
11. Preparing the mouldings

Preparation

Before any laminating or bonding work is carried out on mouldings it is necessary to wash all their moulded surfaces with warm water to remove all traces of the PVA release agent used in their manufacture.

Trimming

Bottom moulding

Trim lines are to be found on the mouldings but are difficult to see. Use a pencil to highlight the lines. See figure 1 for a typical location to find a trim line on the fuselage bottom moulding. The mouldings also include faint small crosses on the aircraft centreline, which indicate fuselage stations every 10".

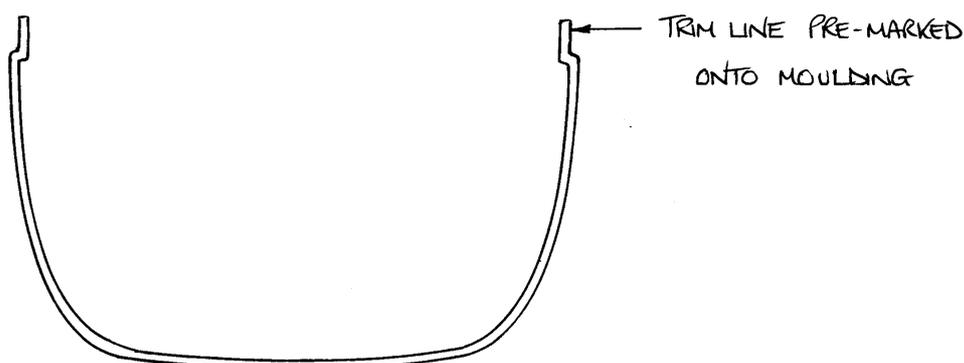


Fig 1. Typical trim line location.

Top moulding

The top moulding, which is moulded to size, simply requires the flashing of excess resin sanded off from around the edges. Do not trim any material from the rear part of the fuselage where the rudder will attach.

The section of the upper moulding joining the fin to the main portion is not very strong and, unless the fin is supported during handling, could be damaged. The corner in this area has been trimmed with a generous radius to give it added support but will later need trimming to suit the lower moulding sharp corner. Leave this until you are ready to bond on the top moulding as there is less likelihood of the fin section being damaged whilst handling the moulding.

Trim the windscreen rebate to 12-13 mm (½") in the top fuselage moulding. At this stage you could also roughly trim the door rebates to no less than 20 mm (¾"), stepping around the door strut recess at the upper rear of the aperture.

