

Moulding Balsa Fuselages

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I have used this technique a number of times, mainly because I am absolutely useless at making a good stringered fuselage for a scale model! I can make no claims to the originality of this method of making monocoque fuselages, which was passed to me by my SAM member Chris Chapman, who had built a lovely Bell XS-1 and Fairey Delta 2.. I too (a self-confessed bodger) have found the results using Chris's method have been quite gratifying:

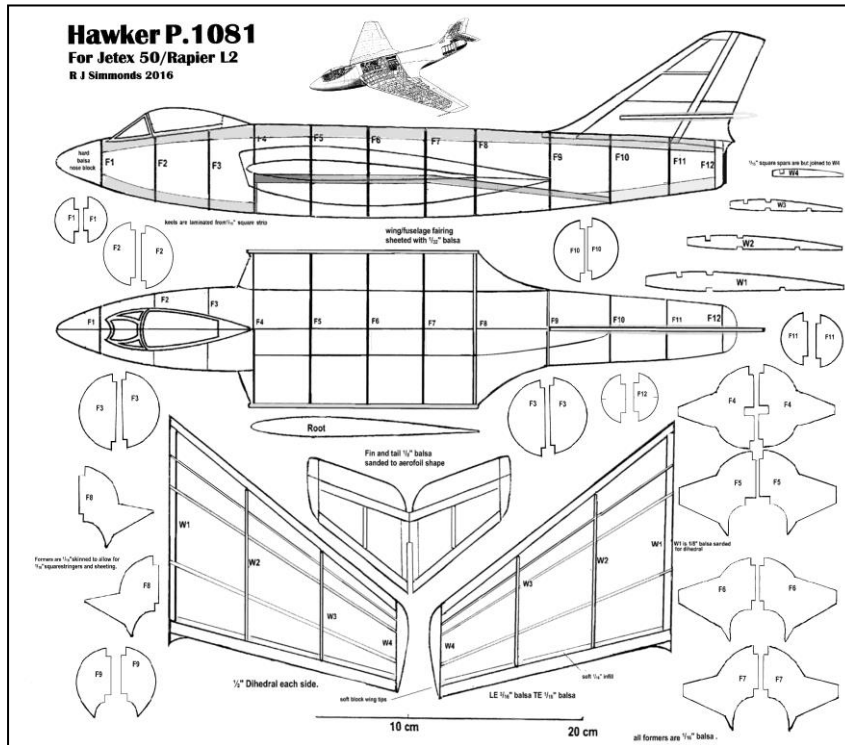


Above: Saab Draken for Rapier L-2 power. Note the lack of stringers. Despite the moulded fuselage it weighs only 36 grams ready to fly

The building sequence below is for the immediate precursor of the Hawker Hunter, the 1949 P.1081:



First, draw up a reasonable plan:



Next, 1/32" plywood templates are made of the fuselage cross sections at regular (2-3") intervals and sandwiched between block balsa. This is carved and sanded to shape and given two coats of epoxy resin. A really smooth finish is obtained with various grades of 'wet or dry' paper:



The moulds are 'tack-glued' to 1/2" balsa before the next step. Very soft 1/16" balsa is soaked in hot water with a little washing up liquid for 2-3 hours:



The still wet balsa sheet is then wrapped around the mould and quite tightly bound with flat rubber strip:



Above: not a mummy taken from an ancient Egyptian tomb but the 1/16" balsa sheet tightly bound to the mould.

