

➤ This model glider project will give hours of fun for both you and your child.

High in the sky

Chris Beswick shows you how to make a model glider – an ideal Christmas present for a child or for yourself.

Even if you've never tried aircraft modeling before, a model glider is easier to make than you might think. The very basic design described in this article is inexpensive and quick to make, but as you can see from the photograph, it flies rewardingly well. All you need to make it is a sheet of 1.5mm balsa which comes in 1 metre lengths 100mm wide, some tissue paper and PVA wood glue. The fuselage is a piece of hardwood 450mm x 10mm x 3mm.

The plan which accompanies this

article is shown at scale and, if photocopied and temporarily taped onto the balsa sheet, will provide a sacrificial template for cutting out.

Cutting the components

You need a sharp craft knife and a ruler. It is better to use a more substantial knife, such as a Stanley knife for the straight lines, but a small-bladed knife is easier to handle for the curves. The design is very economical on materials as the nine ribs, tailplane (or horizontal

stabiliser) and rudder are cut from the waste of the wing frames.

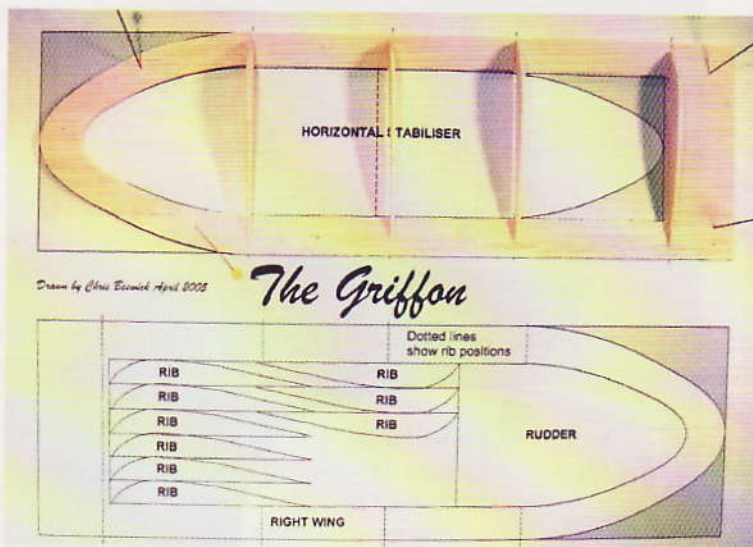
Making the wings

Each wing is assembled from the frame and four ribs. The last rib is used later in final assembly. The rib positions are marked with dotted lines on the plan. When gluing balsa which is very absorbent, it is better to apply a coat of glue to the mating surfaces to seal the surface. Allow this to dry and then apply a second coat and assemble. The joint can be reinforced by applying a further coat of glue around it after assembly is complete.

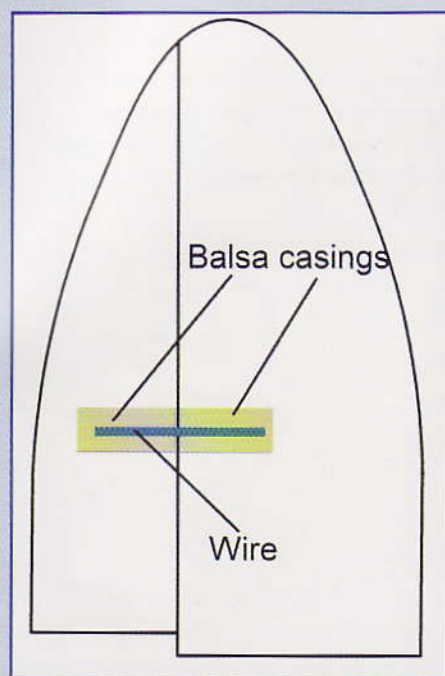
You may find it easier to pin the frame to the plan over a piece of softboard or polystyrene and use the markings on the plan to precisely align the ribs. The ribs provide the aerodynamic shape and hence the thicker part of the rib should be placed at what will be the leading or front edge of the wing.

