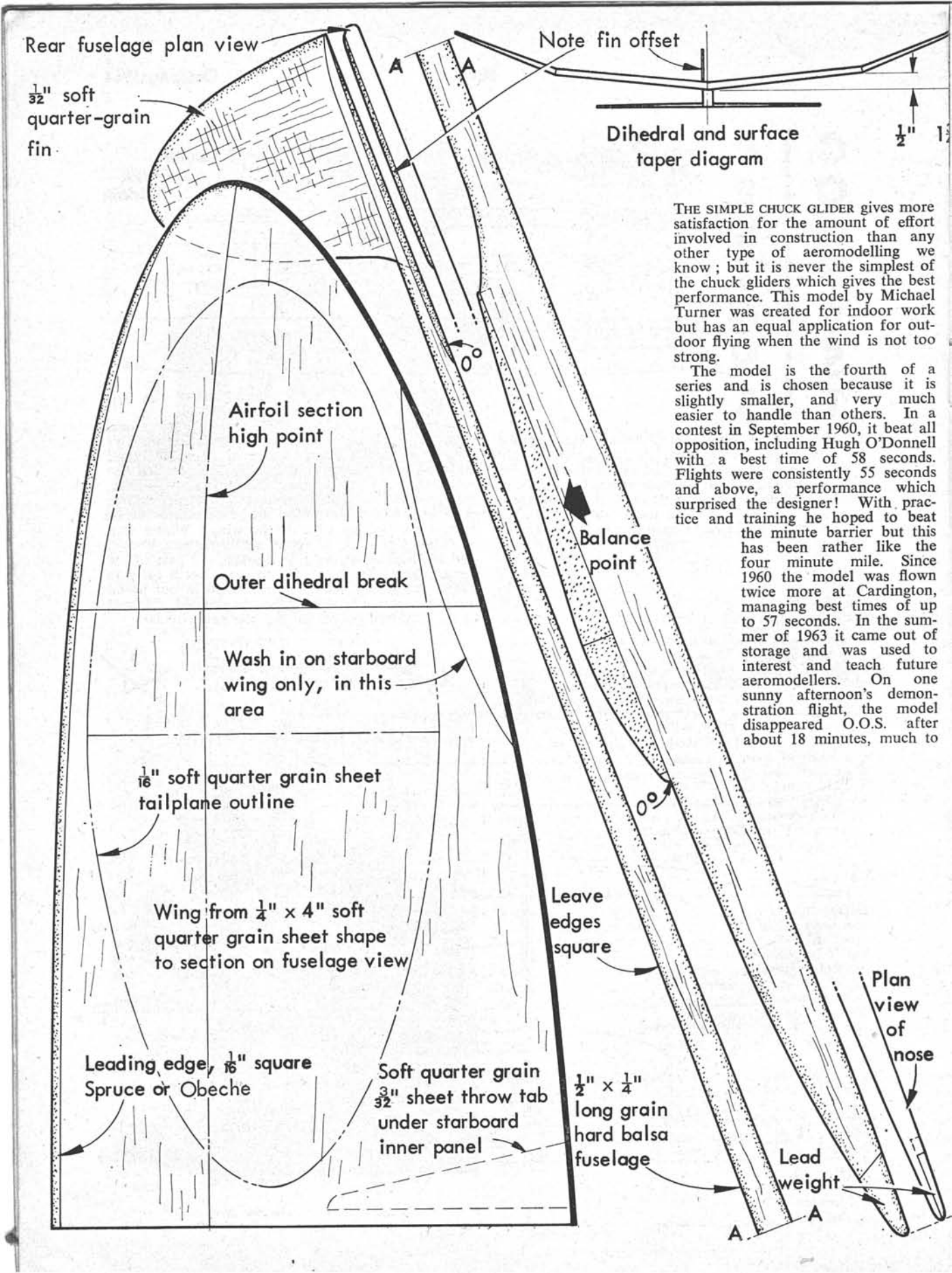
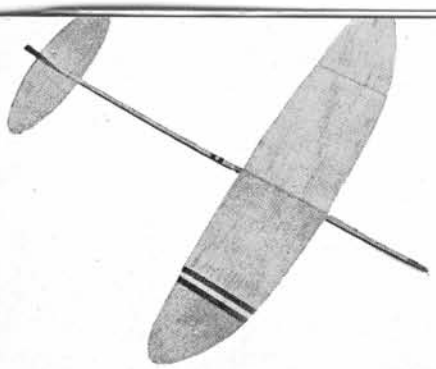


THE SIMPLE CHUCK GLIDER gives more satisfaction for the amount of effort involved in construction than any other type of aeromodelling we know ; but it is never the simplest of the chuck gliders which gives the best performance. This model by Michael Turner was created for indoor work but has an equal application for outdoor flying when the wind is not too strong.

