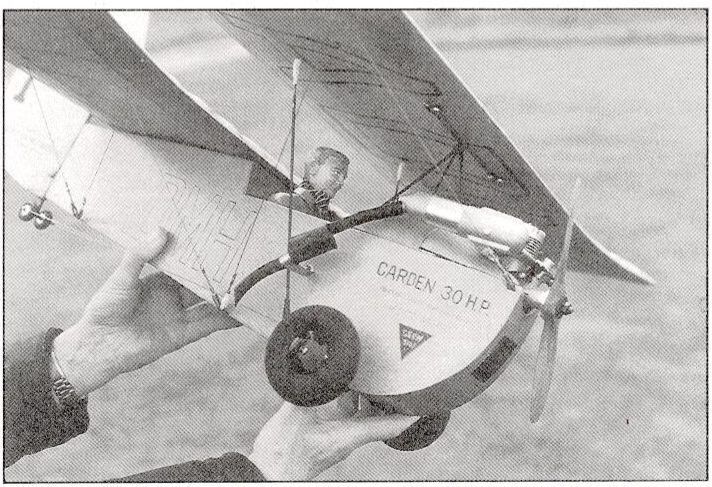
Designer Bob Wright with the prototype at a gusty Old Warden earlier in the year. 53.1/2in span, 1/5th scale model requires .25 power units.

HM-18 Flying Flea

Your free 'Superplan'! Build Bob Wright's delightful HM-18 'Flying Flea'



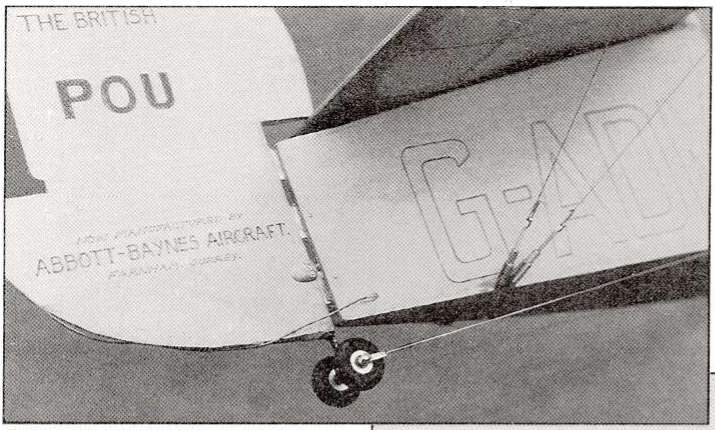
A slight degree of scale sacrificed in the interests of silence...

When Henri Mignet's book *The Flying Flea*, was first published in England, I was a schoolboy and the Flea craze was at its height. Mignet wrote in a style of such infectious enthusiasm that many would-be aviators were encouraged to go into their backyards and start cutting timber! A large number of Fleas were thus started, but only a small percentage ever flew.

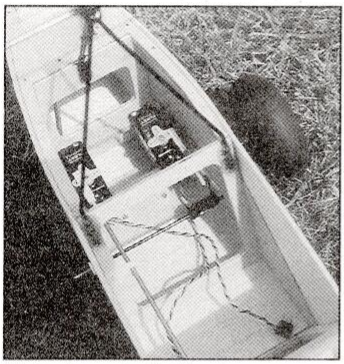
Sadly the Flea craze came to a tragic end in this country with the deaths of several pilots when their Fleas dived inexplicably into the ground. As a result of these deaths the Air League asked the Royal Aircraft Establishment to test a Flea in the wind tunnel at Farnborough. It was found that, at angles of incidence in excess of -15°, there was insufficient pitching moment to raise the nose. The Air Ministry thereafter banned all Flea flying, a ban which is still in force today.

