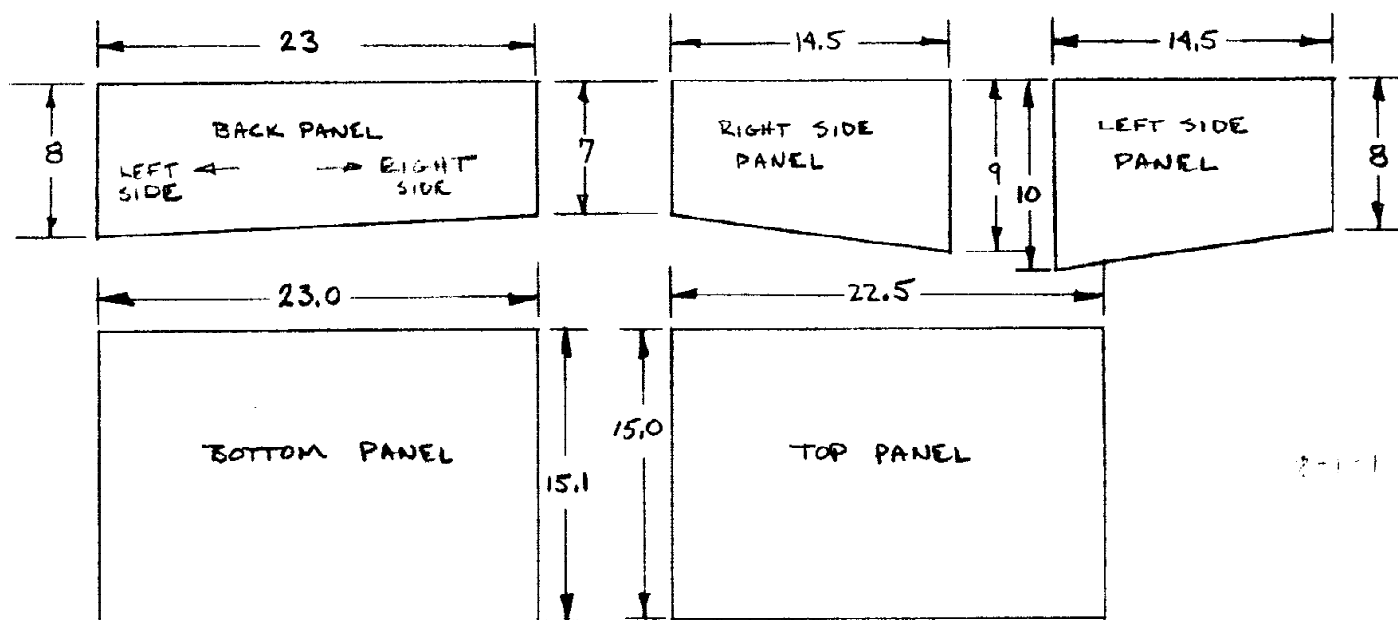


Front Fuel Tank

The front fuel tank has volume for 11.5 gallons. Resist any urges you might have to enlarge it. The forward c.g. limit will have to be out near the spinner if you try to load too much fuel forward. The front tank is a three wall (glass, foam, glass) fuel barrier. Each of the three walls is fuel proof and capable of containing the fuel alone. 6 lb/ft³ PVC foam is used in 9mm thickness for the foam core.

Start by cutting out the five P.V.C. foam tank panels shown below. All five are made from 9mm (.35 inch) thick 6 lb/ft³ red P.V.C.



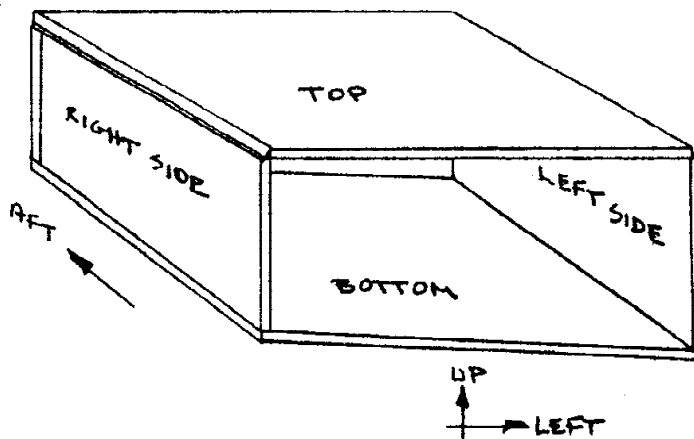
Jig the back panel flat on your work bench front (inside) face up. Jig the two side panels flat on the bench inside faces up. Also jig the bottom panel flat with its inside (top) face up and the top panel inside (bottom) face up. Refer to the sketch below to visualize the finished tank geometry.

