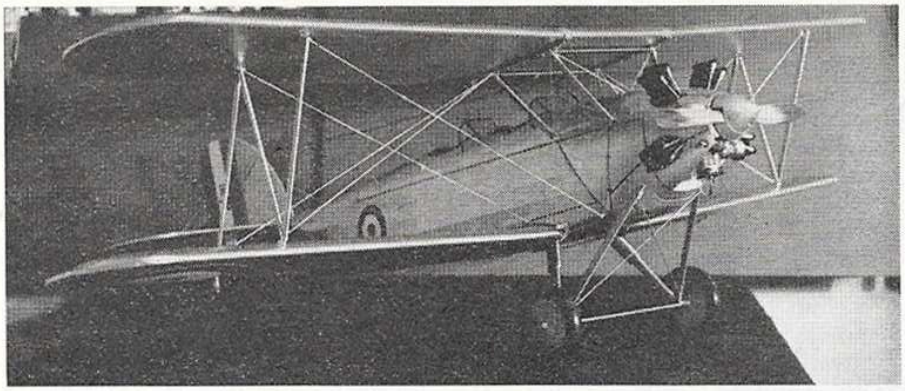
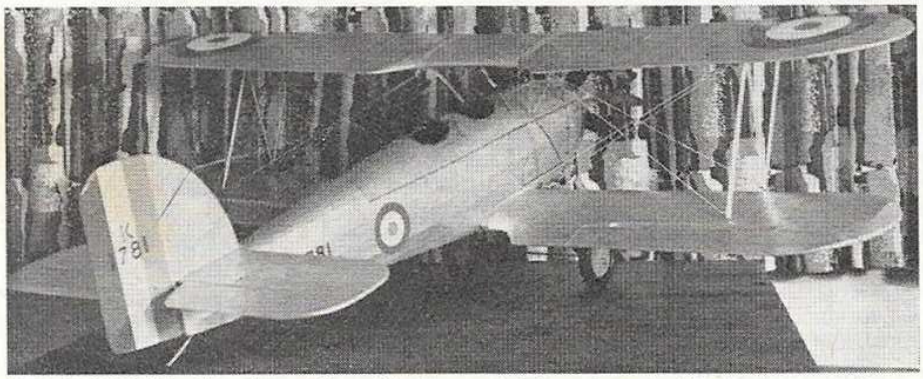


