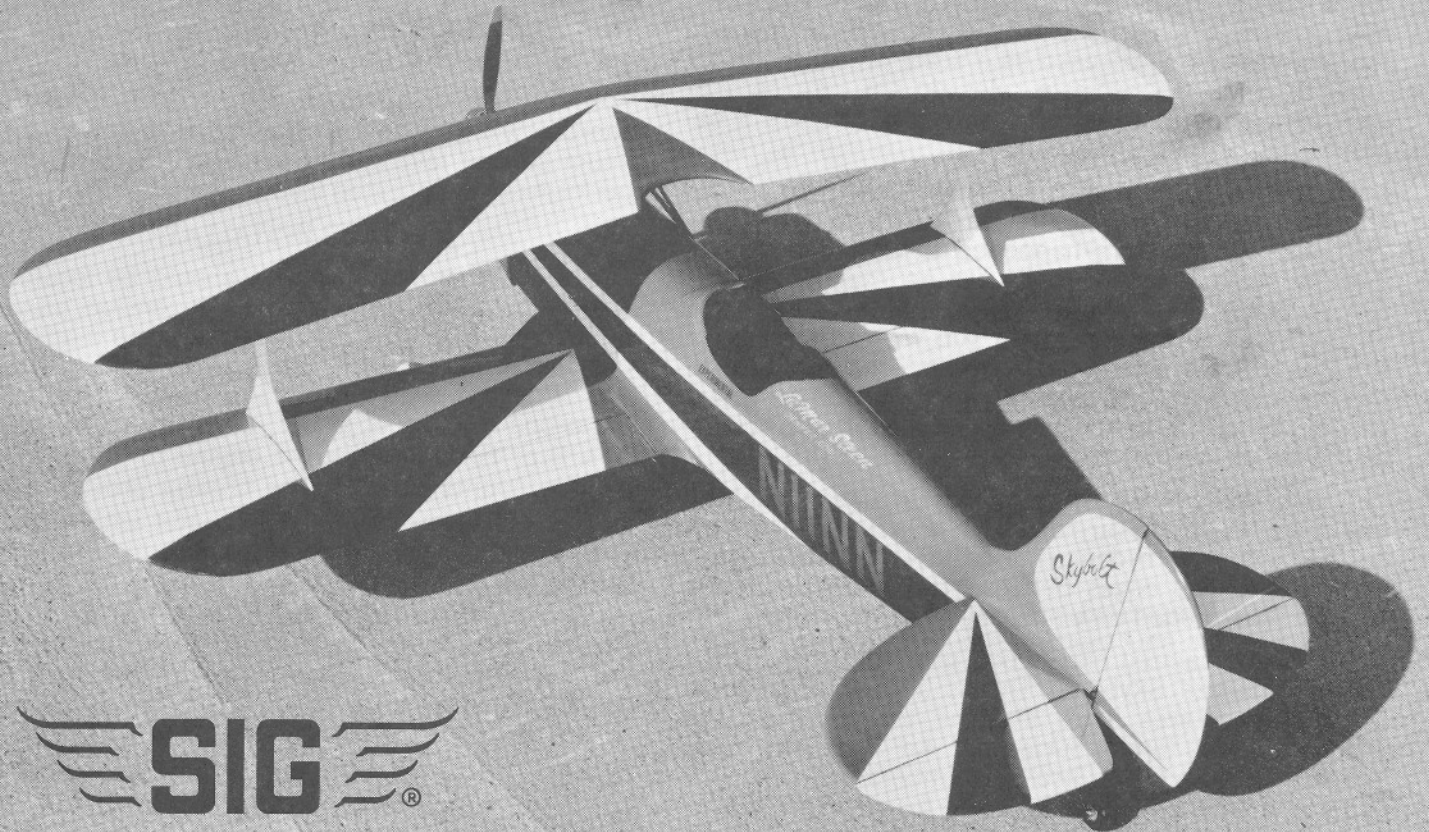


# Skybolt



## BUILDING AND FLYING INSTRUCTIONS



 SIG®

# Skybolt

BY CLAUDE McCULLOUGH

LaMar Steen's homebuilt Skybolt is not only a great looking airplane but a practical design as well. There are no machined parts and a welding torch and ordinary shop tools are sufficient to construct it. The prototype was built by LaMar's students in the Aerospace program at Manual High School in Denver - a fact which will help clarify the lettering on the decal in this kit.

Full symmetrical wing sections are used to aid aerobatic characteristics and the structure is stressed for 9 G's plus and 8 G's negative. The top wing span is 24 feet and the lower span is 23 feet. One quality that has made it so popular is the reasonable size of the cockpits.

An information pack on the Steen Skybolt with 3-view can be obtained for \$2.00 from Steen Aero Lab, Inc., 15623 DeGaulle Circle, Brighton, Colorado 80601.

## ABOUT THE MODEL

Our version of the Skybolt was designed with easy building and good model flight characteristics in mind and the exact scale outlines have been modified. It is primarily intended for the NSPA-AMA biplane stunt event and for sport flying. However it can be used for Sport Scale events if desired. In this connection it should be noted that the available 3-view is not quite like the actual airplane in that a different shape and style of cowling is shown so it is recommended that pictures alone be used as a scale presentation for judging. AMA Sport Scale rules do not require a 3-view for competition - photos only may be used if desired.

It's common with homebuilt's for some component shapes to vary from plane to plane depending on how the individual builders happened to bend the tubing. The tail surfaces on Skybolts are an example of this artistic expression. We used the general shape shown on the Steen three-view and if you wish to emphasize the Sport Scale aspect, be sure and check photos of the particular Skybolt example being copied for exact shape. Touch up the curves of the kit tail accordingly with a sanding block.

The color scheme of the model was taken from the markings of LaMar's airplane as it was originally painted. He has since redone it in a more complex pattern with air brushed edges between the colors, while his first version needed only masking tape.

Hale Wallace painted his Skybolt pre-production model like his full-size Skybolt. This is a colorful arrangement but requires more masking to reproduce the checkerboarded under-surfaces. An alternate decal is available with stars, license numbers and the Skybolt name for the cowl to duplicate his airplane.

Hale used a more elaborately shaped cowling on his Skybolt, as have some other home builders of the design. The fairing behind the spinner and the lower scoop can be made from balsa. Glue balsa to the cowling plastic with Sig-Ment. Paint the balsa parts with Sig Sanding Sealer to fill the wood grain.

## ABOUT BALSA WOOD:

We do our best to put as good a grade of balsa in our kits as the supply situation permits. The world-wide increase in demand for balsa has made it impossible to obtain as high an average quality as used to be the case.

Every piece of balsa supplied cannot be 100% perfect or kit prices would have to be greatly increased. Mineral stains or small knots do not affect wood strength. Even with the very best grades of balsa, there is a natural tendency for some sticks or sheets to immediately bow upon being cut off from a perfectly square block because of built-in stresses. In most cases, these can be bowed back into alignment during building. True up the edges of bowed sheets by trimming, using a metal straightedge.

Due to the balsa wood supply situation, it is sometimes necessary to supply alternate sizes. In most cases, this will be a larger piece than required and rather than saw it and throw away the excess we put in the larger piece so that you can trim it and use the scrap wood for something else.

## SINGLE OR DOUBLE AILERON?

The original model used single ailerons on the lower wing to keep the linkages to the servo simple. The installation was very effective, gave good response and as rapid a roll rate as desired. The complications of hooking up the double ailerons are not worth the trouble for sport fliers - the single ailerons are more than adequate. As a matter of fact, the single aileron set up can give a good account of itself at a contest.

