CHAPTER 5

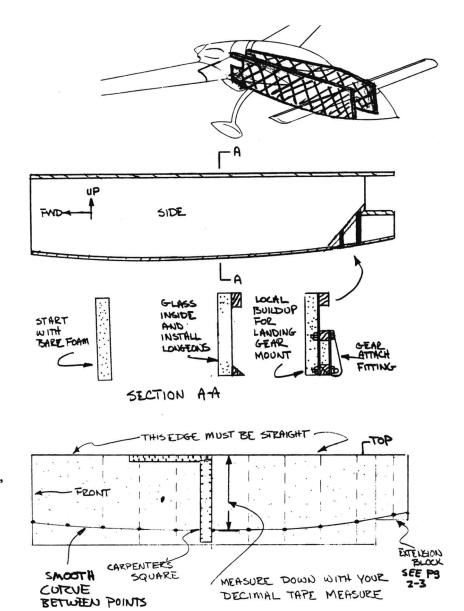
THE FUSELAGE SIDES

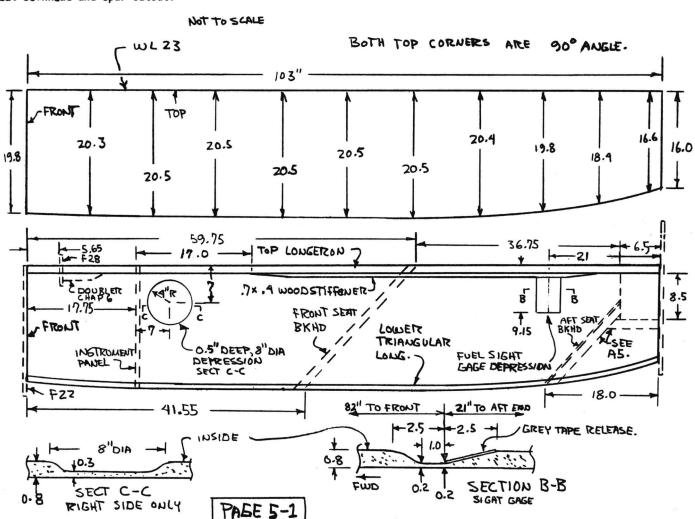
Overview - In this chapter you will manufacture the sides of your fuselage. To do this, 0.8" thick dark blue PV core type 45 foam is cut to size, determining the fuselage profile. The inside surfaces are contoured (dished out) for fuel gages and for extra room near the front control stick. The inside (contoured) surface receives a 2 ply UND skin and,while the layup is wet,the upper rectangular wooden stringers are bonded in position. The lower triangular stringers and some local beef-up in the landing gear attachment area are then installed and cured. The area where the centersection spar mates to the fuselage is opened and the main gear attachment fittings installed. The outside foam surfaces are left bare until after assembly of the fuselage is completed in chapter 6.

STEP 1.- Shaping the foam sides. Butt pieces of 0.8" thick dark blue type 45R PV core together to obtain two 103" x 21" rectangles laid flat on your workbench. Bond the joints with wet micro. Trim or sand one 103" edge absolutely straight.

Using the adjacent drawing your decimal ruler, and carpenter's square as shown, measure and mark the 12 dimensions that determine the curve of the fuselage bottom Refer also to pages A5, A7, and A8 to check the shape of the curve. Draw this curve on the foam with a ball-point pen of felt marker. Cut along this line and use this as a pattern to make the other fuselage side.

Layout the positions of the four interior bulkheads. Use drawing A5 (full size) to layout the aft seat bulkhead and spar cutout.





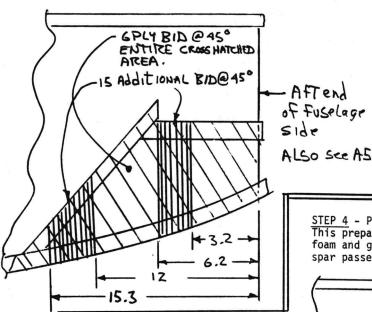
WOOD PARTS ALL ARE AIRCRAFT STEP2 SITKA SPRUCE. Now, layout the circular depression shown, in the right side only (inside surface). The depression gives some extra room inside at the control stick area. Using 36-grit sandpaper, dish out this area about 0.5" deep 1"x .7" Longeron 103.5 MAKE TWO with smooth edges. 7.0 Refer to the dimensions for the fuel MAKE sight gauge depressions. Refer als to Chapter 7 and Chapter 21 to see Refer also Two the function of these. Note how the depression is tilted to face the pilot. All foam is later removed in this area so the fuel can be viewed through the translucent glass skins. IT IS OK TO LAMINATE TWO I" PIECES, WITH EPOX Y 9.0 After carving, apply a 2½" strip of shiny-surface grey tape (duct tape) to this area so the layup does not bond to the foam. 14.7 MAKE STEP 2 - Fitting the longerons and making the Two inside layup. inside layup.
This step should take you about three to four hours. An assistant is nice for the layup but not absolutely necessary. Refer to the full-scale drawing on page A5 and cut your rectangular 1.0 x 0.7 wood longeron material to lengths as shown. Cut UND cloth and lay up 2 crossing plies over the contoured foam as shown. This is the inside of the fuselage. Be sure you are making LWX 11.0 12.4 359 inside of the fuselage. Be sure you are making a left and a right side. So not use micro slurry. See chap 3, for Type 45R p.V. Foam.

