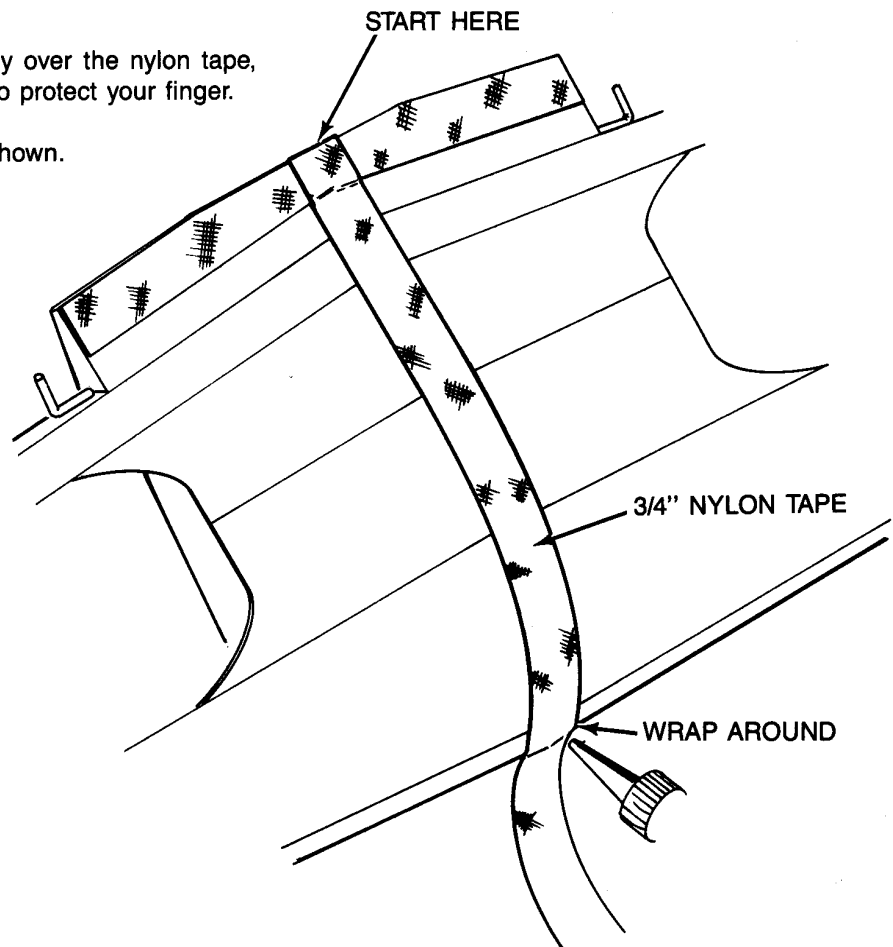


38. ☐ Starting at the T.E. glue a length of 3/4" NYLON TAPE to the top of the wing over the centerline.

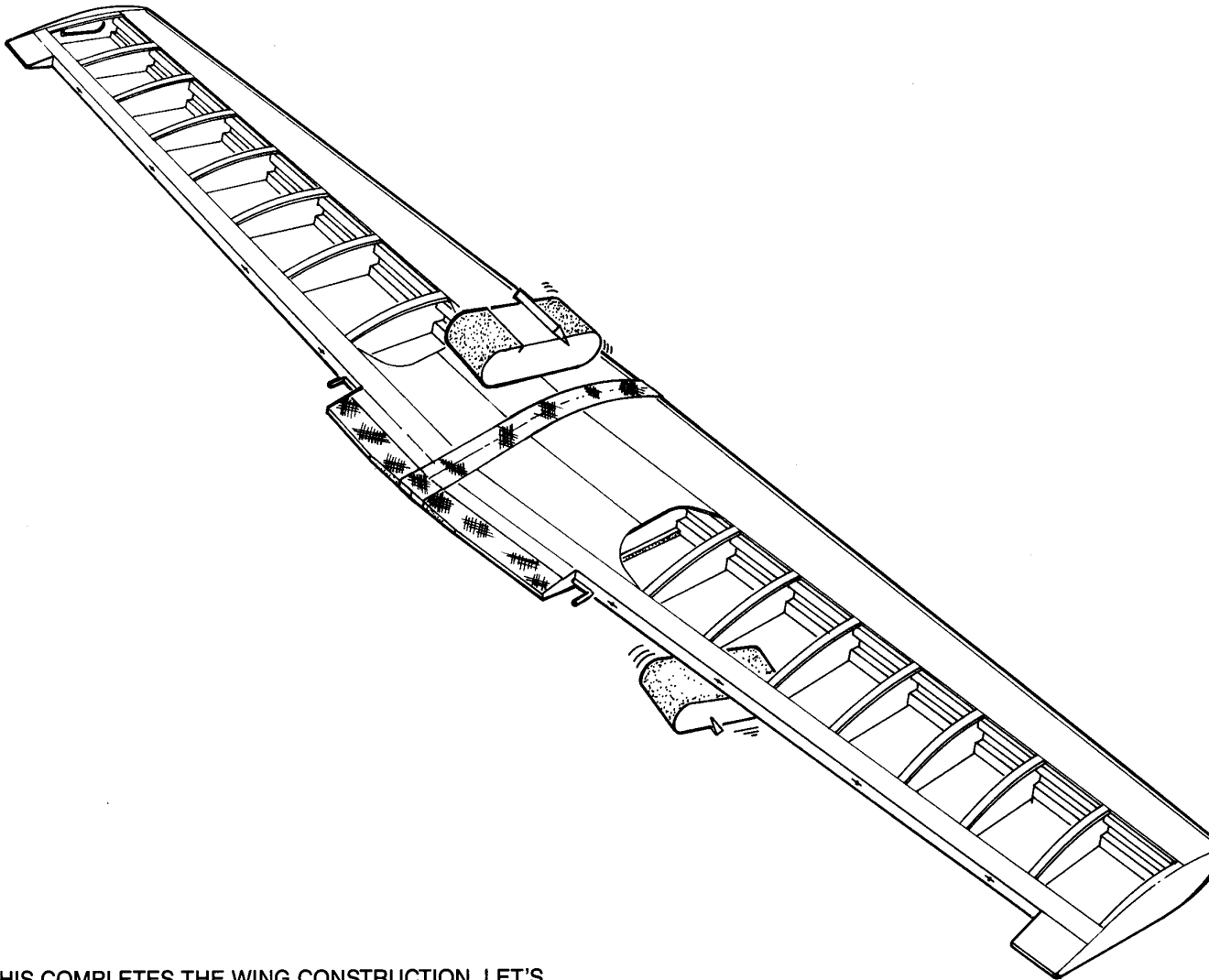
☐ Wrap the tape over the L.E. and across the wing bottom.

