KIWI

BUILDING AND FLYING INSTRUCTIONS

SIG®
CRAFTSMAN'S KIT

RC 42

SIG MANUFACTURING CO. . . Montezuma, Iowa 50171

KIWI

By Hank Pohlmann Kit No. RC-42

KIWI DESIGN FEATURES

The KIWI engine compartment is designed for ease in cleaning out engine oil residue. The plywood side doubler, and F-1 form a solid compartment with a minimum of glue joints exposed to engine oil. The design intent is for good cooling and minimum oil leakage behind the firewall. Cleaning is done by spraying cleaning fluid around the engine and allowing it to drip out the open bottom. Upright and side mounted engines can be accomplished by rotating the engine mounts to the desired position and cutting out the sides for engine and muffler.

ABOUT THE BUILDING SEQUENCE

The quickest and most efficient way to complete a model is to work on several pieces at the same time. While the glue is drying on one section you can start on or proceed with another part. Work can even go forward on several sections of the same assembly at the same time, such as the front and rear of the fuselage. We occasionally get suggestions that our instruction books should be in exact step-by-step building sequence. But this would result in many sentences starting, "While the glue is drying on the fuselage, move to the wing.....etc." and a lot of jumping back and forth between assemblies with no consistent pictorial progression. Also, a pre-selected building sequence by our choice might not suit your workshop space and time allotments. Therefore, we feel the present system of covering main assemblies in a unit works out best for the majority of kit builders. So keep in mind that the numbering sequence used in this book was chosen as the best way of explaining the building of each major assembly and is not intended to be followed in exact one-two-three fashion. Start on the wing at No. 1 and after performing a step or two, flip over to the next main heading of "FUSELAGE CONSTRUCTION" and do a step or two there, then over to "FIN ASSEMBLY" and so forth. You will, of course, arrive at points where you can go no farther until another component is available. For example, you need a completed and mounted wing before the front of the fuselage on top can be completed. The way to understand these relationships is to read the book completely and study the full size plan before beginning to work.

SOME RULES TO FOLLOW

Cut all long pieces of balsa first, followed by medium lengths before cutting up any full-length strips into short pieces. Remove die-cut pieces from the sheets carefully. If difficulty is encountered, do not force the part from the sheet. Use a modeling knife to cut it free. Leave parts in the sheets until needed in construction.

A piece of Celotex-type wallboard makes a handy building board, into which pins can easily be pushed. Lay the building board on a table with a flat and untwisted top. Pins can be pushed through all pieces of balsa in the kit without any lasting damage. Don't be afraid to use plenty of pins. The holes will fill up during sanding and doping.

Wax paper should be used to protect the plan during building when the glue used is epoxy or an alphatic resin glue such as Sig-Bond. If a model cement like Sig-Ment is preferred, use plastic wrap to protect the drawing. This type of glue can dissolve the wax, which will inhibit drying.

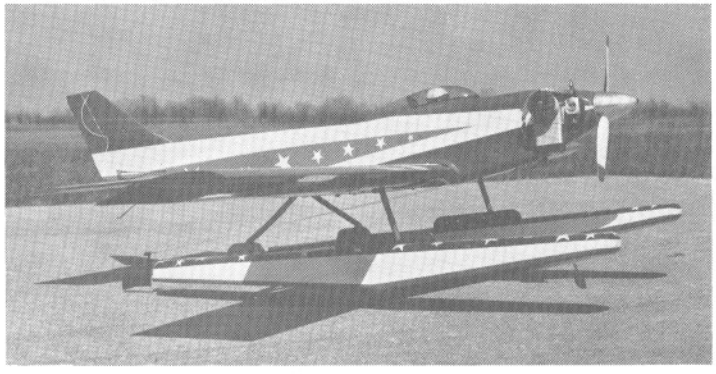
Be careful where you use a ball point pen for making marks. If not sanded off, these marks will bleed through many coats of dope and show on the finished model.

Any reference to right or left refers to right or left as if seated in the cockpit.

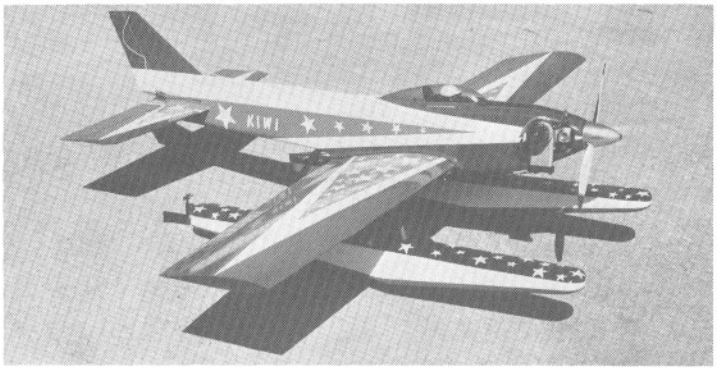
". . . . . read the book completely and study the full size plan before beginning to work."

RECOMMENDED GLUES

The framework may be glued with either Sig-Bond resin type glue or Sig-Ment solvent type cement. In any joint involving plywood or hardwood, Sig-Bond is the best choice. Areas subjected to unusual strain, exposed to fuel or oil, or including metal pieces, should be epoxied with Sig Epoxy Glue or Sig Kwik-Set 5 minute type epoxy. Some specific pieces have other recommendations. You will find these in the directions concerning the part.



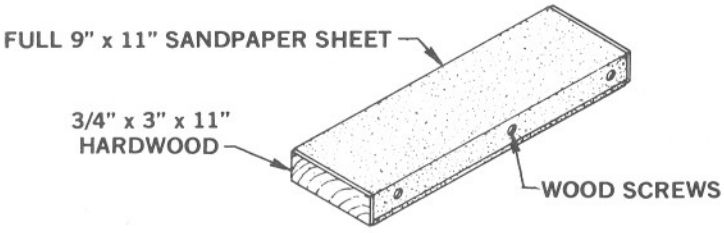
Jim Duda (Davenport, Iowa) put his Kiwi on a set of 33" Gee Bee plastic floats. See the Sig catalog for more information on these ready-to-go accessories that can be easily mounted or removed for dry land flying.



To make his Kiwi handle better on the water, Jim added a water rudder. If you look closely, the cables connecting the rudder to an easily removable steering arm installed in the Kiwi nose wheelbracket can be seen.

WOOD SIZES IN THE KIT

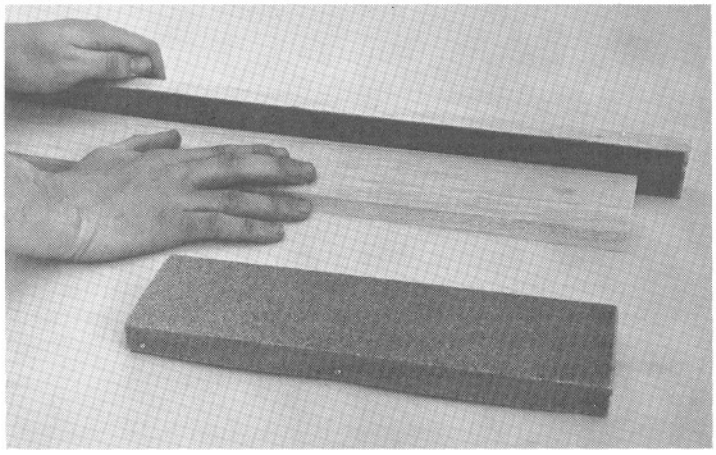
Sometimes, depending on the raw wood supply and sawing schedules, we may put a larger piece of planking wood in the kit. For example, you may get 2" wide wood for the wing trailing edge planking instead of 1-1/2" wide. This extra wood, cut off when planking, can be saved for some other use.



SANDING BLOCK

The first construction requirement is to make (if you don't already have one) a large sanding block that will take a full sheet of sandpaper. You will find it to be an almost indispensible tool for many operations and well worth the small effort involved in making it. Use several wood screws along one edge to hold the sheet in place. 80 grit garnet paper is recommended for use on the block during general construction. You can switch to 100 grit for final finish just before covering.

To supplement the large sanding block, sandpaper may be contact glued to several sizes of square hardwood sticks and round dowels. These are handy for working in confined areas of the model or smoothing corners.



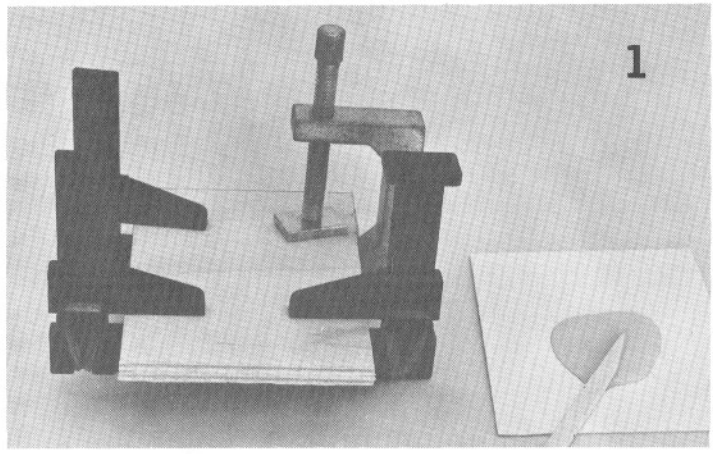
Another handy tool is a long piece of aluminum approximately 1" square 24" or 36" long, one side covered with sandpaper contact cemented. The long bar is used for trueing balsa sheets and sanding leading and trailing edges, the smooth side can be used as a straight edge. Most hardware stores carry a stock rack of aluminum, various shapes and sizes in 5' to 7' lengths.

CUTTING OUT PRINTED PARTS

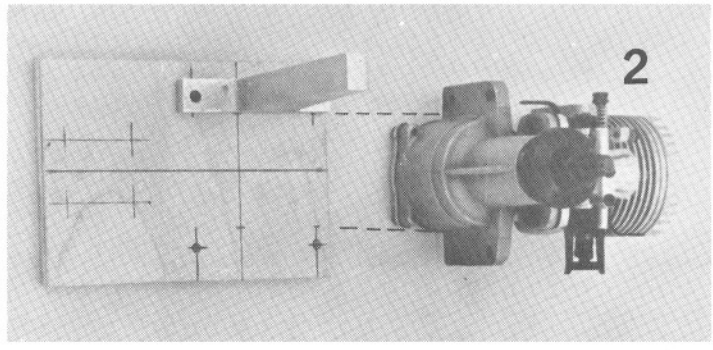
A jig saw is best for this job. Cut just outside the lines, leaving all of the black line on the part. When fitting the part into place in the model, use the sanding block to bring the edges to an exact fit. If a modeling knife is used to cut out the parts, don't cut too close to the lines---leave some extra wood outside the line. True up and finish the edge with the sanding block.

FUSELAGE CONSTRUCTION

SPECIAL NOTE: It is best to have the engine, muffler, and spinner that will be used on hand when working on the fire wall set-up. For example, the backplate on Goldberg spinners has a recessed back, so the engine must be mounted about 1/8" farther ahead than when using other brands of spinners.



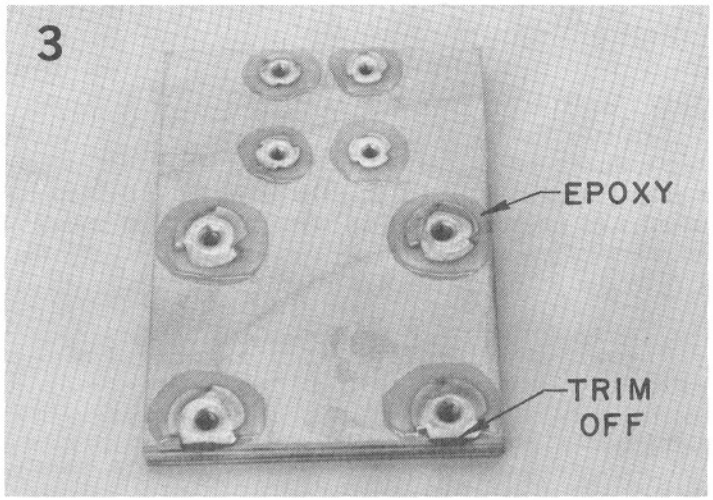
1. The firewall is made by gluing the two die-cut 1/8" ply-wood formers F-2 and F-3 together to form a 1/4" thick piece. Use epoxy glue and weight down or use clamps until the glue sets up.

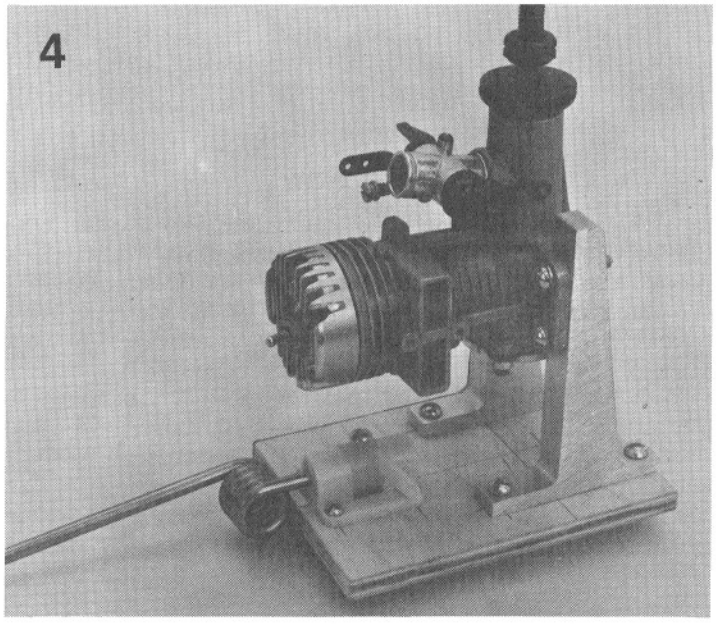


2. The engine installation, using a inverted mounted engine, is shown on the plan. The prototype Kiwi used no engine offset to the right or down. It is easiest to set up the engine mounts and nose gear bearing before the firewall is attached to the fuselage. Mark the vertical and horizontal center lines on the firewall, using the drawing on the plan as a reference, or as required, by the engine being used. DETERMINE THE SPACING REQUIRED BETWEEN THE ENGINE MOUNTS FOR YOUR ENGINE. Mark the appropriate mount and bearing locations and mounting holes on the firewall and drill them out. The holes in the firewall back must be large enough to allow the shanks of the blind nuts to pull into the firewall when tightened.

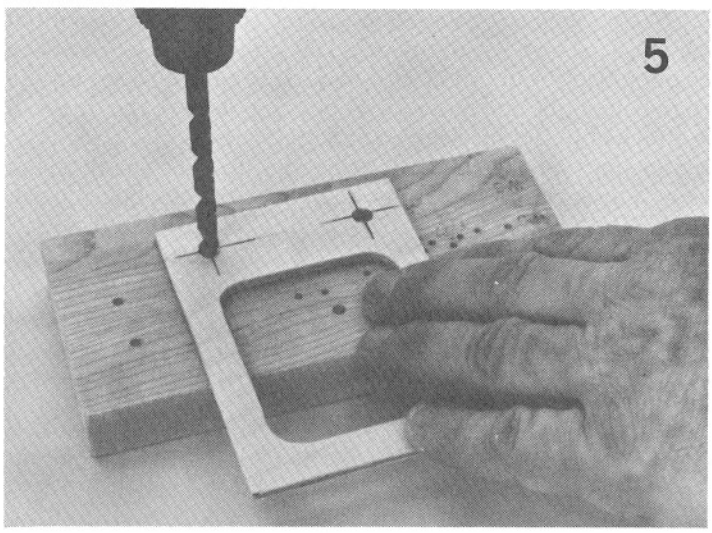
3. Epoxy the blind nuts to the back of the firewall.

4. The engine should be positioned on the aluminum mounts so that the spinner backplate is about 1/16" to 3/32" ahead of F-1. With the mounts bolted in place on the firewall, refer to the full size plan and determine the proper location of the engine on the mounts. Mark the mounting holes. Drill the holes with a #36 drill and tap for 6-32 mounting bolts. If you do not have a tap, use bolts, lock washers and nuts. Photo shows a Fox 36 RC installed.





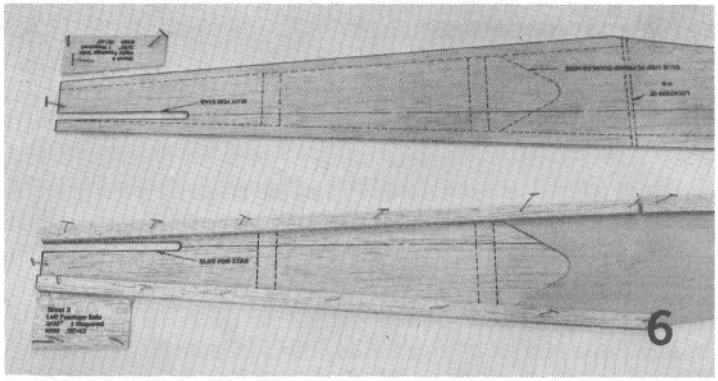
Locate and drill the holes for steering arm and throttle control cables.



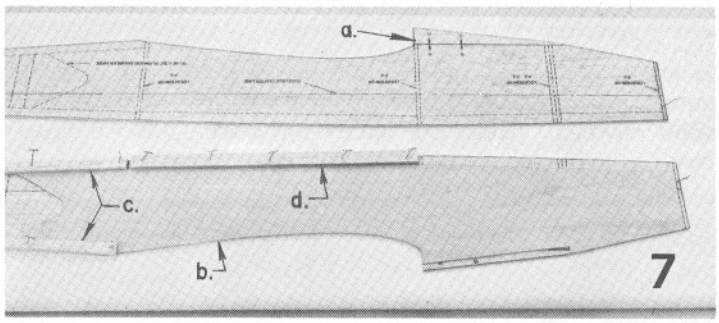
5. Using the drawing, mark the locations of the wing hold down dowels on F-4. Drill two 1/4" holes in F-4. When drilling plywood, always back up the underside with a hardwood block to prevent splitting as the drill passes through.

CAUTION!

Do not glue the plywood doublers on with Sig Bond, Tite Bond, Elmer's, white glue or any other adhesive that has a water base. Water base glue will cause the doublers and sides to curl because of the large area being glued. Don't use an excessive amount of glue---it will add unnecessary weight.



6. The internal framework of the fuselage is built directly on the printed wood sides. Cut outside the lines and sand to the line.

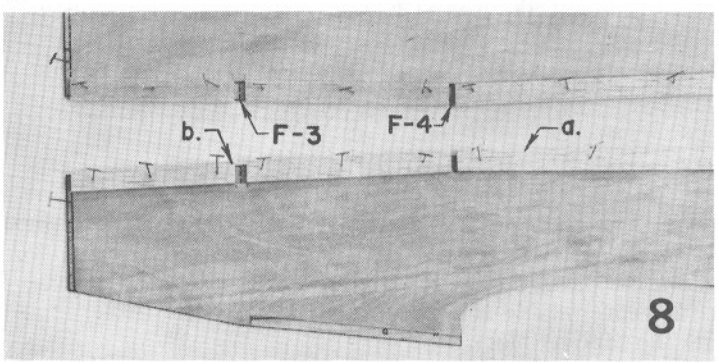


7. a. Glue the small printed pieces marked G and H that are on each fuselage side sheet to the side, matching the arrows and letters.

b. The doublers on the prototype were glued in place with Sig Kwik-Set five minute epoxy. Work quickly, spread a thin film of glue over the entire doubler, put in place and press down by rubbing with a rag while the glue is setting up. Avoid excess glue---it will add unnecessary weight.