For high level competition and expert fliers the double ailerons will probably be desired. They provide maximum control leverage and a very rapid roll rate for performing complicated free-style maneuvers.

## MUFFLER INSTALLATION

Large chamber type mufflers should be located completely outside the cowl on an extension pipe. The Du Bro Muff-L-Aire or similar stack-type mufflers have a neater appearance. These work well if the plates are taken off and varnish and carbon cleaned away occasionally. Use of a 1/2" prop extender such as a K & B or Fox will allow the engine to be moved back on the mounts closer to the firewall providing a little more room below the exhaust outlet within the cowl. This was done on the prototype model and a Tatone EM-SS Special Manifold was fitted. (See Sig Catalog for photo and current prices of the EM-SS.) This has side-mounted tubes, which were exited straight out of the cowling bottom. Rudder extension tubing is provided with the manifold.

NOTE: The Semco Pitts, Jr. muffler will not fit inside and a hole must be cut in the bottom of the cowling.

### BEFORE BEGINNING CONSTRUCTION

The isometric drawings and instructions are numbered in a sequence for explanation of techniques. This does not mean that the sequence must be followed exactly, step-by-step. To speed construction it may be desirable, for example, to start building the wing or tail while the preliminary parts of the fuselage are drying. This will work satisfactorily as long as simultaneous construction is not carried past the point where it will interfere with proper completion of some of the interlocked parts. Protect the plan from glue damage by covering it with wax paper or plastic wrap.

To understand all of the construction requirements, read the complete instructions and study the drawings carefully before beginning. A little time spent in looking at the isometrics will make it clear where construction out of the descriptive sequence is required or can be done.

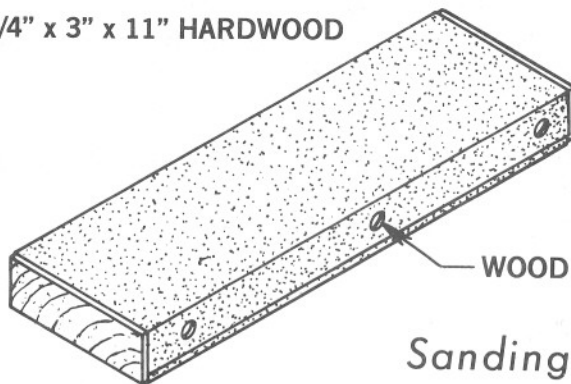
Cut all long pieces of balsa first, followed by medium lengths, before cutting up any full-length strips into short pieces. Remove die-cut pieces from the sheets carefully. If difficulty is encountered, do not force the part from the sheet. Use a modeling knife to cut it free. Leave parts in the sheets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

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.

#### (1.) SANDING BLOCK

The first requirement is to make a large sanding block to take a full sheet of sandpaper. It is an indispensable tool for many operations. Use several wood screws along one edge to hold the sheet in place.

3/4" x 3" x 11" HARDWOOD



WOOD SCREWS

Sanding Block

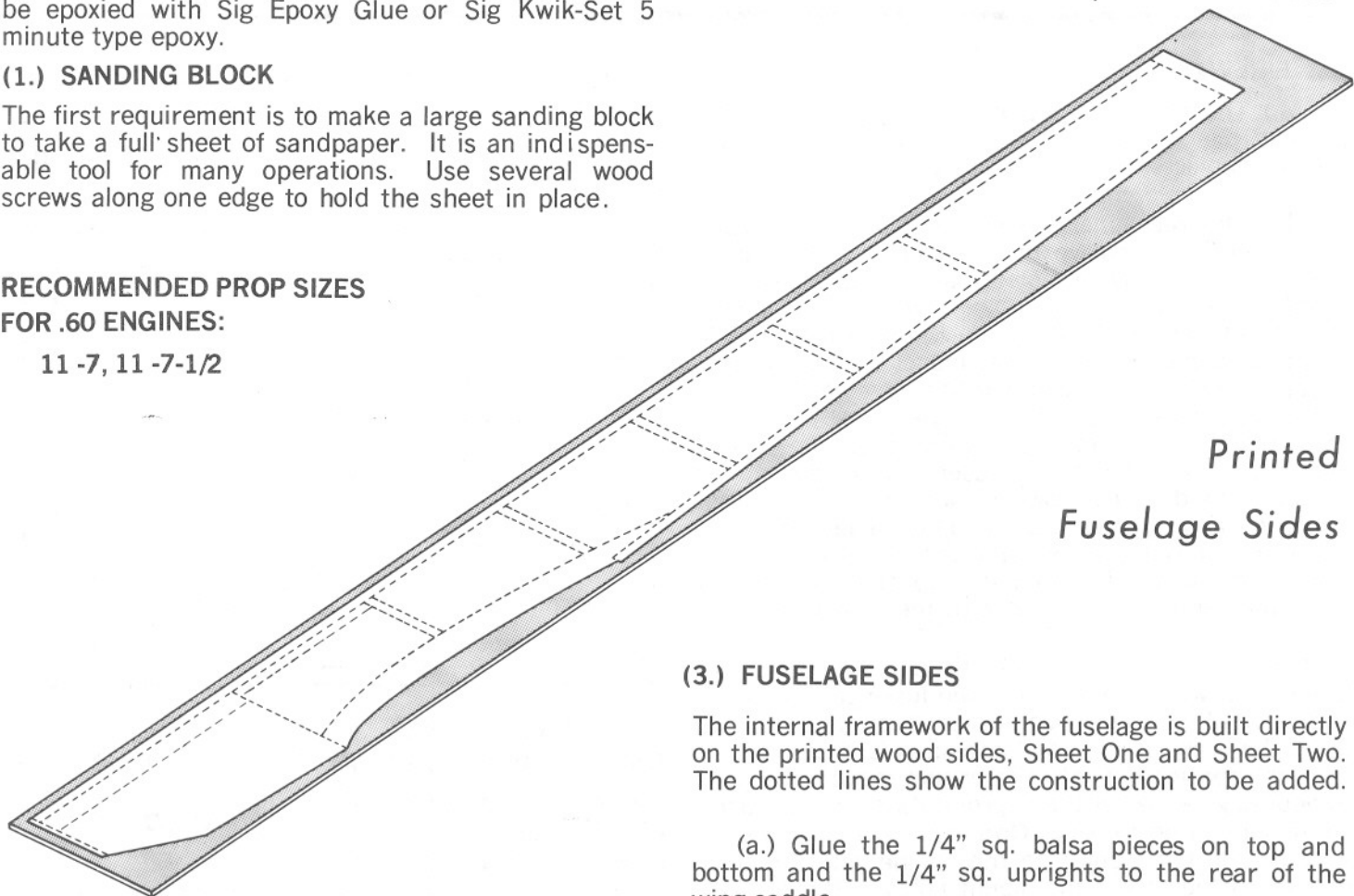
#### (2.) CUTTING OUT PRINTED PARTS

A jig saw is best for this job. Cut just outside the lines, leaving all of the line on the part. When fitting into place in the structure or joining with an adjacent part, use the sanding block to bring the edges to an exact fit. If an X-Acto knife is used, don't cut too close to the lines but leave enough margin to true up and finish the edge with a sanding block. It is easier to cut at an angle with a knife so more tolerance may be needed for final fitting with the block.

The fuselage sides need not be cut out of the sheets until the internal structure is glued to them. Decide before beginning construction whether you intend to use a wing fillet. If you do not, omit plywood part FZ and use the cut line on the parts for "No Fillet".

#### RECOMMENDED PROP SIZES FOR .60 ENGINES:

11-7, 11-7-1/2



Printed Fuselage Sides

#### (3.) FUSELAGE SIDES

The internal framework of the fuselage is built directly on the printed wood sides, Sheet One and Sheet Two. The dotted lines show the construction to be added.

