

HELLBENDER



THIS model is the latest in a series of open designs and was planned originally for a .19 glow motor. It was, in turn, developed from a model having a smaller span and lower weight and using a 2.5 c.c. diesel. *Hellbender* should still perform well on a good 2.5 c.c. motor, particularly if care is taken over the weight and span is reduced by 2 to 4 in. After seeing other .29 jobs perform, I decided to fit an Eta 29, the results being well justified.

These highly powered models are more tricky than their 2.5 counterparts, but not exceptionally so. More care is needed during the initial stages and adjustments tend to be finer, but once trimmed you really have got something!

Construction

Fuselage. The only feature a little out of the ordinary is the method of fixing the engine bearers, which was devised to take into account the rear intake on the Eta 29. Remember to glue the bearers to the ply plate with Araldite or a similar glue—not balsa cement. Apart from this the construction of the basic fuselage and pylon is self explanatory, but care must be exercised to keep things "straight."

Tank and Timer. A tank of some 30 c.c. capacity is needed for a .29, so if you dislike soldering, I suggest using a team race tank. Some thought should be given to the tank installation etc., before the fuselage construction gets too far advanced, as precise details inevitably

depend on the motor used. Needless to say, the timer must be 100 per cent accurate, capable of cutting the motor consistently at the desired time.

Wing. Use good quality wood of the correct grade. Pin down L.E. and T.E., and glue or cement in the ribs. Do not forget to pack up the front of the T.E. by $1/32$ in. to give the correct droop—likewise the wash-in on the right inner panel. The tip ribs are rather a wangle, but ultimately work out O.K. Cut the notches for the spars. Assemble the whole wing, taking care over dihedral angles. When set—not before—cement the spars and remaining dihedral braces in place and then sheet cover the L.E. Sand to correct section, cement silk or bandage reinforcement where needed. The wing is now ready for covering.

Tailplane. This is quite straightforward, but do not forget the hooks for the bands.

Fin. I recommend a built up fin, as simple sheet fins can warp. Build up the outline shape, cement to root rib, add spar and ribs. When dry, carefully trim, sand to section and cover with $1/16$ in. soft sheet. Cement top and bottom fins to fuselage accurately.

Covering. Use Modelspan on fuselage, fill with one or two coats of sanding sealer and colour to choice, i.e. black!

For the wing I advise lightweight silk—alternatively Modelspan or jap tissue. I have used jap on one version, but it is rather a worry when taking hard D/T landings, or getting "treed." Double jap on the inner panels would have been

better. Use a good dope which does not shrink too violently (i.e. plasticise with a few drops of castor oil), or there will be trouble with warps later—two coats on wing will be necessary.

Use jap tissue or lightweight Modelspan on the tail and give two thin coats of dope. Fuel proof the fuselage and 8 in. or so of the inner wing panels. If you want to fuel proof the tail, go very easy, and make sure you use a reliable fuel proof.

At all times there should be precautions against warps. Pin down after doping for a day or two and watch for any changes during the next few weeks. Unwanted warps should be steamed out.

Dethermaliser. I am now sold on clockwork D/Ts which, for one thing, simplify test flying. One can do a great deal of useful testing in a small field, whereas a fuse D/T cannot be adjusted so finely. However, provision for a fuse D/T should be made, in case of a fly-off,