☐ Smear CA glue evenly over the nylon tape, again using the plastic bag to protect your finger.

☐ Trim the excess tape as shown.



39. ☐ Lightly sand the entire wing using FINE paper. Make sure that you remove all burrs and rough areas. Be informed that any rough seam and uneven joint will show-up in the covering. So, hear me now and listen later, do a good job.



THIS COMPLETES THE WING CONSTRUCTION. LET'S GET THIS COVERED.

COVERING THE MODEL.

See the section on "COVERING" in the GENERAL INFORMATION BOOKLET enclosed in this kit.

VIII. ATTACHING THE STAB AND FIN TO THE FUSELAGE

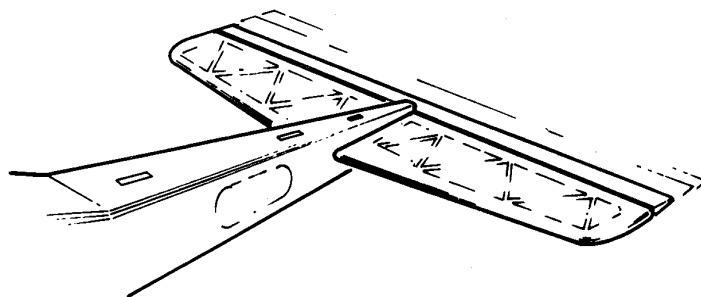
1. ☐ Slide the horizontal stabilizer into the fuselage slot. Check that the stab is parallel to the top of the fuse. Trim or shim the slot to insure proper alignment.



LIKE THIS



NOT THIS

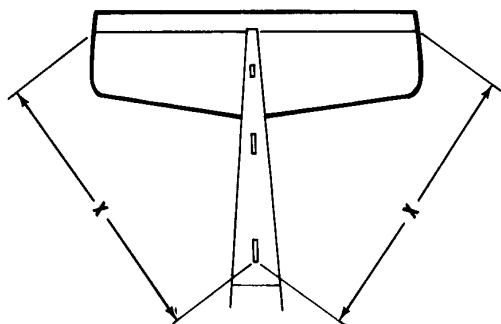


2. ☐ Insert the rudder post into the slot in the top of the fuselage, and down through the slot in the stab.

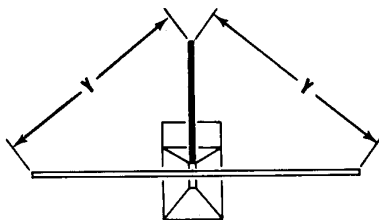
☐ Insert the two tabs on the dorsal into the remaining slots in the fuse.

☐ Adjust the fin and stab until they are correctly aligned.

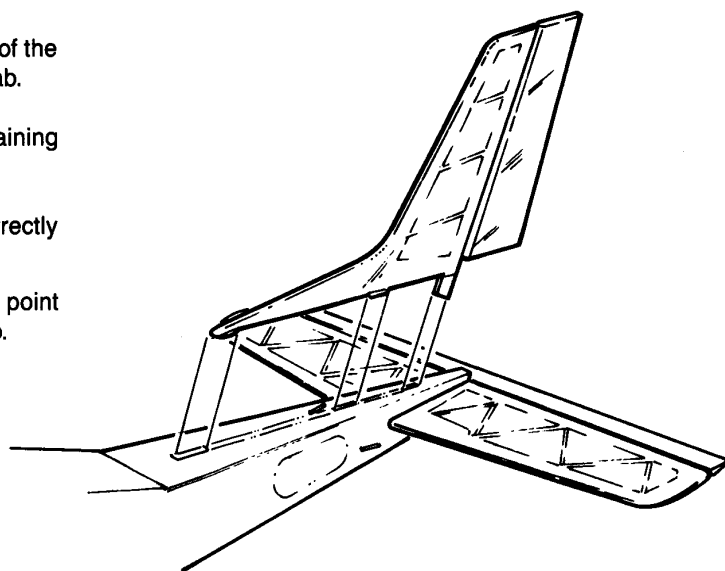
To do this measure equal distances from a fixed point on the centerline to the same spot at each tip.



