City Gent

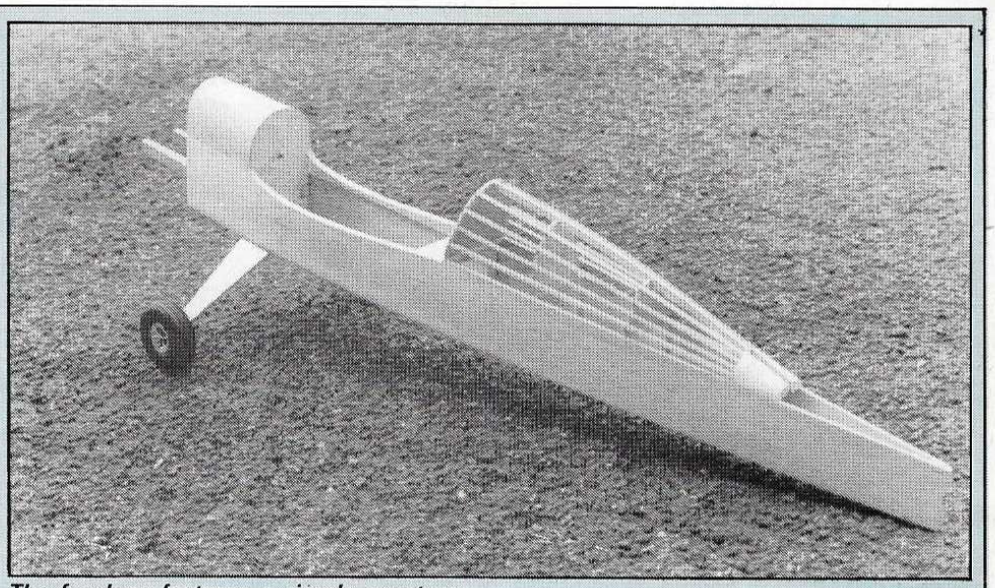
Designed for .40 four strokes and four function radio by PHIL KENT, this little sportster is ideal for noise sensitive fields.

"Yes, I like it, do it". That was the comment by your editor when I showed him a small scale drawing of a proposed aerobatic fun machine for small four-strokes at last years Cranfield Expo. At that time I was wanting another fun model for flying at one of our club fields, which had become four-stroke only. My previous design Bantam, was being used at the time, but I wanted something which looked different to the run of the mill sport aerobatic model. I thought that a model based on the 1930 American circuit racers could be quite appealing. This led to a design with upright engine (easy to operate), open cockpit (cheap and easy to make) and nicely rounded flying surfaces (good looks). I also made provision for bolt on wings, a dural undercarriage and steerable tail skid. A shoulder wing layout was adopted and the model would fit into the car in one piece. I like to use standard size sheets of balsa, it's cheaper and there is no trouble getting hold of it. There is nothing exotic used in the construction and don't be put off by the shape of the wing and rolled ply decking, they are easy.

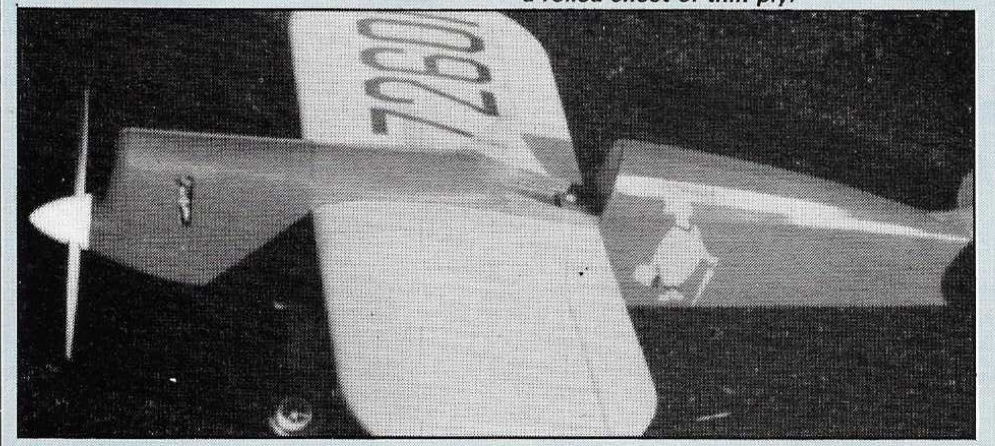
So you're wanting to get started? I like to kit a model before starting. It's much easier if all the parts are to hand before you start.