RCM&E Kit Review No 33

Veron's HAWKER TOMTIT

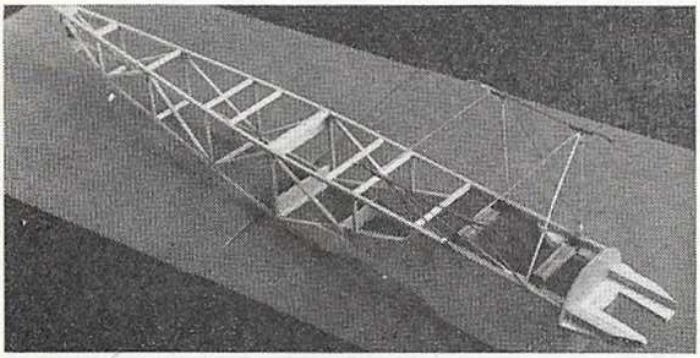
By Jack Barnard



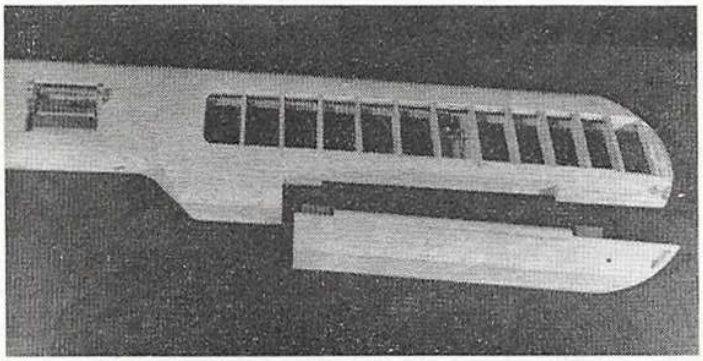
VERON'S Hawker Tomtit is, in my opinion, a winner, introduced right in the building season. The kit itself is well up to the high standard we have come to expect from this manufacturer, and one just cannot fault the excellent set of plans and instructions included in the kit. What has in fact been produced is a basic scale model, to which can be added, at one's leisure, the details of cockpit interior, etc., as one wishes. The model as presented, departs from true scale with a slightly enlarged tailplane and fin for added stability, but a note is added to the effect that the model is quite stable when built to true scale.

One's first impression when opening the box is that one is faced with many months of building. This is a completely wrong impression, as the model builds quite fast. I know that the normal procedure when reviewing a model of this type is to show the completed model uncovered, but with the building method I employed, this was impossible and pieces went together so fast I had the wings and tail covered before I had completed the fuselage, as this was placed on one side at various stages waiting for epoxy and resin to dry. An added aid to building is the inclusion in the kit of an excellent set of photographs of the prototype model in various stages of construction.

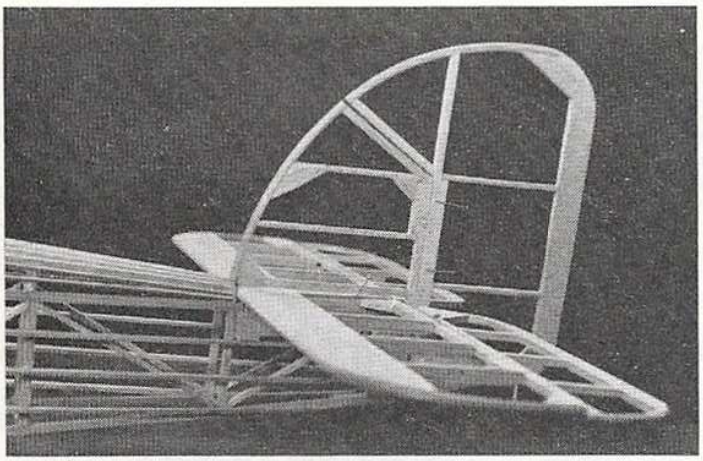
The model is built on the plan, the basic fuselage comes first, and one is given the alternative of an upright or inverted engine. I chose to build with the engine inverted, as per the prototype, with the silencer hidden away and a silicon rubber tube from the end of the silencer emerging beneath the fuselage. The engine (I used a Merco 35), has to be fitted quite early in the building sequence in order to enable one to modify the silencer and align it accurately with the special box built into the side of the fuselage. To guard against any overheating problems here I coated the inside of the box with fibreglass resin, and made the entry and exit of the silencer box large enough to allow a cooling flow of air through it. The upper half of the nose cowling is removable to give access to the engine retaining bolts, allowing the engine and silencer complete to be removed quite easily downwards and forwards. I did make one modification to the plan, by constructing a hatch in the bottom of the fuselage to allow for complete removal of the undercarriage and provide easy access to the power pack box and fuel tank. This is quite a simple modification, the hatch being strengthened by a strip of 1/16 in. ply, and held securely by two bolts screwed into nuts epoxied into the fuselage sides. The rear of the undercarriage slots into the underside of the lower wing, and is held in