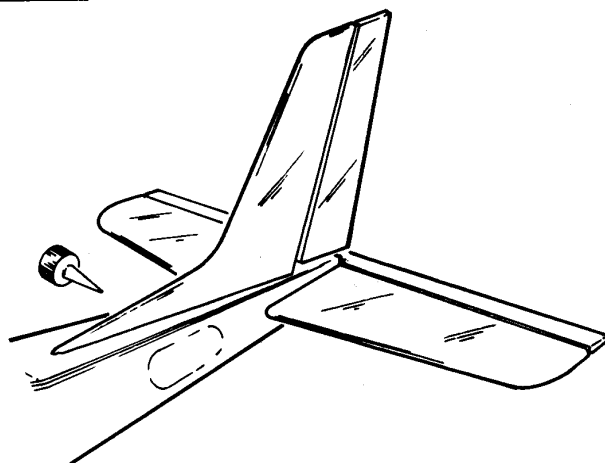
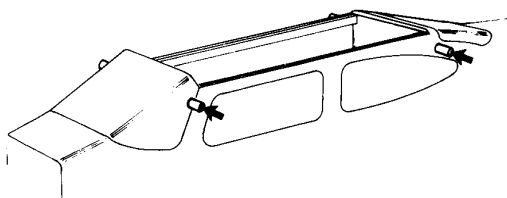
LIKE THIS



LIKE THIS

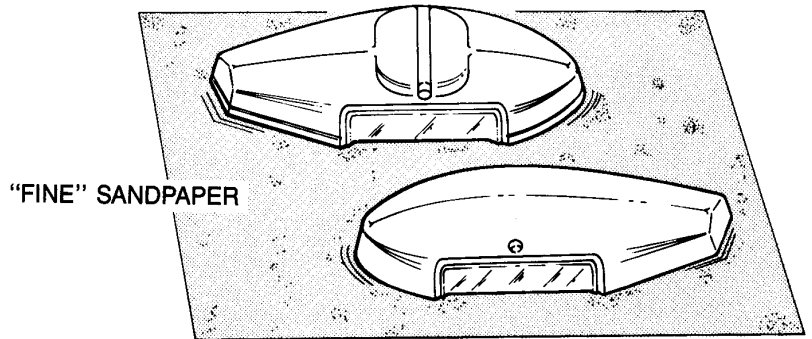


3. ☐ When proper alignment has been accomplished, run a bead of glue around all of the seams attaching the fin and stab to the fuselage.
4. ☐ Install the windshield transfer. See instruction in BOOK 2 for procedure.
- ☐ Install the 1/4" wing-hold down dowels.

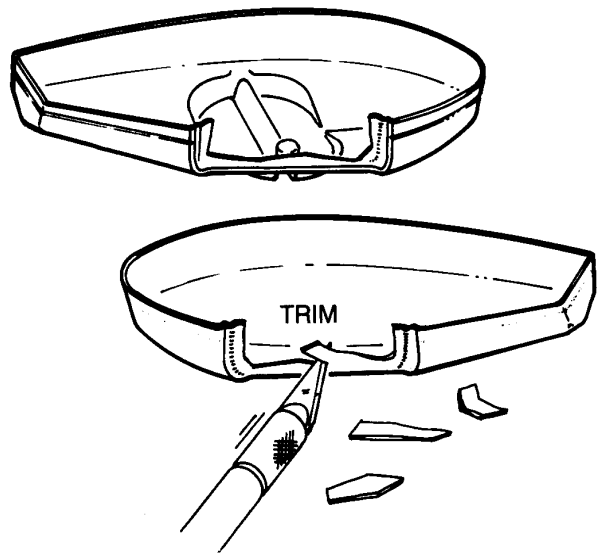


IX. WHEEL PANT ASSEMBLY (8 Steps)

1. Remove any burrs and unevenness by lightly sanding the edge of the pant halves. Use FINE sandpaper.

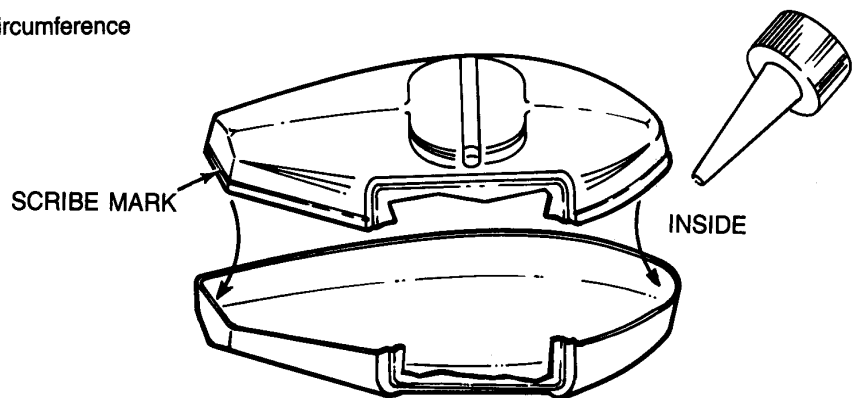


2. Rough-cut the wheel opening on both halves. Don't get too carried away at this point, you will fine trim them after assembly.

