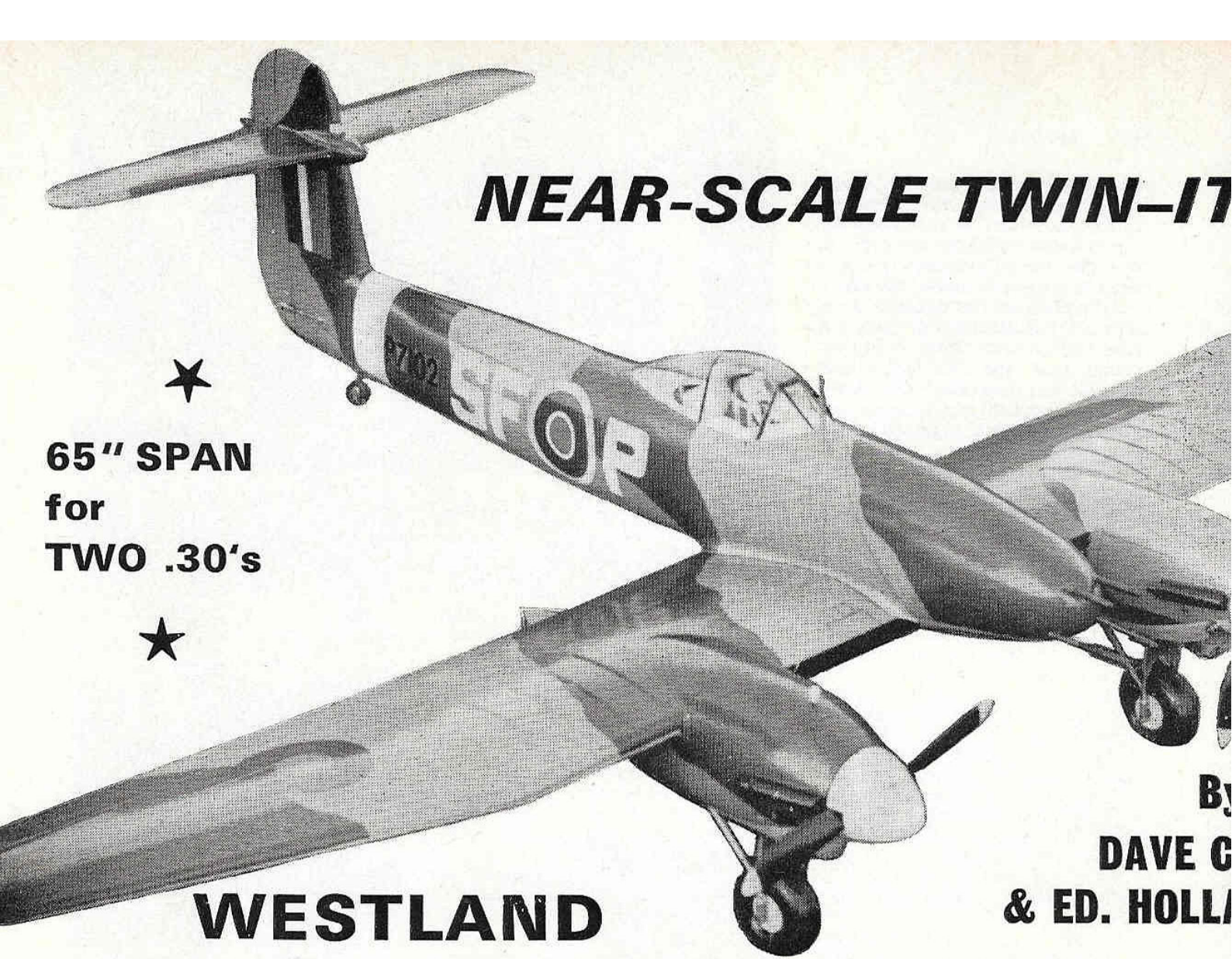






NEAR-SCALE TWIN-17

★
65" SPAN
for
TWO .30's
★

WESTLAND

By
DAVE C
& ED. HOLL

'WHIRLWIND'

WESTLAND WHIRLWIND!
No, not the chopper but a twin-engined fighter-bomber of World War Two. Having flown *Super Sixties* and the like for about three years, I graduated to low wing models by building a *Mustfire*—finished to resemble a Mk. XIV Polish *Spitfire*. After learning to fly this, there came the Japanese *Hein* and then a *Hurricane*. This latter was flown in the Gravesend demonstration team, as well as being a familiar sight on our local flying ground. After a while, my clubmates started getting at Dave Cronin and me to produce something "out of the ordinary" from W.W. II—knowing our liking for aircraft of that period.