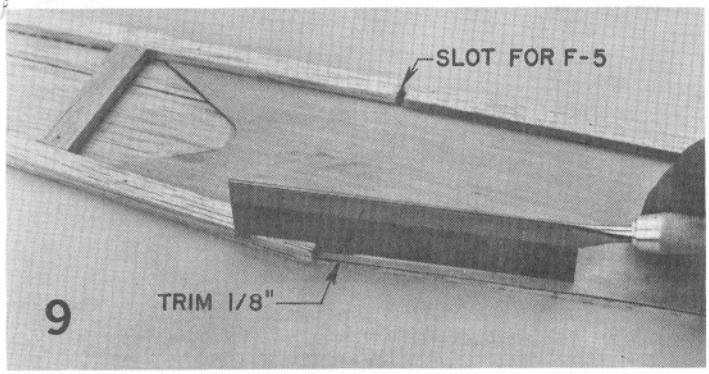
c. Pin and glue the rear and bottom 3/16" x 3/8" fuselage stringers in place. The bottom stringer tapers to about 1/4" - leave the excess hang over fuselage side, it will be trimmed off later.

d. Pin and glue the top 3/16" x 1/2" fuselage stringer in place.

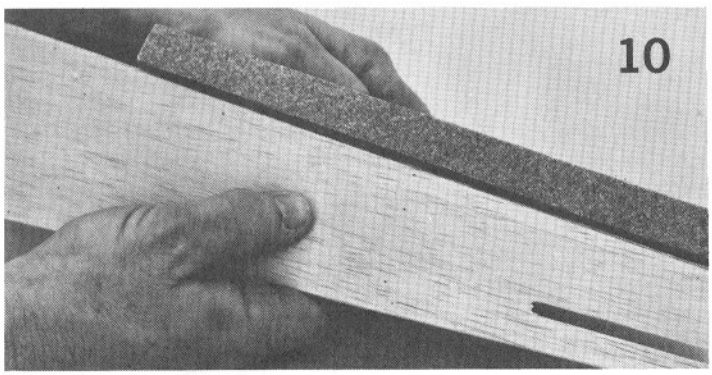


8. a. Leave a 1/8" gap for F-5. Glue and pin the next piece of 3/16" x 1/2" from F-5 to F-4.

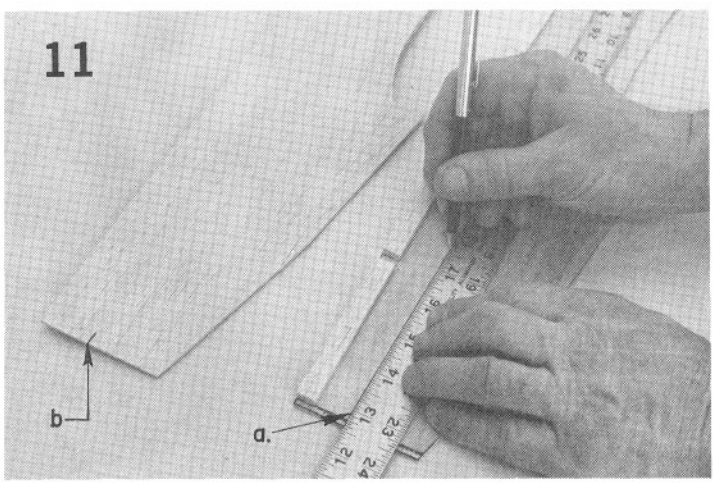
b. The front piece of 3/16" x 1/2" balsa has a 1/4" gap for F-2 and F-3.



9. Trim the bottom stringer with a razor saw.



10. Trim and match sand the two sides. The forward top has a slight curve, the rear top and bottom are straight.

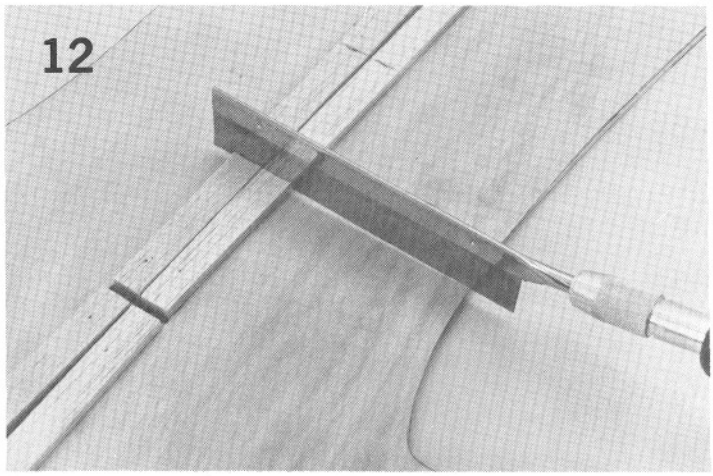


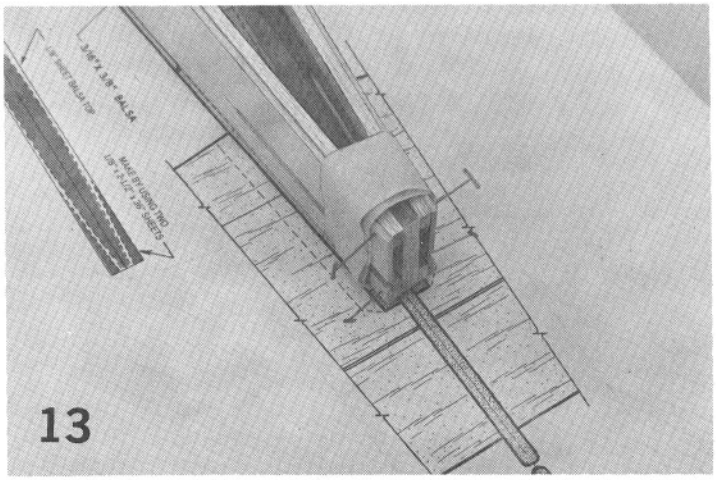
11. a. Mark the thrust line on the plywood doubler for future reference.

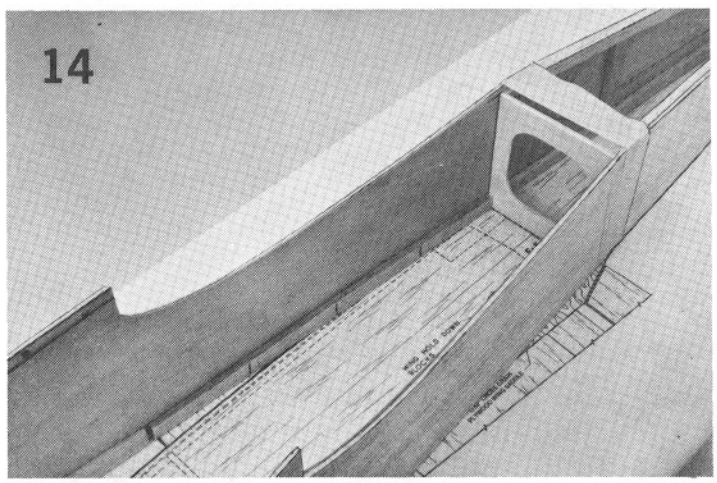
b. Mark it on the outside of the fuselage also.

12. Saw half way through the top 3/16" x 1/2" stringers in three equally spaced locations between F-4 and F-5. This will assist the bending of the fuselage sides in a smooth curve.

13. Place the fuselage sides on the top view plan with the top down. Align the sides and pin a 1/4" x 1/2" x 1-5/8" scrap piece of wood between them at the rear. Wrap several turns of masking tape around it.





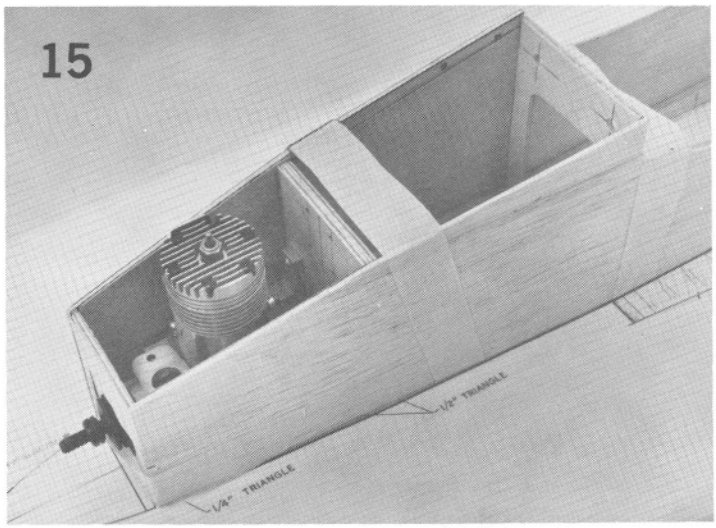


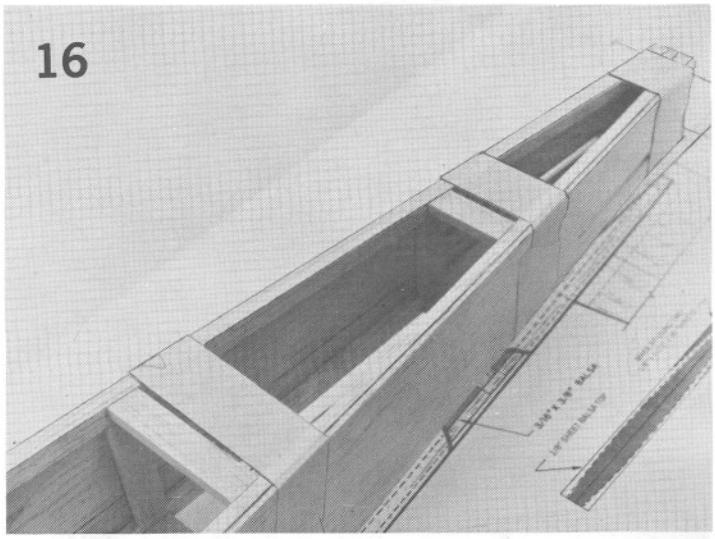
14. Place F-5 in position. Check for alignment. It may be necessary to trim the notches or sand the former a bit to square up the assembly. (The same holds true for formers farther forward.) When satisfied with the former alignment, glue F-5 in place, using tape or clamps to hold the sides together.

15. a. Add F-4 in the same manner as F-5.

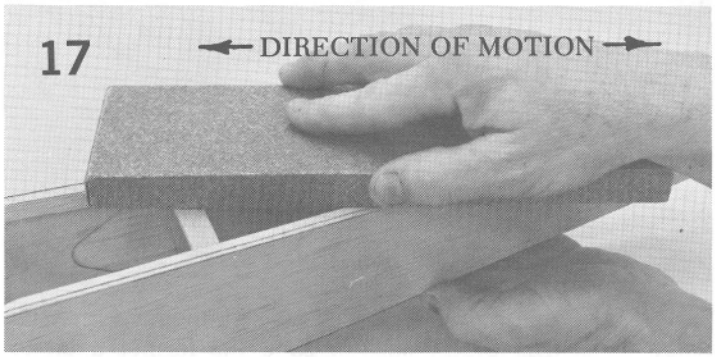
b. Glue in the F-2/F-3 firewall assembly, using the reference marks on the fuselage and firewall as an alignment check. Use epoxy.

c. Finish side joining with F-1, which fits into the 1/8" notch between the balsa sides and plywood doubler.





16. Cut 3/16" x 1/2" fuselage cross-pieces to fit and glue them in place. When dry, remove all clamps and tape except those at the tail shim block.

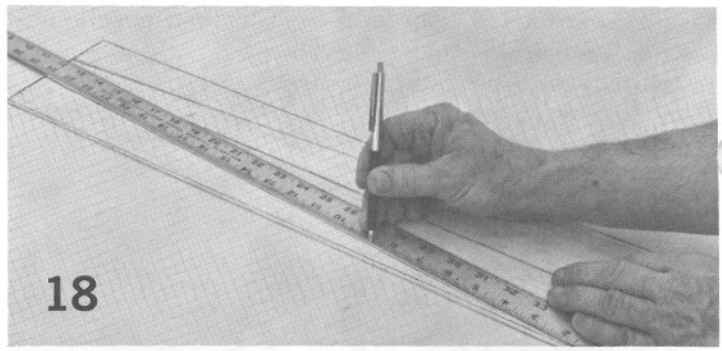


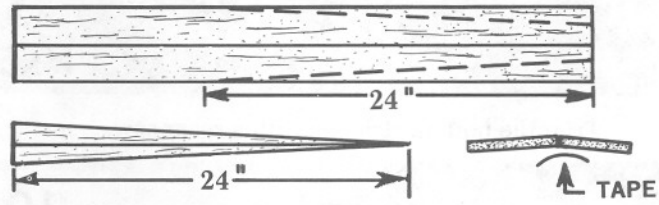
17. Smooth and sand the joined sides with the sanding block.

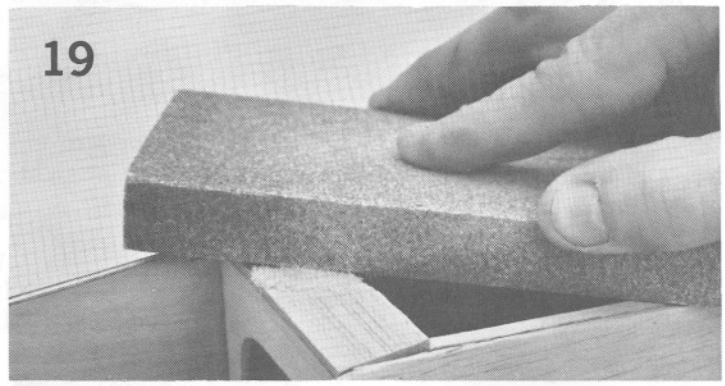
18. a. Glue two sheets together using masking tape.

b. Cut a 1-7/8" x 24" triangle from each side of the two sheets - glue together as shown. The large sheet is used for top of fuselage. The small assembly is for bottom rear of fuselage. LAY SHEETS ASIDE TO DRY.

NOTE: Some builders like to cover the bottom (and top) with the grain running crosswise instead of lengthwise. In this case glue and pin pieces on to the fuselage one at a time. This makes the fuselage a bit stiffer than when the grain is running lengthwise but takes a little longer to do and has more glue seams. The kit is supplied with enough 1/8" x 2-1/2" x 36" to sheet the model either way.

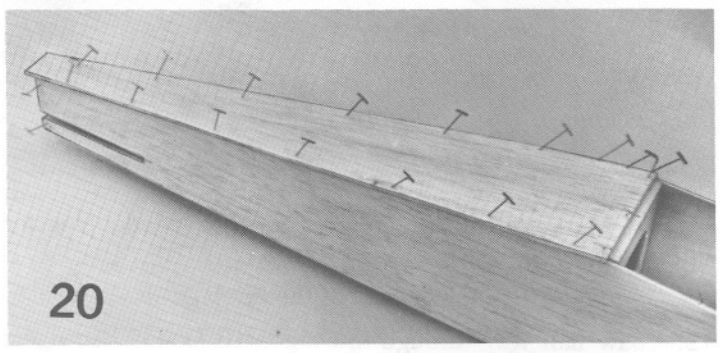






19. a. Glue a 1/8" x 1" x 3-1/8" piece of scrap balsa on top of F-5 and between the sides.

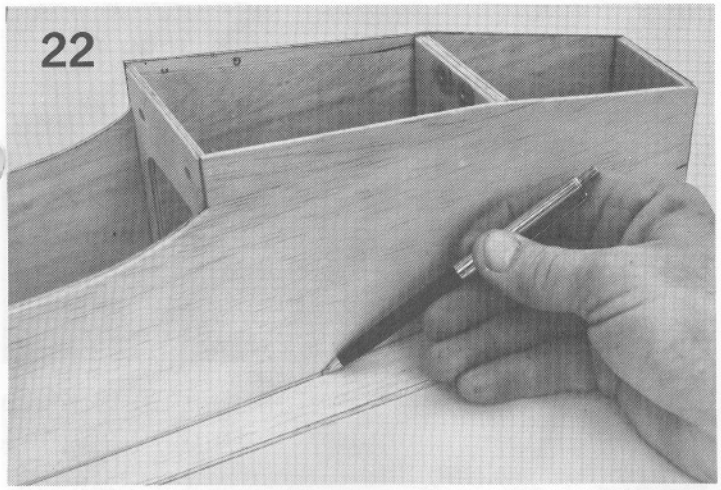
b. Sand it off at the same angle as the fuselage sides.

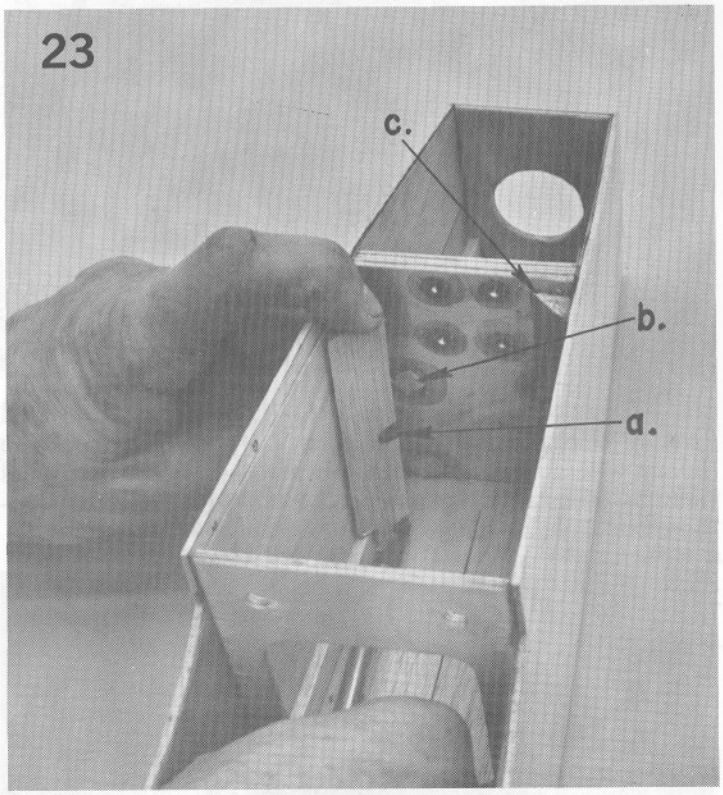


20. Pin and glue the bottom sheeting in place.

21. Mark and trim the top planking sheet. Glue on with Sig Bond.

22. Remove the temporary shim from the rear end. Sand the end square with the sanding block. Glue the 3/8" x 1" x 2" balsa tail block in place.





23. a. Cut two 1/2" x 3-1/2" pieces of triangular stock and sand to fit against the firewall. Mark and cut out clearance holes for the blind nuts.

b. Cover the holes in the blind nuts with tape to prevent glue from getting in the threads.

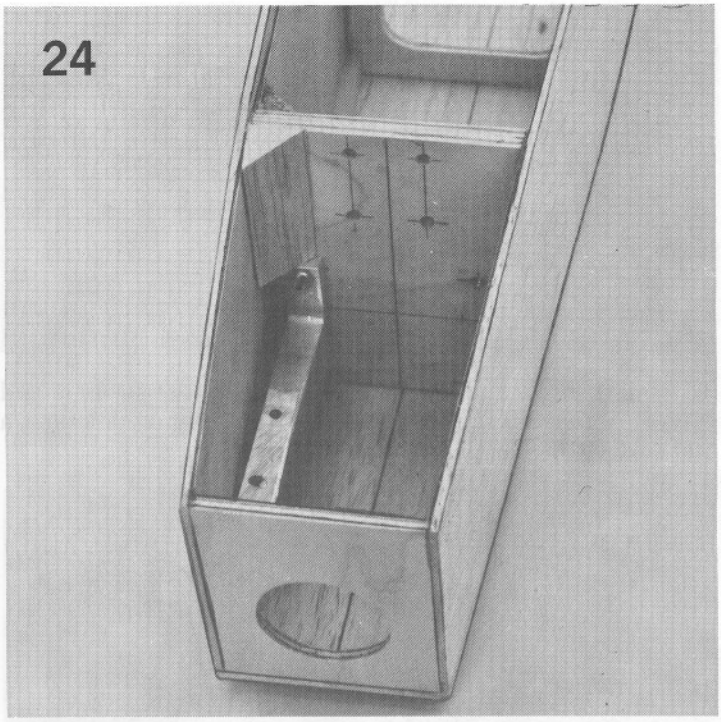
c. Before gluing in place, note that they are 1/4" short of the bottom to allow space for the 1/4" sheet fuselage floor to be glued in later.

