

# CHEROKEE 40

## INSTRUCTION BOOK



### The Choice is Yours!

Having performed the final checkout and engine run-up, I taxied out on the runway and slowly advanced the throttle. By the time I had full throttle, the Cherokee was light on its wheels. A touch of right rudder was needed to counter the torque of the engine. Gathering a few more knots, I eased back on the stick and the Cherokee majestically headed toward the heavens, hardly noticing the 5 knot crosswind. A little less rudder as we gathered more speed, and down elevator to bring the Cherokee to cruise speed and straight and level simultaneously. "Take off complete."

It's not often that a model airplane is scale, easy to build and easier to fly, but your new Cherokee fits into this category. We know you'll be happy with it.

Building the Cherokee will be an easy task if you will familiarize yourself with the parts and construction sequence *before* getting started. Follow our instructions exactly, and your chances of producing a light, strong and true Cherokee are very good.

We offer you a variety of choices that you should consider before you start building. With your imagination and a little help from us, you choose how your model will look when it is finished.

One choice is the optional, scale-like Flaps. All parts needed for building the Flaps are included as well as building and flying in-

structions. Install and use the Flaps, install them but don't use them until later or use ailerons only with no Flaps. You decide!

Fairings can be added to the wing leading edge for a more scale-like appearance for another choice. Materials for this addition are not included but can be found in your scrap materials or at your hobby shop.

You can also choose to purchase an optional wheel pants set and instructions for assembly from your local dealer (Great Planes Part #WPSM2). Optional Strut Covers (Robart #SGST2) are available through your dealer also. It's up to you.

Choose to build your kit into a "Cherokee," modeled after the 1975 "C" version. (The C model has 2 side windows as shown on the plan.) Or choose to build the "Cherokee Archer" version, a newer aircraft. Just add another window and use the "Archer" decal as shown on the plan.

Scale information can be found at any Piper aircraft dealer. Or use your imagination and make your model look like any of the various Cherokee versions found at most local airports. You may even want to combine parts of different airplane's trim schemes to create your own "custom trim scheme." After all the Cherokee is designed to be fun ... and scale-like!

Engine/Size	.35-.452 cycle
Wing Span	60"
Wing Area	630 sq.in.
Length	46"
Weight	5-1/2 to 6-1/2 lbs.

### Materials Needed to Complete the Cherokee:

4 or 5 Channel Radio	Propeller	Covering/Paint
Engine	Wheels	Instant Glue
Fiberglass Cloth/Resin	Fuel Tank	Epoxy
Engine Mounting Bolts	Spinner	White Glue
	Hand Tools	



## Preparing the work surface

To build the Cherokee, you will need a flat surface a minimum of 12 x 48 inches. Because your model will be no straighter than this surface, it is critical that it is truly flat.

The surface of the work area should be flat and be of a material that you can push pins into such as fomecore or Firtex. When the surface is ready, use a straight edge to check fore and aft, side to side and diagonally for warps. Shim your board until it is exact.

## Choosing Adhesives

The prototype Cherokee was built with a variety of adhesives — thin cyanoacrylate (CA), thick CA, and epoxy. The primary glue used was a thin CA such as Hot Stuff, Jet or Zap. These glues are used primarily because they penetrate and bond extremely well, with very little weight added to the airplane. They also allow very fast construction. Thin CA's work best where you are bonding balsa to balsa, and there is a tight fit. If there is a slight gap, or hardwood is involved, the thicker CA such as Super Jet, Zap A Gap, or Super T should be used. These glues are also useful for applying wing sheeting to the wings.

Many modelers prefer slower drying aliphatic resins because it allows them more time to correct potential mistakes. Epoxies are suggested for high stress applications such as joining wing panels, firewall installation, and landing gear mounting.

Glues are very much a matter of personal preference. If you have questions about glues, see your local dealer. He will be able to advise you as to different products available and more techniques.

Warning: Cyanoacrylate glues, epoxies, paints, thinners, etc. give off fumes that may be harmful to your health. Observe manufacturers warnings on labels and always make sure you have adequate ventilation in your shop.

## Choosing the right radio system

The Cherokee was designed for use with any of today's modern 4 or more channel R/C systems with standard size servos. We also recommend use of a standard 450-500 mil battery pack - don't use a 225 or 250 mil pack to save weight unless you constantly monitor battery consumption. A transmitter with reversing switches will simplify installation of the radio system ... but don't forget to check and re-check control direction every time you fly! You will need a transmitter on an "aircraft only" frequency as determined by the Academy of Model Aeronautics. (See "Join the AMA" for more information.)

## Choosing an Engine

The Cherokee will perform well with a wide variety of engines, .35-.45 two cycles or .40-.60 four cycles. We will cover engine installation of a 2 cycle .40, because that is the most popular approach due to it's high power-to-weight ratio and ease of operation.

Because the Cherokee looks best flying at medium speeds, hi-output engines are not necessary. Non-Schneurle ported .40's, when operating correctly, produce plenty of power to make the Cherokee fly comfortably. With an engine like the K&B 40, the

Cherokee flies at scale-like speeds and is capable of mild aerobatics like loops, rolls, etc.

For very docile performance, a .35 will fly the Cherokee but reserve power is marginal and the Cherokee may have difficulty taking off if the field is particularly rough or grass too long.

A high power, Schneurle ported .40 or .45 will provide ample reserve power and will probably result in flying at 1/2-3/4 throttle in straight and level for scale appeal. However, the philosophy of "too much is better than too little" is hard to argue with when it comes to engine selection. If you do choose a high power engine, don't worry about making the Cherokee difficult to fly. The symmetrical airfoil we've chosen won't change trim as speeds increase. With Schneurle engines, the Cherokee will be fully aerobatic, capable of non-scale maneuvers like Figure "M"s, Cuban Eights, Square loops and more.

Don't forget that you will dramatically influence the performance of your Cherokee, regardless of the size or power output, by your choice of propellers. This is true of all models.

## Selecting a propeller

You can change the speed, acceleration and deceleration of your airplane by your choice of propellers, much like picking the gears in a manual transmission car. We suggest consulting your engines directions for the most accurate information, but if your instructions are misplaced, use this as a guideline. There are a wide variety of props manufactured in both wood and nylon.

		.40 Standard .40:45 Schneurle		
	4-cycles	.35 2 cycle	2 cycle	2 cycle
Break-In	See	9x5, 9x6	9x6, 9x7	9x7, 10x4
General Flying	Instruc-	9x6, 10x4	10x5, 10x6	10x6
Slow Flying	tions	Not recom-	11x4	11x5, 11x6
		mended		

Whatever you choose, don't forget to balance your prop! You can obtain a balancer at your hobby shop to check the balance of the prop you select. If the prop does not balance, sand the heavy blade on the front (the side with lettering) near the tip, until it balances correctly. This reduces vibration in your airplane, important for keeping your radio operating correctly.

## Important tip about prop selection

If your engine isn't running properly, it could be from a wide variety of problems like bad fuel, dirt in carb., bad plug, loose screws, wrong needle valve setting, worn out engine, etc. One often overlooked problem is *too large a prop!* While the engine will run with too large a prop, it may be difficult to adjust, overheat, and die unexpectedly. These can all be symptoms of too much load on the engine. The answer: Put on a prop 1 inch smaller in diameter or 1 inch less pitch. This will let the engine rev-up more. Most 2 cycle engines are happiest if they run at no less than 12,000 rpm. If you have troubles running your engine, try to borrow a tachometer to take a reading. If it says less than 12,000, you either have too much prop or something is wrong with your engine.

### Selecting covering

As with adhesives, covering selection is largely a matter of personal preference. The proto-types were covered with Monokote, as this is a light, fast and attractive method.

### Covering techniques

If you are unfamiliar with Monokote techniques, we suggest purchasing the Edson Mfg. "How to apply plastic film coverings" book written by Dan Deluca. It is very informative and gives a lot of hints on how to achieve professional results.

### Trim scheme

The model shown on the cover was finished with white and red Super Monokote. The wing was first covered completely in white. Then the stab and fin were covered white. White was then added to the side and bottom of Fuselage in 3 pieces. Trim line is as shown.

Next the top was covered in red, overlapping the white on the sides. Start by trimming the 1/4" fin cut out and tack red around fin. Then extend forward to canopy and down around sides. Using a straight edge, trim red on sides to match model on cover.

The cowl was painted with K & B superpoxy white, or it can be left plain. The top was painted with matching chevron red.

Black trim on the fuse was cut from trim Monokote, and the white center stripe was added with Great Planes Kwik Stripe 1/8" white.

The darts on the fins were cut from trim monokote. Wheel pants were painted the same as the cowl. Stripes on wing tips were cut from Trim Monokote.

Walkway on wing and numbers were cut from Black Trim Monokote.

Door was added with 1/16" black Kwik Strype tape.

(Use Trim Monokote-Black for 3rd Window for "Archer" version.)

### Join the AMA!

The Academy of Model Aeronautics is the governing body for model aviators. With over 85,000 members, they offer services such as a monthly magazine, liability insurance, sanctioned competitions and have over 1,800 affiliated clubs scattered throughout the United States. Write them for information on how to become a member.

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

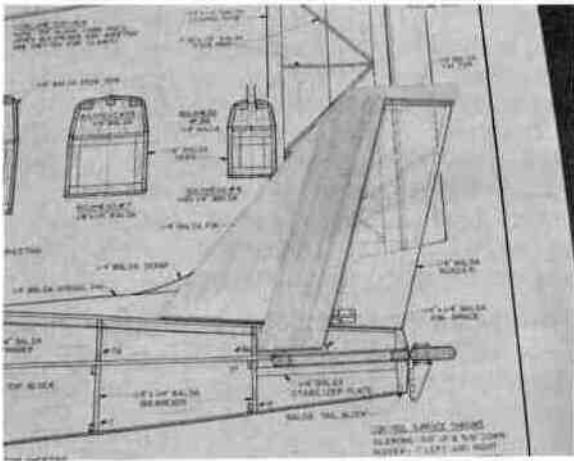
### We'd like to hear from you!

We really enjoy getting feedback from modelers that use our products. Comments, both pro and con, help us in our continuing efforts to improve our products. That means your next G.P. kit might be better because of your response.

Thanks for your patronage.  
Good luck and good flying!

Great Planes Model Manufacturing Company  
P.O. Box 721  
Urbana, IL 61801





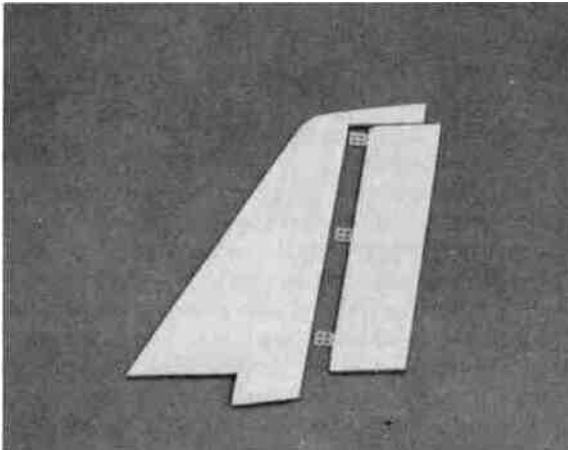
## TAIL SECTION

### 1. D GLUE THE BALSA 1/4" FIN FRONT TO THE 1/4" FIN REAR

Place waxed paper over the plans so you don't glue the parts to the plans. Use CA (cyanoacrylate) glue or white glue. If you use white glue, hinge the parts with masking tape, open the hinge, apply the glue, close the hinge, wipe off the excess glue that squeezes from the joint, and pin the parts to a flat work surface with the tape side up. Let the parts dry. Remove the tape and sand the glue joint.

### 2. D GLUE THE 1/4" FIN TOP TO THE FIN; FINAL SAND

Use white glue or CA and glue the Fin Top to the Fin. When the parts are dry, sand the Fin to the shape shown on the plans. Round the Fin front from the Dorsal Fin location upward. Round the Fin Top also. Leave the Fin bottom and the Fin trailing edge as is; do not round.

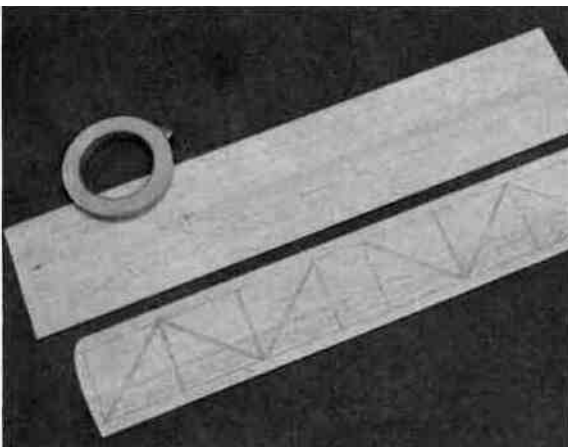


### 3. D MARK AND CUT HINGE SLOTS IN THE RUDDER AND FIN

Draw centerlines down the length of the Fin trailing edge and the Rudder leading edge. Cut the hinge slots after marking their positions. There are some great hinge slotting tools available in your hobby shop for this job. Trial fit the hinges by hinging the Rudder to the Fin. Remove the Rudder and sand the leading edge of the Rudder to a "V" as shown on the plan.

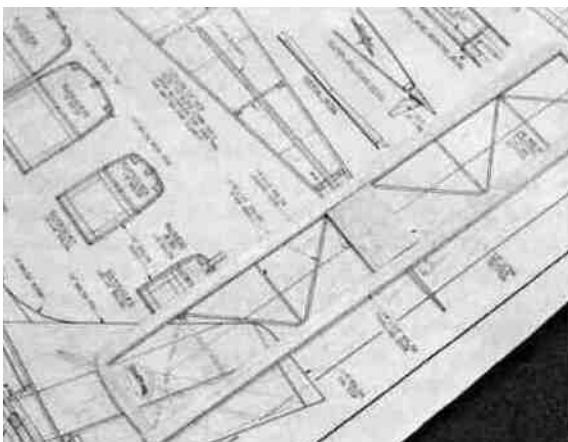
### 4. D PREPARE THE TOP AND BOTTOM STABILIZER SHEETING

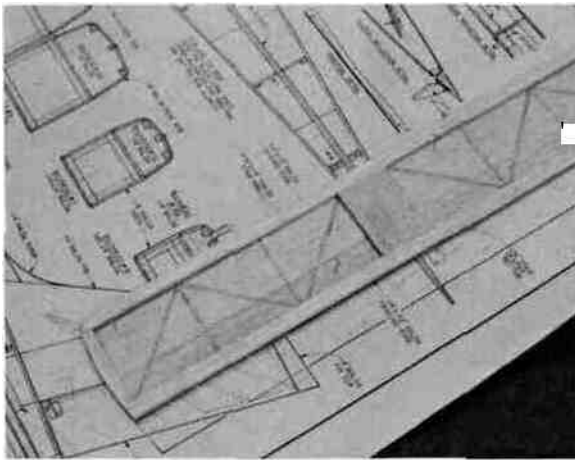
Glue two pieces of 1/16" x 2-5/8" x 24" balsa together with CA or white glue. Glue the other two pieces of sheeting this size together. If you use white glue, use the masking tape hinge method described above. When the glue is dry, sand the glue joints. Trim the sheeting to shape using a hobby knife and a straight edge. Now mark the Leading Edge, Trailing Edge, Tip piece, Center Section and Rib stick locations on one piece of sheeting. This now become the Bottom Sheeting.



### 5. D PREPARE AND TRIAL FIT THE STABILIZER PIECES TO THE BOTTOM SHEETING

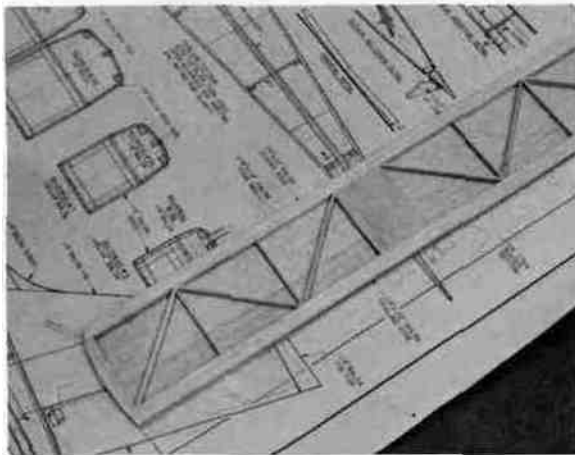
Cut the Leading Edge piece, the Trailing Edge piece and the Tip pieces from 1/4" x 1/2" x 29-3/4" Balsa stock provided. Trial fit these pieces and the 1/4" Center Section to the Bottom Sheeting.





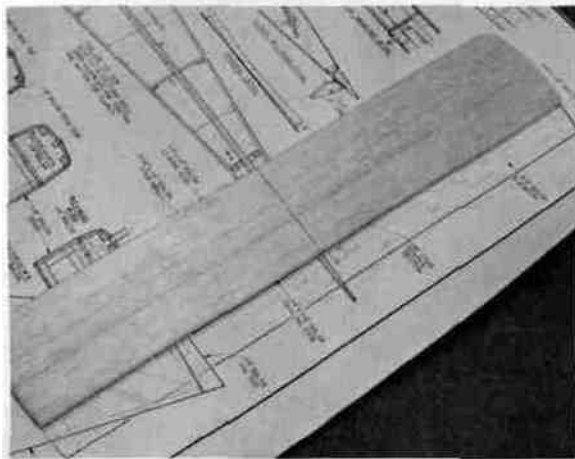
6. D GLUE THE CENTER SECTION AND THE 1/4" x 1/2" BALSA PIECES TO THE BOTTOM SHEETING

Pin the Balsa Bottom Sheeting over the plan on a flat surface. Glue the 1/4" Balsa Center Section piece to the Bottom Sheeting. Now glue in the Tip pieces, the Leading Edge and the Trailing Edge piece.



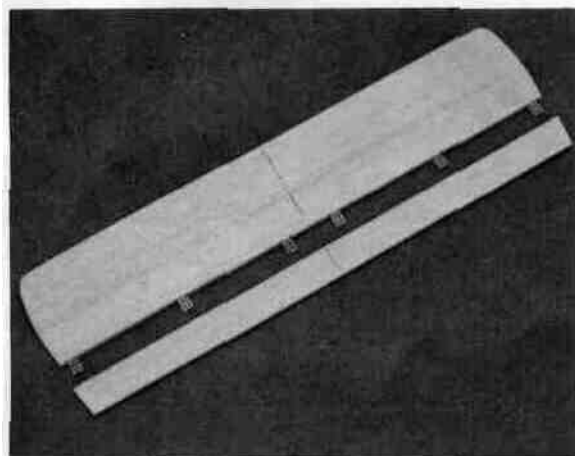
7. D GLUE STABILIZER RIBS TO THE BOTTOM SHEETING AND STAB PARTS

Custom cut the Stabilizer Ribs from 3/32" x 1/4" x 36" stock. Glue the Ribs on edge to the Bottom Sheeting and the 1/4" parts. When the glue is dry, sand the top surface of the parts slightly with a sanding block or T-Bar so the Top Sheeting will mate correctly.



