Try this multi-purpose power-glider

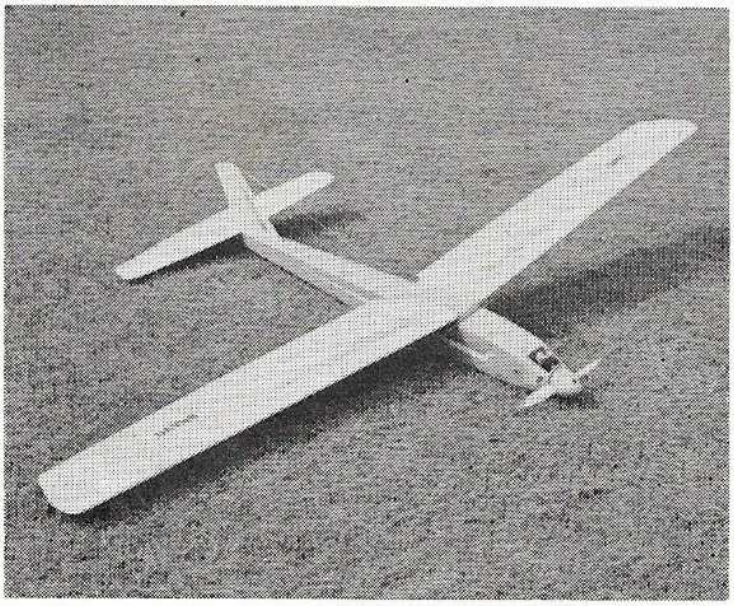
BRAVO

by IAN BARRETT

- TWO-FUNCTION POWER MODEL
- POWERED GLIDER
- SLOPE-SOARER

Propeller removed for slope soaring—and never ever use the engine on slope sites!

ALTHOUGH designed primarily as a powered-glider, *Bravo* has, in fact, a higher performance under power than one has come to expect with this type of model, which also applies to its secondary role—that of a slope soarer. In a bid to produce an economical model, the size has been reduced to a practical minimum for two-channel control. Most economy models tend towards chunky fuselages and low aspect-ratio wings. However, *Bravo* uses a slender box fuselage, supporting moderately high aspect-ratio wings and tailplane. The low drag of the model enables a very ordinary 1.5 c.c. motor to provide a respectable climb while, in level flight, a surprisingly high speed is achieved. After the motor cuts (no throttle is used), the model settles into a gentle glide, ready to be brought home for a featherlight touchdown.