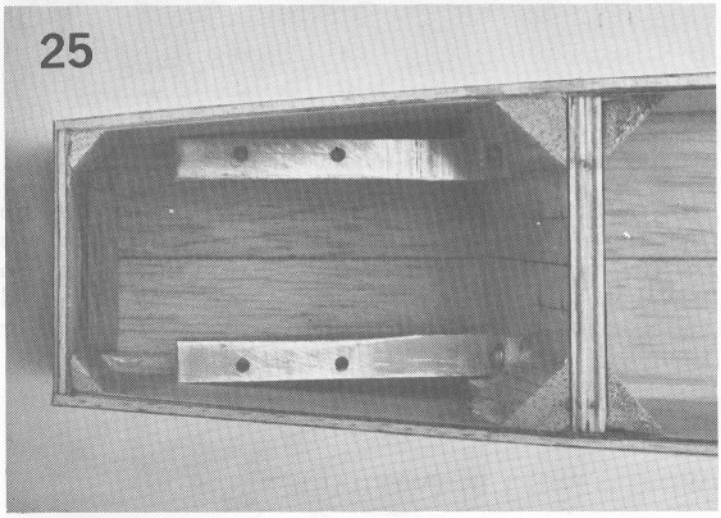
d. Glue the pieces in place with Sig Kwik-Set 5-minute epoxy.

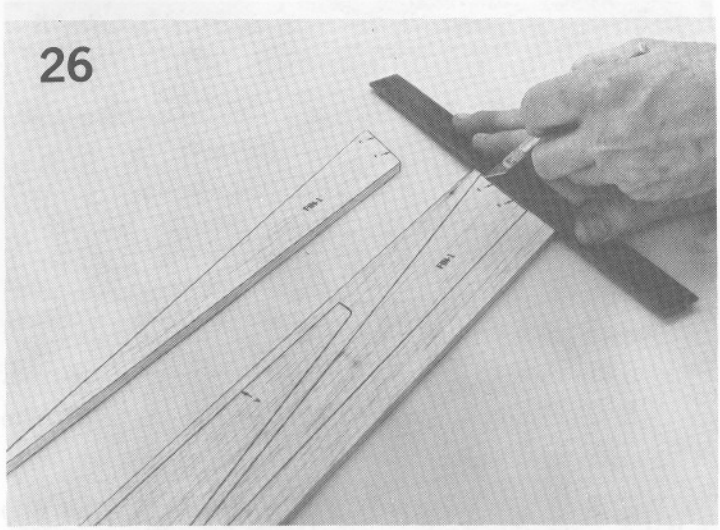
DO NOT INSTALL FUSELAGE FLOOR AT THIS TIME.

24. Cut two 1/2" x 1-5/8" pieces of triangular stock for the front firewall gussets. Sand to fit in the less than 90° angle. Glue in place with Kwik Set.

25. Cut, fit and glue 1/4" triangular pieces behind F-1.

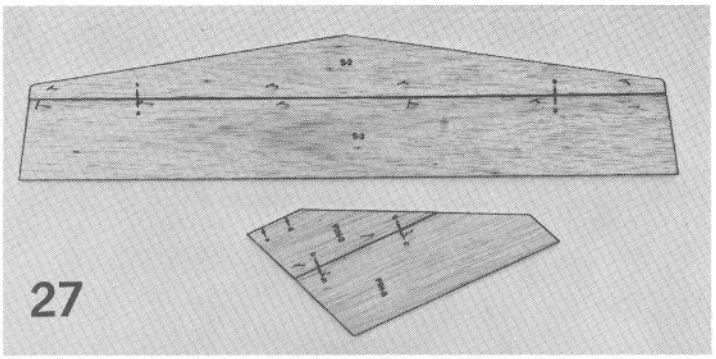




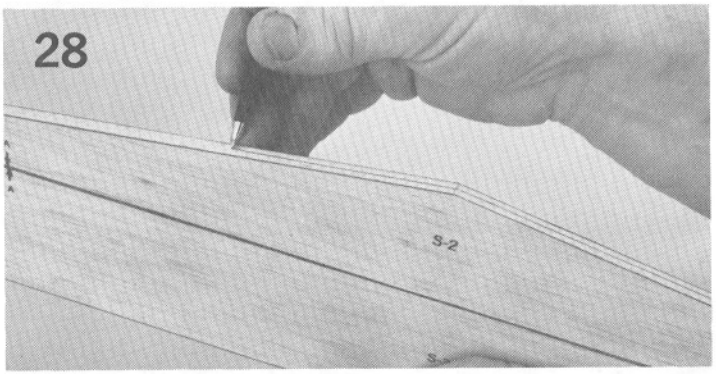


TAIL SURFACES

26. Vertical fin and stabilizer are cut from the printed sheets.



27. Key letters and arrows are printed on the sheets to aid glue joint assembly. Glue them together pinned down on a flat surface on wax paper or plastic wrap.

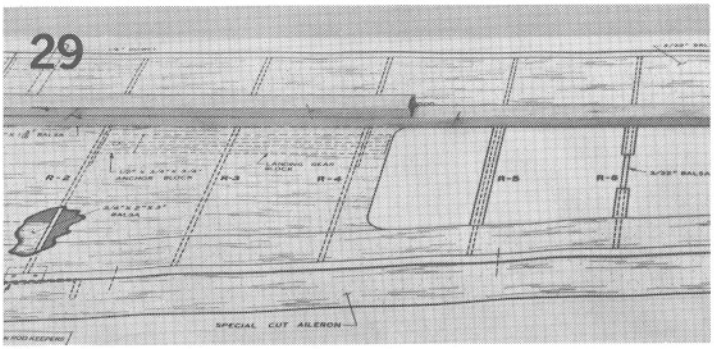


28. Trace a centerline on the leading edge to aid in even shaping when sanding to a rounded contour.

NOTE: Some builders prefer to cover the tail parts before gluing to the fuselage. If this is done, be sure and remove the covering where the parts are glued to the fuselage so that there is a wood-to-wood joint. Hinges may be located and installed now or later or after partial covering and/or painting.

WING CONSTRUCTION

WING IS BUILT IN TWO HALVES

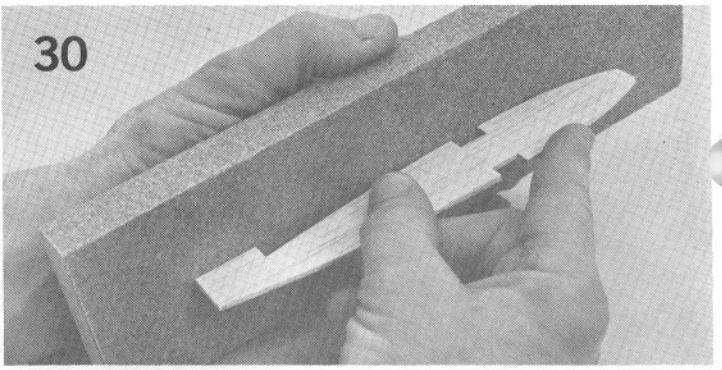


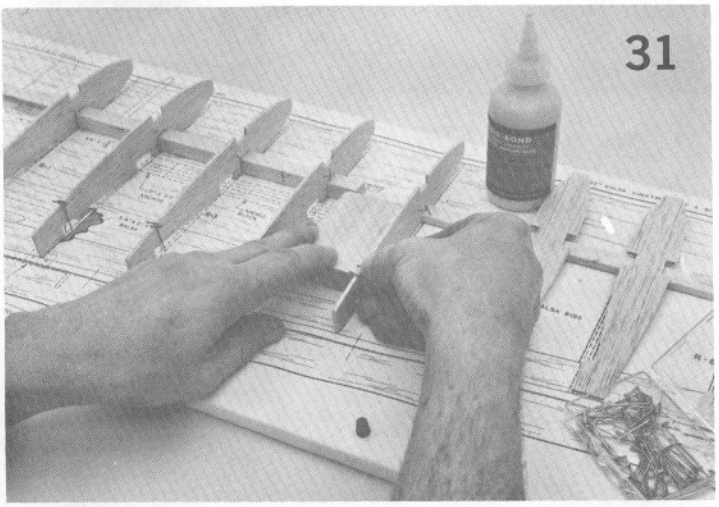
29. a. Pin the 1/4" x 1/2" bottom wing spar on the plan.

b. Glue and pin the 1/4" x 1/2" doubler on top of the spar.

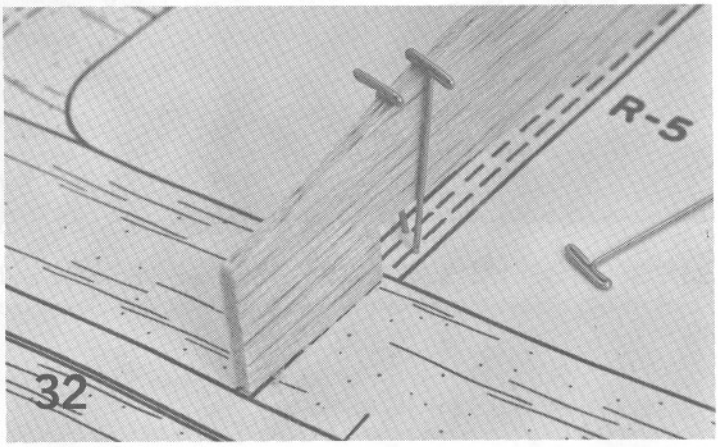
NOTE: Slant pins rearward. This will make it possible to pull them after the planking is on later.

30. Smooth and even the bottoms of the ribs with a sanding block. Do not oversand.





31. Glue the ribs in place on the bottom spar. Use a small square block to aid in pinning the ribs vertical. Check the lineup with a straightedge as you proceed. Slight variances may be adjusted by shimming the tab with paper or cardboard or slight sanding.

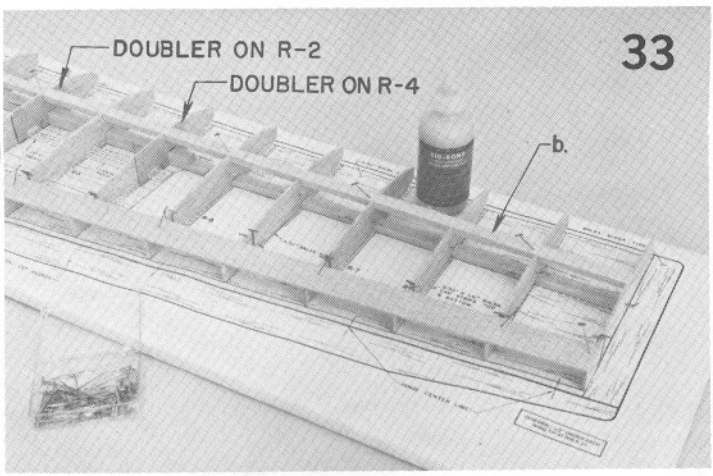


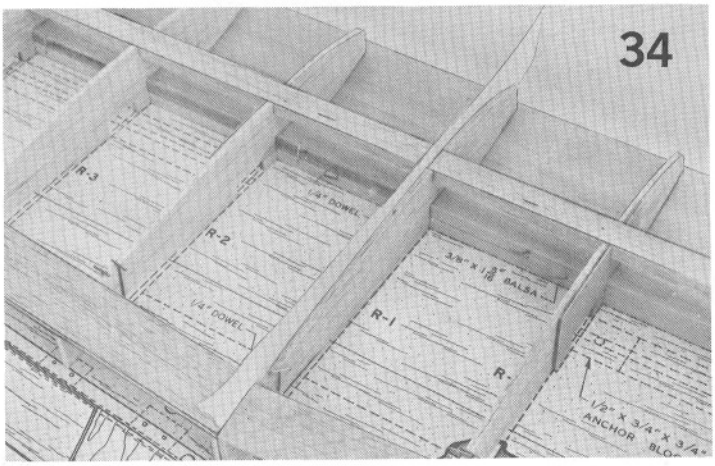
32. Hold the tabs down against the plan with two "T" head pins.

33. a. Identify two of the four 1/16" plywood doublers for the landing gear blocks---they are marked with TWO PUNCH marks. Glue to the outboard side of R-2. Glue the unmarked doublers to the outboard side of R-4. Use Kwik-set and clamp with clothespins or model clamps until set.

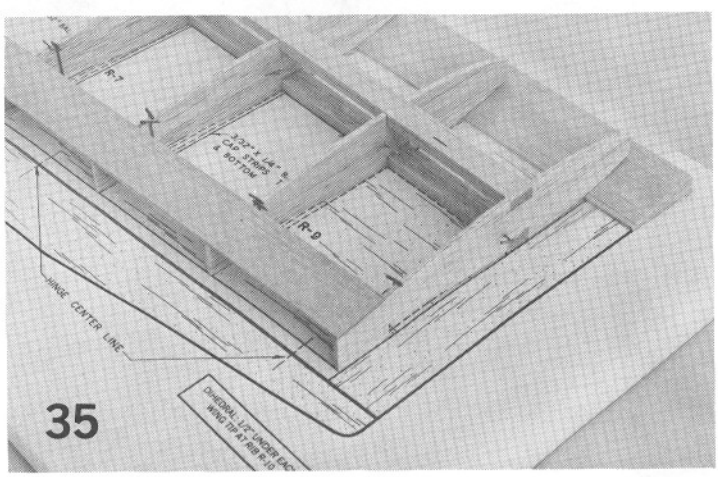
b. Add the 1/4" x 1/2" top spar.

34. a. Slide a piece of wax paper between R-1 ribs on each wing half so that the halves will not be glued to each other.



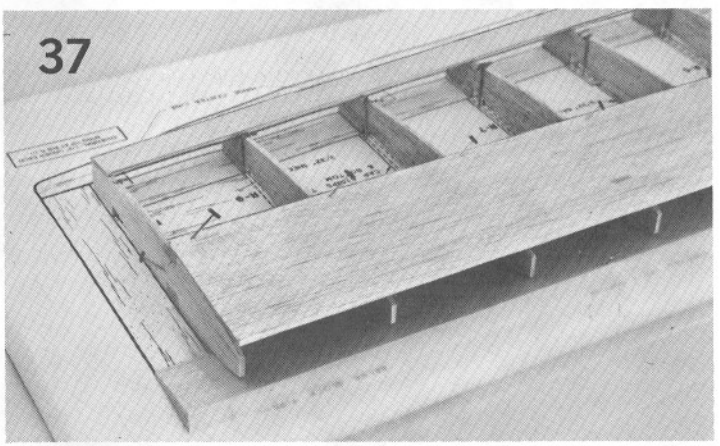


b. The rear planking is 3/32" x 1" sheet wood. It may be found that the sheets are slightly wider than the plan or they may be bowed out of line. Trim the edges, using a metal straightedge before gluing and pinning them in place. Sheet the rear of the wing, gluing and pinning the 3/32" x 1" flush with the back edge of the ribs, with a slight overhang.

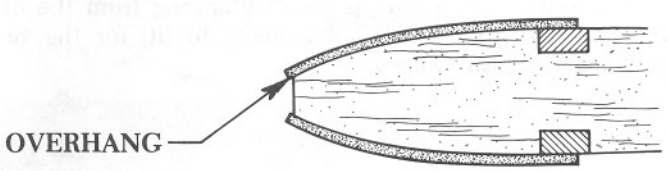


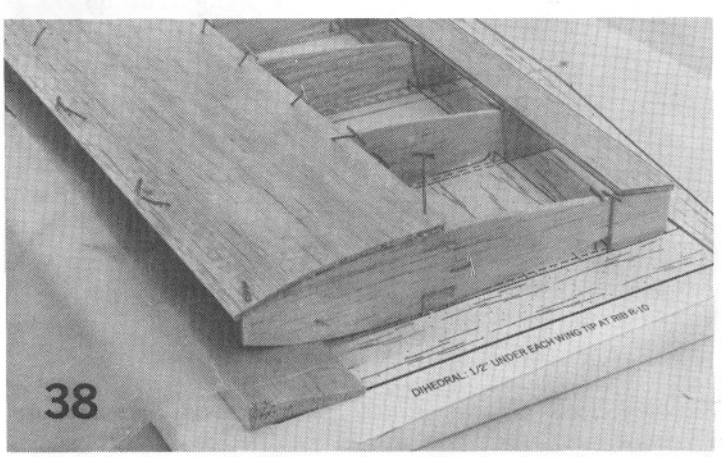
35. Lift the wax paper protecting the plan and slide the aileron stock under it at the front of the ribs to support the ribs while planking.

36. Use the sanding block to lightly touch up the tops of the ribs. Check with a straightedge.

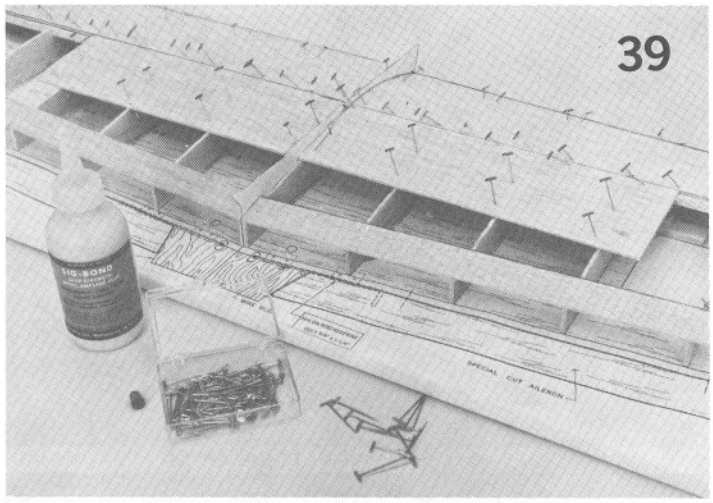


37. Cut a planking sheet to fit the front of the wing. Leave a slight overhang at the front for later sanding down. The waste wood from the end of the sheet (about 9-3/4") will later be used for the center section planking. Glue the front of the wing and pin the sheet to the top spar.

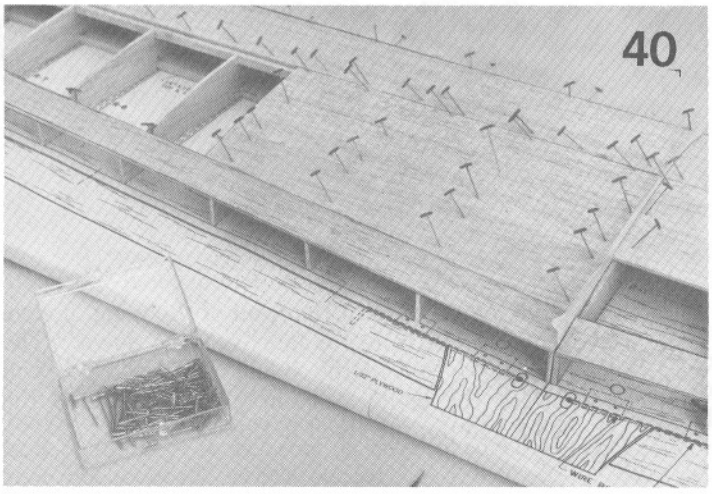




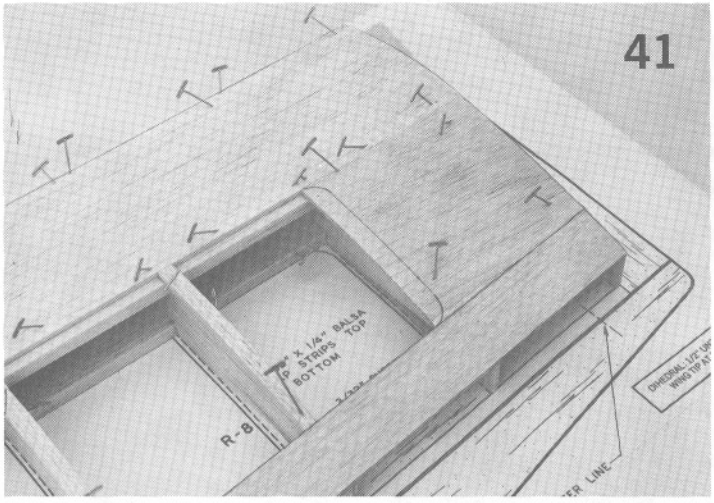
38. Complete pinning down the front planking. Do it dry if it will bend down easily. If not, dampen the wood until it will bend down.