It is then left to dry for 12 hours (or so) in a warm place - say a radiator top. When completely dry the rubber is unwound and the shell carefully taken off the mould. The next bit is tricky: the shell is trimmed and pinned around the edges back on the mould and the surface wetted (hot water). Any slack in the shell is taken out by stretching over the mould and re-pinning. Hopefully, wetting the outer surface of the shell will remove the marks made by the rubber strip. The whole is then left to dry completely. The near-perfect shell can then be taken off the mould and trimmed to shape:

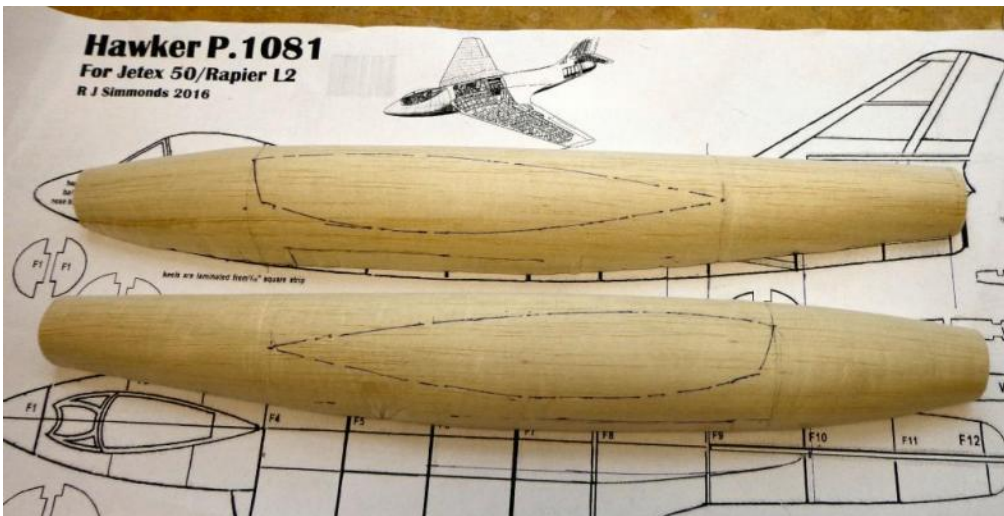


Above: shells for the P 1081 fuselage. Some of the compound curves in the prototype are quite large, so the balsa did 'pinch' in places. Hopefully these can be sanded out later. The worst of these (I should have cut in darts) are fortunately on the underside and will be cut away later for the motor trough. The shells weigh about 3.6g each - quite pleasing.

I know from experience that unsupported shells can warp, so the next step was to cut out some light 1/16" balsa formers and glue in place, followed by 'tabs' at the fuselage join:



Next, the outline of the wing fairing is drawn on accurately, making sure the two halves match:



The two halves were then glued together using PVA glue and bound (lightly) with rubber strip:



The air intakes are made from very light 1/16" balsa sheet:



And glued in place using a jig, taking care Great care was taken to make sure the left and right sides match and it's all square.



Next, the trough was cut out,;



And everything 'cleaned up' and smoothed. I line my troughs with 1/32" balsa sheet - this helps keep things neat at the cost of some weight and means old foil can be peeled away and new foil attached when the need arises:



Above: the fuselage (at last!) nearly finished. At this point it weighs 18g and just needs the nose block, tail pipe and smoothing down.

Flying surfaces etc are built conventionally, but, importantly, a jig is used to attach the wings:



Note the cotton used to check all was square and the two sides match!



The tail feathers are then glued in place - Rapier/Jetex powered models fly fast so uncorrected inaccuracies and warps will make trimming trickier than it should be!



Above: with the canopy taped in position it looks vaguely 'Hawker P 1081-ish' even if I think I've overdone the dihedral a tad. No bad thing for its flying characteristics, but retrospectively I might have been bolder. At this point it weighs 30.2 grams - a little over what I wanted, but if it's under 40 grams covered and painted it should go OK as there is plenty of wing area.

It then remains to finish and paint. One word of warning: do not use shrinking cellulose with tissue, as the very light balsa can, despite the formers, 'pull in' slightly spoiling all your hard work, so a modern finish, like Deluxe 'Foam Armour' or 'Sand 'n Seal', might be the stuff to use.

Any questions, please ask (rsimmo@globalnet.co.uk).