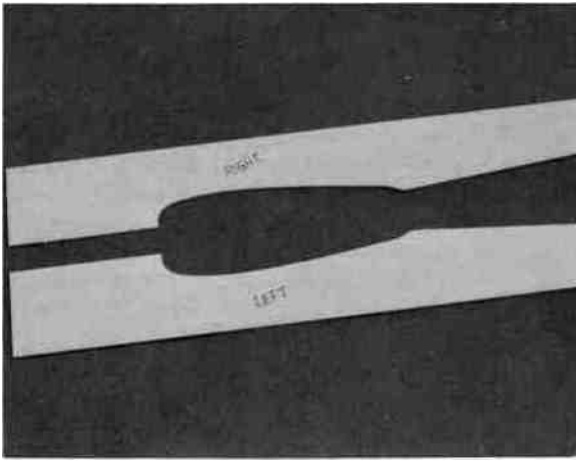
8. D GLUE THE TOP SHEETING TO THE STABILIZER: FINAL SAND

Glue the 1/16" Balsa Sheeting to the top of the Stabilizer. Make sure you glue the sheeting to all the Stabilizer parts. A slow cure epoxy is recommended. Place some weight on the sheeting to hold it in place so you build a straight, flat Stabilizer. When the epoxy is dry, sand the edges of the sheeting smooth and even with the rest of the Stab. Draw a centerline from the Leading Edge to Trailing Edge. You will use this line to align (line up) the Stabilizer to the Fuselage later. Also sand the Stabilizer Leading Edge and Tips to the Rounded shape shown on the plans. The Trailing Edge is square; do not round.



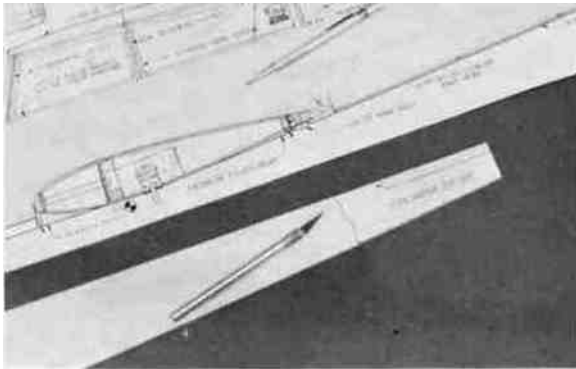
9. D MARK AND CUT THE HINGE SLOTS IN THE STABILIZER AND ELEVATOR

Draw centerlines down the Stabilizer Trailing Edge and the Elevator Leading Edge. Cut the hinge slots. Trial fit the hinges. Final sand the Elevators while they are temporarily hinged to the Stabilizer. Sand the Elevator Tips to the Stab contour. Round the Elevator Tips and Trailing Edge as you did with the Stabilizer Leading Edge. Remove the hinges and sand the Elevator Leading Edge to a "V".



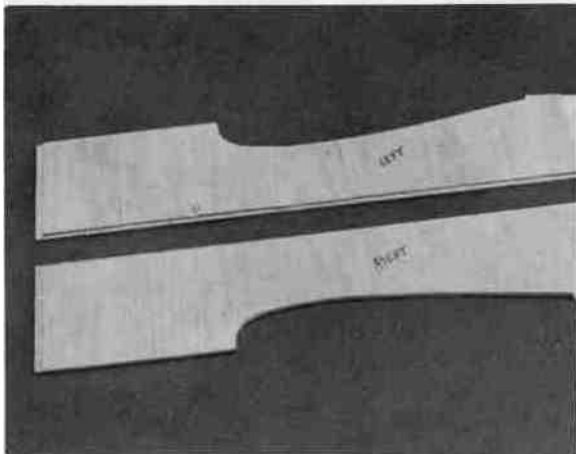
## FUSELAGE

1. D MARK THE INSIDE OF ONE FUSELAGE SIDE "RIGHT" AND THE INSIDE OF THE OTHER FUSELAGE SIDE "LEFT"



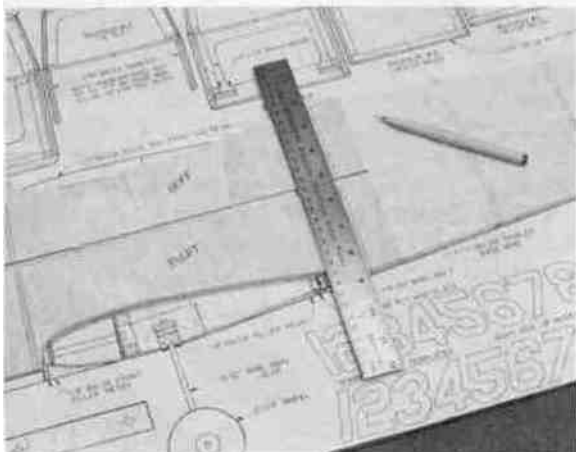
2. D RELIEVE (CUT OUT) THE REAR PART OF THE WING SADDLE AND THE STAB SADDLE TO MATCH THE PLAN

Use and X-Acto knife or similar tool to cut out the balsa wood on both Fuselage Sides. Make all cuts accurate as these areas partially determine Wing and Stabilizer placement.



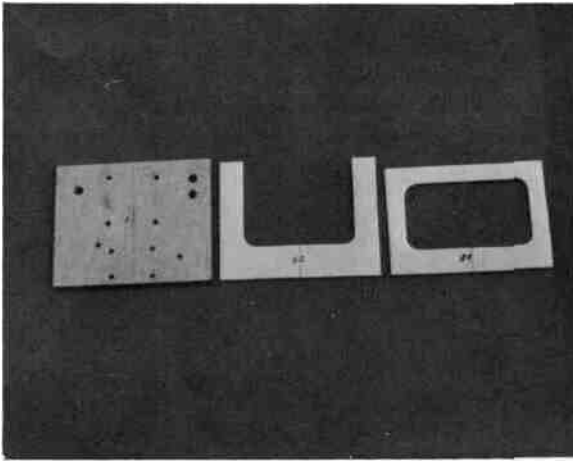
3. D GLUE 3/32" BALSA DOUBLERS TO THE INSIDES OF BOTH FUSELAGE SIDES

Draw a line 1/8" below the top of each Fuselage Side (inside) as the Doubler stops here to allow room for Cabin Base. Cut and glue 3/32" Balsa Doubler stock, vertical grain, to the inside of each Fuselage Side up to the lines you drew. Use the Balsa 3/32" x 2-5/8" x 30" stock for the Doublers. Also the Doubler starts 1/4" back from the front of the Fuselage Side to leave room for the Firewall (Bulkhead #1). Trim and sand the Doubler even with the Fuselage Side at the bottom. **MAKE SURE YOU MAKE RIGHT AND LEFT SIDES!**



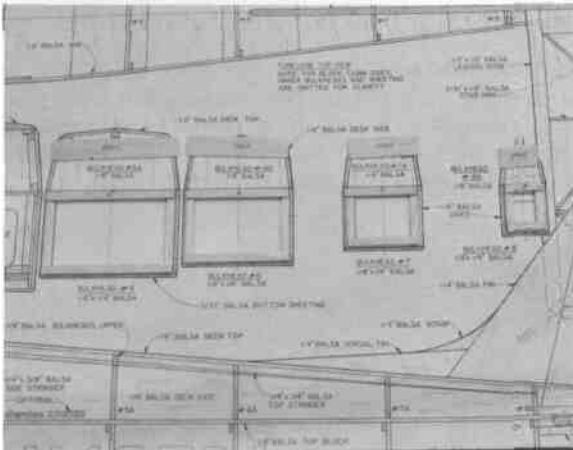
4. D MARK BULKHEAD POSITIONS ON THE INSIDES OF BOTH FUSELAGE SIDES

Mark the positions of Bulkheads #2,4,5,6,7 and 8 on the inside of the Right Fuselage Side (extend the lines on the plan so you can see where to make the marks when you lay the Right Fuselage Side over the plan). Lay the Left Fuselage Side next to the Right Fuselage Side and extend the lines onto the Left Fuselage Side.



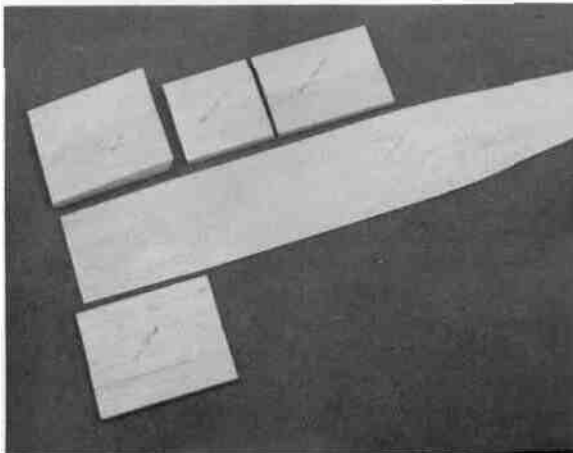
#### 5. D PREPARE BULKHEADS #1,2 and 4

Draw centerlines down each Bulkhead, front and rear. Mark and drill holes in Bulkhead #1, the Firewall, for engine mount, fuel lines, steering and throttle linkage and nosegear bearing. Install the 6-32 Blind Nuts for the motor mount screws and the 4-40 Blind Nuts for the nosegear bearing screws.



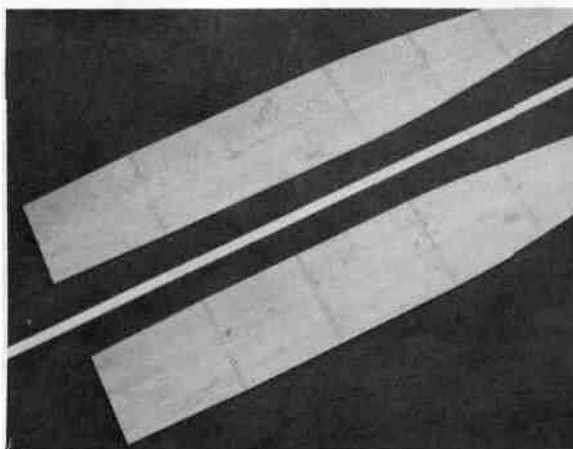
#### 6. D PREPARE REAR BULKHEADS #5,6, 7 AND 8

Make Bulkheads #5,6,7 and 8 from 18" x 1/4" x 36" Balsa Stock provided. Build the Bulkheads over the plans. Build accurately as these Bulkheads determine the shape of the rear of the Fuselage. Also make pushrod braces from 3/32" Doubler stock or scrap. The widths of the braces are the same as the Bulkheads. These braces will be installed when the pushrod housings are added.



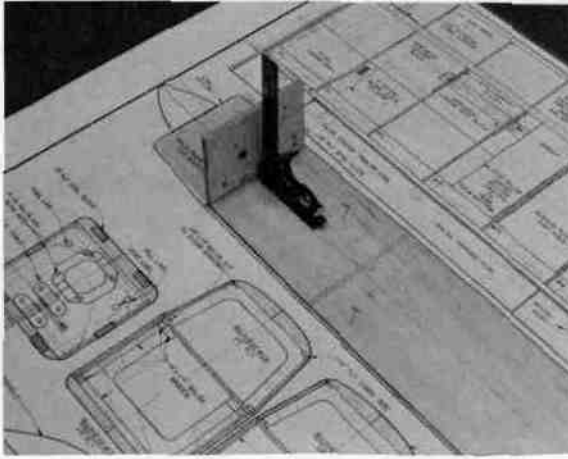
#### 7. D GLUE THE TWO PARTS TOGETHER

The two piece Balsa parts are the 1/8" Cabin Base, the 1/2" Rear Cabin Top, the 1/2" front Cabin Top, the Cowl Top Block and the 3/8" Tank Bottom Block. Glue these pieces using the white glue/tape method described earlier. Sand the pieces if necessary at the glue joint after the glue is dry.



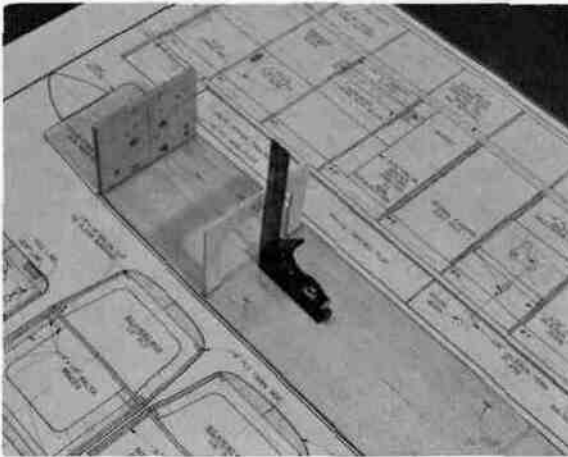
#### 8. D MARK ALL BULKHEAD POSITIONS ON THE TOP AND BOTTOM OF THE CABIN BASE

Draw a centerline down the 1/8" Cabin Base. Mark all Bulkhead positions (#2, 4, 5, 6, 7 and 8) on the Cabin Base. This is now the bottom of the Cabin Base. Now turn the Cabin Base over and mark the upper Bulkhead positions (#2A, 3A, 4A, 5A, 6A, 7A and 8A). This is now the top of the Cabin Base. Note that the Cabin Base butts to the Firewall.



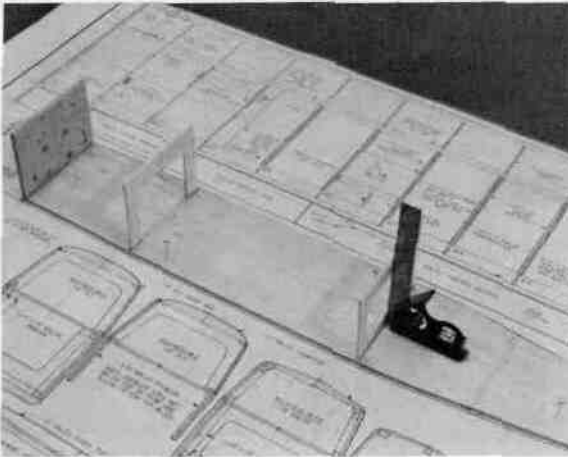
#### 9. D GLUE THE FIREWALL TO THE CABIN BASE

Pin the 1/8" Balsa Cabin Base upside down on the waxed paper covered plans on a flat work surface. Make sure the Cabin Base is securely fastened over the top view of the Fuselage on the plan for the next series of steps to insure a straight fuselage. Check to see that the bottom of the Cabin Base is facing up. Now, using epoxy, glue the 1/4" Plywood Bulkhead #1, the Firewall, at 90 degrees to the Cabin Base. (Remember the Cabin Base butts to the Firewall.) Use a square or right triangle to insure that the Firewall is 90 degrees to the Cabin Base. **GLUE THE BULKHEAD UPSIDE DOWN TO THE CABIN BASE.**



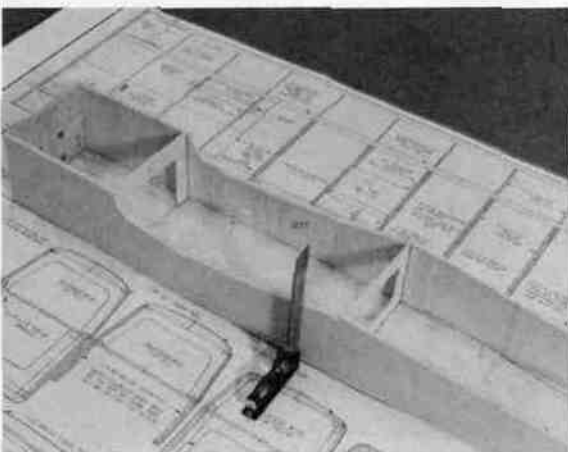
#### 10. D GLUE BULKHEAD #2 TO THE CABIN BASE

Use epoxy and glue the 1/8" Plywood Bulkhead #2 upside down and 90 degrees to the Cabin Base. Use your square or right triangle to check this. Center Bulkhead #2 over the Cabin Base to leave room for 3/32" Fuselage Doublor on the Fuselage Side.



#### 11. D GLUE BULKHEAD #4, 1/8" PLYWOOD, TO THE CABIN BASE •

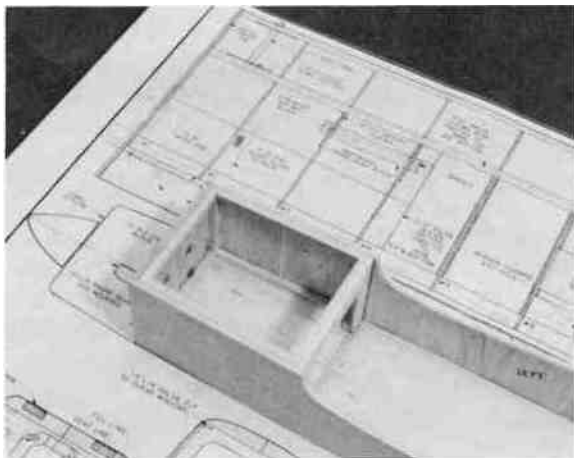
Use epoxy and glue Bulkhead #4 upside down and 90 degrees to the Cabin Base. Use a square or right triangle to check this. Center this Bulkhead also, leaving 3/32" on either side.



#### 12. D GLUE THE FUSELAGE SIDES TO THE BULKHEADS AND CABIN BASE FROM BULKHEAD #4 FORWARD

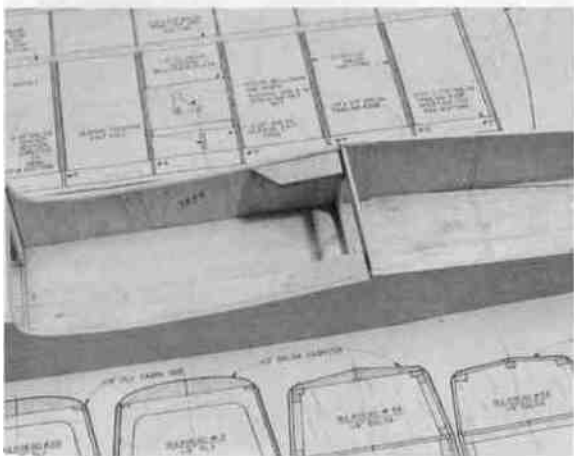
Use epoxy and glue the Fuselage Sides to the Cabin Base Assembly at Bulkheads #1, 2 and 4 and the Cabin Base. Use a right triangle to insure that the sides are 90 degrees to the work surface when they are glued on. Clamp or pin the Assembly in place until dry. **DO NOT GLUE THE FUSELAGE SIDES TO THE CABIN BASE BEHIND BULKHEAD #4 YET!**





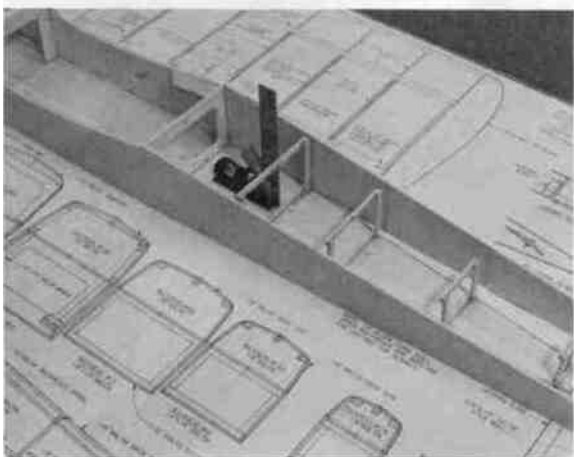
**13. D GLUE IN THE 1/4" x 1/4" Balsa BRACES BETWEEN BULKHEADS #1 AND #2**

Custom cut and glue in 1/4" square Balsa behind Bulkhead #1, in front of Bulkhead #2 and between Bulkheads #1 and 2, top and bottom.