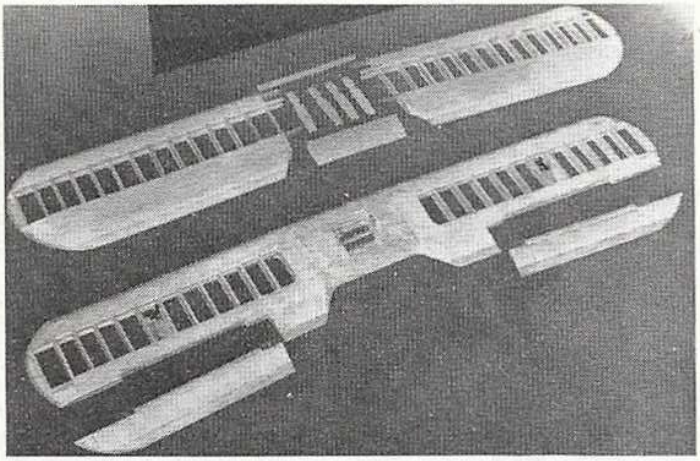
The basic fuselage structure complete with struts in place and motor mounts. The final fuselage structure to provide the scale outline is then built up around this basic frame.



Detail of lower wing structure with wing fully sheeted, showing aileron, with hinges, ready for installation. Ailerons are fitted to lower wing only.



Close-up of fuselage rear showing structure of tail cone and stringered fuselage.



The wings. Lower wing is complete less aileron hinging, while upper panels have yet to be joined at the centre section.

place by the wing retaining rubber bands.

The tailplane and fin/rudder assembly can be built as a removable unit, held in place by rubber bands, but I preferred, as I am sure most builders will, to permanently glue it in position. The tailplane rigging is nylon fishing line, epoxied in place, which plays an important part in strengthening the fin. The fin, tailplane and rudder must be built as light as possible, to avoid C. of G. problems, and all are of adequate strength as shown on the plan, so avoid any temptation to 'beefing up' in this area.

The cabane struts are quite simple to construct. Built of 12 s.w.g. wire with 18 s.w.g. crosspieces, the joints are bound with fusewire and soldered, but absolute accuracy of assembly is of course necessary to ensure correct rigging of upper mainplane, which has a positive incidence of one degree. The lower mainplane has zero incidence.

The dummy cylinders and pushrods are fixed securely with epoxy, but are not fitted until after the fuselage has been covered and painted.

The undercarriage assembly is built of 12 s.w.g. wire with 18 s.w.g. cross bracing and a 10 s.w.g. axle, faired with balsa streamline section secured with epoxy glue. The cabane struts are faired in the same manner. The front undercarriage strut swivels freely in its mounting for ease of fitting the lower wing.

After covering the fuselage (I used nylon covering throughout), the cockpits are cut out, and the windscreens fitted. A ply template is provided for accurate cutting of the windscreens. Split black rubber fuel tubing forms a nice edging around the cockpits. After painting the fuselage the detail lines of cowlings, hatches, etc., can be drawn on, and here I used the method advised, i.e., thinned down enamel and a ruling pen.

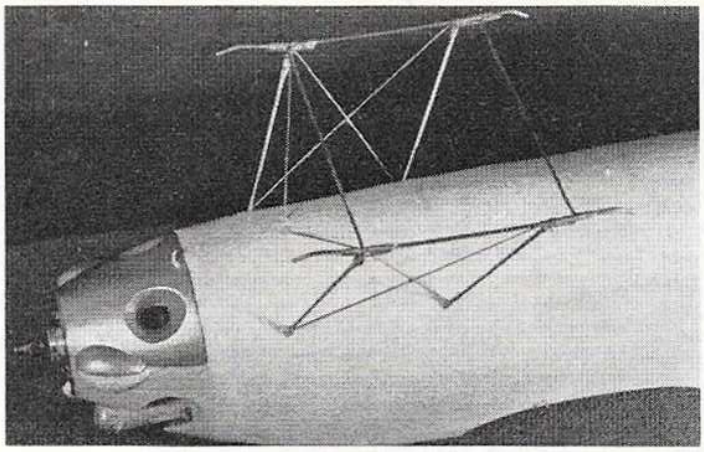
Both top and bottom wings are identical as far as structure is concerned, the outer panels are built first, pinned over the plan with $1\frac{1}{4}$ inches under each wingtip. The centre section is then built in. The servo box and ailerons are then cut out of the lower wing and the ailerons are cut back and a shaped leading edge fitted to form the aerodynamic balance. It is in fact a 'Frise' aileron.

