

Do you fancy an R/C twin? Does the thought of two big capacity engines put you off the idea?

Then why not try this simple twin .049 machine.

By G. STRINGWELL

TWIN-KLE should actually have been built a long time ago, in the days of super-regen and rubber driven actuators, but, perhaps, fortunately, it did not materialise in three dimensions until early 1971. I first had the urge to build a twin-engined radio controlled model after watching one fly at Doncaster ten or more years ago (Jim Bridgewood's modified 'Sixgun' with manual pulse rudder), but the sketches drawn at the time did not re-emerge until recently, and any resemblance to the original is now purely co-incidental.

The model was built quickly, since I deliberately kept it structurally as simple as possible, feeling that the twin engines provided sufficient complication. The original uses Pecon 5 on rudder and elevator, and is powered by a pair of Cox TD 049s - relics of my free-flight contest days.

When the time came for the acid test, the model was despatched from a hand launch (rough field conditions) with both motors at full song. A moment's panic followed while it headed for the ground, and then I grabbed for the stick with my launching hand (being a mode 1 flier). A liberal application of up produced a 45° climb with no apparent diminution of speed. After a couple of minutes I had it trimmed out, and took time to breathe again! The model proved faster than I had expected, but was by no means a 'wild ride'. One motor was stuttering badly, and thus the second moment of truth arrived. As the port motor cut out I pushed in full right trim, and found that I still needed a little right stick. However, everything was perfectly controllable and the model

climbed well on one motor. The second cut was followed by a routine (if fast) approach and normal landing (i.e. bumpy in the rough grass).

Subsequent flights were carried out from a runway and the take-off and landing proved to be a pleasure to behold.

The only modifications made have been to fit larger sub-fins, so that single-engined straight flight is achieved with full trim and no stick pressure, and to install clunk tanks once I realised the aerobatic potential.

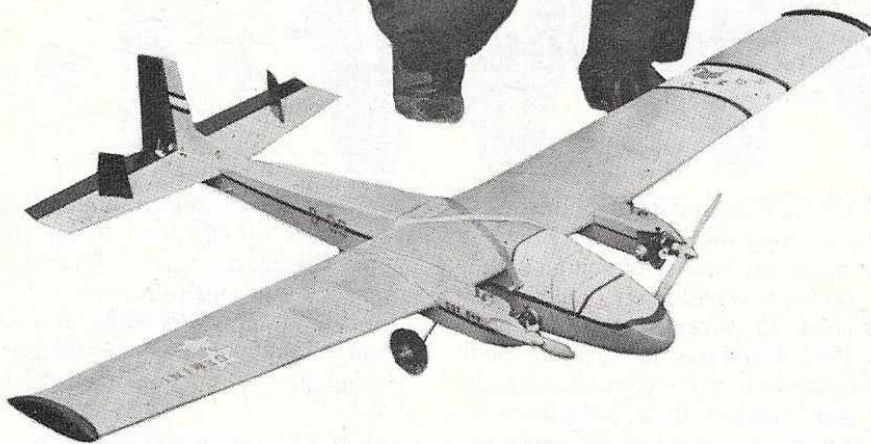
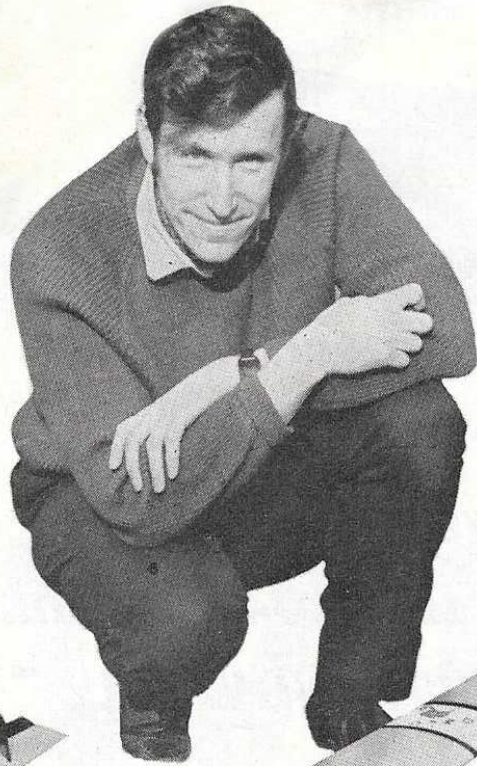
The aircraft is extremely lively with the TD's at 38 oz. all-up weight. Provided that lead-lined balsa is not used, two Babe Bees or QZ's will be quite adequate, although you should be prepared to land with one running if it is sick. Single-engined performance with the TD's leaves nothing to be desired, being similar to a Junior Falcon.