(a.) Glue the 1/4" sq. balsa pieces on top and bottom and the 1/4" sq. uprights to the rear of the wing saddle.

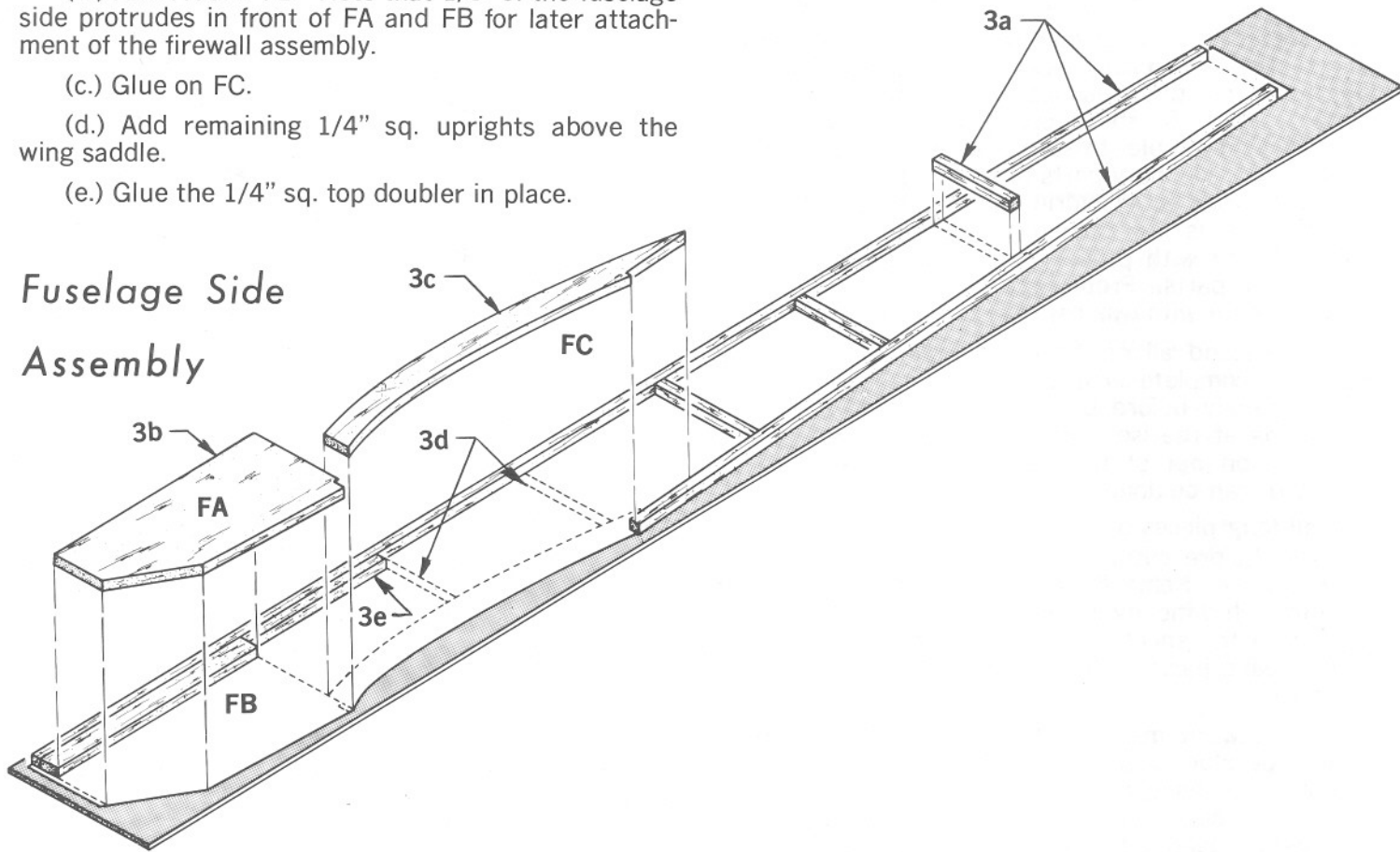
(b.) Add FA and FB. Note that 1/8" of the fuselage side protrudes in front of FA and FB for later attachment of the firewall assembly.

(c.) Glue on FC.

(d.) Add remaining 1/4" sq. uprights above the wing saddle.

(e.) Glue the 1/4" sq. top doubler in place.

## Fuselage Side Assembly



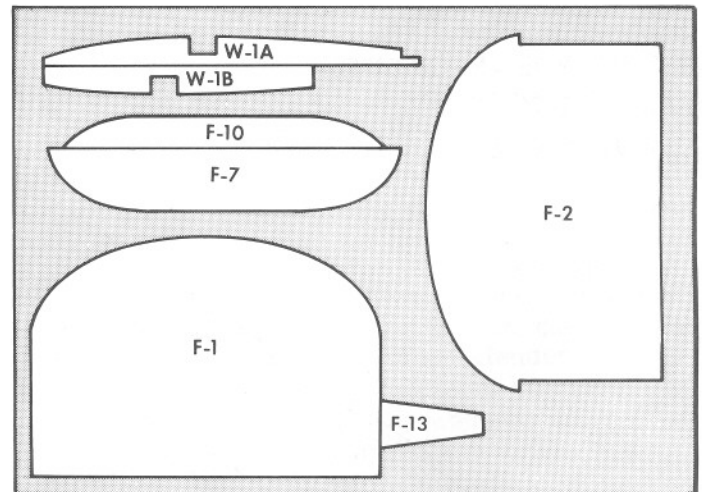
### (4.) FIREWALL

(a.) The firewall is made by gluing the two 1/8" plywood die-cut parts F1 and F2 together to form a 1/4" thick piece. Use Sig epoxy glue.

(b.) The recommended engine installation, using side mounting is shown on the plan. If you should use an inverted engine, be sure and lower the tank so it will be the same distance below the hole in the needle valve body that is shown on the plan for the side mounted engine. The original model used no engine offset to the right or down and this gave good results. Some fliers have a personal preference for 2 to 4 degrees of right thrust to help counteract torque effects. This is an aid on takeoff to lessen pull to the left. If you wish to do this, make allowance for the thrust offset in installing the mounts. Make a tapered shim to put behind the mounts. Shift the mounts over from the firewall centerline so the prop spinner will still be in the center of the cowl with the shims installed.

(c.) It is easiest to install the engine mounts 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. Determine the spacing between the engine mounts required by your engine. Mark the appropriate mount locations and mounting hole spots. One good way to do this is to tack glue the mounts to the engine with 5-minute epoxy and then mark the mount holes in the firewall.

(d.) Drill the engine mount holes in the firewall. Epoxy 6-32 blind nuts to the back of the firewall to retain the mounts. The holes in the firewall must be large enough to allow the blind nuts to pull into the firewall when the mount bolts are tightened.

