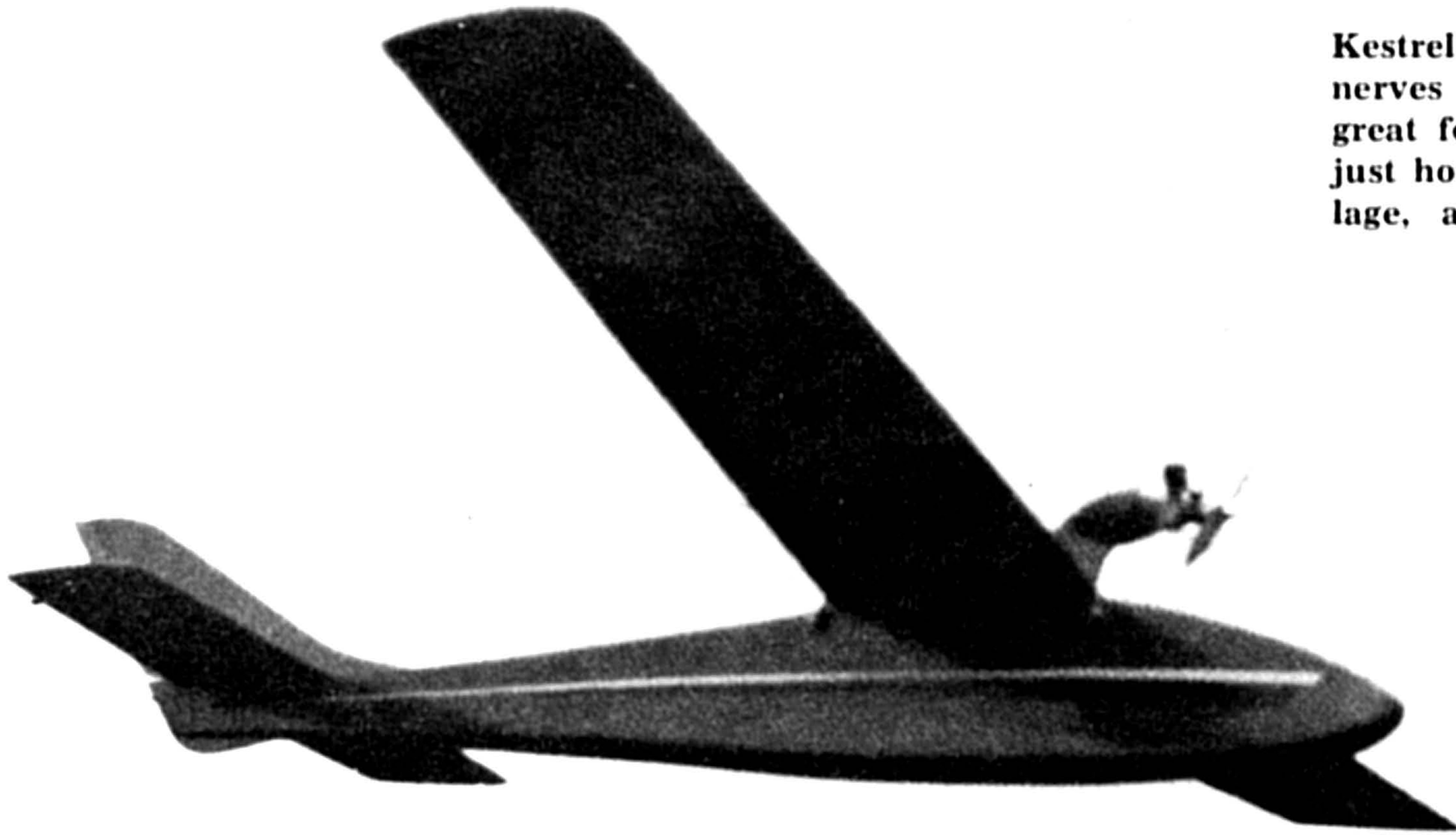


Kestrel is an antidote. It settles high-performance-multi nerves with slow, gentle, single-channel gliding. It is great for in-town small-field flying. Photos below show just how simple it is; all-balsa Jedelsky wing, box fuselage, and sheet tail surfaces. Fine R/C trainer too.