The pressure, in fact, became so great that Dave and I spent several evenings, at his flat, looking over all his aircraft recognition books, ref-

erence works and so on. The only machine that looked good to us and had not been "done before", was the twin-engined Westland *Whirlwind*, an unusual and striking aircraft, brimming with that elusive ingredient—character.

Dave is the design department of our "team," so he got cracking over a hot drawing board and came up with the plans you see here. As you will notice, the model is not intended to be dead scale, since we like our planes to be everyday sport flyers, not something kept in mothballs for those two occasions per year. Most noticeable departure is probably around the tail end. On the full size machine, the rudder was in two parts, above and below the tailplane. To simplify things, we have made it a one-piece control surface, with a cut-out in the elevators for rudder movement. Those

who are offended by this can always built it in the scale way if they prefer. The undercarriage has been shortened, and moved forward, and the nacelles slimmed slightly, and there are other slight departures. But, you'll agree, the essential and very distinctive character of the *Whirlwind* is there in plenty.

The construction is quite straightforward; both crutch and spine systems are used for the fuselage and nacelles for accuracy of assembly. The wing is really beefy around the centre section and keyed into the nacelles, where the vibration and landing shocks have to be absorbed. The whole model is sheeted, yet the fuselage and tail unit are surprisingly light.

With a little forethought, the building sequence of fuselage, nacelles, wing and tail can be dovetailed to allow plenty of time for the glue

S A BEAUTY!



to set, without holding up proceedings.

CONSTRUCTION

Fuselage and fin

Pin down hard $\frac{1}{4}$ in. sq. hard balsa main members over the crutch plan and cut, fit and glue in the cross pieces. Cut out and laminate the doublers, cut out all keel pieces and formers and the cockpit floor.

When the crutch is dry, lift it from the plan and fit the formers by twisting them so that the notches slide over the main members and their faces butt against the cross pieces. Working quickly, before the glue sets, slip in the cockpit floor and push one doubler part way up on the centre line dry, to ensure that F2 to F5 are upright. Mark the positions of the formers on the keels and glue these in position. F10 and F11 are held at the top with a temporary spacer to ensure that the fin, when built is warp-free.

Prop up the fuselage on scraps of 2 in. softwood with a small sub-board at the tail-end so that, when laid on its side, the tail-end is level and the fin can be built on the aforementioned board.

The fin ribs are made "sandwich" method, and the rudder assembled with the fin then cut free after forming the frame. Care is necessary when fitting the tailplane seat blocks. Leave these full in plan view so that they can be sanded to the streamline fairing shape after sheeting.

Insert the $\frac{1}{8}$ in. ply mount for the elevator bellcrank by passing it forward into F10 and F9, then reversing smartly into F11. Add the elevator linkage and bellcrank and the blocks of soft balsa at the fin/fuselage junction.

Plank the fuselage with soft strips of $\frac{1}{2} \times \frac{1}{8}$ in. balsa and blend into the tail-end blocks. When dry, sand and cut out the cockpit well, sand off at F1 and add the noseblock. Cut an access hatch for the tail linkage. When the wing is complete, the surplus sheet at the wing seat can be cut back to the bottom line of the doublers to fit exactly with strips of $1/32$ in. ply which form a wing seat and fairing support. Soft block is glued to the fuselage/seat joint and sanded to form fillets. You

can now fix the wing bolt plate between the doublers, using epoxy.

Wing and nacelles

Cut all ribs, those for the centre section should have notches for the balsa spars only. Assemble on the plan taking care to build in the washout at the tip panels. Prop up the tips to dihedral angle and add the ply braces. Fit all linkages and sheet the whole top surface. Remove from the plan and open out the rib notches to accept the nacelle spars/former units (NS1 and NS2). Cut a small slot in the top sheeting to allow the tops of NS1 to protrude.

