build this neat sweet sport model with the "light aircraft" look!

— by J. Di Giorgio —

42¼" SPAN FOR .19 TO .25 MOTORS

The COCCIN

HAVING DECIDED to design a new model, I wanted something which would look "like the real thing", be economical to run, and accommodate my radio equipment comfortably. I like to think that the result—the *Coccinelle*—is a success on all these counts, and I believe its performance should satisfy most people.

The *Coccinelle* is a small, easily constructed model, but rugged enough to withstand the rough landings I have put it through. It is aerobatic and, when properly trimmed, flies as well inverted as it does right-side-up.

CONSTRUCTION

The wings

To make the wings, cut two templates, W1 and W12, as shown on the plan, from aluminium sheet (01 ply if preferred) and sandwich 11 pieces of $\frac{1}{16}$in. sheet and 1 of $\frac{1}{8}$in. sheet balsa between them, (the $\frac{1}{8}$in. piece being for rib W1). After shaping the sandwich, dismantle it and remove the sharp chamfer on each individual rib, taking care not to degrade the actual aerofoil section shape of the ribs. By placing the ribs over the plan, work up the locations of the spars, undercarriage rail and ply braces, and then trim them to size before adding the trailing edge.

After cutting the ailerons from the wings, be sure to leave enough play, at each end, for movement. Control linkages are a matter of choice, since one may use either a straight rod across the wing, with bellcranks and pushrods, or else flexible cable linkages.

When the wings have been joined, with the ply braces, and covered all over with $\frac{1}{16}$in. sheet, a piece of scrap block is added on the lower centre section leading edge, to fair it in with the fuselage, as will be seen in the side view on the plan. It need hardly be added that care should be taken, when sheeting the wings, to ensure that no warps are built-in. Check, and re-check, for these, while building—and then check again before flying.

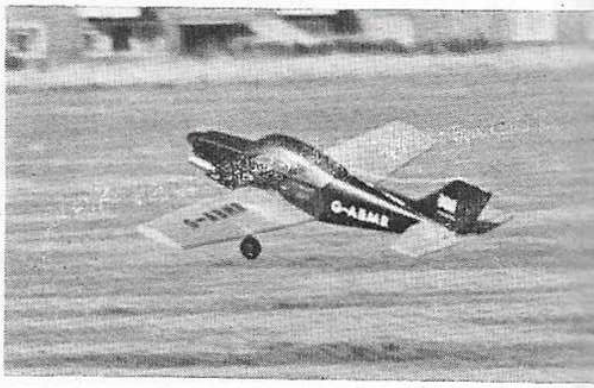
Fuselage

Cut the two fuselage sides from $\frac{1}{16}$in. sheet, add the $\frac{1}{16}$in. ply doublers at the front and the $\frac{1}{8}$in. sheet balsa wing seat doublers. Then build up the rest with $\frac{3}{16}$in.sq. and $\frac{1}{8} \times \frac{3}{16}$in. as shown on the plan. Glue the engine bearers in place with epoxy, and, to complete the sides, add the $\frac{1}{16}$in. sheet tail doublers.

Make up formers F1 and F2 as per plan. When the two fuselage sides are dry, make sure that they match, and then glue former F2 between them as the prime joining former. Next add the $\frac{3}{16}$in.sq. spacers across the top and bottom of the fuselage, at the rear of the cockpit area. When this is secure, join the two rear ends together, and fit former F1 at the front. Add the remaining $\frac{3}{16}$in.sq. crosspieces, and then the beech hatch supports across the bottom of the tank compartment.

I would suggest that the builder

Here are some typical ground and air shots of this lively little sportster. The original and our check model are both powered by Fox .25's and have very snappy performance



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glues the balsa block up front, and the $\frac{3}{16}$in. crosspieces, only *after* he has decided what method to use to secure the engine plate in position. This doesn't matter if woodscrews are to be used, but it does in the case of blind nuts.

Cut sheet formers F3, F4 and F5 from $\frac{1}{8}$in. sheet balsa and place them in position, noting the angle of F3 at rear of cockpit. Add the $\frac{1}{8}$in. stringers to the rear and cover the area with $\frac{1}{16}$in. sheet—probably best done in two halves, joined along the centre stringer, and curved around the formers.