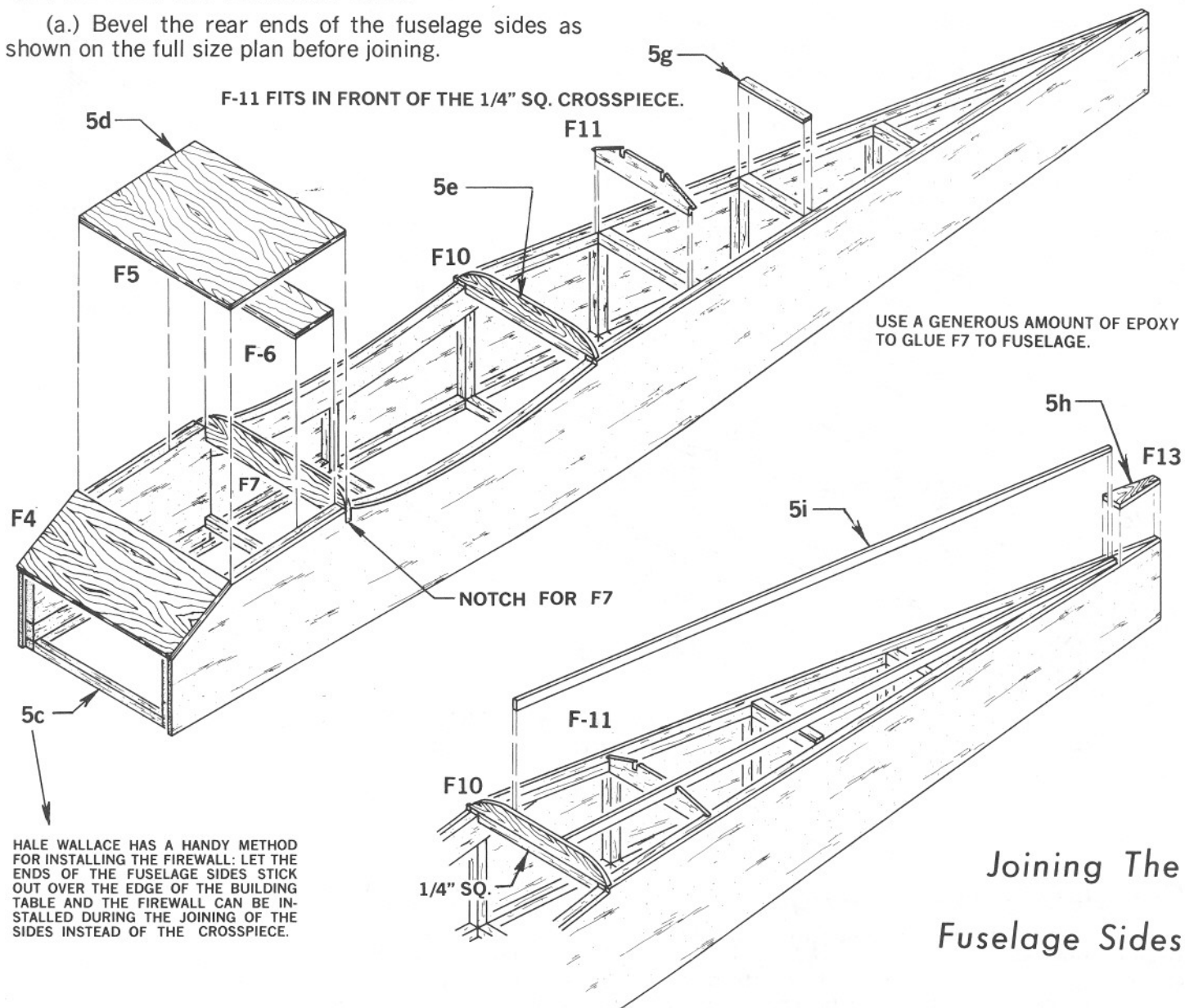


1/8" x 4-3/8" x 7-3/8"	F3
1/8" x 2-1/2" x 5-1/8"	F4
1/8" x 5-1/8" x 3-7/8"	F5
1/8" x 1-1/2" x 4-3/8"	F6
1/32" x 10" x 2-1/2"	FZ
1/16" x 2" x 4"	AILERON MOUNT, SCABS ON W1

Key To  
Plywood Parts

## (5.) JOINING THE FUSELAGE SIDES

(a.) Bevel the rear ends of the fuselage sides as shown on the full size plan before joining.



HALE WALLACE HAS A HANDY METHOD FOR INSTALLING THE FIREWALL: LET THE ENDS OF THE FUSELAGE SIDES STICK OUT OVER THE EDGE OF THE BUILDING TABLE AND THE FIREWALL CAN BE INSTALLED DURING THE JOINING OF THE SIDES INSTEAD OF THE CROSSPIECE.

(b.) Gray tone shade on the Fuselage Top View locates the 1/8" sheet fuselage sides. Pin the sides on the plan upside down - flat top of the sides against the building board.

(c.) At the front, use several temporary 1/4" sq. cross pieces. Later, after removing the joined sides from the board and installing the firewall and F-3, the temporary cross pieces can be removed.

(d.) Add ply parts F7, F4, F5 and F6 in this order. Let the front parts dry before pulling the rear together.

(e.) Continue joining the sides toward the rear with ply part F10 and 1/4" sq. balsa crosspieces.

(f.) Carefully mark the centerline of the plan onto each of the 1/4" sq. crosspieces. This is to later provide an accurate lineup for gluing on the tail.

(g.) Glue on the 1/16" x 1/4" crosspiece addition at Section "R".

(h.) Epoxy the ply tail wheel bracket mount F13 in place.

(i.) Install the 1/8" x 1/4" bottom stringers. Note that they must be tapered to fit against the fuselage frame toward the rear. (See full size plan.)

The frame may now be removed from the plan.

## (6.) MOUNTING THE LANDING GEAR

(a.) Hold the gear in place against the bottom of F5. Using it for a drill guide, drill holes through the plywood for the mounting bolts.

(b.) Install 4-40 blind nuts on the inside of the fuselage to retain the gear. Glue in the nuts with epoxy.

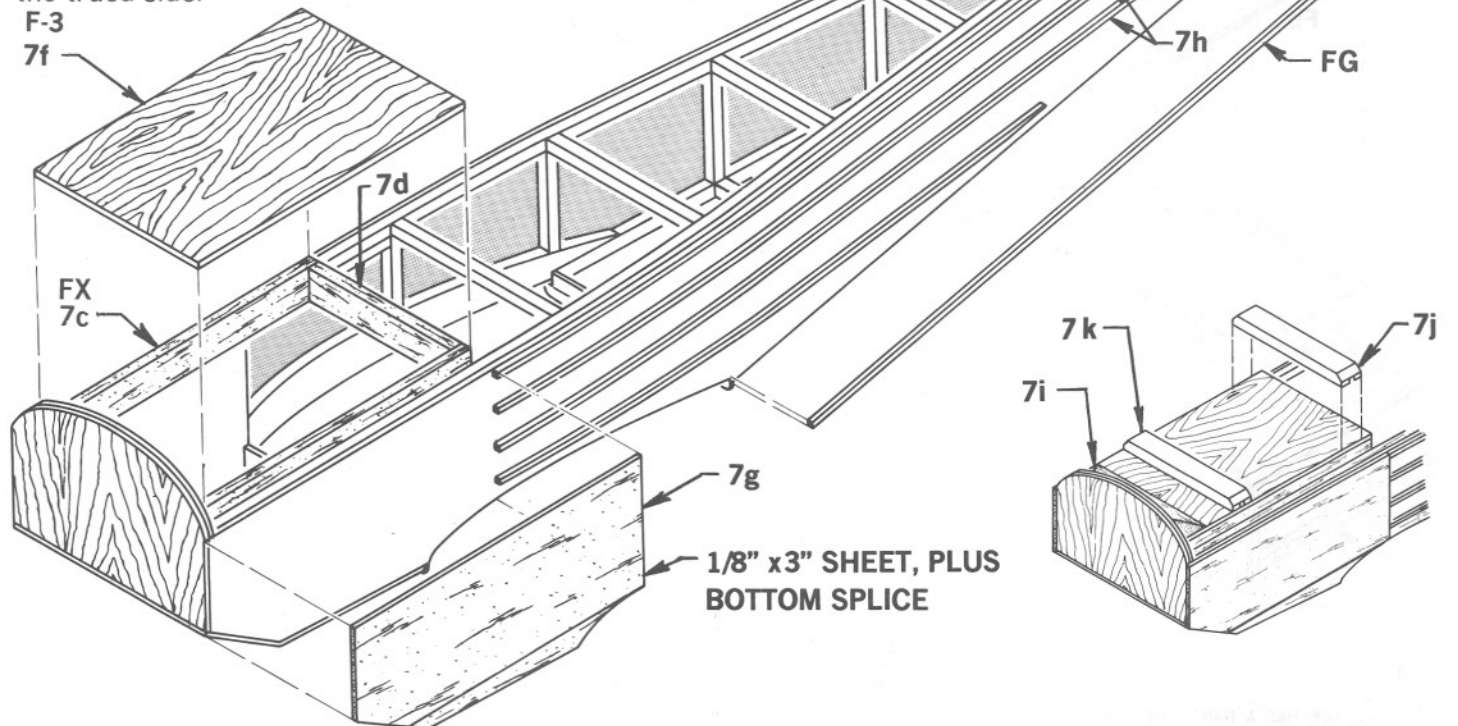
(c.) Glue 3/8" sheet balsa to F5 in front of the landing gear. A separate piece of 3/8" sheet is glued to the landing gear itself. Drill holes through the sheet to pass the landing gear mounting bolts, allowing the landing gear to be removed if desired.