39. Sheet the center section, beginning with the two 9-3/4" waste end pieces from the front planking sheets. The planking intentionally overhangs R-4.



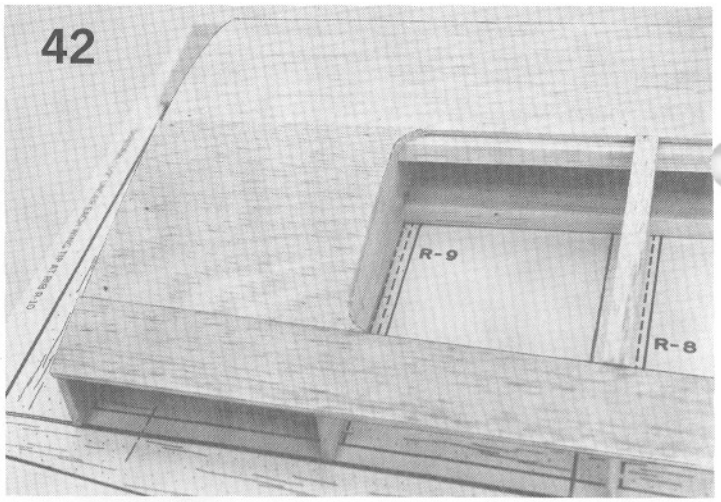
40. Cut one more 9-3/4" piece of planking from the 5th sheet provided. Use it, cut diagonally to fit, for the two remaining sections required.



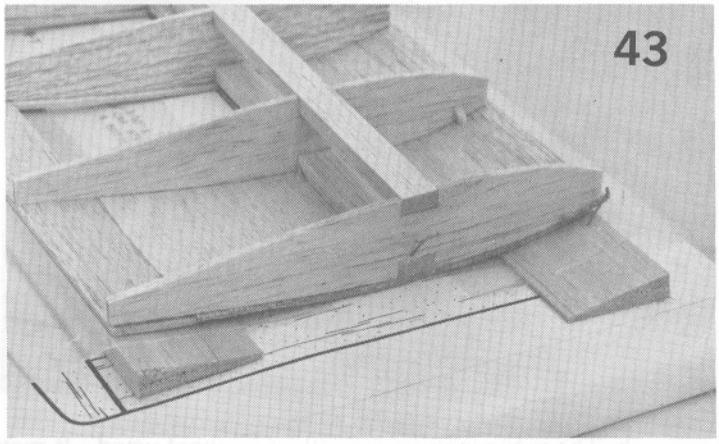
41. a. Sheet the wing tip areas with wood from the 5th sheet.

b. Pin and glue the 3/32" x 1/4" cap strips to each of the ribs.

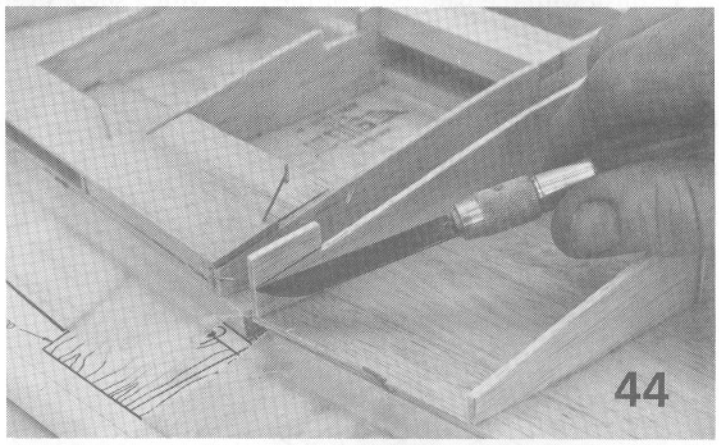
c. Draw a trim line for the round corner.



42. Round the corners of the planking when trimming.



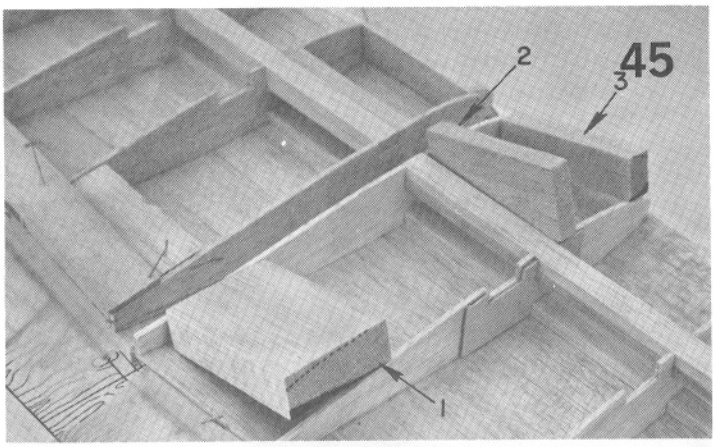
43. Turn the wing halves over and pin in place on the plan, using the shaped aileron stock piece as supports for the leading and trailing edges. Slip them under the protective wax paper.

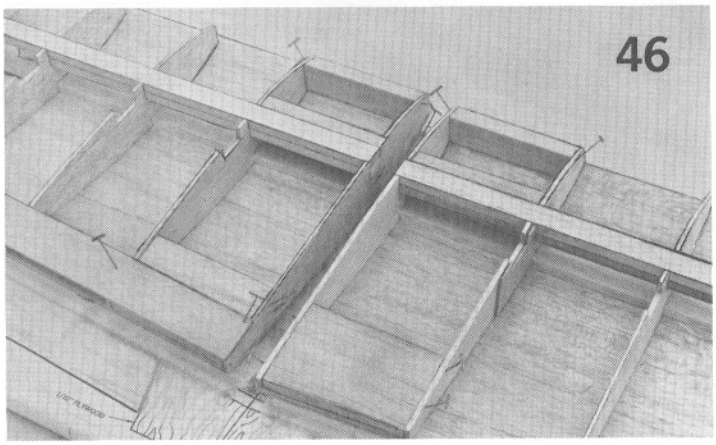


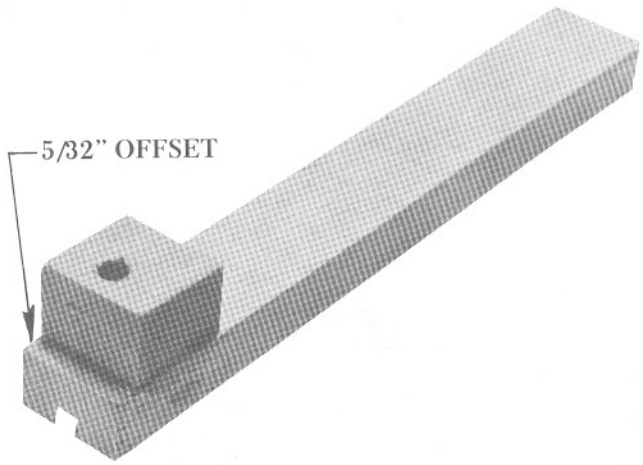
44. Cut off the jig tabs. Touch up the bottom of the ribs with the sanding block.

45. Contour fit the 3 blocks into wing center section. No. 1 (rear bolt down block) is 3/4" x 2" x 3". No. 2 is 3/8" x 1-5/16" x 3". No. 3 is 1/2" x 3/4" x 3" (front dowel supports). Carve the blocks to fit their respective positions and glue in place. Sand to finished contour with the sanding block.

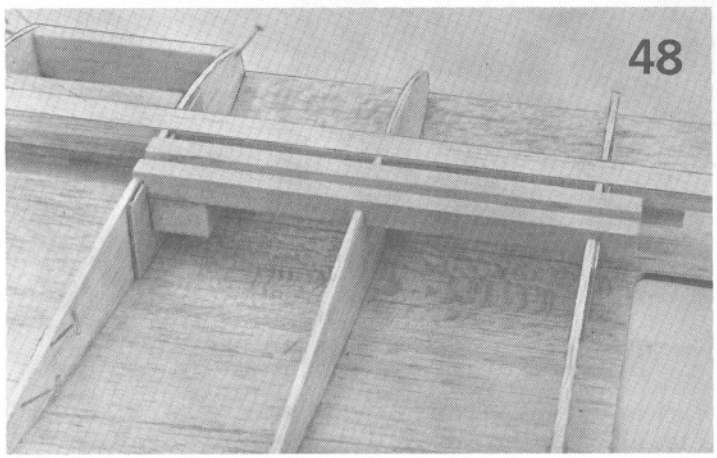
46. Add the 3/32" x 1" trailing edge planking.



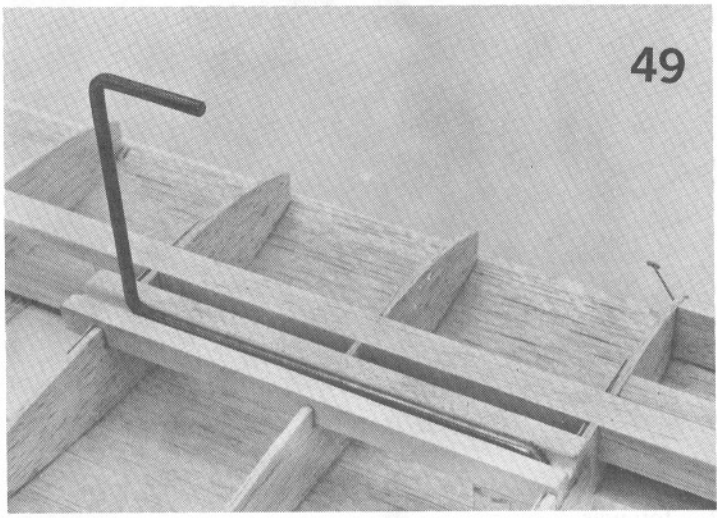




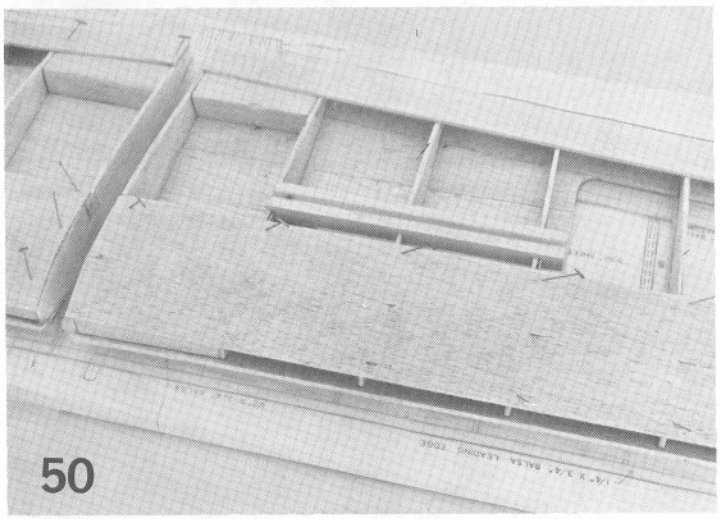
47. Glue the anchor block on the grooved landing gear block with epoxy. Note the 5/32" offset.



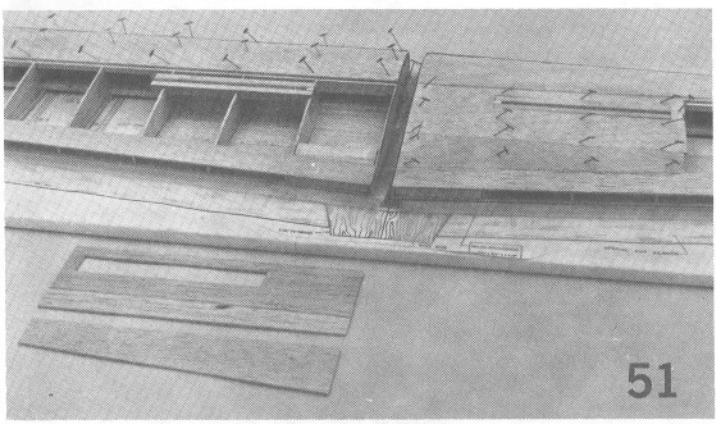
48. Fit the landing gear block assembly into the rib notches. It should stick out 3/32" so as to be flush with the planking when it is added. Glue in place with epoxy.



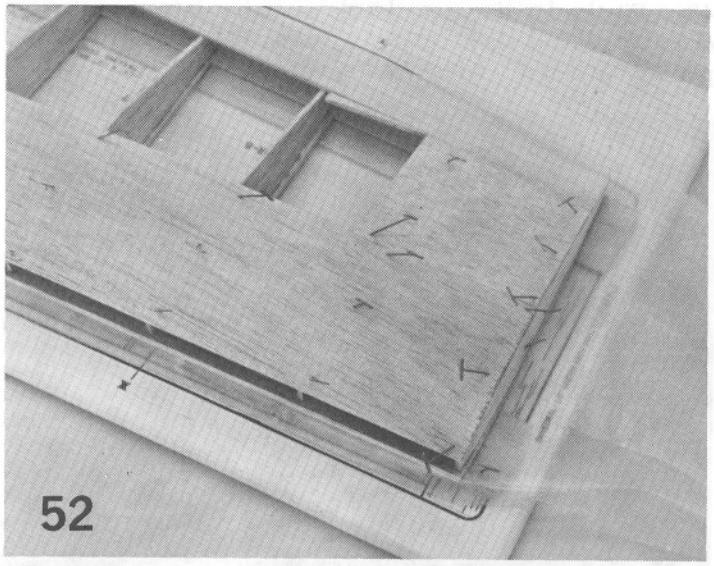
49. Clean out the anchor block hole and groove as may be necessary to make it possible to install and remove the main landing gear when required.



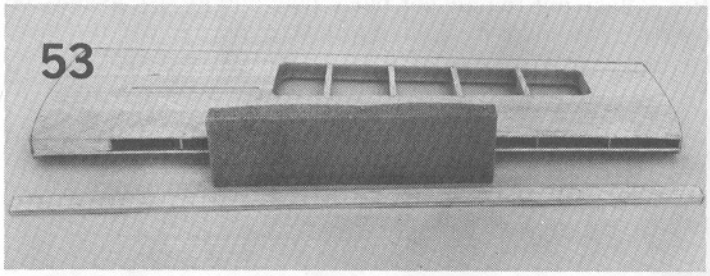
50. Sheet the bottom leading edge in the same manner as the top was done.

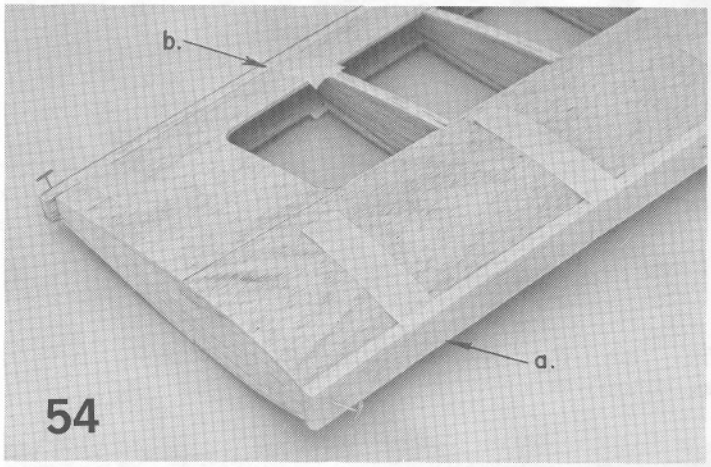


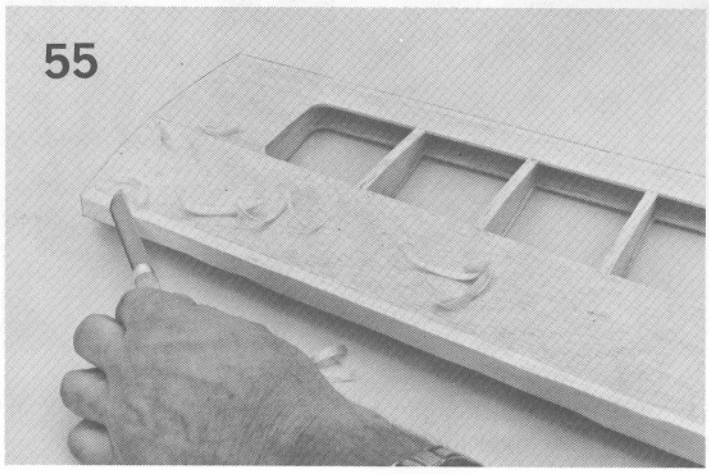
51. Cut center section pieces to fit around the landing gear block and glue in place.



52. Sheet the bottom tip sections in the same manner as the top was done.





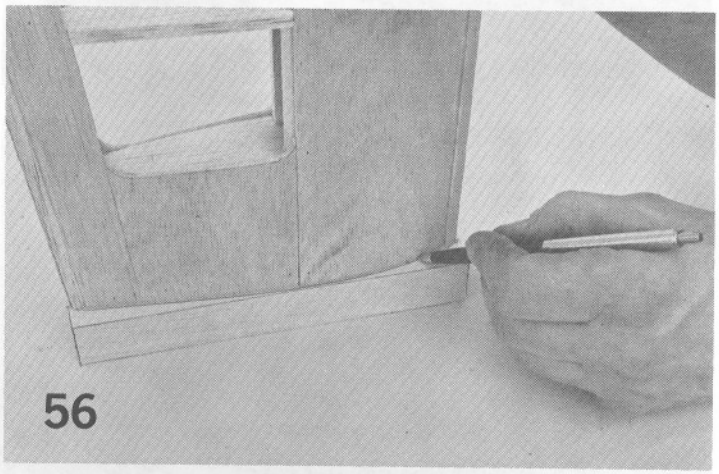


53. Sand off the overhang of the front planking flush with the fronts of the ribs. Check with a straightedge. Do the same for the trailing edge.

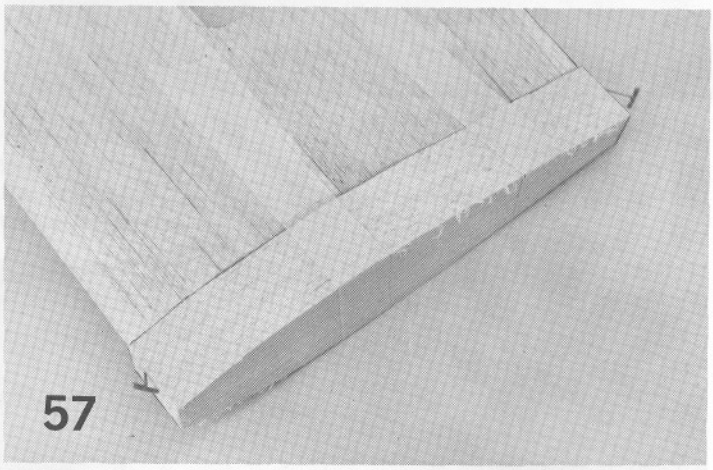
54. a. Glue on the 1/4" x 3/4" leading edge piece. Hold in place with masking tape.

b. Glue and tape on the 1/4" x 1/2" trailing edge.

