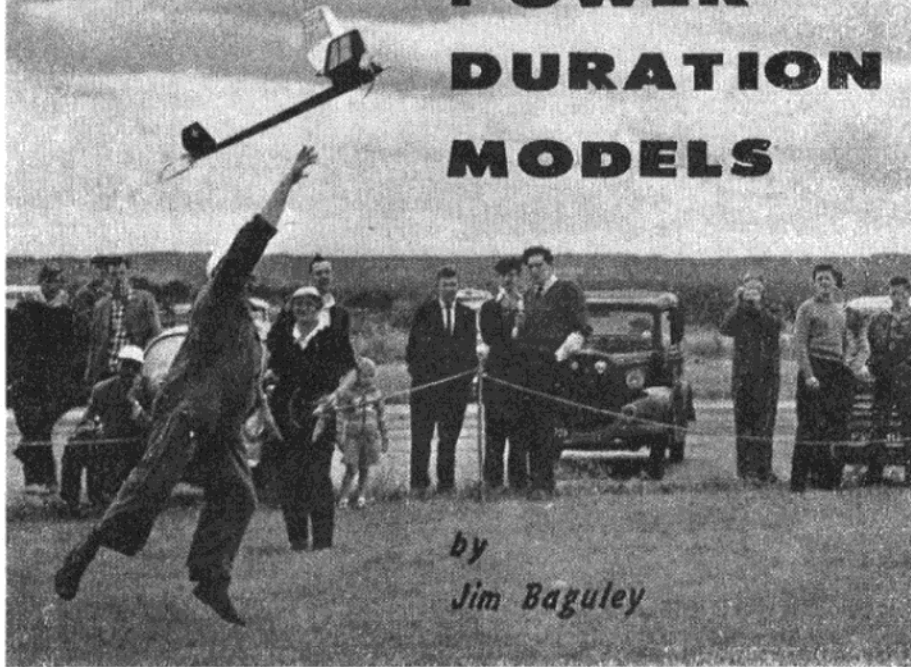


Concluding

POWER DURATION MODELS



by
Jim Baguley

Fuselage

It may be said that the purpose of this component is to keep wing, tail and motor rigidly in their correct positions, with provision for adjustment. It must also contain the timer, cut out, etc., and provide the necessary side area in the correct places.

The usual basic fuselage constructions are (a) sheet box, (b) longeron and spacer, (c) longeron, spacer, and sheeting, (d) crutch and former with or without sheeting, (e) planked (usually near circular).

The planked fuselage is probably the best, strength weight and shape considerations taken overall, but is not the easiest to construct. The usual method of building is shown in Fig. 20.

The sheet box construction (Fig. 21) is by far the easiest to make, whether it has sides of equal thickness (Fig. 21a) or top and bottom of large section strip of constant width, with sheet sides (Fig. 21b). It usually has the disadvantage, if built light, of disintegrating fairly easily on impact, but against this it is also easy to repair.

The longeron, spacer and tissue-covered construction (Fig. 22) is light and strong, but its resistance to twisting is largely dependent upon the tightness and strength of the tissue covering if no triangulation is used. The longeron, spacer, and sheet covered construction (Fig. 23) provides an excellent compromise, being fairly light, strong and rigid, and seems to stay in one piece better than the sheet box.

The actual fuselage section is also a compromise, the most rigid shapes being near circular or triangular, with rectangular the easiest to construct; although the elliptical or circular shape may be built up from a basic rectangle or square as shown in Fig. 24.

It must be emphasised that while

rigidity is not a good thing for promoting crack-proof structures, the fuselage needs to be very rigid in flight to allow minimum distortion due to flight

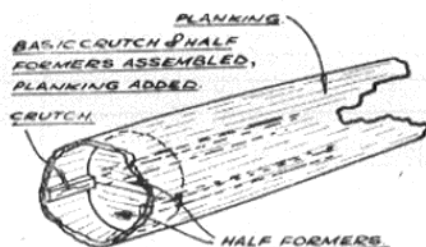


FIG. 20. PLANKED CONSTRUCTION.