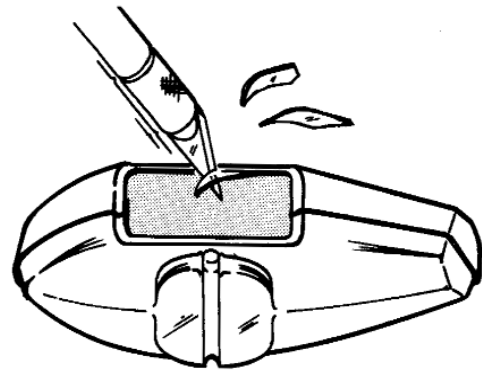


3. ☐ Fit the pant half, with the side slot, INSIDE of the other half to the scribe line.

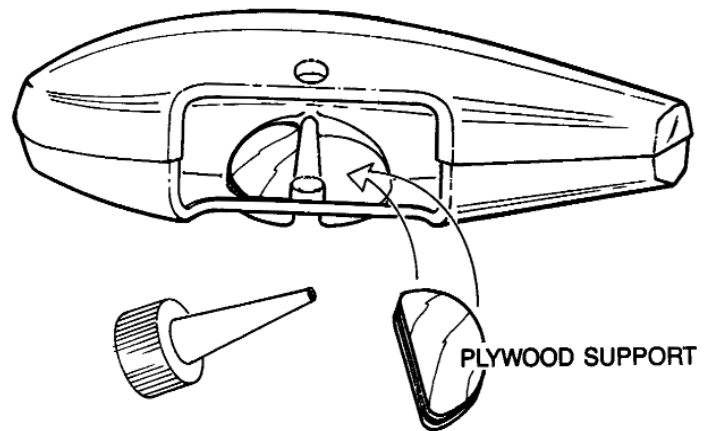
- ☐ Run a bead of glue around the entire circumference of the seam.



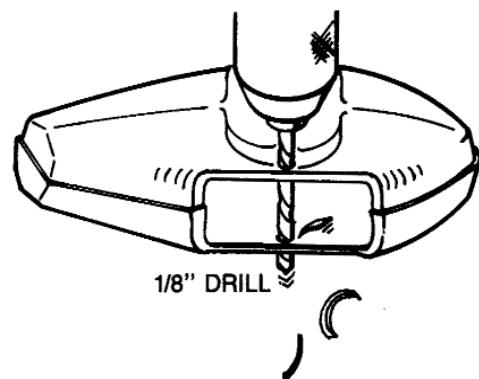
4. ☐ Trim the wheel opening to the scribe mark. Be careful not to take too deep of a cut at one time. The plastic does not have the same characteristics as the balsa that you've been working with.



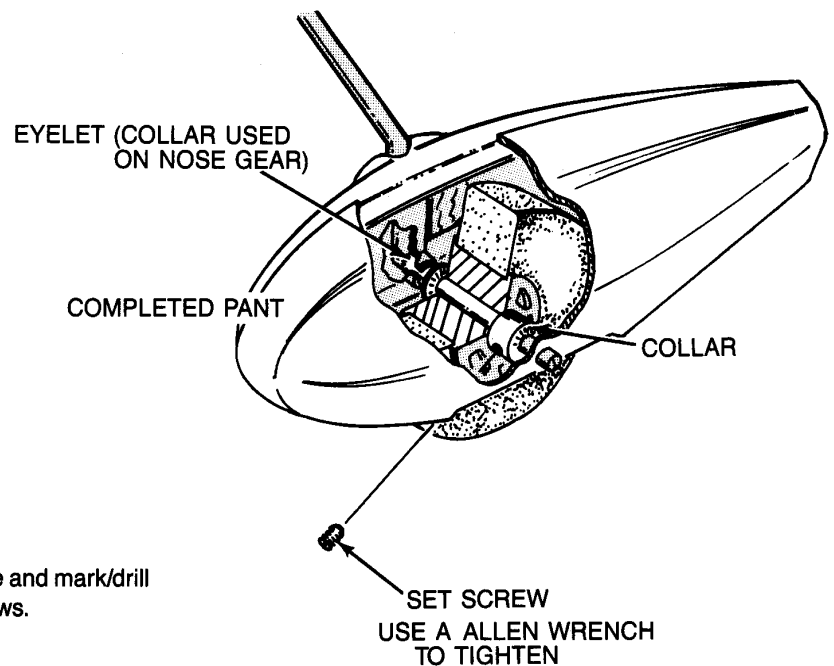
5. ☐ Glue the two D.C. PLY supports onto the flat on each side of the side slot.