In the last four years I have rebuilt and have been successfully flying John Derbyshire's 1/4 scale Flea. However, this is now twenty years old and a bit loose in the joints. So, with 1993 marking the fortieth anniversary of the first flight of the Flea and also the centenary of Henri Mignet's birth, I set about designing a new model. The scale I have chosen is 1/5th as at this size a fully rigged Flea may be fitted into an average sized car. The HM 18 benefits from the modifications incorporated by Abbott-Baynes Aircraft of Farnham, Surrey. A 10hp Ford engine adapted for aircraft use, a larger span wing and pushrod operation of the wing are the main differences.

Those familiar with this particular version of the Flea will notice that I have made one or two minor departures from scale. For example, the rudder is operated by a snake inside the fuselage, the external cable to the rear wheels being a continuous free-moving



Twin 1in dia. tailwheels pivot with rudder; cable is a dummy.



Plenty of space inside! Note front strut anchorages.

closed-loop. Perhaps the most significant departure from scale is the provision of two wing pivot points instead of one. These are out of sight and do not detract from the scale appearance.

Construction

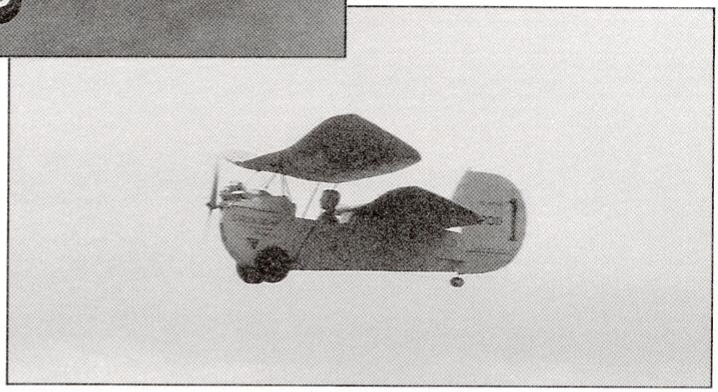
Why not start with the rudder? The drawing is self-explanatory. Use light wood because the twin tail wheels add weight just where you don't want it. Next you may as well tackle the wings. These cannot be built over the plan as normal. The Flea is different – *Vive la Difference*! The curved spars are laminations as shown. The wood must be well steamed to the curves, pinned down over the plan and left a few days to settle permanently to shape. The spars are then mounted upright on the bench with the rib positions marked on them. Assemble the ribs to the spars and glue well.

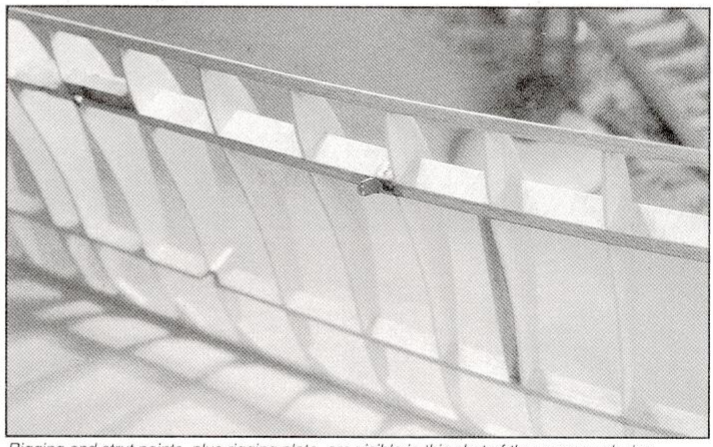
Next fit the leading and trailing edges. These you will probably be able to do without steaming, depending on your choice of wood. The tips are cut from sheet balsa and should present no problem. Now add the compression struts and the hard points for the swivels, pushrods, bracing wires and rear wing securing bolts. It is essential for the front wing to be wire braced but the rear wing does not need working rigging.