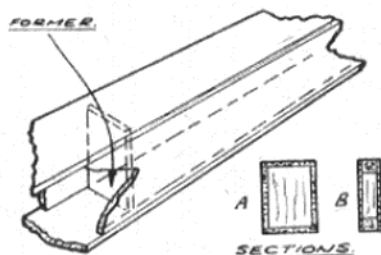


FIG. 21. BOX FUSELAGE CONSTRUCTION.

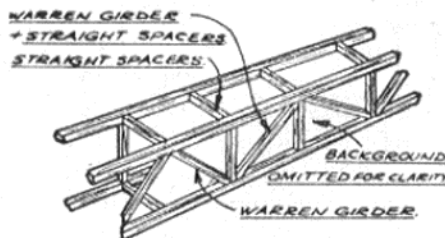
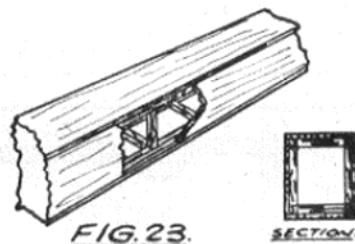


FIG. 22. LONGERON SPACER CONSTRUCTION.



LONGERON & SHEET CONSTRUCTION.

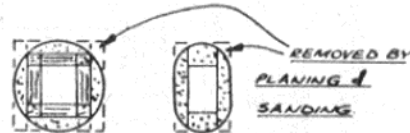


FIG. 24. CIRCULAR & ELLIPTIC SECTIONS FROM SQUARE & RECTANGULAR SECTIONS.

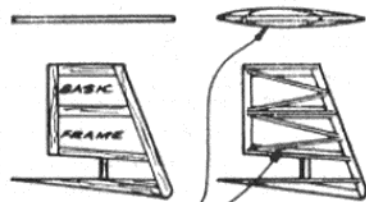
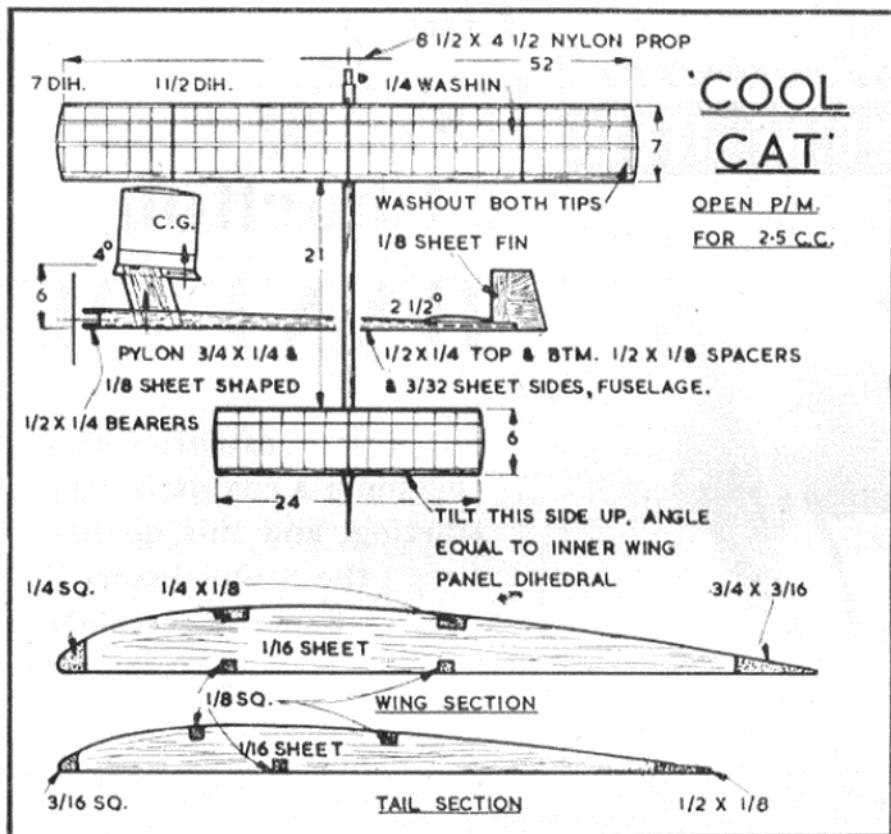