6. ☐ Drill an 1/8" hole completely through the pant at the formed indentation.

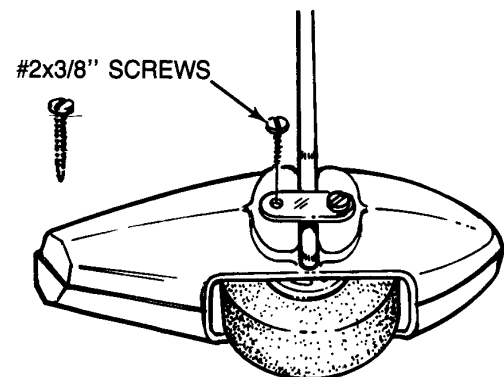


7. ☐ With the eyelet, wheel and collar inside the completed wheel pant, slide the axle through all and seat the wire into the side slot. NOTE: For the nose gear strut use another collar in place of the eyelet.



- ☐ Position the nylon strap over the wire and mark/drill hole for the #2 X 3/8" mounting screws.

- ☐ Center the wheel in the opening and tighten the collar set-screw. (Two collars for the nose wheel.)



8. ☐ Go back to step #1 and repeat the sequence for the wheel pant(s).

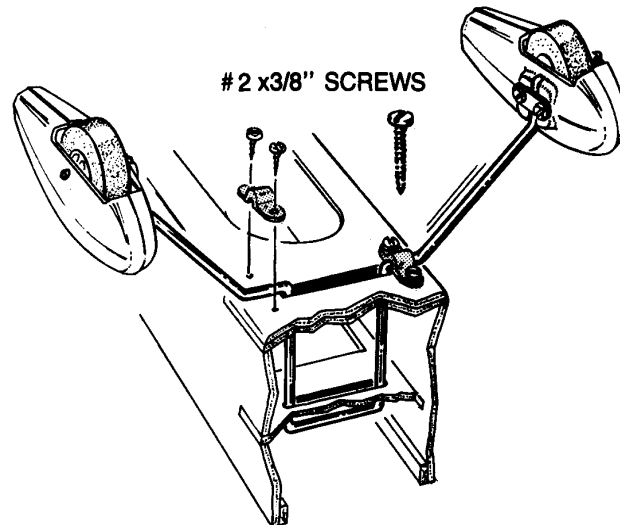
ROUGH FIELD CONDITIONS MAY CAUSE DAMAGE TO THE WHEEL PANTS.

THIS COMPLETES THE WHEEL PANTS. THEY CAN BE USED AS IS, OR THE SEAMS CAN BE FILLED, SANDED AND PAINTED FOR A MORE FINISHED LOOK.

X. ATTACHING THE LANDING GEAR TO THE FUSELAGE

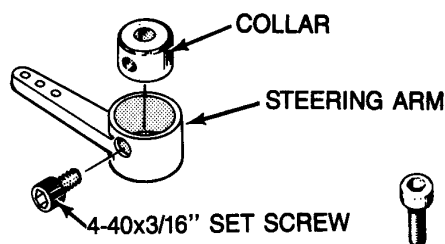
MAIN GEAR

1. ☐ Slide the "U"-shaped portion of the landing gear wire into the slot in the bottom of the fuselage. Continue sliding the wire down through the slot in the platform, and seat the bendouts against the fuselage bottom.
2. ☐ Position the two nylon "U"-BRACKETS around the wire and against the bottom. Mark/drill/install the #2 x 3/8" mounting screws.



NOSE GEAR

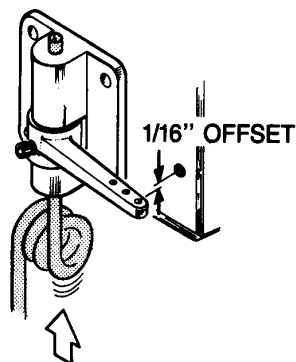
1. ☐ Install the collar in the steering arm, and thread the set screw into the collar half-way.



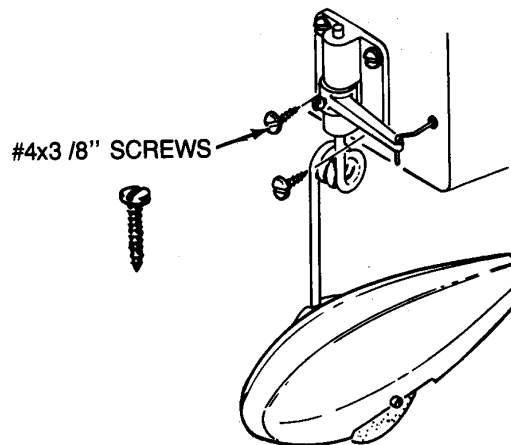
2. ☐ Slide the strut through the bearing and steering arm.

Note: Be sure that the opening for the steering arm is toward the spring coil, and that the coil extends to the back.

3. ☐ Position the nylon nose gear bearing assembly on the firewall. Position the steering arm slightly below the push rod exit tube. Position the arm slightly forward and tighten the set screw.