Kestrel

An 020-assisted soaring model for rudder-only, offers relaxing, long flights.

DAVID BODDINGTON

TWITCHING the transmitter levers of a high-speed guided missile demonstrates present-day radio equipment is accurate enough to follow every shake of the hands. It is exhilarating, but it needs an antidote. Kestrel is such an antidote. Flying is slow and easy with only rudder control. This type of model can give hours of fun, and it can be flown from any small flying area.

The Kestrel is the fourth in a line of powered gliders. The design started life as a pure glider for thermal and slope soaring. Unfortunately, the nearest slope soaring site is about 50 miles away and with the vagaries of English weather, often results in an abortive day's would-be flying.

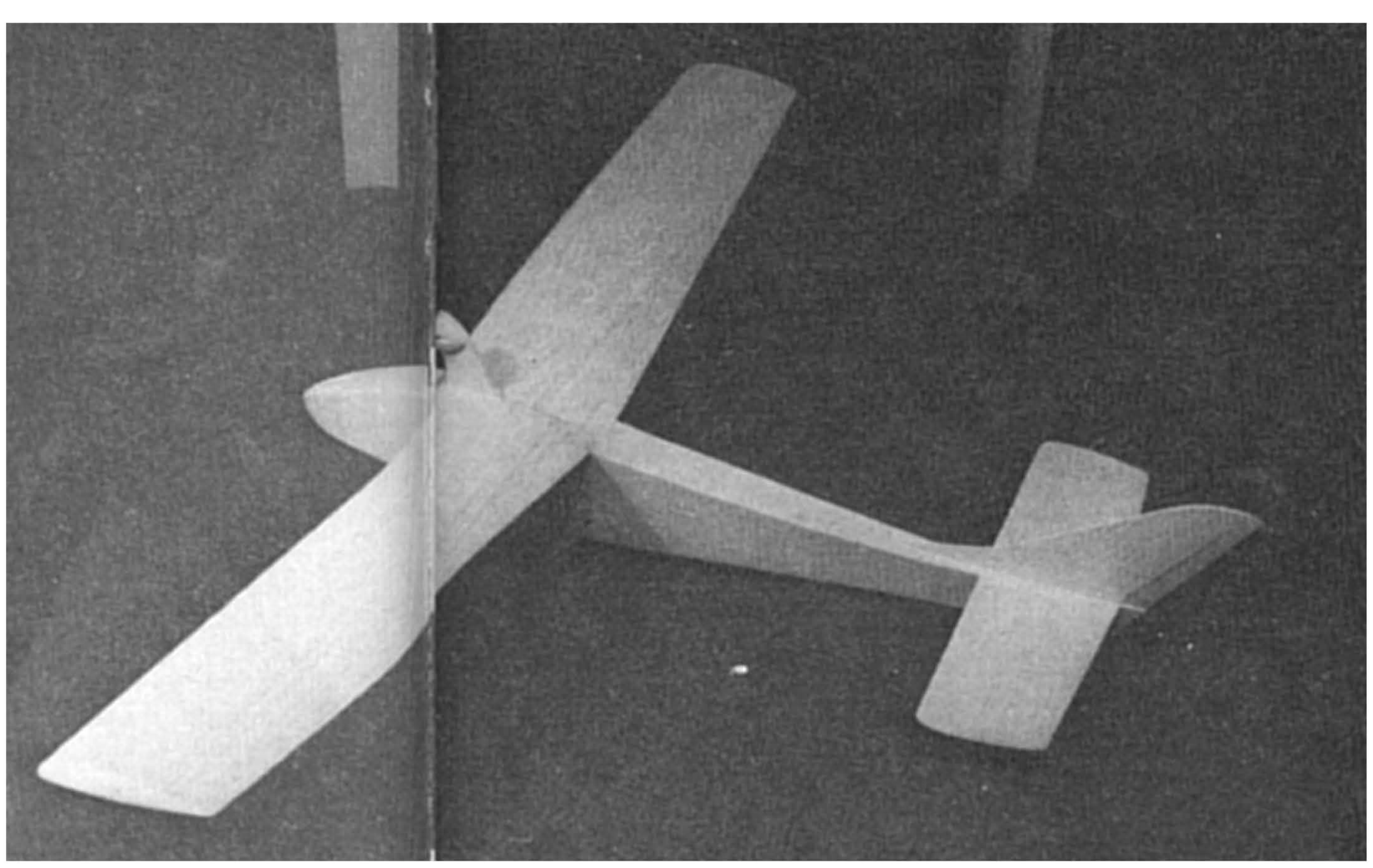
Having given up free-flight flying eight years ago, my attempts to tow the model up on the line proved that my fitness had deteriorated and my legs would do a maximum of 6 mph. But the model required a towing speed of about 8 mph ground speed in still air conditions. By substituting a great length of 1/4" flat rubber, it was possible to achieve the same results without expehding so much energy, or needing a hill. But long grass sliced through rubber like a sharp razor blade. So back to the building board. With a large hill, uncooperative legs, 30 yards of rubber cut to assorted lengths and with a Cox 049 mounted on a pylon and, presto, I was in business.

