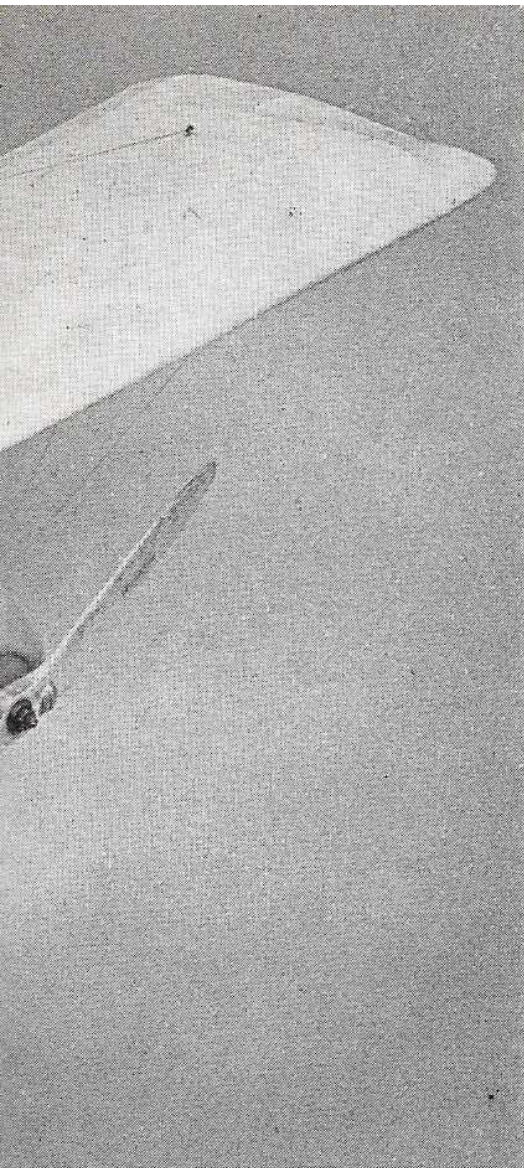


AS MY experience of radio control flying had been limited to the high wing trainer type of model, and I had never built an aircraft of my own design, I started looking round for a suitable first project. The problem was that I—like so many—wanted an aircraft that would look and fly just like the real thing, but would not involve a high speed aircraft, or need a great deal of building work. The end result, after studying many books on all types of full-scale aircraft, was that I decided on the Blackburn *Monoplane*, 1912.

The choice of the Blackburn has resulted in its receiving quite a lot of attention whenever it has been flown, and it has not given too bad an account of itself in Class 2 scale events. At the Canterbury Pilgrim's show last year it placed 5th and, later, at the Kent Air Show, 13th. On both occasions, unfortunately, the weather conditions did not allow it to be seen flying at its best but, on our club flying around, it has been seen by many in its element. The model has been described by one member, when he was flying it, as "not so much an aircraft but more a parachute with an engine fitted."

The full-size machine was built in



BLACKBURN MONOPLANE

— 1912 —

*build this interesting
old timer—for
a touch of nostalgia*

by B. BUNDOCK

55 $\frac{1}{2}$ " span for .25-.35 motors

1913 and was fitted with a 50hp Gnome rotary engine (where the crankshaft is fixed and the crankcase and seven cylinders rotate around it!) This used castor oil, as a lubricant, at the alarming rate of two gallons per hour, so I am glad the model does not have the same thirst, the price of castor being what it is. The actual aircraft may still be seen, as part of the Shuttleworth Collection, at Old Warden, and it is the oldest British aircraft still in flying condition. The wingspan is 38ft. 8in., and it has a top speed of 60mph.

My model has been built to a scale of 1 $\frac{1}{4}$ in. to the foot, and the wingspan is 55 $\frac{1}{2}$ in., the wings de-rigging for transportation.

CONSTRUCTION

The basic construction of the model is very simple, except for the undercarriage, which requires rather a lot of soldering of 8g. wire. (For this, one of the presently available gas-operated miniature blow-torches is ideal). The airframe may appear to be on the fragile side, but the original has stood up to some very bad landings, sustaining only minor damage.