Shaped leading and trailing edges are provided for the wings, and all ribs are cleanly cut. The aileron push rods and small wire hooks for retaining the interplane struts are fitted during building.

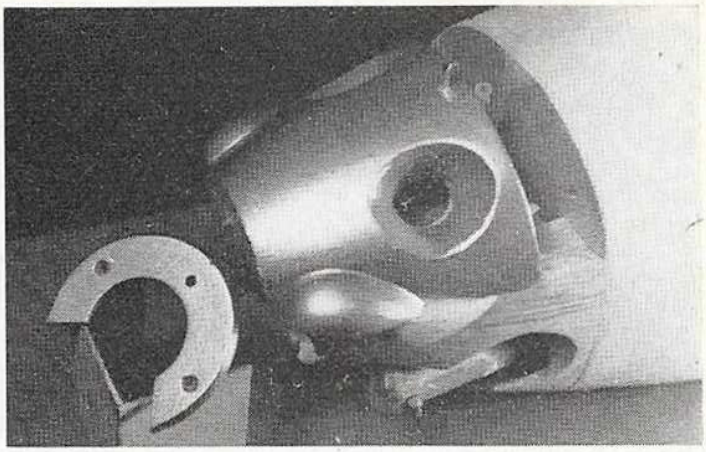
The wings are now positioned on the fuselage for a rigging check, and the interplane struts can be fitted, the latter are made from 3/16 in. dowel with wire loops epoxied to the ends, and faired with the shaped balsa fairing supplied. The wire loops fit over the wire hooks in the wings and are held in place by the interplane rigging of *sheering elastic*.

The wing tips are formed by laminated ply strips, as are the tips of the tailplane and fin/rudder. An alternative method is shown using block balsa, but I advise the laminated ply, as this does produce really tough impact resistant tips, very useful on those Chinese (Wun-Wing-Lo) landings!

