



THE DICTIONARY defines 'Thrift' as economy and as a flower; the model looks (to my eyes at least) beautiful, performs perfectly and is very economical, both in materials and fuel. To go into the design philosophy as our American friends call it, some time ago I compared the cost of one of my biplanes and a normal stunt model, and found that the cost differential was very marked. At about the same time the price of fuels had risen greatly so I began to think about a monoplane stunter that would give the performance of a .35 powered model at a reasonable price. A minimum reduction in size was called for to maintain the performance, so a Fox .25 was chosen as the power unit, as I knew that this motor was powerful enough to fly models intended for .29's while consuming far less fuel for its power.

The size of the model was set at 48in. span, with a wing area of 450sq. in., this was so that those of us who are unfortunate enough not to possess a .25 could use a .19cu. in. motor. I now started to think about using less wood in the construction; after all less wood means less weight and less money. All flying surfaces were built up from  $\frac{1}{8}$ in. sheet strips of varying widths cut from sheet, but the biggest saving was made in the wing. I used the method of construction which has not been used in England very much, but was very popular in the States and is typified by Bill Werwage's *Aries*: cap strip ribs in which each rib is a  $\frac{1}{8}$ in. wide curved strip on edge with the spar in the middle. This construction is light, cheap and surprisingly quick and easy to make while it also gives a perfectly smooth wing. The only disadvantage is that care must be taken when handling the wing as it is very easy to crack a rib or two.

It is almost impossible to save wood in the fuselage construction short of building it out of strip in the manner of a free flight job, but by using coloured tissue one saves money on paints and saves weight: one further economy was made by using 2in. diameter wheels as this size is available in the cheaper types. I have not done a real costing of the model but one saves roughly 25 per cent of the cost of an equivalent-sized, conventionally

## THRIFT by Peter Miller

spanning just 48 in. and using a 0.19 - 25 cu. in. motor, this stunter offers maximum performance at minimum cost - cheap thrills in fact!

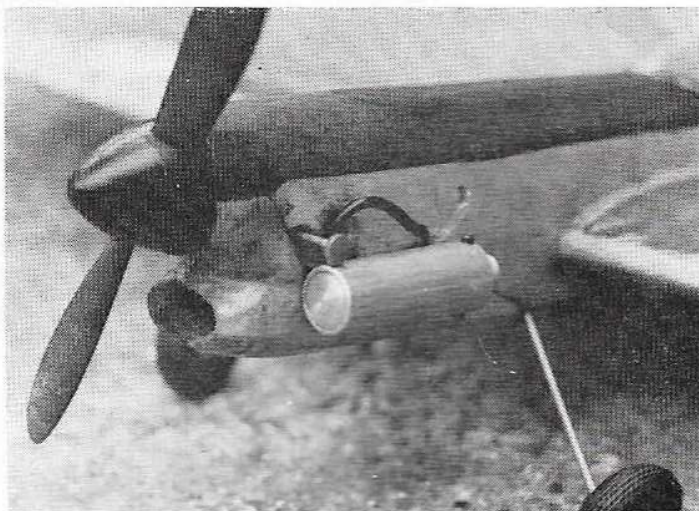
built model which in these days of rising prices, can't be bad!

Construction must start with the fuselage: cut out the  $\frac{1}{8}$ in. sheet sides and  $\frac{1}{8}$ in. ply doublers and glue these together, noting which is the port and starboard sides as they are different. The doublers must be accurately fitted to the side so that the spar holes are true, the trueness of the wing depends on this. Now cut out all the formers and bind or bolt the U/C to F-2 and glue this and F-1 to the bearers which are  $\frac{3}{8}$ in. sq. Ramin, which is far cheaper than the normal bearers and is just as strong; your local D.I.Y. shop should stock it. Next glue the sides to the bearer assembly, again making sure that it is really square. When dry, fit the remaining lower formers and glue the tail together, making sure, etc. While this assembly is drying, cut out the main spars from  $\frac{1}{8}$ in. sheet plus the ply joiners and glue them all together, then slide the main spar through the fuselage and glue. At this stage the  $\frac{3}{8}$ in. sq. bell crank mount can be fitted and drilled.

The only really unconventional part of the model is the wing but although it looks complicated it is, in fact very easy and just as quick as the normal wing and possibly more accurate. Place the fuselage upside down on the plan between the arrowed lines (this is the reason for drawing the wing upside down) and fit the tip jigs in the appropriate places. The trailing edge is fitted but do not forget to put the horn through the hole first; next the leading edge is glued in place. While the spars are drying cut out 82 wing ribs from  $\frac{3}{8}$ in. sheet. This sounds a lot but will take less than half-an-hour - use 4in. wide sheet and cut to 10in. lengths, now mark  $\frac{1}{8}$ in. spaces down each side of the six pieces of wood, and then starting at the top place the template in position lined up with two of the marks and cut along the curve. Now move it down a  $\frac{1}{8}$ in. and repeat and so on *ad infinitum*.

