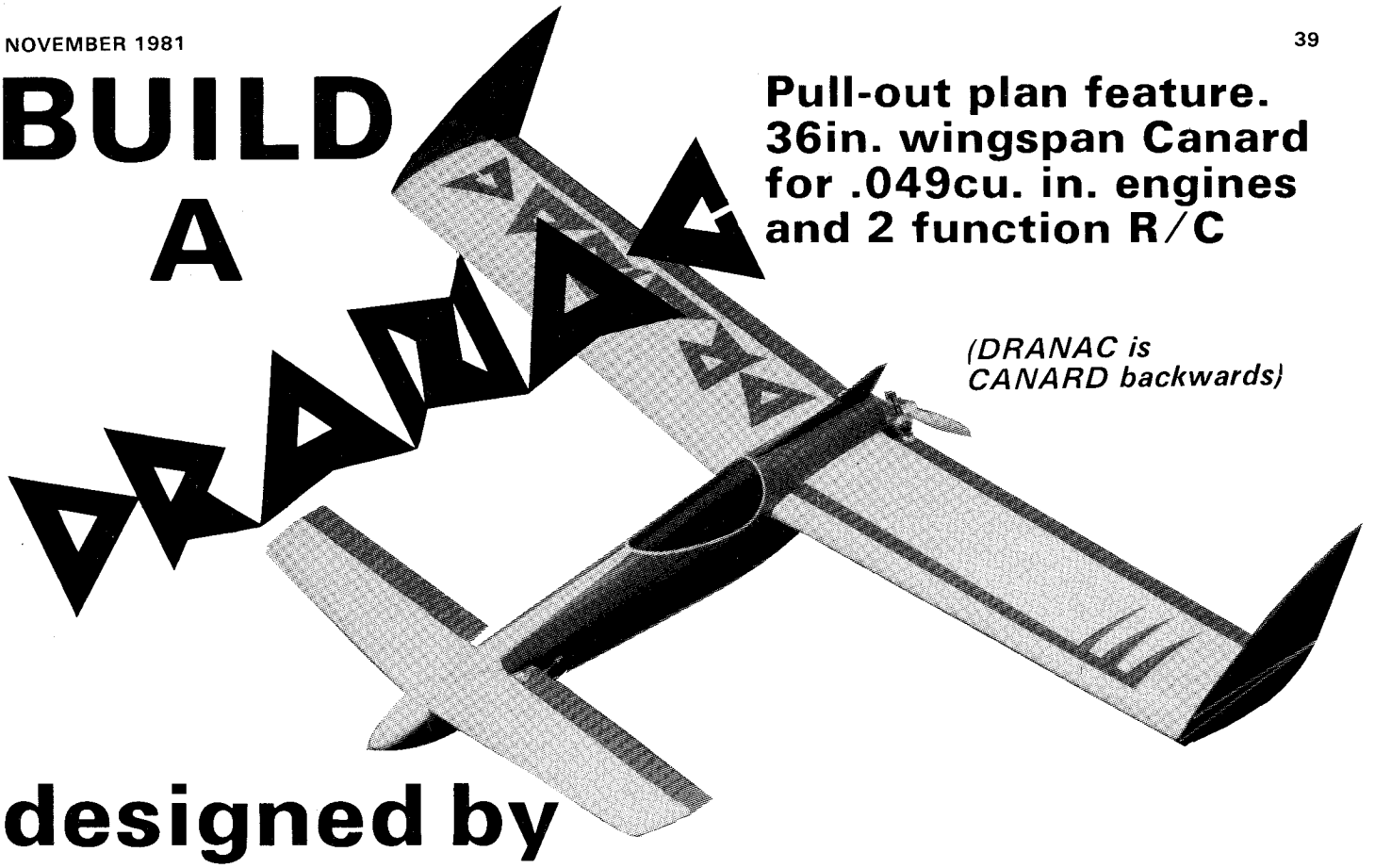
BUILD A DRANAC

Pull-out plan feature. 36in. wingspan Canard for .049cu. in. engines and 2 function R/C

(DRANAC is CANARD backwards)



designed by JOHNNIE BOWMER

BACK IN the 1930's I used to build canard models for rubber duration. They used to climb very steeply, with no risk of stalling, and were usually way above the opposition when the motor ran out. The odd thing is that even though they won the occasional competition, everyone still regarded them as nothing more than a novelty.