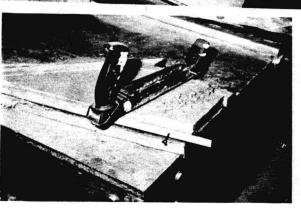
With both plies wet out and squeeged well, apply wet flox to the 103.5" wood longeron mating surfaces and position on the fuselage sides. Install STIFFENER MAKE TWO wet flox to the 103.5" wood longeron mating surfaces and position on the fuselage sides. Install, with wet flox, the .7 x .4 wood stiffeners under the longerons. Weight them into position for cure. Peel-ply the bottom edge. Refer to the full-size drawing on page A5 and carefully position and flox in place the other two small longerons. Knife trim skin to the foam edge all around. Allow to cure. After cure, radius the edge of The top longeron and glass the 3 ply UND. AND 1 PLY BID STEIPS

STEP 3 - Installation of the lower triangular Longerons. 5 55.0 Peel ply where Bulkhouds will go. INSIDE LAYUP STEP 2 1ST PLY 6 Longerons. This step should take about one hour. Remove peel ply along the bottom edges of the fuselage sides. Fit the triangular longeron to the lower Buu sides. Fit the triangular longeron to the low edge foam curvature by holding it in position with nails as shown in the photo. Don't try 3°° to drive the nails with a hammer; drill a hole for them so you can shove them in by hand. Notch the longerons with saw cuts every 2 inches at the aft end so they will more easily bend to the correct curvature. The longerons are installed with wet flox. Wipe off excess Flox. FUSELAGE PLY INSIDE. O AUGN LONGERON FLUSH WITH FORMEDGE. STEP 2 clean off EXCESS FLOX DO NOT TRIM SELVAGE -Z-PLY UND. BUTT, DO NOT OVERLAP EDGES KNIFE TRIM FLUSH 4.8"THICK, RAS PV CORE. See page 5-1 for positioning this 55" long .4 x .7 stiffener. Glass as shown with 3 plies UND with orientation lengthwise. The 3" wide strips of UND stop at the ends of the stiffener. The 1 ply BID shown at left goes over the UND. 1 PLY BID-LAPS 1"
ONTO THE 2-PLY UND LAYUD
THIS EXTENDS THE ENTIRE 103"LENGTH TOP 3 PLY UND - OHERTATION IS THE 55" dimension LONGERON 13. 19. 18. 18. 14 TOP MOTE: LONGERON IS FLUSH AT FRONT AND STICKS OUT 1/2" AT REAR. STEP 3 .Flush with 0.5 FOAM AFT NAIL, EVERY AUB -LWX AFT END AFTER STEP LWY TWO NAILS LWX7 POSITION PER PG A5 PAGE 2-5

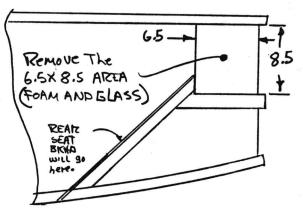
At the bottom rear of the fuselage, from LWX aft, the lower triangular stringer is doubled to form a square (see page A5 and A4). A pair of clamps and a few nails can be used to position the doubler (while the flox cures) as shown in the photo. Wet micro a 1" urethane block in the area bounded by LWX and LWY as shown in the photo. Notice that the lower stringer is left long at this point to be trimmed later, after the firewall is installed.

Let the micro and flox cure. Use your surform file to carve the foam insert down level with the stringers. Layup the 6-ply and additional 15-ply glass over the stringers and foam insert as shown. Knife trim flush, all around. The heavy 15-ply area absorbs main landing gear loads.



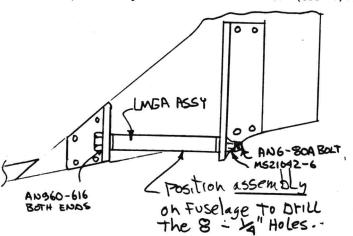


 $\frac{\text{STEP 4}}{\text{This preparation for fuselage assembly.}}$ This preparation takes about an hour. Remove the foam and glass from the area where the center section spar passes through the fuselage sides.

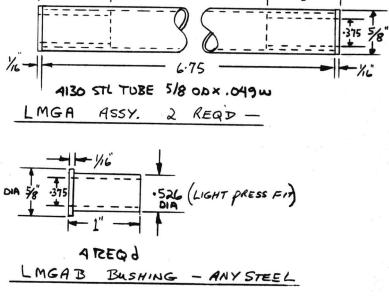


Fabricate the 1" aluminum extrusions, referring to the Page 9-3 drawings and to A5. Be sure to make one left and one right set. Fabricate, or purchase from a distributor, the LMGA assembly. This is two LMGAB bushings pressed into a 6.75" length of 5/8 x .049 4130 tube. Using the AN6-80A bolt, assemble the sets of 2 extrusions and LMGA tube as shown - this holds the extrusions in the exact relationship relative to each other.

Referring to drawing A5, position the assembly on the fuselage side and drill through the sides at the eight locations (per side) with a $\frac{1}{4}$ " drill. Coat the extrusion faces with wet flox to bond. Install the 16 each AN4-16A bolts AN960-416 washers and MS21042-4 nuts to permanently mount the 4 extrusions. (see A5).



EXTRUSION FULL SIZE ORAWINGS ARE ON PAGE 9-3.



PAGE 5-3 LAST PG chaps