(d.) Carve and sand the fuselage bottom to contour shape.

**(7.) COMPLETING THE FUSELAGE**

(a.) Epoxy the firewall in place on the front of the fuselage. The temporary 1/4" crosspieces may now be removed. Add the 3/4" triangular stock firewall braces labeled "A" in the cowl cut-away view on the plan to the 1/4" sheet inner doubler. See Note 5c. on page 5.

(b.) Should the 1/4" x 3/4" balsa provided for the construction labeled "FX" on the plan be a little bowed or not perfectly flat on one side, correct with a sanding block. Carefully draw a line 3/8" from the top of the trued side.



(j.) Bevel the ends of the grooved hardwood blocks to clear the sides of the plastic top.

**Completing The Fuselage**

(c.) Glue the FX pieces inside the fuselage frame. Position the line drawn on them exactly on the top of the fuselage sides, with 3/8" of FX protruding above the sides. The top of FX must be parallel to the top of the fuselage sides so that the plywood platform F3 will also be parallel and thus set the wing incidence at 0 degrees.

(d.) Add the 1/4" x 3/4" crosspiece at the back of the FX pieces.

(e.) Glue 3/16" x 3/4" T. E. stock to the inside of the FX pieces. (See "Typical Front Section At F7" on the full size plan.)

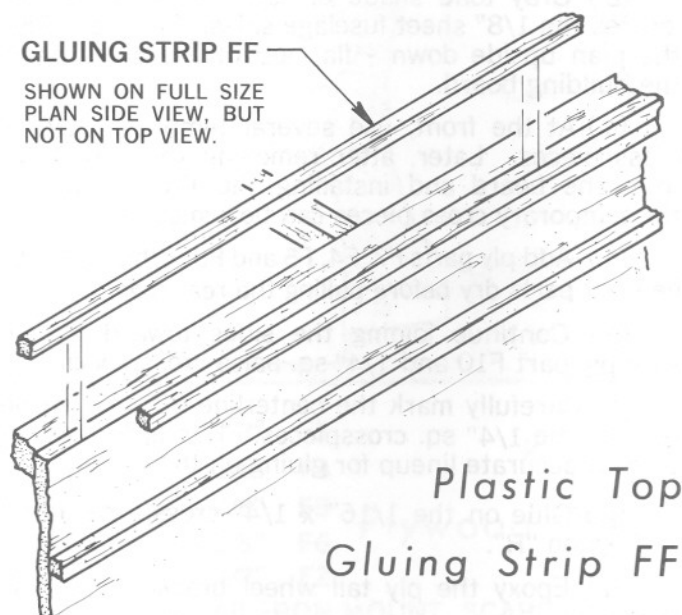
(f.) Glue plywood part F3 to the FX frame just completed.

(g.) Glue 1/8" sheet balsa to the side of the nose.

(h.) 1/8" sq. balsa stringers are added to the fuselage sides. Use the full-size plan as a guide in installation.

(i.) Epoxy the 1/4" triangular stock brace to the back of the firewall top and on top of F3. Be sure and keep epoxy out of the blind nuts for the motor mounts by filling them with modeling clay or putting a small square of plastic tape across the hole.

(k.) Glue the grooved hardwood blocks to F3. Use plenty of epoxy, but be careful not to get the groove plugged with glue. Pass a 1/8" sq. balsa stick through it to insure that this has not happened. Check carefully to see that the space between the grooves is exactly the same on both sides—4-1/4" center to center.

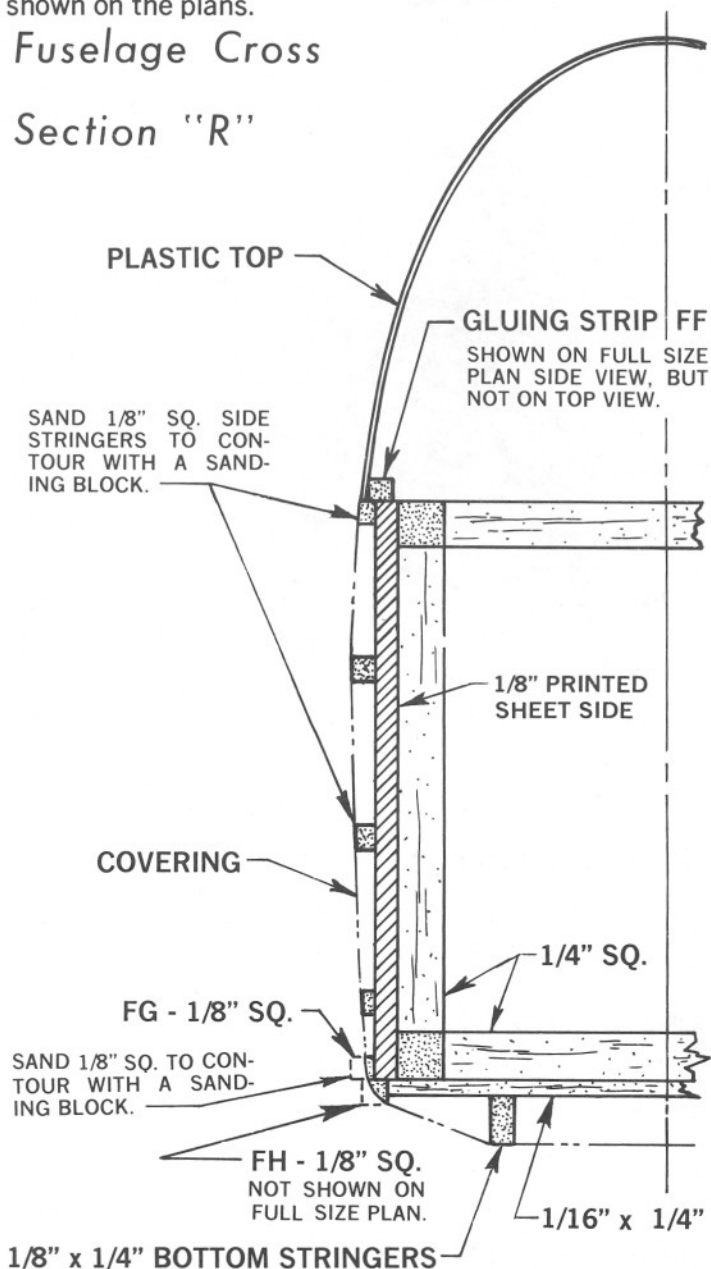


(l.) Note on the adjoining cross section view of the fuselage the stringer on the bottom corner labeled "FH". This 1/8" sq. stringer was not shown on the full size plan to avoid the confusion of so many overlapping lines that would result. It is glued to the corner to help form the contour and keep the covering from sticking to the fuselage frame when being doped.

