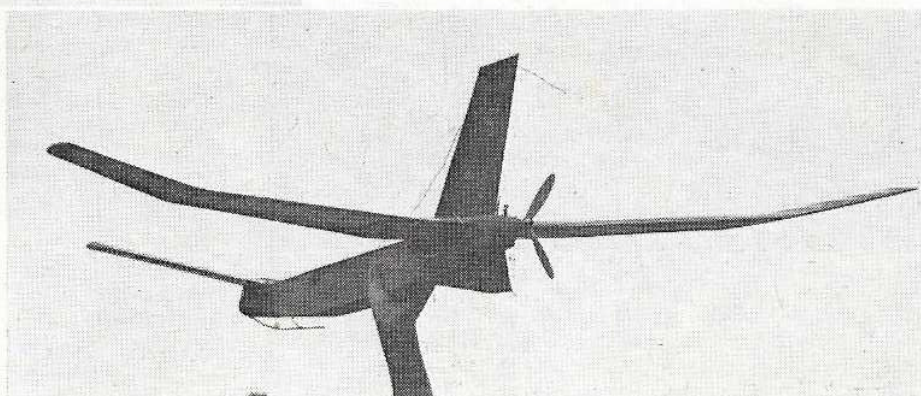


CAN — CAN

Something really different for single channel R/C

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MOTOGLIDING means, to me, at any rate, slowly climbing very high, perhaps by tacking each side of the wind, then gliding slowly around, using wind or thermals, as long as possible, until turning into the gentle flat approach, touchdown and skid to your feet. Stunts are possible—but the real fun is, to me, using wind or sun to go higher or stay up longer than last time.

Another way of looking at motoglidng is that you get all the grace and elegance of silent flight without the trouble of towlines or catapults—and more of it, for altitudes of well over 1,000 ft. are the norm.

So, how to find the most suitable layout for motoglidng? My starting points were (1) .049 Cox power—by far the most suitable in this class; (2) Lightweight S/C gear, such as RCS super-regen, with Elmie escapement; (3) Wing loading on the high side, for windy weather.

Having sketched several arrangements for gliders-with-motors, two things dawned: that the motor should be at the rear of the fuselage, pushing; and that the canard has several attractions. These include: (1) The wing and stabiliser are at either end of the fuselage, thus obtaining maximum moments for stability—so 'tail-first' comes out lighter and shorter than 'wing-first' (I have built several examples of each). (2) The radio gear may be spread out around the mid-point of the fuselage permitting a clean, sharp nose and low frontal area—'wing-first' means cramming it all in the nose to balance out the engine. (3) The effect of C.G. travel in the wing is much reduced (due to the large moment arm about the C.G.) which permits highly cambered airfoil sections if desired, and (4) It is 'different'—something that my Sevenoaks Club colleagues are kind enough to say is a virtue in itself!

As usual, there can be a few snags: the fin and rudder must be rather large; the foreplane (stabiliser) operates at high CL and, therefore, high drag (on the other hand it does 'work' for its living—which makes the Canard a tailless biplane, functionally!); and knock-off wings are essential owing to the proximity of a 15,000 r.p.m. Cox-powered balsa cutter.

I certainly did not succeed in solving all the problems of Canard design at the first attempt—there is little published data—even so, No. 1 version of

Can-Can sailed serenely away O.O.S. on her third flight—with a wiring fault—to be found miles away 3 months later. Three more versions taught their lessons, as a result *Can-Can* has been really reliable, consistent and maintenance-free for all of the great 1969 flying season. Furthermore, a larger, streamlined, tailfan 'Hurrikan' powered version produced recently has identical flight characteristics, which suggests that the general principles are sound. With both of them, one gets a lot of flying for very little fuel.

Original Designers may like to know that Can-Can has a loading of about 9 oz./100 sq. in., based on the main wing area of 230 sq. in.; this puts the flying speed around 25 ft./sec., permitting activity in quite a stiff wind. It is suggested that keen O.D.'s might like to build a Can-Can—she's cheap and simple enough to tempt you—so as to get the hang of Canardy—and then experiment with various airfoils, C.G. position and so on. (Me? I am building a scaled-up propo version!)

Construction

Turning to construction, then, I will, as is now often done, make a note of the special points only. *Fuselage*: After making all the components it is easiest to assemble formers 1, 2 and 3 to the 'keel' B, first, so that this sub-assembly is ready to be nipped between the 3/32 in. sheet fuselage sides. The DEAC tube can be made from thin ply wetted and wrapped around a broom handle—or from the cardboard tubes for computer paper; either way, ensure that the hole cut in former 5 will accept it, prior to assembly; if you use, say, a PP3, then cut the appropriate shaped hole in former 5 and make a box (foam lined) instead of the tube. The 18 s.w.g. skid support should be left sticking straight out below former 4 until covering is completed, as the skid is left to last of all. It is preferable to use white glue for the whole job, except where epoxy glue is specified for the rear (engine) former. Fit the underfin when the fuselage is complete except for the 1/16 in. lower sheeting of former 8.