Next cut the fin, dorsal fin, rudder, elevator and tailplane from $\frac{3}{16}$in. sheet and place into position. Add scrap block and sand to shape. Make control horns from dural and epoxy them in place—note that the purpose-made rudder horn is angled and goes through a suitably shaped cut-out in the tailplane, just aft of the stern-post. The elevators are joined with 14g wire, in the conventional manner, making sure they are quite flat, relative to one-another. Commercial horns may be used if desired, but then the rudder one, at anyrate, will not be so neat, as the push-rod or tube will have to go above the tailplane instead of underneath it—unless you can work out some other clever scheme!

Finally, the canopy may be made in two pieces, the front part being from one of a number of possible commercial canopies, and the rear from plain acetate sheet. The join is made on the aluminium strip shaped

to the contour of the canopy and epoxied in place. Alternatively, there are some canopies available, in some shops, which are just about right, without any hacking about or joining. However, you have to be the persevering type to locate them, and —so long as you can make a neat job of it—the line of least resistance is to produce a composite one.

Finishing

The original model was covered with iron-on film. Nylon may be used, but remember that it is a small model, so go easy on the amount of pigment that is applied, as this could put the weight up disproportionately.

The c.g. position was found to be just right at 1/3 of the chord from the leading edge, so the radio equipment should be positioned so as to achieve this. I used servo trays, and found there was plenty of room to accommodate them.

I used a Fox .25 to power my original, driving a 9 × 4 propeller.

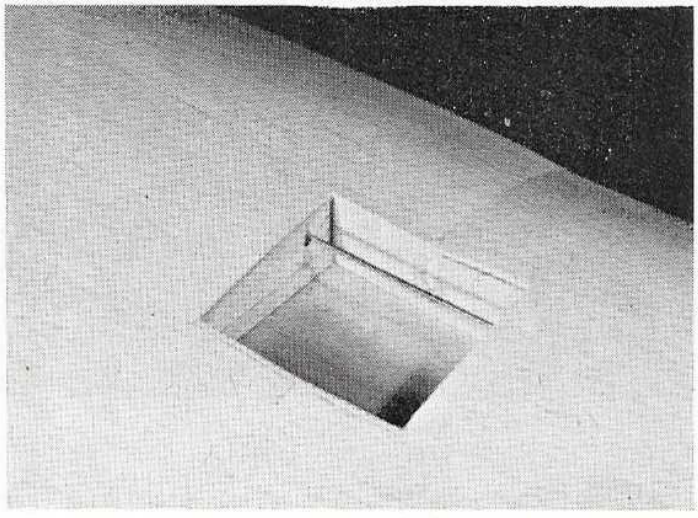
Flying

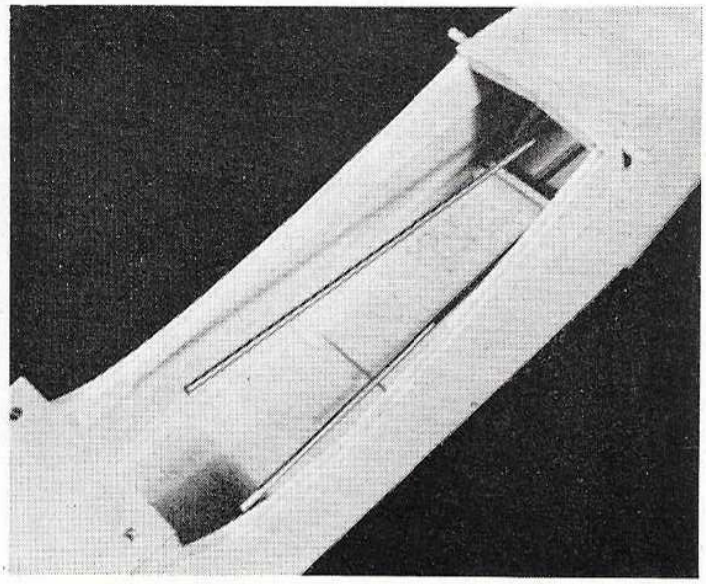
On the engine/prop combination noted, the model proved to be quite fast. It is a sensitive model, and care should be taken, during the first few flights, not to over-control on elevator and ailerons.

The take-off is normally short, and the climb should be kept steady and not too steep. When the runway is busy, or the grass too long, I can hand-launch *Coccinelle* with one hand and hold the transmitter with the other, though it must be admitted that, before doing this, the model had been thoroughly trimmed out in previous flights.