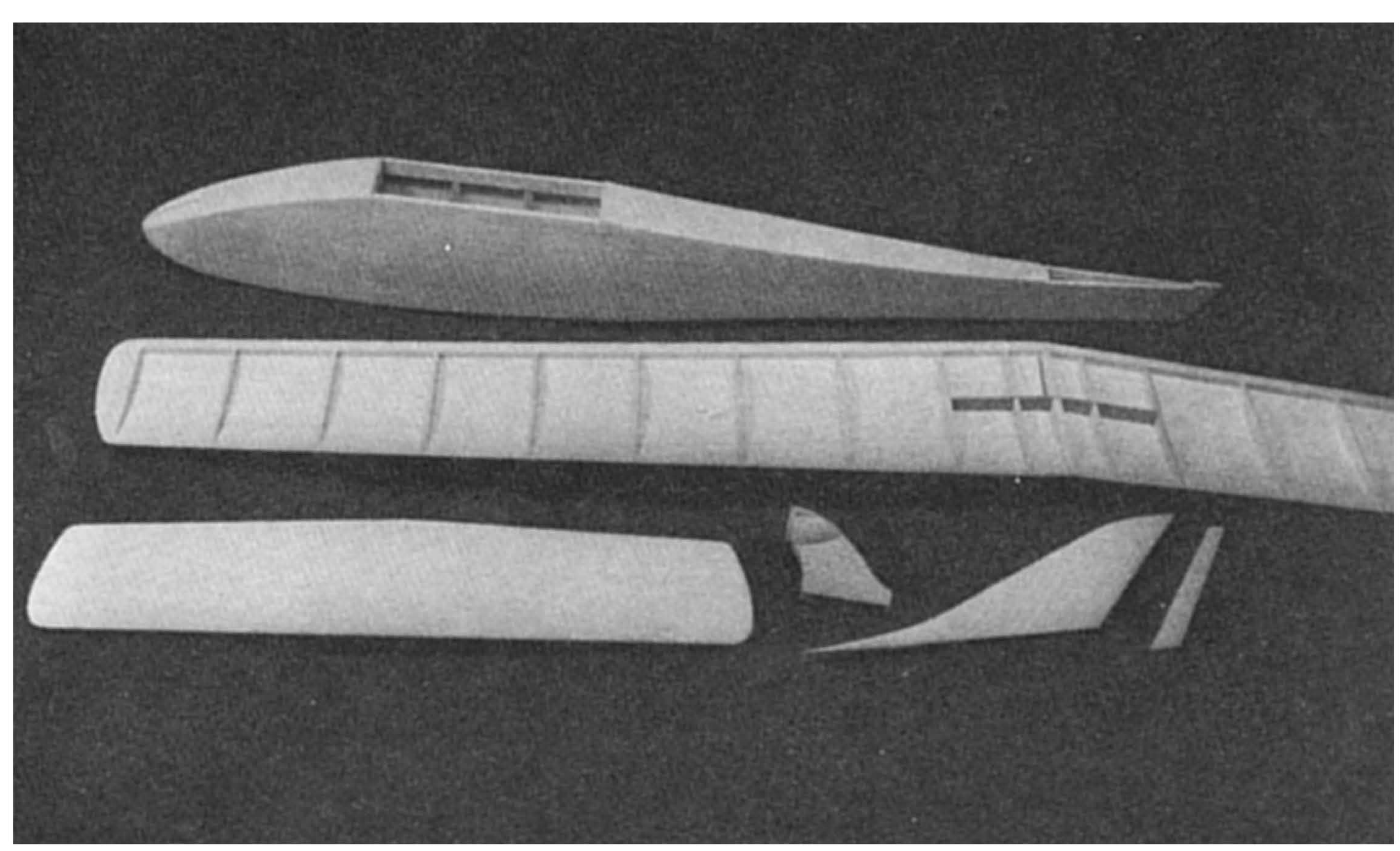
This original 53" span model was eventually joined by a 36", 010-powered design featuring similar construction to the Kestrel shown here. "Picconiny" proved delightful to fly. It gave an interesting comparison between the sheeted, undercambered wing used, and the conventional built-up, covered wing of the previous design. The sheet wing had a higher lift / weight ratio, allowing a slower flying speed — excellent for calm days and thermaling. For heavier and more bulky radio gear the "Apprentice" was drawn up to cope with 020 to 049 engines, and used a constant-chord conventional wing of 49" span. Although it could be flown in more varied weather conditions, and was tough enough as a slope soarer, it did not possess the power-off characteristics of the Picconiny. The Kestrel resulted.

