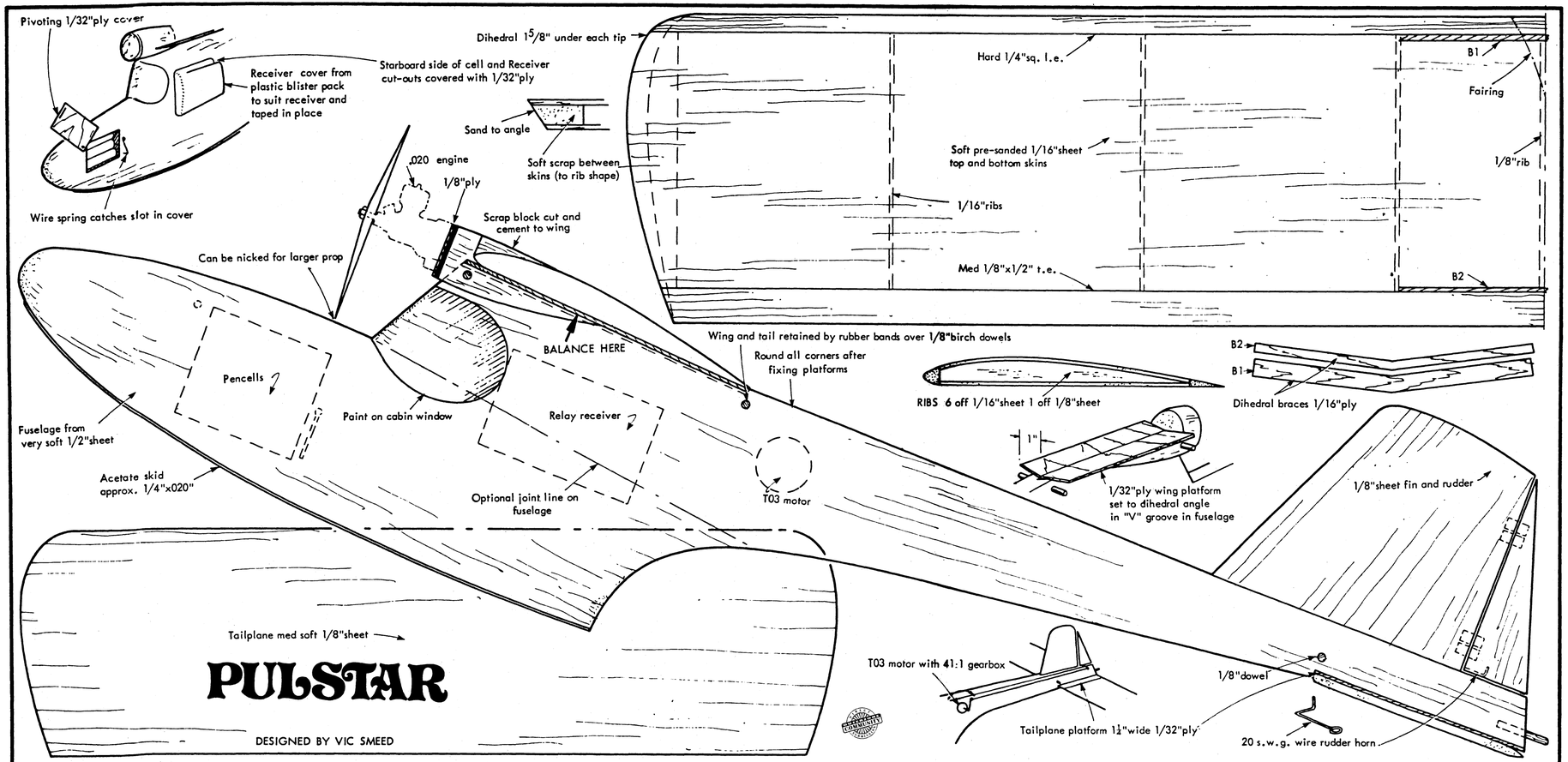

either direction is likely at the neutral position, when the dwell (or mark) is equal on both contacts. You may have heard the expression 'mark/space ratio' which is how the relative switched-on/switched-off time of the contacts is expressed. In neutral, 50-50 means equal mark and space on both contacts, while 70-30 means one contact on for 70% of the time, with 30% 'silence', and vice-versa on the opposite contact.