Should anyone feel like fitting 07's or 09's, by all means proceed, but please sound the four-minute warning first. Be assured, however, that such steps are not necessary, since two motors seem to give a much more zippy performance than one of twice the size. No doubt there is some inscrutable scientific reason for this, probably related to the relative efficiency of the airscrew discs. However, I just accept it!

Building points

The structure is utterly conventional and the plans well annotated, and since this is not a beginner's model (it is too hot) the following then is merely a summary of points of interest.

Do not neglect the ply reinforcements where shown on the wing, or the



wire fittings which prevent bands cutting the L.E. and T.E. Note carefully the method of keying the engine nacelles. The top of the short, vertical dowel engages the hole in the wing T.E. ply insert for fore and aft keying, and the hold-down (actually hold-up) bands hook over the bottom of the dowel. The $\frac{1}{8}$ in. sq. spruce key slots into a groove in the wing leading edge fairing.

Detail of the trike undercarriage system showing simple mounting system with plywood let into the fuselage bottom. Noseleg arranged to absorb plenty of shock.

You can, of course, fit the nacelles permanently if you wish, but I much prefer to have them detachable.

Do not omit the sub fins, and note the angle to the centre line at which these are set. The nose wheel fitting may look rather odd, but it springs nicely and on this and other models, has survived many 'untidy arrivals' (i.e. controlled crashes). The main legs on

the original look thick, because instead of piano wire they are made from $\frac{1}{8}$ in. diameter alloy knitting needles (yes, dear, that's where they went), which are very light and have shown no sign of deforming yet (also easier to bend).

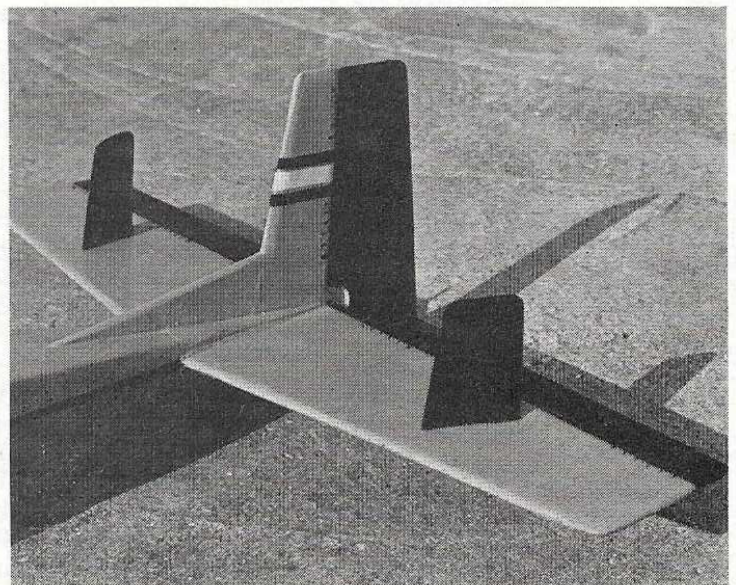
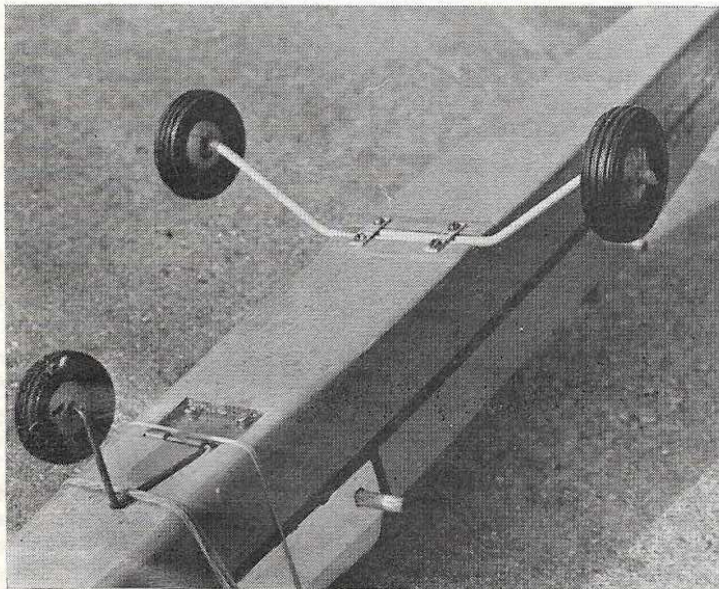
Please use PVA glue throughout, it makes a much better job. Notice that the main spar is full depth, with two part ribs and continuous cap strips. The balance of the wing structure is conventional, and the centre section is completely sheeted. Assemble the wing spar first, and then build one panel at a time, pinning down all the $\frac{1}{16}$ in. bottom sheet components (cap strips, T.E., bottom L.E., etc.) first. Do not neglect the $\frac{1}{8}$ in. washout on the outer panels. The nacelles are assembled like 'mini' fuselages, the beam mounts for the T.D's being $\frac{1}{8}$ in. ply.