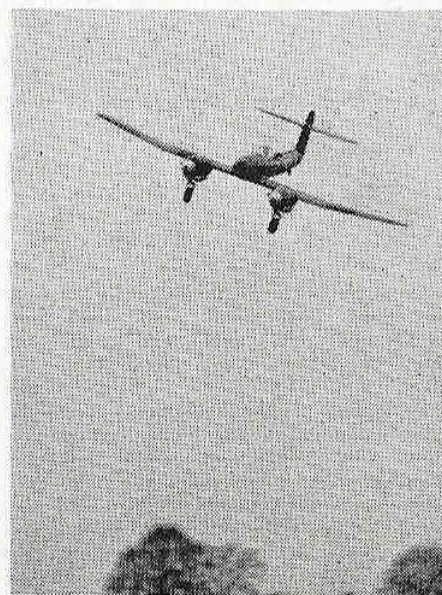
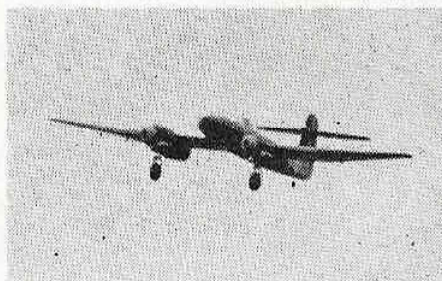
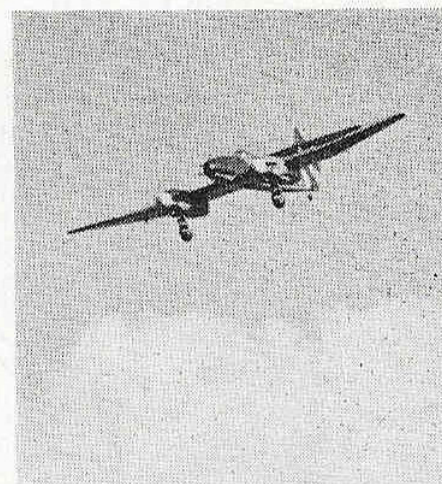
Sheet the whole bottom surface of the wing, sand and add the ply nacelle crutches (N4). Insert the previously cut nacelle formers while the glue is wet. Fit the nacelle keels (the lower ones are continuous through the undercarriage wells, for temporary alignment, and are cut after planking all over with soft $\frac{1}{2} \times \frac{1}{8}$ in.). The plan shows this planking carried right up to the noserings, so the engines and bearers could be fitted before the planking is complete. The prototype has block cowlings.

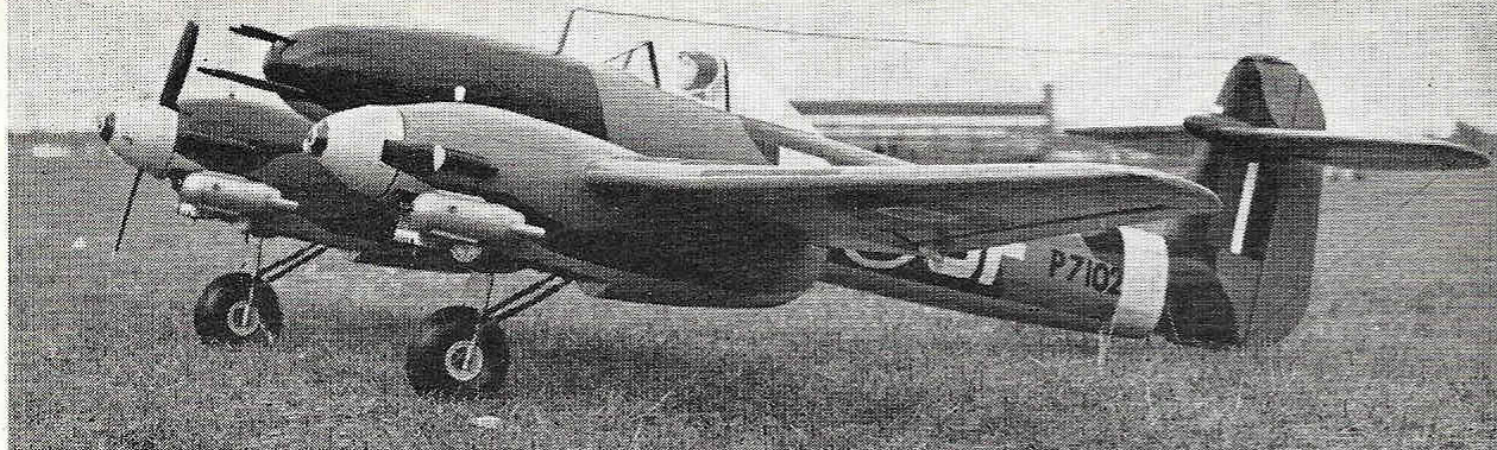
Cut out the wheel wells and onto the rear face of each lobe of N2 fit a piece of steel angle to which has been soldered a pair of 6 B.A. nuts. Strips of hardwood $\frac{1}{2}$ in. sq. are epoxied to the front faces of the lower lobes of NS1. These are the fixing points for the undercarriage plates-cum-tank hatches (Kavan square 6oz. tanks just fit).

