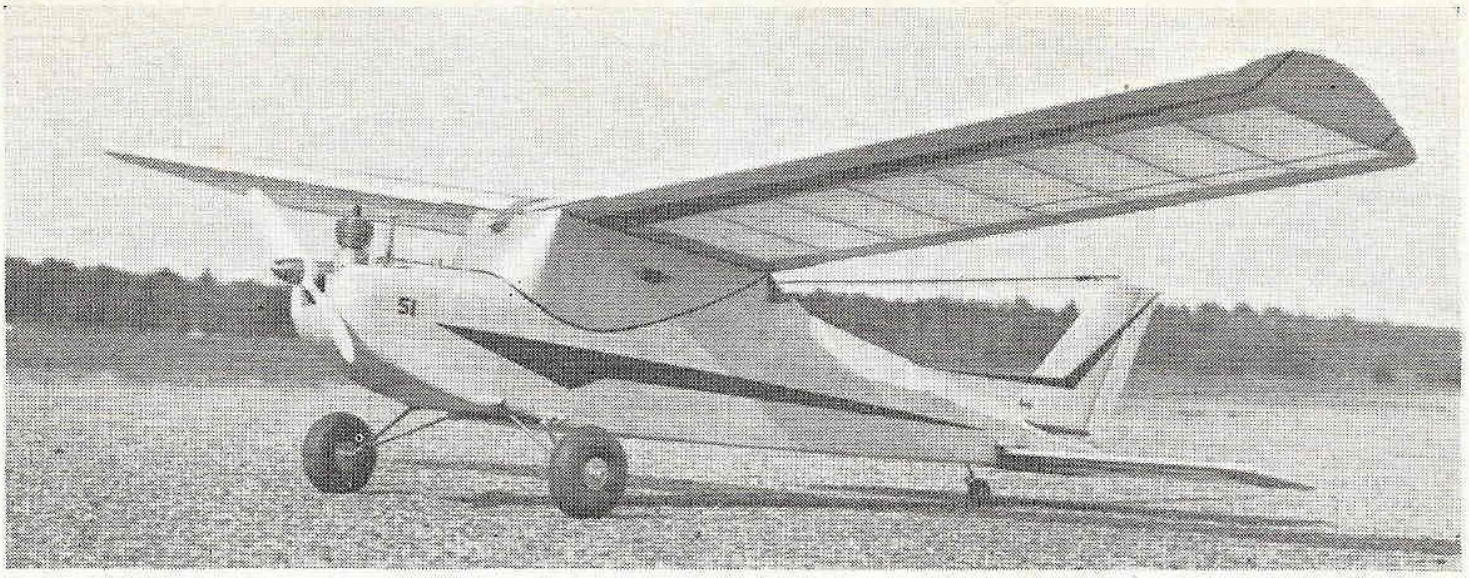


Little Dragon —

a 49in. span "traditional" type sport single channel model—by HOH FANG-CHIUN

THIS little sport design is recommended if you want fun at low expense and little effort. It is easy to build, robust in construction and possesses a constant stable flight performance once the model is trimmed. Powerplant can be any diesel or glow engine of .09 to .15 capacity. Any radio outfit providing rudder and motor throttle controls may be readily installed. Because there are so many suitable R/C outfits available on the market I did not specify any particular installation on the plan. My original prototype uses German Variophon-Varioton 4-channel outfit, with a Bellamatic servo for rudder and a Servo-autoMatic servo for throttle, the installation of which is clearly shown in the photograph.