55. Carve the leading edge to contour with the planking. Do the same for the trailing edge.



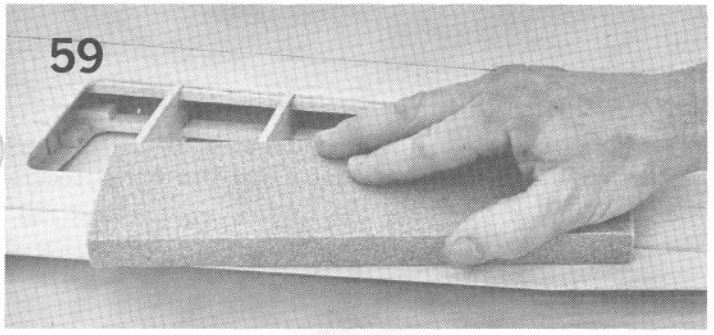
56. Trace the outline of the end of the wing on the 1" x 1-1/2" x 7-1/2" tip block.



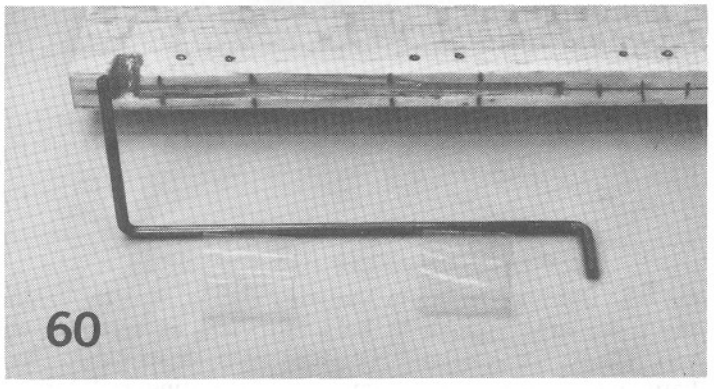
57. Glue on the tip block, holding it in place with pins and tape.

58. a. Sand the complete wing to finished contour.

b. Cut the ailerons from the shaped stock provided in the kit. Save the waste end for later use.



59. Make the hinge slots in the wing and ailerons and temporarily install the ailerons. Sand as required for good contour.



60. The aileron horn wire has half of its radius in the wing and half in the aileron.

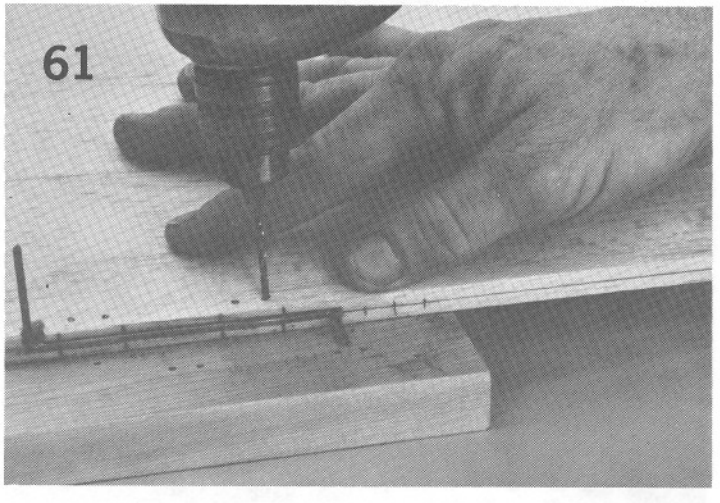
a. Cut a radius groove in the wing of about 1/8", slightly oversize for the 3/32" wire horn. Locate as shown on the plan.

b. Notch into the wing to allow the horn to rotate forward.

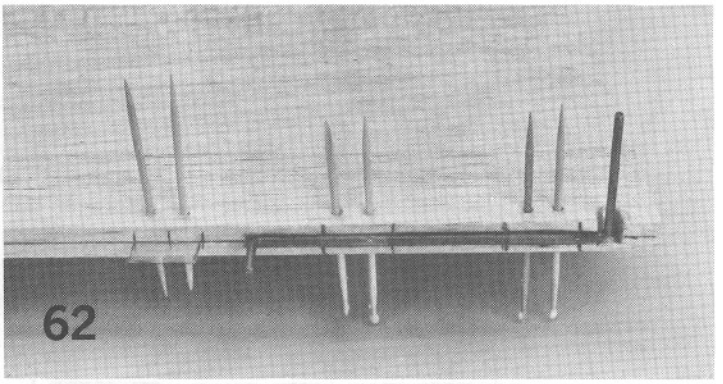
c. Lightly coat the aileron slot and groove with Kwik-Set epoxy to fuel-proof the area.

d. Cut two pieces of .010 nylon strip, 1-1/4" long.

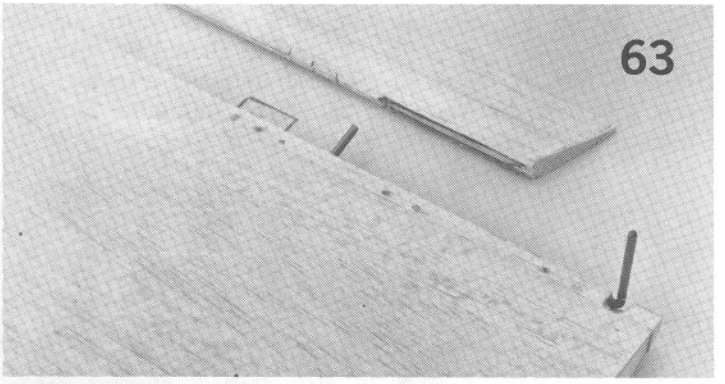
e. Make slits over and under the groove in the wing to accomodate the nylon strips.



61. Put the strips over the horn and insert them in the slots. Drill 5/64" holes through the wing and strips.

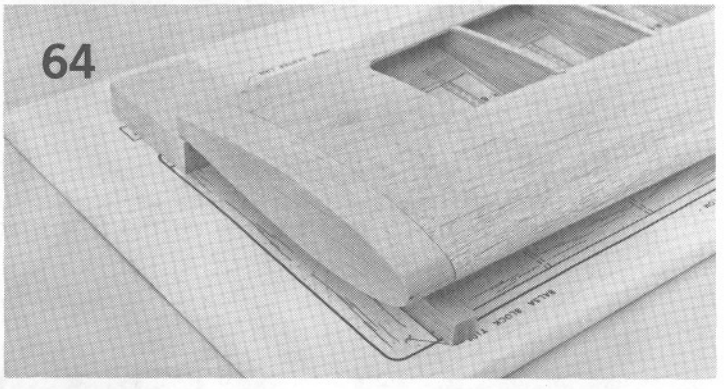


62. Put a drop of Sig Bond in each hole and insert a round wooden toothpick. Push the toothpicks into the thickest part.

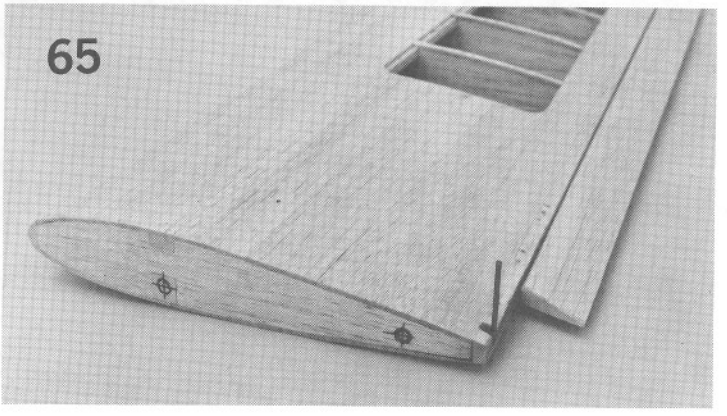


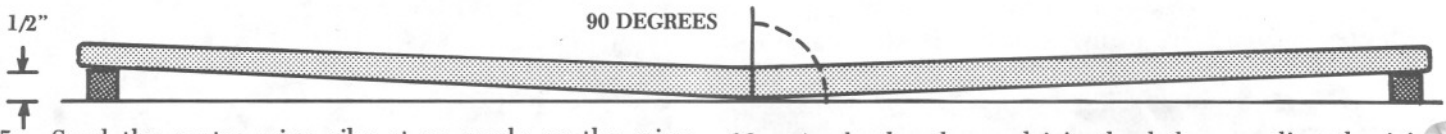
63. Saw the toothpicks off flush with the wing. Sand smooth.

DO NOT ATTACH THE AILERONS UNTIL LATER.



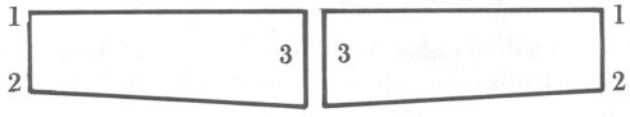
64. Block up the tips 1/2" each. (Measure at the spar location.)



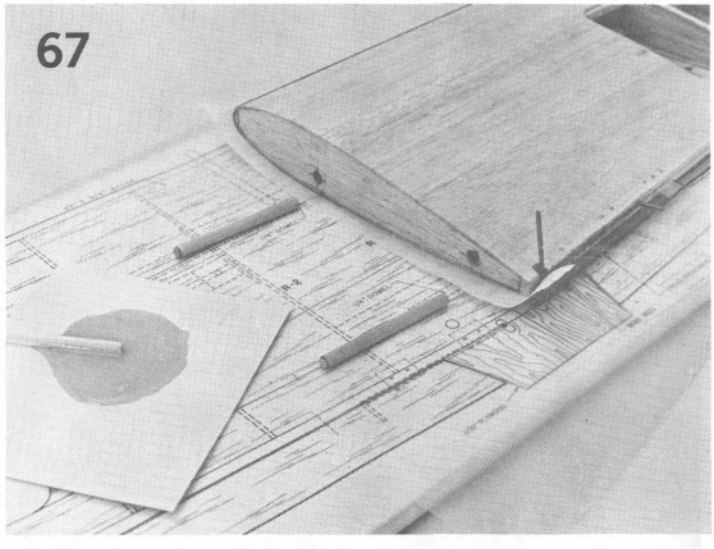


65. Sand the center wing ribs at an angle so the wing halves fit snugly together when blocked up at each tip. Do this carefully. The top of the rib will be thinner but don't sand away the bottom of the rib.

Mark the dowel locations and drill holes in them about 1/32" oversize so the dowels fit loosely when the panels are placed together.

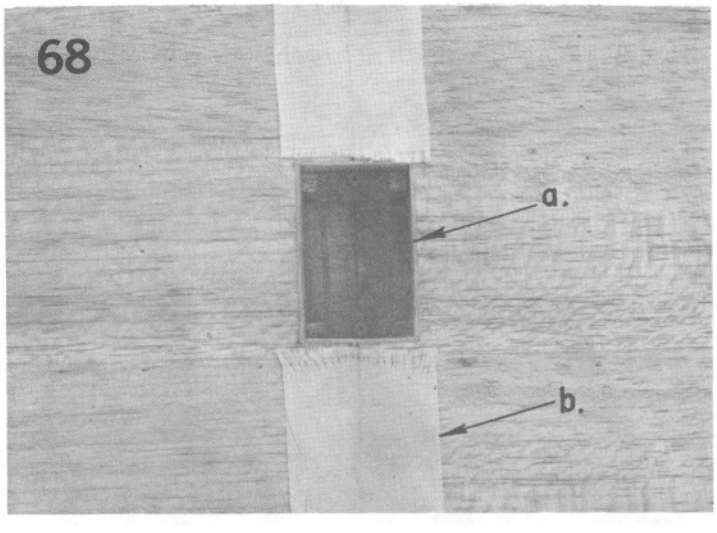


66. Set up the complete wing as it will be glued together. Check alignment carefully. Each half should be resting on three points, as shown in the accompanying drawing. Correct any twist between the panels by shimming or adjustment of the setup.

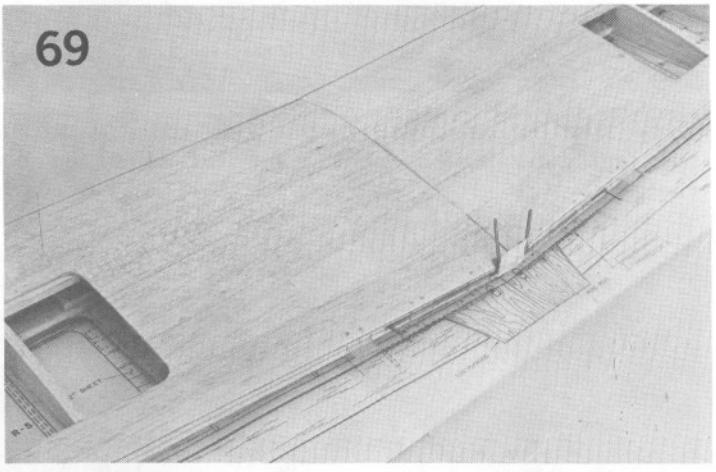


67. a. Put a piece of 1" masking tape on the first wing half.

b. Mix enough epoxy to fill the dowel holes, coat the dowels and apply a thin film on each R-1 rib.

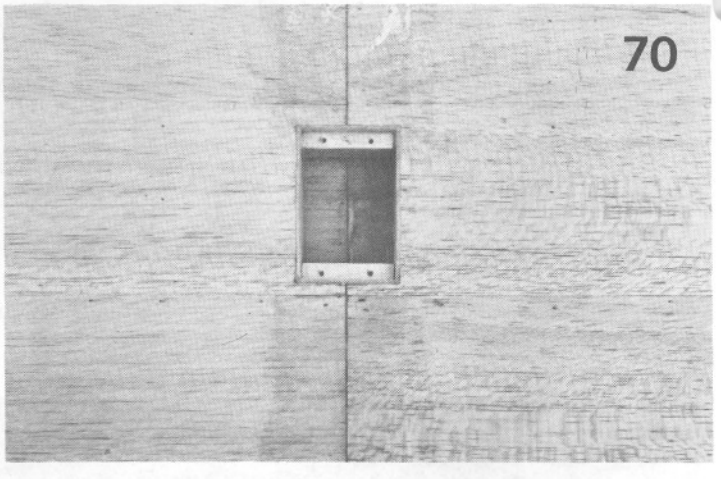


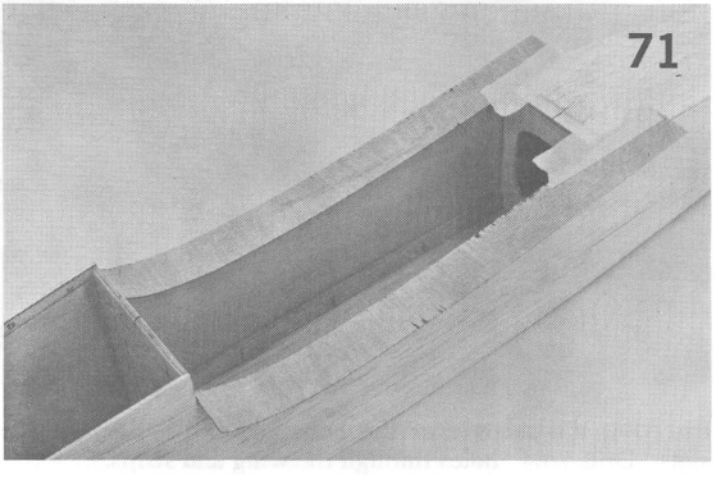
68. Apply the glue and join the halves, sealing the joint with the tape. Re-check alignment and tape halves securely together until glue sets up.



69. a. Cut an opening in the wing center, directly behind the spar, large enough to hold the servo or servo mount you will be using. Line the sides with scrap balsa. Use hardwood pieces at each end as a mounting rail for the servo.

b. Cut strips of fiberglass tape or cloth (not supplied) to cover the rest of the seam.

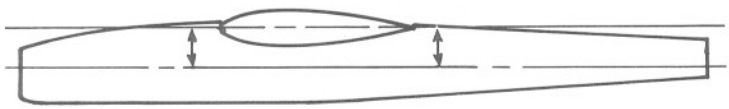




70. Liberally coat the tape with epoxy glue. Repeat the operation on the bottom seam. Do the same on the inside and bottom of the aileron servo box.

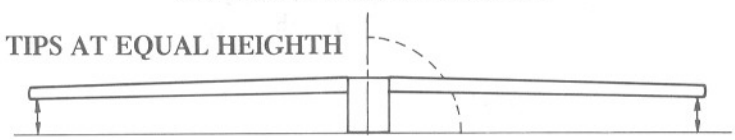
MOUNTING THE WING

71. Block up the fuselage on a flat surface with the centerline parallel to the surface. Set the wing into the cavity with the wing saddle fillet plywood temporarily taped between it and wing. Check alignment and fit. Sand the fuselage, or use shims as required to square up the assembly.

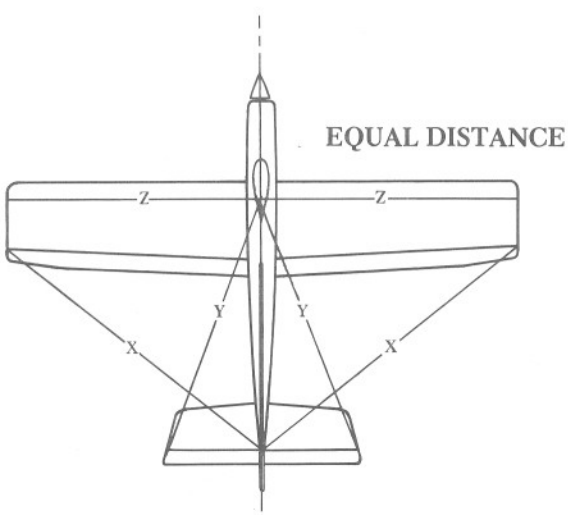


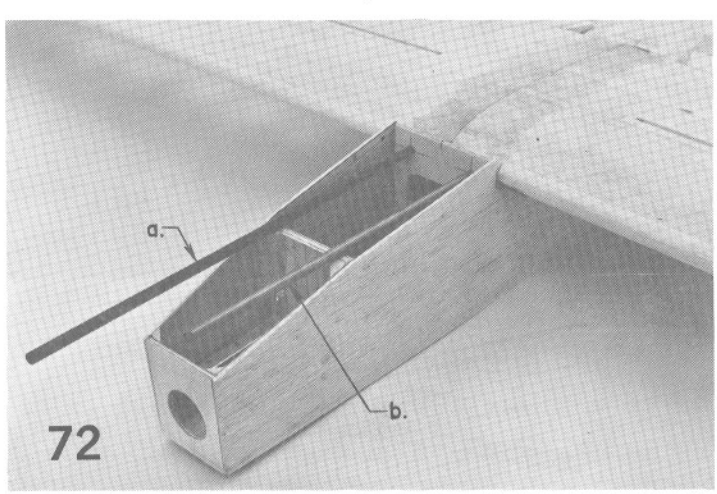
AIRFOIL CHORD LINE AT 0 DEGREES

THRUST LINE AT 0 DEGREES



FUSELAGE SQUARED--90 degrees

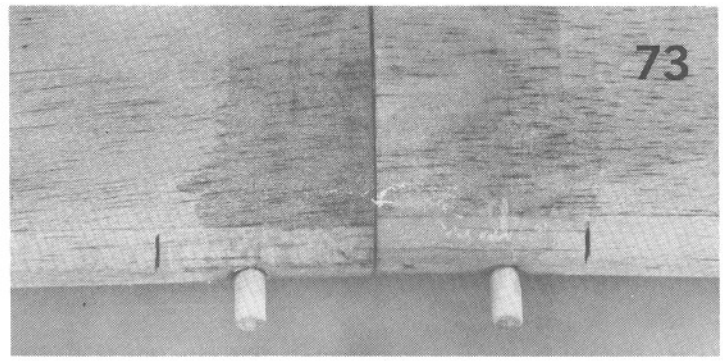


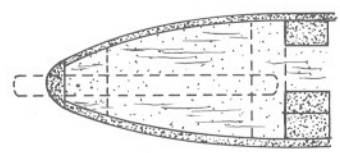


72. Weight or hold the wing in place.

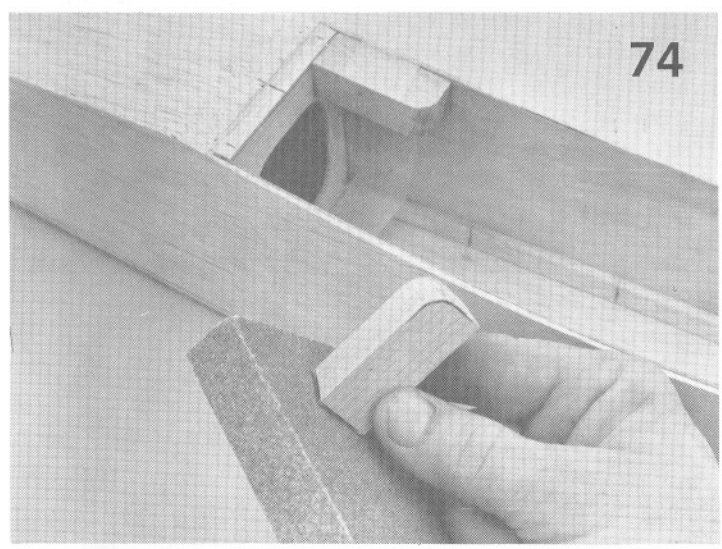
a. Drill 1/4" holes through F-4 into the wing leading edge, using a long bit.

b. If a long drill bit is not available you can do it with a piece of 1/4" brass tubing.

