



DESIGNED BY
J. VAN HATTUM

"SATYR" was designed as a small sailplane model, simple enough to be used as "the beginners first contest model," yet capable of a useful performance. The small tailplane on a long lever-arm gives excellent stability and the sturdy construction makes the fuselage capable of standing up to any rough treatment—except a careless foot! Of the four prototype built, three came out below the minimum F.A.I. weight of $11\frac{1}{2}$ oz.—the heavy one being the designer's!—so do not spare cement and reinforcement where it serves a good purpose.

Fuselage

First cut plan shape from $\frac{1}{16}$ in. sheet, glue longerons along the edges and fit bulkheads and top longerons. Next mount the vertical sides from former 1 to 6. Finally put on the decking, but don't forget to fix the hardwood dowels while the fuselage is still open. Decking can be left well oversize and trimmed after cement has set. Use plenty of pins to keep sheet in place where it has to be forced into a bend. The nose block is made of three layers of hardwood, total width about 1.2 in.; the centre one being hollowed out to take trimming ballast. Nose block is glued straight on to former 1. Fit fin, when model is nearly complete so that you can check for true alignment and rigging relative to wing.

Wing

This is quite a simple constant-chord structure and all ribs are $\frac{1}{16}$ in. balsa. Build it in three sections which are later joined by the dihedral braces. I found joining very easy when I glued one brace to the spar on the outer section and the other on the inner section: it gives more support when joining up the sections and less danger of finding insufficient dihedral after cement has set. The constructional method used in building the wing has been described in the May, 1950, issue of MODEL AIRCRAFT. Briefly,

it consists in first cementing main spar and leading edge to the nose sheeting; taking good care that the distance between the two is just right to cover the nose portion of the ribs. When the spars are well in place cement the ribs to the main-spar and a short length of the sheeting. When set, pull the sheeting over the ribs and cement with plenty of pins to keep the parts in position. Take care to line up the tails of the ribs. When this job is done, fit the cap-strings—on top if ribs only—leaving the required length to provide anchorage for the trailing edge. Pay good attention to dihedral braces and local reinforcements as many a broken wing results from bad joining where large local stresses are present!

Tailplane and Fin

This is a small version of the wing and one may build this first to become acquainted with the method. The fin is just a balsa-sheet, cut to shape, sanded round the edges and very well cemented to the top of the fuselage. Note strengthening along the base by means of scrap balsa and take care that the fin sits true in relation to the wing. The same applies to the tailplane.

Trimming

To obtain maximum duration a model must be trimmed to fly at the angle of incidence where sinking speed is smallest. This means inevitably that it flies very close to the stalling angle. It is obvious that we must trim the model so that when it stalls owing to a gust, it quickly returns to its "cruising attitude." When this is not done, the model will carry out a series of stalls, very often becoming more and more violent. This means loss of height and possibly damage. The best way to avoid this is by carrying out the following test procedure:

When the model is reasonably well trimmed and flies fairly straight, pull it up on a tow-line of 70-80 ft.

Just before release, give a gentle pull on the line to make the model stall. Now carefully observe its behaviour. If it keeps undulating in consecutive stalls, decrease the rigging angle of the wing—or, if you prefer neatness, increase that on the tailplane. Also remove a little ballast from the nose. The aim is to get the C.G. as far rearward as possible and the smallest possible difference between the angles of incidence of wing and tailplane. Carry on step by step until the model starts making a shallow dive. It would recover eventually with sufficient height and this is the point where you have passed the limit of longitudinal stability. So the next thing is to increase the difference between the angles of incidence between wing and tailplane a small amount and the model should now be properly trimmed; that is, when stalled it should neutralise the stall in not more than three undulations. Do not be satisfied until

you have obtained this kind of trim on all your models. One word of warning: when you approach the critical stage and the model tends to enter the dive, go carefully. When not done in very small steps the model may end in a vertical dive!

I have not given much detail on dethermalisers as these devices need no description. I would suggest starting with a d.t. parachute strapped to the side, but if you like neat work, carefully break a door in the fuselage behind former 4 and fit a compartment in the usual way. Reinforce the sides and corners of the opening. A tip-up tail has not been tried, but the design lends itself very easily for this type of insurance against loss.

If the model happens to fly in a dead straight line, cement a narrow tab to the trailing edge of the fin to make it circle. A model flying straight does not pick up thermals.