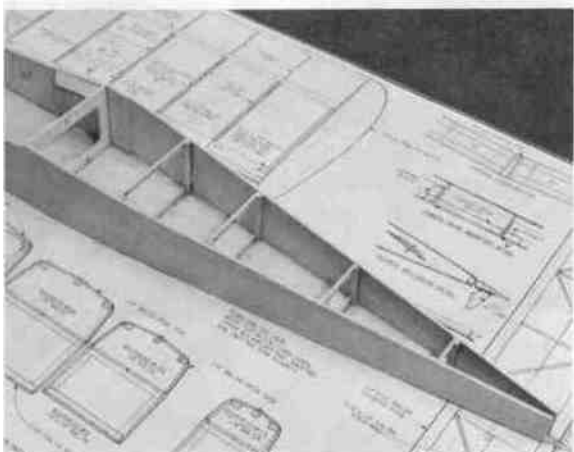
**14. D GLUE THE PLYWOOD REAR HOLD DOWNS TO THE FUSELAGE; ADD THE 1/4" SQUARE Balsa**

Glue the 1/4" Plywood Rear Hold Downs and 1/4" x 1/4" Balsa to the rear of the wing opening in the Fuselage. Use epoxy to glue in the Plywood Hold Down. Position the Hold Downs as shown on the plan. Glue the 1/4" square stock to the Hold Downs first, then glue in the Hold Downs.



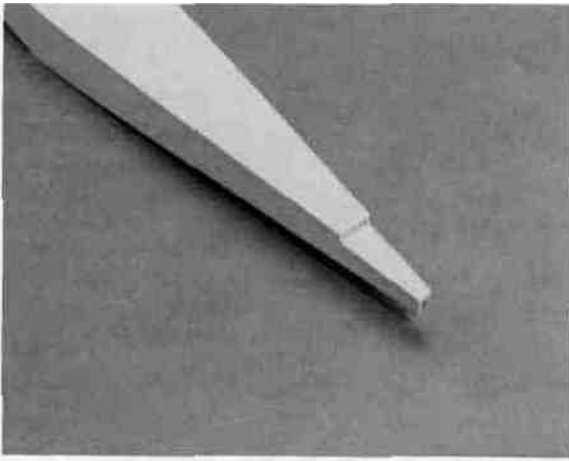
**15. D GLUE BULKHEADS #5,6,7 AND 8 TO THE CABIN BASE**

Position the Bulkheads on the lines you drew on the Cabin Base and at 90 degrees to the Cabin Base. Glue the Bulkheads in place. Slightly sand the Bulkhead sides so the Bulkheads will mate with the Fuselage Sides better.



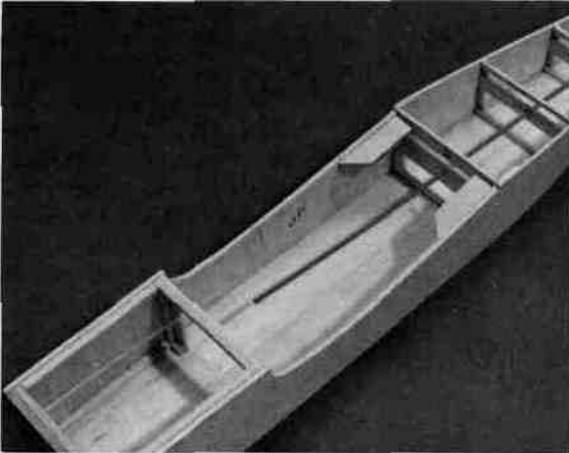
**16. D GLUE THE FUSELAGE SIDES TO BULKHEADS #5,6,7 AND 8 AND THE CABIN BASE**

When you glue, check to see that the Fuselage Sides are 90 degrees to the work surface. (The Cabin Base should still be pinned to the plan.) When the glue is dry, you may remove the Fuselage from the plan and work surface.



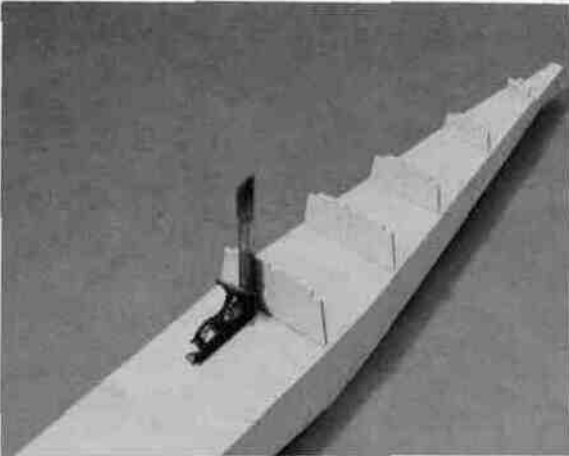
#### 17. D GLUE THE 1/4" Balsa STABILIZER PLATE TO THE FUSELAGE

The Stabilizer Plate glues to Bulkhead #8 and the Fuselage Sides. Glue this Plate in even and level with the top of the Stabilizer Saddle Cut Out in the Fuselage Side. This Plate will help support the Stabilizer which will have 0 degrees incidence when positioned correctly. (0 degrees incidence means that the Stabilizer is level and parallel to the ground when the Fuselage itself is level and parallel to the ground. Positive or negative incidence means the Stab leading edge is higher or lower than the Stab trailing edge when the Fuselage is level and parallel to the ground.)



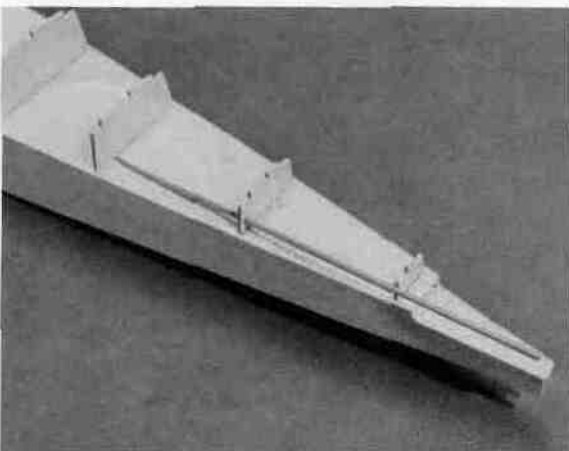
#### 18. D INSTALL PUSHROD OUTER HOUSINGS FOR ELEVATOR, THROTTLE AND STEERING LINKAGES

Wire in a tube style pushrods are provided for Elevator (and Rudder); wire in a tube type pushrods are provided for throttle and steering. Cut the exit hole at the rear of the Fuselage for elevator Pushrod Outer Housing. A brass tube that has the inside of one end sharpened with an X-Acto knife makes a great hand cutting tool for this. Install the Elevator Outer Tube and brace it at the various Bulkheads with the Braces you made earlier. CA glue works fine for gluing the tube to balsa wood. Install the Throttle and Steering tubes in a similar manner, gluing them to the Firewall and Bulkhead #2. (You will install Rudder Outer Tube later.)



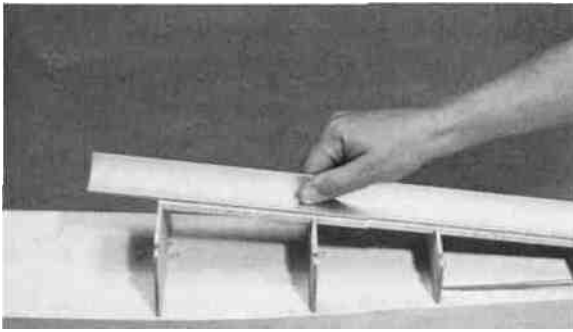
#### 19. D GLUE IN BULKHEADS 4A, 5A, 6A, 7A AND 8A

Glue these Bulkheads in the positions you marked on the Cabin Base earlier. These Bulkheads must glue at 90 degrees to the top of the Cabin Base. Check with a right triangle or square. The Bulkheads should also be centered to the Cabin Base to leave room for the 1/8" Side Deck Sheeting. Draw centerlines down the Cabin Base and down each Bulkhead to help center the Bulkheads to the Cabin Base.



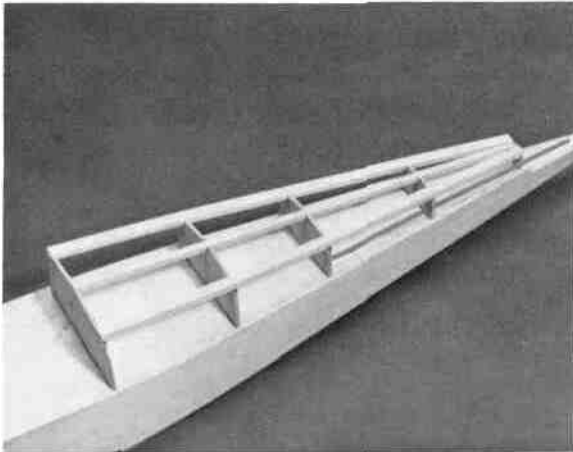
#### 20. D INSTALL THE RUDDER PUSHROD OUTER TUBING

Use a long brass tube, sharpened inside of one end or a long drill bit and cut holes through Bulkhead 7A and the Cabin Base between 6A and 7A. Install the Outer Tube but do not glue it in place yet. You'll have to cut the exit hole later after you install the Deck Side.



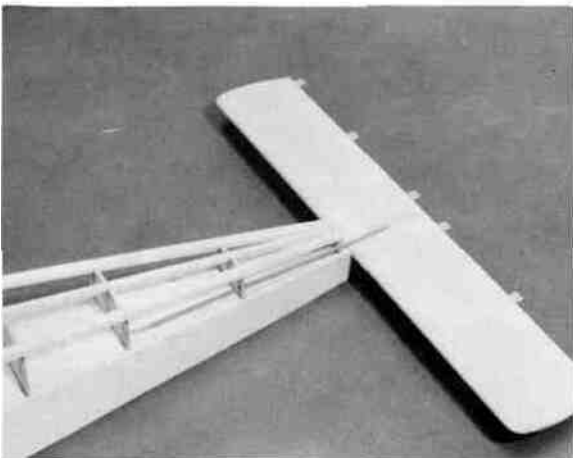
**21. D GLUE THE 1/4" x 1/4" BALSA TOP STRINGER TO THE UPPER BULKHEADS**

Glue the Stringer in the top notches of the upper Bulkheads and against the front of 8A. Trim and sand the end of the Stringer even with the front of 4A. Sand the Stringer along its length with a T-Bar or Block to match the contour of the Bulkheads. The Top Deck Sheeting will fit better if the Stringer is sanded in this manner.



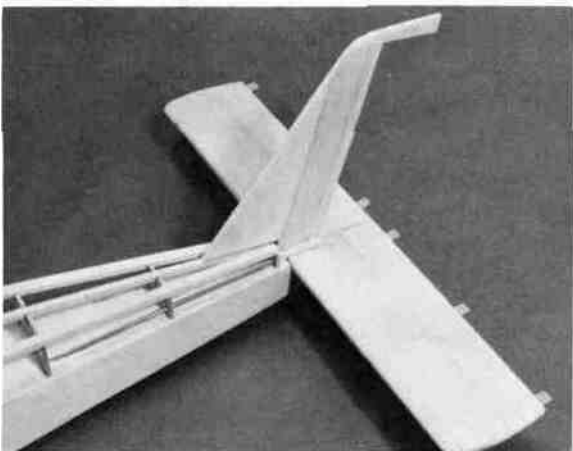
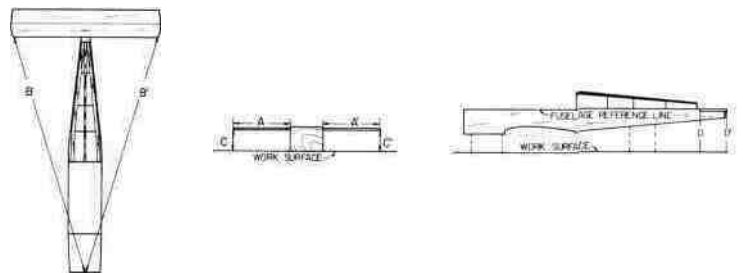
**22. D GLUE IN THE 1/4" x 3/8" BALSA SIDE STRINGERS**

Glue the Side Stringers to the upper Bulkheads. Sand the Stringers even with the front of 4A and the rear of 8A after the glue dries. Wait to sand the Stringer top along its length until after the Deck Sides are added. These Stringers bend slightly to fit the Fuselage contour.



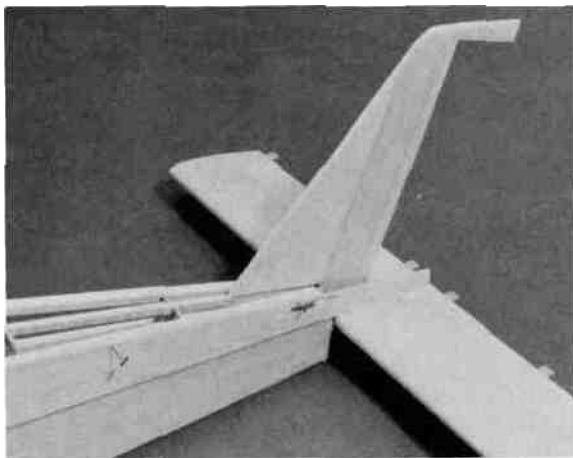
**23. D ALIGN AND GLUE THE STABILIZER TO THE STABILIZER PLATE AND FUSELAGE**

First align the Fuselage to a flat work surface. The Fuselage Reference Line (the line along the top of the Fuselage Side) should be parallel to the work surface. Now align the Stabilizer to the Fuselage in this manner: A-Draw a centerline down the Stab Plate and line up the Stab centerline to the Stab Plate centerline. B-Measure from each Stab Tip to a point at the center of the top of the Firewall. Each measurement should be the same. C-Measure from each Stab Tip to the work surface. Each measurement should be the same. To make sure you have 0 degrees incidence, measure from the center of the Leading Edge to the work surface. These distances should be the same. When the Stabilizer is aligned, use epoxy and glue the Stabilizer to the Stabilizer Plate and Fuselage.



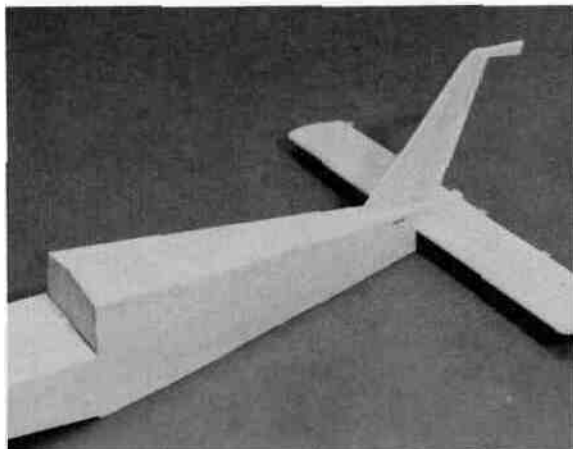
**24. D GLUE THE 1/4" BALSA FIN ASSEMBLY TO THE FUSELAGE**

Sand a slight taper on the bottom of the Fin Front piece to match the taper on the 1/4" x 1/4" Top Stringer. Use epoxy and glue the Fin 90 degrees and centered to the Cabin Base, Stab and Top Stringer. Cut and glue 1/4" x 1/4" Balsa Fin Brace pieces to the Fin and Stabilizer.



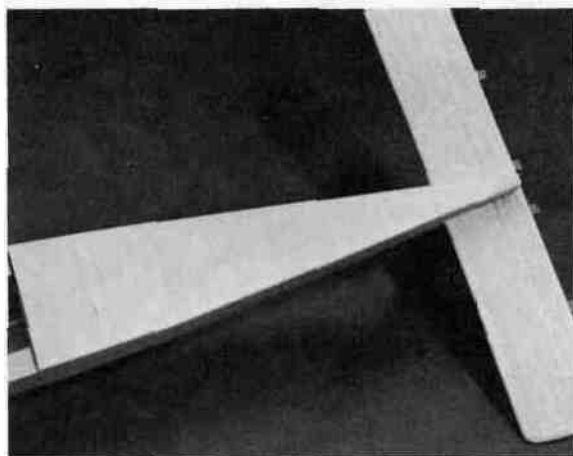
- 25. D** GLUE THE 1/8" DECK SIDE PIECES TO THE FUSELAGE; GLUE THE OUTER RUDDER PUSHROD TUBING TO THE FUSELAGE AFTER CUTTING EXIT HOLE IN DECK SHEETING

Cut the left side Deck Sheeting to fit. Use 1/8" x 2-1/2" x 24" Balsa provided. Slightly sand the bottom edge of the sheeting to fit along the top edge of the Fuselage Side. Cut the pushrod outer housing exit in the sheeting. Trial fit the housing in the sheeting and the sheeting on the Fuselage. Glue the pushrod housing into the Fuselage with CA glue. Now glue the sheeting to the Fuselage. Glue the tube to the sheeting at the exit. Trim the tube even with the sheeting at the exit. Cut right side Deck Sheeting to fit and glue in place.



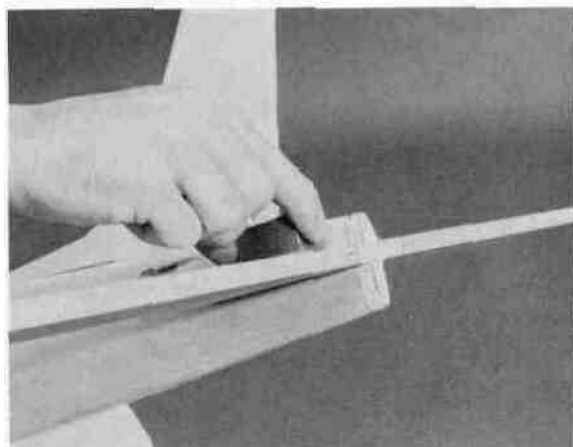
- 26. D** GLUE THE 1/8" Balsa DECK TOP PIECES TO THE FUSELAGE

Bevel (sand at an angle) the top of the Top Deck pieces (1/8" x 2-1/2" x 24") to mate at the center above the 1/4" x 1/4" Top Stringer. Notch out the Top Deck pieces 1/8" each for Fin clearance. Sand the top edges of the Deck Side pieces and the 1/4" x 3/8" Side Stringers even with the upper Bulkhead contour. Trial fit the Top Deck Sheeting. If the fit is good, glue it in place.



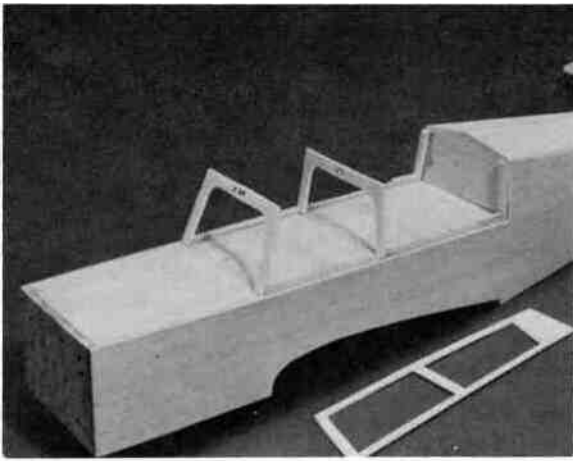
- 27. D** ADD THE 3/32" Balsa CROSS GRAIN BOTTOM SHEETING TO THE FUSELAGE

Use the 3/32" x 2-5/8" x 30" Balsa Sheeting provided and custom cut pieces to fit the Fuselage bottom from the wing saddle rear back to the rear of the Fuselage. Trim and sand the Bottom Sheeting even with the Fuselage sides after you glue the sheeting in place. Then slightly round the bottom corners of the sheeting as shown on the plan.



