**Red Arrow**

Red Arrow can be made from one sheet of 1/16 inch (1.5mm) balsa and so has a total cost of less than £1. To effect this economy all you need to do extra is make three 1/16th sheet balsa fuselages and stick them together using the minimum of glue.

If you had a good stock of balsa select the grades for each component as recommended on the plan. If not, go to a model shop and choose a 1/16" x 36" x 3" sheet of light, good quality balsa with a straight grain. For glue you can use balsa cement or an ordinary white PVA wood glue. Although the latter takes longer to set it is easier to use. With a waterproof poster paints and a rubber band you have all the materials you will need.

Transfer the shapes of the plan onto the wood. This can be done in two ways. The simplest way is to place the plan over the wood and stick pins through it to give a series of pin pricks in the wood which will enable you to draw the outline of the shapes. If you can obtain the use of a document copier then there is an even easier way. Just make a copy of the plan and you will find that when you iron the copy face down onto the wood it will transfer the lines onto the wood.

Cut out all the components with a very sharp knife and sand them to the exact shapes required. You can buy special balsa knives but the ones with snap-off blades are good too. If any part is not quite right, it is worth making another one if you have enough wood left.

That's what the experts do. The 1/8" X 1/16" strip to stiffen the front of the wing can be cut from the sheet using a ruler as a guide. Metal rulers are the best ones for this but do not glue them to the wings yet. To obtain the curve in the wing make up a jig which will hold the wing in the curved position. A strip of balsa 1/8" thick (two pieces of 1/16") under the highest part and weights on the leading and trailing edges should do the job. Steam or wet the wing and then leave it in the jig over night to dry and set.

Sand the root of the wing where the two halves join to an angle to give a good joint when they are put together with the 1/16th dihedral at each wing tip. Do not glue the two ribs in yet. Very carefully cut the curved slot in the fuselage to the shape of the wing. It will be easier to cut the slot to take the tail at this point too. Arrange two blocks to rest the wings in their correct position for the dihedral. It is a good idea to put a piece of clingfilm under the wing joint to stop it sticking to the surface underneath. Glue the two wing halves together and leave them until the glue is perfectly dry. Usually overnight.

Slide the wing into the fuselage and glue it into its true position when viewed from the front and top. You may need to trim the slot a little. Once again leave to dry. Now add the stiffeners and two ribs which will help to keep the undercamber. The ribs can be held in place using clothes pegs. When dry sand to shape. The final piece of construction is to glue the tail and fin. If you are not sure about what paint to use try it on a spare piece of balsa first. Many paints will do but only use ones that are light such as waterproof poster paints. Check the CG, or balance point, and add lead or plasticine to the nose until it balances exactly at the point shown on the plan.

Make a catapult as shown on the plan and go out to a big open space with no people about. Try throwing the model a few times to see what it does. A launch at a slightly downward angle should produce a gentle smooth glide. If it stalls by going up and then dropping the nose suddenly, push the tailplane trim tab down. If the model dives push the trim tab upwards. A slight turn is obtained using the trim tab in the fin. When this trim is OK you can try by trial and error to get a good catapult launch. This is usually done by launching the model slightly nose up with a considerable bank angle of about 45 degrees. Try different ways until you get a good flight pattern.

To get the best performance you will need a lot of practice. When you feel you have got it right why not build a higher performance version. Instead of 1/16" sheet for the wings, tail and fin use fairly hard 1/32". You will need to be more careful handling it, but it should be lighter and perform even better.