

IRONSIDES

40 inch free flight sportster for .5cc-.75cc engines by B. Cracknell

THIS OVERWHELMING URGE to create some oddly shaped flying machine seems to overtake me at regular intervals. The pleasant memory of my last aberration — a kind of powered tea tray — was beginning to fade, so I began to look for some new distraction with which to jack up the adrenalin levels.

It was then I realised that I hadn't built a conventional low winged aircraft for the best part of two decades. So that was it! A conventional low wing design; a bit ordinary perhaps, but maybe it could be big on personality.

'Ironside's' began very grandly with a set of design criteria.

1. The aircraft would have a low wing.
2. The 'shape' would be reminiscent of the light aircraft of the 1930s.

It would be designed primarily for slow stable flight.

4. A good flat glide, with the ability of land every time without nosing over, would be important.

5. Easy general handling was essential.
6. A light robust airframe was required; remember that well known aerodynamic axiom — 'lighten and simplify.'

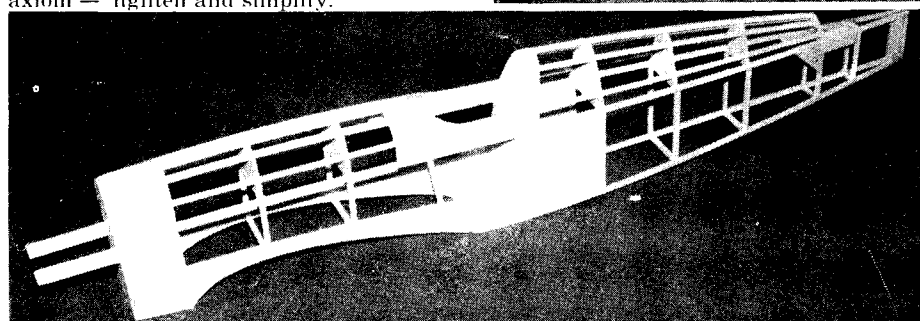
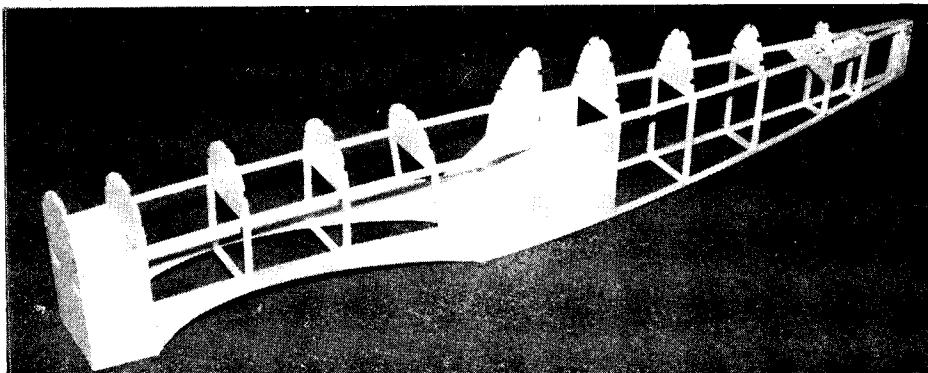
Within a week it was designed and built; it looked just right, and aeroplanes that look right usually fly right.

When I got to my flying field for the initial flight testing, I was met by the entire committee of the Lee Bees model club, who were coincidentally doing their own thing at the time. Under the full glare of this formidable official scrutiny, I found that 'Ironside's' glided immediately without alteration — and that there was no getting out of putting the power on. It flew first time, and with a

tweak on the trim tab to achieve a pleasing circle, I haven't had to touch the trim since.

The plane will take off and circle in steady, slow, head high circles with my Mills .75 throttled back. With more power on it will climb nimbly but the slow flying characteristics are ever present even with its nose easing up. The glide and touchdown are a real joy.

