



I WAS ONE of the people who got their hands on the Kyosho Sportavia when it was at the Aeromodeller offices for testing. The way the Cox Black Widow is able to pull a two channel model of nearly two metres span into a respectable climb never failed to amaze me. It also set me thinking that this is the kind of model I need for some nice, relaxed, Sunday afternoon flying. It will slope soar if I feel like it and operate out of a small field if I cannot be bothered to drive very far. After thumbing through some magazines on full size gliders, I had a firm

Three weeks later the prototype was ready to fly and I had burned a lot of midnight oil. What emerged is an attractive model which is not difficult to build or fly and is at home on a slope or a flat field.

Wing

The ribs for the straight taper wings are made by the sandwich method. Cut out a root rib and tip rib template from thin ply and sandwich the required number of balsa blanks. Remember the templates are 1.5mm smaller all round than the final

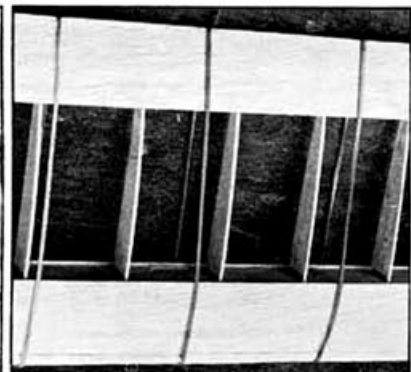
straight and true. When this is dry, pin the spar vertically onto the plan with a 1.5mm packing piece under the full length. Also pin onto the plan the bottom 1.5mm sheet piece of the trailing edge and glue on all the ribs. Using a straight edge or marking gauge cut out the vertical grain trailing edge webs and glue in place between each rib. Epoxy in the small rear wing joiner tubes. Add the top of the trailing edge plus the top spruce spar and leave to dry. Cut out the rear member of the leading edge from 3mm balsa sheet and sand the edges to fit into the rib outline. Glue on the trailing edge 3mm square cap and the rear member of the leading edge.

When dry sand to exact shape and epoxy in the main wing joiner tubes. Cut out the top and bottom leading edge sheeting. Damp the outside surface to encourage a curve and then glue and pin in place, or use contact adhesive.

Add capping strips top and bottom and the centre section sheeting. Carefully sand the leading edge absolutely flat. Add the 6mm sheet front piece of the LE to the rear member, and carve to shape. Add the tips and centre end plates. I glued mine on with the wings together to get an exact fit. Sand carefully all over using a fine paper on a fairly large piece of wood. Rough blocks or scraps can be put in at this stage to achieve the centre section fairing although the final shaping should be left to match the fuselage at a later stage. Finally, add the small 1mm ply segment shaped plates to the fair-



Full depth wing spar. The bottom spruce spar is glued to the vertical web before fitting the wing ribs.



Use elastic bands to hold the leading and trailing edge in place while glue sets.



With the end plates fitted, join wings and mount on the fuselage. Shape soft balsa block to fair wing into fuselage form.

idea in my mind of what sort of model would resemble a typical sailplane. For some reason or other I do not like the look of low wing glider designs although it is the practice for most full size motor gliders. A high wing design was therefore adopted for looks and stability.

The preliminary outline sketches began to look very attractive. I talked them over with the editor who gave me the benefit of his experience with similar models and then the ideas joined the 101 other projects I have not got round to doing.

A telephone call from the editor asking after progress and whether it could be ready for this issue lifted the project to the top of the pile and me into frantic action.

section due to the sheeting and capping going on later. Numbering the blanks before making up the block makes assembly easier. I prefer to make two, handed, sets of ribs at the same time.

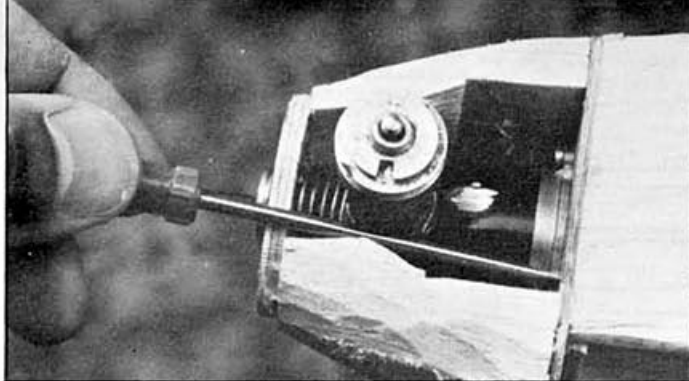
Sanding down the same set of templates twice can result in wings of slightly different section. Using a small saw, cut out the spar knotches and leading edge flat. A small file is a useful tool for getting a good fit. Using the root and tip rib to mark the tapering depth of the 1.5mm balsa main spar, cut out two spars using a long straight edge. Mark off and cut out the rib knotches and use the template to cut the root rib angle. Glue on the bottom spruce spar only and leave to dry under weights to hold it

ing and trim to shape. The fairing shape enables the wing to twist and ride up on 'wing tip first' landing and the ply facings avoid damage during this manoeuvre.

Fuselage

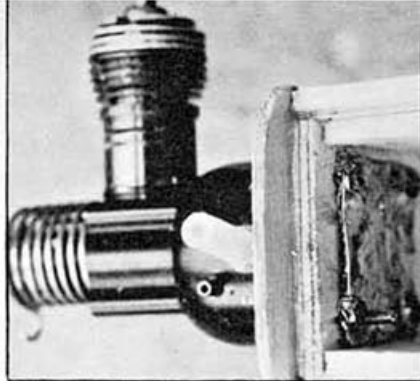
Before making a start on the fuselage, spend some time making sure your engine and your radio will fit the version drawn.