Wings

The balsa ribs are made using the sandwich method, by making up two templates, placing sheet balsa blanks between them, and sanding to shape. The wing has an undercambered section, similar to its full-size counterpart, and features 2 $\frac{1}{2}$ deg. of incidence which, as you may imagine, together give the desired slow-flying qualities for realistic flight performance. The wing is built in three parts—two outer panels and centre section—as follows.

Outer panels. Pin the $\frac{1}{4}$ in.sq. and the two $\frac{1}{8}$ in.sq. lower spars in position, using scrap packing to raise them to the correct height. Fit the leading and trailing edges in place but do not forget to raise the front of the trailing edge with scrap packing, too, to the correct position. The ribs may now be added and, when set, the top $\frac{1}{4}$ in.sq. spar is fitted. Next fit the $\frac{1}{8}$ in. sheet wing tip pieces, whilst the wing is still pinned to the board, and cut the top spar so that it slopes down to the tip, as noted on the plan.

Centre section. Build this unit up as shown on the plan and, when dry, add the two $\frac{1}{8}$ in. thick ply tongue pieces, epoxying very securely into place. Build up the box type structure in the outer wing panels to take

these tongue pieces, ensuring that the correct angle is formed where the panel roots meet.

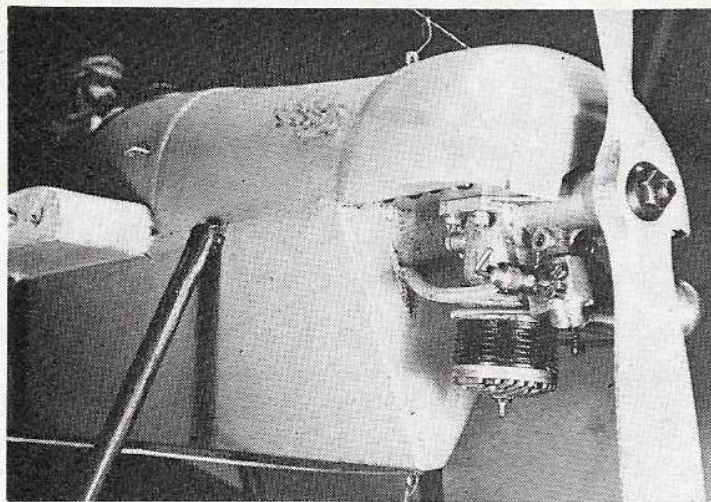
Fit the hardwood blocks—six in each wing panel—as shown on the plan. These are anchorages for the eyelets which take the rigging wires and should be securely epoxyed in place, as they take the strain while the model is in flight, and while landing, according to whether the wires concerned are “flying wires” or “landing wires.”