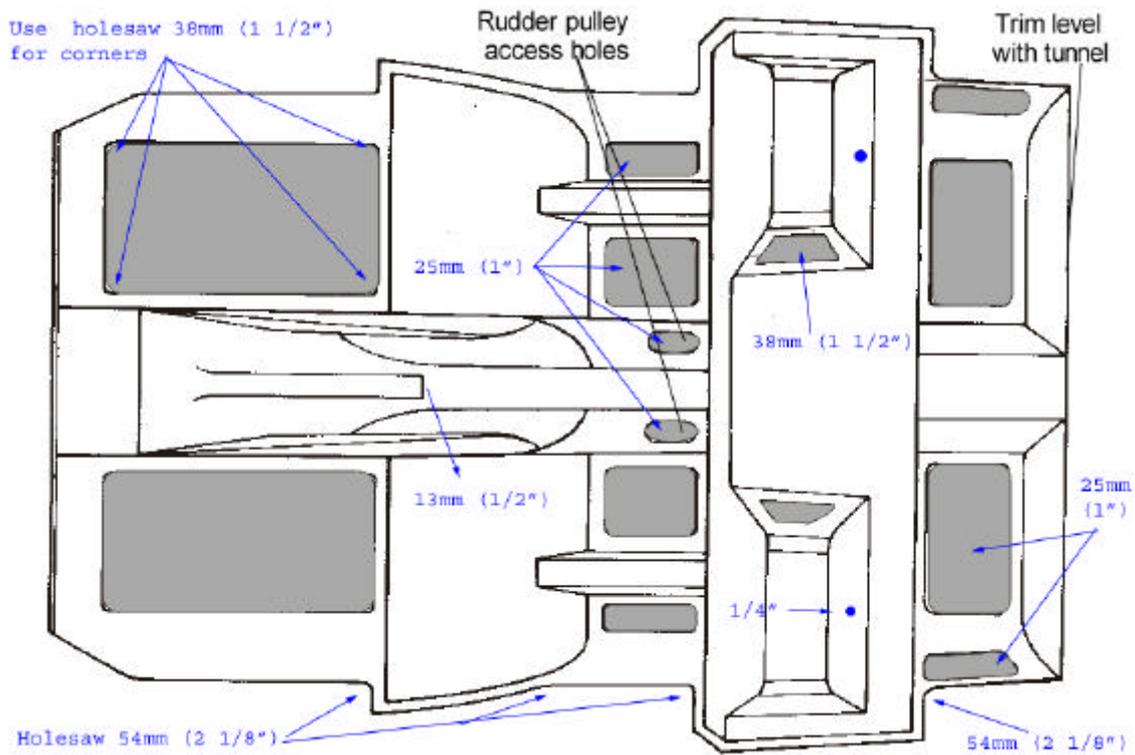


Fig 2. Top view of cockpit module.

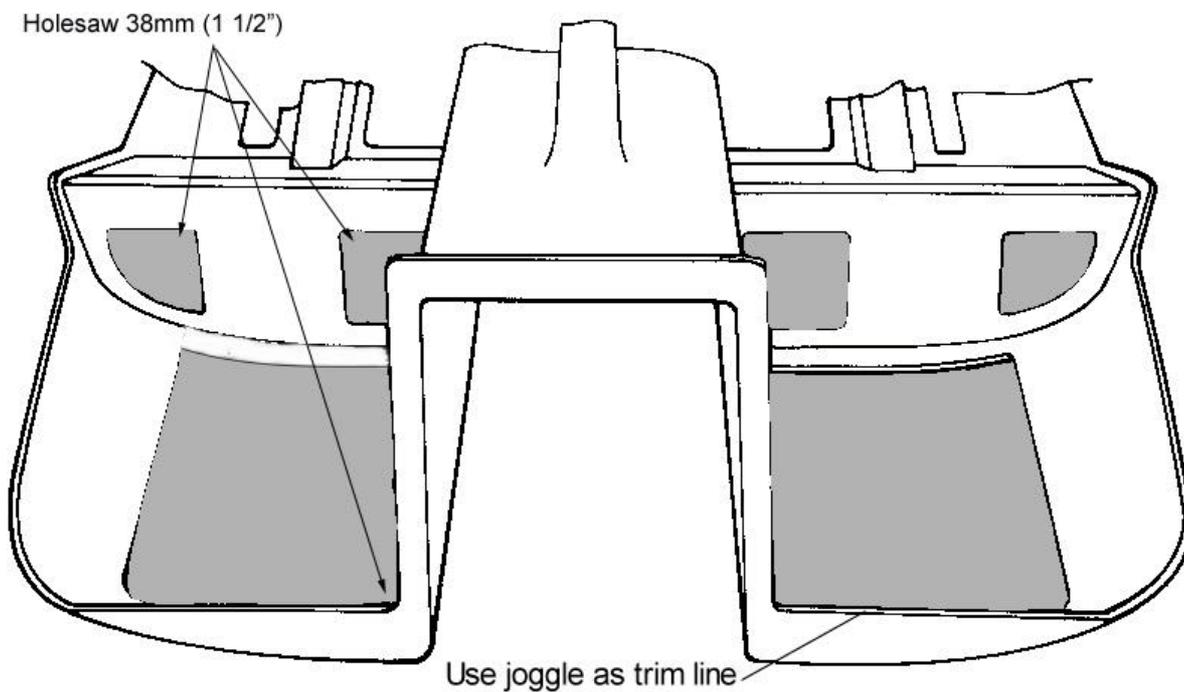


Fig 3. Partial view of cockpit module looking aft.

Cockpit Module

Trim the cockpit module using the trim lines as guides and cutting away the shaded parts shown in figures 2 and 3. Cut also the access panels in the separate baggage bay rear bulkhead and floor moulding.

Do not dispose of the D-shaped panel cut out of the rear bulkhead. You'll need this with which to make access panels for the fuselage underside and cockpit module tunnel later.