(m.) Glue the F-12 pieces to the fuselage sides as shown on the plans.

## Fuselage Cross

### Section "R"



### (8.) TAIL ASSEMBLY

(a.) Pin down the tail surface parts on a sheet of wax paper and glue them together with Sig-Bond or Sig Epoxy glue. Key letters appear on the patterns to insure proper assembly. Connect matching letters to each other.

(b.) A pattern appears on the centerfold page of this booklet showing the elevator glued to the piece of 1/4" x 1/2" balsa. This pattern also shows the distance between the halves for installing the 3/32" wire connector.

NOTE: The stabilizer, elevator, fin and rudder parts are easiest to cover before they are hinged and attached to the fuselage. Refer to the Finishing Section at this time and prepare the tail parts before hinging and attaching to the fuselage. Be certain to test assemble them on the hinges before covering to insure that a good edge and end match has been obtained in the sanding operation. Do not cover portions of the tail that are glued to another part so that there will be wood-to-wood joints. If it is more convenient, remove a section of the covering to expose the wood. It is also probably best to have the lower wing completed and fit into the wing saddle of the fuselage while the tail is pinned in place so that they can be lined up in conjunction and any difference in alignment corrected. The tail surfaces must be in place before the plastic top is permanently attached.

(c.) Punch a series of angled holes with a 1/16" wire in the bottom of the stabilizer every quarter of an inch or so in the places where it will contact the fuselage frame. Do likewise in the fuselage frame. Work these holes full of epoxy glue and this will in effect "nail" the two parts together when the glue sets.

(d.) Use the crosspiece center marks as a guide in correct alignment when gluing the stabilizer onto the fuselage.

(e.) Draw the centerline on the top of the stab, using the previously established cross piece center marks and the back end of the fuselage as guides in getting the line exactly correct. Measure 1/8" on each side of this center line and mark this as the fin position on top of the stab.

(f.) Punch 1/16" holes as previously done in the mounting of the stab on the fuselage. Epoxy the fin in place on the stab, filleting with a bead of glue.

### (9.) INSTALLING THE PLASTIC FUSELAGE TOP

(a.) A 1/8" sq. stringer is shown on the side view labeled "FF". This is a gluing strip for the plastic top. It has not been shown on the top view on the plan to avoid too many overlapping lines. A separate view on the center fold of this booklet shows how this strip is located. Run it directly on top of the 1/8" sheet fuselage sides until about the front of the cockpit. At this point it should begin to taper off onto the top 1/8" stringer.

(b.) The gluing strip should be beveled to fit the curve of the sides of the plastic top. Toward the rear, very little bevel will be required but progressively more is needed toward the front. Lay the plastic top in place to determine the amount. Dress the bottom of the top with the large sanding block so that the top will sit exactly level. Also it is possible the top may have flattened somewhat during storage of the kit. The top is flexible and can be held in the installation position with a row of pins just to the outside of the gluing strip. Keep in mind that the fuselage side stringers will be sanded to blend into the contours of the plastic top, as indicated in the cross section views of the fuselage. Trim down the tail fillets on the plastic top as required for a good fit against the tail.



Above: Hazel Sig with both prototype Skybolts, model and full size.

Below: Norm Tobison's Skybolt features a sharp red and white color scheme.







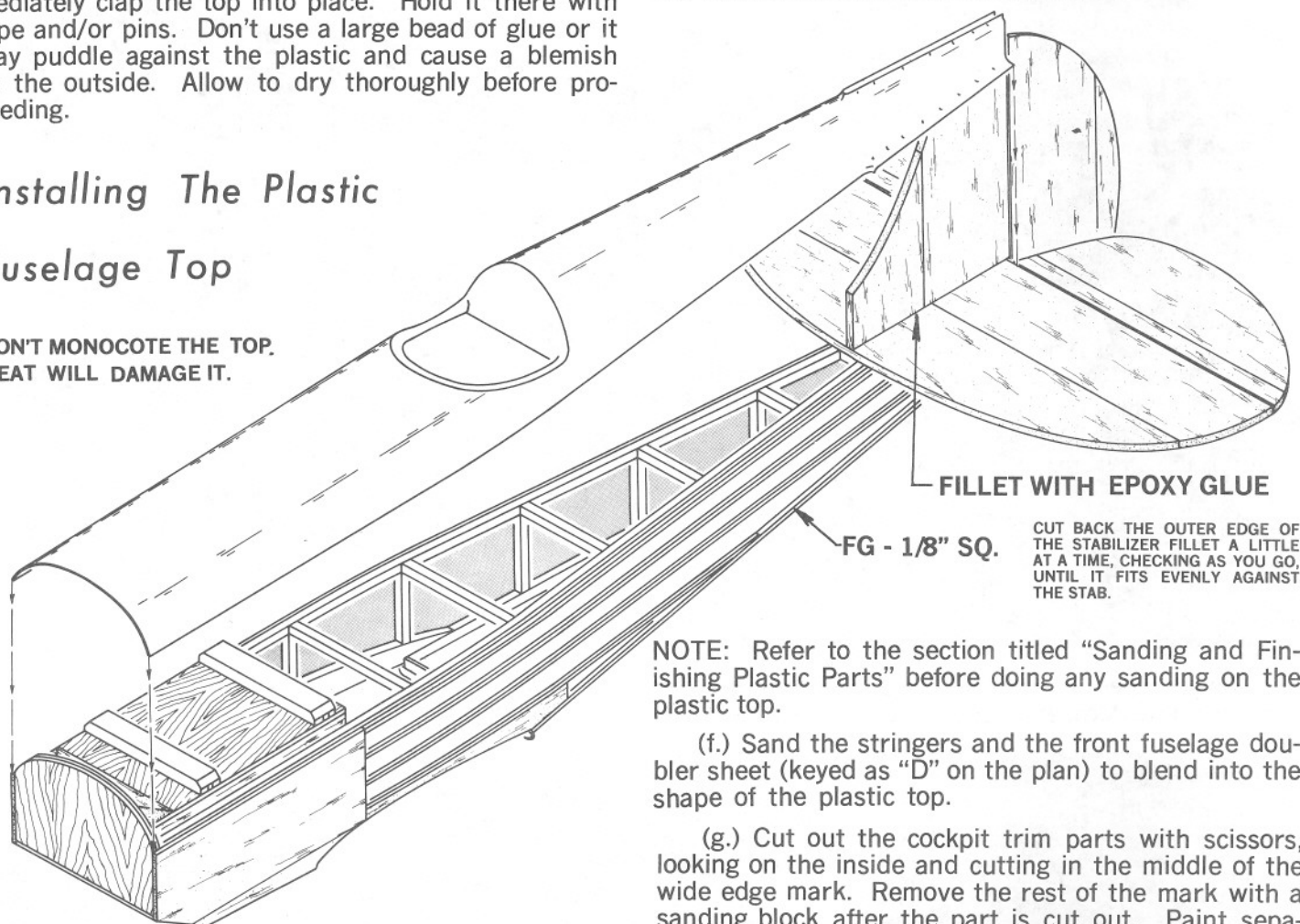
Hale Wallace spent 3 years building this beautiful 12" = 1' scale model. See the Sig Catalog for details of the alternate decal available to help duplicate his fine red, white, blue and black color scheme.