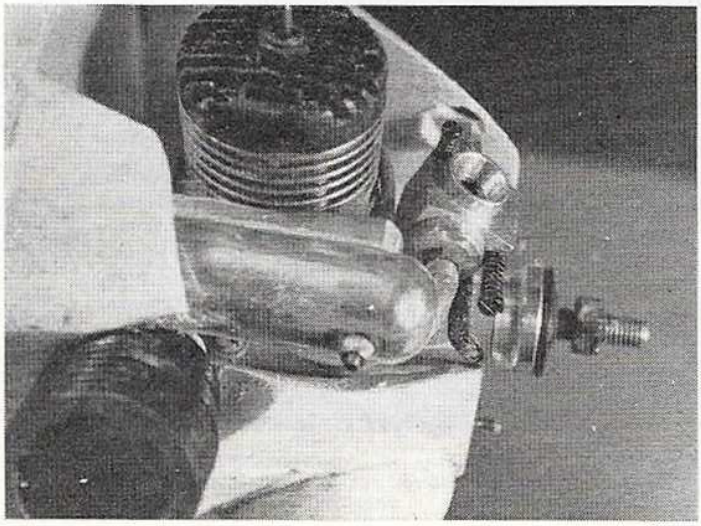
To obtain a 'fabric' finish one



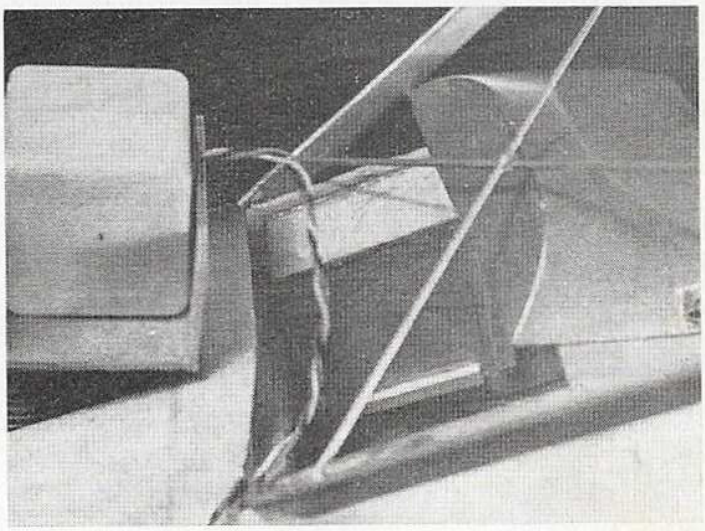
Close-up of fuselage fore section showing structure sheeted around the cabane struts, and engine cowling.



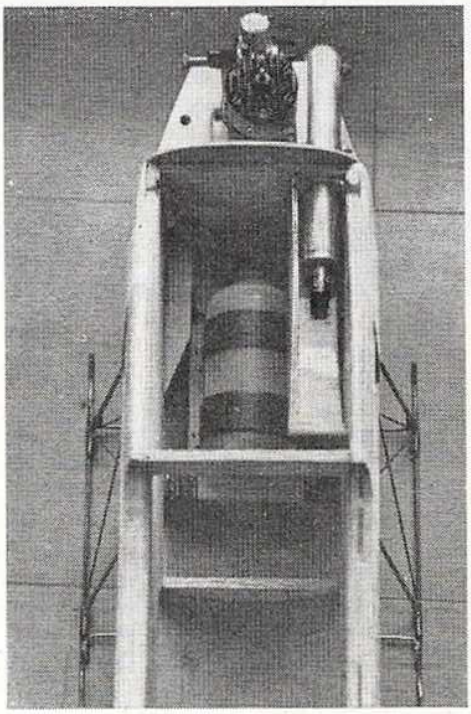
Detail on removable motor cowl showing recesses for the dummy cylinders. Note the relief for the silencer.



Merco .35 motor installed complete with silencer awaits tailoring of removable cowl to suit. 6 c.c. Merco seems adequate power.



The power pack installation. Hatch on fuselage underside removes to allow access to power pack installed on the plywood tray.



Close-up of basic fuselage construction from underside shows the installation of the motor, fuel tank and silencer, passing through firewall.

is advised to cover with nylon and not to completely fill the nylon with dope. I found, with the lightweight nylon I used, that three coats of dope were just about right, followed by one coat of silver enamel. The civil version of this aircraft looked very nice with silver wings and tail and royal blue fuselage. Civil registration letters are noted in the instructions, as are the service registration numbers.

The R.A.F. transfers are now placed in position, the whole model is given a coat of matt fuel proofer and we are ready to fit the radio gear. Although the model is advertised as suitable for mini propo I had no trouble at all in fitting my *Kraft KP6B*. The R/x went into the top of the fuselage and three servos immediately under it and well forward against the fuel tank to keep the C. of G. in the right place.

I built this model exactly as per the plan, apart from that bottom hatch, and using a .35 instead of a .29 engine, so I fitted a four ounce tank in the mounting shown in the plan. There is however, plenty of room for a larger tank with modified mounting. I usel a two vent Veron tank, in which the vent is led out through a copper tube in the top cowling.

An address is included in the building instructions to which you can send your silencer for modification if required, as the stub has to be reduced considerably. The spinaflow is recommended, and fits very nicely, and I personally found no difficulty in modifying it myself with a hacksaw and a rat tail file.

A word of warning re. fitting the dummy cylinders. These are hollow and are epoxied on to a short stub of dowelling, which is in turn epoxied into holes in the cowling. I made the joints in the cowling a tight fit and held the cylinders with rubber bands while the epoxy glue set. When I removed the rubber bands I found that all the cylinders had tilted forward about two degrees.

