

TUMBLETOT

Here's a neat 22.5 (570mm) span traditional sports free flight model for small diesel engines that can just as easily be fitted with lightweight R/C to provide hours of uncomplicated flying fun. Designed by Vic Smeed (with constructional input by Mike Parker, who built the prototype)



Let us first explain the name. If you have any connection with children around three years old, you will probably know of 'Tumble Tots', a chain of playgroups initiated some twenty years ago with an emphasis on kindergarten gymnastics and, from personal experience with a grand-daughter, a very good institution. Since this model is very small and designed to cope with the rough and tumble of (almost) all-weather flying, it seemed appropriate to base its name on similar precepts to the playgroups, with, of course, due acknowledgement.

Once again the design originates from a request from Mike Parker; this time for a small, easily-built model suitable for throwing in the car, to be taken out if weather conditions are a bit too poor to risk flying larger or more serious models. Alternatively, with present day radio being so small, an R/C version would be entirely practical, if perhaps a shade lively. Older modellers might remember Percy Norman's 'Natsneez', a stubby little model very small for its time; while this one isn't anything like as complex or heavy

and doesn't have a spark ignition engine, the concept is much the same, on the lines of the smaller the tougher.

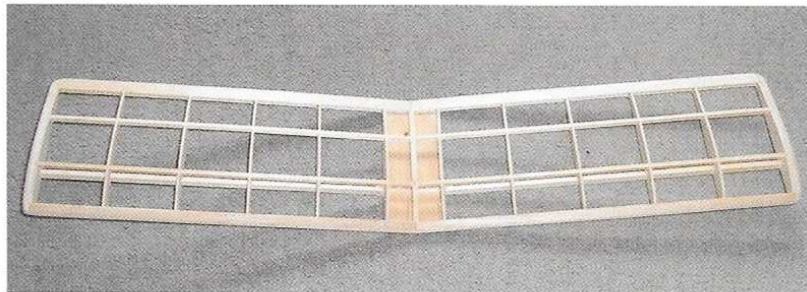
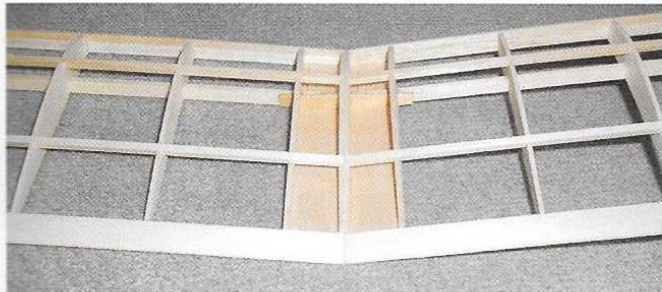
Recent years have seen the growth of the very small diesels, i.e. under 0.5 cc, most of which have been scaled down from successful standard engines and the majority imported from Russia, where redundant high quality steels etc. from the space programme have provided a ready source of materials. Examples suitable for this model include the Mills 0.25 cc, the half-size Elfin and E.D. Baby and the Kalper; at its original 0.32 cc size. At the time of writing, there has been a slow-down in deliveries, believed temporary, but a lot of these and other 0.2 to 0.4 cc engines are in circulation.

In Britain the A.E. 0.2 cc is no longer being made and there is a long waiting list for the superb scaled-down Mills motors from Derek Giles, but interest appears to be increasing in other countries and the Parker prototype *Tumbletot* has a German Schlosser 0.25. This remarkable little engine has been described as looking like a scaled-down Oliver and it is certainly of very high quality - it even has a twin ballraced crankshaft! It swings a 6 x 3 prop and is really rather too powerful for this model, although with the prop on back-to-front and a fairly rich setting to throttle it down, it is safe enough. Production is understood to be somewhat limited and the price reflects the quality, but batches do become available for import from time to time. If your taste runs to glow motors, incidentally, there are still a good few Cox .010 and .020 around and the model should handle these quite happily.

Constructionally, there is very little to say. The wing is conventional and quite straightforward, but with only one break, giving a V-shape which sits on two 1/8 in. square runners cemented to the fuselage top. If you wish, a bit of fiddling with odd scrap can tidy up the leading edge/fuselage joint with a little fillet, but this would be unlikely to have a discernible effect on flight performance.