'Ironside's' performs comfortably in a stiffish breeze, there are plenty of reserves of stability. Given calm flying conditions this



Heading photograph of 'Ironside's' seems to capture the character Brian Cracknell has wanted to achieve with this model. An attractive mixture of solidity of fuselage and yet a light floating impression with the open wing structure showing quite clearly. Above and left: two views of 'Ironside's' fuselage whilst under construction, showing how simple construction can produce a design with 'character.'

Two views of 'Ironside's' fuselage whilst under construction, showing how simple construction can produce a design with 'character.'

is a real precision flyer, it will do exactly as it is told on minimal power. The whole flight is characteristic of a full sized aircraft of the 1930s period.

Fuselage

Build the two basic frames first, one on top of the other, with a piece of cling film between to make separation easy.

Remove side frames from plan and join with spacers top and bottom (immediately over the wing housing only at this stage). When dry pull the rear of the fuselage together and glue at the stern post. Then fit other spacers top and bottom — aft of wing.

Add nose formers, slide engine bearers into place and glue. (Note, you may wish to mark out the position of the undercarriage wires on the appropriate formers and drill holes for sewing through before fitting, although a hot wire will be capable of forming any holes required after the formers have been glued in place!)

Now lightly sand basic fuselage box.

Fit all remaining formers on top of fuselage, add stringers and cockpit sheeting.

Sew and epoxy undercarriage in place on the fuselage formers, bind the two legs just above each axle with fuse wire and solder.

Drill fuselage and trial fit wing and tail retaining pegs, do not glue at this stage. Then remove pegs until after the fuselage is tissue covered, when the pegs are finally fitted and glued in place.

Cowling

Cut cowling formers and plank from soft sheet. It is useful to link the cowl formers at the top and bottom and both sides first. Do this with balsa planks about $\frac{1}{8}$ in. wide. This will establish the basic cowling shape right from the outset, before continuing with the planking.

Wings

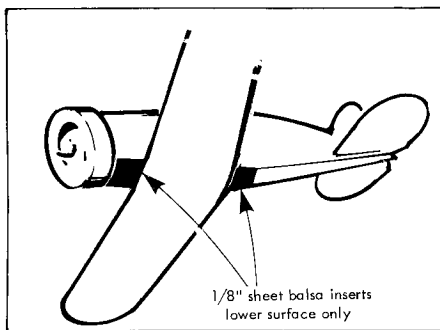
Construct the mainspar first, this will establish dihedral angle before any building begins.

Lay out leading and trailing edges of one wing only, on the plan. (Note, ensure that the trailing edge of the wing is blocked up towards the tip — as per plan instructions — this will add tremendous flying stability to the finished model).

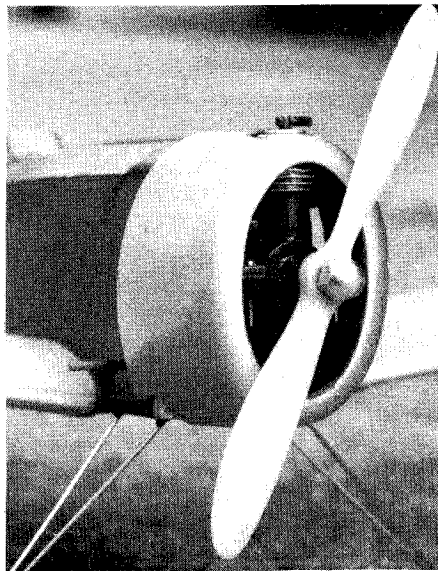
Fit all wing ribs and tip shape (*no mainspar at this stage*). Allow structure to dry really thoroughly, then remove from plan.

Repeat procedure for the second half of the wing. Remember to block up the tip trailing edge; and not to fit the mainspar yet.

When the basic wing panels have dried they can then be carefully slipped onto the mainspar. Each wing slides onto the main-



Above: detail showing local strengthening fore and aft of the wing mounting. Below: close up of front end showing simple but effective engine cowling.