Tail unit

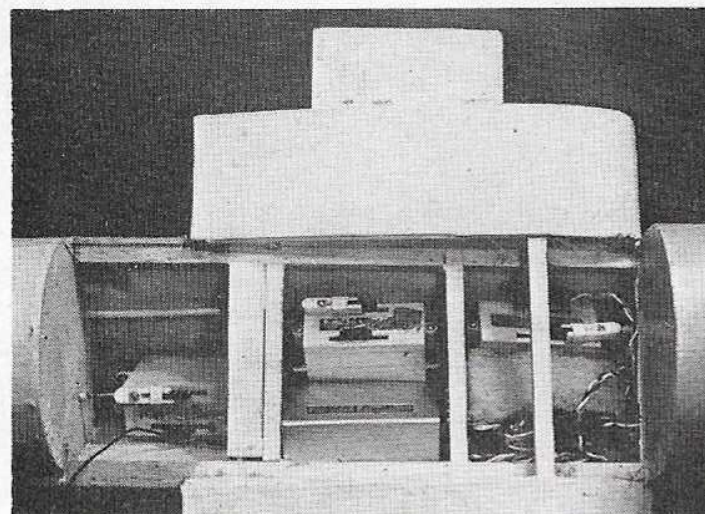
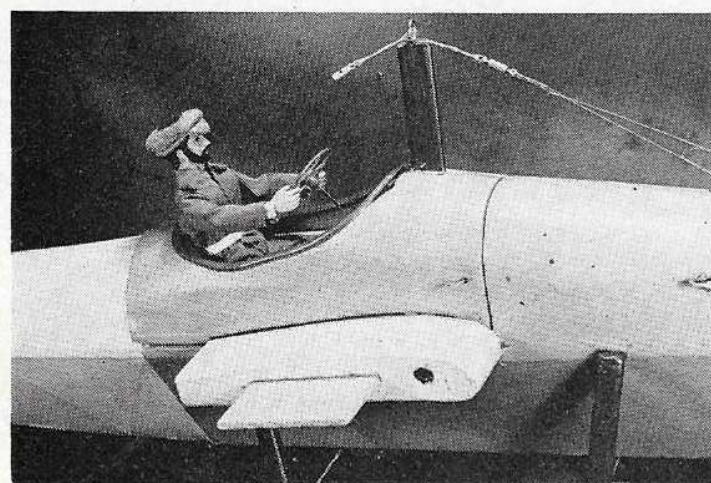
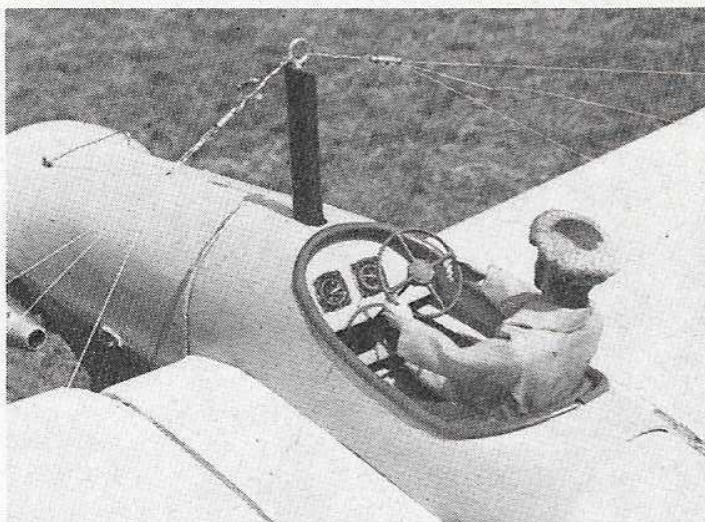
This is made up from $\frac{1}{2} \times \frac{1}{4}$ in. balsa strip, over the plan and, when assembled, the $\frac{1}{4}$ in. hardwood strips are added to the fin (as a rudder post) and to the elevators, as a joiner. It is very important also that the 1/16in. ply strips are added to the top and bottom of the centre part of the elevator as, if omitted, the two panels of the elevator would distort in flight and act like ailerons!

Fuselage

This is quite simple, as the basic structure is of $\frac{1}{4}$ in.sq. strips built up like a ladder and, when dry, the formers F1, F2 and F5 to F10 are added. Fit the $\frac{1}{2} \times \frac{1}{8}$ in. keel longeron to the bottom of the fuselage, from formers F1 to F10, and cut the two $\frac{1}{16}$ in. ply pieces to fit between



Designer's K & B 35 inverted. Cowl is part of commercial ABS radial type. Right and below: cockpit lifts off to reveal radio installation—tape used here, for servos and receiver.



the formers F1 and F5 (this forms the radio bay). Inset a piece of $\frac{1}{16}$ in. sheet balsa to fit each side, underneath the crutch, from formers F5 to F10 and glue into place, leaving room for the $\frac{1}{8}$ in. sq. strips between the bottom keel and the $\frac{1}{4}$ in. sq. crutch—as shown in section on the drawing of former F6, on the plan. This side sheeting is very important as it prevents the fuselage twisting in flight. The $\frac{1}{8}$ in. sq. strips are now added, at each former position (again as indicated on F6 section), plus the dummy diagonals, also cemented to the outside of the sheet sides. Do not add the stringers at this stage, however.

General assembly

The tail unit is now added and, when dry, the tail skid (from 8g piano wire), after which the $\frac{1}{8}$ in. sq. top deck stringers are fitted. Fit the centre section of the wing to the fuselage at this juncture and, when set, cover the top over with $\frac{1}{16}$ in. sheet where shown. It is now possible to construct the cockpit and the nose section between formers F3 and F5a, covering this section with $\frac{3}{8}$ in. sheet.

The section in front of former F1

is made from block balsa, and the cowl is part of a standard $5\frac{1}{2}$ in. ABS plastic cowl. Note that the length between former F1 and the cowl may be altered to suit the particular engine fitted.