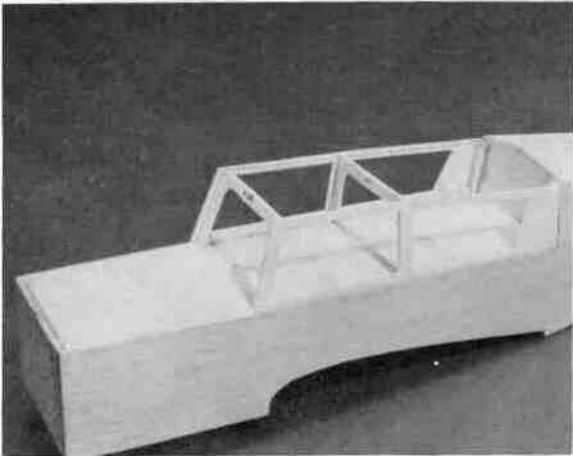
- 28. D** CUSTOM CUT AND INSTALL THE 3/8" TAIL BLOCK

Using the rear of the Fuselage as a guide, cut the Balsa 3/8" x 5/8" x 2" block into two pieces. Trial fit the pieces in place above and below the Stab at the rear of the Fuselage. Glue the pieces in place. Final sand to the shape shown on the plan.



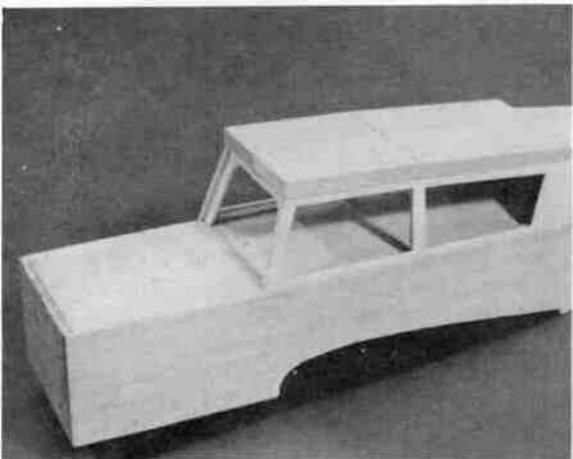
29. D GLUE IN BULKHEADS 2A AND 3A AND THE 1/4" SQUARE STOCK ALONG THE BOTTOM OF THESE BULKHEADS AND IN FRONT OF 4A

Use the Cabin Sides (from the plywood razor cut sheet) as a guide for placement of Bulkheads 2A and 3A (so 2A has the correct angle and both 2A and 3A are centered on the Cabin Base). Bevel the bottom of Bulkhead 2A *slightly*. Glue the Bulkheads in place. Cut and glue 1/4" square balsa vertically in front of Bulkhead 4A; it stops at the top of the Cabin Side to be added next. Custom cut 1/4" square balsa to fit between 2A and 3A and between 3A and 4A long the bottom of the Bulkheads on both sides. Trim the 1/4" square balsa so it won't show when the window sides are glued in later. Glue the 1/4" balsa in place.



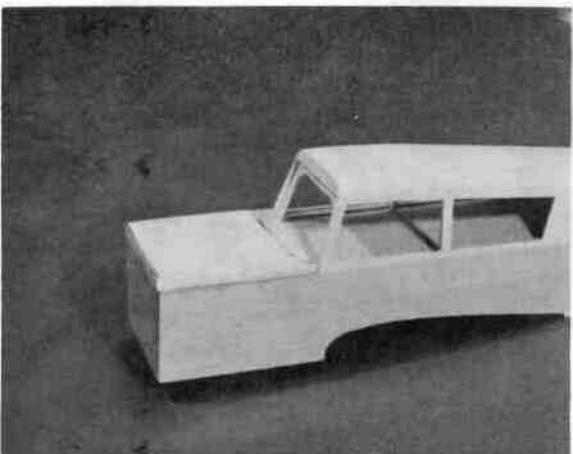
30. D GLUE THE 1/8" CABIN SIDES TO THE FUSELAGE; GLUE IN THE 1/4" SQUARE STOCK ALONG THE TOP OF THE CABIN SIDES

Slightly bevel the bottom edge of each Cabin Side. Glue the Cabin Side in position. Custom cut 1/4" square stock to fit between Bulkheads 2A and 3A and between 3A and 4A at the top. Save the plywood scrap from inside the windows until later.



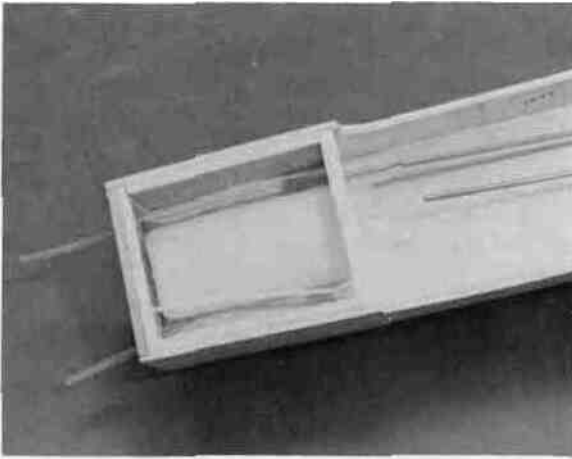
31. D GLUE IN THE FRONT AND REAR 1/2" CABIN TOP PIECES; FINAL SAND

Sand the Cabin Top pieces so they fit to each other and to 4A. Sand the tops of the Cabin Sides and Bulkheads if necessary for a good fit. Glue the Cabin Top pieces in place. Final sand the Cabin Top as shown on the plan. Cut the front Windshield on the cut lines and use the windshield as a guide when you sand the front of the Cabin Top. You will be insetting the windshield into the Cabin Top later so keep this in mind when sanding. You might want to leave the Cabin Top slightly oversize until you install the windshield later.



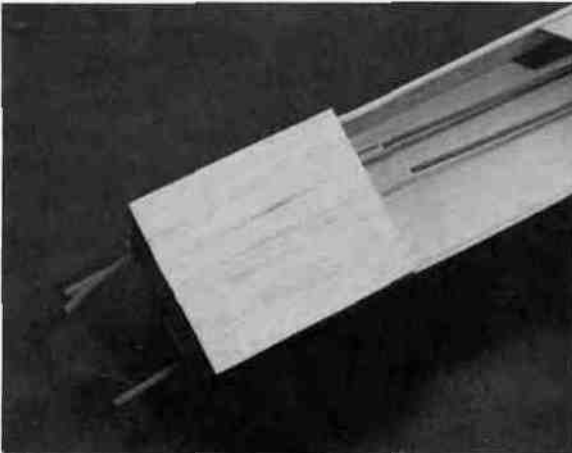
32. D CUSTOM CUT AND GLUE ON THE BALSA COWL TOPBLOCK

Carve and sand the rear of the Cowl Top piece if you wish to simulate the dashboard. Glue the Cowl Top in place. Do *not sand* the front of the Cowl Top until after you fit the Cowl later. The Windshield will be inset later into the Cowl Top piece so *do not sand the top* of this piece yet either.



### 33. D INSTALL THE ASSEMBLED FUEL TANK

The fuel tank is shown here installed so you can see it. However, you may wait to install the tank until after all the final sanding and covering is done. You can install the tank later by feeding the lines through the front of the Firewall, attaching the lines to the tank and pulling the tank in position. If you don't want to install the tank that way, install it now while you can see what you are doing better. Just plug the fuel lines so they don't get full of balsa dust! Also leave the lines a little long until the engine is installed•



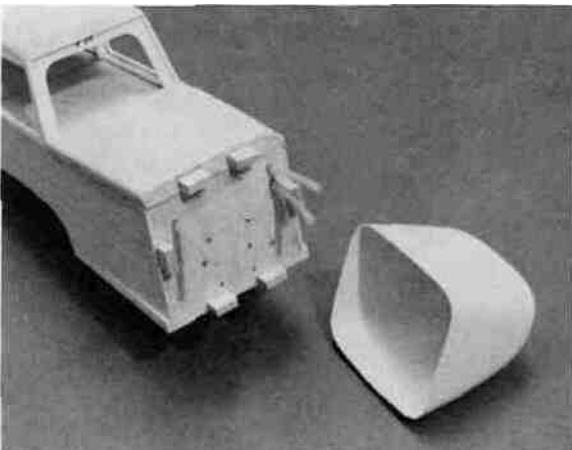
### 34. D INSTALL THE NOSEGEAR BEARINGS AND GLUE THE Balsa 3/8" TANK BOTTOM TO THE FUSELAGE

Install the nylon nosegear bearings now before you glue on the Tank Bottom. Use 4-40 screws to attach the bearings to the Firewall. Glue the 3/8" Tank Bottom in place. Do not sand the Tank Bottom until after you fit the Cowl.

## COWL

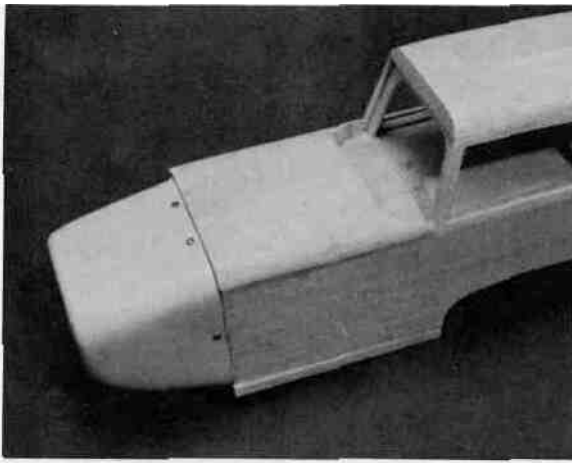
### 1. D CUT THE COWL HALVES FROM THE SHEET AND GLUE THEM TOGETHER

Carefully cut the Cowl halves from the ABS plastic sheet. Make the cut around the bottom first. Sand the bottom flat now. Then cut the Cowl halves apart. Slightly sand the parts so they fit correctly. Use CA glue and glue the Cowl halves together. Sand the glue joint. Cut the fiberglass tape provided into two 4" pieces. Place the pieces of tape on the seam on the inside of the Cowl on either side of the engine shaft cut out location. Use 5 minute epoxy or CA glue on the tape to reinforce the seam.



### 2. D GLUE THE 1/4" COWL BLOCKS TO THE FRONT OF THE FIREWALL

Mark the position of the Cowl on the front of the Fuselage. Tack glue the 1/4" x 1/2" x 3/4" Cowl Blocks in place. Trial fit the Cowl in place. Sand the angles on the Cowl Blocks to match the Cowl angles. Use epoxy and glue the Blocks in permanently. Use 1/4" square balsa to brace the Blocks for added strength.

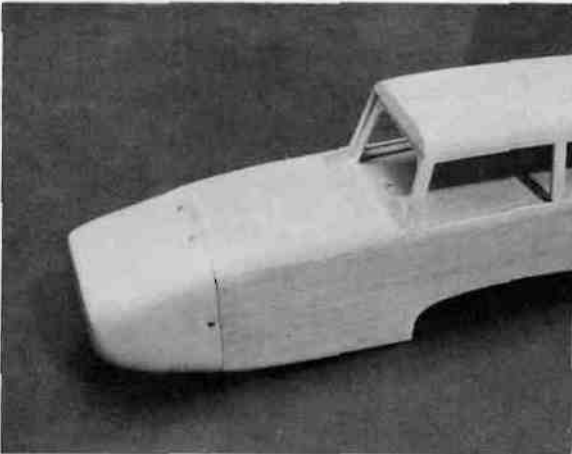


3. D ATTACH THE COWL TO THE FUSELAGE WITH #4 SCREWS INTO THE COWL BLOCKS

Place the Cowl on the Fuselage. Drill a 5/64" pilot hole through the Cowl and through the 1/4" Cowl Block underneath. Enlarge the hole in the Cowl for #4 screw clearance. Install the screw to check your work. Repeat this process for the other 5 screw locations.

4. D FINAL SAND THE FUSELAGE TO THE COWL CONTOUR WITH THE COWL ATTACHED

Sand the Balsa Cowl Top Block and the Balsa Tank Bottom to match the Cowl contours. Remove the cowl screws and the Cowl when you have finished sanding.



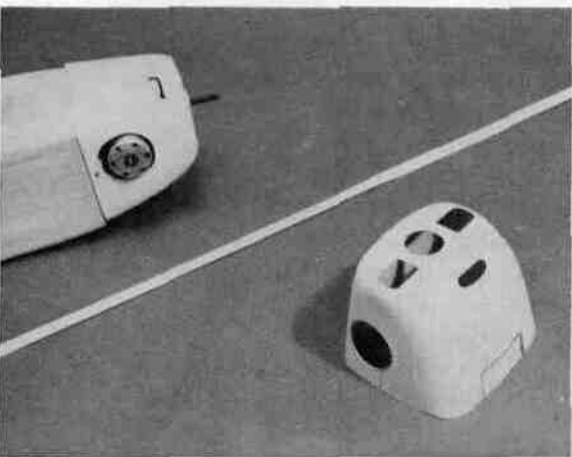
5. D SAND OR CUT AWAY AREAS ON THE COWL FOR ENGINE CLEARANCE

Install the engine mount with four 6-32 screws (the engine is side mounted, the engine head faces the right side of the model). Temporarily attach the engine to the engine mount (use CA glue-just a little!). Trial fit the Cowl and cut openings in the plastic for engine head clearance, needle valve adjustment, engine shaft hole, air intake holes (use the template as a guide), air outlet for muffler and nosegear clearance. Now position the engine (break the glue bond so you can move the engine) so the prop shaft has 1/16" or so clearance between the spinner back and the Cowl front. Slightly enlarge the engine head opening if necessary.

## WING

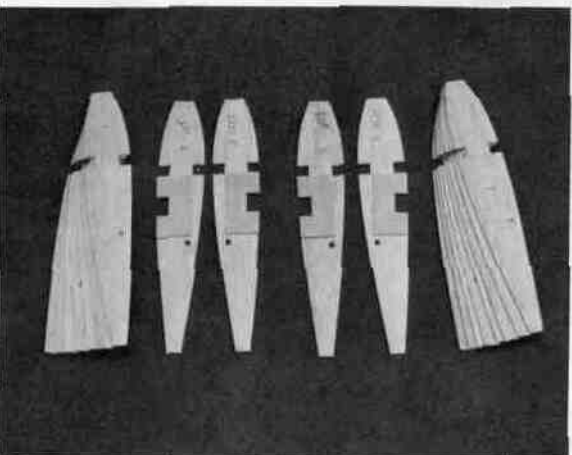
READ THIS FIRST BEFORE YOU START BUILDING THE WING PANELS: It is very important that you build a straight wing with no warps or twists or you will get some flying characteristics you didn't expect! Be very careful when you align the ribs, spars, leading edges and trailing edges and sheeting at the various steps below. All these parts should be in their correct positions before you glue them in place. Hold or pin the parts in place, then glue. Use the following instructions to help you build the wing straight and warp free.

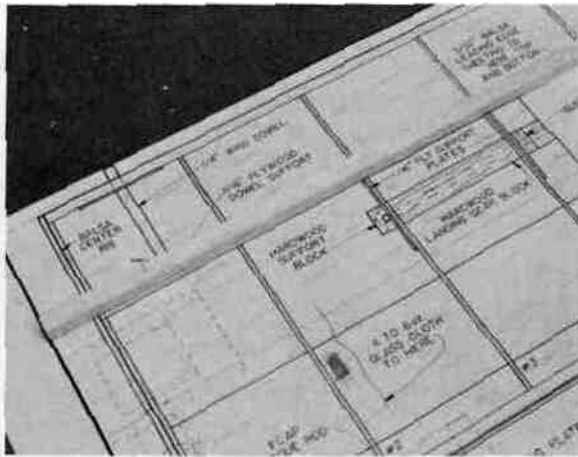
Remember: Anyone can build a wing. Only a careful builder can build a straight wing.



1. D PREPARE THE RIBS FOR BOTH WING PANELS

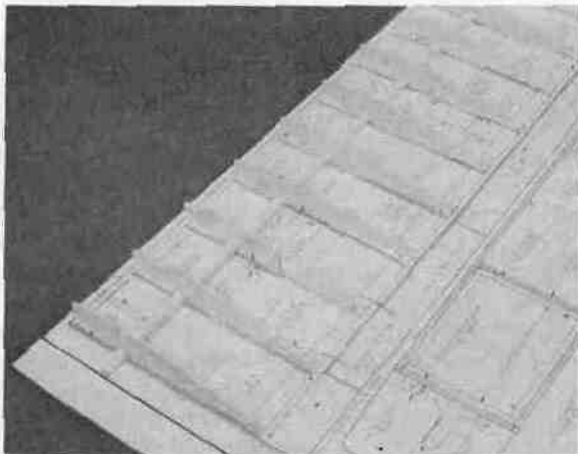
Remove the Ribs from the razor cut sheets. Find 4 Ribs with the landing gear notch in them. Number these Ribs #3 and #4. You'll have 2 of each. Glue the 1/16" Plywood Brace (it has a notch that matches the landing gear notch) on the left side of one Rib #3 and on the right side of one Rib #4 for the right wing panel. For the left wing panel glue the 1/16" Ply Braces to the left side of the other Rib #4 and the right side of the other Rib #3. Locate the Ribs with the Bellcrank Plate slot in them (2 for each panel). Number these Ribs #6 and #7. Any remaining Ribs may be used in any of the other positions. Put the Ribs aside for the left wing panel. You will build the RIGHT wing panel first.





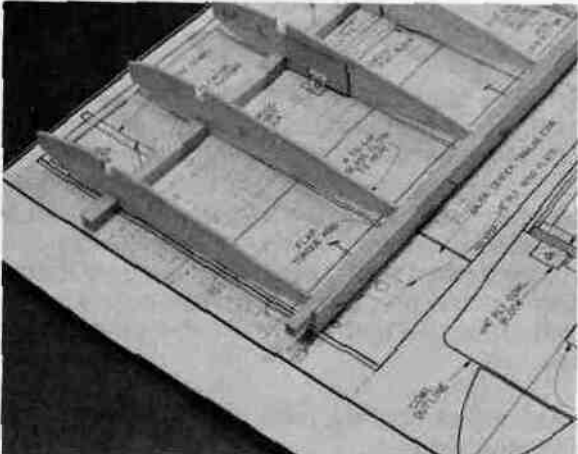
2. D PIN THE 3/8" x 3/8" x 30" BOTTOM SPAR OVER THE PLANS

Place the wing plan on a flat surface and cover the plan with waxed paper or kitchen wrap. Pin the Bottom Spar in position on the plan.