The fuselage

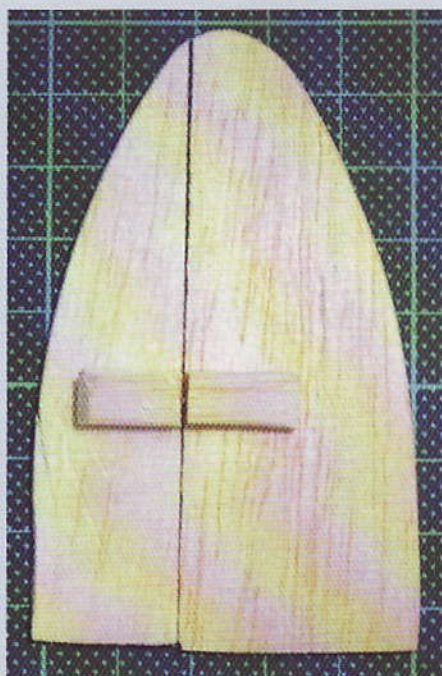
The fuselage should be tapered over the last 90mm of its length to a thickness of 5mm. The tailplane is mounted on the underside of the fuselage at this slightly negative angle and helps to stabilise the glider in flight. You can now glue the tailplane to the end of the fuselage.



➤ Each wing is assembled from the frame and four ribs. The template provided opposite will make the job easier.



❶ Graphic 1. The rudder.



❶ The movable rudder gives better control over the direction of flight and requires just a little more work.

The rudder

You now need to decide whether or not to opt for a movable rudder. The movable version will give much better control over the direction of flight and requires just a little more work. Cut the rudder into two as shown on the plan and cut away a millimetre or so from the bottom of the movable part to allow clearance for movement when mounted on the fuselage. Cut the two U-shaped pieces of balsa (coloured in yellow) and glue them to the rudder parts. The small piece of soft florists' wire (coloured blue) which provides the hinge should now be glued using a bed of epoxy resin adhesive inside the wells provided by the two U-shaped pieces. Cut out two covers (shown in the photographs) and glue them to the U-shaped pieces to complete the housing. Now glue the rudder to the rear top of the fuselage to complete the tail assembly.

Assembling the wing structure

The wings are mounted on pylons as shown in the diagram at an angle which is known as a dihedral angle. This improves stability in flight. At this stage the assembly must not be glued to the fuselage as the optimum wing position will be found by test flying and moving the wings' position

on the fuselage (see later in the article).

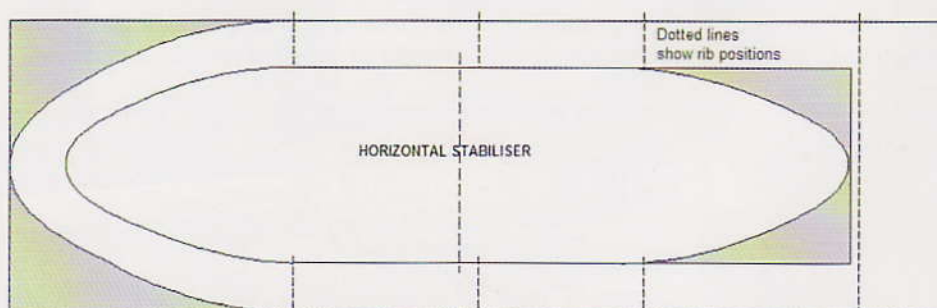
The wing mounting block is made from two pieces of the balsa glued together. After gluing the pylons to the block, file or sand a shallow 'V' into the top of the assembly to fit the wings (see the diagram).

After bevelling the end of the wing to the angle required (see the diagram), glue

the first wing to the pylon assembly, resting the wing tip on blocks providing a 35mm difference in height between the wing root and tip. In the photographs, you can see that I have slid the pylon assembly temporarily on to the fuselage for stability whilst the glue dries. Glue the second wing in the same way and when everything is dry, apply a fillet of glue to the underside of the joints for strength. Finally, the last rib can be glued on top in the joint between the two wings.

