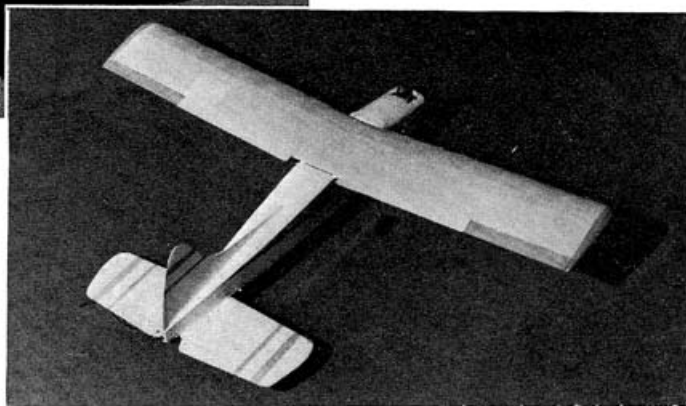


## A LINE OF DEVELOPMENT

By Mike Pitchers

### The story behind this month's FREE PLAN



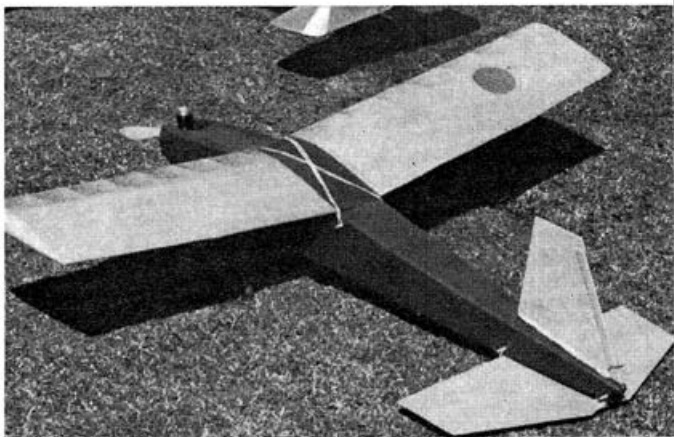
**A**BOUT three years ago my son bought a Veron Mini-Robot kit. The resulting model flew so well that I decided to build one for myself. This Mk. II was designed to accommodate two actuators, an Elmic Compact, and a modified Futaba for engine control. The engine used was a Cox Medallion .049. The airframe was strengthened in places, and I think this was the cause of its poor performance. The all-up weight was 23 oz., against 19 oz. for the kit aircraft. It dragged itself around the sky and proved most disappointing. It is clear that this design should be kept below 20 oz. or provided with much more power.

Mk. III (Photos above) was designed to make up for the shortcomings of the ill-fated Mk. II. More power was provided by a Cox .049 TD. The airframe was extensively lightened, and inset ailerons operated by brass tube torque rods running through the hollow trailing edges. The Elmic Compact was modified to operate the ailerons, the elevators worked in the normal way by torque rod. The wing can still knock-off, the mechanism is protected by press studs in the linkage. This aircraft has now completed well over 100 flights. It is a most exciting model to fly, being capable of continuous loops or rolls, horizontal eights, vertical upward rolls etc. On the glide there is hardly any reduction in sensitivity to control. Coming down from height it is quite easy to pick up some speed and complete a roll, and this on the glide with a dead engine. Rolls are, of course, barrel rolls, but much straighter than the skew-loops usually produced with rudder only.

The original Mini Robot by this time had become very tatty following various "sudden arrivals", and so Mk. IV was drawn up (photo right). Dimensions, areas, and rigging angles as Mk. I. Rudder

and Elevator controls from an Elmic Compact. Internally, further alterations giving better accommodation and access to the radio and DEAC pack. The dummy cabin was eliminated as was the external hatch under the nose. The wing was strengthened by the use of spruce for the spars and leading edge. At special request from my son, a different tail unit was included. What more different than the American Mooney, so the Mk. IV became the "Mooney Robot" (sorry).

A friend then suggested that all these new features should be incorporated in a new design which could be modified as required, all the way from a docile trainer to a hairy aerobatic bomb. Thus the Mk. V was drawn, this time on tracing cloth so that the friend could have a copy (Mk. V plan herewith).



Left: the Mini Robot Mk 3 with ailerons and elevator controls. Right: the Mini Robot Mk V, the subject of this month's free plan is attractively re-styled from Phil Smith's original.

Still retaining the original areas, moments, dimensions, good performance was more or less guaranteed. At this stage the Mk. IV was altered to conform as nearly as possible to the new Mk. V design (photo right), and proved in flight. One further Mk. V has been built, and this too flies well.

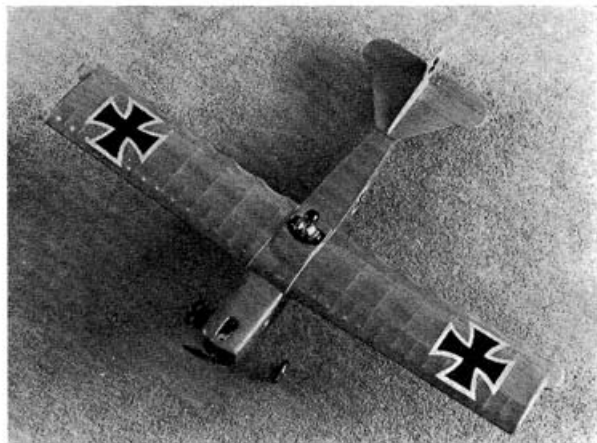
So we come to the latest, Mk. VI (photos below). This is the first one which departs radically from Mk. I layout. As can be seen in the photograph, the object was to produce an aircraft having the appearance of a W.W.I. German fighter. I have neither the time nor the patience to build a super-scale job, although I admire the chaps who do. To give the model some guarantee of airworthiness the new design was drawn on tracing paper laid over the Mk. V plan. Scale-wise the general effect is a blend of Fokker D VII and D VIII, thus the number painted on the fuselage reads Fok D VII½. Every effort has been made to save weight. Aft of the wing the fuselage is built up from 3/16in. sq. balsa, in-



stead of 1/16th sheet. The tail-plane is, of course, quite different in shape, but is close to original area. The fin and rudder do not conform, the rudder area is large by any standards, at least it should be sensitive to control. Rudder and elevator are operated by the usual Compact. The most difficult job was to modify the Compact to give push-rod output to both control surfaces. This was necessitated by the tail unit design making torque rod operation impractical. Power is supplied by a Silver Bee, which is completely hidden in the deep nose. The radio is a new Staveley 'Tone Lock', powered by a four-cell DEAC. The all-up weight is 19 oz. in spite of the heavier equipment. I am now waiting for some fine weather to try this one out.

For the future, Mk. VII, I have several times considered a low wing version, and have even drawn it in outline. So far it looks too ugly to build, this is going to need much more extensive redesign to get a good looking model. I visualise it having ailerons and elevator control, like Mk. III. I think it will have two-wheel undercarriage, possibly with spats. It should finish up looking like a miniature pylon racer. The other proposition favoured by my son is for a twin engine version, I'll have to think about it.

What I have described is a series of modifications to an existing successful design, to give changes in performance, or appearance. The real brain work was already done for me by Veron to whom all credit must be given for an excellent aircraft. The point that I want to make is that it is easy to "design" your own model, all you have to do is to select a well-proven airframe, and keep your modification near to the original, well fairly easy!



Left: Mini Robot Mk 4, dubbed the 'Mooney Robot' on account of its re-shaped tail surfaces along line of the range of full size Mooney light aircraft. Right and above: the Mini Robot Mk 6 with scale-like W.W.I. Fokker look.