Tailplane

This is built and sheeted, the elevator separated and slid through the fin. The elevator is hinged and the linkages completed, only now can you sheet the fin fully. Pay particular attention to the cross-over

These in-flight pictures show typical flight attitudes faithful to prototype. Right: coming in for landing and, below (not typical, we hope!) rough weather take-off with full aileron correction.





point when fitting the rudder and elevator, to preserve large rudder throws.

Undercarriage

Bend this up, using a wire bender to form three turn springs on each leg. Make two left and right handed legs and clamp together with large nylon saddle clamps and 6 B.A. bolts. Brass axle caps carry the axles, pieces of electrical connector pins being used on the prototype. Solder short pieces of $\frac{1}{16}$ in. welding rod to the main legs and clamp two more pairs to the rear saddle clamps. Slide nylon tube over these and join them with lengths of black fuel tube. This flexes when the u/c bends back, yet gives a scale-like appearance of rear leg struts.

Details

Most of the detail is shown on the plan. Undercarriage doors are made from $\frac{1}{16}$ in. ply and even if the rudder/elevator detail is not quite scale, a "silhouette" of the rear part of the tailplane fairing can be made from $\frac{1}{16}$ in. ply and fitted to the rudder, to turn with it.

Strips of hard $\frac{3}{8} \times \frac{1}{16}$ in. balsa are bent and glued into the wing to represent stiffeners after tissue covering. Guns are hardwood dowel, bound at the ends with thick thread. The radiator openings are simulated by leaving the inboard part of the l.e. flat and hollowing it slightly. Strips of $\frac{1}{16}$ in. sq. balsa form dummy Warren bracing in the apertures. Ammunition boxes and exhaust manifolds are carved from block.

Covering and finishing

The whole airframe was covered with lightweight tissue, and given two coats of clear dope. We then had to decide which particular individual aircraft we were going to dress this up to resemble. We finally decided on one that is seen in many reference photos, in books and pamphlets—P7102. Perhaps we are a wee bit superstitious in choosing this machine as our prototype, since it is on record that the machine finished its flying career by being dismantled, in 1944. Which evi-

dently can be taken to mean that it got down safely, even the last time!

When the odd looking beast was finished in its camouflage and squadron markings, and was gracing the clubroom table, members stood all around it, some shaking their heads ("It'll never fly!"), others with just a grin on their faces. Me? I was shaking at the knees, since we had conned the local twin expert, Tony Major, of the Esher club, to do the test flying, and the day was not far off . . .