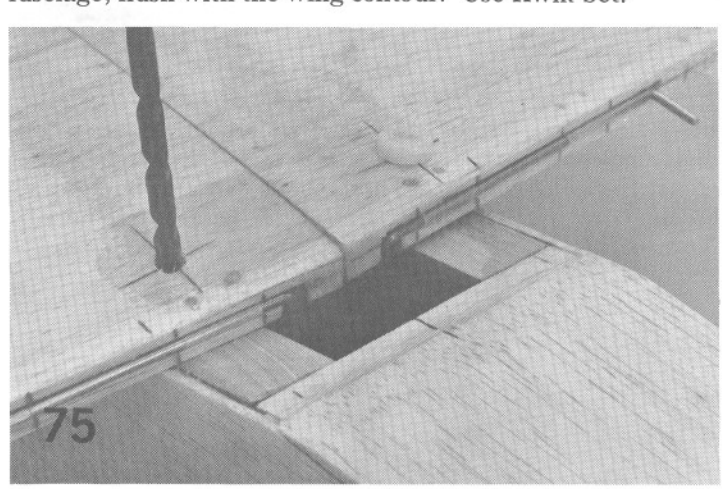




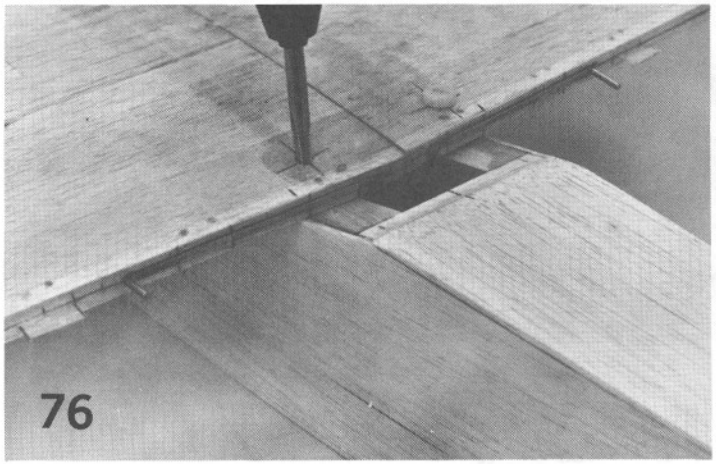
73. Glue the 3" dowels into the leading edge of the wing. Make sure the end is embedded in the second support block on the front of the main spar.



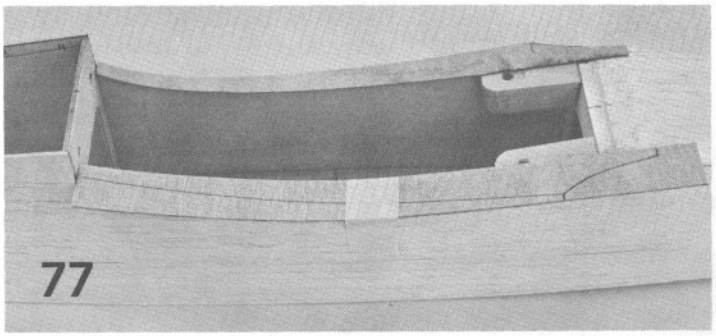
74. Sand and fit the wing bolt anchor blocks. Glue to the fuselage, flush with the wing contour. Use Kwik-Set.

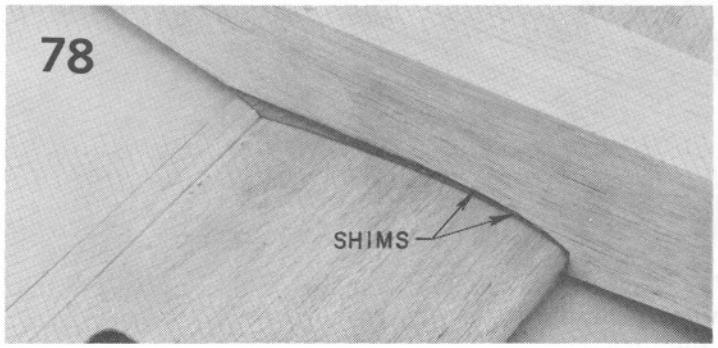


75. & 76. Place the wing back in position on the fuselage. Locate and drill a No.7 size hole (or 13/64", if a No. 7 is not available) through the wing and through the wing anchor block. Thread with a 1/4-20 tap. Put in the first bolt and repeat the operation. Remove the wing and drill out the holes in the wing to 1/4" diameter to pass the nylon bolts.



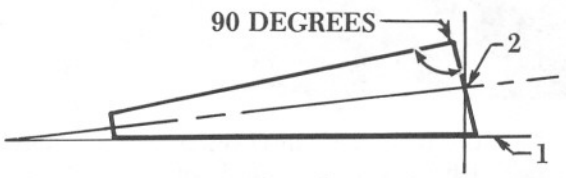
77. Tape the 1/32" plywood saddle in place and draw the outline, cut to shape and retape in place.





78. Cover the wing center with wax paper and bolt loosely in place. Put glue between the fuselage and wing saddle with a glue gun. Tighten down the wing bolts. Small wood shims may be required to push the 1/32" plywood saddle against the wing contour. These shims can also be used at this time to true up the wing-fuselage match, if required. Allow to dry and cure.

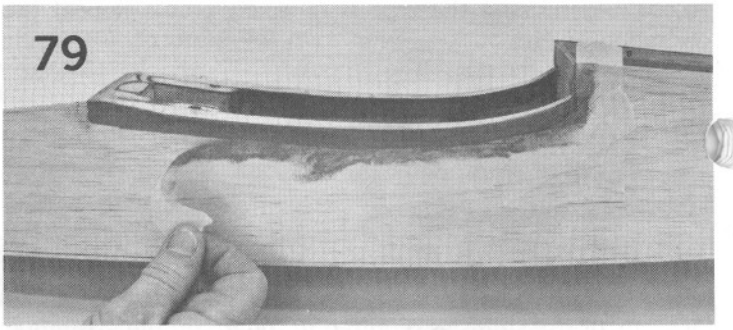
SHAPING THE AILERONS



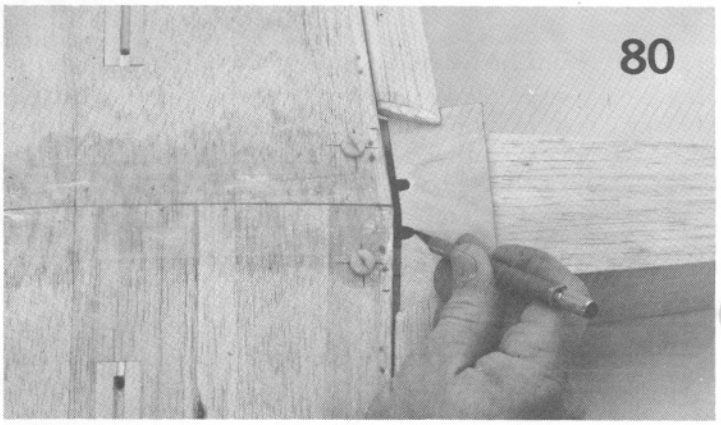
1. Lay the aileron on the side opposite the 90• angle.

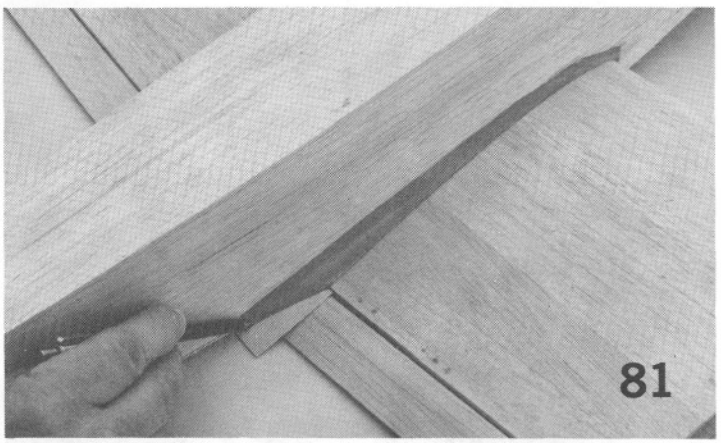
2 Place on table edge and use sanding block to form angle.

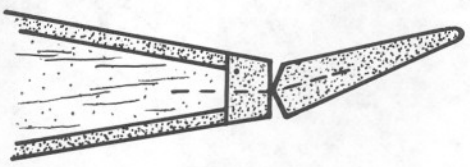
Leave the wing trailing edges square.

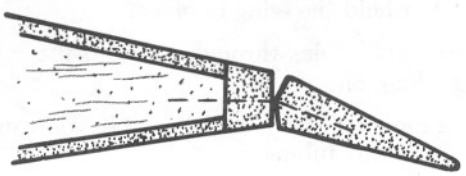


79. Protect the fuselage with masking tape and apply a fillet of Sig Epoxolite. Use only enough for a well-rounded fillet. Push the putty into any crevices resulting from the use of shims. Smooth the putty with a finger or tool dipped in water and allow it to set up. Sand at once, before removing the tape and before the putty has a chance to completely cure and harden. Use coarse sandpaper for shaping the fillet, which does not clog up with putty dust as do finer grades. Also fillet the saddle inside the fuselage with Epoxolite.





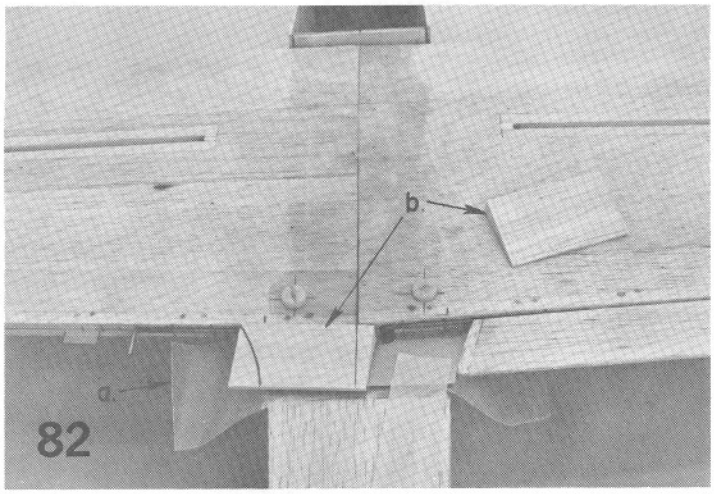




80. Trim the 1/32" x 2" x 4-1/2" plywood bearing cover to fit behind the trailing edge of the wing. Notch out for the aileron horns.

81. Mark and trim to clear the aileron ends.

NOTE: Mount the ailerons permanently on the wing before proceeding.

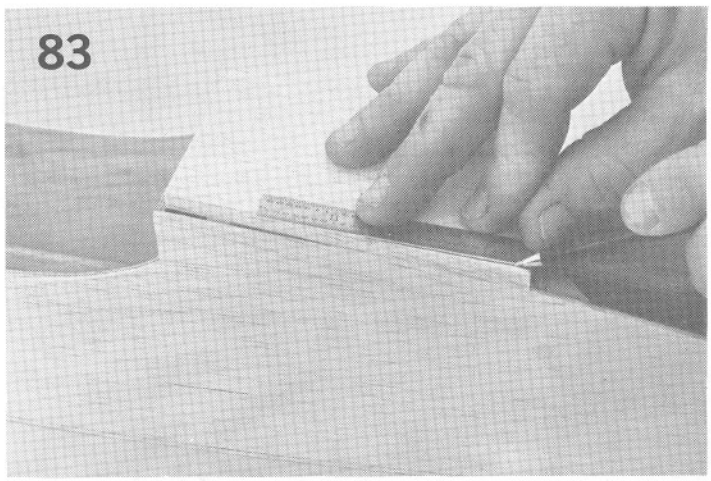


82. a. Put a piece of wax paper between the fuselage and wing.

b. Trim two pieces of aileron stock waste wood to fit in the center section. Groove the front so as to clear the aileron horn wires.

c. Epoxy to the wing, holding with tape.

d. Be careful with the gluing operation so that glue is not squeezed into the horn bearings.



83. Mark the shape of the nose bottom on the 1/4" sheet.

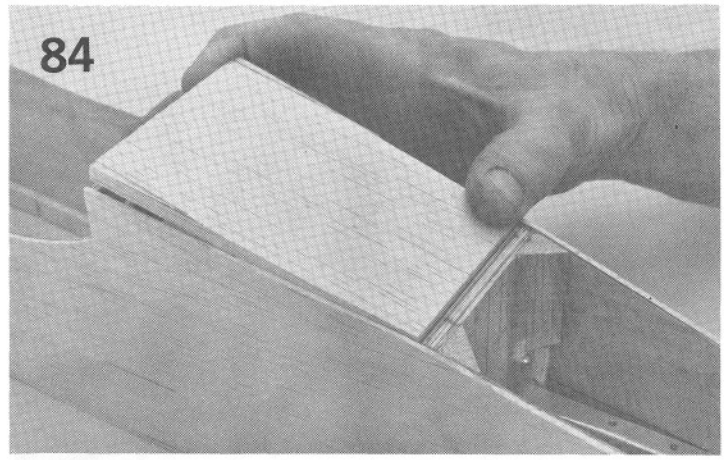
84. Trim and fit in place. Use Kwik-Set Epoxy.

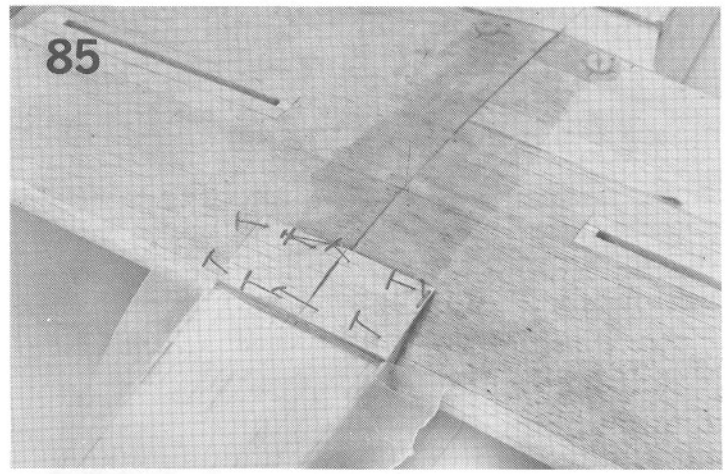
85. a. Protect the fuselage with wax paper.

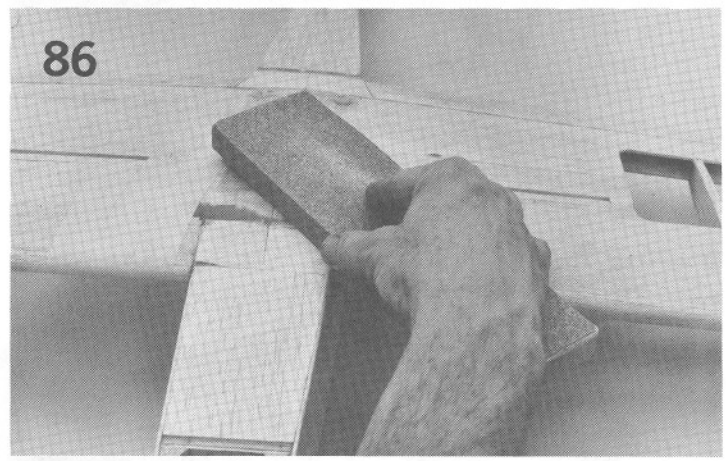
b. Glue balsa scrap to the wing to form a streamline fairing.

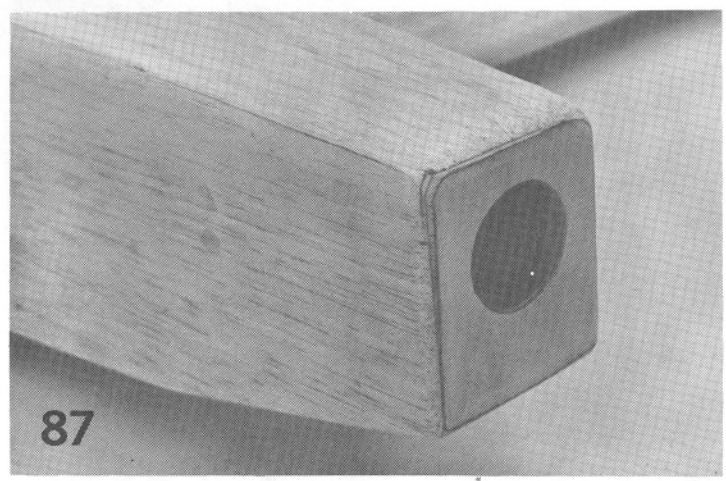
86. Sand the fairing contours to match the fuselage.

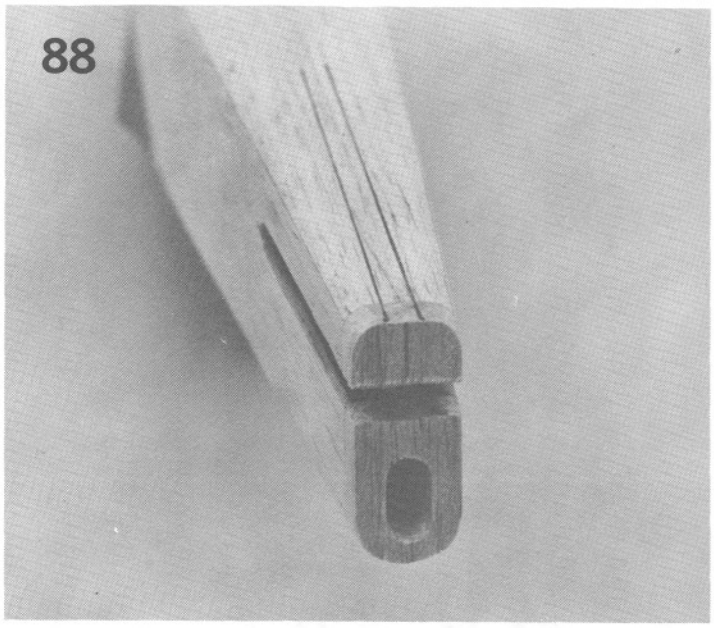
87. Shape the fuselage corners with the sanding block. See the plan for amount of radius at various cross-sections. Note that the bottom corners have a smaller radius than the top at the fuselage front and at the wing trailing edge.