Go cut the following 0-90° BID cloth.

- 2 each 24 x 9 inches
- 4 each 24 x 16 inches
- 2 each 15 x 10 inches
- 2 each 15 x 11 inches

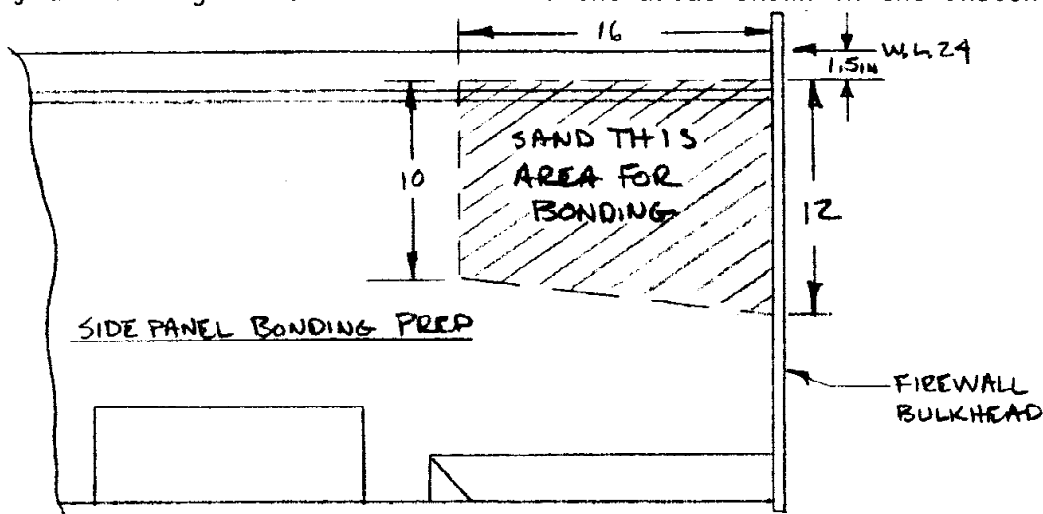
Cut 2 inch wide peel ply

- 6 each 23 inches long
- 4 each 13 inches long
- 4 each 15 inches long
- 2 each 6 inches long
- 3 each 7 inches long
- 2 each 8 inches long



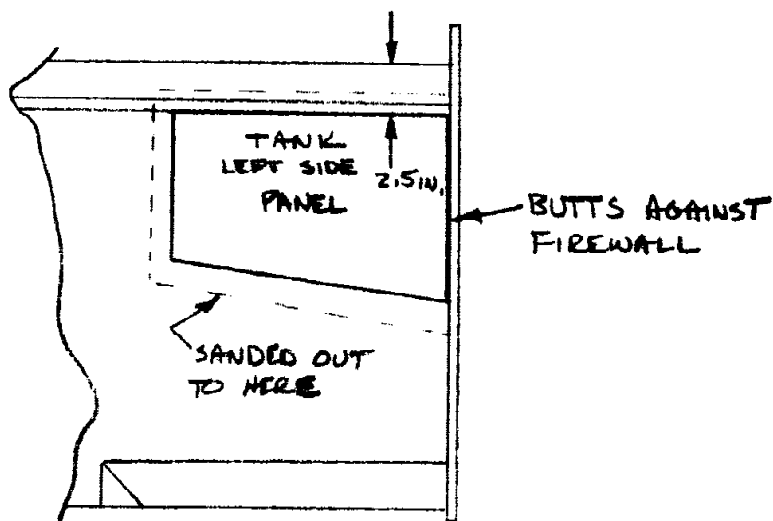
Slurry the foam surfaces completely and lay up two plies on each panel. Make these lay ups wet. Don't try for a good dry structural lay up, leave it wet and shiny. Peel ply all edges. Knife trim and cure.

Next lay your fuselage on one side and sand the areas shown in the sketch dull bonding.



Paint the bare foam outside of the left side panel with micro slurry, squash into position as shown below, weight down, clean off squeeze-out, and cure.