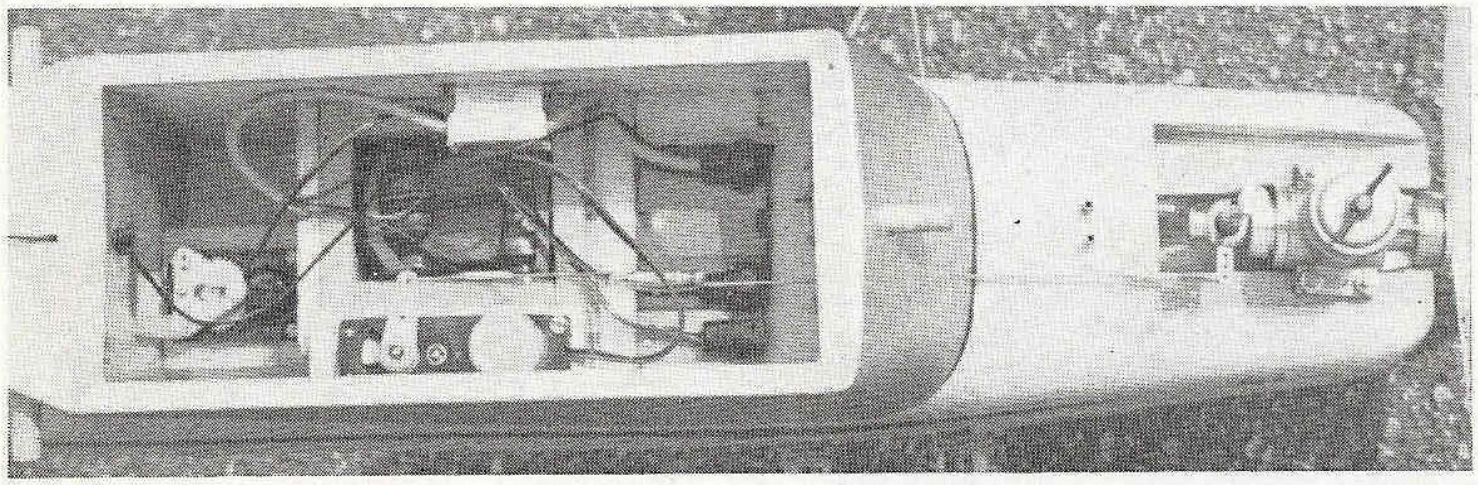
The construction of the model is quite conventional, so building it should not offer difficulties even to beginners. As can be seen from the plan, materials used are often generous, so you should select only *medium* or *medium-soft* balsa wood throughout the entire model, in order to keep the weight down. I find this a better method than using hard stock of lesser proportions.

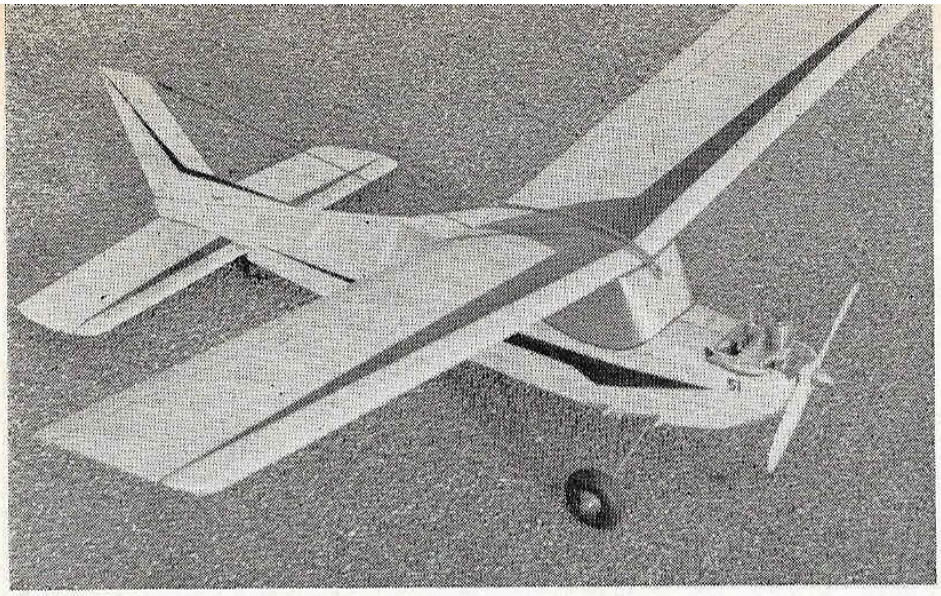
CONSTRUCTION

Wing. After cutting the ribs and spars from the indicated wood, pin down the trailing edge directly on the plan, over wax paper or polythene sheet—having previously cut the appropriate notches in the trailing-edge. When cutting these notches, make them slightly undersize for a tight fit to the ribs. Cement all ribs in place except centre rib WA, using pins to hold these in position while they are drying. Note that rib WB is cut $\frac{1}{16}$in. undersize, top and bottom, to hold the centre section sheet covering. Add $\frac{3}{16}$in. sq. top spar and leading-edge stock while the panel is still on the working board. Now cement the lower spar and sheet wingtip in place. The opposite wing panel is built in same manner having traced it through to the back of the drawing. The three dihedral braces are cut from $\frac{3}{32}$in. plywood. To join the wing panels, first cement brace BB to the $\frac{3}{16}$in. thick centre rib WA, checking carefully that the joint is at right-angles. Fill the gaps between brace and wing spars with $\frac{1}{16}$in. strips and cement this unit to one panel side, allowing several hours for drying.