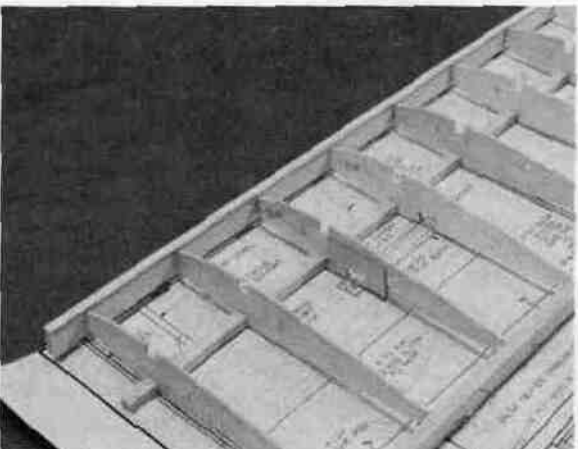
3. D PLACE THE RIBS IN POSITION ON THE SPAR; DO NOT GLUE YET!

Temporarily install all the Ribs in position on the Bottom Spar. Make sure all the Ribs are 90 degrees to the Spar. The Landing Gear notches on Ribs #3 and #4 should be down. The Bellcrank Plate slots in Ribs #6 and #7 should angle down toward the Rib trailing edges. Remove the balsa from the bellcrank wire pushrod holes in Ribs #1



4. D ALIGN AND GLUE THE 1/4" x 3/8" x 30" Balsa TRAILING EDGE TO THE RIB ENDS USING THE 3/32" x 7/8" TRAILING EDGE BUILDING SUPPORT PROVIDED; GLUE THE RIBS TO THE BOTTOM SPAR

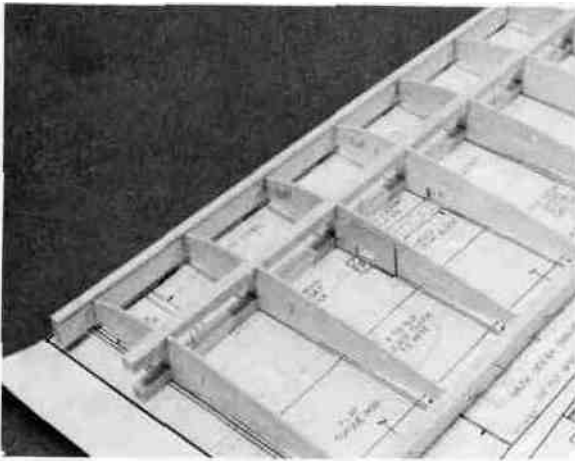
Align the top edge of the 1/4" x 3/8" Trailing Edge to the top edge of the Building Support (the extra Trailing Edge Sheeting piece). Use kitchen wrap between them and pin the Trailing Edge to the Building Support. Center the Trailing Edge on the Rib ends. Glue the Trailing Edge to the Ribs with the Support pinned to your work surface. Glue the Ribs to the Bottom Spar with CA. (CA glue works very well on the wing panels. White glue has a tendency to warp the wing.) Make sure you don't glue the Building Support to the Trailing Edge as you'll need the Support to build the left wing panel.



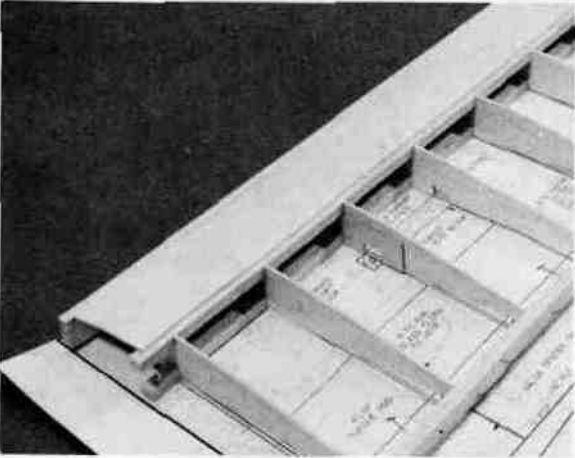
5. D PREPARE AND GLUE THE 1/4" x 7/8" x 30" Balsa LEADING EDGE TO THE RIBS

Draw a Rib Alignment Line (a straight line) on the back of the Leading Edge about 1/8" from the top of the Leading Edge. Align the tops of the Rib leading edges to the line you drew and glue the ribs to the Leading Edge.



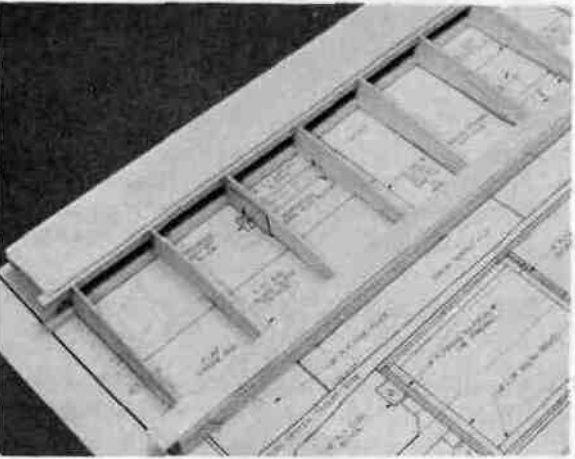


6. D GLUE THE 3/8" x 3/8" x 30" BALSA TOP SPAR INTO THE RIB NOTCHES



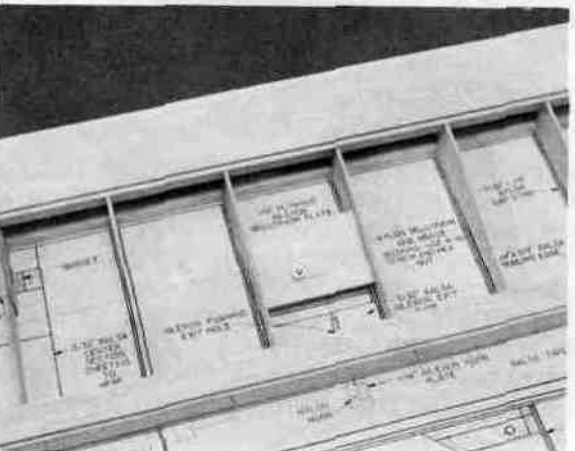
7. D GLUE THE 3/32" BALSA TOP LEADING EDGE SHEETING IN PLACE

Glue the Sheeting to the Leading Edge first. Then glue the Sheeting to the Ribs and the Top Spar. You may have to wet the Sheeting with a solution (50-50) of water and ammonia to help the balsa wood bend over the rib contours. Wet the Sheeting and hold it in place until dry. Then glue in place.



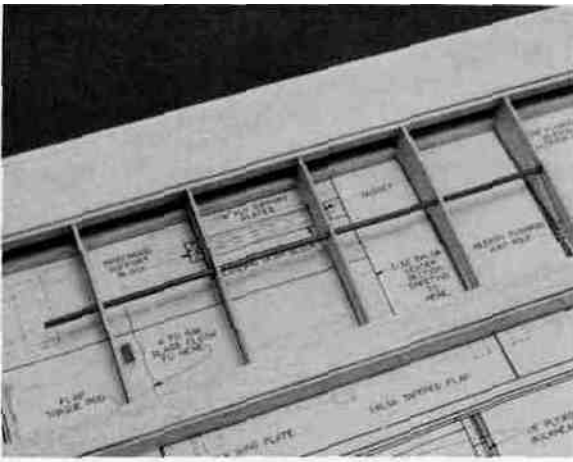
8. D GLUE THE 3/32" x 7/8" x 30" TRAILING EDGE SHEETING IN PLACE

Position this Sheeting so the rear edge is flush with the rear of the Trailing Edge. A good way to get a straight Trailing Edge is to remove the Building Support, roll the wing panel back until the Trailing Edge is flat on the work surface. Then glue on the sheeting. Realign the panel when the Sheeting is dry.



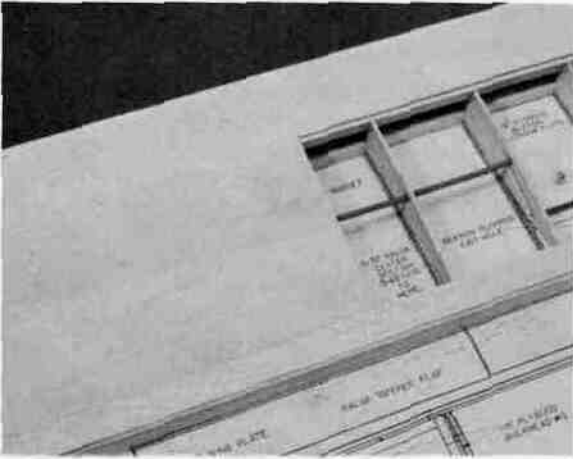
9. D ADD THE 1/8" PLYWOOD BELLCRANK PLATE

Remove the Bellcrank Plate (1/8" x 2" x 3-1/4") from the razor cut sheet. Mark and drill a clearance hole for the 4-40 bolt into the Ply Plate. Attach the Nylon Bellcrank and Brass Bushing to the Bellcrank Plate by threading a 4-40 bolt through the brass Bushing, the Bellcrank and the Ply Plate and then securing the Bolt with a 4-40 Hex Nut and Washer. Trial fit and glue the Plate in position into the slots in Ribs #6 and #7.



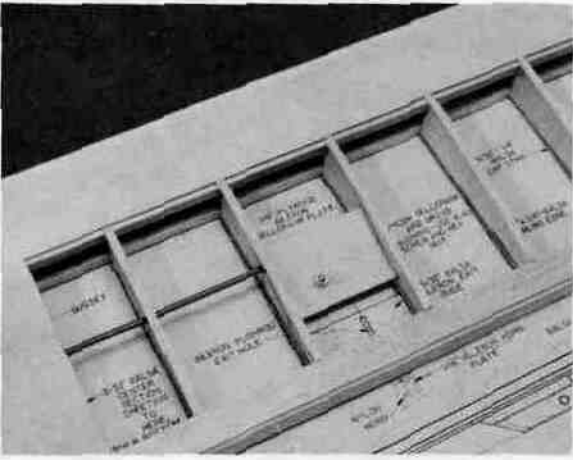
**10. D INSTALL PUSHROD TUBES INTO THE WING PANEL**

Thread Outer Pushrod Tube through the small holes in the Ribs. Cut the Tube to fit between Rib #2 and Rib #6. Use CA and glue the Tube in place to each Rib.



**11. D GLUE THE 3/32" x 3" x 11-7/8" TOP CENTER SECTION SHEETING IN PLACE**

Glue the front Center Section Sheeting in place first, from the Leading Edge Sheeting back. Custom cut a second piece of Sheeting to fit between the front Center Section piece and the Trailing Edge Sheeting. Glue this second piece in place.

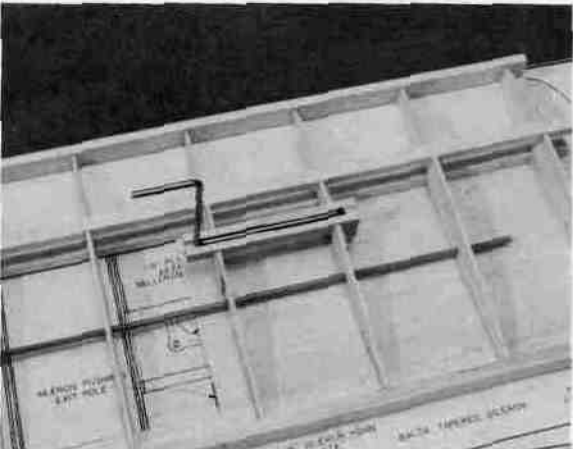


**12. D GLUE THE 3/32" x 1/4" BALSA TOP CAP STRIPS IN PLACE**

Custom cut Cap Strips to fit between the Leading Edge Sheeting and the Trailing Edge Sheeting over the remaining Ribs. Use the Wing Panel itself to measure the length of the Cap Strips. Note that the Cap Strip on the Tip Rib (outer end of the wing panel) is offset so the outer edge of the Cap Strip is flush with the outer edge of the Rib.

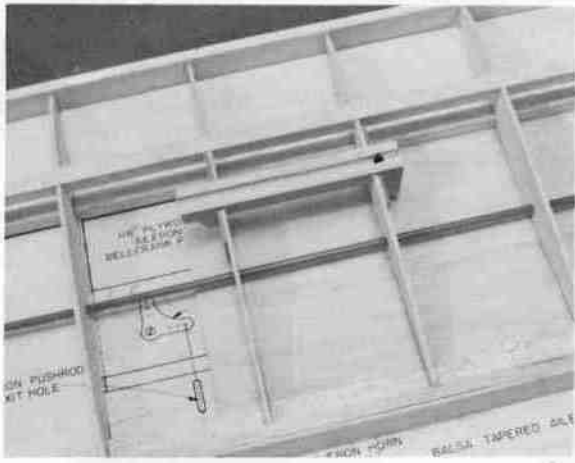
**13. D REMOVE THE PANEL, TURN IT OVER AND REALIGN**

Pin the Trailing Edge to the Building Support piece. Pin the wing panel to the work surface without placing pins where they will get glued inside the wing. The wing panel should be aligned to the work surface. Align the panel over the plan to help keep it straight.



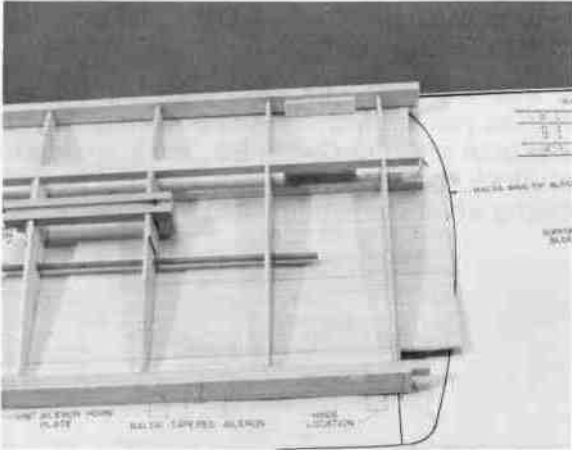
**14. D PREPARE AND TRIAL FIT THE LANDING GEAR BLOCKS INTO THE WING PANEL**

Use epoxy and glue the grooved Support Block to the inboard (inside) end of the Landing Gear Block as shown on the plan "Landing Gear Mounting Detail". After the glue dries, drill a 5/32" hole down through the Landing Gear Block using the groove in the Support Block as a guide. Put the Wire Gear in the block and trial fit the assembly into the wing. The Gear Block should extend 3/32" above the Rib in order to be flush with the Center Section Sheeting to be installed later. Remove the Wire Gear.



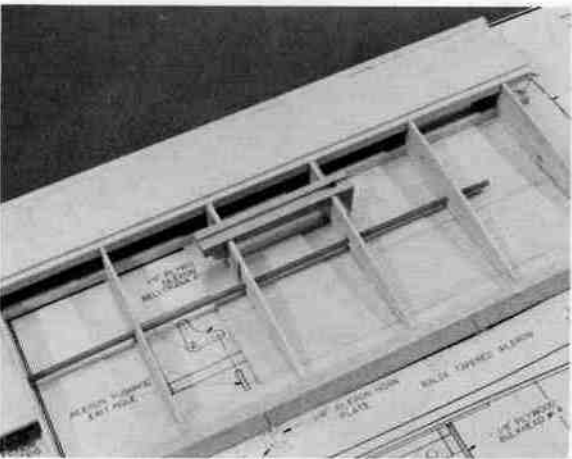
**15. D GLUE IN THE LANDING GEAR BLOCK AND GUSSET**

Use 5 minute epoxy to glue the Landing Gear Assembly in place. Add the small pine gusset under the outboard (outer) end of the Landing Gear Block. Put a small amount of glue at each end of the groove to keep foreign matter out of the wing.



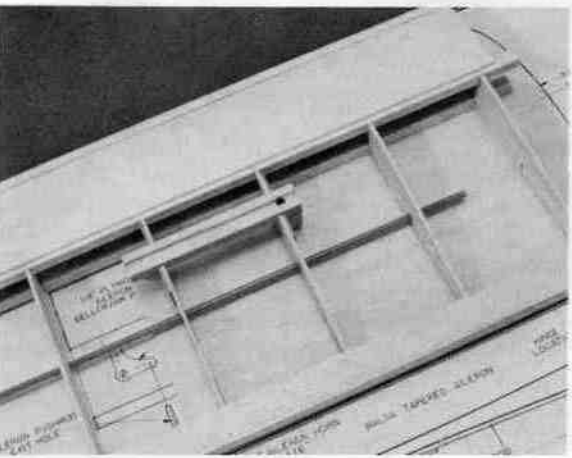
**16. D GLUE THE TWO 1/8" PLYWOOD DOWEL PLATES TO THE WING PANEL**

Remove the 1/8" Plywood Dowel Plates from the razor cut sheets. The smaller Dowel Plate glues to the rear of the wing panel Leading Edge. The larger Dowel Plate glues to the front of the Top and Bottom Spars. Use epoxy and glue both Plates in position between Ribs #1 and #2 as shown on the plan.



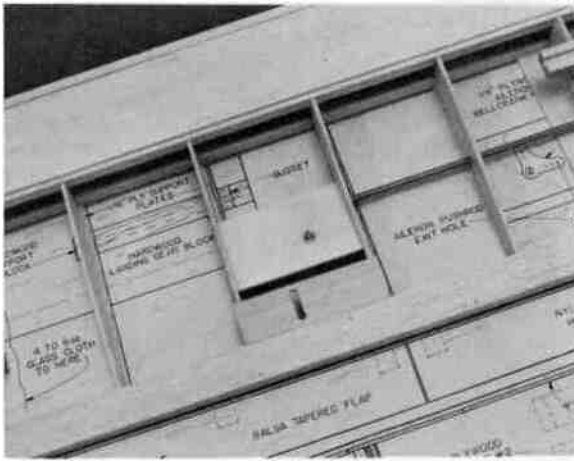
**17. D ADD THE 3/32" BALSU BOTTOM LEADING EDGE SHEETING TO THE WING PANEL**

Use the same method that you used to glue on the Top Leading Edge Sheeting.



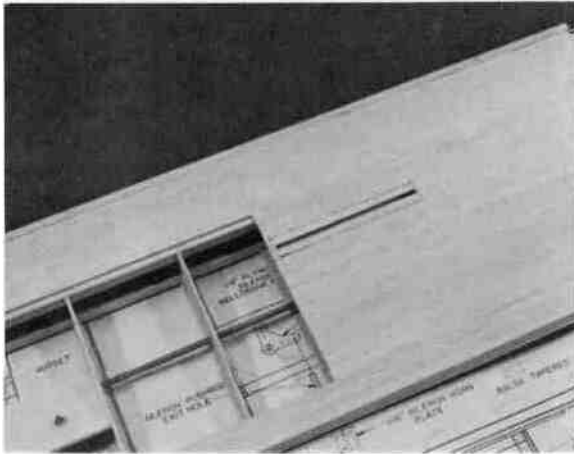
**18. D GLUE THE 3/32" BALSU BOTTOM TRAILING EDGE SHEETING IN PLACE**

You can roll the Trailing Edge of the wing back so it is flat on the work surface when you glue this sheeting in place. Realign the panel again when the glue is dry.