The model is the fourth of a series and is chosen because it is slightly smaller, and very much easier to handle than others. In a contest in September 1960, it beat all opposition, including Hugh O'Donnell with a best time of 58 seconds. Flights were consistently 55 seconds and above, a performance which surprised the designer! With practice and training he hoped to beat the minute barrier but this has been rather like the four minute mile. Since 1960 the model was flown twice more at Cardington, managing best times of up to 57 seconds. In the summer of 1963 it came out of storage and was used to interest and teach future aeromodellers. On one sunny afternoon's demonstration flight, the model disappeared O.O.S. after about 18 minutes, much to



BOMARK

16 inch chuck glider
by M. A. TURNER

Picture below shows author's launching stance and close up at left emphasises the attractive lines of this glider.

the amazement of the onlookers.

Bomark is stable so it can be flown outdoors with little or no trim change. Similar models have had very good handling characteristics and delighted the beginners who made them.

In summer 1962 a model with larger wingspan and elliptical wing plan form was constructed, this was flown at Cardington, giving two flights of 59 seconds and one of 61.5 seconds. The model was damaged on a girder so the record was not officially broken.

Selection of materials. Time should be spent on choosing wood since this makes all the difference to performance and strength of the model.

A very soft $\frac{1}{4}$ in. sheet should be selected for the wing, 4 in. wide and quarter grain if possible. Avoid long straight grained stock as this warps. On the original a 3 in. sheet (.25 oz. per sheet) was joined to give correct chord.

The plan shape is cut out carefully with a balsa knife then tapered in thickness spanwise as shown. The leading edge is $\frac{1}{16}$ in. sq. spruce, glued into position.

The flat rear part of the wing section is carefully sanded down to section using a block and an edge to make sure the highpoint is not lost. Now shape the leading edge section.

The partly finished wing is now placed on newspaper or a foam pad. The wing is smoothed down with 200, 320, 400 "wet and dry" paper. Talcum powder is rubbed into the grain and lightly doped with 50 per cent dope/thinners. The wing is rubbed down with 320, 400 paper and another rubbing down treatment given. A final coat of thin dope is rubbed down to a glass finish with 400 and "Crocus" paper. Positions of dihedral breaks are carefully marked on the upper surface of the wing. The tips are cut off using a flexible straight edge and a balsa knife. The centre edges are bevelled to the dihedral angle on a table edge using a sandpaper block. Joints are pre-cemented and packed up to the dihedral angle, then the two parts are cemented. The centre dihedral break is treated similarly *after* the tips have dried. When the joints have dried, extra cement fillets are added. A final polish is given with sandpaper at the joints and a soft cloth overall. Proceed same way for tail.

A piece of hard long grained $\frac{1}{4}$ in. x $\frac{1}{2}$ in. stock is carefully selected for the fuselage. Avoid wood which is warped and has a short grain. Choose several possible strips and test the ends for strength.

Cut out the profile after joining the plan half lengths, using a balsa knife and straight edge, sand in tapers and progressively smooth to shape with edges left square. A coat of thin dope is applied and rubbed down when dry. Cut a shallow V shaped recess to seat the wing, tailplane has a recess made with a sandpaper block.

The fin is cut from soft quarter grain $\frac{1}{32}$ in. sheet sanded to section and smoothed with 400 paper.

A throw tab is cut from soft $\frac{3}{32}$ in. sheet with the centre edge bevelled to fit the fuselage side. The tab is smoothed so that it fairs into the wing leaving the part on the trailing edge at full thickness.

Assembly. All areas of joints are pre-cemented then the wings are carefully aligned and pinned in place to dry. Cement gussets are added in the angle between wing and fuselage. The tailplane is pinned in place after cementing. Similarly the fin is glued to the side of the fuselage as shown on plan. Cement gussets are added to angles and throw tab is glued in place. Linen strips were glued at the joints for extra strength. Finally coloured tissue strip can be added and numbers if needed.

When dry, the model is balanced. Lead sheet is trimmed to approximate nose shape until model balances 1.75 in. from wing trailing edge. Linen is glued over the lead after it has been recessed.

N.B.—pure lead sheet must be used, balsa cement tubes are not dense enough.

If correctly aligned the model is ready for flight tests. Alignment and accuracy is as important in hand-launch gliders as it is with any power model.

Flying. Test on a calm day. If all is well a slow left-hand circle will result. The fin is offset to give a left circle. Small amounts of Plasticine may be used as additional trim or very small changes in the trailing edge of tailplane or fin to achieve this trim.

Wash-in is carefully applied to the right wing trail-trailing edge by pressure and heat.

The model should now be launched in a right bank so that a half right spiral occurs, the transition to a left hand glide may occur without a flick roll. Final trim has to be made by varying: glide circle, nose weight, tailplane, trailing edge and wing wash-in. This really has to be practised—each 'plane is different. If you want to lose a chuck glider, fly around mid-day on a hot summer's day!