Now cut out all the fuselage formers and bend up the upper wing wire supports. Attach these to F1 and F3. Glue F1 to F2 making sure that they are absolutely square. The next bit is rather tricky. What you have to do is glue the thin ply doublers to F1 and F2 and at the same time glue F3 in position

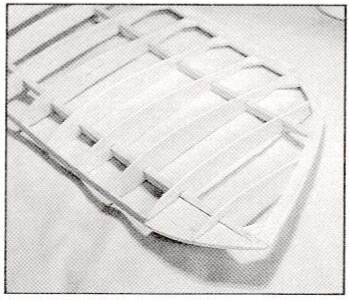
SUPERPLAN

The Flea ticks past in convincing style; model can be trimmed easily to fly hands-off.





Rigging and strut points, plus rigging plate, are visible in this shot of the uncovered wing.

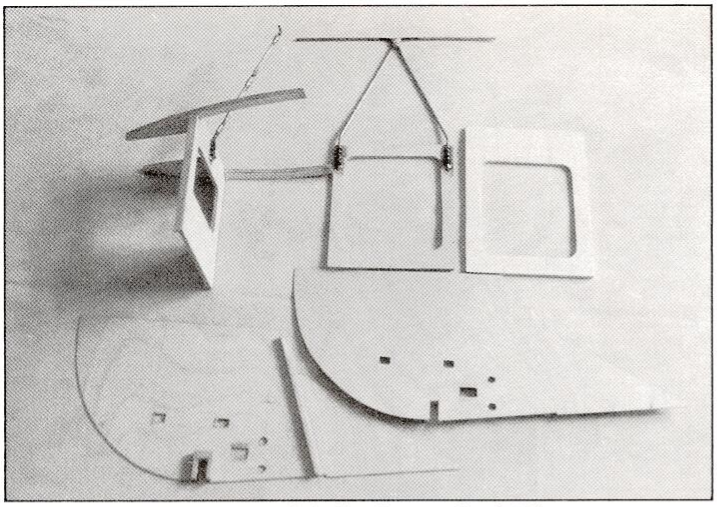


Tip construction close-up; wing rocks for pitch control.

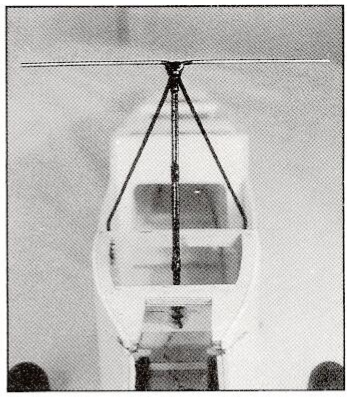
– and of course it must be all fair and square. If you get this bit right then the rest of the model will be right so... take care.

At this stage it is a good idea to make up the wing incidence cross shaft and levers. You can then carry out a trial fit of the mechanism together with the servos to see that it all lines up properly. If all is well, cut the sheet fuselage sides, noting that there are two pieces each side, butt jointed where the grain changes. Glue the sides to the ply assembly, insert F4 and draw in the rear to fix to the sternpost. Sheet in the top and bottom to complete the fuselage.

Rather than go to great lengths describing the way the u/c, engine, tank and so on are fitted, I have made, I hope, sufficient notes on the drawing to enable the



Main ply fuselage components; 1mm ply doublers (foreground) and 1/8 formers.



Main and front strut close-up; the 'Superplan' gives all the dimensions and fixing details.

average modeller to complete these items satisfactorily.

There is only one colour scheme for this Flea and that is silver with black lettering!

Rigging

The rear wing is bolted to the fuselage and should need no adjustment. Set the top wing so that the gap between its trailing edge and the top of the rear wing is 2.9/16". Movement of the wing should not exceed 1/8" up and down. Balance the model as shown on the plan. Rudder movement in the air is minimal but for best steering on the ground more will be required.

Flying

Experiment with short hops on a day with a light wind. Remember that, with such a vast moving surface, only tiny movements of the stick are necessary. It is best to use the throttle to ascend and descent, regarding the stick as a trim control. With patience the Flea can be trimmed to fly hands off.

The only other advice I can give is to read the history of Mignet and his Fleas because, if you build one, it will attract a great deal of interest from both modellers and the general public. In fact, you'll be bitten!

Bon chance mes enfants!