I am convinced of the desirability of positioning the engine on a pylon over the wing. The high thrust-line helps avoid nosing-up following turns and dives. The high engine position is more efficient than the conventional nose set-up. It is surprising that this layout has not been employed on more models, particularly beginner's designs, since advantages include the non-sensitive engine side- and down-thrust conditions.

The Kestrel (virtually an enlarged Picconiny) was constructed quickly because I could not wait to try out the latest ACE Pulse Commander outfit. When you consider that the superhet measures only 1 5/16 x 1 3/4 x 9/16", weighs little more than half an ounce and operates from 2.4 volts, the potential of this double-ended receiver becomes apparent. Add an Adams Baby magnetic actuator and a couple of 225 nickel cadmium button cells and you have a lightweight outfit suitable for small or low-pow-

Continued on page 66





Kestrel

Continued from page 35

ered models. (There is no reason why you should not use more powerful twin L. V. actuators with larger Nicads for 15-powered models.) To be able to fly small models safely and reliably is a distinct advantage for modelers with small field facilities.

Because the transmitter was specifically designed for use with magnetic actuators, and features a 95/5% width variation, the rudder action is smooth and proportional to stick movement over the total range.

My only complaint was the method of coupling the actuator to the rudder. The double yoke system seems to be unnecessarily complicated and the method shown on the drawings works excellently, is simple to install and uncouple. Also shown on the drawing is a mounting board arrangement for the receiver, actuator, switch and charging socket.

This model is a proven design and is strong enough to stand up to the average flying conditions. Please think twice before "improving" it by strengthening various parts, sheeting in the underside of the wing, or adding an 049 to the power pylon, etc.

Construction: Try to get clear, straight-grained wood that is tough but not too heavy (not the carroty type that snaps easily across the grain). Bear in mind that the lighter the completed model, the better it will fly and the softer it will come to earth. White P.V.A. glue (Titebond or similar) can be used for nearly all the construction. Cut out all the balsa wood and plywood parts before commencing construction; this saves time in the long run and makes assembly enjoyable.

Fuselage: Glue to the 1/16" sheet fuselage sides 1/16" nose doublers, 1/8" center-section doublers, 1/16 x 3/16" uprights and stern posts. Glue in position, when the sides are dry, formers F.2, 3 & 4, temporarily holding together the stern posts to assure correct alignment. The tail unit can either be removable or glued in position and, if the former is contemplated, dowels will have to be allowed for in the fuselage.

Epoxy a piece of plastic tubing between grooves in the stern posts and glue these posts permanently together. Rear fuselage top and bottom sheeting should all be fixed with the grain running crosswise. The 1/4" top nose sheeting to the nose can have the grain running lengthwise and the forward underside sheeting is reinforced with 1/32" or 1 mm. plywood. Add the 3/16" plywood nose keel (which serves as a weight box) and the hard block balsa to either side. Sand the whole assembly smooth and drill for dowel holes.