Drill through the glassfibre with a large hole saw, in the corners first, then cut between them. 2 1/8" diameter is ideal and this size will be used later installing the control system and some of your instruments. At the front, follow the joggle when trimming the flange around the wheel well and where it runs out to each side. This flange will support the rear of the rudder pedals' floor. The access holes for the rudder cable pulleys are 50 mm x 25 mm (2" x 1").

Thigh support ribs

The plywood ribs you're about to make now, which go under the thigh supports provide added longitudinal stiffness to the fuselage and also separate the wheel well and control system from small pockets which are handy for storing small items in, such as a small tool kit and cleaning things.

Refer to the cutting plan for the 3mm plywood in Annex A.

From three pieces of 35 x 23 cm (13 3/4" x 9") 3 mm thick plywood cut six triangles to fit under the thigh supports and follow the projected curve of the fuselage floor.

Their installed locations are shown in figure 5. The ribs that go each side of the control tubes must be positioned wide enough apart so that they don't interfere with the nuts and washers that will secure CS04.

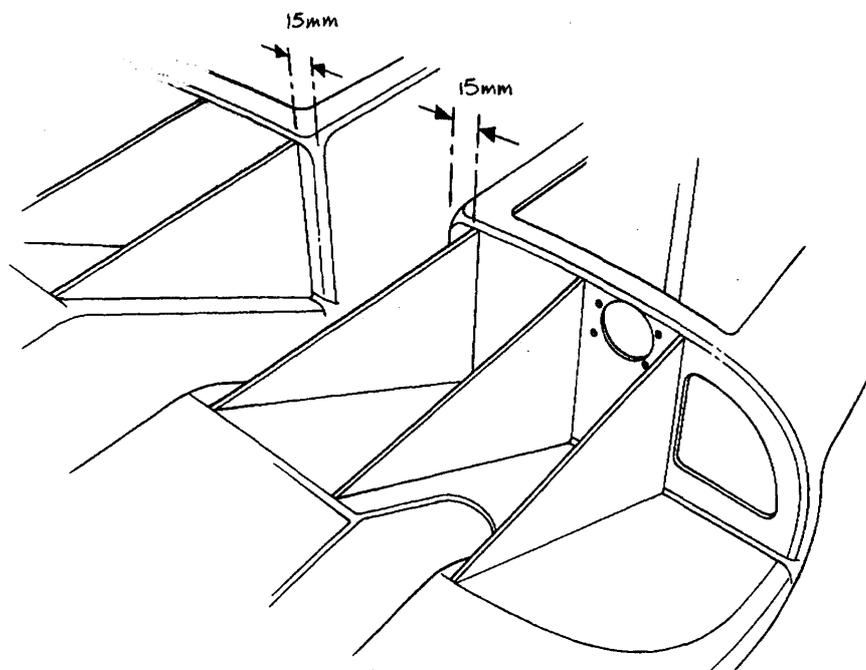


Fig 5. Thigh support rib locations.



Scuff sand the cockpit module skin for at least 3 cm either side of where the ribs will go and also scuff sand the entire faces of the ribs to ensure that the surface will accept resin, then bond the ribs in with dabs of rapid epoxy, setting the inboard ribs so they are about 15mm outboard from the wheel well's sides.

Whilst the epoxy is curing cut tapes of 'bid' at $\pm 45^\circ$ to be about 5 cm (2") wide. The easiest way to make these is to layup one ply sufficiently large onto plastic sheet and cut the tapes and the sheet to the size required. The plastic sheet will hold the glassfibre's shape until you apply it.

Scrape a small floc fillet into the corners of all the ribs and lay one tape each side of the four outer ribs, and the outboard side of the two ribs which close off the wheel well, lapping onto the cockpit module's skin and the rib itself by approximately 2.5 cm (1"), *not* forgetting to remove the plastic afterwards. Paint the uncovered areas of the ribs with resin to seal them off.

Cover the entire inboard surface of the wheel well ribs with 1 ply of 'bid' lapping onto the cockpit module as you did with the tapes. Peel ply all the edges and allow to cure.

Headrest storage area

The headrests are useful storage areas for small bits and pieces much like the thigh supports. To close them off from the rest of the structure it's necessary to put a base in which is made from the usual 3 mm plywood with glassfibre skins.