FIG. 25. BASIC FIN (& PYLON) CONSTRUCTION.



proving unequal to what was demanded of them after 10 sec. of climb! This was due to lack of dihedral braces and poor pre-cementing at the central dihedral joint (lesson now learnt).

The flat plate fin section is compensated for by very large fin area and the pylon is of small area to lessen any possible slipstream effects. The wing construction would appear to have been balanced as it did not warp appreciably.

Troglodyte (name only refers to its cave dwelling instincts if wings fold)

This represents the stage that my power model development has reached. It is an attempt to achieve good climb and glide from a small model, the size being about the trimable minimum for a modified Oliver with present knowledge of trimming technique.

In achieving the glide by the use of high aspect ratio the climb is not made easier by the lowering of the rate of roll, but the design usually trims out quite easily. It would probably be improved by increasing the wing and tail chord by $\frac{1}{2}$ in. but for those who like something spectacular yet fairly easy to trim it should provide much entertainment. The main point to watch is that the wing spars selected are of very tough balsa, as mine usually fold at least once before being fully trimmed, although the

Continued on page 86

fuselage front and wing and tail mounting should be covered with linen soaked in cement.

The grain of the sheet covering of a fuselage should generally run lengthwise but can sometimes be changed locally to good effect to prevent grainwise splitting, e.g. at engine bearers. Cross grain diagonal sheeting is also very strong when allied to longeron-spacer construction.

General

An important factor in the maintenance of a high strength/weight ratio in the construction, is the selection of wood, this, however, only comes from experience.

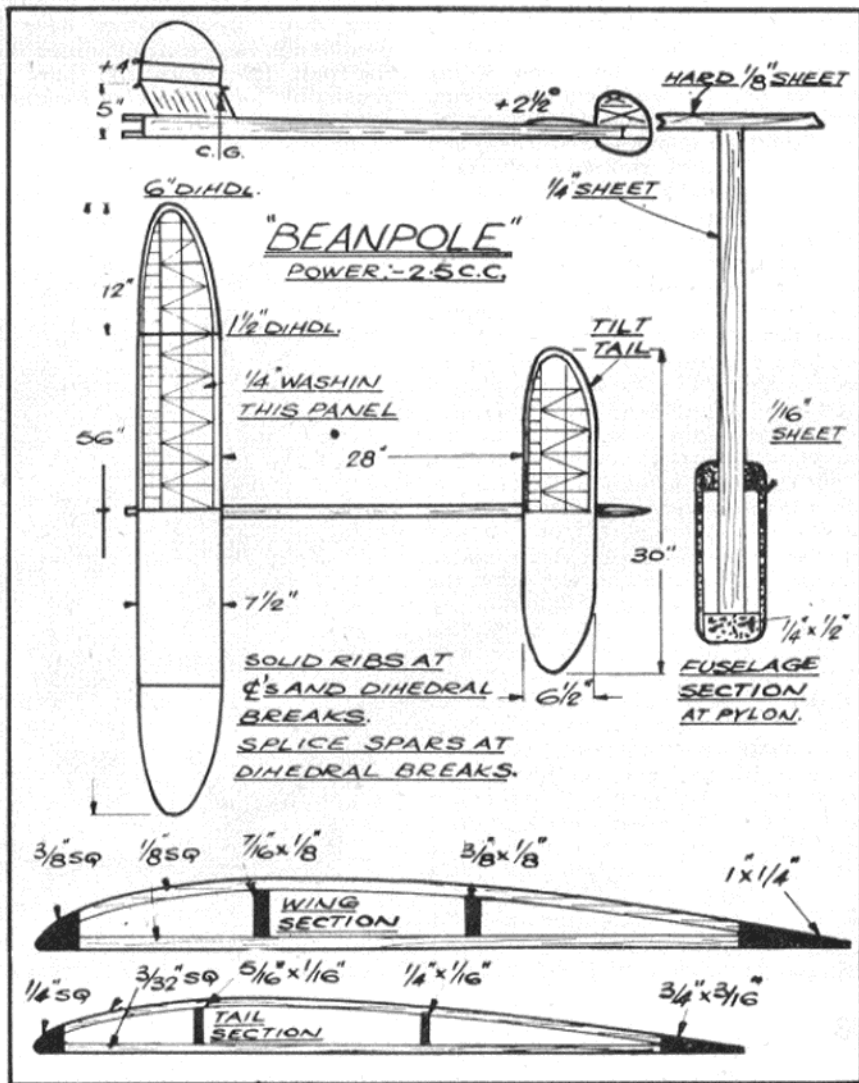
It is useless attempting to write only about power duration model construction as so much has already been written on construction in general. In any case, the only difference in the case of power models is the necessity to ensure freedom from warp change as a result of the high stresses incurred during the power run.