4. ☐ Mark/drill/install the bearing to the firewall using 4 - #4 x 3/8" screws.
- ☐ Remove the four #4 x 3/8" screws and place a drop of CA glue into each hole.
- ☐ Reinstall the steering bearing to the firewall.



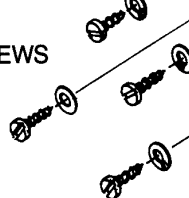
XI. MOTOR MOUNT, COWL AND SPINNER ATTACHMENT

1. ☐ Fit the motor mount into the locating slots in the firewall.

Note: Make sure that the 4-40 mounting nuts are on the bottom.

- ☐ Use 4-#4 x 3/8" screws and #4 washers to secure the motor mount permanently to the firewall.
- ☐ Remove the four #4 x 3/8" screws and place a drop of CA glue into each hole.
- ☐ Reinstall the motor mount to the firewall.

#4x3/8" SCREWS



#4 WASHERS



2. ☐ Position the engine and bolt onto motor mount using (4) 4-40 x 1/2" socket head bolts.

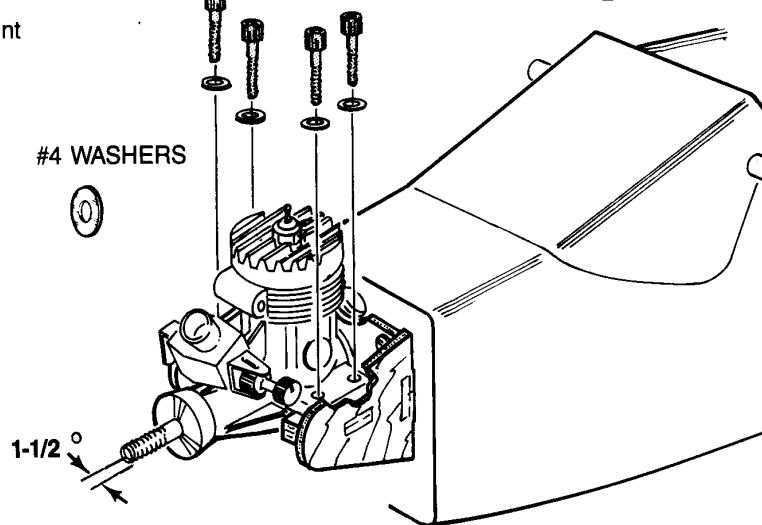
4-40x1/2" SOCKET HEADS



#4 WASHERS



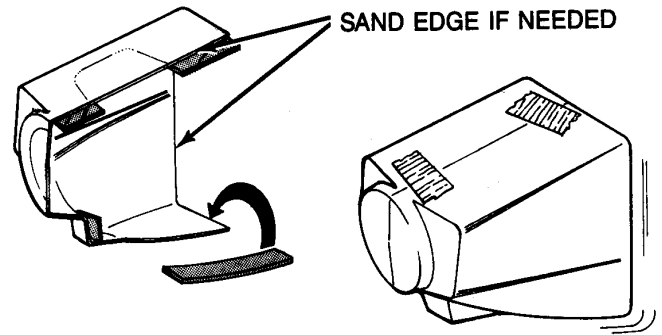
1-1/2"



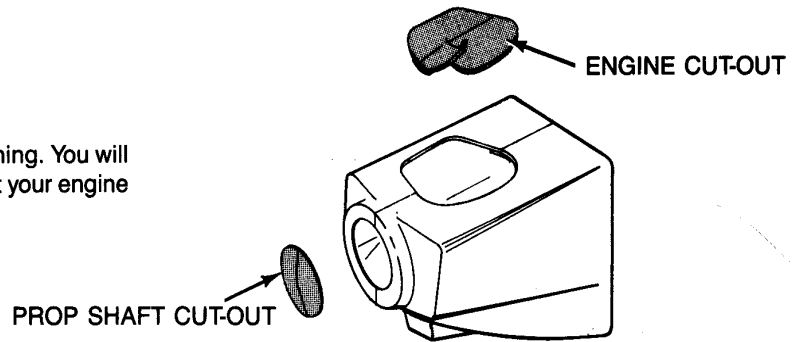
3. ☐ Trim the cowl halves to the scribe line all around.

☐ Glue the 1/2" plastic seam strip onto one of the cowl halves (COWL "A"), lapping the cowl 1/4".

☐ Tape the remaining half (COWL "B") onto "A" and glue together at the seam strip. Use Model Mate to fill any gaps.



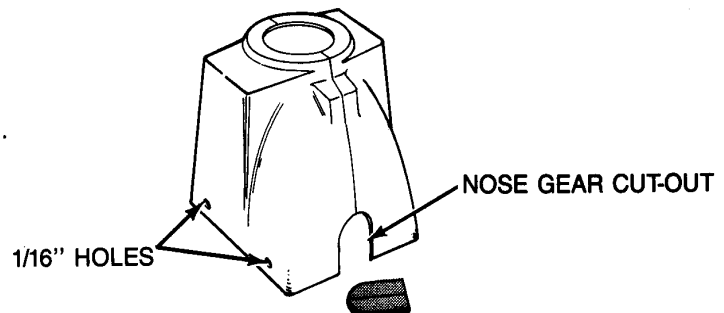
☐ Cut out the engine top clearance opening. You will probably need to enlarge this to custom fit your engine as you proceed.