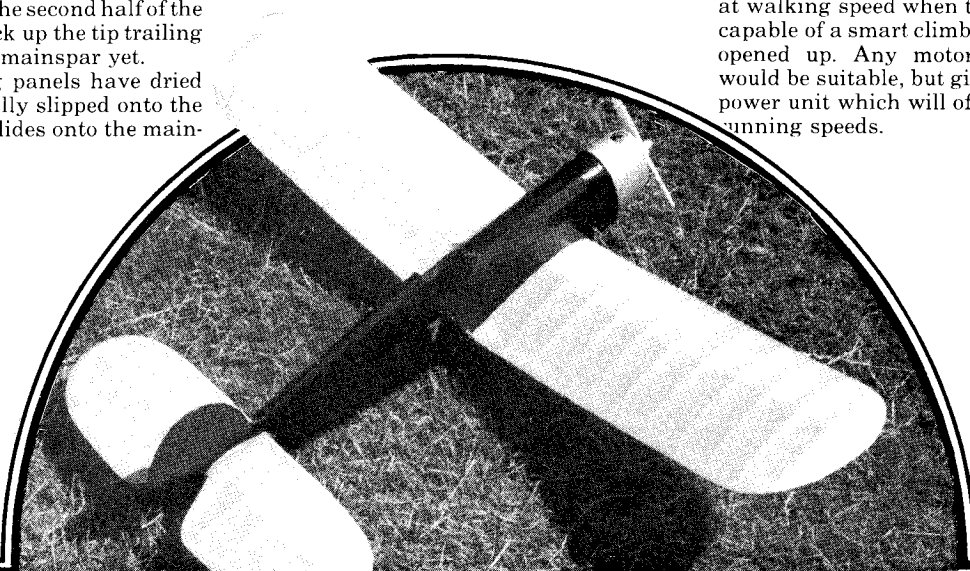
spar (*do not glue yet*). Check that the undersurface of the spar coincides exactly with the undersurface of each wing rib. Then glue ribs to mainspar with PVA glue.

Place both wings, now linked together with the mainspar, flat on a board at the centre section. Prop each tip up to the correct dihedral and add the wing centre section trailing and leading edges. Leave to dry thoroughly.

Add last centre section rib, plus gussets and any sheeting. Sand lightly ready for covering.

Tailplane and fin

Construction is straightforward. Build fin first then the tailplane is made in two halves



and each half is glued on either side of the fin.

Finishing

The cowl is given several coats of sealer, rubbed down and then painted. This component is held back against the fuselage by two internal rubber bands. The rear cowl former locates on the engine bearers. The wire tailskid is fitted to the rear fuselage. Shape the fin to flow into the rear fuselage lines. Note that the windshield is fitted after covering and doping.

Covering

Cover all flying surfaces with lightweight Modelspan tissue. I double covered the fuselage with lightweight Jap tissue. By itself one layer of Jap would not be strong enough but there are some attractive colours available which can make the double covering worthwhile. If you don't fancy double covering, then use lightweight Modelspan tissue all over. You may even be lucky enough to have some coloured sheets stored away somewhere.

I use tissue paste to affix tissue and water shrink afterwards.

Three coats of dope and thinners will be needed. The first two coats can be a 50/50 mix. The final coat is 60 per cent dope, 40 per cent thinners.

Now is the time to add the windshield and any decor that you wish. My model has a black fuselage, silver cowl, and white flying surfaces.

Finally add one thin coat of fuel proofer all over.

Flying

Check that there are no warps in the airframe. Balance model at the indicated balance point. Establish a flat straight glide by handlaunching the model into the wind.

When satisfied, start the motor, throttle well back, and aim for a gentle climbing turn. The trim tab is effective in controlling direction.

The original 'Ironside's' flies in left hand circles, but it trims and flies equally well in right hand circles. Have fun...

Power

The Mills .75 is the ideal power unit because it runs smoothly over a wide range of engine settings. A lot of pleasure will come from operating 'Ironside's' at different power settings. The model will float around at walking speed when throttled back, or is capable of a smart climb when the engine is opened up. Any motor from 0.5 to 1cc would be suitable, but given a choice, pick a power unit which will offer a good range of running speeds.