Fuselage

Select two similar medium hard sheets of 1/8 x 3 x 36in. balsa for the sides, cut to shape and using a contact adhesive attach the 1/32in. ply doublers. Shape the engine bearers as shown on the plan (note that the spacing shown is for the Enya 35/40 four-stroke) and epoxy them to the sides. The plywood formers F2 and F3 are then epoxied in place and when dry the lower F5 and stern post (make sure that the fuselage is true at this stage). The remaining lower formers are then fitted, the 1/8in. sheet doublers under the wing and the rear decking formers. The 1/8in. sheet keel piece F9 ties the upper formers together and the 1/8in. square stringers complete this portion, epoxy the 1/8in. ply undercarriage plate in place and the 3/16in. ply wing mounting plate. The 1/8in and 3/32in. balsa underside sheeting can now be added with the grain running cross-ways. To complete the fuselage add the rolled ply decking at F2 and F3 and the soft balsa fairings on the rear decking.



The fuselage features a simple construction and distinctive lines. Front decking is a rolled sheet of thin ply.



The tail surfaces are simple, all 1/4in. sheet structures. Choose light, stiff sheet. One 36 x 3in. sheet will make the tailplane if you cut carefully and about half a sheet for the fin and rudder. I used a wire joiner for the elevators, but spruce could be used along with an external horn. Make up the steerable skid before epoxying the tube to the fuselage.

Wings

Make a plywood template of the wing rib, complete with slots for the spars. Using the template cut out four 1/8in. ribs and twelve 3/32in. ribs. Cut W2 and W3 out individually. Select some hard 1/8in. sheet for the mainspar and some 7/16 x 1/4in. for the rear spar. (This is a non-standard size, you may have to cut your own). Shape and slot the spars as shown on the plan. Cut the 1/16in. ply tips and dihedral braces and you are ready to go.

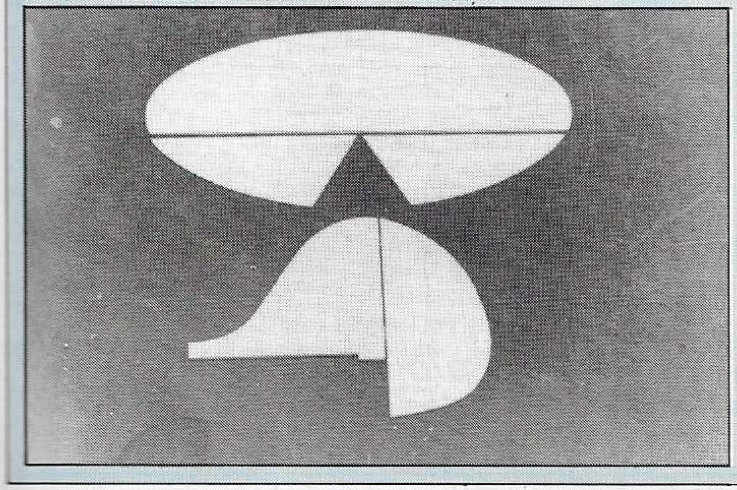
Join the mainspars with the ply braces and pin the mainspar and rear spar to the plan. There is a 3/8in. packing piece below the rear spar. Try a dry run with the wing ribs, you will have trim the centre ribs for the braces. Glue all the ribs in place and add the 3/4 x 3/8in. leading edge which is on 1/4in. packing pieces. Add the 1/16in. ply tips to complete this stage of the construction. Remove the port wing from the plan and using the marked positions on the plan repeat this building sequence for the starboard wing.

Cut the 2in. wide lower trailing edge, chamfer the rear edge and pin down over the plan. Position the wing and glue in place. Pack up the front of the wing until dry. Add the top sheeting, but do not cement the curved part of the sheeting at the trailing edge. This can be done when the ailerons have been cut away from the wing structure. Repeat for the starboard wing checking that the wing remains true. Remove from the board and add the balsa tips, shaped and faired to accommodate the leading edge sheeting. Add the gussets and filler pieces at the centre section and then re-pin the wing down over the plan again, with the packing under the leading edge. Complete the top leading edge sheeting, holding down the tip portion with plenty of masking tape. Repeat for the other wing. Add lower leading edge sheeting, centre section sheeting and cap strips. Cut the ailerons away from the wing and add the 1/4in. sheet aileron spar. Glue up the curved part of the aileron and shape the spar to allow for the aileron movement. Fit the horns and hinge the ailerons. Fit the bellcrank mount and push rod exit sheeting. The 16 swg push rod, bellcrank and aileron push rods are fitted prior to covering.