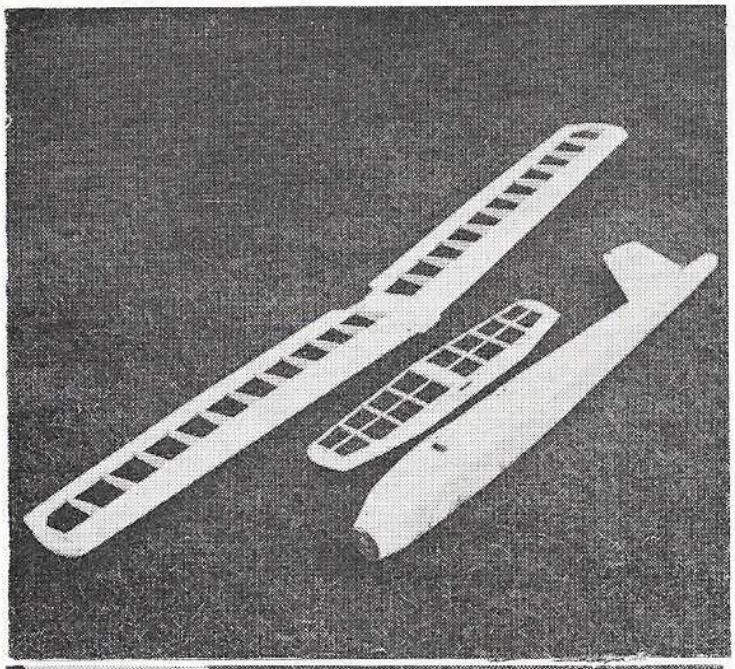


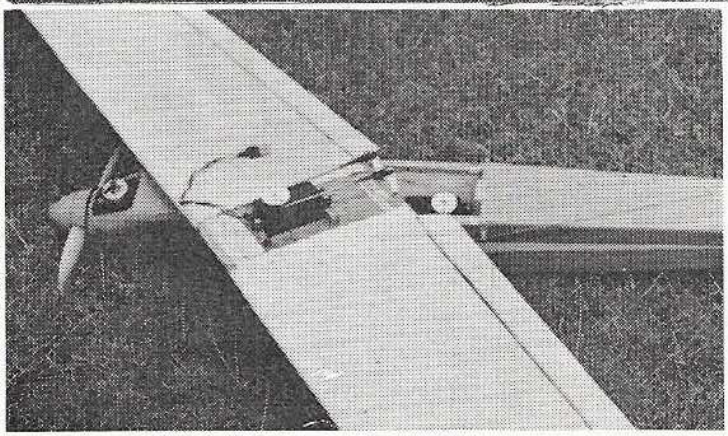
Building Bravo

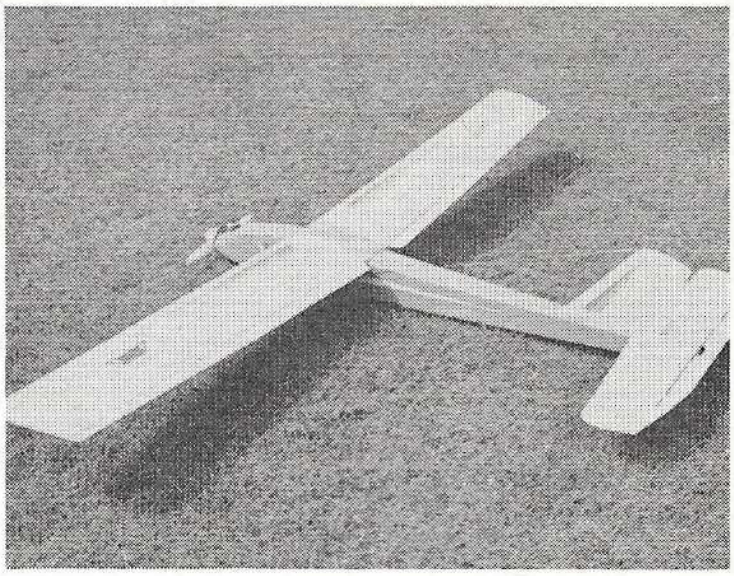
Construction should present no difficulty to anyone with previous aeromodelling experience, so why not rescue that old 1.5 from the workbench drawer, and start work on the fuselage?

Cut the engine bearers to length and bolt the engine to them. Drill recesses for the retaining nuts on the underside of the bearers, and secure them in place with epoxy. Cut out the plywood formers, adjusting the bearer hole positions to suit the motor being used, and glue them to the bearers using P.V.A. adhesive. When the assembly is dry, the fuselage sides and the remaining formers can be added. Note that there is a sheet doubler on both inner sides, running from the wing trailing-edge position forward. Apply adhesive to the longerons, and hold these in place with clothes pegs while the glue dries. The plywood tray for the elevator servo goes in next, and this should be positioned as low as possible in the fuselage to clear the aileron linkage.

Before proceeding further with the fuselage, build the tailplane, which is of straightforward construction. Pick a hard grade of wood for the







Simplicity of construction and clean, uncompromising lines are shown in the two upper pictures, while below is shown the servo mounting, with direct push-rod coupling to the strip aileron horns.

hinge spar—most of the strength comes from this item. With the control horn fitted, the tailplane can be located on the rear fuselage, and the push-pull rod from the servo to the elevator fitted to the correct length.

Cut out the fin and sand to a streamline section, then drop it into position on top of the rear former. Add the supports fore and aft, before fitting the top and bottom decking to the fuselage. The upper nose decking should be added after the fuel tank has been secured in place. A side exit for the pipes and vents, with the tank diagonally across the fuselage, has proved satisfactory. The hinged lid over the battery compartment will be held closed when the wings are in position.

Wing construction is, again, straightforward, but particular care must be taken over the centre-section. The plywood bridge over the servo takes nearly all the wing bending load, and should be securely glued to the plywood servo tray. The wing is held to the fuselage by rubber bands, which will tend to pull the wing aft against the block stop. This stop gives clearance to the aileron operating cranks.

Put all the radio gear in the model and check that it will operate all the flying controls without fouling. The prototype had control surface movements of about 20° either side of the neutral position.

Although Solarfilm covering was used on the original model, heavyweight tissue would also be satisfactory, or even nylon for rough terrain flying. The finished weight should be around 2 lb., thus giving a moderate wing loading. The balance point is shown on the plan.

Flying

A few test glides will show you if your neutral trim set-up is correct and, when it is, a powered flight can be attempted. It has not been found necessary to employ side-thrust on the engine, although a little down-thrust would be beneficial with a motor of high power output. Elevator trim will cope with the power-on/power-off conditions.

The model is neutrally stable laterally, that is, once the required amount of bank has been initiated, the control stick may be centralised while the model continues the turn without tightening. A little " opposite stick " immediately levels out the model. After a shallow drive, *Bravo* will loop.

For gliding over a slope, just remove the propeller to decrease the drag and fly as with a normal sailplane.

Now are you ready to go out and surprise the big boys with their racing engines ? Bravo !