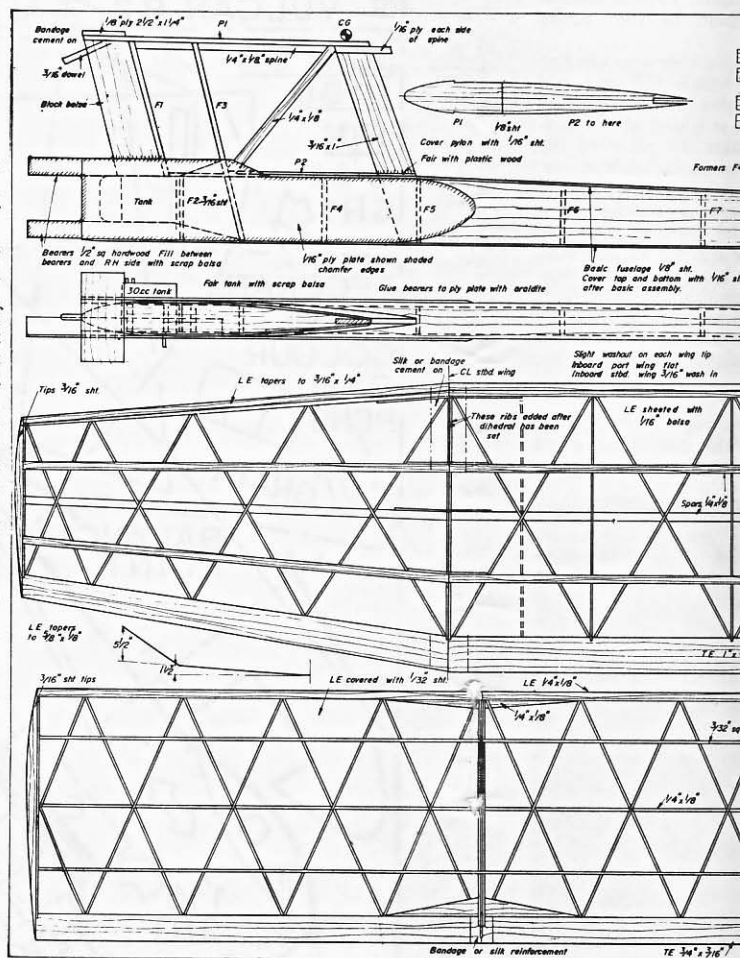
when over six minutes. This is a good idea and I advise its fitting to some difficulty with position. It should open before the motor cuts, this should only be reliable.

Trimming. Check balances about $1/2$ in. There should be no up just the slight wash-in the $3/16$ in. wash-in on panel.

The longitudinal trimmed model is in or less, but the exact on the weight and C tail tilt is approximate inner wing panel.

The cut-out must the D/T, if clockwork

FULL SIZE
THE "M"



An open power model for "29" engines by M. GREEN

Auto rudder. This is an optional extra and I advise its fitting only if there is some difficulty with power/glide transition. It should operate about $\frac{1}{2}$ -1 sec. before the motor cuts. Any device like this should only be used if absolutely reliable.

The longitudinal dihedral of the trimmed model is in the order of 1 deg. or less, but the exact amount will depend on the weight and C.G. position. The tail tilt is approximately parallel with the inner wing panel.

The cut-out must work reliably and the D/T, if clockwork, must not get

Find somewhere with long grass and hand glide. If the above points have been followed the glide should be correct and the turn perceptible. If you wish, make one or two flights with the prop on backwards and shortish motor runs (5-6 sec.) mainly to check the glide. Set the D/T for 30 sec.

However, with this type of model it is a waste of time to continue testing on low power, so once reasonably happy, set the timer for 4 sec. and let go. This motor run should not be long enough to lead to disaster, but sufficient to show the trend of events. Work in the power turn by adding small pieces of balsa—

The glide turn is obtained by tilting the tail, as is now normal practice. Remember that this also affects the power turn a little, so go easy and only make one adjustment at a time. When things look O.K. increase the motor run slightly (1-2 sec. at a time) and proceed.

The eventual flight pattern is a right hand climb turning about three times in 15 sec., followed by a flat right glide. I do not recommend too tight a glide turn. For the final trim add ballast to the rear, but do not overdo this as the model may develop a stall in turbulent conditions. I do not normally use down or side thrust, although I have no deep rooted objections to the latter.

Persistent spiral diving under power can be due to too much negative on the tail—shim up the tail L.E. This is nerve racking at first but experience provides the necessary judgment.

One final point, try to do your trimming away from the sports fraternity, or from the public in general—it leads to clearer thinking.

FULL SIZE WORKING DRAWINGS ARE OBTAINABLE FROM YOUR LOCAL DEALER, OR BY POST FROM THE "MODEL AIRCRAFT" PLANS DEPARTMENT, 19-20 NOEL STREET, LONDON, W.1, POST FREE