Wing Centre Section

This should be tackled next, making the ribs from the wing root templates—note that the spar notches are different; at this time, make the wing root ribs

Right: detail of wing centre section, showing wing tongues and crank arrangement to drive rudder. Below right: rear end view showing Cox Babe Bee motor installation.

also, and ensure that they match up. Assemble the centre section over the lower 1/32 sheet (on which it is convenient to mark out the rib positions using carbon paper under the plan); leave the two centre ribs to be glued when the fin and rudder assembly is stepped. It is convenient to Solarfilm the latter before stepping. Fit the wing tongues, taking care that they are flat and true to each other, since an error here is difficult to overcome later. Lastly, cover the upper surface with 1/32 sheet, then put the assembly aside for a few days, weighted down flat. Needless to say, white glue is essential to a first-class job here. The 1/4 sheet location piece, and rudder operating shaft assembly should not be glued on yet, as the centre section must lie flat on the board for setting the wing true on the tongues.

Wings

Cut the 1/32 lower sheet panels, and T.E. pieces. Mark up with carbon paper, pin flat to plan and build upwards, again using white glue. Make a ply jig from the plan to set the inward slant of the root rib to match the dihedral. The outer dihedral break can be made after the upper sheeting is completed by sawing neatly through it, adding the 3/32 x 3/32 keeper behind the upper 1/16 x 1/16 spar. Lastly, assemble the wing tongue boxes, using the centre section to line them up. Make the boxes a tight fit, or the wings will flap; and take special care over gluing the lower sides of the box into the cutaway below No. 2 rib.

Returning to the centre section, the assembly can be completed. The brass tube into which the arm and the tongue rod engaging loop are sweated, is worth the extra trouble to ensure torsional stiffness—this was a typical development modification.

Foreplane

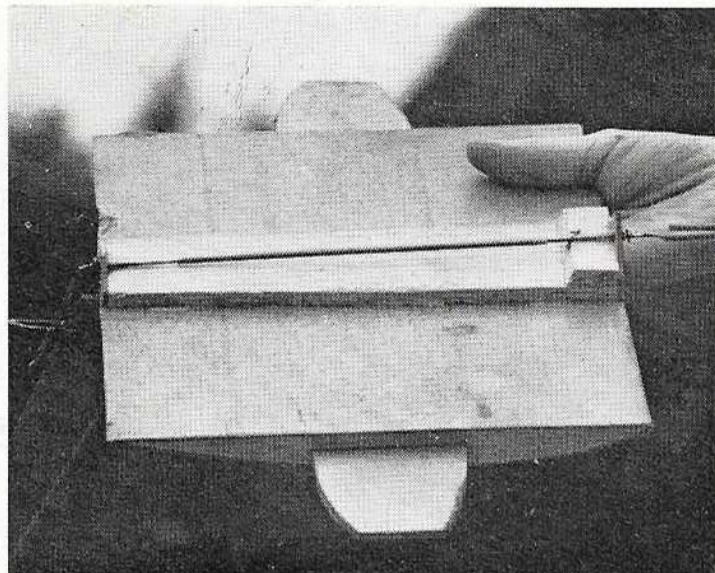
Nothing much to worry about except—be sure to jack up the T.E. to match the specified airfoil section. The reason for using multi-spar construction, rather than the more elegant D-box of the wings, is that the former is easier to repair—quite an important point, as the foreplane is slightly more vulnerable in the odd incident, like flying 'through' a fence, which happens to us all... doesn't it?

Finish

The prototype was covered in coloured nylon, except where Solarfilm is specified, and given two coats of thinned clear dope followed by two of thinned field proofer (equals 'weather-proofer')—with an extra coat or two around the engine area. Choose bright colours such as red and orange, since visibility at altitude is a real problem. Prototype component weights were as follows: Fuselage 5.2; wings plus centre section 6.4; foreplane 1; Babe, or Golden Bee 2.3; radio and ballast 6; total 21 ounces.

Flying

Fit a 3-bladed 6 x 3 *Tornado* prop (tractor or pusher—immaterial which). Test glide, using ballast to trim slightly nose heavy. Set motor thrust line zero-zero at first; assemble the Cox so that the cylinder is to the left, thus making priming and starting easy. Put a drop of light lubricating oil behind the prop-driver before each start, as this prac-



tically eliminates crankcase wear, due to 'pushing'. When flicking the prop, always hold the motor between finger and thumb to protect the engine former from undue stresses. Be sure the engine is running in the right direction before launching—no... don't laugh... it's quite easy to overlook this one!

A few low altitude flights to obtain perfect trim, by ballasting for best glide, or packing foreplane and a touch of micro adjustment to the thrustline; remember, 'down' becomes 'up' and so on, with pushers when, and only when, satisfied with trim, and with radio installation, put your binoculars handy and fill the fuel tank right up with best brew.

Can-Can is easiest to fly, actually, in slight-to-moderate breezes (just as well), since she can tack up wind without ever flying too far away. Indeed, if the wind velocity happens to equal her flying speed, a steady vertical climb can be achieved right overhead, with tiny corrections to keep her always into wind. On some occasions I have been interested to find that following a dead calm launch there can be high wind velocity 500 ft. or so up. The golden rule for windy conditions is—never circle, always keep more or less into wind. In fact, the main hazard for this little model is turbulence from obstructions around our small Kentish fields, which can make landing a trifle fraught. However, if there should be a 'heavy landing' as we call it, Can-Can will bounce—just refit the wings and foreplanes, and away she goes again.