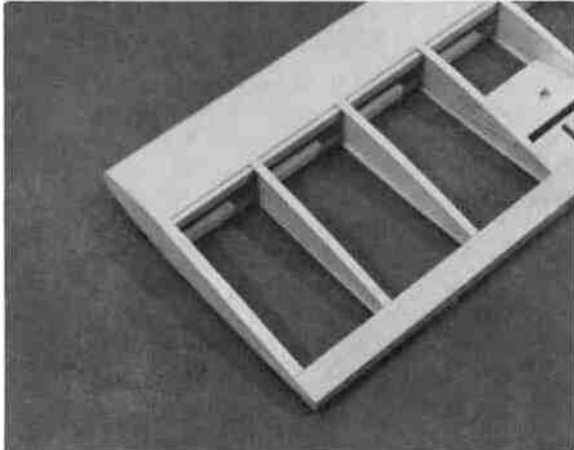
**19. D ADD THE 3/32" Balsa AILERON EXIT PLATE**

Glue the Balsa 3/32" x 1" x 3-3/8" Aileron Pushrod Exit Plate to Ribs #6 and #7 and the Trailing Edge Sheeting. Cut a slot in this Plate for Aileron Linkage clearance. Line up the slot with the end hole in the nylon Bellcrank.



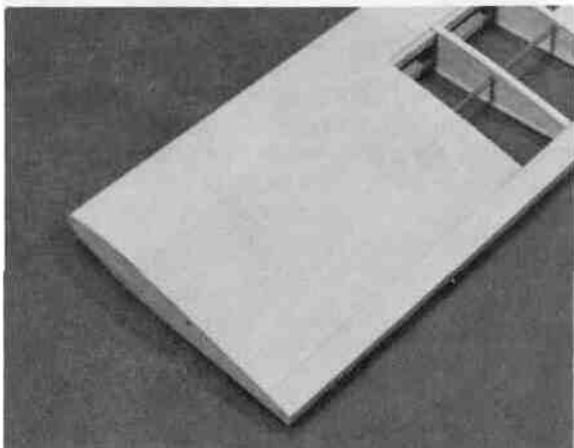
**20. D ADD THE 3/32" Balsa BOTTOM CENTER SECTION SHEETING**

Use 3/32" x 3" x 11-7/8" Balsa provided. Cut and glue the sheets as you did with the Top Sheeting. Cut out the area in the front piece of Center Section Sheeting for Landing Gear Block Clearance. The Block should be flush with the Sheeting when you are finished.



**21. D ADD THE Balsa 3/32" x 1/4" BOTTOM CAP STRIPS**

Remember the outboard Cap Strip is flush with the outer edge of Rib #10. Also the Cap Strips on Ribs #6 and #7 stop at the Balsa Aileron Pushrod Exit Plate.

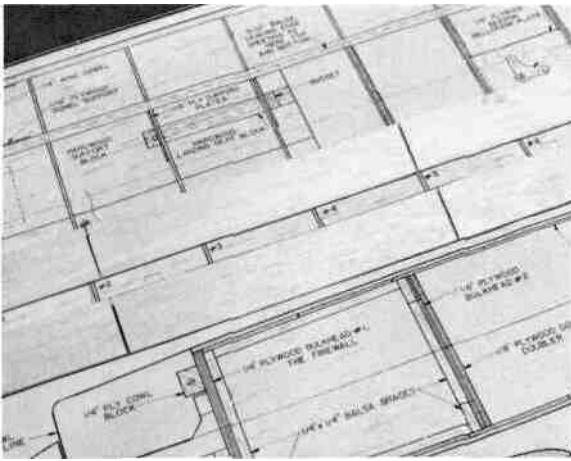


**22. D TRIM BOTH ENDS OF THE WING PANEL; FINAL SAND**

Trim and sand the wing parts even with Rib #1 and Rib #10. Final sand the panel by rounding the Leading Edge as shown on the plan and sand the Trailing Edge and Trailing Edge Sheeting slightly at the rear so all parts are even.

**23. D BUILD THE LEFT WING PANEL NOW**

Follow steps 2 through 22 and build the left panel the same way you built the right panel except the left wing panel is built upside down over the plans. The gear notches in Ribs #3 and #4 are up and the Landing Gear Blocks are glued in before any sheeting is added. Glue in the 1/8" Ply Bellcrank Plate and the Balsa 3/32" Aileron Pushrod Exit Plate before you turn the wing over and before you add the Cap Strips. Check that these parts are in their correct positions for the Left Wing Panel **before** you glue!

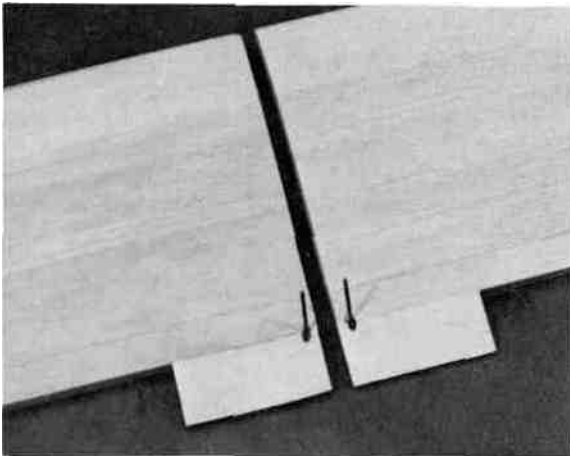


**24. D CUT TAPERED BALSA TRAILING EDGE STOCK INTO AILERONS, FLAPS AND CENTER TRAILING EDGE PIECES**

Mark and cut the Balsa Stock into three parts as shown on the plan. Make parts for both wing panels. Even if you will not have workable Flaps, you still need to cut the Flap pieces from the stock provided. The Flaps will simply glue to the wing Trailing Edge later.

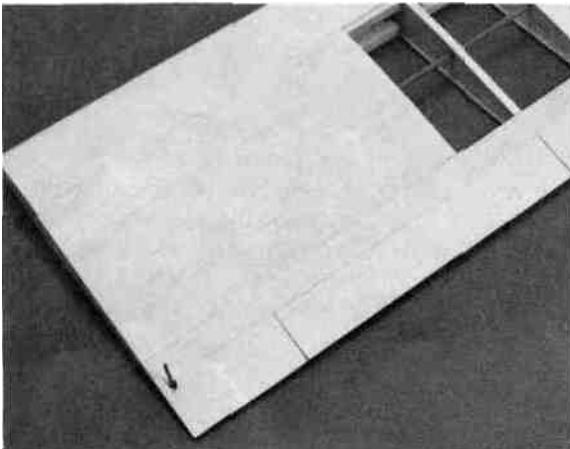
**D PREPARE THE CENTER TRAILING EDGE PIECES**

Groove and notch the Center Trailing Edge pieces for Flap Torque Rod clearance. Use epoxy and glue the brass tube only of the torque rods into the groove in the Center Trailing Edge piece. Make Right and Left pieces. (The long torque arm goes up when the Center Trailing Edge pieces are upright.) If you do not want workable Flaps, there is no need to glue the torque rods into the Center Trailing Edge pieces. The torque rods will not be used.



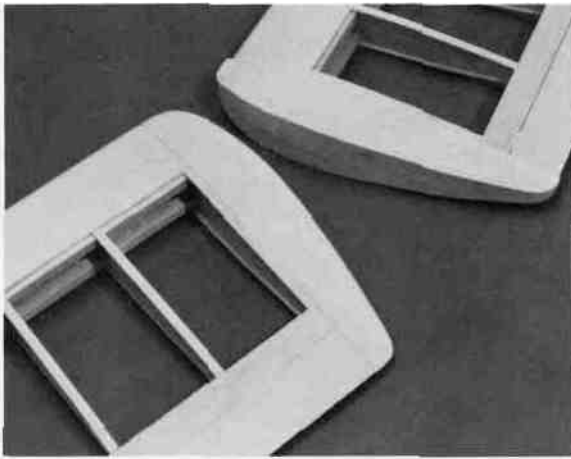
**26. D GLUE THE CENTER TRAILING EDGE PIECES TO THE WING PANELS**

Sand the Center Trailing Edge Pieces if necessary and check the fit to the wing panels. Notch out the wing panel Trailing Edge for Torque arm clearance. Glue in place using epoxy. Use extreme care when gluing so you do not glue the torque arms themselves to the Wing Panels.



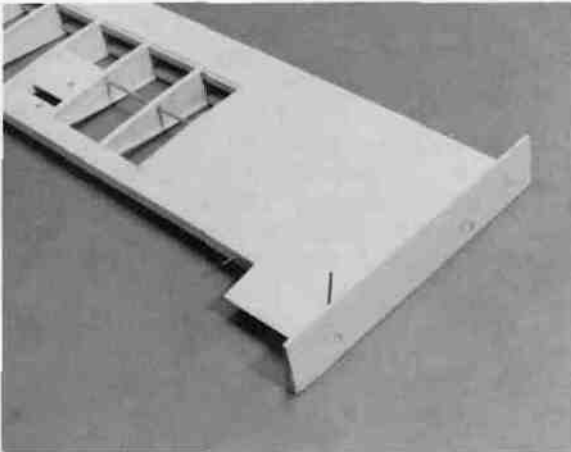
**27. D TEMPORARILY HINGE THE FLAPS AND AILERONS TO THE WING PANELS**

Mark the positions of the hinges on each wing panel trailing edge and the Flap and Aileron leading edges. Check the drawings on the plans. The Flaps are Bottom hinged; the Ailerons are Top Hinged. Cut the slots for both at the angles shown on the drawings. Mark and drill a hole in the Flap leading edge for the torque arm. Groove the Flap leading edge for torque rod clearance. Trial fit the Flaps and Ailerons. Tack glue the Flaps and Ailerons to the wing panels and final sand. (If you do not want workable Flaps, then just glue the tapered Flap to the Wing panel.)



## 28. D GLUE THE WING TIP BLOCKS TO OUTER RIBS ON EACH WING PANEL; FINAL SAND

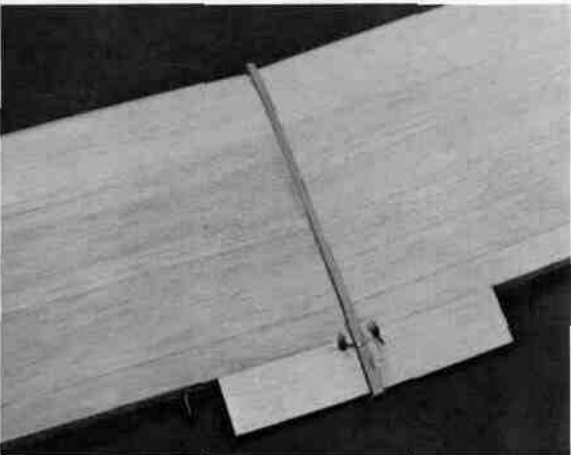
Draw centerlines down Rib #10 and the Wing Tip Block. (Draw centerlines on both sides of the Wing Tip Block.) Center and glue the Wing Tip Block to Rib #10 by lining up the centerlines. Sand the Wing Tip Block to shape. Use the outside centerline to help you get the correct shape when you sand. Sand the Tips to the shape of the Ailerons. Remove the Flaps and Ailerons when you are finished.



## WING JOINING

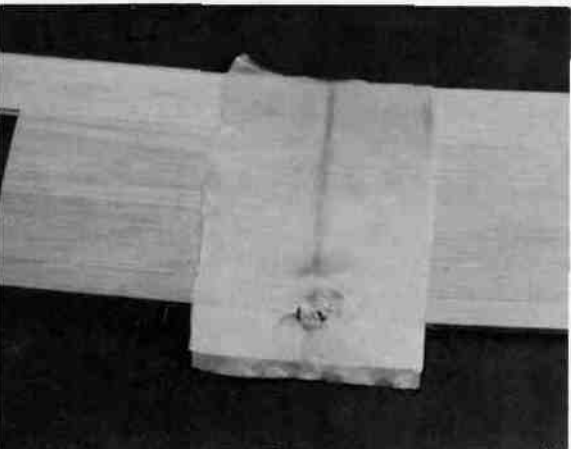
### 1. D GLUE THE TAPERED CENTER RIB WEDGE TO ONE WING PANEL

Draw a centerline down the Center Rib Wedge and down the outside of Rib #1 on one wing panel. With the larger edge of the Center Rib down and the wing panel right side up, line up the Center Rib on the wing panel. Using epoxy, glue the Center Rib to the wing panel.



### 2. D JOIN THE WING PANELS TOGETHER

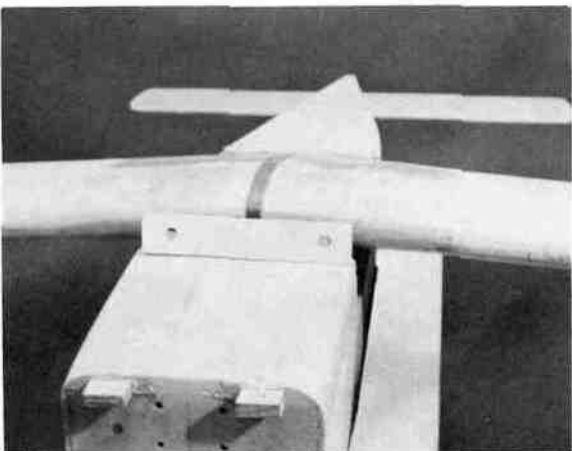
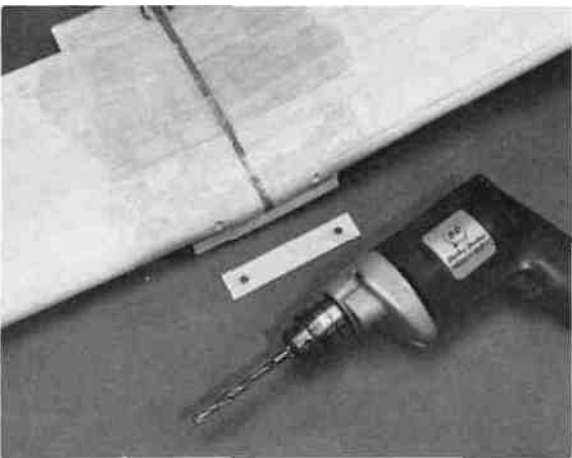
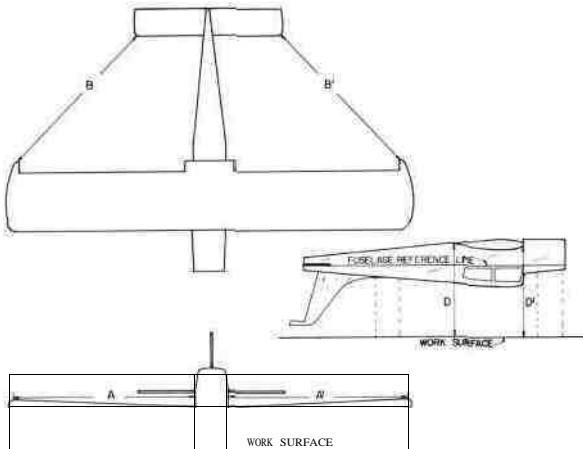
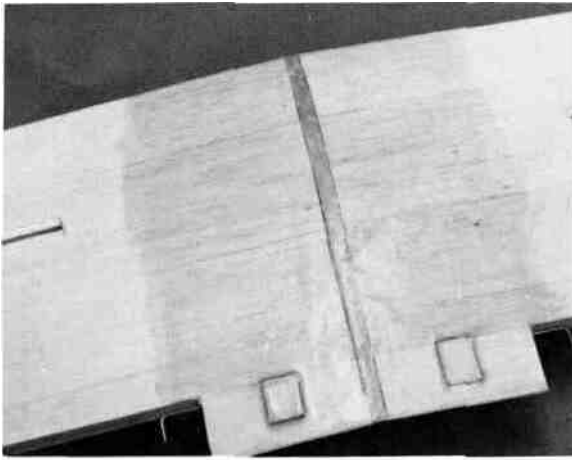
Rough cut the Center Rib to about 1/8" oversize. Align the Wing Panels together making sure the Leading Edges and Trailing Edges are lined up to each other. Use slow set epoxy and glue the Wing Panels together. Each Wing Tip should be blocked up 2 inches for the proper dihedral. Keep the Panels in this blocked up position until they are dry.



## GLASSING THE CENTER SECTION

### 1. D CUT GLASS CLOTH TO FIT THE WING CENTER SECTION

When the glue is dry, final sand the Center Rib to match the Wing itself. Cut one piece of 4 or 6 oz. glass cloth to fit the wing center section. One piece of cloth 6" wide should be used. You may use one piece of cloth for the top and one for the bottom of the wing. Fill in the holes around the torque arms with wax from a burning candle so resin will not stick to the torque arms, which must be moveable for Flap control.



## 2. D GLASS THE WING ; ADD THE 1/16" PLY PLATES

Apply a thin coat of polyester resin (or thinned epoxy) to the wing center section. Lay the cloth on the wing. Add more resin (or epoxy). Immediately squeegee off the excess. Let cure until dry. Sand the glass lightly. Brush on a second coat of resin and let it dry (or apply a second coat of epoxy). Let that coat dry. Turn the wing over and glass the other side of the wing, overlapping the cloth at the wing leading edge and trailing edge. Finish sand the wing when the glass is dry. Now glue on the 1/16" x 3/4" x 1" Plywood Wing Plate on the bottom of each Center Trailing Edge piece.

## ASSEMBLY OF THE MODEL

### 1. D ALIGN THE FUSELAGE TO THE WORK SURFACE AND THE WING TO THE FUSELAGE

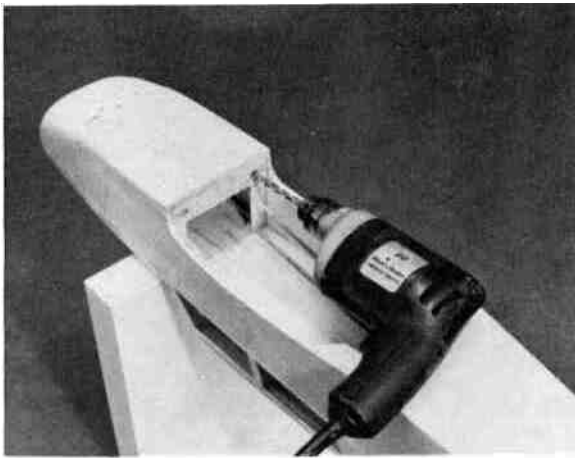
Align the Fuselage to the work surface using the line along the top of the Fuselage Side as the reference point. This line should be parallel to the flat work surface with the Fuselage upside down. Align the Wing to the Fuselage by making the following measurements: A-Center the Wing side to side in the saddle. The distance from the Fuselage Side to the Wing Tip on each side should be the same. B-The Wing Tip to Stab Tip distance should be the same. C-Wing Wing to work surface distance should be the same on both sides. D-The Wing has 0 degrees incidence like the Stabilizer. The Leading Edge to work surface should be the same as the trailing edge to work surface distance. When the wing is aligned correctly, mark the position of the wing on the Fuselage so you can realign the wing again. (Remember these measurements will not work unless you have aligned the Fuselage to the work surface first. The reference line should be parallel to the work surface. Measure from this line down to the work surface at several points on both sides of the Fuselage. All the measurements should be the same.)

### 2. D USE DOWEL JIG AND DRILL HOLES IN THE WING LEADING EDGE FOR DOWELS

(The Dowel Jig is used to help you drill holes in the Wing leading edge. The Jig also gives you the location of the 1/4" holes in Bulkhead #2. You drill the Wing holes first, position the Dowels and Jig and then drill the holes in the Bulkhead after the Wing is in position.) Use the plan and mark and drill 1/4" holes in the 1/8" Ply Dowel Jig piece (1/8" x 7/8" x 4-9/16"). Center the Dowel Jig over the Wing Leading Edge making sure the holes in the Jig are centered on the Wing Leading Edge centerline. Drill 1/4" holes into the wing leading edge and through both 1/16" Dowel Plates inside the wing. Be sure that the holes are drilled parallel to the rib centerlines and at 90 degrees to the wing leading edge.