Referring to figure 6 cut the plywood to the shape and dimensions so that they sit flush with the underside of the surrounding panel. Mark them so you know where they fit after you remove them for layup.

Scuff sand the cockpit module around the edge of the headrests.

Layup 1 ply of 'bid' at $\pm 45^\circ$ each side of the plywood panels with the glassfibre approximately 2.5 — 3 cm (1") overhanging all around. Lay the panels in place in their respective headrests, stippling the overhanging fibres onto the cockpit module. Peel ply the edges and allow to cure.

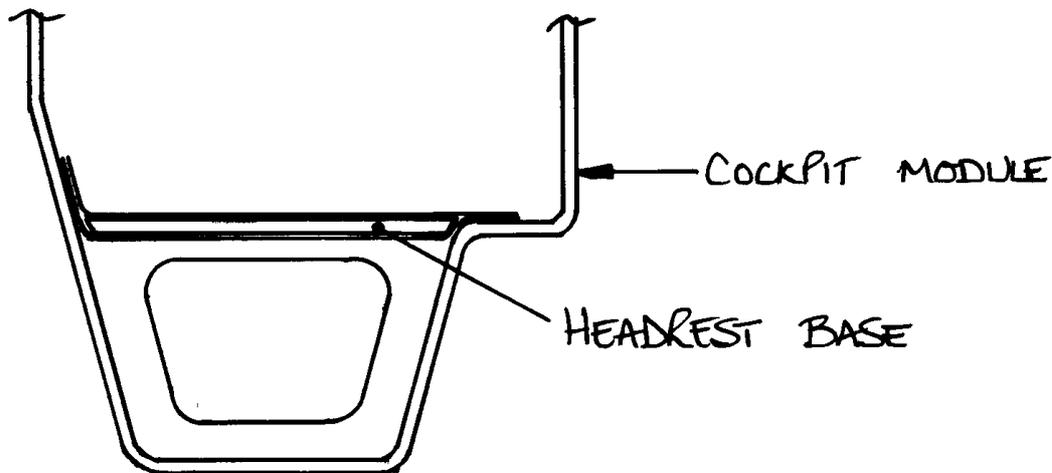


Fig 6. Section through headrest with base panel installed.

Centre console bulkhead - monowheel only

A centre console bulkhead is fitted, which will act as a mudguard. This should be made removable since access will be needed later to fuel system components.

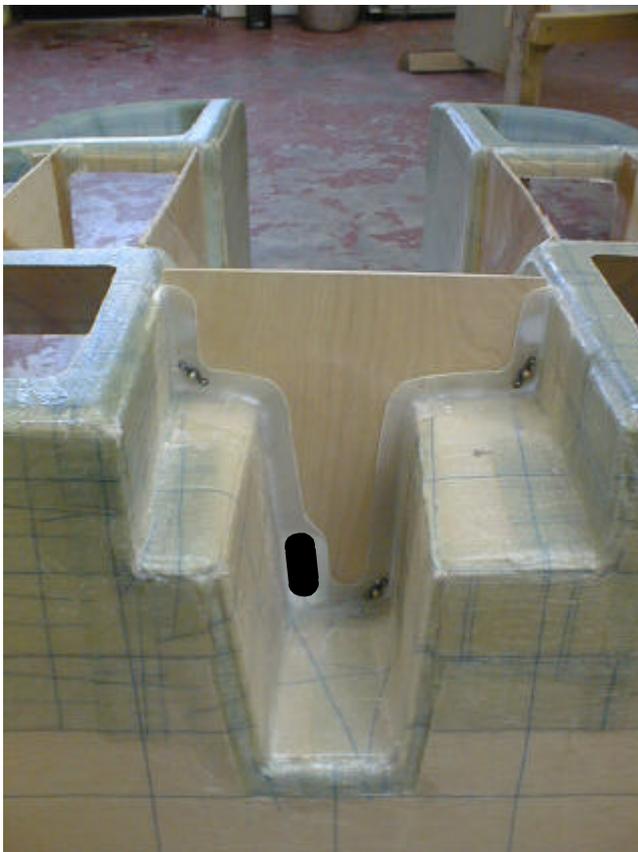


Fig 7. Photo of centre console bulkhead viewed from the rear.

