

Fuselage Side Panels

Study the 1/10 scale side view and sections shown on pages A-9 and A-10.

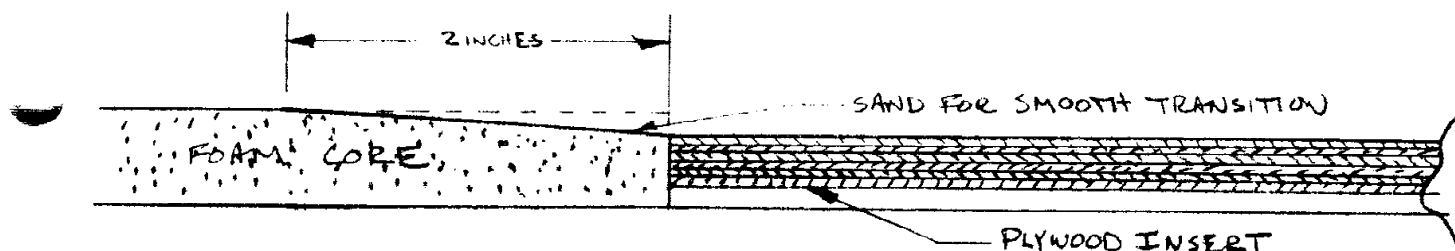
The side panels are built up from 24 inch wide, 96 inch (8 ft) long sheets of 1/2 inch thick blue styrofoam (Dow brand I.B.) and hot wire cut blue foam corner blocks of various shapes. Wooden and metal inserts are added in a number of places to accomodate the installation of wings, tails, landing gear, control systems, entry step, etc. later on. The process of building the side panels is simple, you start by hotwire cutting a batch of 24 inch long corner block material, then cut the side panel outline from 1/2 inch thick foam, bond the corner blocks in position, install the various inserts, and glass the inside surfaces. It is helpful for later assembly to mark the locations of bulkheads, side consoles, flap and aileron pushrod holes, wing attachments, step mounting holes, etc. on the foam surfaces before laminating. Later assembly will be simplified by peel plying the bulkhead and console joint areas, edges and some other areas where mating assemblies are to be bonded later.

Let's begin by dragging out your hotwire and trim templates to cut corner blocks, drag out a block of 2 inch thick foam and cut 10 each 24 inch lengths of 1.5 x 2.5 triangular corner block material (13 x 24 x 2 required foam block). Then change to 1/2 inch thick blue foam and lop off 10 lengths of the top edge block material (Section B-B page A-10). Put the hotwire back into storage for a while.

Next cut the outline of the side panel from 1/2 inch blue foam. The side is too long to cut from a single sheet of foam so you'll have a butt joint in the core 96 inches aft of the firewall. Protect the foam edges at the butt joint on the outside surface (against the table) with masking tape and protect the table under the joint with waxed paper. Join the foam slabs with wet micro. Try to avoid copious squeeze-out. The joint is small and not much micro is required. Paint the joining surfaces of the side slabs and the corner blocks with micro slurry and nail the corner blocks into position. Start from the rear and work forward so that the corner blocks serve to hold the side slabs in position at the butt joint. Try to starve the joint of micro slurry where the corners are carved away later (first 1/2 inch in from the edge of top forward and bottom forward blocks and first 1 inch bottom aft). Let the micro cure for 12 hours then remove the waxed paper and tape.

Cut out two 5 X 15 X 1/4 pieces of plywood for the wing/gear attach insert, one (right side only) 1 X 2 inch piece of .020 2024-T3 aluminum for the downspring attach insert, and one (left side only) 1/2 X 3/16 X 2 piece of 2024-T4 aluminum bar for the canopy latch insert.

Cut the blue foam core away to admit the plywood insert. Space the insert up off of the table 1/8 inch with a metal or masonite shim. This should center the insert in the foam core thickness. Bond the plywood in place with 5 min/micro. Clean off all squeeze-out. Locate the downspring insert on the right side panel, brighten and bond to the foam surface with 5 min/micro. Locate the canopy latch insert in the left side panel, flush with the foam surface, brighten and bond in place. Sand the foam core surrounding the plywood insert for a smooth transition over a two inch slope surrounding the insert as shown in the sketch below.