Wing and engine pylon: The wing sheeting is made up of front and rear balsa sections with a strip of 3/32" x 1/4" spruce between. This spruce strip can be omitted if very tough (stringy not brittle) balsa sheet is used for the wings. Cut the wing panels slightly oversize on plan to allow for the camber. As the wings are left open on the underside it is suggested that the sheet balsa be well sanded before construction, and also given two coats of sanding sealer. All wing ribs should be cut initially to identical sizes.

Pin down the 1/2 x 3/16" shaped L.E. and glue and pin the ribs in position. When the joints between the L.E. and ribs have dried, the 3/32" sheet is glued in position — the pins can be left in the ends of the ribs to hold them in position. Both wing panels are constructed in a similar manner. When the panels are dry remove them from the building board and trim the underside of the ribs toward the trailing edge. This method of wing construction automatically builds in a desirable amount of wash out.

Add the 3/8" wing tips and sand the wing panels to a smooth finish. Cut slots for the dihedral brace and glue in position at the same time joining the two wing panels together. Reinforce the trailing edge of the wing center with 1 mm. plywood, bent in the middle to follow the dihedral angle, but not cut. The engine pylon is made up from a 3/16" balsa center core, with lightening hole, and 1 mm. plywood sides. These ply sides extend through a slot in the 3/32" sheet wing root ribs. Make sure the joint between the wing slot and the pylon is well glued to prevent ingress of fuel. Former F.1. is epoxied to the pylon and reinforced with 1/2" balsa side cheeks. Round off the side cheeks to blend with former F.1.

Tail Surfaces: These are all from sheet balsa and straight forward to construct. I prefer to use sewn nylon thread hinged for the rudder, but whatever method is used, it must be absolutely free in operation. This applies also to all linkages and bearings, etc. With the limited amount of torque available from small magnetic actuators, no binding or stiffness of any description can be tolerated.

Radio installation: The advantages of having the receiver actuator and attendant equipment and all wires neatly mounted on a board are numerous. It is electrically and mechanically superior to having all items separately installed and the board can be changed easily from one model to another. The 3 7/8" x 1 1/2" mounting board will fit most small models. The Nicads are kept separate and their position can be adjusted to obtain the correct center of gravity.

I used 600 ma. Nicads to reduce the amount of ballast to be added to the nose. Most technical radio experts will agree that the vertical whip aerial is the most effective. It is a practical proposition. A suitable length of thin (about 1/40" dia.) piano wire is epoxied and bound to F.4 at the rear of the wing and the shortened receiver aerial lead soldered to it.

Completion of model: Methods of finishing the Kestrel will depend to a great extent on the modeler's preference but try not to overdo the decoration which adds weight. Under no circumstances should the bottom of the wing be covered and I would suggest that the wings be uncovered, and decoration added only to the leading edge and center section. Fuel-proof the whole of the model paying particular attention to the pylon area and top of the wings. Use a small strip of foam plastic between the fuselage and bottom of the wing leading edge to prevent any fuel from seeping into this gap.

Flying: Before ever venturing onto the flying field for test flights check carefully: 1) that the balance of the model is correct; 2) the wings and tail surfaces are free from warps; 3) the radio equipment is functioning 100% (99% is just not good enough).

Wait for a relatively calm day for test flights. The Kestrel flies quite slowly and test glides will give a good indication of the glide trim. Do not launch it too hard or with the nose up. Adjustments to elevator trim can be made by adjusting the incidence of the wing or, if a removable tail assembly is used, on the tailplane. Alternatively, a hinged trim tab can be fitted to the tailplane.

Power flight can be undertaken with the engine running rich or the propeller reversed to reduce the thrust. Make a note of any tendency to turn, climb, or dive both under power and on the glide. Aim to trim out for a straight, flat glide first; any further adjustments for powered flight should then be made with engine thrust-line alterations.

You will find this model really easy to fly with no vicious tendencies. It holds its nose into the wind very nicely, needing little rudder correction. On the first dozen or so flights the model has only landed on half of those occasions; the other flights were terminated straight into the hands of the waiting helper.

If you live in an area where strong thermals are prevalent it may be necessary to fit some form of D.T.

FULL SIZE PLANS AVAILABLE — SEE PAGE 60