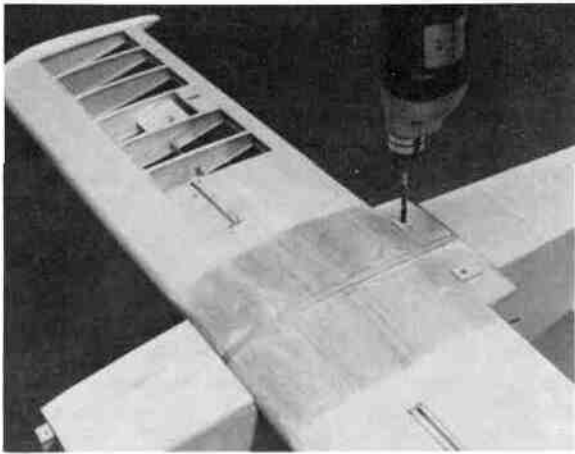
### 3. D REALIGN THE WING TO THE FUSELAGE; GLUE DOWEL JIG TO FUSELAGE

Place 1/4" Dowels into the holes in the Wing leading edge. Place the Dowel Jig on the Dowels. Position the Dowels so they are flush with the Dowel Jig when the Jig is next to the Wing. You may want to tack glue the Dowels to the Wing so they don't fall inside the Wing during this step. Now place the Wing, Dowels and Dowl Jig into the Wing Saddle. Realign the Wing. Push the Dowel Jig forward against Bulkhead #2 and tack glue the Dowel Jig to the rear of Bulkhead #2. Remove the Wing and Dowels from the Fuselage.



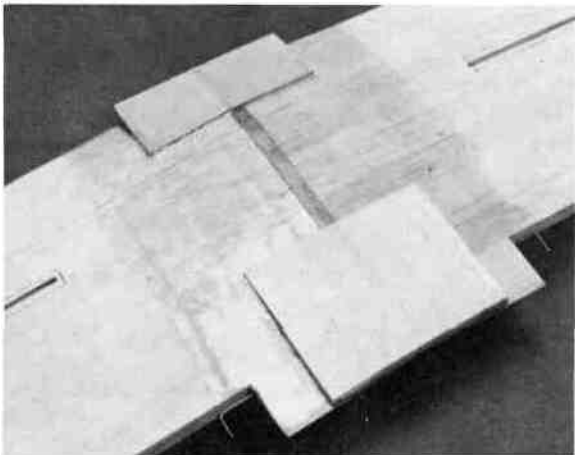
4. D DRILL 1/4" DOWEL HOLES THROUGH THE DOWEL JIG HOLES INTO BULKHEAD #2; GLUE DOWELS INTO THE WING

Use the holes in the Dowel Jig as a guide and drill 1/4" holes into Bulkhead #2. Remove the Dowel Jig and now permanently install this Jig with epoxy using the drilled holes to align the Jig in the exact position. Glue the Dowels into the Wing with epoxy. A little less than 1/2" of the Dowels should extend beyond the Leading Edge of the Wing. Put the Wing on the Fuselage and check your work. The Wing should be aligned correctly.



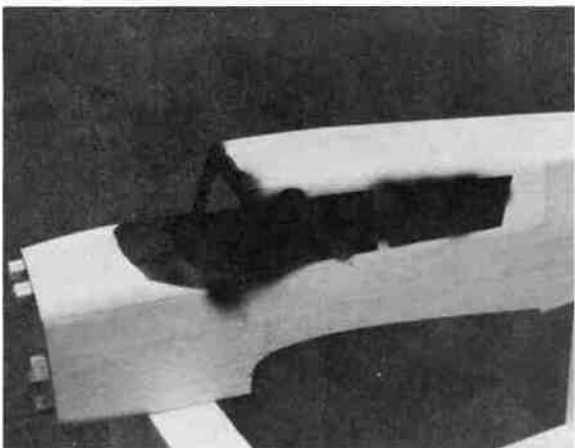
5. D INSTALL THE REAR WING BOLTS

With the Wing aligned to the Fuselage, drill pilot holes (at a slight angle so the bolt head will rest flat on the Plywood Plate) for 1/4-20 Bolts through the 1/16" Ply Plate, Center Trailing Edge and rear Hold Downs in Fuselage. Remove the Wing. Redrill the wing for 1/4-20 bolt clearance. Tap the holes in the Fuselage Hold Downs for 1/4-20 bolts. Bolt the Wing to the Fuselage to check your work. Note - See the "Optional Scale Wing" information on page 29. Add these parts to the Wing now if you wish to have your model more scale-like in appearance. These parts do not have any function except for appearance.



6. D CONSTRUCT AND GLUE ON FRONT AND REAR WING FAIRINGS

Use the 1/8" x 3/4" x 10" balsa and cut a piece 1/8" x 3/4" x 5" for the front part of the Front Wing Fairing. Cut two pieces of 1/8" x 3/4" x 2" from what you have left for the Sides of this Front Fairing. Use the two 1/8" x 2-3/8" x 2" balsa pieces provided for the Bottom of the front Fairing. (Make these pieces slightly oversize at first.) Glue these pieces together to form the Front Fairing. Lay sandpaper on the Wing and rub the Fairing back and forth to get the correct curve on the Fairing. Shape the Rear Fairing (1/4" x 2-1/2" x 4" balsa-2 pieces glued together) in the same way. Trial fit the Fairings with the Wing in place. Glue the Fairings in place when you have a good fit.



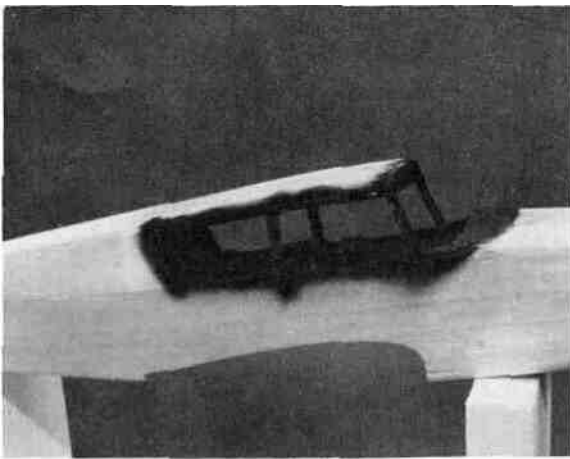
7. D FINISH CABIN AREA - (SHORT CUT METHOD- LESS SCALE IN APPEARANCE)

You may elect to take a short cut here if you do not wish to put a lot of work in the cabin area. If so, do the following. (If you want a more scale-like appearance, go on to the next step.) Put the scrap plywood pieces that you saved when you glued in the Cabin Sides back into the window areas on the Cabin Sides. Glue them in place. Now you can paint the Side Window areas a dark color to simulate tinted glass. Dye the front Windshield dark with Rit Dye. Follow the instructions on the box of dye. There is no need, then, to finish any Cabin interior as you won't be able to see through the windshield anyway. Skip steps #8 and #9 and go on to step #10 for Windshield installation.

8. D FINISH THE CABIN AREA; ADDA PILOT

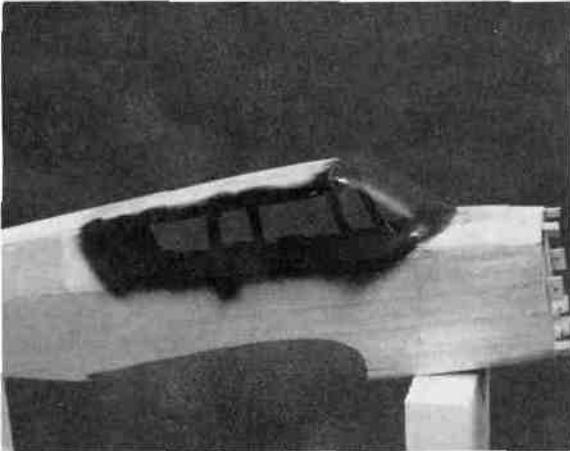
Spray paint the Cabin interior a flat black. Glue in a pilot and passenger at the first side window location. Add any other scale details that you wish. Any additions to the Cabin area must be made now before the Cabin is enclosed by the Windshield and Windows.





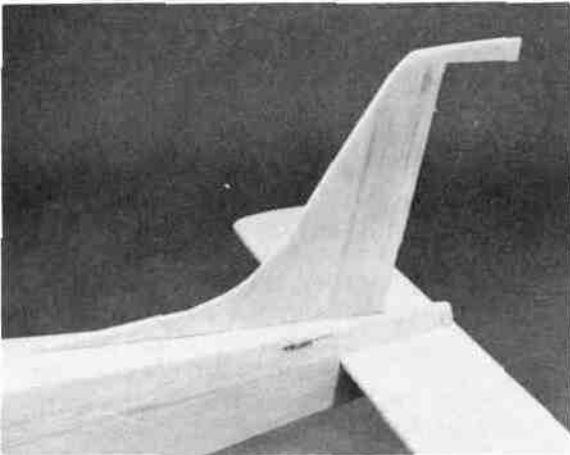
#### 9. D INSTALL THE SIDE WINDOWS

Cut out the Side Windows from the plastic sheets provided. Use the Cabin Side drawing as a guide. Cut the windows 1/8" larger than the window openings in the Cabin Side. Tint the windows if you wish by placing the plastic windows in a hot Rit Dye solution and agitating the solution until the desired color is obtained. The windows are recessed into the Cabin Sides on the outside of the Fuselage. With the plastic Window held in position, mark its position on the Cabin Side. Cut on this line about 1/16" deep into the Cabin Side. Now cut away the Cabin Side up to this 1/16" cut you made. Spray paint this area you cut away a flat black color. The Window will now fit into this cutout and will be flush to the rest of the Fuselage. Glue the Window in place with CA glue. Do the other Window the same way. Use Balsa Filler if necessary around the Window and sand the Filler even with the Fuselage.



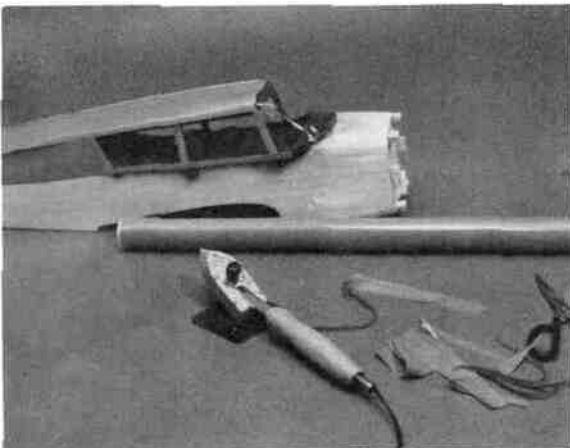
#### 10. D INSTALL THE FRONT WINDSHIELD

The windshield may be tinted using the method described for the Side Windows. The Windshield is recessed into the Front Cabin Top, Cowl Top and Cabin Sides. With the Windshield in place, mark the areas to be cut away. Remove the Windshield and cut away areas of the above parts so the Windshield will be flush with all parts of the Fuselage. Sand any areas of the Fuselage first in the area of the Cowl Top and Cabin Top to get a good fit with the Windshield. CA glue is then used to glue the Windshield down into the recessed areas of the Fuselage.



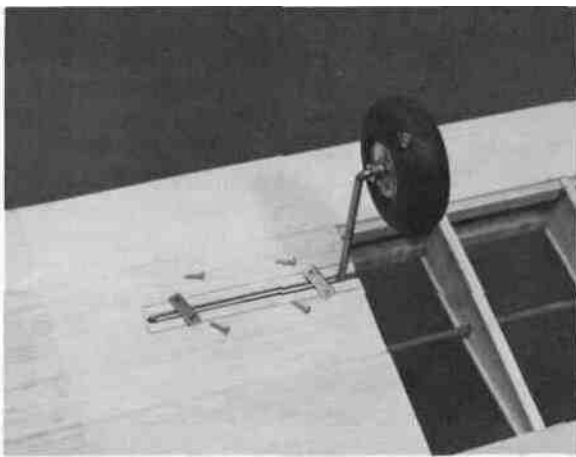
#### 11. D GLUE ON THE 1/4" BALSA DORSAL FIN AND 1/4" SCRAP FIN FILLET TO THE FUSELAGE

Round these parts to match the Fin leading edge.



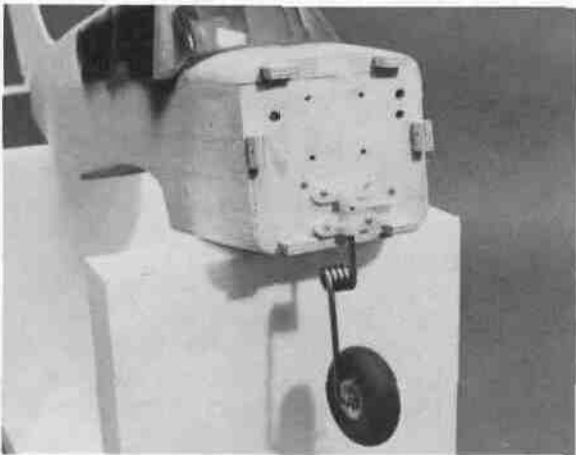
#### 12. D FINAL SAND ANY AREAS LEFT AND COVER THE MODEL; PAINT THE COWL; FUELPROOF THE FUSELAGE

Fuelproof the front of Bulkhead #1 and the Tank Compartment with a coating of polyester resin or thinned down slow set epoxy. Prime and paint the plastic Cowl to match your trim scheme. Make sure you do not use paints that will harm the ABS plastic. K&B paints and primer will work fine on the Cowl. Cover the model with heat shrink covering. If you took the short cut method in the Cabin area and did not paint the Side Windows, use Trim Mono-kote to simulate Windows. Use covering around and between Windows so recessed areas will not show.



### 13. D INSTALL THE MAIN GEAR

Place the Wire Main Gear into the Landing Gear Blocks in the underside of the Wing. Hold the Wire Gear in with the metal Hold Down straps and sheet metal screws. Use two straps on each gear. Drill pilot holes in the Blocks first. Then put the screws in place.



### 14. D INSTALL THE NOSEGEAR AND FRONT WHEEL

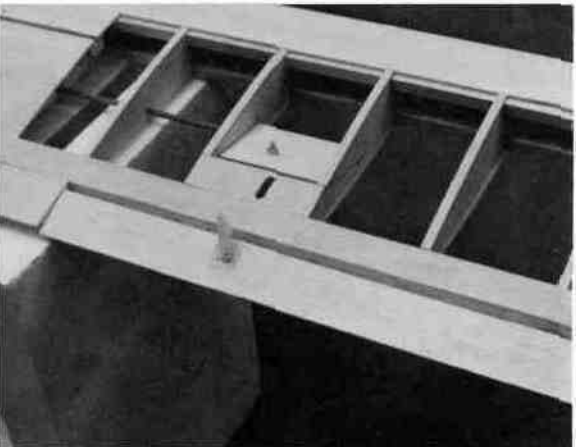
Install the Steering Arm, Wheel Collar and Wire Nosegear into the nylon bearing.

Note: The nosegear bearing is now one piece as shown on the plan.



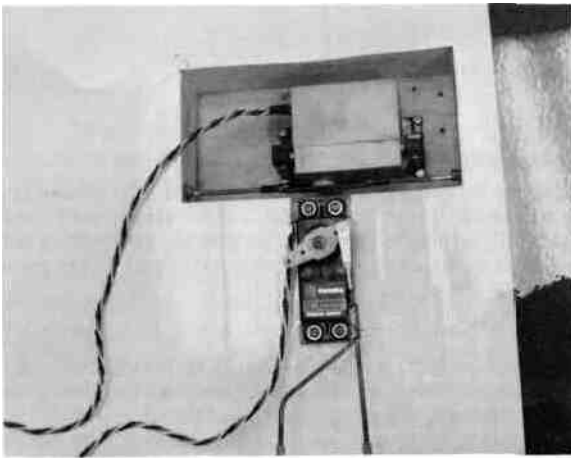
### 15. D INSTALL THE ENGINE AND MUFFLER

Attach the engine with self tapping screws or bolts and lock nuts. To maintain the scale appearance of your Cherokee, we recommend using a muffler that will be contained inside the Cowl. The Tatone Pitts-style muffler (number 11434 TT-60) will strap on the K&B 40 and OS 40 engines, and the exhaust will be pointed out the Cowl. A few suggestions about installation: 1-It might be helpful to use a small jeweler's file to smooth the mounting face of the muffler. Take care in filing - your objective is to get the face as flat as possible. 2-Add a pressure tap fitting. Your local dealer will probably stock several brands of pressure fittings. We would suggest drilling the hole centered in the *front* of the muffler. After tapping the hole with the correct size tap, install pressure fitting using high temperature epoxy or Loctite. 3-When installing the muffler to the engine, (after engine is bolted in place), clean the exhaust port of the engine and muffler with thinner and add silicone to seal the muffler. Use silicone sparingly. 4-Depending on your choice of engines, exhaust port location, muffler choice, etc., you may want to use black neoprene or silicone exhaust extensions to make sure the exhaust is routed out of the Cowl. Fasten the neoprene to each exhaust tube using a nylon tie wrap. Cut the neoprene tube flush with the exterior shape of the Cowl to maintain the scale look.



### 16. D PERMANENTLY INSTALL ALL CONTROL SURFACES AND HORNS

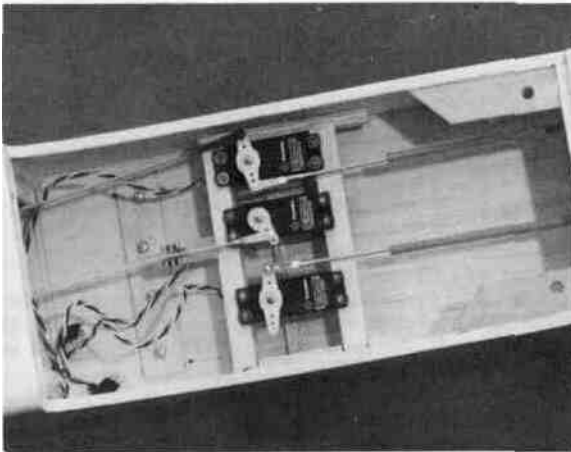
Glue all the hinges in place. Lightly sand both surfaces of the hinges first, put epoxy (or gap filling CA) into each slot and place the hinge in place. Use 2-56 screws and backplate and attach the nylon Rudder Horn to the Rudder. Inset the 1/16" Ply Plate on the bottom of the Aileron at the nylon horn location. Attach the nylon horn to the Ply Plate and Aileron with sheet metal screws. Shorten the screws if necessary so they do not show on the top side of the Aileron. Do not use the Back Plates on the Ailerons.