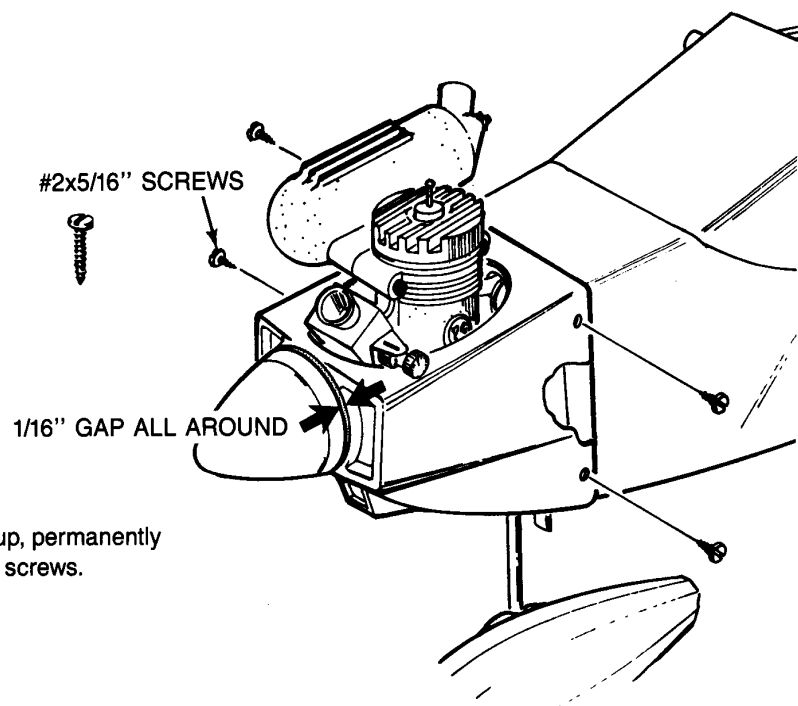
☐ Cut out the nose strut clearance slot.

☐ Drill (4) 1/16" holes. See plan for location.

☐ Place the cowl over the engine.



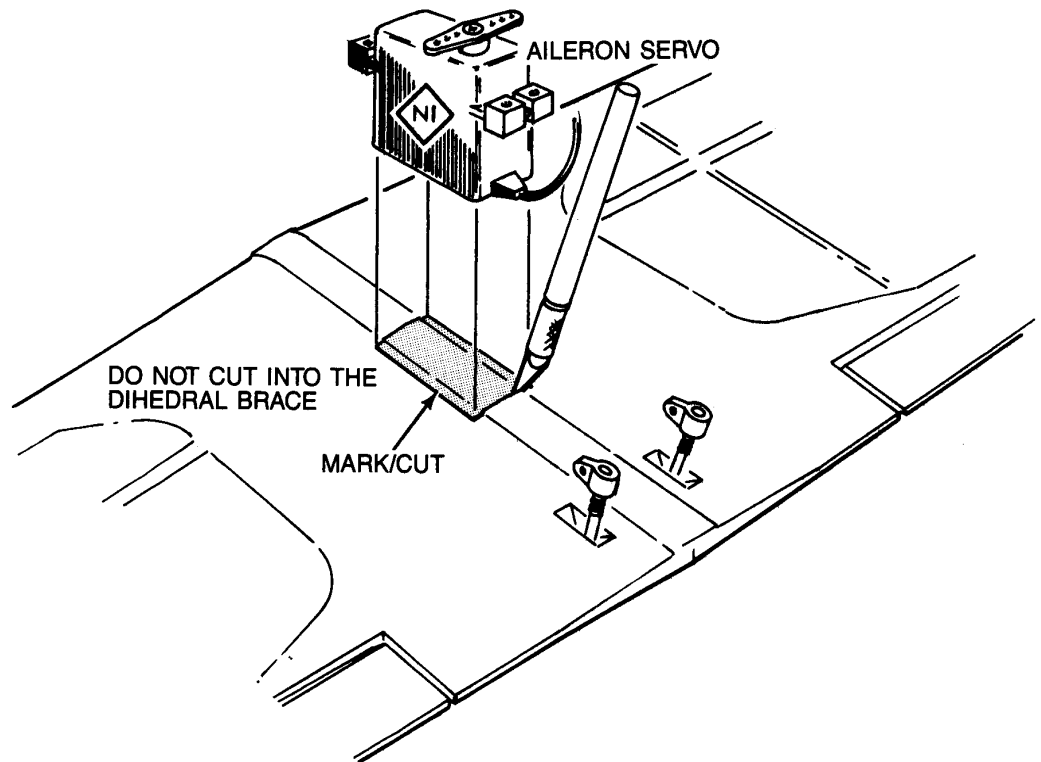
4. ☐ Install the spinner.