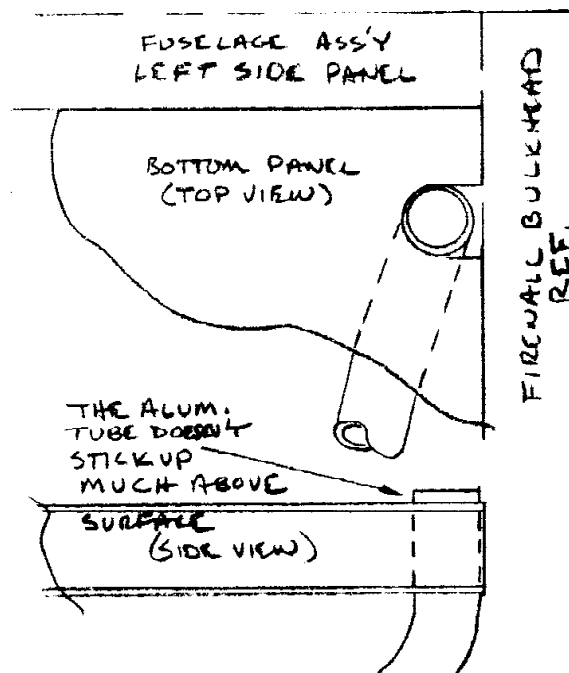
Wait long enough for the micro to set up to at least bubble gum consistency, then you can turn the fuselage assembly over and repeat this exercise on the right side. The top edge of each side panel is located 2 1/2 inches below the top edge of the side panel. Both fuel tank side panels butt up against the firewall bulkhead, micro this joint too. Avoid gumming up the sanded side panels surrounding the tank side panel. Other things bond to these areas.



After curing over night, trial fit the back and bottom panels to the fuselage and to the side panels. Trim if required for a reasonable fit to the firewall, sides, and back panel. Round the aft edge of the bottom panel to provide a smooth radius for glass to lay up around. Fit check the top panel. File the top side (bare foam) edges to assure a snug fit with the fuselage corner block. Sand a radius on the aft top edge of the top panel also.

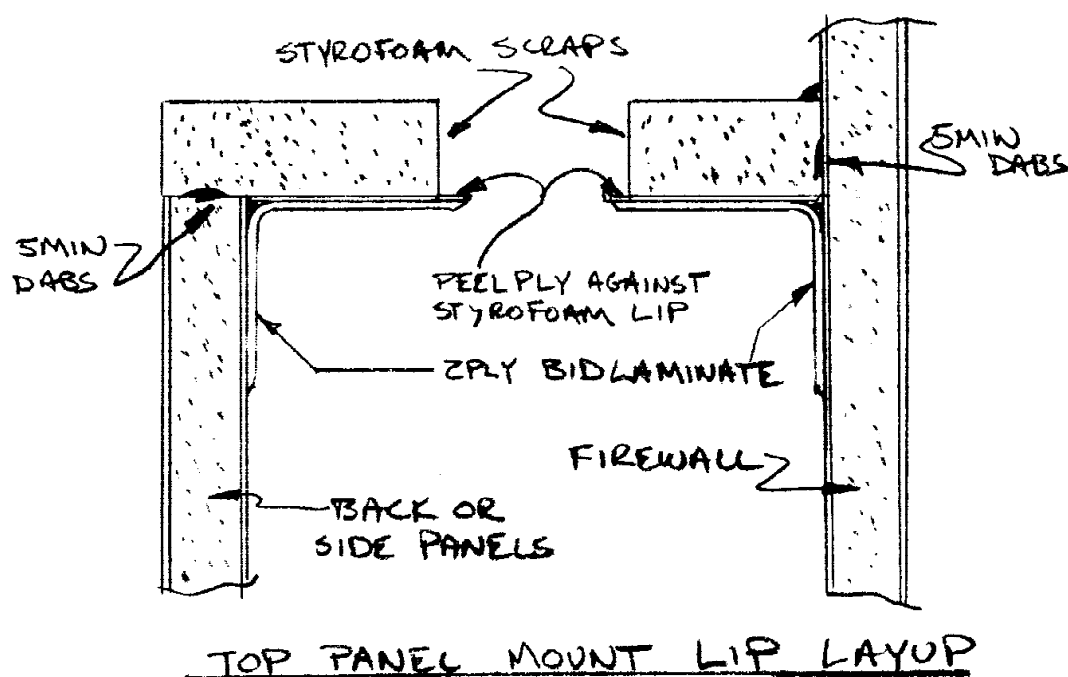
Remove the bottom, top and back panels from the fuselage assembly and lay them bare foam side (outside) up on your work bench. Cut cloth and peel ply same as for the inside lay up, laminate the outside surfaces and peel ply. Add one additional peel ply strip to the bottom panel that is centered and runs from front to rear edge. Knife trim and cure.