I have done every manoeuvre I know with this model and have been satisfied with its performance. Rolls are very fast and crisp. And the aileron response is such that even if,

These constructional shots show (*below*) aileron servo-well with push-rod and, *right*, equipment bay in fuselage with tube linkages partly installed.

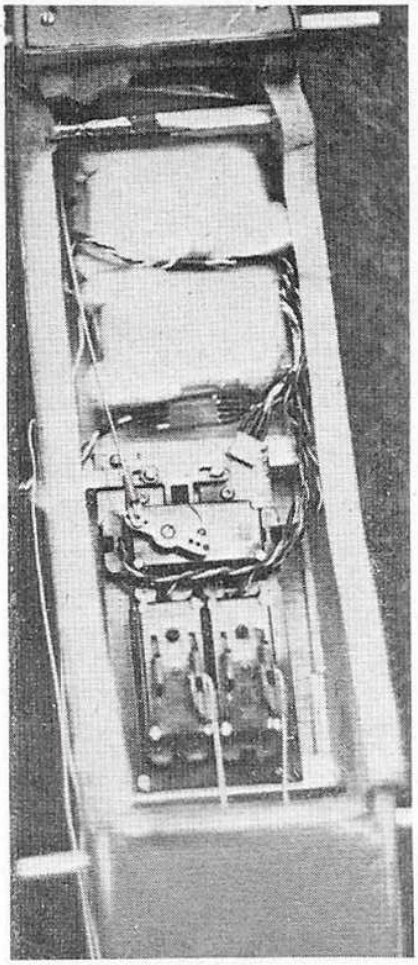


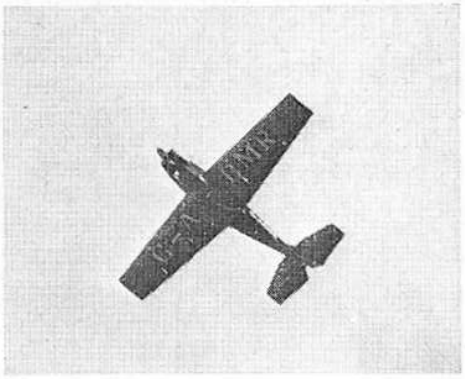


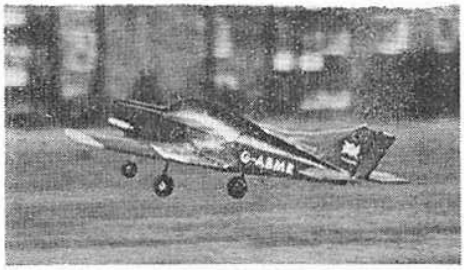
when flying inverted a few feet from the ground, the engine quits, the model can be rolled back upright. Rudder is not really needed at the top of the loop, but sometimes can be found useful if the wind pushes the machine off course. The outside loop is gradual but can be made as tight as the inside loop with practice. Turns can also be very tight, and of the 'pylon' variety, but then a smoother turn is nicer to watch, especially as the model looks just like a light aircraft in the air.

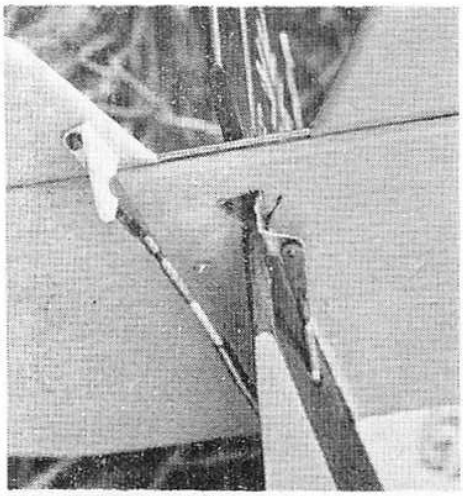
The *Coccinelle* will stall just like any other plane, but there should not be any worries if it is balanced correctly and—when landing "dead-stick"—enough flying speed is maintained by keeping the nose down reasonably. Spins are fairly easy, and to get out of them all one has to do is to let go of the sticks—well, that's been the case up to now, anyway!

FOOTNOTE: A check-model, built for us by Brian Reed, from the designer's drawings, has confirmed the flying characteristics of this interesting little machine. It's fast and responsive and, while not recommended for beginners either to building or flying, makes an excellent choice for those with some experience—Eds.









Above: radio installation, with throttle servo at front. *Left/below:* special rudder horn from sheet alloy, goes through gap in tailplane. *Right:* wing tip gives aileron protection.