Take 12 of these rib strips and glue them up in four lots of three, alternatively these root ribs could be cut

Peter prefers to use pressure feed tapped from the silencer to the fuel tank (blocking off the tank vent tube) to ensure a smoother run. Note also the extension used on the Fox needle valve.





from  $\frac{1}{4}$  in. sheet. Starting at the root, glue these ribs to the leading edge spar, trailing edge and the fuselage sides and then work out to the tip jig, always trimming the ribs at the trailing edge. When you have completed fitting all the ribs to the lower surface of the wing and the glue has set, lift the model from the board, remove the tip jigs and repeat the performance for the top surface of the wing.

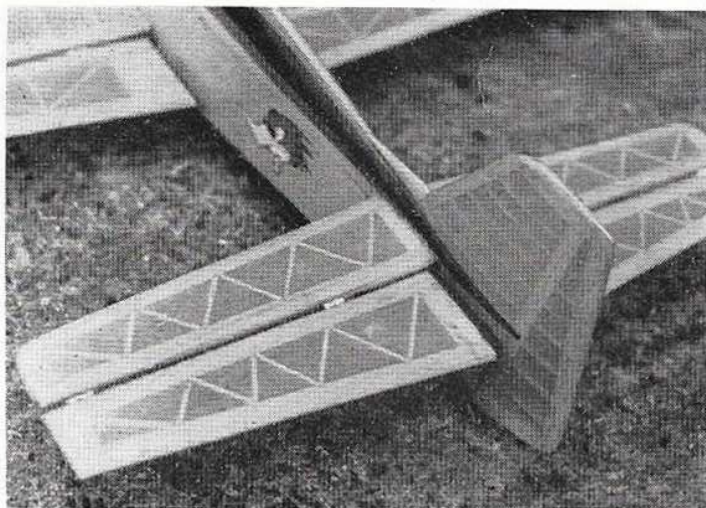
Next, fit the tips and remaining ribs, leadout tubes, tip weight and the bell crank and lead outs. Finally, shape the leading and trailing edges, then cover and dope the wing. The reason for this last point is that the ribs are very fragile and in fact, if you have reached this stage without breaking half a dozen, you are a better man than I am, Gunga Din!

The rest of the model is perfectly normal, the flaps and tail plane are built from  $\frac{1}{4}$  in. strip cut from sheet, the top formers are fitted and the decking completed, push rods are from cycle spokes which work out cheaper than the equivalent length of piano wire, and the ends are useful for cowl hold downs. The cowling has sides made from three laminations of  $\frac{1}{16}$  in. balsa as this is very strong; the blocks are fitted between the sides as is the bottom  $\frac{3}{8}$  in. sheet. The tank shown is best used with a pressure tapping off the silencer as this gives a really steady fuel run throughout the flight. Offset is not used on the rudder, the airfoil section providing adequate line tension.

The only 'extravagance' that I allowed myself on the model was the use of Micro-Mold R/C hinges as I feel that the slight extra cost is well worth the free controls thus obtained. After all, while economy is good it should not be allowed to affect performance.

The Americans use wing mounted undercarriages with this type of wing construction but as my flying field has grass that varies from short to long I did not feel like risking it, though for those who fly over tarmac it is a practical proposition, just make it a torsion bar unit and 'J' bolt it to the spar doublers.

The finish is up to the builder, but in keeping with the idea of saving money and weight I used coloured tissue throughout with a couple of transfers for decoration and this has the added advantage that repairs are easier to



carry out.

The original model needed no trimming at all. Make sure that the balance point is as shown and that all the controls are at neutral (an obvious check but sometimes not carried out) and free moving, and then go and test fly her. *Thrift* is rock steady in straight and level flight, upright and inverted, and does really sharp square corners with no trace of bouncing or wobbling on the pullouts, she has a steady but not excessive pull through all manoeuvres. The performance in square figures is due, I believe, to the smooth airflow over the wing with no spar or change of section at the end of sheeted areas to make the airflow break away, also the close spacing of the wing ribs does not allow any sag on the covering. The all up weight of 2lb. helps as well. Fly on 60ft. lines with a 9x4in. prop and if using the Fox .19 or .25 run on 5 per cent nitro fuel, preferably with a castor oil base.

I personally found *Thrift* one of the nicest stunt models that I have ever flown in some twenty years of modelling, though I will admit that this was probably more luck than good judgement. I will also admit that she was strongly influenced by Bill Werwage's *Aries*. If you build her your model shop will not love you but your bank manager will.