(c.) The plastic top is glued to the fuselage strip FF with Sig-Ment. It is recommended that a large bead of Epoxolite instead of Sig-Ment be put on the firewall to fill any slight irregularities between it and the plastic top. Because Sig-Ment is fast drying, this operation must be accomplished quickly and is best done with a helper. Leave the tail part unglued and work only on the matter of gluing the plastic top to gluing strip FF. Lay down a bead of Sig-Ment and immediately clap the top into place. Hold it there with tape and/or pins. Don't use a large bead of glue or it may puddle against the plastic and cause a blemish on the outside. Allow to dry thoroughly before proceeding.

## Installing The Plastic Fuselage Top

**DON'T MONOCOTE THE TOP. HEAT WILL DAMAGE IT.**



CUT BACK THE OUTER EDGE OF THE STABILIZER FILLET A LITTLE AT A TIME, CHECKING AS YOU GO, UNTIL IT FITS EVENLY AGAINST THE STAB.

**NOTE:** Refer to the section titled "Sanding and Finishing Plastic Parts" before doing any sanding on the plastic top.

(f.) Sand the stringers and the front fuselage doubler sheet (keyed as "D" on the plan) to blend into the shape of the plastic top.

(g.) Cut out the cockpit trim parts with scissors, looking on the inside and cutting in the middle of the wide edge mark. Remove the rest of the mark with a sanding block after the part is cut out. Paint separately and install with small spots of Sig-Ment after other painting and finishing is completed.

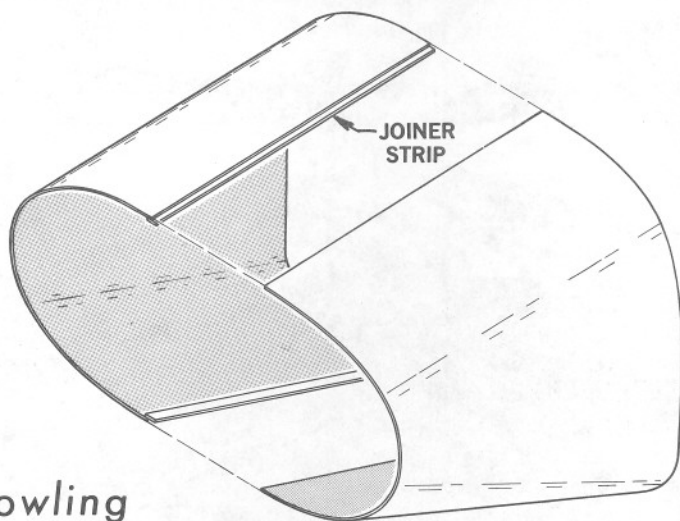
**IMPORTANT: GO EASY ON GLUE, FILLER AND PAINT ON THE TAIL. AN EXTRA OUNCE HERE TAKES 5 OR 6 OUNCES OF WEIGHT IN THE NOSE TO COUNTER-BALANCE IT.**

### (10.) COWLING

Use Sig Supercoat Thinner, Acetone (at some drug-stores) or MEK (methyl ethyl ketone) to weld the plastic together. The fuselage should be assembled with the plastic top in place before assembling the cowl parts.

(a.) Tape the cowl parts together and try a preliminary fit of the match to the fuselage. If the cowl fits the fuselage loosely, remove a little width by sand-large sanding block. If it fits tightly, sand down the fuselage.

(b.) Trial fit the cowl front on the taped together halves. If it is slightly oversize, remove some of the back of it or some of the front of the halves, or both, by sanding down to bring the sizes together.



Cowling

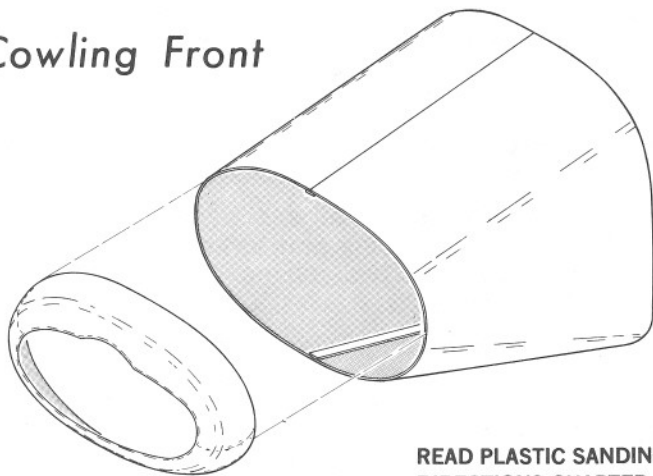
(c.) Untape the cowl when the fit is satisfactory. Hold the plastic joiner strip in place on the inside of one half. Leave half of the width of the joiner strip extending over the edge so as to lap onto the other part half when it is attached.

(d.) Using a small, pointed brush, flow a few drops of thinner under the edge. It will spread along the seam by capillary action. (Don't let the thinner get under your finger, it will leave a finger print.)

(e.) Join the halves on one side with tape. Flow thinner into the opposite seam from the inside. Squeeze and hold together until dry. Remove tape and do the remaining seam.

(f.) A putty may be made from shavings of the waste plastic dissolved in thinner, acetone or MEK to fill any parts of the seam not completely closed. Sig Epoxolite Putty may also be used for this purpose.

## Cowling Front



**DON'T MONOCOTE THE COWL.  
THE HEAT MAY DAMAGE IT**

**READ PLASTIC SANDING  
DIRECTIONS CHAPTER  
BEFORE SANDING COWL**

(g.) Attach the cowling front to the body of the wheel using thinner or acetone to bond them together. After attachment, reinforce the seam between the front and the body by applying joiner strip to the inside surface of the seam. Because of the curvature, short pieces of strip should be used. Bend them to the general shape before holding them in and applying thinner. As the thinner welds the plastic together the strip may be pressed down tightly in place.

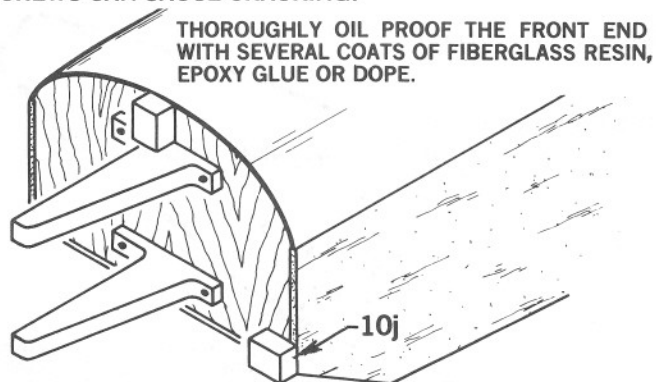
(h.) The seams may be scraped down and any rough spots or flaws taken out with sandpaper. Do not use coarse sandpaper that will cut deep scratches in the plastic. The deep scratches may later open up wider when dope is applied. Use medium paper and finish carefully with fine paper, sanding down enough to have a smooth, scratch-free surface.

(i.) To make the openings in the front of the cowling nosepiece and in the side of the cowling for the engine head, first drill a series of holes about 1/8" in diameter around the cut out portion. Have the holes almost touching each other. Don't get them too close to the edge of the opening. Once the opening is made the edges can easily be trimmed to exact shape with an X-Acto knife. Cut through the bits of plastic between each of the drilled holes with a knife and break out the part to be removed. Don't get hasty in cut-

ting the opening in the cowling side for the engine head - start undersize and open it up slowly, fitting as you go so that it doesn't end up larger than necessary. Don't have any square cornered openings.