This I can only attribute to the glue causing the balsa of the cowling to expand, thus tilting the cylinders from the larger area at the rear. So hold them firmly with something which does not stretch!

As regards weight, my model tips the scales about half a pound heavier that the prototype, due mainly I suspect to all that fibreglass resin in and around the silencer box. Still, it also probably helped in getting the C. of G. well forward. The KP6B is also of course a few ounces heavier than the modern mini proportional.

Finally a few words about the kit in general. All wood is of excellent quality, all cut outs are clean and accurate, accessories, i.e., wheels, dummy cylinders, spinner, etc., are first class. A complete set of plans, building instructions and many useful hints.

After many enjoyable building hours the finished product is a very pretty model, left as it is, or can be improved by cockpit interior detail, etc. (I have ideas on a couple of real oleos for that undercarriage.) By today's prices I would consider this model a good buy, and I am sure we shall be seeing many good examples at the Old Warden meeting this year.

Flying the Tom-Tit

Weather conditions were quite good, with light winds. I had expected a little trouble with starting the inverted engine, especially at this time of the year with the temperatures around freezing, so had provided myself with an electric starter made from a 12 volt drill. I did not really need it however because the engine started quite easily by hand, a few flicks with the throttle closed to suck the mixture in (the normal method of sticking the finger in the intake is difficult to achieve, unless you happen to be a contortionist), then open the throttle fully and the engine starts as easily as when upright. I advise using the inverted engine, the only cleaning to be done at the end of flying is around the engine. If the model does happen to tip on its nose, the engine is well out of the way with that high undercarriage, the spinner is all that hits the ground, and the model does look cleaner with the engine hidden away.

Ground handling is quite good, very little swing on take off, in fact none at all until the tail comes up, then just a slight swing which can be corrected easily. The model gets airborne at quite a low speed, and has to be held level for the speed to build up before climbing away. The ailerons lack sensitivity at low speeds, and I advise setting these up for maximum throw.

The model climbed away quite nicely with neutral elevator trim, but when the speed built up at full power in level flight it required full down trim, which is really to be expected with the wing airfoil section used. I had the elevators set to give approximately 6 degrees up and down (12 degrees total) and this seemed about right.

Power on approaches to land are advised in the instructions, but glide approaches present no problems providing one remembers not to hold off too high for the landing. The model loses speed very quickly as the nose is raised, with very little float, and 'sits down' very sharply. I would advise power-on approaches whenever possible, closing the throttle fully as the model approaches the landing attitude just above the ground. One would need very little practice in flying to take this model off and bring it back to within 6 feet of the ground, but that last 6 feet needs landing experience!

Landings, and take offs, should always be as near into winds as possible, even in light winds, because a high C. of G., plus a fairly narrow undercarriage, coupled with low take off and landing speeds, makes cross wind work very tricky.

I experimented with propellers and found the best sizes for this model with the .35 to be either a narrow blade 11 x 6in. or normal 10 x 6in., both wood.

As I said at the beginning, I think Veron have a winner here a very good kit, a very nice looking model and a very good flier. The model is so stable in the air that I can really see no need to depart from true scale with the rear stabilisers, and I would advise any average pilot to build to true scale.

It will be noticed in the photos of the model that I have not fitted the small struts from the rear of the cowling to the lower wing on the dummy slots, as I wanted to get a look at the real thing before going into too much detail. If you cannot get a look at the real thing you may be able to get hold of a copy of *Shell Aviation News*, Copy No. 384, 1970 which contains some very good close up photos showing cockpit, engine and whole aircraft, plus a flying report by the pilot who regularly flies K1786 at Old Warden.

Below left: the junior Barnards prepare to fire up the Tomtit, using Jack's home-made electric starter which seems to be quite effective, even on fairly large motors like Merco 35 used here. Tomtit airborne at right.