Cut out the bulkhead from 3 mm plywood using the full size template from Annex F. Cover the edges and the sides on the rear face to a width of about 5 cm (2") with plastic (parcel tape will do). Fix the plywood temporarily to the cockpit module 20 cm (8") forward of the seat back face. To make the flange onto which to mount the bulkhead, layup 2 plies of 'bid' to the rear face of the plywood, lapping onto the cockpit module by 2.5 cm (1"). After cure remove the plywood and trim the flange you have just made to a width of 2.5 cm (1"). Reposition the plywood to the flange and drill through as shown in the photograph in three places with a 5 mm (3/16") drill. Fit three MS21047-3 anchor nuts using TAPK33BS pop rivets, and fit the bulkhead with AN525-10R8 bolts.

Drill and file a slot at the position shown in black in the photograph above - this will be used later for the flap drive pushrod.



Fuselage bottom moulding set-up

Set up the fuselage bottom moulding on a couple of supports so that it is level and at a convenient working height. A typical set-up is shown in figure 8.

Although this method of support will work you might find it advantageous to spend a bit more time to make a cradle with several properly cut profile boards. Adding castors is an extra bonus.

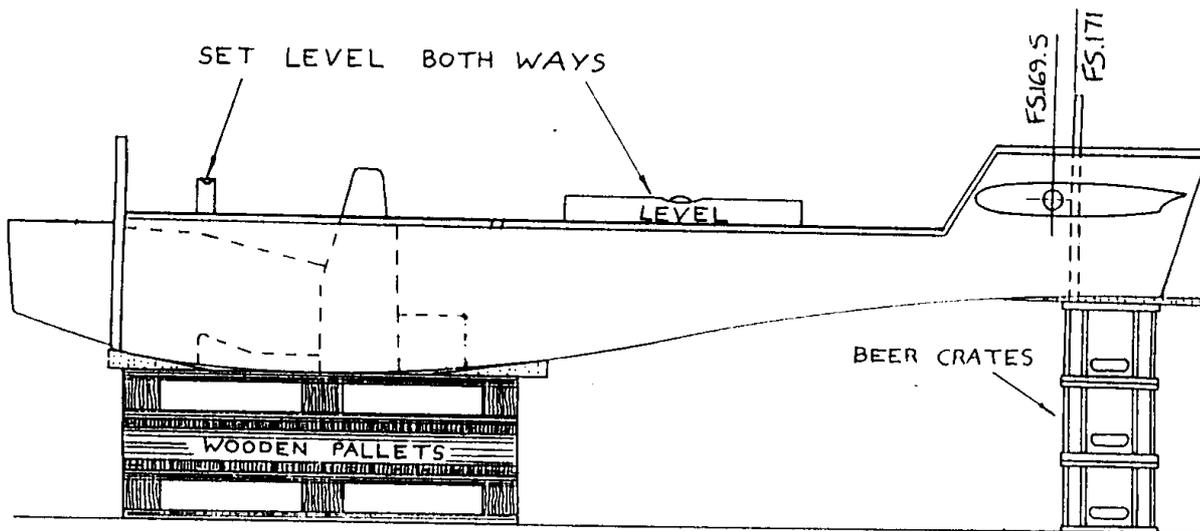


Fig 8. Fuselage bottom moulding setup

Trial fit of cockpit module

Place the cockpit module into the lower fuselage moulding and slide it as far forward as possible. The forward flange around the central tunnel should butt up to the phenolic firewall. You may have to sand away any thick epoxy areas because you are fitting together the unmoulded sides of the mouldings. Take care not to sand away any of the glass structure though.

Drill and cleco the flange to the firewall in 4 places.

Hint : To avoid the clecos pulling through the fuselage skin, use a 1/8" washer to spread the load. Of course, 1/8" bolts and nuts could be used instead of clecos.

Working your way aft and out drill and cleco other areas until your cockpit module is a snug fit. Use as few clecos as is necessary to fit the module to the bottom moulding.

Remember that when you come to bond the module into the fuselage bottom moulding you will be able to locally weight down any small areas that need it. The clecos will be replaced with pop rivets on final assembly which will be drilled out after cure.