Recently, Burt Rutan has made the aviation world sit up and think with the remarkable performance of his canard designs, yet modellers still do not seem to consider the layout as a practical proposition. Prompted by the Rutan designs, I decided a couple of years ago to have another look and have since built half a dozen canards, all pushers except for one tractor and one push-pull twin. They were all successful, each one gaining a little from its predecessor.

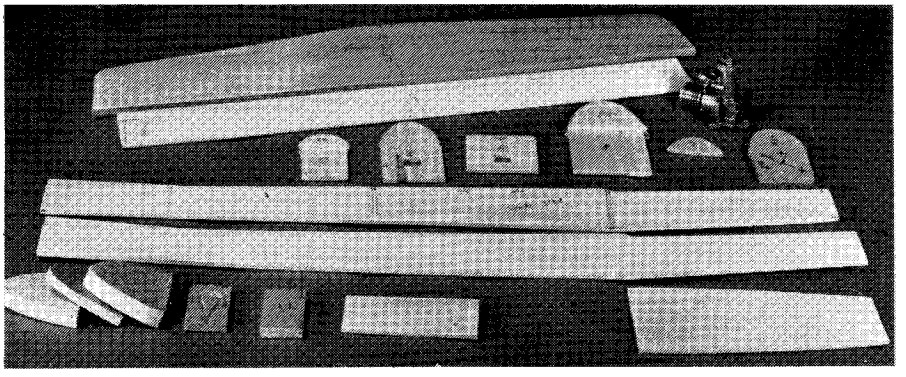
This little model is presented in the hope that it will inspire others to experiment. I once handed it over to the local expert for his assessment, and watched with envy as he took it so smoothly through the book (I taught him to fly full-size, that was a piece of cake!).

"Wonderful performance on such a small engine," he said. "Fantastic glide," (he was actually thermalling it at the end of one flight). He had not flown a canard before, but did not find it strange, nor did he think there was any problem with orientation, although this often seems to worry the spectators.

You may ask why I chose to make it so small. Well, it is quick and cheap to build, you don't need a special pusher prop with a reed valve engine and if you do get disorientated, it will probably bounce. I think it's a good one to start with, and I'm sure you'll like it.

Construction

It couldn't be simpler. Cut the 1/8in. sides accurately, as rigging angles are important. Join them with formers 1 to 5, placing F4 to suit your servos. Make a paper template for the forward top deck, then prepare and fit the 1/16in. sheeting. Pull in the sides at the rear and fit F6. The original used a veneered foam mainplane but an all balsa one is shown on



▲ The simple shapes of the fuselage components and foreplane laid out ready for glue. Note the identification and position markings on the inside face of the side sheet, all outer surfaces have been sanded before assembly and F1 grooved for the skid. Below: the wing assembly under way, built on the lower skins — all pre-sanded on their outer surfaces and identified clearly in the inner ones. There are no spars and the l.e. capping will be added after the top skin is in place and trimmed. The fins are ready for covering.