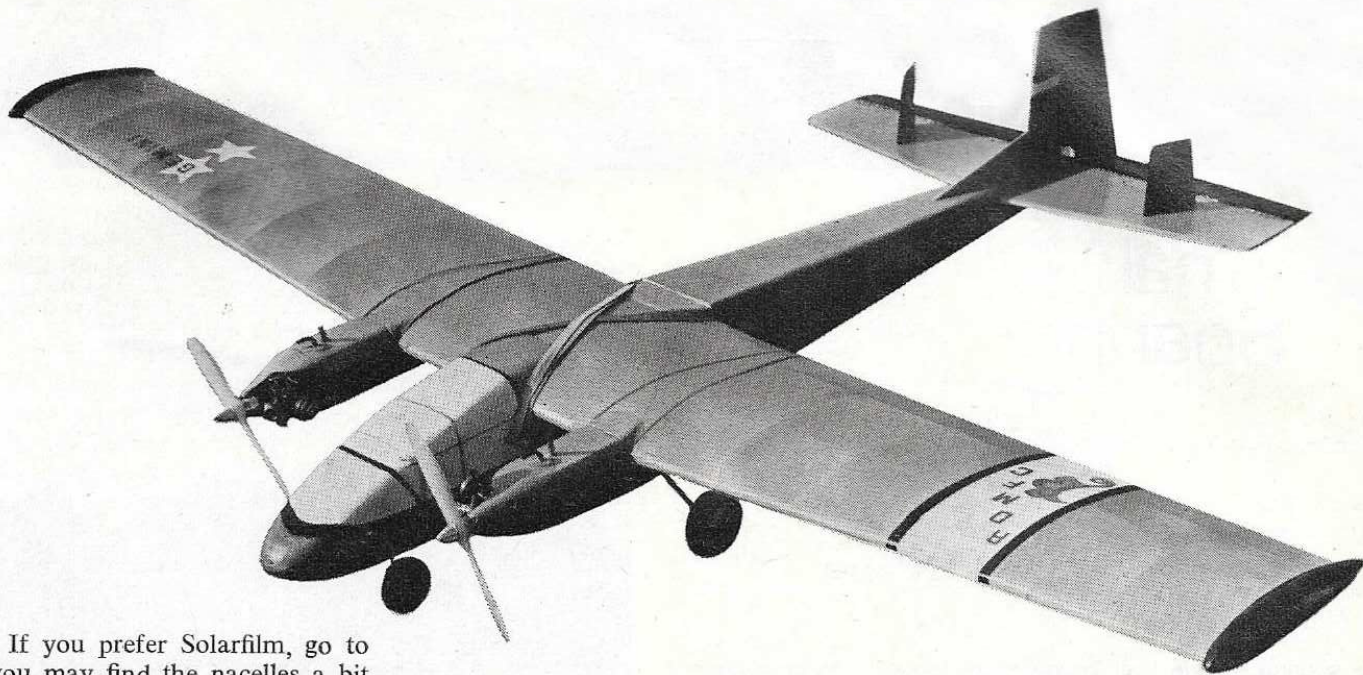
With regard to fuel tanks, I am afraid that these are a 'do-it-yourself' item. Originally mine were straightforward team race types, about 1 oz. capacity. These have since been modified to clunk tanks for aerobatics, and give a 10 to 12 minute run. The tank layout used is shown on the plan, always plug the large bore filler for flying. Of course, Babe and Golden Bee users will have no tank problems.

