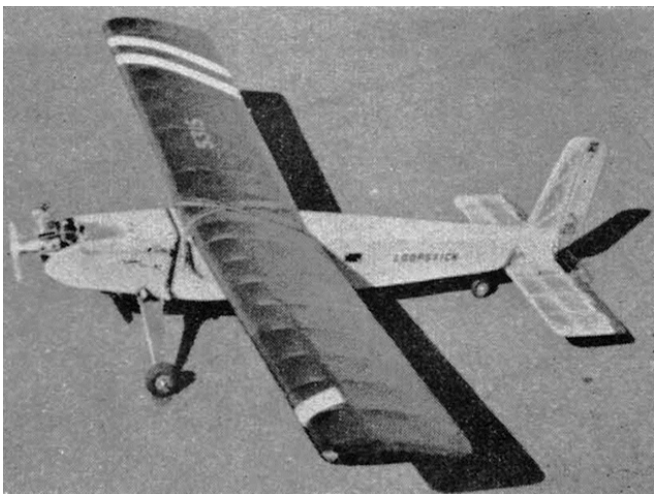
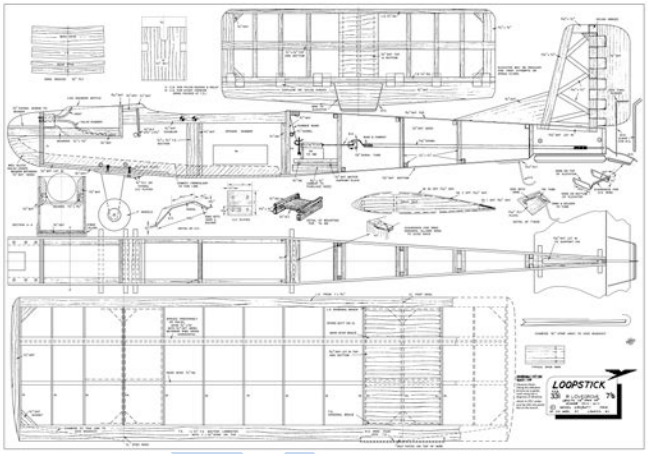
Loopstick





In which C. P. Lovegrove describes the design and construction of his G. G. model Loopstick.

I have definite ideas on model design and these have been justified in practice. The layout which I have always favoured is shown in Fig. 1, and the model Loopstick, published this month, incorporates these ideas.

The span of around 48 in. is ideal in that one can have an all up weight of 3-4 lb. and power up to 4 c.c. (and possibly 5 c.c.), yet the servo motor can still move adequate control areas against the slipstream.

In general, the restricted power of the servo places a limitation on the size of model in which the G.G. can be employed. If the rudder and elevator surfaces are too large, then the pulse rates must be lowered overall and the model will waggle excessively in flight or, in extreme cases, full up elevator may be unobtainable.

I find that an Ever-Ready TG 18 motor will " swing " an elevator 19 x 1 1/8 in. and a rudder 5 1/2 x 1 3/4 in. at plenty of speed. No aerodynamic balancing is necessary or desirable.

A long moment arm should be used since it gives these advantages:

1. One can see the model diverging from a horizontal path in time to correct it.

2. The deflecting and correcting effort from the control surfaces is large due to the leverage available.

3. The control surfaces are small enough to be moved properly by the servo motor.

Loopstick, its predecessors and successors, have been designed for rapid construction. (My fastest time of building was the spare time of four week-days, and I did get to bed !)

You are bound to write off models occasionally, but I got tired of shattering Mighty Midgets in every minor crash, so changed to Ever- Ready TG 18B motors which can easily be fitted with M.M. gears as shown in Fig. 2. These motors may, on occasion, break from their bases through bad cementing but a spot of polystyrene rectifies this easily enough, and the motor itself will survive a crash that nearly obliterates the model. Another advantage is that this motor can be bolted straight on to a ply plate built into the plane.