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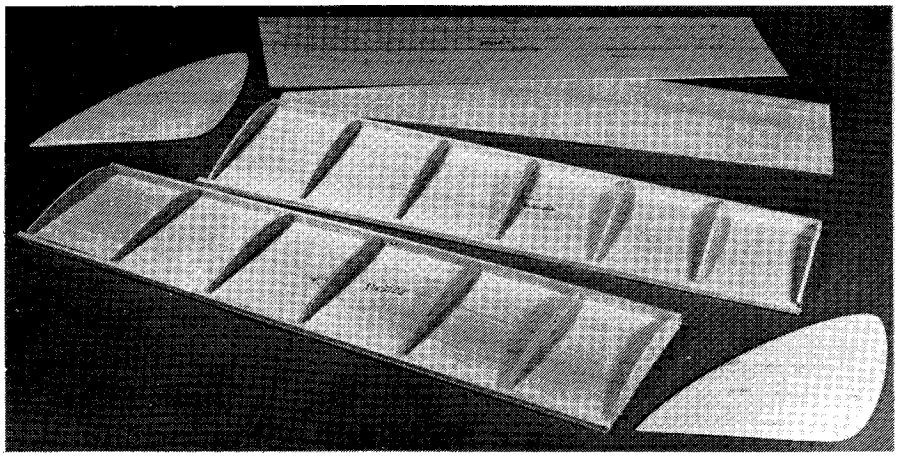
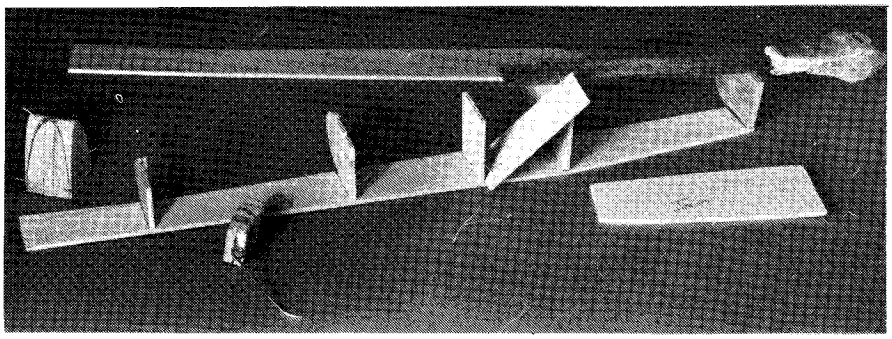
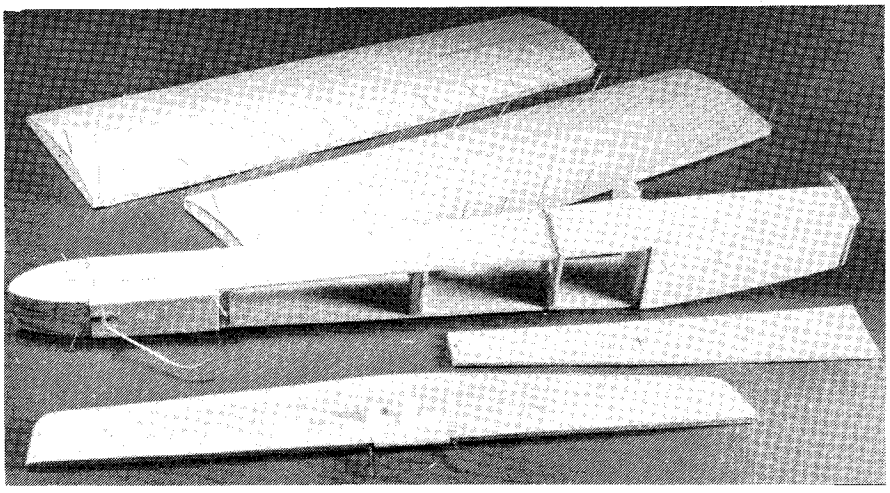
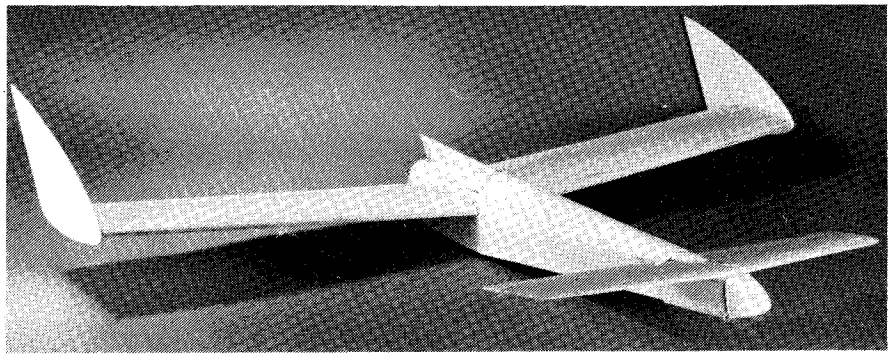