The tail surfaces are all sheet, preferably medium hardness, light but stiff stock. If insufficiently stiff, short inset pieces should be set across the grain to help prevent warping. Radio rudder and elevator are shown but for free flight, a smaller rudder tab should be used, as dotted line. This and the elevator require 'hingeing' with copper or soft iron wires, or aluminium tabs, so that they can be bent slightly to adjust flight trim. Once a satisfactory flight pattern has been achieved, a light touch of cement is advisable to stop any



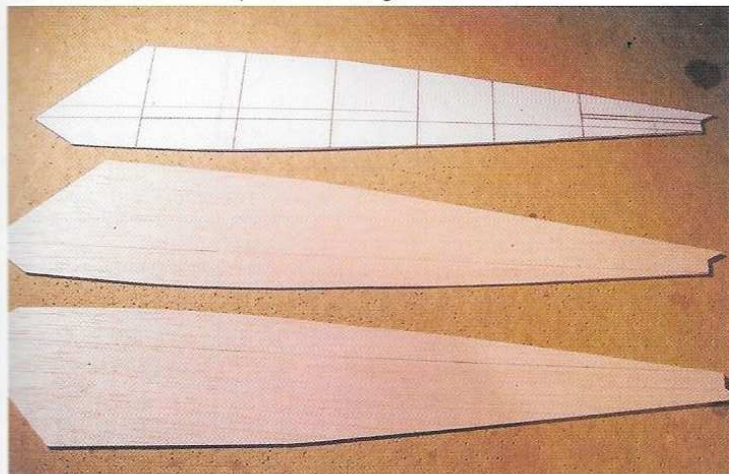


accidental movement of the settings.

The fuselage is a simple box with few additions. Mike found it convenient to cut a card template for the sides (probably a flattened out cereal box could be used) and marked the former positions on this for transfer to the cut sides. He cut the tailplane slots, but left the last 1/2 in. solid to facilitate an accurate joint. Cement in the doubler pieces before joining the sides; these reinforce the sides in the area of maximum handling and may also be helpful if radio is installed.

A choice exists for the undercarriage, both for the gauge of wire used and how it is fastened. If you have a source of the tough 16 s.w.g. piano wire we used to know, it will be perfectly adequate for this model, but if in doubt, 14 s.w.g. can be used. The design intention was to sew it to the back of B1, after laminating B1A and drilling through, which means assembling the fuselage with the u/c already in place. Mike preferred to bend the top to a V and sandwich this, with appropriate thickness balsa packing pieces, between B1 and B1A. This could be done after B1 is assembled to the sides no doubt.

Join the sides to B1, 2 and 3 and allow to dry. Add the remaining formers using the straight top of the rear fuselage upside down on the board and aligning the formers with the marks made when the sides were cut. You may like to cut a card template to the angle between the fuselage top and the formers to assist lining up. Join the rear ends with a scrap of block or a stub of 1/2 in. trailing edge and insert a piece of 1/4 in. sheet to take the tailskid. Sheet the top and bottom, grain across.



ABOVE: Two views of the uncovered wing show the construction to be simplicity itself.

RIGHT: It's a constant-chord wing so the 'sandwich' method of shaping the wing ribs is ideal.



At the nose end, the engine compartment was fitted with 1/4" square bearers each side plus a 1/4" sq. cross-piece. The heads of the engine retainer bolts go on the bottom surface and are locked by soldering to strips of tinfoil. A hatch of 1/16" sheet with a 1/4" sheet plug fits the aperture and is held in place by a tiny magnet. This gives access to a small cylindrical suction feed fuel tank that fits vertically in a hole in the engine mounting plate. The hatch in the photos is partly disguised by the black tissue cabin outline, doped on after covering, a touch that adds to the general pertness of the model.

Covering on the prototype was tissue on the fuselage and tail surfaces with tissue over Mylar on the wing, this last meaning that no sheeting is needed on the centre bays. The tail end slot was cut to full length and the tailplane and fin glued in place. With the Schlosser engine, the model balanced at the point indicated on the drawing and a tiny touch of down elevator produced a satisfactory glide.

Under power, with the prop on back-to-front, 'two washers of downrthrust' and about half power gave a nicely controlled climb. Zero sidethrust and slight left tab gives a left-left pattern, which copes well with windy conditions.

Mike provides the last word: 'with a reliable engine like the Schlosser and Mylar/tissue covering, a perfect all-weather fun flyer that is built to last ...' ■

LEFT: Test builder Mike Parker cut a card template for the fuselage sides, making it simple to mark out the former positions on the cut sides.

BELOW & BELOW LEFT: Here the sheet fuselage sides have been joined with the sheet balsa formers to make up the basic fuselage frame prior to sheeting top and bottom.

BOTTOM: Three views showing the build-up of the engine bay. The Schlosser 0.25 cc diesel engine from Germany is retained in place with four bolts.