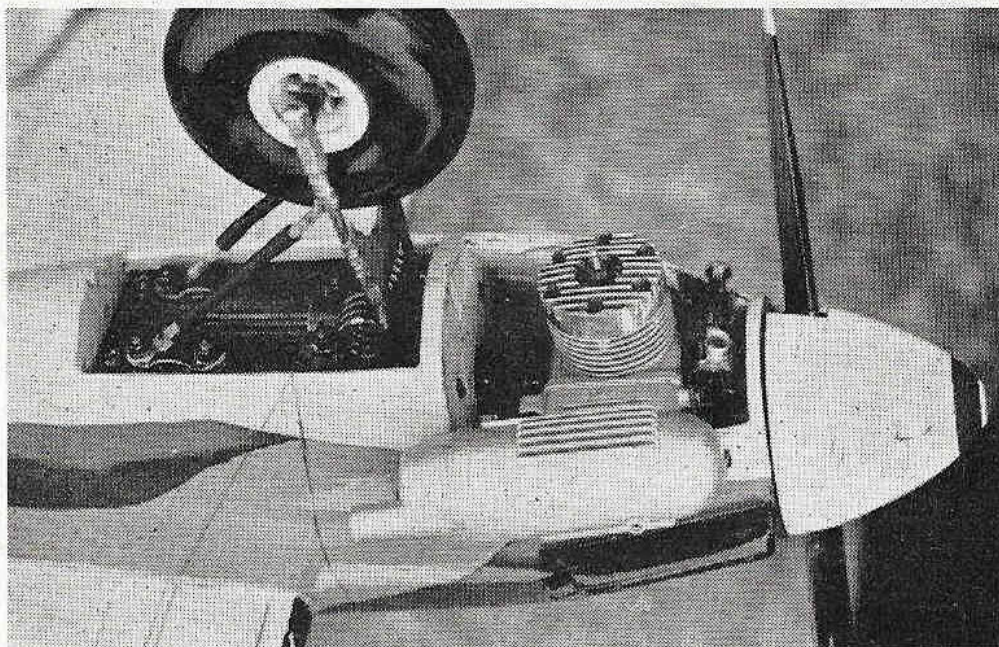
Flying

The morning of the great day dawned sunny but with a cold wind, so amongst the gathering on the flying field there were many hands in pockets and much stamping of feet. Dave Cronin and I arrived, and Tony Major was there, with a number of clubmates, and your Co-Ed., Dave Hughes, came along to witness the tests and take some pictures. After tanking up, checking the gear and taking note of the wind direction, we fired up the motors

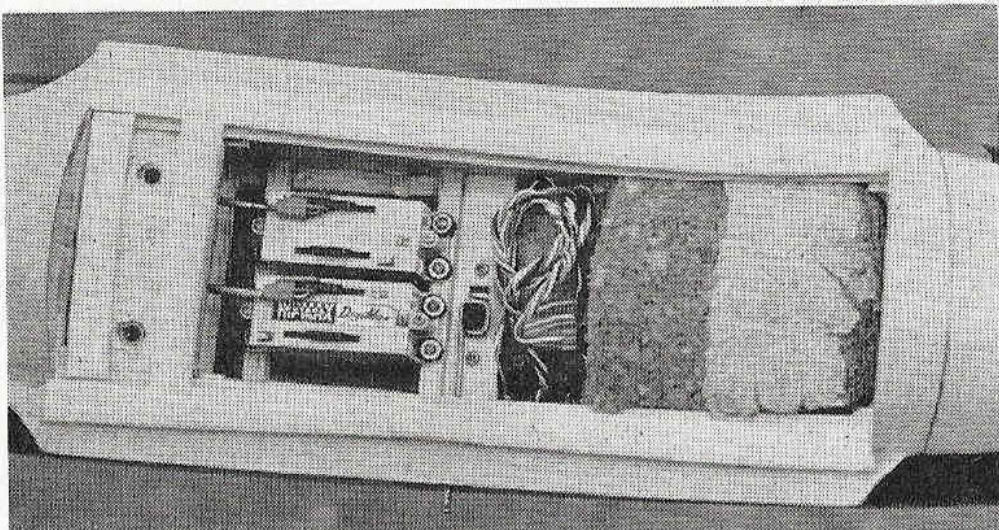


Top picture would be improved with the addition of those u/c doors! Below: getting those two O.S. 30's on song—Dave Cronin holding, Ed Hollandby listening!