## Cowl Mounting Blocks

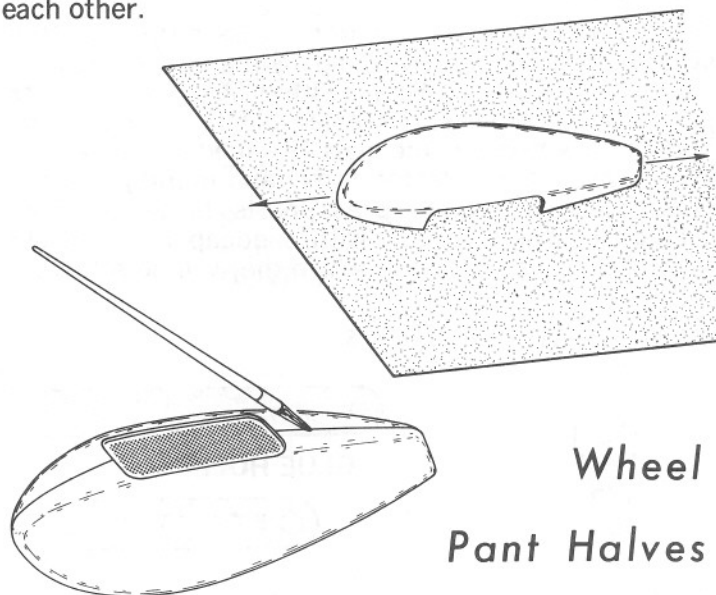
**MAKE CERTAIN THE BLOCKS SUPPORT THE COWL. PULLING THE COWL DOWN TO THEM WITH THE MOUNTING SCREWS CAN CAUSE CRACKING.**



(j.) Epoxy three hardwood cowl blocks to the front of the firewall. Fit the cowling over them, sanding down the blocks until they seat snugly against the inner surface of the cowl. Drill a pilot hole through the cowl into the blocks far enough to start the cowl screws threading into the blocks. Open up the cowl holes so they are large enough to pass the screws.

## (11.) WHEEL PANTS

The wheel pant halves are joined in the same manner as the cowl except that the joiner strips are not necessary. Squeeze the pant halves tightly together after allowing a few seconds for the plastic to soften from the thinner in the joint. This will weld the halves to each other.



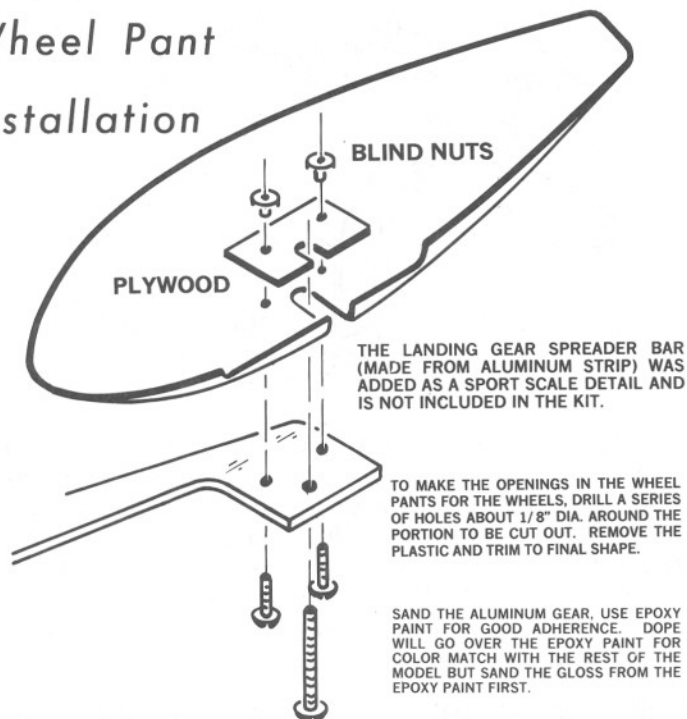
(a.) A heavy duty 8-32 axle bolt is included in the Skybolt so the axle hole in the landing gear must be drilled out to accept the bolt. Use a No. 18 or a 11/64 inch drill.

(b.) A 1/8" scrap plywood plate is cemented to the inside of the pant half with Sig-Ment.

(c.) The slot in the pant and ply plate is made wide enough to clear the axle nut. The pant may be removed without taking off the wheel.

(d.) Blind nuts and 4-40 bolts hold the plywood plate and pant to the landing gear. The best way of fitting is to bolt the pant approximately in place with just one bolt. Then carefully align it to the angle desired, tape it in place and drill the final hole.

## Wheel Pant Installation



**FILE A NOTCH INTO THE LANDING GEAR TO ALLOW THE WING DOWEL ENOUGH SPACE.**

## (12.) BRASS PARTS

Several parts must be cut from brass strip. Cut the strip to proper length by clamping in a vise and sawing off with a hack saw. Finish with a file. Use a center punch to mark places for holes before drilling them. The holes wherever the part is glued to something allows the epoxy to fasten firmly and literally nail the brass piece in place. Brass parts to be soldered should be polished clean with sandpaper, as should the wires or other parts to which they will be soldered.

## Brass Part Patterns



NOTE: Material supplied in kit for Type B Double Ailerons. Type A is optional.

## Wheel Sizes

MAIN - 2-1/2"  
TAIL - 1-1/4" - 1-1/2"

## (13.) CABANE STRUTS

The four 1/8" wire main cabane struts and two 3/32" wire brace struts are prebent but some minor alterations of the bends may be necessary during assembly. The critical matter is to get the front and rear sets of cabane struts made exactly the same. If they are exact, the 0 degrees incidence of the top wing will be set accurately. Use the cabane strut pattern in "Typical Front Section at F7" on the plan for assembly of the struts. Polish all parts clean and bright with sandpaper to insure good soldering.

(a.) Make two top brackets "SS" from the 5/16" brass strip provided in the kit, using the pattern shown here. Drill a 1/8" hole in SS. Clamp the brass in a vise and use a file to notch the bottom portion to 1/4" wide.

(b.) Put a straight board along the bottom of the cabane strut drawing on the plan to provide a lineup edge to work against while pre-assembling the struts.

(c.) Match the cabane strut wires in pairs. In particular make sure that the tops are filed to exactly the same height. This provides a lineup point to check alignment when they are reassembled in the fuselage.

(d.) Fasten a pair of cabane struts and an "SS" piece to the drawing, using pins to keep them aligned. Shim the bottom of the cabane struts with 1/16" shims to level the parts.

(e.) Tack solder only one of the pair of cabane strut wires to the side of brass part "SS". Be careful not to let the solder flow across and fasten SS to the other cabane strut wire. Tack the other wire to SS temporarily with 5-minute epoxy to hold the assembly together for the next operation.

(f.) Take up the first set of wires from the board and turn it over on the drawing. Assemble the 2nd set directly on top of the first, using shims where appropriate to keep the operation level. Slip a small piece of paper between the two SS pieces (which are now touching each other) to keep them from being soldered together. Use a small piece of 1/8" dowel as a pin to hold the two holes in the SS pieces exactly aligned with each other.

(g.) Now repeat the steps previously done on the first assembly in paragraph (e.) above.

(h.) Remove from the board, separate the matching pairs and clean off the 5 minute epoxy used to temporarily join the first set.

(i.) Insert a set of matched wires into the grooved hardwood block holes on each side of the fuselage. Don't glue them in the holes. Make certain that the tops of the wires are once again flush and matched as they were when pre-assembled. Bind the top tightly together with copper wire. Solder permanently, of place while the solder is soft. Protect the plastic fuselage top during the soldering operations with a wet cloth so that dripping solder or the heat of the iron will not blemish it.

(j.) Repeat the process described in paragraph (i.) for the second set of cabane struts.