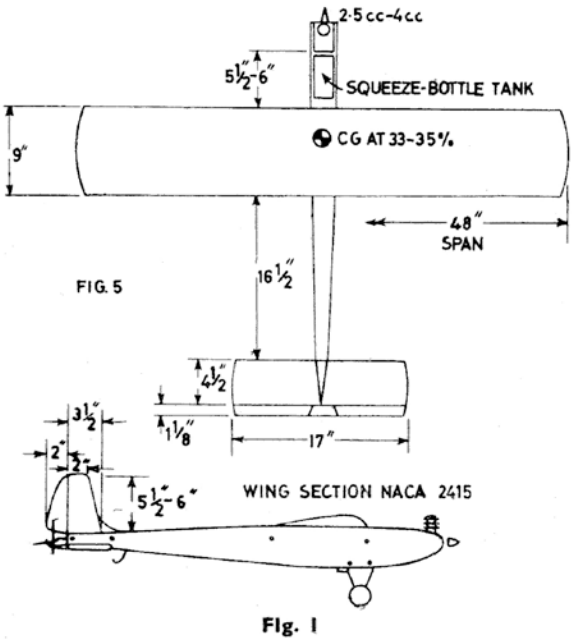


FIG. 5

Fig. 1

Loopstick

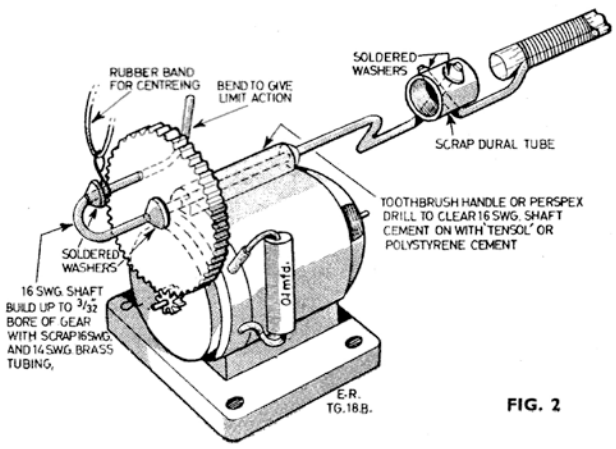


FIG. 2

Constructing Loopstick

Wings: Cut out the ribs, spar webs and dihedral braces using aluminium templates to ensure accuracy. Pin one lower mainspar to the plan and also pin down the 1/4 in. sq. rear spar over scraps of 1/16 in. sheet. Cement the mainspar dihedral brace in position and fit the first rib up against its end, then cement the spar webs and ribs in place. Add the top mainspar and the L.E. and leave to harden.

Now pin down the lower mainspar and rear spar of the opposite wing in the same way, and fit onto it the wing-half you have built by cementing the dihedral brace into position on the other lower spar — supporting the partially built wing on packing, of course. Now proceed as before with the ribs and spar webs, and the upper mainspar, then allow to harden.

Place one wing so that the rib T.E.s are flat on the board and place the laminated T.E. in position. When dry fit the other T.E. the same way and cut the center joins at the correct angle. Cement the T.E. brace inplace, fit the rear half of rib R3 and the brace to the 1/4 in. sq. spar.

Now cement on the L.E. brace and fit the front section of R3, the center section sheeting, gussets and block tips. Sand the framework (remember the tip washout) and cover with nylon or heavyweight tissue. For diesel engines give three thick coats ofdope but no fuel proofer as repairs are easier and proofing adequate with dope, but for glow power you must fuel proof the model. Alternatively, butyrate dope may be used be carried out. It is both diesel and glow fuel proof.

Tailplane: This is a simple flat framework with strips added to give a thicker mid-chord. The elevator is cut from 1/8 in. sheet and is nylon or tissue-covered. Dope as for wing.

Fin: Conventional, and built in a similar manner to the tailplane.

Fuselage: Cut out the sides from 1/8 in. sheet and cement in the bearers, the rear stiffeners, and the locations for F2 and F3. Also fit the lower supports for the Ever-Ready motor platform and the wing seat strips.

