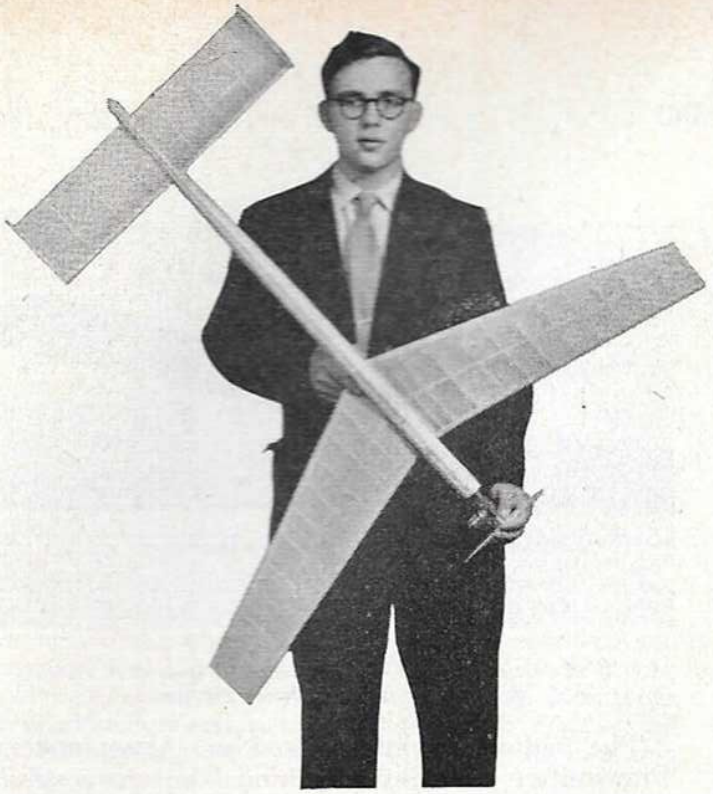

and then using plenty of cement, attached to ply former and slot in fuselage sheeting. It is essential that the wing dihedral and incidence angles are accurate and this can only be obtained by accurate assembly of the wing tongues. Complete the fuselage structure with other small details shown on the plan.

Cover with heavyweight tissue and give two coats of clear dope and one of fuel proofer. Engine bearers should now be drilled to receive the engine.

Cement all wing ribs except the root ribs to the slotted trailing edge ensuring that they are attached at the correct angle and are all aprallel. Add top and bottom spars and the deep leading edge spar which is cut from $\frac{1}{8}$-in. thick balsa sheet. Cement $\frac{3}{8}$ in. $\times$ $\frac{1}{4}$ in. balsa leading edge in place and attach root rib at correct dihedral angle (using template shown on drawing). The wing tongue box is completed before assembling into the wing.

Cover the wings with tissue and apply two coats of clear dope. It is advisable to pin the wings to a flat surface while the dope is drying to avoid warps.

Star Dust

A swept-forward wing design for 1 to 1.5 c.c. motors, sport or contest flying by W. B. HART

FOR THOSE WHO like something with a difference here is an experimental design used to test an unorthodox wing planform and an unusual airfoil section. The distinguishing swept forward wing feature of the aeroplane was intended to increase longitudinal stability in three ways:—

(1) By increasing the moment arm of the tailplane about the C.G. of model for a given length of fuselage.
(2) By utilising the stabilising effect of a large wing area behind the C.P. of the wing.
(3) By harnessing wing twist.

If the model should dive the airspeed would automatically increase and so would the lift. This would increase the twisting moment of the lift (acting at C.P.) about the twisting axis resulting in a slight increase in incidence and the C.P. moving forward in consequence. This exerts a stabilising effect on the model. The reverse (in theory) would happen if the model should climb.

Sweep forward has its disadvantages though, among them being a tendency to go into a spin following a turn. This is successfully counteracted on this model by using a large fin area and moment arm and giving the wings a large amount of dihedral. Airfoil section, L.D.C.2, is used because of its reputably high efficiency at low model speeds.

No undercarriage was fitted as it was not considered necessary on a model with such a low landing and flying speed.

Construction

Build two fuselage side profiles from $\frac{1}{8}$-in. square balsa and join them with formers. Cement engine bearers to ply formers only, using plenty of cement where bad landing stresses may be high. Attach $\frac{1}{8}$-in. square stringers to top and bottom of fuselage making joints in stringers where shown. The two sheets of balsa retaining the tailplane should be cut undersize at first and then opened up to make a good fit with the tailplane ribs. Wing tongues should not be cemented in place until the fuselage sides have been sheeted where shown,

Long tail moment and large tail arm counteract all the disadvantages of swept forward wing designs in Star Dust a most attractive and inexpensive novelty which will surprise all, by its rate of climb

Tailplane is straightforward and may be built in any method desired but care must be taken that no warps develop because of its low rigidity when not covered with tissue. It should be covered with tissue and one coat of clear dope applied.

Fins should be cut from $\frac{1}{8}$-in. thick balsa sheet and sanded to a flat plate airfoil section. They should be covered with rag tissue and doped and then cemented to the tailplane. (Do not cement fins to tailplane before tailplane is cemented into fuselage.)

Flying

The prototype flew straight from the drawing board, no trimming whatsoever being needed, but, due to inaccuracy in building, this may not be the case with every model.

"Star Dust" should be glide tested in long grass and trimmed for a long flat glide by adding weight to engine bearers or tailplane block if this should be necessary. When the glide is satisfactory the model may be safely flown under power.

From testing done so far on the prototype the characteristic flight pattern is a developing gradual increase in climbing angle from the hand launch to a maximum of about 70° to 80°.