**17. D INSTALL THE AILERON AND FLAP LINKAGES AND SERVOS**

Cut the servo well into the wing. Use Ply or balsa and glue in sides and a floor. The flap servo may be mounted sideways instead of as it is shown on the plan. Whichever way you install it, cut away the smallest area in the wing as possible. Install both servos as per radio manufacturer

with the radio for the servos. Use the tray and mount the servos to hardwood servo rails glued into the wing. Attach wire pushrods soldered together to the flap torque rods with nylon connector, wheel collars and screws provided. Use a clevis of your choice for each torque arm. Attach the linkage to the flap servo with a clevis also. Install the aileron pushrods inside the housings and attach the aileron servo arm to the wire with a connector of your choice such as Dubro's Aileron Connector and Dual Take-Off Ball Link. Attach the other end of the pushrod permanently to the nylon bellcrank. Attach a wire pushrod permanently to the bellcrank and run it from the bellcrank to the Aileron Horn. Make this end adjustable at the horn.

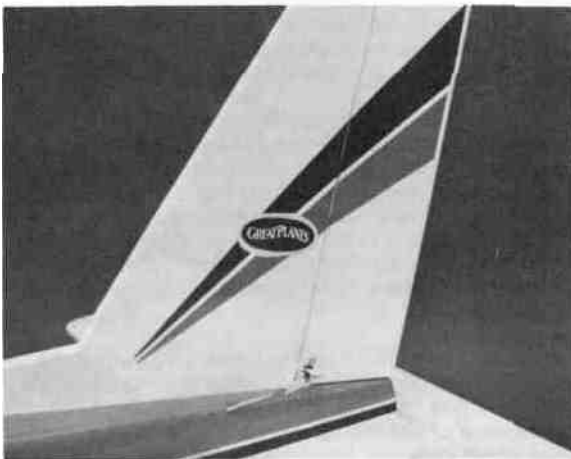


**18. D INSTALL THE FUSELAGE SERVOS AND LINKAGES**

Install the servos for the Rudder, Elevator and Throttle/Steering linkages. Install the inner pushrods and make one end adjustable with a connector of your choice. Install the battery and receiver and switch. Run the antenna out the Cabin Top and attach it to the Fin front. Do not cut the antenna wire. Check the center of gravity and move the battery and/or receiver to get the proper CG.

**19. D APPLY THE DECALS**

The Decals are mylar and are pressure sensitive. Cut the decals apart from each other and select the ones you need for the particular model you chose (use "Cherokee" or "Cherokee Archer"). See the plan for the placement of the decals. Put the decals in position and press them in place.



**20. D INSTALL THE COWL, PROPELLER AND SPINNER**

Install the Cowl with the #4 x 5/8 Screws provided. Install a 10-5 or 10-6 propeller. Install a 2 " Spinner.



**21. D CHECK RADIO OPERATION AND CENTER OF GRAVITY**

The servos and linkages should not bind or interfere with each other. Set the control surface throws as follows:

Ailerons	1/2" up and down
Flaps	3/4" down
Elevators	5/8" up and down
Rudder	1" left and right

Re-check the Center of Gravity.

Flaps can add a whole new dimension to the flying characteristics of your Cherokee, so we hope you'll use them. With flaps, your model will take off and climb quicker plus land at a higher descent rate while touching down at a slower speed. Why? Because as the flaps are lowered, they increase the lift of the wing. Along with the increased lift there is increased drag. The more the flaps are lowered, the more lift and drag is increased.

Before using flaps, become familiar with the way your Cherokee flies. Put in a minimum of 10-20 flights to familiarize control response, power response, stall speed, etc. Also, make sure the Cherokee is perfectly trimmed out.

#### Throw adjustment

Flaps should be on a separate channel, preferably a proportional one that will allow you to add varying degrees of flaps. Total throw should be no more than 3/4" as measured from the trailing edge of the wing to the trailing edge of the full deflected flap.

#### Takeoffs

While taxiing, add 1/2 flaps (3/8 inch). Don't use full flaps until you've gained experience with 1/2 flaps. When you're headed into the wind, add full power. You'll notice the Cherokee will rise off the ground in a shorter distance than normal. As the plane gains speed, the added lift of the flaps will make your Cherokee nose up. This can be corrected by

- 1) raising flaps
- 2) decreasing power
- 3) adding down elevator (or trim)

With full size planes, flaps are pulled up after the plane has left ground effect as the plane is gaining speed and altitude. Power is not reduced until the aircraft is at cruise altitude. The same could follow for your model.

#### Takeoff Procedure (Novice)

- 1) Add 1/2 flaps
- 2) Check engine for reliable operation
- 3) Check radio functions
- 4) Point model into wind
- 5) Add full power
- 6) Pull only a small amount of elevator until model breaks ground
- 7) Climb out, being careful to keep the airspeed up
- 8) At safe altitude, bring up flaps
- 9) Reduce throttle to cruise

#### Takeoff Procedure (Advanced)

- 1) Add full flaps
- 2) Double check engine operation
- 3) Check radio
- 4) Add a couple notches down trim
- 5) Point model into wind
- 6) Add full power
- 7) Add small amount of up elevator until model rotates, then be prepared to add down elevator stick to maintain airspeed during steep climb
- 8) Climb to safe altitude - watch **airspeed**
- 9) Bring up flaps slowly
- 10) Return elevator control to neutral
- 11) Reduce power to cruise

#### Adding flaps at cruise speed, straight & level

Flaps are installed in aircraft to help them take off and land in shorter distances. If you drop the flaps at full speed, your model is going to pitch up, maybe severely. This can be corrected by adding down elevator pressure, but this imparts extra load on the airframe (especially the flaps).

#### Landing

Flaps are used on landing approach to steepen the descent rate. They are very effective, and with a little practice, you can make landings at dramatically steepened rates.

Technique is important. As flaps are deployed, the increased lift should be compensated for by down elevator pressure. This down elevator, combined with the added lift/drag of the flaps, increases the descent rate without increasing airspeed. Of course, adding too much down elevator will increase airspeed, but practice will show you how much to add.

There are many ways of using flaps — we will explain two possible methods.

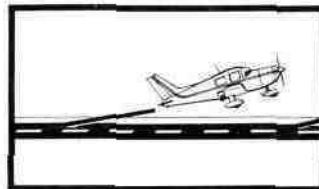
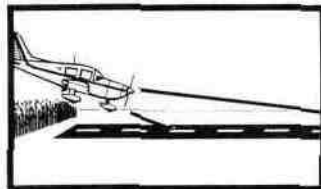
#### Novice

- 1) Enter rectangular approach, but start at 50% higher altitude than normal
- 2) Downwind leg — reduce throttle to 1/2.
- 3) Next, add 1/2 flaps
- 4) Add slight down elevator trim to compensate for flaps
- 5) On final approach, reduce power as necessary to establish descent rate to runway. If too short, add power (don't pull back on the elevator!)
- 6) Flare as usual on runway (you'll note landing speed is reduced somewhat).

#### Expert

- 1) Enter rectangular approach 50-100% higher than normal.
- 2) Reduce throttle as usual during downwind leg
- 3) On final, reduce throttle to idle. You should be a lot higher than normal.
- 4) Add full flaps, and as you do, add down elevator to maintain constant airspeed and a steep descent.
- 5) If you're short, reduce down elevator and/or add power. If you're long, add power, retract flap and go around.
- 6) As you approach runway surface, reduce down elevator and when ready to flare, a little up elevator will slow plane down to landing speed. You'll find the stall speed is reduced quite a bit for nice nose high, slow touchdowns.

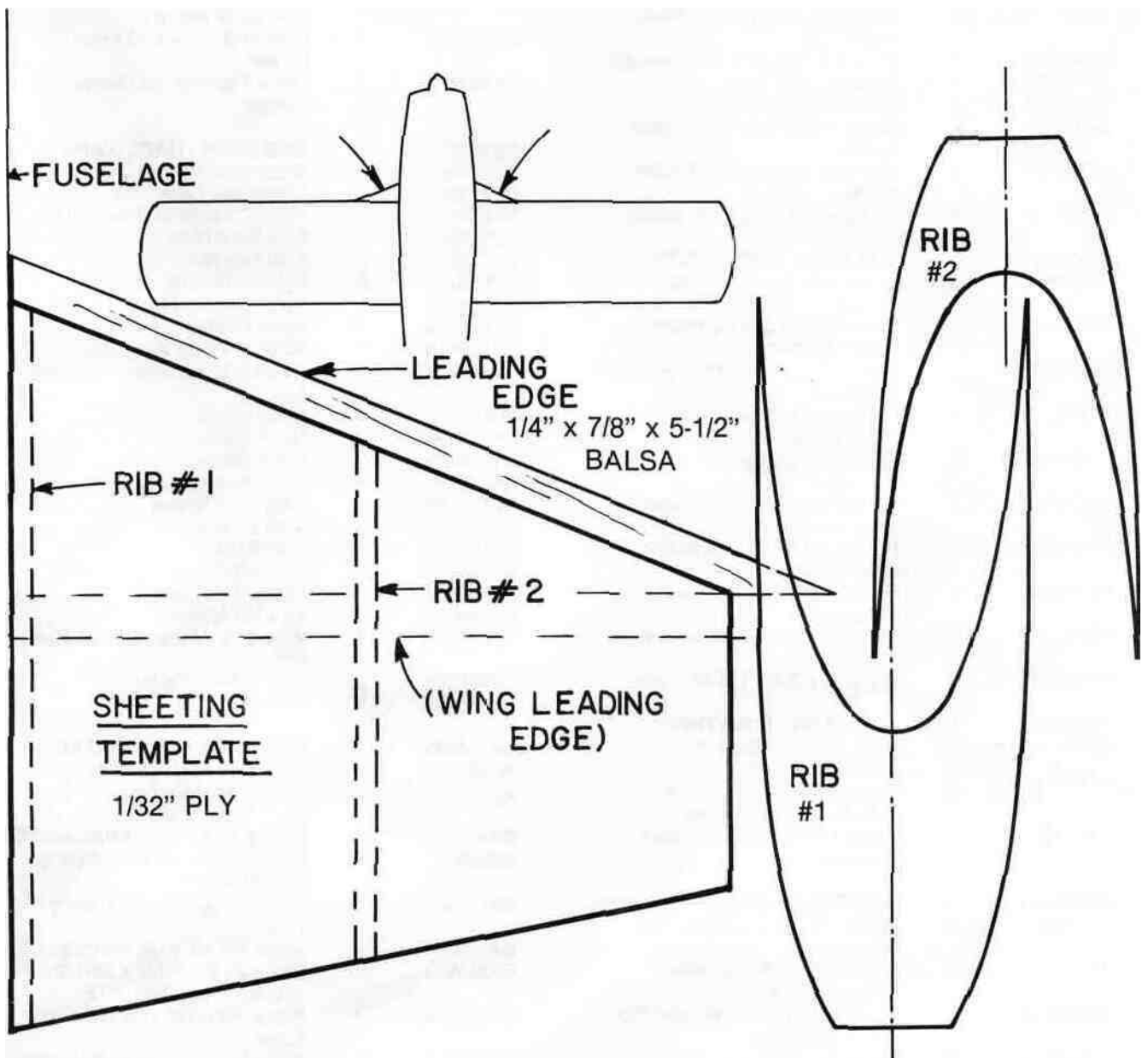
Like anything else, flaps take practice. If you would like further explanations of the use of flaps, consider reading full scale flight manuals. Generally, the techniques are the same. Of course, models are more of a challenge because we are not in the cockpit to read airspeed indicator, tachometers, nor line up a spot on the cowl with the runway threshold. But in time, you'll get the feel of it. That's the fun of flaps!



## OPTIONAL SCALE WING FAIRING

Use the Templates below to construct an addition to the leading edge of the wing shown here for a more scale-like appearance. Follow these steps after assembly and sanding of the wing and fuselage just prior to covering.

1. Using the Templates below, cut 2 each Ribs#1 and #2 from 1/8" Balsa or Light Plywood.
2. Mark the Rib positions on the wing with the wing mounted to the Fuselage. Glue the Ribs in place on the wing being careful to glue Rib #1 only to the wing (not the wing to the fuselage) while leaving adequate clearance for wing removal. Glue Rib #2 to the wing also.
3. Sand a piece of 1/4" x 7/8" x 5-1/2" Balsa to fit the Rib and Wing Leading Edges. Glue the Leading Edge piece in place (Taper the Rib leading edges to fit).
4. Use the Sheeting Template and cut 1/32" Plywood or 1/16" Balsa to fit, top and bottom. Glue the sheeting in place. If you use balsa, sand the trailing edge of the sheeting or use filler material so you can continue the curve of the airfoil where the sheeting meets the wing. **DO NOT CUT THROUGH THE WING'S LEADING EDGE SHEETING** as this may cause a structural failure in flight.
5. Sand the balsa Leading Edge to match the rounded shape of the rest of the Leading Edge.



## CHEROKEE 40 PARTS LIST

PART#	QTY	DESCRIPTION	PART#	QTY	DESCRIPTION
CK40F03	2	Balsa Shaped 1/8" Cabin Base			
CANPY030	2	Clear Plastic Windows	CK40A05	1	<b>SUB PACK - DIE CUT PARTS</b>
CANPY031	1	Clear Plastic Windshield	CK40F11	1	Balsa 1/8 DC Bulkheads 4A-8A
CK40D01	1	Decal Sheet	CK40W02	4	Balsa 3/32 DC Wing Ribs
CK40F01	2	Balsa 1/8 Fuselage Side			
CK40F12	2	1/8 Ply DC Cabin Side	CK40A06	1	<b>SUB PACK - FUSE PARTS</b>
CK40F13A	1	1/8 Ply DC Bulkheads 2	CK40F06	2	Balsa 1/2 x 2-1/8 x 5-7/8 Cabin Top Rear
CK40F13B	1	1/8 Ply DC Bulkheads 4			
CK40P01	1	Plan Sheet	CK40F08	2	Balsa 1" Cowl Top Block
CK40P02	1	Instruction Book			
CK40S01	1	Balsa 3/8 x 1 -3/8 x 24 Elevator	CK40A07	1	<b>SUB PACK - FUSE PARTS</b>
CK40W09	2	Balsa Wing Tip Block	CK40F07	2	Balsa 1/2 x 2-1/8 x 4-1/4 Cabin Top Front
COWL003	1	ABS Plastic Cowl	CK40F09	2	Balsa 3/8 x 2-1/2 x 6-1/8 Tank Bottom
MM40U	1	Motor Mount	CK40F10	1	Ply 1/4 x 4-7/16 x <b>3-5/8 Firewall</b>
PLTB002	3	Plastic 36" Outer Pushrod Tube	CK40R01	1	Balsa 1/4 Rudder
WIREST21	1	1/16 x 36" Threaded Pushrod Wire (wing)	CK40R02	1	Balsa 1/4 Fin Front
WIRES10	3	2-56 x 36" Threaded Pushrod Wire	CK40R03	1	Balsa 1/4 Fin Rear
CK40A01	1	<b>SUB PACK - FUSE PARTS</b>	CK40A08	1	<b>SUB PACK - WING PARTS</b>
CK40F05	1	Balsa 1/4 Stab Plate	BAL098	8	Balsa 3/32 x 3 x 11 -7/8 Center Section Sheeting
CK40F14	1	Balsa 3/8 x 5/8 x 2 Tail Post Block	CK40W06	1	Balsa 1/8x3/4x10 Front Fairing
CK40F15	1	Ply 1/8 x 7/8 x 4-9/16 Dowel Jig	CK40W10	1	Balsa Tapered 3/8 Center Rib Wedge
CK40R04	1	Balsa 1/4 Fin Top			
CK40R05	1	Balsa 1/4 Dorsal Fin			
CK40S02	1	Balsa 1/4 x 2 x 3 Stab Center Section	CK40M01	1	<b>SUB PACK - HARDWARE</b>
CP60F19	6	Plywood 1/4 x 1/2 x 3/4 Cowl Blocks	BRSB001	2	Brass Bushing For Bellcrank
PLY3009	2	Plywood 1/4 Rear Hold Down	GLTP001	1	Fiberglass Tape 1x 8
			NYLON36	4	Nylon Gear Hold Down Straps
CK40A02	1	<b>SUB PACK - WING PARTS</b>	NUTS003	4	6-32 Blind Nuts
CK40W05	2	Balsa 1/4 x 2-1/2 x 4 Rear Fairing	NUTS002	2	4-40 Hex Nuts
CK40W07	2	Balsa 1/8x2-3/8x2 Front Fairing Bottom	NYLON01	2	Nylon Bellcrank
CK40W11	2	Balsa 3/32 x 1 x 3-3/8 Aileron Exit Plate	NYLON03	4	Nylon Control Horn
DOWEL017	2	Hardwood 1/4 Dia x 3 Hold Down Dowel	NYLON09	24	Nylon Hinges
HRDWD005	2	Hardwood 5/8 Landing Gear Gusset	NYLON13	2	Nylon 1/4x20 Wing Bolt
HRDWD010	2	Hardwood 5/8x4-1/2 Landing Gear Block	NYLON16	1	Nylon 5/32 Nosegear Steering Arm
HRDWD013	2	Hardwood 5/8 x 3/4 Landing Gear Block	NYLON 17	4	Nylon Clevis
PLY3004	4	Ply DC 1/16 Landing Gear Brace	NYLON20	2	Nylon Swivel
PLY3007	2	Ply 1/16 x 9/16 x 3/4 Aileron Horn Plate	NYLON21	2	Nylon Swivel Clevis
PLY3020	2	Ply 1/16 x 3/4 x 1 Wing Plate	NYLON33	1	Nylon Nosegear Bearing
CK40A03	1	<b>SUB PACK • SHEETING</b>	SCRW002	4	2-56 x 5/8 Screw
CK40F16	3	Balsa 3/32 x 2-5/8 x 30 Fuselage Bottom	SCRW003	6	4-40 x 1 Bolt
CK40F17	4	Balsa 1/8 x 2-1/2 x 24 Deck Top, Deck Sides Sheeting	SCRW008	4	6-32 Bolts
CK40S03	4	Balsa 1/16 x 2-5/8 x 24 Stab Sheeting	SCRW010	6	#4 x 5/8 Screw
			SCRW020	1	6-32x1/4 Screw
CK40A04	1	<b>SUB PACK - STICKS</b>	SCRW024	12	#2x3/8 Screw
BAL046	5	Balsa 1/4 sq x 36 Fuse Top Stringer	WBNT002	1	Wire 3/32 Aileron Torque Rod Set
BAL047	2	Balsa 1/8 x 1/4 x 36 Rear Bulkhead Stock	WHCL005	1	5/32" Wheel Collar
CK40F18	6	Balsa 3/32 x 1/4 x 36 Stab Rib Stock, Cap Strips	WSHR005	2	#4 Flat Washer
CK40F19	2	Balsa 1/4 x 3/8 x 24 Fuselage Side Stringers	CK40M02	1	<b>SUB PACK - LANDING GEAR</b>
SK40F07	2	Balsa 1/4 x 1/2 x 29-3/4 Stab LE, TE and Tip Stock	WBNT094	2	5/32 Wire Main Landing Gear
			WGNT094	1	5/32 Wire Nose Gear
			CK40W01	1	<b>SUB PACK - WING PACKAGE</b>
			BAL060	5	Balsa 3/32 x 7/8 x 30 Trailing Edge Sheeting
			BAL110	2	Balsa 1/4 x 3/8 x 20 Trailing Edge
			BAL131	4	Balsa 3/8 sq x 30 Wing Spar
			CK40W03	2	Balsa 9/16x1-1/2x28-1/2 Aileron, Flap, Center TE
			CK40W04	2	Balsa 1/4 x 7/8 x 30 Leading Edge
			CK40W08	4	Balsa 3/32 x 2-1/2 x 30 Leading Edge Sheeting