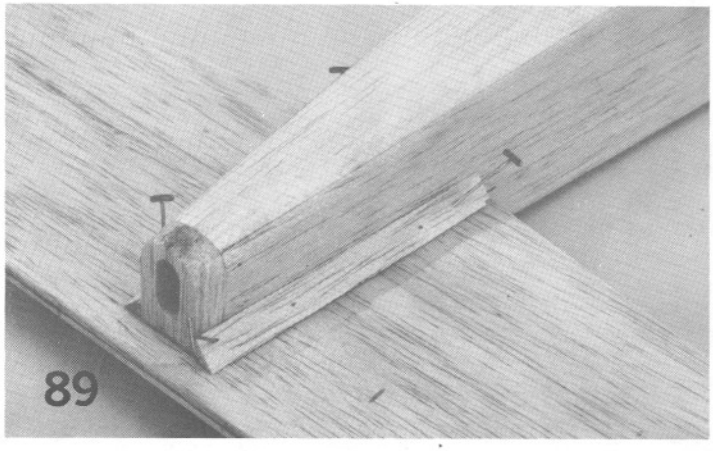


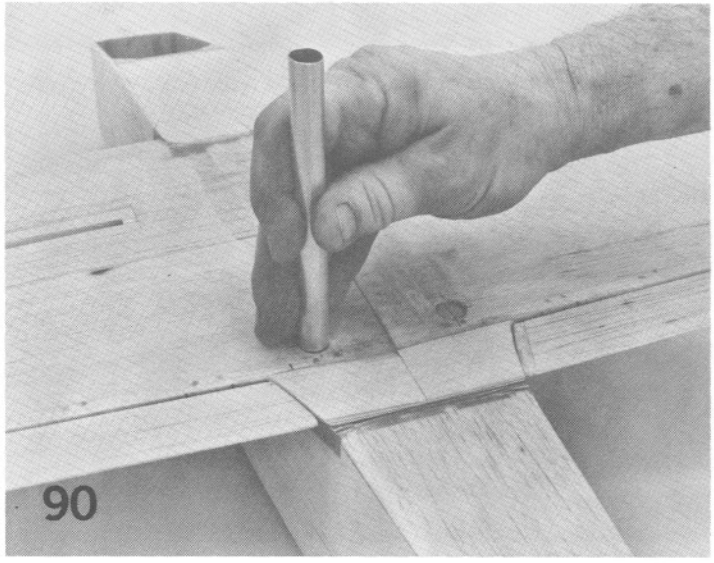


88. a. Toward the rear of the fuselage, both the top and bottom are rounded.

b. Cut through the rear block at the stabilizer slot with a razor saw.

c. Cut an opening for the pushrod. (A drill bit may be used to start the opening.)



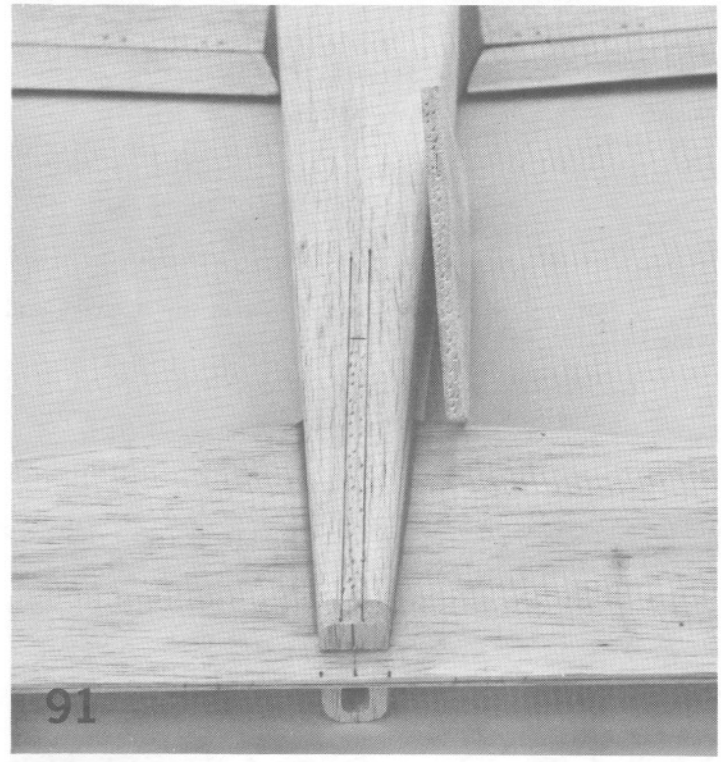


TAIL ALIGNMENT

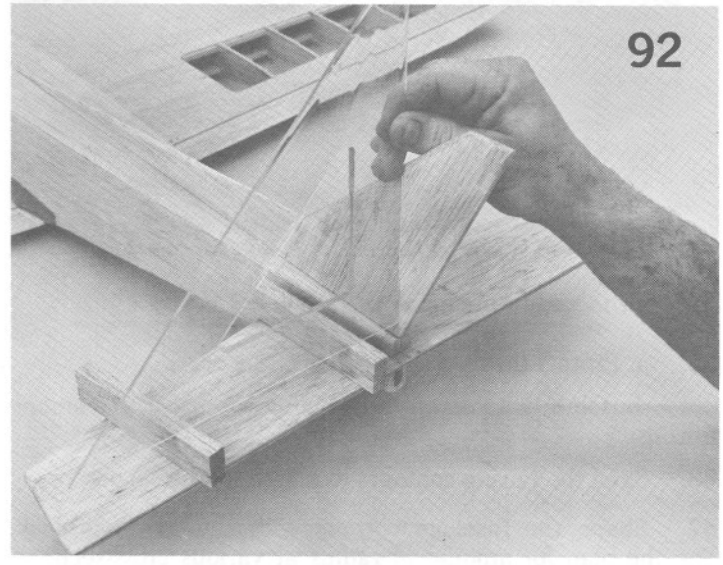
89. a. With fuselage and wing joined, place the model INVERTED on a flat work surface. Block the wing tips level. Locate the center on the stabilizer and epoxy in place, blocking the stabilizer level also. Check and align stabilizer hinge line with equal distances (Z - Z on alignment drawing). Square with the fuselage center line.

b. Glue and pin the 1/4" x 4" triangles on both sides of the bottom of stabilizer.

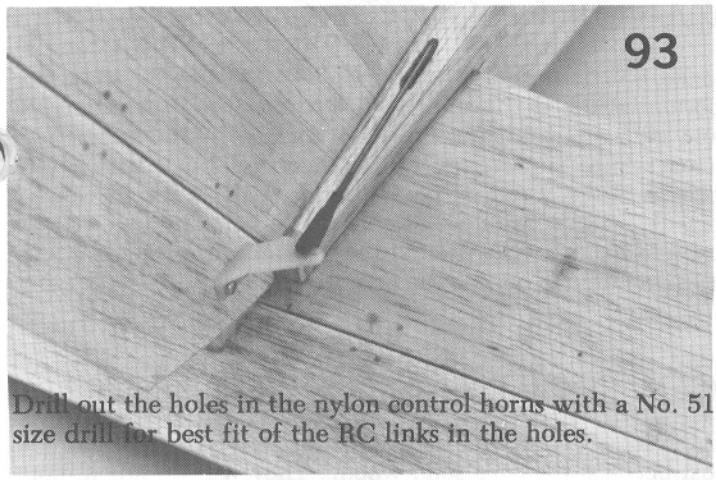
90. Use an 11/32" piece of tubing (not furnished) to countersink the heads of the nylon wing bolts to a depth of 1/8"



91. Punch holes in the fuselage and fin. Work epoxy glue into the balsa and join the parts.



92. Check alignment with the stabilizer by checking with a square or triangle.



Drill out the holes in the nylon control horns with a No. 51 size drill for best fit of the RC links in the holes.

93. a. Attach the rudder and elevator with the nylon strip hinges. Refer back to the wing directions for specific procedure on installing the hinges and toothpicks.

b. Cut a slot in the fuselage top planking 1/4"x 1-1/2" beside the fin. Bring the rudder pushrod through this slot by bending the RC link as required to clear the fuselage.

c. The rudder pushrod may be fed through the slot easier if it is rotated as the threaded end, with clevis removed, comes through.

RADIO EQUIPMENT INSTALLATION

94. Photo shows three EK SM servos mounted on an EK UM-11 plastic servo mount. The flexible cable pushrods from the motor and nose gear are fastened to scrap wood standoffs with G.E. Silicone Bathtub Seal or Devcon Seal-It. Most other radio manufacturers offer similar plastic servo mounts for their equipment. The mounts are screwed to hardwood rails placed across the fuselage.

Servos, for which plastic mounts are not available, can be screwed directly to the two 3/8" square hardwood rails placed across the cabin, three abreast as shown in the accompanying drawing. With rubber grommets installed in the servo mounting holes, mark the spots for drilling the pilot holes for screws. Space the servos at least 1/8" apart and do not have them contacting the hardwood mounting rails except on the grommets. Using a washer on the wood screws, mount the servos to the rails. Do not tighten the screws down against the grommets since this will cause vibration to be transferred to the servos. The washer should rest against the grommet without compressing it.

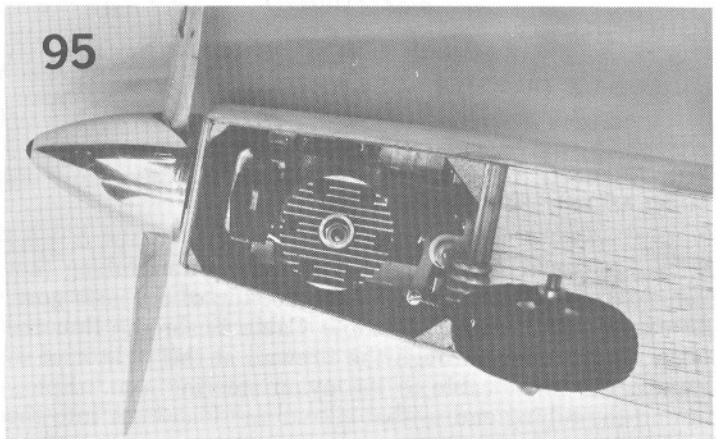
The pushrods for the fuselage are pieces of firm 5/16" sq. balsa. The 1/16" wire ends are wrapped with thread and coated with epoxy glue. Use the R/C links at the tail end so that trimming adjustments can be made quickly.

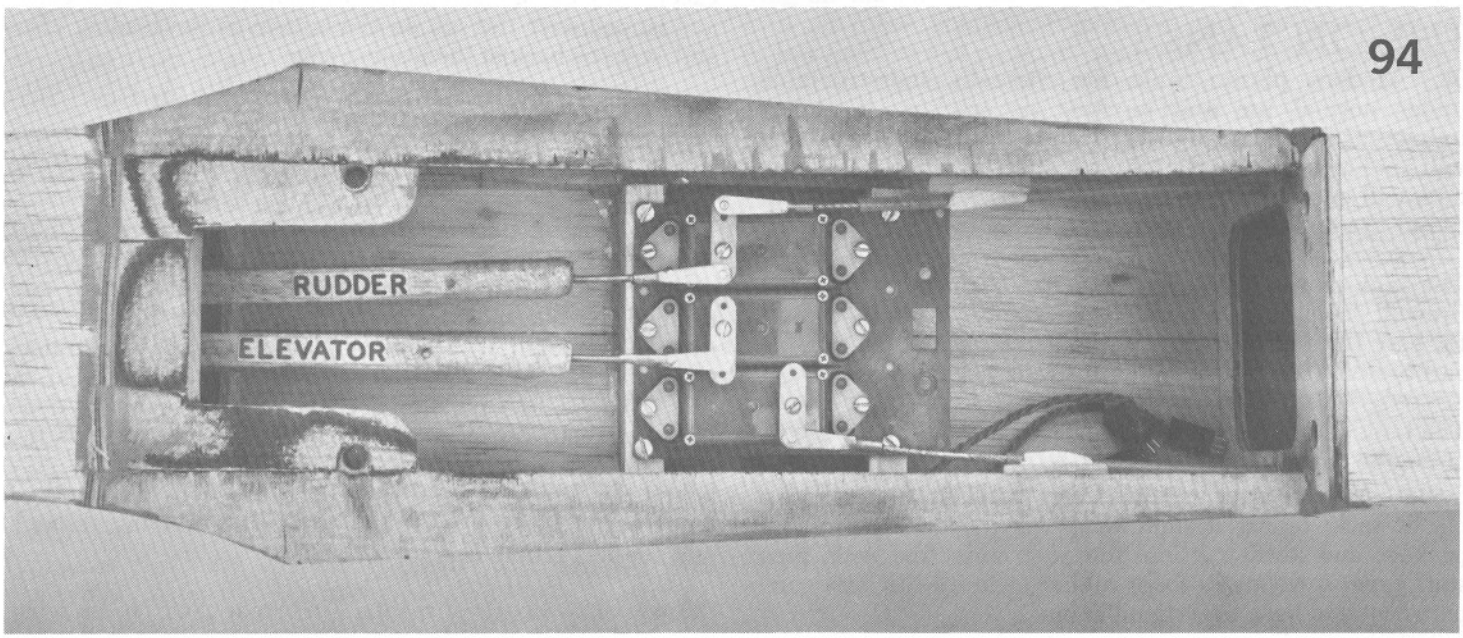
Nylon adjustable strip aileron horn wire connectors such as Du-Bro AH-103 or Rocket City Aileron Links (not furnished - see Sig Catalog) are recommended for hook-up of the aileron servo to the wire aileron horns.

A flexible cable pushrod with nylon outer tubing (not furnished) is recommended for hookup of the throttle to the motor control servo. Use silicone seal to fasten the outer nylon tubing to the scrap support and to the fuselage inner wall. (This also applies to the nose gear pushrod.) The seal is better than glue since it doesn't make a hard spot in the tubing that may restrict movement of the cable inside.

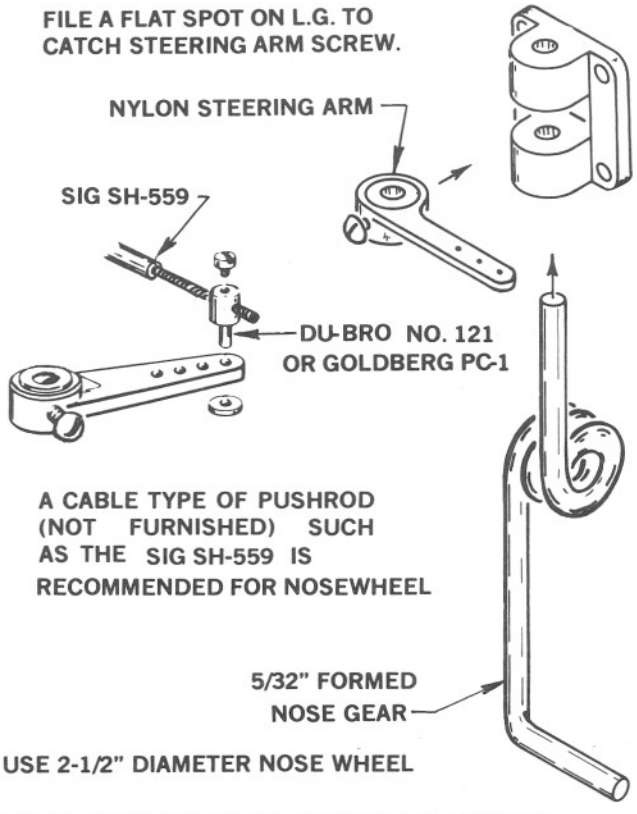
A variety of quickly detachable pushrod retainers are available from the Sig Catalog for hooking the pushrods to the servos. Solder clevises are handy for this application.

NOSE GEAR





95. The nose gear is held in the nylon bearing by the steering arm. Angle the arm forward so that when the servo pulls it back for a left turn, the arm will clear the face of the firewall.



STEERING ARM CAN BE USED ON EITHER SIDE OF THE BEARING, DEPENDING ON SERVO PLACEMENT AND PUSHROD DIRECTION.

A flexible steel cable pushrod with nylon outer tubing (not furnished) is recommended for the hookup of the nose gear, such as the SIG SH-559 Flexible Cable Pushrod. Run the nylon outer tubing through the firewall at the right spot to connect the inner cable to the nylon steering arm. Epoxy around the tubing end so that oil will not leak back into the fuselage.

TIPS ON TANKS

96. Modern plastic tanks are virtually indestructable under normal use and bursting or cracking is almost unknown. If you use Sig Heat Proof Silicone tubing (which will not harden or deteriorate in fuel) in the plastic tank, the tank will seldom have to be removed. So it is quite practical to put the tank in semi-permanently.

The tank in the KIWI has 2 or 3 tubes coming thru the firewall depending on builders preference. Proto type has 3 for easy fill and over flow without taking fuel line off the carburetor. (See full size plan for tank assembly drawing.)

The tank and battery may be reversed depending on height of engine carburetors.

Some builders, after putting their receiver battery in a plastic sack, taping it shut, wrapping it in a foam rubber package and stuffing it into the nose under the tank, then stuff paper toweling or foam rubber in to fill the nose compartment and keep everything in place.

CANOPY MOUNTING

Make a floor from 1/8" scrap sheet wood the shape of the bottom of the canopy. Glue this to the top of the fuselage and glue the canopy to the ridge formed by the floor. Cyanoacrylate "super glue" or Sig-Ment will stick the canopy plastic to the wood. Epoxy glue does not stick to canopy plastic. Sig Epoxolite will stick to the canopy and can be used to make a fillet around the bottom of the canopy. Use masking tape to outline the area to be filleted.

COVERING AND FINISH

IMPORTANT: Don't skip covering the fuselage and tail just because they are solid wood. They will be much more resistant to splitting and breaking on hard impacts if they are covered with something --- silk, silkspan or iron-on covering material---or if a resin shell is applied. (For resin surfacing directions, see the next section of the book.)

A good finish begins at the framework. Sand carefully with fine sandpaper.

Brush a coat of clear Sig Supercoat or Sig Lite-Coat Dope over all parts of the framework that will contact the covering. When dry, re-sand with fine sandpaper. Brush on a second coat of clear and allow to dry and again sand to remove any raised grain or fuzz.

Silk (either light weight or heavy weight) is hard to beat as a model covering material. The bottom of the wing is a good place to start. Cut a piece of silk about 1" larger than half of the wing, with the grain running lengthwise (grain of the silk runs parallel to the finished bias edge).

Dip in water and apply. Work around the edges, pulling out all of the wrinkles and stretching it smooth. Brush around the outside edge with clear dope. It will soak through the silk and adhere to the dope already dried on the framework. Let dry and trim off the edges with a sharp razor blade. Go over any areas that have not completely adhered with more dope. The top half is done in identical fashion except that the silk should be brought down over the edges and lapped over the silk on the bottom at the leading edge and over the back at the trailing edge.

Use the same process on the tail section and fuselage. Silkspan could be substituted for silk on the tail and fuselage if desired but they should be covered with some material to avoid splitting and cracking.