Undercarriage

First bend up the undercarriage side pieces from 8g piano wire, and bind them together using 30 amp fuse wire. Now solder the assembly, using the mini blow-torch mentioned earlier to provide sufficient heat.

This basic frame is now epoxied to the fuselage—into holes drilled through the engine bearers, and through centre-section rib W1. Solder the two 16g cross pieces into place whilst the next stage is in progress. Build up the undercarriage fairings, using $\frac{3}{16} \times \frac{1}{4}$ in. strip and 1/32 in. ply as detailed on the plan. Sand these to shape and wrap the legs in a nylon bandage, doped into place.

At this stage, the bottom $\frac{1}{16}$ in. sheet may be added to the centre section of the wing.

Covering

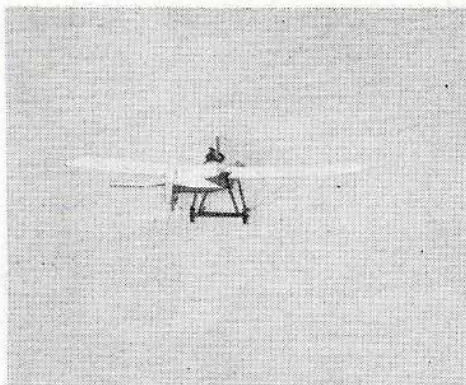
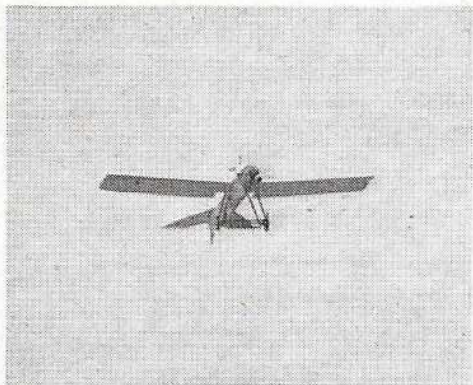
First cover only one side of the complete tail unit with tissue; allow

to dry and then cover the other side. Cover both upper and lower surfaces of the wings with tissue, and to top fuselage decking, over the stringers. When dry, the complete airframe should be covered with nylon. This adds a great deal of strength, when doped, and imparts a fabric-like appearance to aid realism.

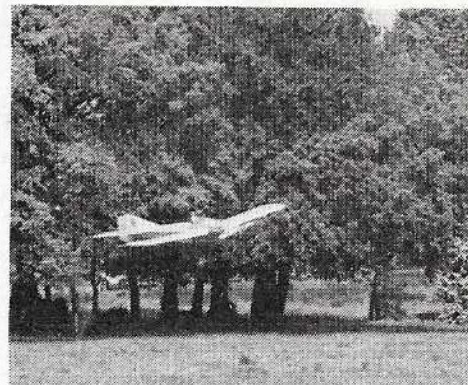
Finishing and rigging

After clear doping, the original was painted matt cream, with matt grey areas for the cockpit surround and nose section. (The full-size machine actually has engine-turned aluminium in these areas, and you are welcome to imitate this if you have the patience!) The wooden undercarriage legs are painted brown. Cockpit detail is very simple, as may be seen from the photograph, as there was virtually no instrumentation in those days.

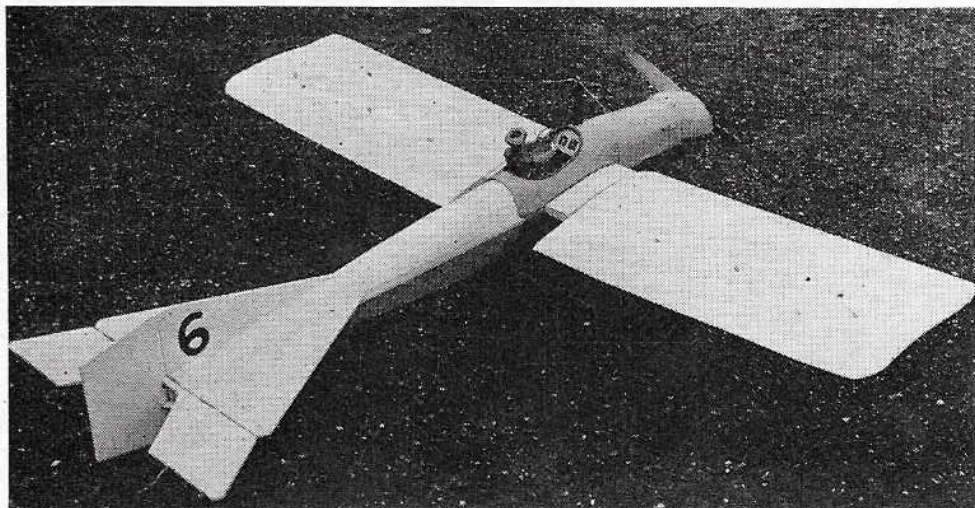
The rigging is from seven-strand Laystrayte control-line wire, fixed to the eyelets screwed into the wings and fuselage for this purpose. The wires are adjusted by means of miniature turn-buckles, as supplied for model yachts. The outer wires on the wings are load bearing and should be set up first; the remaining



