

Mike Delacole gives construction notes for his .46 size high wing sportster

Plans

excellent sports machine. The prototype, as mentioned in my Chilli Wind article, had a 57" wingspan and weighed in at just over 4.1/2lbs. Power was provided by a Super Tigre S45 ABC, fitted with a tuned silencer, and went like a rocket, yet handled well at low speeds. The wing is identical to Chilli Wind, with 9/16" dihedral under each tip. Anyone wishing to try this configuration would only have to increase the distance between F2 and F3 by 1.1/2" and amend the wing seat to accept the different wing section.

prototypes have all used two stroke engines, I would be interested to see one fly with a 70 four stroke. For this the nose would have to be shortened by about 20%, but one of the advantages of 'straight line' models is that they are easy to customise. Whilst there is no need to go over the top with your efforts to save weight, it pays to be sensible in your choice of timber. Do remember that house bricks are not renowned for their slow speed flying capabilities. A realistic target would be between 4.1/2 - 5lbs. The eagle eyed amongst you will have noticed that the undercarriage in the photos is different to that shown on the plan. Having tried both types, I have come to the conclusion that the simpler approach, carried over from Kamco Kadet days, is preferable.

During this period I also did some experiments with a tapered wing version of the Rival and this was called the Cyclone. This is a slightly more specialised aircraft, but still makes an

this type of model, but a foam wing will not add too much weight and will also cut down the building time. The prototype weighed in at 4.3/4lbs and power was provided by a Rossi 40 that I had left over from the Chilli Wind project. This is a beautiful, robustly engineered piece of equipment and now comes with a tuned silencer that DOES reduce the noise. The Rival has been designed with a 40-46 engine in mind and does not really need anything more powerful, but I am sure that will not stop a few of you squeezing something a tad naughtier up front! Although the

Building notes

The first thing to do is to study the plan to familiarise yourself with the way everything goes together. Try and build the airframe 'in your mind' before putting knife to wood. This will save a lot of





Mike designed the original Rival way back in '85. This, the latest version, is slightly bigger to accommodate the popular .46 class motors. A .40 will still give a good account in the all built up, lightweight airframe.

time and expensive errors. All models fly better if they are accurately built, so do take care during each stage of construction, from marking out to the final balancing.

Ways with wings

If you are going for the built-up wing, the first job is to make a pair of templates so we can knock out a couple of sets of wing ribs. It is a good idea to have the aileron stock and a bit of scrap 1/16th sheeting at hand to check that the trailing edge of the finished wing will match up with the leading edge of the aileron. This can save time later on and makes for a neat job. Check also that the spars are a good, but not tight, fit. I like to load the rib blanks between the templates in the order that they will go into the wing, so just to make sure, I number them. It will also help to mark 'top' on one edge of the templates, then run a felt tip pen across the 'top' of the finished set of ribs. The wing will be built in two panels, to be joined later using ply braces. The sequence for each panel is:

1. Pin bottom spar over plan.
2. Glue ribs on to bottom spar, supported at the trailing edge so that the centre line of each rib is horizontal.
3. Glue the leading edge in position.
4. Ditto trailing edge.
5. Ditto top spar.
6. Shape top and bottom of trailing edge to follow contour of ribs.

Purists amongst you may be tempted to make a separate rib for the one which is set at an angle as it is, in fact, slightly longer, but I have not found this to be necessary.

We now have two panels which are to be joined together using ply braces. If you want to build in some dihedral then now is the time to do it. Take your time over this stage and make sure everything is accurately aligned. Next job is to add the ribs at the centre and

plan the servo box. I always like to prepare the groove for the wing locating dowel at this point, so as to eliminate the need for drilling at a later stage. In anticipation of the need to add some weight to the left hand tip, glue some scrap block to the inside face of the tip rib immediately aft of the main spar.

Now we can start the sheeting process. Starting at the bottom, first fit the leading edge sheeting, followed by the trailing edge and finally the centre section and tip. When adding the top sheeting it is a good idea to have the structure supported in such a fashion that all is straight and true and leave it in that position until the glue has thoroughly dried.

The next jobs will be:

1. Shape the leading edge using a razor plane and sanding block.
2. Add capping strips.
3. Cut each piece of aileron stock into three pieces.
4. Hinge ailerons.
5. Epoxy torque rods in position.
6. Drill ailerons to accept torque rods.
7. With the ailerons fitted (but not glued) and held accurately in a neutral position, add the fixed portions to the centre and tip. Don't forget to groove the centre portions to accommodate the torque rods.
8. Add 1/4" sheet tips.
9. Glue wing locating dowel in position.

The wing can be laid aside for the moment whilst we make a start on the fuselage.

Quick build fuz

The fuselage goes together very quickly, so it is a good idea to make up a kit of the remaining parts, including the tail feathers, to avoid any hold ups. I like to mark the centre and datum lines on each former, as this is a great help when it comes to checking incidences etc. Drill all holes for the

motor mount etc in F1 before it is glued in position. Note that the engine is mounted 15 degrees off horizontal in an effort to get the silencer as near as possible to the centre line of the fuselage. The suggested building sequence is as follows:

1. Glue the ply doublers to the fuselage sides using a contact adhesive.
2. Mark horizontal datum line and position of all formers onto the inner face of each fuselage side and cut out the tailplane slot.
3. Pin the fuselage sides to a flat building board and glue on the triangular stock, doublers around the tailplane and wing seat reinforcement.
4. Check that the formers are an easy, not tight, fit when held in their respective positions.
5. With one side still pinned down to the building board, epoxy F1 and F2 in position and leave until the glue has set.
6. The other side can now be added. Take whatever steps necessary to ensure that this is done accurately as any twist built in at this stage will be permanent.
7. Chamfer the ends of the fuselage sides prior to joining them together, not forgetting the 1/4" spacer made from scrap sheet. F3 can also be added at this time. Glue the 1/2" triangular reinforcing fillets to the rear of F1.
8. The rest of the fuselage sheeting can now be added. Fuel proof the tank bay before it is fully enclosed. Note that the sides are straight from F3 rearwards.
9. For a neat job it is advisable to fit the nose plate with the engine installed and the spinner to be used also to hand.
10. Glue the undercarriage mounting plate into position and accurately drill the holes for the undercarriage legs. Glue the ply supports to the inside of the fuselage sides.
11. Add the ply support and short piece of dowel in place for the tail skid mount.
12. Accurately mark and cut out the slot for the fin in the fuselage top.
13. Now is the time to do the rounding off and shaping of the basic fuselage.
14. The next task is to fit the tailplane and fin in place, so firstly the 1/4" spacer will have to be removed. Before applying any glue it is a good idea to have a dry run to check that everything will be accurately aligned. It is also useful to make a simple jig so that everything is supported in the correct position while the glue is setting.
15. Now we can tidy up the wing seat and check that the incidence is as shown on the plan. Don't forget to allow for wing seating tape if it is to be used.
16. Glue captive nut plate into the fuselage and prepare the holes for the wing mounting bolts, making sure that the wing will be correctly aligned when the bolts are tightened down. Finally, the ply reinforcing plate is glued in place. Any fine adjustment can be made before the glue dries, so here again a dry run will be useful.

We now have the basic airframe and can start on the little jobs that need doing before covering takes place. These include the wing fairing, pushrod exit holes etc. This is also a good moment to make up the pushrods and plan the closed loop, if used, to the rudder. For positive, slop-free operation, I like to run the pushrods diagonally through the fuselage in order to eliminate the need to make any bends in the wire ends. When satisfied that all the building is complete, give the entire airframe a final sanding.

Cover up

The prototype was covered and trimmed with Solarfilm and this is undoubtedly the lightest way to go. Some of you might prefer Solartex or even a mixture of materials. Whichever route you choose, give the model a thorough dusting off before starting work. It is a good idea to treat problem areas, such as around the engine bay or sharp internal corners, with Clearcoat (or a similar product) to aid the adhesion of the covering and increase the longevity of the finished job. Fuel seepage is the kiss of death for iron-on coverings, so anything you can do to avoid the problem can only be beneficial. Thoroughly fuel proof the engine bay before installing the engine mount etc.

Radio installation

There is plenty of room to allow you to plan what goes where. This is best done with the model fully assembled so that the R/C gear can be positioned to achieve the required C of G, if possible. There is plenty of room above the tank to install the nicad if necessary. Also

balance the model laterally. A lot of modellers seem to prefer to have the receiver aerial running down the inside of the fuselage. If you plan to do this you may think about installing some sort of conduit a little earlier in the proceedings.

The finished model, less fuel, weighed in at exactly 4.3/4 lbs, which is not bad considering that the Rossi weighs about 3 oz more than some .40s. I should mention that I shortened the nose slightly on the prototype to allow for the extra weight.

Rival in flight

Before starting the engine, carefully check that all the controls are moving in the correct sense and then get someone else to check them too! The control throws shown on the plan are intended as a safe starting point and I would recommend that you familiarise yourself with the model before increasing them, as things can get quite lively!

The day for the test flying was ideal; warm blue skies and just a little breeze. The Rossi was fired up, turning a Bolly 10.5" x 6.5" at 13,500 rpm on the ground. Bolly props are really superb – it's just a pity that they cost about four times as much as the cooking variety! I suppose that this is a small price to pay for excellence. Who needs to eat anyway?

For the maiden flight the transmitter was put into the hands of ace flyer, Trevor Burgess, who proceeded to put the model through its paces. And very impressive it was too, with continuous axial rolls, slow rolls, inside loops, outside loops etc etc. The Rival showed the smoothness I was hoping for and proved capable of all the manoeuvres

DATAFILE

Name	Rival
Designed By	Mike Delacole
Aircraft Type	High wing sport
Wingspan	55.5"
Wing Chord	10.5"
Wing Area	575sq ins
Aerofoil	15% symmetrical
Dihedral At Each Tip	None
Fuselage Length	46.5"
Tailplane Span	22"
Tailplane Area	135sq ins
Tailplane Section	Flat plate
Fin Height	8"
Engine Range40-.46 cu ins
Fuel Tank	8-10oz
Rec. Number of Channels	Four
Control Functions	Aileron, Elevator, Throttle, Rudder
C.G. (from L.E.)	3.5"
Elevator Throws	1/2" each way
Aileron Throws	3/8" each way
Rudder Throws	1.1/4" each way
Sidethrust	None
Downthrust	None

Materials used in Construction

Fuselage	Balsa, ply
Wing	Balsa, ply
Tail Surfaces	Balsa
Weight, Ready to Fly	4.5-5lbs
Wing Loading	18-20ozs/sq ft

normally associated with a low wing pattern job. Vertical performance was also very impressive, but the slow speed characteristics are excellent, so the novice or the expert should feel equally comfortable twiddling the sticks.

So, enter the Rival, a flying machine with a 'pussycat to hot dog' performance range, that builds up both quick and light, has distinctive, yet classical lines, and is also an ideal subject for building from a plan. What more is there to say except get yours today! Have fun and fly safely... ●



"Enter Rival, the flying machine with the 'pussycat' to 'hot dog' performance!"