The first coat of clear dope over the entire silk surface must be brushed on sparingly. As the brush rubs across the ribs on the open sections, dope is rubbed off the brush and through the silk and runs down the inside of the ribs. An excessive amount will run completely through the framework and puddle against the covering surface on the other side. When these puddles dry, the large amounts of dope solids in them cause more shrinkage than the rest of the covering and a scarred area results. So apply dope very lightly the first time over. A second coat will seal most of the pores of the silk and from this point, running through will not be a problem.

Use one or two coats of regular Supercoat clear on the wing

to shrink the covering. After that, unless the covering is still not tight and unwrinkled, Sig Lite-Coat low shrink clear dope is recommended to help prevent warping. The solid wood fuselage and tail can have Sig Lite-Coat from the beginning if desired. Sig Supercoat Color Dope has low shrink qualities.

A third coat of clear should provide a good base for color dope. Sand lightly, when dry with 220 grit 3-M Tri-M-Ite no-load paper. Don't bear down on the edges of the ribs or the silk fibers will be cut through. The color dope may be brushed or sprayed.

Supercoat Color Dope should be thinned with 10% or more Supercoat Thinner for brushing. This helps prevent brush marks and gives smoother coats. Flow on wet coats and avoid rebrushing back over an area already painted. For spraying, thin dope about 50-50. Add more thinner if the dope does not go on evenly.

If high humidity causes the dope to "blush" or turn white, the best way to handle this problem is to wait until the humidity situation improves and apply another coat of dope. This will eliminate the blush. If it is necessary to dope during high humidity, Sig Retarder may be used in place of part of the Supercoat thinner (amount depends on the humidity) to reduce the tendency to blush.

Painting the entire model white is recommended for a good color base, particularly when white is part of the color scheme. Color coats can be sanded 360 Tri-M-Ite or 400 or finer wet paper. When using masking tape for trimming, seal the edge with a coat of clear dope to prevent the color dope from bleeding under the edge. Don't leave the masking tape on any longer than necessary. The longer it is on, the harder it sticks. Complete the job with several sprayed coats of clear over the color scheme. This seals the colors and adds gloss. For a smooth, realistic finish the final coat may be rubbed down with Sig Rubbing Compound. For best results, it is not a good idea to try to mix different brands of paint. Use Sig products from the start.

ALTERNATE RESIN BASE FINISH

A 2-coat Polyester Glass Resin based finish was used on the fuselage and tail of the prototypes. This provides a smooth surface for color application with a minimum amount of work. Carefully read instructions on the SIG Finishing Resin can. The resin is applied only over the bare wood areas of the model. It will not cure properly over Dope, Epoxolite, Celastic, Epoxy or any other type of resin-based glue or putty. To insure a good glue bond, leave the areas on the tail surfaces which must be cemented to the fuselage unresined. These areas are usually covered by fuselage sides, fillets etc. Epoxolite fillets can be put over the cured, sanded resin.

Mix a small amount of Glass Resin according to the directions on the can to check coverage and set-up time. The tendency is to mix too large a quantity at a time. A large batch of resin sets up faster than a small batch. If the resin sets up too rapidly, reduce the amount of hardener used. Another method of slowing the set up time is to place the mixing container in a shallow pan filled with ice water. The lower temperature will slow the set up time.

Apply the first coat of resin sparingly, well brushed out application. After the first coat cures, sand with 80 or 100 garnet paper. Use a sanding block, try not to cut into the wood. Any low spots should be hand sanded to remove resin gloss. Brush on second coat, brushed out thin, let cure and sand with 220 to 320 Wet-or-Dry Paper, preferably use wet. All resin gloss should be sanded to a dull satin looking surface. Remember to sand and remove as much resin as possible without cutting through to the wood, this keeps the added weight at a minimum.

Epoxy primer was used on top of the resin base, preferably sprayed.

The prototype models were spray painted with white epoxy primer (K&B) sanded with 220 till about 80% of the primer is removed. A second light coat may be required should sanded areas show through to the resin base. Lightly sand the second prime coat to smooth out over-spray. Use 360/400 and wipe dust from the surfaces with a tack rag or dampened rag with Butyrate Thinner.

The prototype models were then spray painted with one coat of white epoxy paint. The trim colors were added with enamel. A Badger Spray Gun #250 was used for all primer and finish coats, including the trim colors.

Silk covered wings should be doped as recommended, (see COVERING & FINISHING) up to the point of final color. Lightly sand to remove dope gloss and spray entire wing with K&B primer. One light coat is sufficient. Epoxies or enamels may now be applied. Use a low-tack masking tape such as drafting tape for trim colors. Remember---don't leave the tape on any longer than necessary.

ALIGNMENT

The Kiwi is set-up 0-0-0. The wing incidence is zero degrees, the stabilizer is set at zero degrees and no down thrust or side thrust was used in the engine.

BALANCING

The recommended Center of Gravity location is shown on the side view on the full size plan. Extend these marks to the bottom of the wing at the tips. (A handy way is to stick a piece of masking tape on each wing and mark the positions on it.) For the first test flight, balance the Kiwi by suspending it on the finger tips placed on the bottom of the wing on the mark. Balance with an empty fuel tank, but with all other equipment installed and the model completely finished and painted. Add lead to the nose, if necessary, to get the model to hang level. Be sure and fasten the weight securely. Do not attempt flight tail heavy. When slightly nose heavy, the model is more stable and less likely to stall or snap froll from over-elevating. It also cuts down reaction of the model to control movements and this is good during test and practice flights, to help prevent overcontrolling. After the model has been test flown and initial trimming accomplished you will want a little quicker response.

Some aerobatic capability is sacrificed with the forward C. G. position so for making deliberate snap rolls and spins a position farther back may be required. Move the C. G. back slowly and check results and control response in the air at a good altitude. Don't move the C. G. back any farther than necessary.

CONTROL MOVEMENTS

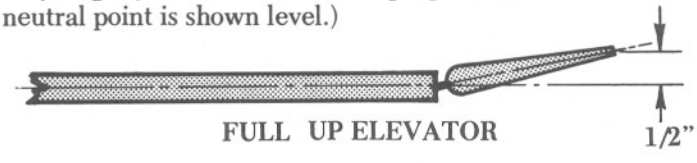
Various brands of servos can give different control movement direction and amounts of travel. For this reason,

follow the measurements below when setting the Kiwi up for flight rather than any particular horn hole drawn on the full-size plan or visible in a Kiwi picture. Shift the RC link to whatever horn hole will produce the amount of movement shown in the drawings below. Measurements are made at the trailing edge of the control surface.

The control measurements below are suggested as a beginning. Test flights may indicate a need for more or less movement, depending on individual model differences, C. G. location, your personal preferences, etc.

ELEVATOR IN NEUTRAL.

(Flight Tests may determine that the neutral point should vary slightly from level but for purposes of illustration the neutral point is shown level.)



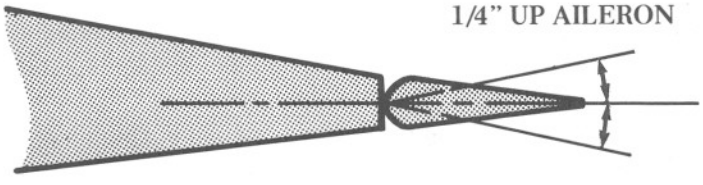
FULL UP ELEVATOR

FULL DOWN ELEVATOR

For training purposes, do not carry excessive elevator movement. Use only enough to properly perform a nice sized loop. Over control with excessive movement can get a novice in trouble. After you are an expert flier, additional movement can be used, if desired, for snaps and other violent maneuvers.

FULL LEFT RUDDER

FULL RIGHT RUDDER



FLYING

IMPORTANT: The Kiwi is not a trainer. If you have no previous RC flying experience you cannot successfully fly a responsive design like the Kiwi, particularly on the test flights. A basic trainer, such as the Sig Kadet, should be used for a number of hours before attempting to fly the Kiwi by yourself.

It is recommended that novice fliers should not attempt to fly the Kiwi without the assistance of an experienced pilot. Contact the local model club or ask your hobby dealer for the names of good fliers and a suitable location for flying.

Many hours of work are involved in the construction of a model and it can all be lost in a moment of beginner's indecision. A skilled flier can help you get past the first critical test and trimming flights without damage to the model and give instruction in proper control.

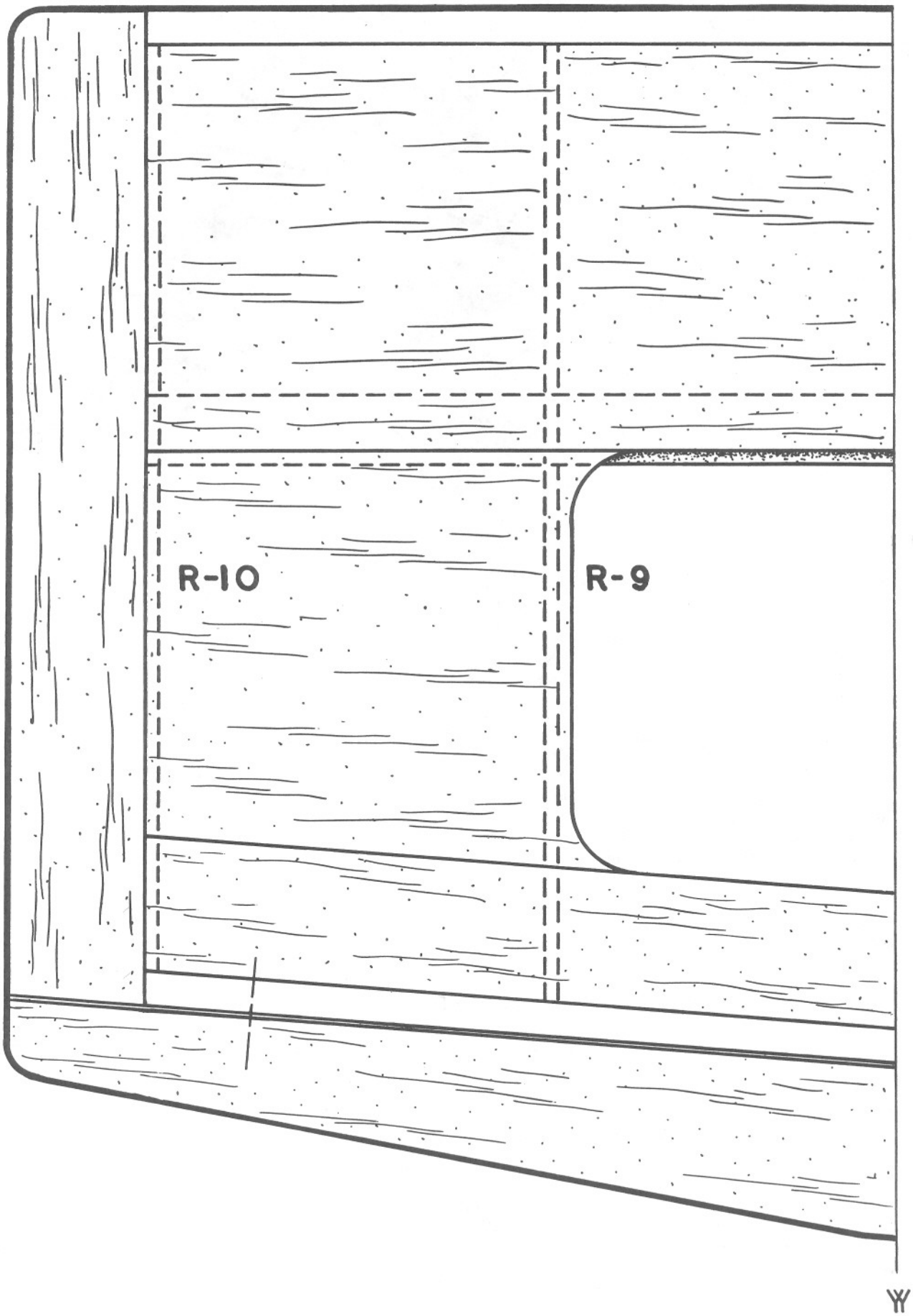
Be certain to carefully range check your radio equipment and see how it operates with the engine running before attempting test flights. A lot of problems can be avoided if the engine has been well broken-in and idle adjustment perfected on a test block or in another airplane before installation in the model.

Takeoffs with the Kiwi from grass fields are easily made if the grass is not too long or the ground too rough. Generally alot of elevator application is required for liftoff. Be prepared to relax control pressure partially after becoming airborne so the climbout will not be too steep. On surfaced or smooth dirt runways less application of elevator will be needed.

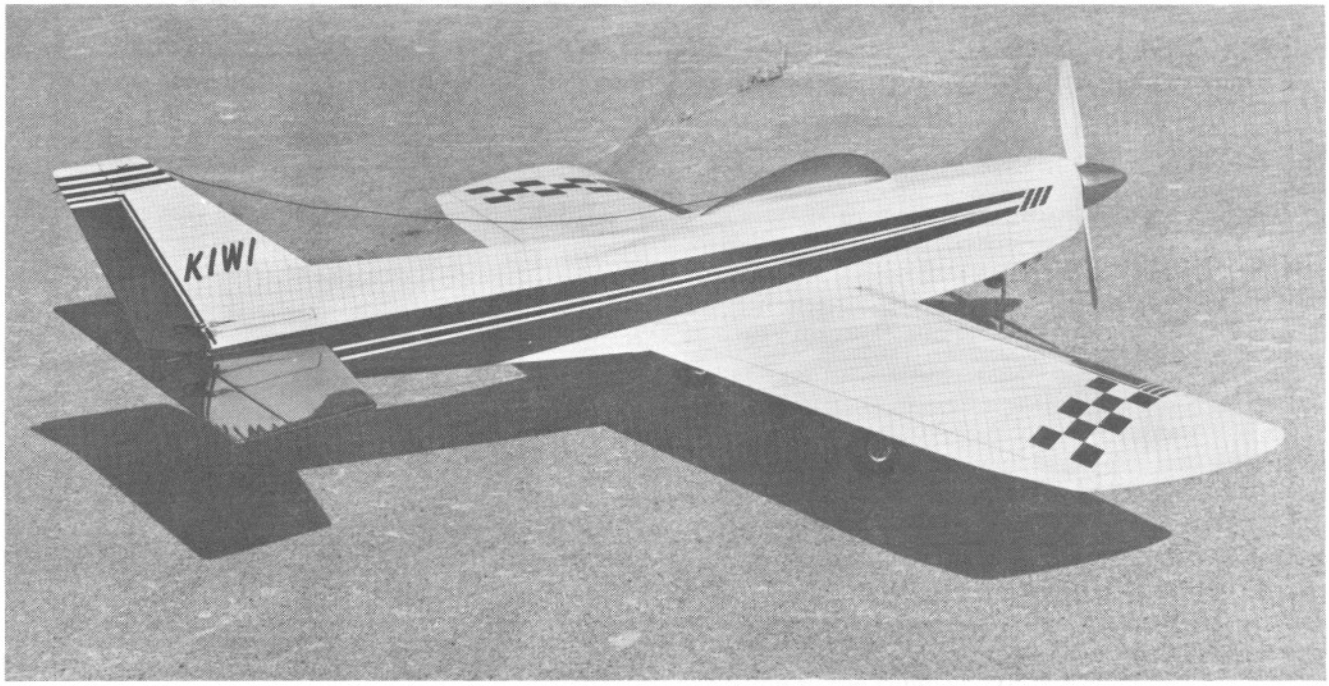
If a good, smooth take-off surface is not available, the model can be hand launched by the pilot's assistant. (Do not attempt to hand launch by yourself — instant action on the transmitter may be required.) Holding the front part of the fuselage with the left hand and under the tail with the right, run into the wind at a fast trot and thrust the model forward with the nose slightly up in a spear throwing motion. It is not necessary to achieve a lot of velocity in the launch— it is more important that it be released smoothly and with the wings level. The model may dip slightly and then should begin climbing at a slight angle. If it does not begin to climb after about fifty feet of flight, apply a small amount of up elevator to lift the nose.

Use the ailerons to keep the wings level and headed straight into the wind until about seventy-five feet of altitude is obtained. Keep first turns gentle and not steeply banked. Stay up wind of the transmitter. Use trim levers on your radio equipment where necessary to obtain straight and level flight with the contol sticks in neutral position but don't attempt to make these adjustments until the model is at a good altitude. Throttle back at altitude to find out the model characteristics in a gliding condition so that some indication is seen of what to expect during the landing approach. It is a good idea to make several practice landing approaches at a good altitude to get the feel of the model for this approaching critical maneuver. Make your final and complete landing approach while your engine still has plenty of fuel remaining so that the engine is not liable to stop before completion of the flight. This will allow application of power if the approach is undershot. Notice the percentage of of missed landings at an R/C flying field. Those undershot greatly outnumber those missed by overshooting. So, if an approach that looks a little high is maintained, chances are good that a spotlanding can be made.

After each test flight, readjust the RC clevis links on the pushrods so that the trim levers on the transmitter can be returned to a neutral position. It will take several flights before exact trim is extablished on all axis of flight.



This wing tip pattern is provided so that it will not be necessary to cut up the full size plan.



KIWI

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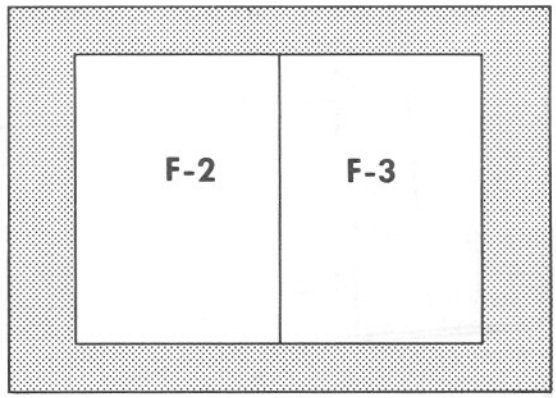
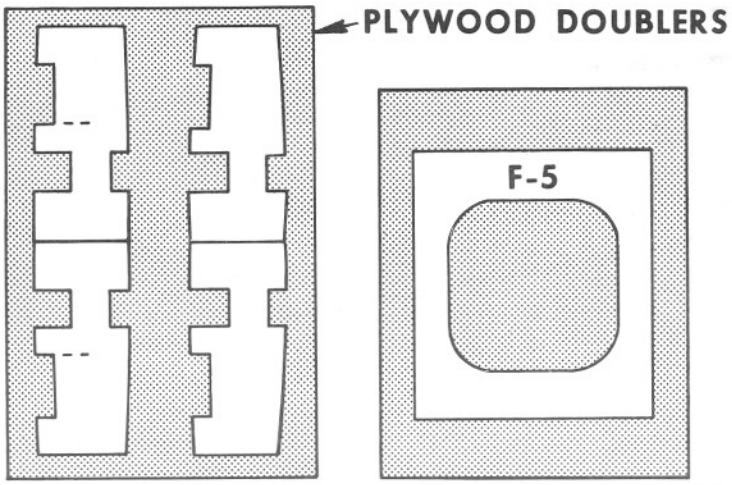
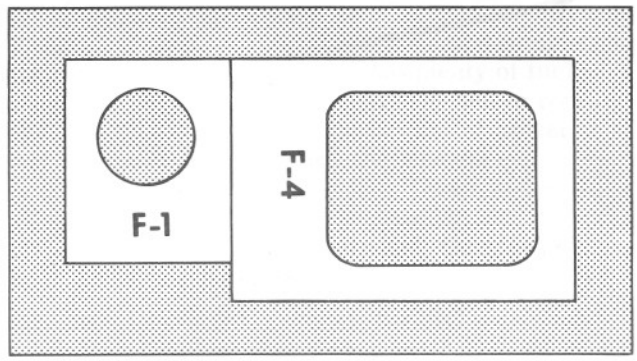
In use of our products, SIG Manufacturing Co's only obligation shall be to replace such quantity of the product proven to be defective. User shall determine the suitability of the product for his or her intended use and shall assume all risk and liability in connection therewith.

KEY TO PLYWOOD PARTS







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