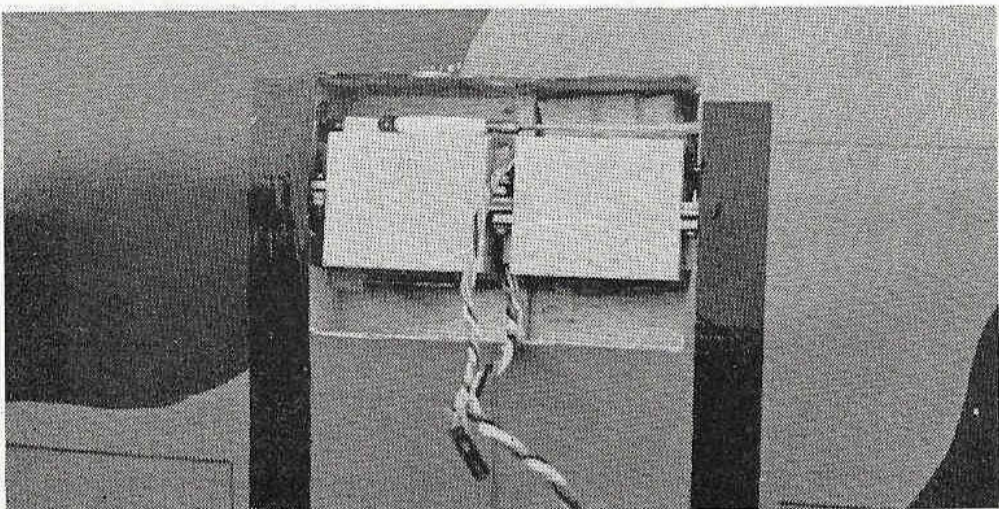




Model inverted to show undercarriage fixing arrangement. Rear legs are dummies, from fuel tube. Assembly clamped onto ply plate—original had access to tanks via these. Note "practical" accessibility of engine.



Wing removed to show radio bay, with rudder and elevator servos. Throttle servo (for both engines) is shown in the wing (below), alongside aileron servo.



and synchronised them. We got those O.S.30's humming like a bird. (So they should, we'd been doing practice runs for long enough.) Then I noticed Tony looking up to the heavens—and wondered if he were saying a swift prayer. "Well,"

he said, "it's no good standing here looking at it"—and whacked the throttles open.

After a run of about 15 yards the tail lifted, and a few more yards saw her unstick. A gentle climb to gain some height for trimming, though it

didn't appear to be violently out of trim, to any of us. I asked Tony how the trim seemed, and he replied "Just a sniff of left aileron, and just a tweak of down elevator and she seems O.K." He took her up higher, levelled out and "look no hands!"—perfect! And don't those two O.S.'s sound grand!

Now for the real testing; throttles still wide open, so what about rolling it? There she goes . . . "Beautiful," said Tony, "a wee bit barrelly possibly due to the high-mounted tailplane." Now for loops—just a very shallow dive, up-elevator and . . . up and over she goes. Very smooth. Now for some low passes. It really looks terrific coming down from about 300ft. in a shallow dive, to level out at about 100ft. for a level run past the on-lookers. (I hope Dave managed some fast panning shots there!) A few more loops and rolls, and it was time to land . . .

Down to half throttle . . . now for landing circuit . . . no vices are showing up yet . . . line up for the strip, throttle down a bit more . . . lower . . . lower she comes, still as steady as a rock . . . down to quarter throttle now . . . the landing speed is quite fast with that wing chord of a mere 9in., but still very steady . . . main wheels touch close throttles and a perfect first flight and landing are over.

The second and third flights were just as good, the model proving very responsive, yet groovy, and quite steady all the way—just looking like the real thing, against that cloud-flecked sky (for those of us old enough to remember!). More photographs, and then we all celebrated with a drop of the hard stuff, brought out specially for the occasion . . . er, to keep out the cold, of course.

The following Sunday I decided to try my hand at going it alone with this, my first twin and, after four flights, with loops, rolls, dives, and both high and low-speed passes, I was more than satisfied. Incidentally, the 6oz. tanks give 12 to 14 min. safe flying. Don't go beyond that or you may have to contend with one motor cutting out. (Of course, if this *should* happen, throttle back both immediately and bring her in.)

I hope all this has made you *Whirlwind* conscious, and that you will shortly be joining the ranks of the twin-fliers. Or have I put that the wrong way round? Well, anyway, let's hope all you twin-fliers become *Whirlwind* conscious!