The engine I used is a Cox Black Widow and the radio is a two channel Futaba Medallion 'M' series with 33M servos. Because the radio installation needs room to get the pack in and push it forward into the nose, the servos need to be side by side well back and out of the way. On the prototype they only just went in, too close for comfort,



Left: make sure that engine fixing screws are accessible and that the motor can be removed after fitting cowl. Right: epoxy engine fitting nuts to rear of bulkhead or solder to tin plate which can then be epoxied to bulkhead.

Fuselage side with 1mm ply doubler in place. Make sure the doubler is glued over its whole surface.



and even then they needed to be slightly staggered. The plan shows a fuselage 3mm wider than the prototype so 33M's should fit nicely but check if you are using any other type. This plane asks quite a lot from an O49 so do not be tempted to fit anything clapped out or with significantly less power than the one I used.

A G-Mark 06 would be a good alternative but remember not to extend the beams back too far otherwise the radio gear cannot be pushed far enough forward to get the right centre of gravity. Select two similar pieces of 3mm sheet balsa and cut out the fuselage sides.

The 1mm ply doublers can be cut out next — note that they stop short of the 6mm sq balsa at the bottom. The rear triangular strengthening plate is also cut from 1mm ply. Glue the sides, plates and doublers together making absolutely certain you have made one left hand and one right hand fuselage side. Leave them to dry under substantial weights. Add the 6mm sq balsa along the bottom edge. I made mine out of two pieces of 3 x 6mm as it was easier to bend. Glue on the 3 x 6mm spruce braces. When the side assemblies are dry, set them up, upside down, on a flat board exactly vertical and exactly parallel. Glue in the spacers at the parallel part of the fuselage and leave to dry thoroughly. Trim the inside of the rear end so that it fits together neatly when pulled in. Make sure the sides pull in symmetrically around the centre line of the fuselage. Glue the rear end together and leave to dry.

Cut out the engine bulkhead and drill for the engine. Solder the engine mounting nuts to a tin plate and epoxy it to the rear of the bulkhead. Pull the front fuselage together and glue in the engine bulkhead.

Plank in the bottom of the front fuselage with 3mm sheet cross grain. Add strengthening fillets behind the bulkhead. Make up a mounting to suit your servos and fit them in place. Fit in the control rods. I used the plastic snake type. Connect up to the radio gear and make sure the controls operate in the correct mode. Make up a radio gear parcel of the battery pack and Rx. Mine is wrapped in foam carpet underlay. There is no foam on the sides as it is a tight fit. The parcel needs to be neatly made to be able to slide in and out. A loop of sellotape will provide a handle to pull back out of the nose.

Try your parcel in and out a few times before filling in the nose top because then it is too late if it gets stuck. Make sure you fit



the switch somewhere where it does not get in the way. Cut out the rear top deck formers and the piece of 1.5mm sheet to be rolled round.

I made mine very wet and rolled it slowly round a broom handle. When dry it can be eased on and trimmed quite easily. Fit in the vertical braces and glue the top formers in place. When dry, fit and glue on the sheet top. (If you cannot get on with this rolled sheet idea, plank it with soft 2.5mm sheet).

Glue in the wing dowels and fill in the top of the nose. Trim the wing fairing to a good fit. Make up an engine cowl to suit your engine. Remember you need to be able to remove the engine — that's why both my

thin coats of a domestic polyurethane paint. Finally, a thin coat of hot fuel proofer was applied to the fuselage and over the trim and edges of the Solarfilm. Assemble the model and check that the centre of gravity is at the position shown on the plan. Reposition the radio gear or add ballast, if necessary. Carefully view the model from all angles to ensure it is square and true.

Flying

Choose a calm day for test flights and a sloping field with long grass if possible. Adjust the engine thrust line if there are significant trim changes between power-on and glide.



'cheeks' are removable — to be able to get at the screws. Trim and sand the whole fuselage to shape. (Go easy on that 1.5mm rear top deck sheeting). With the 6mm sq set in the bottom one can get a quite large radius. Trim a commercial canopy to fit or fashion one out of flat sheet. Do not glue it on yet.

Top deck made wet and rolled round broom handle.

Fin and tailplane

Cut the fin and rudder out of 4.5mm sheet (medium). Sand to shape and fit the hinges and horns. Glue the fin at right angles to the tailplane. Glue the assembly to the fuselage making sure it sits on squarely, add block to either side of fin and shape to match fuselage. Connect up the control system, line up the horns and make final adjustments to the control system.

Finishing

Sandpaper the whole airframe structure very carefully and fill any mistakes with Polyfilla. On the prototype the wings, fin and tailplane are covered with iron-on film. The fuselage was covered with tissue and given three or four coats of dope and talcum powder. After rubbing down, I gave it three

The prototype was flight tested in rather blustery weather and proved rather lacking in elevator control. All the photographs are of this model although after the first flying session a larger, all sheet tailplane was fitted and this is shown on the plan. The larger tailplane did the trick and the model is no longer over sensitive. Remember it is a powered glider and steep turns must be avoided near the ground because the model almost invariably loses height. Flat, gentle turns are much easier to execute.

Marking the servo fixing holes. The plan allows more width in the fuselage than is shown here.