Mark the foam with positions of bulkheads, side consoles, instrument panel, wing cut-out, aileron pushrod and flap torque tube holes, wing chordline reference, and F.S. 53.0 reference lines. Sand the bottom edge corner blocks for a smooth transition into the flat side panel forward and aft of the wing/gear attach insert. Go cut the cloth and peel ply listed below:

Two 100 inch long 37 inch wide pieces of 0° UNI

One 16.0 x 7.0 piece of 45° BID

One 15.5 x 6.8 piece of 45° BID

One 15.0 x 6.5 piece of 45° BID

One 14.5 x 6.3 piece of 45° BID

One 14.0 x 6.0 piece of 45° BID

One 16.0 x 7.0 piece of 0-90° BID

One 15.5 x 6.8 piece of 0-90° BID

One 15.0 x 6.5 piece of 0-90° BID

One 14.5 x 6.3 piece of 0-90° BID

One 14.0 x 5.0 piece of 0-90° BID

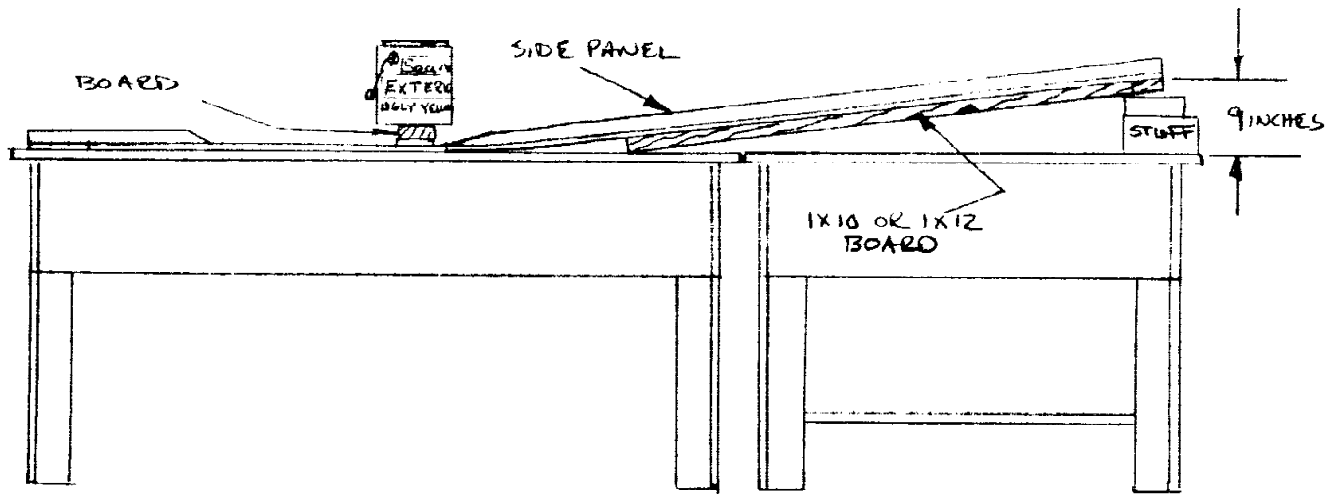
105 inches of 2 inch wide peel ply for the bulkheads, consoles and instrument panel.

240 inches of 2 inch peel ply for the top and bottom edges

16 inches of 4 inch peel ply for the wing/gear attachment area.

Slurry the foam surfaces, paint the wood with epoxy, grab your squeegee and lay 'er up. Start with the UNI skins which are layed up with the fibers 45° to the top edge. You make three selvaged edge to edge butt joints to cover the fuselage side length. One joint is in the cockpit area and visible in the completed airplane so make the joint butt up tightly but not overlap, the joint in the tailcone area may overlap 1/2 inch to speed things up. Two plies are layed up in the fashion such that you end up with the first ply and second ply fibers at 90° to each other and at + 45° to the top edge. Add the 10 BID reinforcement plies over the wing/gear attach area starting with the largest and working down in size. Alternate 45° with 0-90° plies.

Add a two ply UNI patch over the step marking on the left side (one 0°, one 90°) only. Peel ply the edges, the bulkhead side, console and panel joint areas, and the wing/gear attach insert area. Knife trim the edges and cure 24 hours. About four to six hours into the cure (just about knife trim time) place wax paper patches on the side panel top edge and bottom edge along F.S. 70, put a 1/2 inch foam spacer on top of the bottom edge waxed paper, then lay a 2 x 4 across the side panel and weight in position. Slip a 1 x 10 board under the aft end of the fuselage side, and prop the aft end of the fuselage up as shown in the sketch below to cure fully.



Curing the side panels in this fashion will aide in assembling the sides and bulkheads without needing the Green Bay Packer's defensive line to help out. Keep the long board parallel to the top edge but relatively centered in the width of the side panel's aft end.