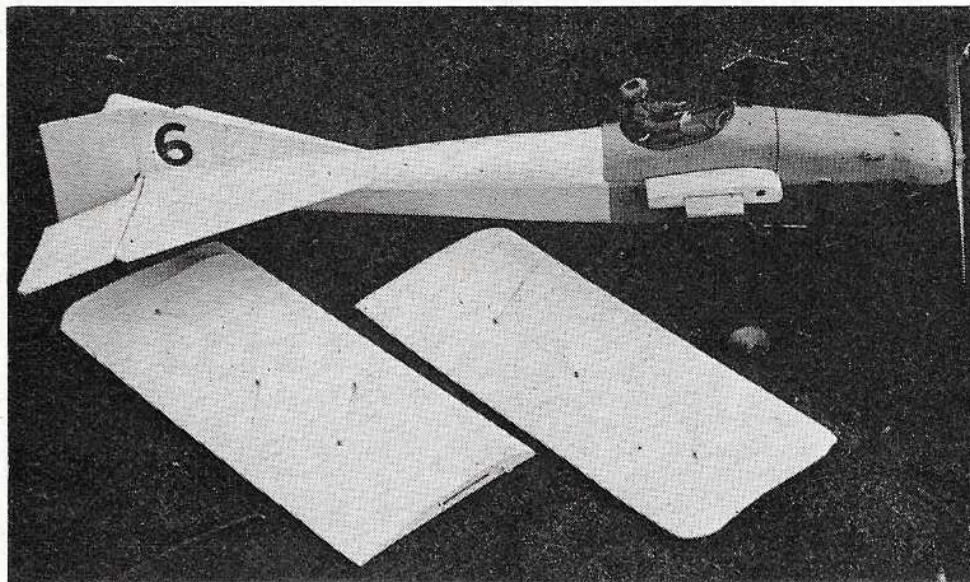
The model flies slowly and steadily, but it must be stressed that it is really a model for fairly calm weather. Right: landing deadstick (those who fly there will recognise the tree groupings of Wanstead Flats).



wires on wings and fuselage are dummy ones.



The Blackburn has a relatively low aspect-ratio, but the length of the fuselage prevents our usual lazy habit of putting in the back of our estate car assembled! Just as well, then, that it disassembles as shown below, for transport. Wire rigging features model yacht turnbuckles.



Flying

The model Blackburn is a fine weather flier—just like the real thing—so do not attempt to fly it in wind speeds of over 10mph. It is impossible to stall the machine with the motor running, and it is advisable to have your engine adjusted so that it can be made to cut, if required, on the final leg. This is because, with the very slow landing speed, the model will not stay down when it touches, but keeps trying to take off again.

This is not academic advice as we have found that, with a fast tickover, it was not possible to land the model and, with an 8oz. tank fitted, we once had to keep flying it around until the fuel was used up—about 30 minutes. During this time, as you may imagine, other club members on our frequency were threatening to shoot the model down so that they could have some flying time!

After initiating turns, it is necessary to apply a small amount of *opposite* rudder, to correct a tendency to side slip. Be ready for this, but it is by no means vicious.

With its undercambered wing, the model is a slow flier, so do not try to make it go faster than it wants to or it will simply tend to climb without much forward progress. My original is a dream to fly and, fitted with a K & B 35, it not only looks like the real thing in the air but also sounds right. The flying and landing speeds are most realistic, and scale type take offs can be carried out in safety. Roll on those calm, warm summer evenings, once again!