The cardboard tube built into the nose is from a toilet roll! This is just the right diameter for the power pack. Stuff a bit of hairlok into the nose of it. The servos are simply mounted on the fuselage side with double-sided tape, with a 'crash pad' of hairlok in front of them, and push rods are used on the original, although, of course, tube and cables will do just as well.

Finish on the original was heavy modelspan on wings, light elsewhere, countless coats of dope and two Humbrol orange and sea-grey with black and white trim, plus, of course, fuel

The tail cone of the model showing stitched elevator and rudder hinges. Note the angles of the sub fins - a very important detail which should not be omitted.





proofer. If you prefer Solarfilm, go to it, but you may find the nacelles a bit fiddly if you are as ham-fisted as me. World War 2 camouflage or any airline livery would look fine on this model, but try to keep it light. I would advise not more than 40 oz. with T.D.'s, 35 oz. with Babe Bees. The glide will be fast enough at these loadings!

Control surface moments should be $\frac{1}{2}$ in. each way elevator, as much rudder as possible.

Flying

Fill it up, start it up, let it go (if you have a runway) or chuck it. I start the port motor first so that I am flicking away from the running prop (since I have grown accustomed to having four fingers and a thumb). 6 in. x 4in. props (TopFlite nylon preferred) seem to suit this model very well. Use 15 per cent nitro fuel and make sure both motors are singing flat out. Check fuel feed with the model is a nose up attitude. If you are going R.O.G. (and that really

is half the pleasure) hold it down until it is moving fast, so that you have single engine speed on lift off.

Mine performs loops, rolls, Cuban eights, spins (yes - full power!), and the most horrifying flick rolls (merely get up a little extra speed and whack in full up and rudder - if you can stop it under two rotations, then your reflexes are pretty good). It will also bunt, but I cannot recommend this, the wing was not designed to stand it! All manoeuvres are fast and open, not competition style, of course. Naturally, with less power the T.D. performance will be more restricted.

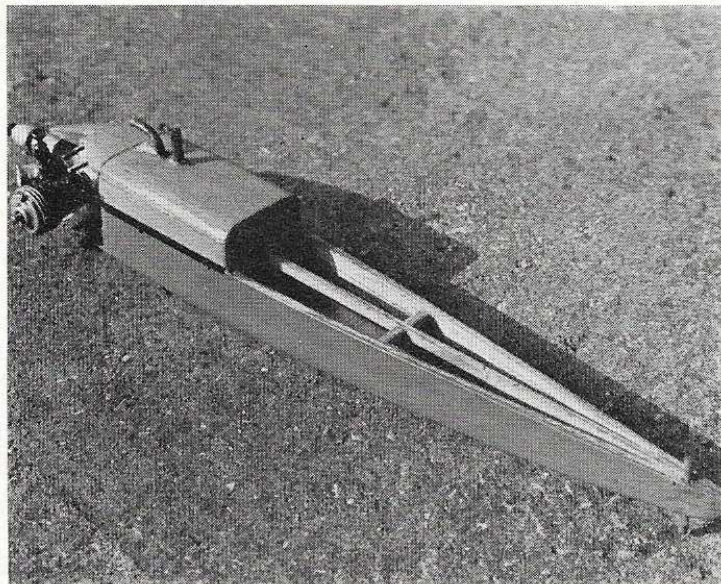
As noted, single engine flight is no problem, simply use full opposite trim and carry on flying normally, merely exercising a little extra care when turning into the dead engine to keep the nose up. Keep some height in hand for when the second motor cuts, since the glide is not a floater, a full circuit takes

a lot of altitude. When the motor stops REMEMBER to take the rudder trim off (yes - I forgot!) Make the final approach fairly steep and fast and, if landing on hard top or short grass, flare out low and put the model down firmly while still moving fast. Once mastered, this technique gives lovely 'wheelers'. If over rougher ground, hold off longer and let it settle tail down, to prevent cartwheeling.

As a final thought, *Twin-Kle* can be a dual purpose model. Take off the nacelles, unbolt the undercarriage, add some lead to the nose, leaving the C. of G. a little behind that shown on the plan, and you have a fairly aerobatic slope-soarer for medium wind speeds.

In summary, this model has given me a bigger kick than any sport multi I have flown before. It can be flown around gently just for looking at (a rewarding pastime) or hurled about in the most spectacular fashion.

Close-up of one of the engine nacelles showing motor in place, and tank vents, construction is simple.



Note here how the engine nacelles attach to the wing. Cylinder heads of the two motors point inwards towards the fuselage to preserve appearance.