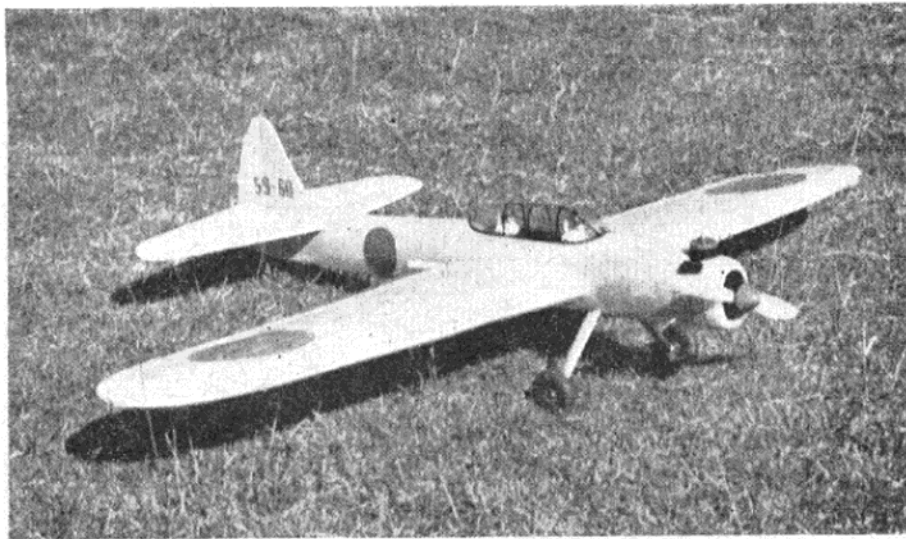
Three Design Studies

Coolcat

This was an attempt to produce a power model which was just about as simple as is reasonably possible, bearing in mind the necessity for performance. The characteristic climb was found to be, as was expected, a 60 deg. spiral with low rate of roll and turn, perhaps five turns in 15 sec.

It finally came to grief at the Devon Rally after a poor first flight when the Enya had finally become run in and was beginning to "give," the wings





GEISHA GIRL

A 'do the book' .29 stunt model
with attractive semi-scale appearance
designed by RAY BROWN

THE "Lee Bees Controliners" club needs no introduction to C/L stunt fliers, and one of their most prolific builders is Ray Brown, whose *Zero* inspired *Geisha Girl* we feature this month. Despite its scaly appearance the *Geisha* will easily perform the stunt schedule. To date Ray has won the stunt contests at the Beaulieu and Godalming rallies, come second at Enfield and only lost the Gold by $2\frac{1}{2}$ points!