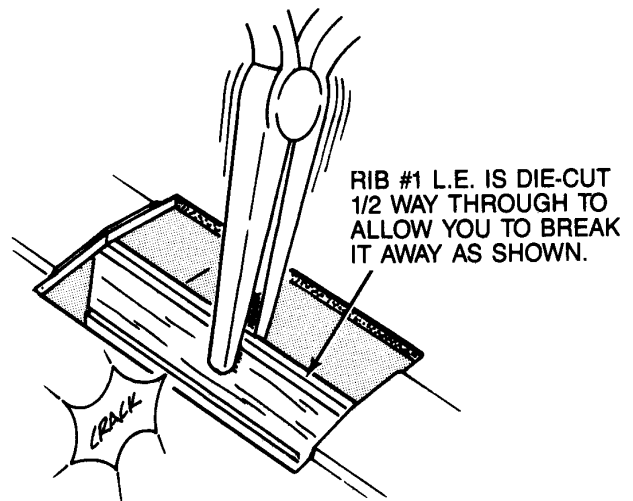
5. ☐ When you are satisfied with the fit-up, permanently attach the cowl using 4 - #2 x 5/16" screws.

XII. AILERON SERVO MOUNT

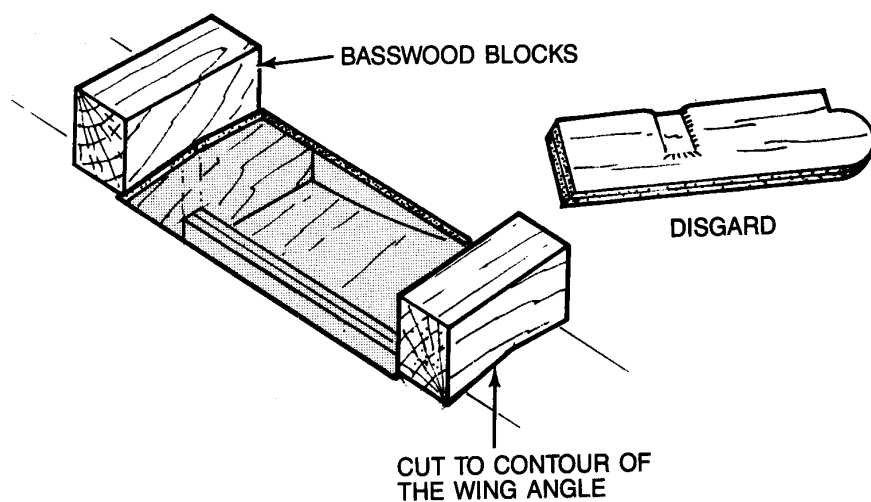
1. ☐ Mark your servo outline on the bottom of the wing at the centerline. Make sure that the outline does NOT interfere with the spar. (SEE PLAN)



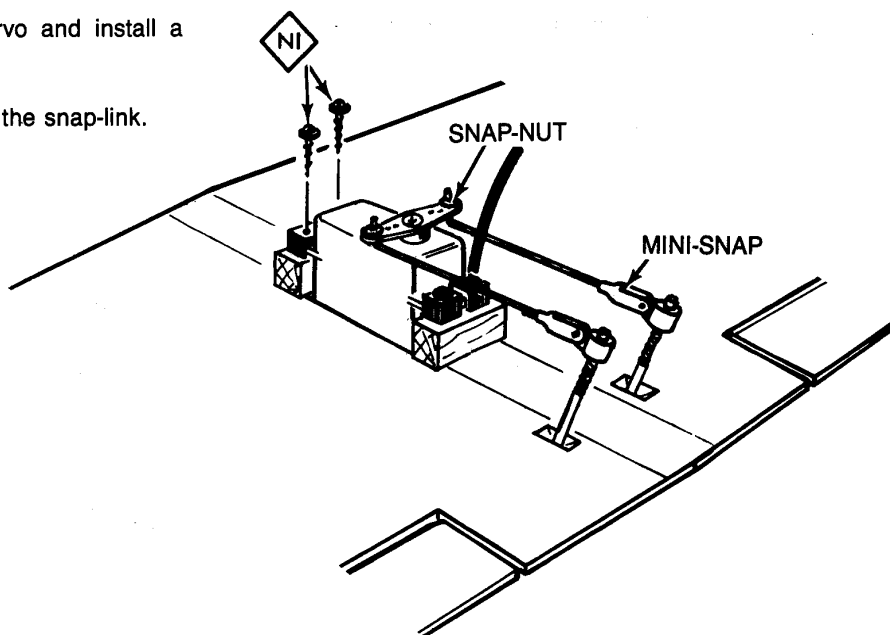
- ☐ Cut out the servo outline and break away the portion of rib #1 to allow the servo to fit down into the wing.



2. ☐ Fit the two basswood blocks to the dihedral angle of the wing at both ends of the servo cut-out, and glue them to the wing.



3. ☐ Mount your servo to the blocks.
- ☐ Connect the mini-snaps to the horn brackets and clamp the ailerons into the plane of the wing.
- ☐ With the servo at neutral trim, mark/bend 90 degrees the pushrods in line with the holes in the servo arm.
- ☐ Attach the pushrod to the servo and install a snap-nut.
- ☐ Make any fine adjustment with the snap-link.



THAT'S IT ...
... NOW GO TO BOOK #2
AND SEE HOW TO
INSTALL THE RADIO &
BALANCE YOUR FREEDOM.