If the motor is geared down around 50 or 60:1, a dozen revolutions of the shaft will give 70-90° movement at the final gear, which can have an arm fitted to it. Alteration of the mark/space ratio will cause the motor to rotate more in one direction and thus bias the arm. The arm will always be moving and therefore if a rudder is connected to it (by the usual pushrod and horn) the rudder will be continually wagging. However, when the mark/space ratio is altered, the wagging rudder will be biased left or right, thus turning the model.

Pulsing, in its heyday, was created by mechanical or electronic pulse boxes which pulsed the transmitter signal on and off and could vary the mark space ratio. Nothing other than the receiver, relay and actuator was needed at the model end, apart from batteries of course. Manual pulse simply substituted the thumb for the pulse-box, simply pressing a button on/off at about 1 pulse per second. It takes only a few moments to get the hang of varying the on-off action to influence the rudder left or right. There were refinements such as spring-biased output arms, to prevent the output arm making complete revolutions at moments of inattention and it was (is) possible to use a transistor switcher rather than a relay, but the simple system described works well.

On the original, a T03 motor/gearbox was used as an actuator but any efficient, low-drain small motor could be used, with a couple of gears from a discarded servo. Alternatives are one of the very small rubber-driven escapements such as the Futaba (with the rubber run along the fuselage side), an American Rand miniature pulse unit, or even one of the modern very light miniaturised servos used conventionally.

Power is a Cox .010 (if you still have one!) or .020 but a free-flight version flew very successfully with a 'Wasp' .049. If you go to this size, use an inefficient prop, at least for initial flights. The model is rugged and should survive a few tumbles while trimming but if a hot .049 and efficient prop would be called for. Another suitable motor would be the *G-Mark* 03 'Humming Bird.'

Check for balance at approximately where shown after installing all the gear, adding a little ballast if necessary. Hand glides are safe enough — it's little more than a powered chuck glider anyway — and use a little wing or tail packing as necessary. The original didn't need any and the thrust line proved to be correct as shown on the plan.

Just one warning if you've fitted radio — everyone will want to have a go with it, so remember to take a spare set of cells along with you or you could get it back too late!

In the beginning . . .

Construction is very straightforward but pick really soft balsa for the fuselage, if possible with a long grain pattern. White, grain-free wood could snap in a cartwheel. A join line is shown so that it all comes out of a 3in. wide sheet. Fit the wing platform after making the wing, to get the angle right. The only critical bit is the thrust line, though a couple of running-rich test flights will give the opportunity of shimming behind the radial mount to give more up or down thrust. The cut-outs for the pencells and receiver will depend on your particular equipment; a thick (.010in. or so) blister from a used accessory pack, or a plastic soap box, makes a container for the radio.

Make half the wing by pinning down the leading and trailing edges with dihedral braces cemented in place and the bottom sheet of soft 1/16in. Add ribs and tip block, sand and add top sheeting. Then prop up while the second half is built.

Tailplane and fin are softish 1/8in sheet with the edges sanded round and the rudder is attached with nylon ribbon or film off-cuts, etc. The original model was sanded all over, given three or four coats of clear sanding sealer, decorated with colour dope lines and tape, then thinly varnished with polyurethane. Obviously thin fuel-proofer could be used. The tape was chrome Sellotape, which flashes when the model is very high and stays weathertight under the polyurethane.

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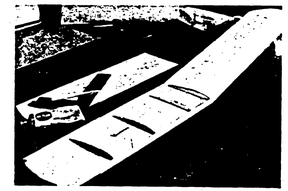
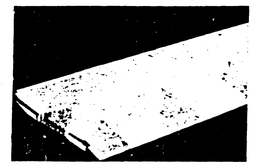


Left: showing the simple construction of Pulstar's wings, being all sheet they provide a durable, fairly crashproof structure but be sure to use light sheet. Below and below left: wing construction detail, note the use of adhesive tape to hold wing sheeting whilst glue sets. Far below: major construction finished, check alignment of wings and tail before continuing.



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