Constructional Notes

Cut formers from $\frac{1}{8}$ in. balsa as shown on the plan. Bolt the under-

carriage between the ply-formers. Select two sheets of pliable medium soft, $\frac{3}{32}$ in. sheet for the sides and cut to a shape slightly wider than shown on plan. Fix the 1 mm. ply doublers with impact glue but do not cut out the wing slots at this stage. Bind the sides to the formers with Sellotape and cement well, allow to set hard before removing the Sellotape.

Add the motor mounts and tank at this stage. Fill in between the mounts and sides with scrap balsa. (Note: before cutting wing slots add silk or rayon to inside as shown

on plan.) The tail wheel assembly is now fixed between the sides before adding the bottom block.

Build the wing in two halves, and begin cutting out two sets of ribs sandwich fashion. Fix the ribs to the lower main spar and lower T.E. first, then add L.E., top main spar and $\frac{1}{8}$ in. square along the T.E. before fixing the tip. T.E. can be assembled after removal from the plan. Cement the wings together and add $\frac{3}{16}$ in. braces across the centre section—pin down the entire T.E. whilst setting. Add the $\frac{1}{8}$ in. ply bellcrank platform and leadout wires then the $\frac{1}{16}$ in. L.E. sheeting and cap strips, line guides, etc.

The wing can now be slid through the fuselage and fixed in position. Cut panels out of $\frac{1}{16}$ in. centre section sheeting afterwards to allow control pushrod complete freedom. Flaps are added after assembly, but the horn-rod must be placed across the fuselage before the wing is fixed in place.

The tail is cut from medium-soft $\frac{1}{2}$ in. sheet and the $\frac{1}{16}$ in. ribs are sanded to the section shown on the plan. Connect up the control rods at this stage, making sure that everything centres properly before fixing the tail to the fuselage sides. The fin consists of medium-soft $\frac{3}{16}$ in. sheet sanded to a symmetrical section.

Cut out the soft fuselage blocks to plan view and cement lightly to top and bottom. Carve to the section shown on the plan, remove and hollow out to $\frac{3}{16}$ in. wall thickness, then fix permanently in position. Front cowl and top are fashioned from soft block and are fixed to the engine bearers with small woodscrews.

The model should balance on, or about, the main spar position for smooth flying.

POWER DURATION MODELS

Continued from page 67

easiest construction (shown on the plan) took a lot of punishment before showing signs of failure, and seems to be capable of withstanding a d/t under power.

I do not claim to have ever seen any still air but the still air duration with everything just right, should exceed 5 min. from 15 sec., this with a 16 oz. example and a good 2.5.

Beanpole

Future development will be on the lines of the long model described in the "designing for a flight pattern" section, a prototype of which is shown in the

accompanying diagram. Wing chord is increased $\frac{1}{2}$ in., tail chord 1 in., tail span 2 in. and moment arm 2 in. The fuselage construction is greatly simplified and a flat pylon is used despite better judgment saying "no"! Flat bottom wing and tail sections enable a simpler wing and tail structure to be used.

A suspected snag with this layout is the pull out, which may have to be obtained by the use of an auto rudder.

Much Developed Version of Vic Jay's
1955-56 F.A.I. 2.5 c.c. Model

This model has only recently been

built and is, as yet, suffering from teething troubles. These are in the form of a fuel system which was not built in strongly enough and started disintegrating, and a pull-out which, although not a large dip, sometimes caused the model to carry on stalling indefinitely.

The former is being re-built in, while the latter is cured by making the climb shallower and faster.

The power this model has to contro (size being that of a normal 2.5 c.c. model!) seems to be no problem but everything is built immovable and thoroughly keyed in place.

This design gives the wide sweeping type of climb rather than a vertical spiral rolling about the fuselage.