After the outside lay ups cure, cut a 3 inch long piece of 3/8 O.D. soft aluminum tubing. Form it into an arc of 2 inch radius. Notch out the bottom panel at the front left (lowest) corner to slip over the tubing as shown in the sketch. The tube should be a tight fit in the notch so it doesn't wander around once positioned. Brighten the tube for bonding.



Remove the peel ply from the tank side panels, bottom, front, and back edges. Pull the peel ply off of the back panel and bottom panel edges. Mix wet flox and bond the back panel and bottom panels to the firewall, side panels, and each other. Use a mixing stick to spread a uniform flox radius along the joints inside the tank. Be careful not to plug up the fuel outlet line but pot it securely with flox. Allow the assembly to stand about 1 hour. Then, using 2 inch 0-90° BID tape, lay up a 2 ply corner tape around all inside corners. Cut a triangular piece of wire screen (hardware cloth) and bond it into the corner over the outlet to keep any single, small object from closing off the outlet. Use a small bead of flox around the edges of the screen. Cure fully.

After curing the inside tape lay up the next step is to build a mounting lip for the top panel on the sides, back, and firewall. Use styrofoam scraps, as shown in the sketch below, to build a lip around the top of the tank. Remove any remaining peel ply from the tank edges and sand any cured glass (shiny, not peel plied) areas dull for bonding (corners!) Lay up a strip of peel ply against the foam lips inside surface, then lay up a 2 ply BID corner with BID scraps or 2 inch 0-90° BID tape. Scraps cut at 45° will go around the corner areas far better than 0-90° will. Knife trim the edges and cure.



After curing remove the styrofoam lip completely to expose the glass mounting lip. Remove the peel ply from the top side of the mount lip. Cut and brighten another 3 inch long piece of 3/8 O.D. soft aluminum tubing. Bend the tube about 45 to 60 degrees.

Drill a 3/8 hole through the mounting flange, next to the firewall bulkhead, in the center of the airplane. Slip the top panel into position, mark the location of the tube, and notch the edge to clear the tubing. Aim the bend in the aluminum tube toward the left side of the airplane. Remove the peel ply from the inside and outside surfaces of the top panel. Vacuum the inside of the tank thoroughly, then use a painters tack rag to get all of the fine dust. Mix wet floc and trowel an ample bead along the mounting flange, side panel edges, back panel edge and along the front edge of the top panel. Squash the top panel into position, slide it around slightly to get good adhesion with the floc, and stick a weight on top. While you have the epoxy mixed, lay up one ply corner tapes (2 inches wide 0-90° BID tape) from the top panel to bulkhead and sides of the fuselage and around the top to back panel corner. Tape the back panel to the fuselage sides also. Pack floc around the aluminum tube where it comes out of the top of the tank. Cure.

Flip the fuselage assembly over and lay up one ply BID tapes from the tank bottom to the bulkhead, fuselage sides, and around the corner to join with the back panel. Cure.

Allow at least a three day cure period before making this pressure test. Get out your altimeter (no case leaks allowed!) and install a 1/8 NPT to 3/8 tube fitting (weatherhead 10006B-102, AN840-6D, Ryan Herco 0700-158 or other equivalent) on the metal fittings use teflon tape to seal the threads. Cut one 36 inch length of 1/2 O.D. x 3/8 I.D. tygothane tubing and another piece about 10 inches long. Attach the short section to the altimeter at one end and the top aluminum tube on the tank at the other. Use worm type hose clamps on both ends. Slip the long piece of tygothane over the bottom fitting and clamp. Dust off your patience and stoicism and get ready to put them to the test. Get comfy, stick the loose end of the long tube in your mouth and suck until the altimeter shows 1500 feet above its initial reading. Stick your tongue in the end of the tube to block it against leakage and wait. Watch the altimeter (on and off) for 20 minutes (a very long period of time) to see that the suction holds. If it doesn't (arrgh!) recheck your hose clamps and check the altimeter by itself, then try it again. If you still have leaks, go call George Mead for a little coaching.