Now join the opposite wing panel to this very carefully with spar ends joining each other precisely. Cement the leading- and trailing-edge braces in place, using spring-loaded wood clamps (clothes pegs) to hold them in position. Complete the wing by adding leading-edge and centre section sheeting, both on top and bottom. Note that the leading-edge sheeting butts against the back of the leading-edge but rests on top of the spar. Finally, add the trailing-edge protector wire, reinforced with gauze as shown on the plan.

Tailplane. Note that the trailing-edge is cut down to $\frac{3}{4}$in. wide from





¼ x 1in. stock. Since the tailplane has a symmetrical airfoil, I suggest assembling it "in mid-air" rather than on the working board, Slide and cement the ribs onto the main-spar, checking the alignment frequently to avoid warp. Next, add leading-edge, trailing-edge and sheet tips. Cover top and bottom of the centre section with 1/16in. sheet before final sanding.

Fuselage. Start this by cutting out all the components. For the fuselage sides, medium grade balsa is preferred. Cement cabin formers FC and FD to the sides and be certain that the joints are at right angles. Cement front formers FA and FB in place and join the fuselage sides at the rear with a small balsa block. Add the remaining formers and complete the rear fuselage with the top boom or 'backbone' and ⅛in. sheet covering as shown. Install a suitable metal fuel tank between the hardwood engine mounts and plank the front top decking with ⅛in. balsa strips.

Regarding fuel tanks, I believe personally that a permanent metal one is entirely satisfactory for sport flying purposes, as is the case here. The one shown on the plan gives my model a powered flight of approximately 20 minutes. With a .15 engine a good 15 minutes engine run should be obtained.

Landing-gear platforms consist of three ⅛in. plywood plates, cemented on. Before covering the fuselage bottom with ⅛in. sheet do not forget to cement the tailwheel components in place. The tailwheel wire should be bound with heavy thread to the tailwheel platform, using plenty of cement. Nose and windshield blocks are now added and sanded to shape. Use soft blocks for this purpose to facilitate the sanding. Leave all hardwood dowels at this stage. These are glued in place after the fuselage is covered.

The vertical stabilizer or fin, is entirely built up from sheet. Cut two identical pieces of fin from soft ⅛in. sheet. Cement the 3/32 x ⅛in. centre spar to the sheet sides and join leading- and trailing-edges as shown on the cross-section on the plan. Add a small block on top of the fin and sand it to a streamlined section. Join the sheet rudder to the fin with durable linen hinges or miniature moulded nylon ones.

Make the landing gear from piano wire, dural or aluminium; the former method is shown on the plan and used in the original model. Use lightweight balloon wheels, air-filled type is preferred but not necessary.

Finishing

Finish the model by first giving the exterior balsa surfaces two coats of thin clear dope, sanded lightly between each coat. For covering, use lightweight silk for maximum strength. To cover "open areas", that is, wing, stabiliser and fuselage rear top it is suggested to use wet method for freedom from wrinkles. After fuselage covering is completed cement rudder assembly and dorsal fin firmly in place and add all the dowels as mentioned previously. Now give the entire model at least four coats of clear dope before applying any coloured finish. Personally, I rather prefer coloured silk than painting the whole model with coloured dope with regard to weight and possible repairings. If no coloured dope is used, add extra couple of coats of clear dope. The original model is covered with white silk and finished with red decorative lines.

Installation

Radio installation is, of course, your own decision, as regards specific detail. A general rule, however, is to house heavy components such as batteries and receiver as far forward as possible to avoid a tail-heavy condition which, incidentally, is very common for high-wing designs. Also, always secure battery and receiver packs in place against foam rubber pads with rubber bands in order to prevent their coming off in the event of a crash.

Trimming out

The engine should be offset slightly to the right for a straight power flight. The down-thrust may vary from model to model, so the exact amount can only be determined through flight tests. To start with, the built-in downthrust shown on the plan should be sufficient for a .09 engine. More downthrust will be required if a .15 engine is used. Regarding propellers, a 8 x 4 size would be correct both for .09 and .15. If a .15 diesel engine is used, increase propeller diameter to 9in., still with a 4in. pitch.

Before any flight attempt, be sure that the centre of gravity location is according to the plan and that there are no warps in the flying surfaces. A hand-launched glide test is good, but not necessary if above precautions are taken. With a .09 powerplant, full power may be used for tests, while reduced power is recommended if a .15 engine is used.

Mr. Hoh with his original model — uses Variophon gear, on rudder and motor. Plenty of flying space!