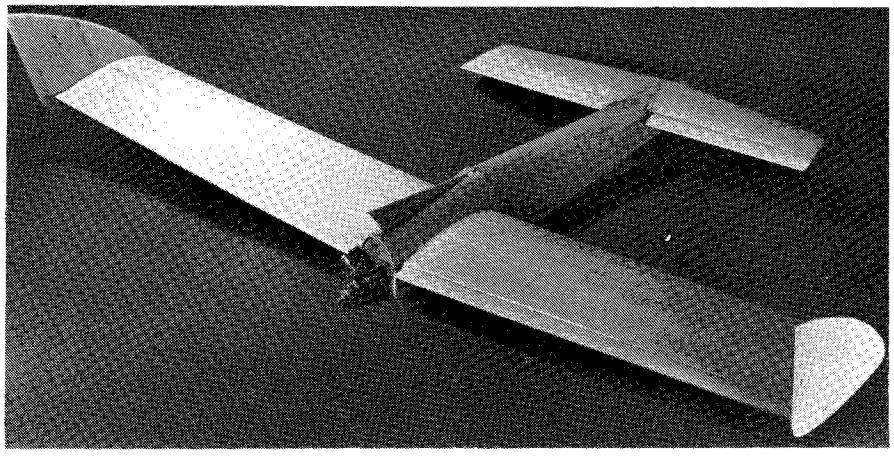
Bringing some weight to bear with a large file, to hold the port side sheet in place whilst the epoxy on F6 cures. A scrap of sheet holds F5 upright, white glue is used on the rest of the fuselage assembly. ▲



Porcupine time; the upper wing skins are on and the fuselage is taking shape, but the bottom rear sheet is only pinned on for alignment. It will be glued after installing the aileron linkage. In the foreground; the elevator yoke tubes are taped in place while the epoxy cures. ▲



These shots of *Dranac* show the top decking pinned over. Paper templates save time and misfits at this stage — tracing paper is easier to mark out than opaque paper; the joint lines show through. Now all that remains is the covering (Solarfilm on our version) and the radio installation. ▲ ▼



the plan. Build it up on the bottom sheeting. A butt joint between the two panels is quite strong enough, as the wing is glued to the fuselage sides and formers 5 and 6, after which F7 and the top sheeting is added.

The foreplane is made in the same way as a conventional tailplane. If your batteries weigh more than 2oz, use light stock. The brass tubing is in two halves to ease the bending of the elevator link wire. The rubber bands used for mounting the foreplane must pass over these tubes, so position them accordingly.

It is unlikely that you will need the ballast box, none was required on the original. Throughout the construction keep the weight down when you can by careful wood selection, likewise choose a lightweight finish. I used heat shrink film on the flying surfaces and the rest was tissue covered and sprayed. Aim for a maximum all-up weight of 20oz.

(Howard Blackwell can supply obechi veneered foam wings and top deck. See the classified adverts).

Radio installation

If your elevator servo turns the wrong way, transpose its position with the aileron servo and come out to the elevator on the other side. For simplicity, I did not provide any adjustment to the ailerons, as if they are set up zero-zero, and the model is built true, there is no reason why they should ever need altering. I strongly recommend the use of a 225mAH Ni-Cad, if you use a heavier battery it will have to be placed near to F3 and the switch repositioned. The aerial is a bit of a problem with a pusher. I built it into the wing, connecting it to the receiver with a servo plug and socket. This comes in handy, however, if you switch your receiver from one model to another. If you string the aerial externally to the wingtip, beware of its turbulator effect.

Engine

The **Cox R/C Bee** was used on the original as it has a clunk tank. The **Golden Bee** and the **Black Widow** are also excellent, but sustained inverted flight is not possible. These reed valve engines can use a tractor prop, the engine running in the opposite direction to normal. The convex face of the prop is fitted facing forward, of course. If you use a **TD 049** you will have to use either a Tatone tank mount or fabricate a tin tank to fit in the fuselage. Take the fuel feed from the aft end of the tank.

Flying

Have the C of G as shown, and not in front, or you will have a job stopping it doing a dirty dive. Launch fairly fast, and climb ahead to a sensible height to give yourself a chance of getting used to flying the 'Wright' way round. If the model is divergent in pitch, then you haven't got enough incidence on the foreplane, so insert packing under the leading edge. On the glide you will note that you can apply full up control and it will not stall, but the sink rate will increase significantly. You will soon find the speed for the best gliding angle. Steep turns on finals are quite safe, and if you have sufficient speed she flares beautifully for the landing.

What next?

If you don't like small models, scale this one up by 4.1 for a 20, or 8.1 for a 40. You would need to fit a landing gear, so fit a wide track main undercarriage just aft of the C of G. Fit a steerable nosewheel to F2, linked to the aileron servo (or to rudders, but the linkage gets a bit complicated). The fuselage bottom should be parallel to the ground. With a larger model, I would be inclined to experiment with a thicker, bi-convex section for the foreplane. You may have to carve a pusher prop, as they are not easy to come by in the shops, but at least you should never break it! Another bonus with pusher models is that they do stay nice and clean.