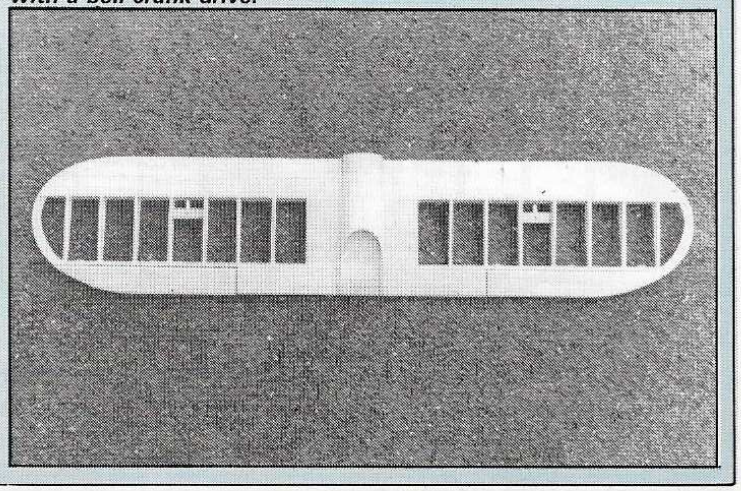
The fuselage and wing can now be married together and the mounting plate and peg epoxied in place. The formers F3A and F4 should now be fitted to the top of the wing centre along with 1/8in. sq. strips for attaching the ply decking. Make a paper template for the ply decking, when satisfied, transfer the shape to the ply.

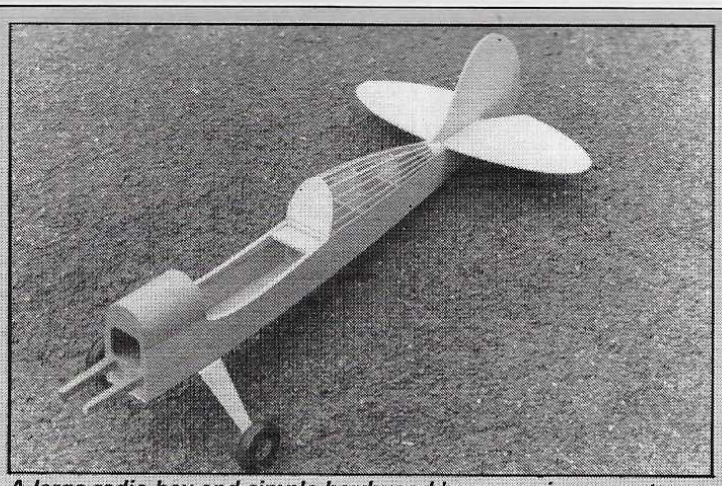
The cowl is made up from block balsa and ply rolled over formers C1 and C2. When finished the cooling ducts should be cut, don't worry about cutting away former

Tail surfaces are cut from 1/4in. balsa sheet.



Light and strong wing has a D-box leading edge and inset ailerons with a bell crank drive.





A large radio bay and simple hardwood beam engine mount are a feature of the model.

All that is missing from this photo of the uncovered complete airframe is the built up cowling.

C2. The cowl is attached with small woodscrews into the bearers, a lower block cowl is fitted after the engine bolts have been screwed in place. The tailplane and fin should be tied in place, do not glue until after painting. The complete structure should be well rubbed down and filled.

The tailplane, fin and rudder were covered with lightweight modelspan and the rest of the model with Solartex. Cellulose paint was then used, white for the wings and tail and claret for the fuselage and fin. Amber trim sheeting provided the City Gent logo. (These are the Bradford City AFC colours). The SMAE number was in black Fablon. The whole model was then sprayed with aerogloss fuel proofer. The dural undercarriage was attached with 4BA nylon screws. These have proved quite satisfactory so far and I've had one or two bouncy landings. There is ample room for the radio gear as can be seen from the photographs. The model balanced on the mainspar when finished and this seems fine. When all the controls are connected the fin and tailplane should be epoxied in place. An acetate windscreen completes the model.

Kick Off

I was quite pleased with the result but would it fly? We were in the middle of the first calm period of weather for ages, so it was down to the flying field as soon as possible. The model was fuelled up and the engine started. A check showed that all the controls were working and in the correct mode. You can't check this too carefully, I know! The throttle was opened and away it went, straight as an arrow. I climbed to a safe height and did a few circuits to get the feel of the model. This was fine, no trims needed to be altered. What would it do? All the usual loops, rolls, inverted flight and combinations were tried. I would think some of you clever pilots would be able to do almost anything.

The engine was not running quite right so I decided to land. No problems here, the final leg being flown quite fast. The model was down for a three pointer, which was very pleasing. Further flights confirmed that there were no handling problems and a couple of dead stick landings proved the low speed characteristics.

This model is a fun machine. Go out and enjoy yourself, remember also with a four-stroke up front you are not going to upset Joe Public too much.

Hope you like the City Gent, good flying to all who build one.