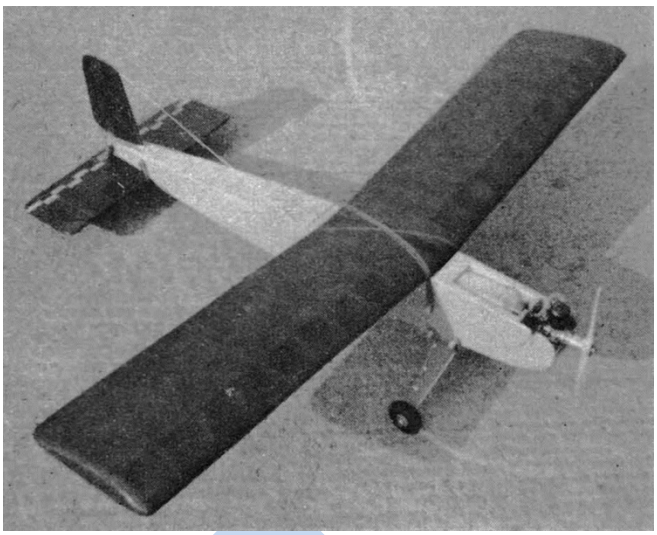
Cement F1 and F3 to one side, check for squareness and allow to harden and then cement the other fuselage side to these formers. Fit the tank compartment floor to the under-side of the bearers and add F2, let in the 1/8 in. floor at the front and fit the 1/8 in. bottom skin from F1 to F3. You can now pull the tail-ends together and cement a piece of scrap block between them. When dry, fit the cross-braces to the rear fuselage and let in the in. fin mounting. Now sheet the rear fuselage top and bottom with in. balsa, leaving a hatch opening above the servo platform.

Let in some 3/8 in. balsa above the bearers to reduce the tank space width to about 2 in. Pre-drill the bearers where the woodscrews that secure the engine plate are inserted— this is essential or you wall end up with split bearers; now fill the underside of the engine bay with soft block. Cut a 1/8 in. ply plate, to take the E.R. servo, drill, and then bolt on this motor unit. Cement the plate in on top of the 3/4 x 1/4 in. supports and cement £ in. sq. scrap pieces above either end of it.

Fit the top piece behind F2 and fit the spacer on the underside of this, cut a 1/8 in. ply plate to rest against this spacer and the front wing dowel. This will carry your receiver and actuator plugs and sockets if you wish. At a later date I shall be giving details of another, and better though less conventional, way of mounting the wiring, etc.

Cement the fin into position together with its dorsal section, sandpaper the fuselage, fit fiberglass reinforcement where shown and cover with nylon, terylene or heavyweight tissue. Dope heavily and be

Loopstick



sure to saturate the engine and tank bays with dope. Fuel proof if you wish, but do this after fitting the wing and tail dowels, undercarriage dowels, torque shaft bearing, tail skid and the rudder. Finally push the torque rod in through a 1/4 in. sq. hole before fitting the rear bearing over it.

Make and bolt on the undercarriage plates and for these use plywood, or better, Tufnol. Construct the U/C from 16 g. Dural and 14 s.w.g. piano wire as shown on the plan. The linkage for the elevator, rudder and crank is made by reference to the plan.

For colour finish, use Valspar, Starline Enamel or butyrate dope as they are proof against all but very hot glow fuels.

Next month I shall be discussing the wiring and the radio side generally and will afterwards conclude the series with some notes on flying.

LOOPSTICK
Materials List

Balsa
7 strips 1/4 in. sq. x 36 in.
1 ,, 3/16 x 1/2 x 36 in.
1 ,, 1/4 x 1/4 x 36 in. L.E. section.
1 ,, 1/8 x 1/2 x 36 in.
2 ,, 1 x 1/4 x 36 in. T.E. section.
4 ,, 1/2 x 1/8 x 36 in. Spruce or Balsa.
1 Sheet 3/4 x 4 x 36 in.
1 ,, 3/32 x 3 x 36 in.
1 ,, 3/32 x 4 x 36 in.
2 ,, 3/16 x 4 x 36 in.
1 ,, 3/4 x 3 x 36 in.
4 ,, 1/8 x 4 x 36 in.
1 Piece 1/2 x 1 1/2 x 18 in.
Plywood 1/8 x 6 x 6 in.
,, 3/32 x 1 1/2 x 6 in.
,, 1/4 x 4 x 3 in.
Dowel 3/16 in. dia. x 18 in.
,, 1/4 in. dia. x 24 in.
Dural Sheet 12 x 1 1/2 in. x 16 s.w.g.
Wire 12 s.w.g. x 18 in.
,, 14 s.w.g. x 12 in.
,, 16 s.w.g. x 36 in.
,, 20 s.w.g. x 36 in.
Tufnol (or Ply) 1/8 x 3 x 6 in.

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