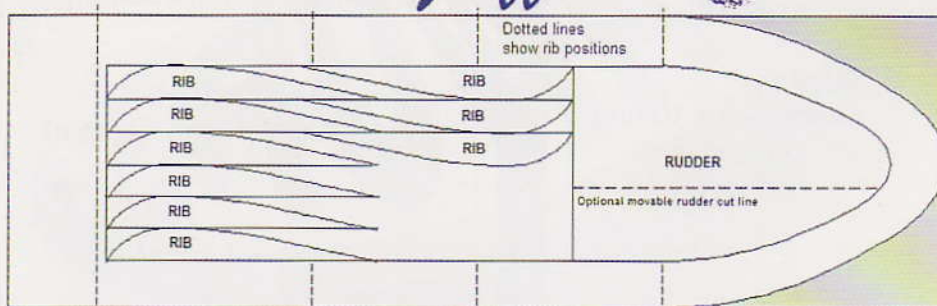
Covering the wings

The wings are covered in tissue paper. Buy the best quality that you can find. White is preferable as the dye in the coloured tissue is water soluble and can run. Make up a 50% solution of glue thinned with water, and with a brush, apply to the outside edges of the wings and to the top of the ribs. Allow this to dry. Tissue can be applied in two or more pieces and overlapped. Cut out sufficient tissue to cover the wing and apply another coat of adhesive to the wing. Attach the tissue to one side of the wing and smooth it down as tightly as possible to the other side. Remove as many wrinkles as possible, but do not worry too much as the next stage will tighten it up. Trim off the excess tissue.



Drawn by Chris Bewick April 2005

The Griffon



❶ The template to use to build your own model glider.

Steroids for powertools!



Give your powertools the edge with Ruwag's comprehensive range of professional drill bits, hole saws and jigsaw blades. **Remember, your powertool is only as good as the accessories you use.**

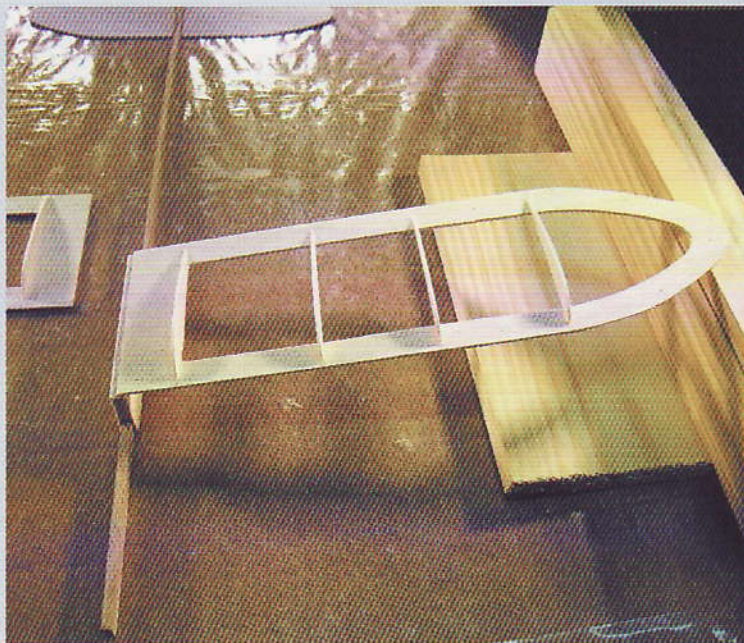
Don't settle for 2nd best, insist on Ruwag's proven German quality from your nearest retailer.

THE PROFESSIONALS CHOICE!

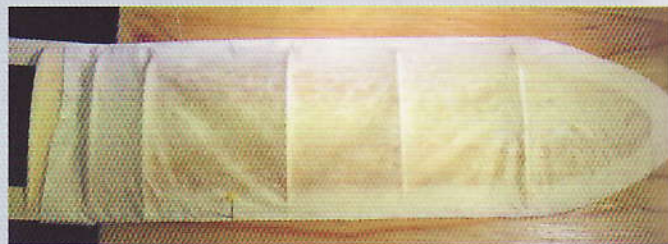
Quality Guaranteed

Original Ruwag

Precision Tools



© After bevelling the end of the wing to the angle required, glue the first wing to the pylon assembly. In the photo, you can see that I have slid the pylon assembly temporarily on to the fuselage for stability whilst the glue dries.



① The wings are covered in tissue paper. Make up a 50% solution of glue thinned with water, and with a brush, apply to the outside edges of the wings and to the top of the ribs.


When the glue has dried, pin one wing onto the board to prevent warping, and spray the pinned down wing lightly with an atomiser full of water. The paper should not be wet, but the idea is to get a light, even dampness. As the paper dries it will shrink. Leave the wing pinned down until dry. Repeat for the other wing.

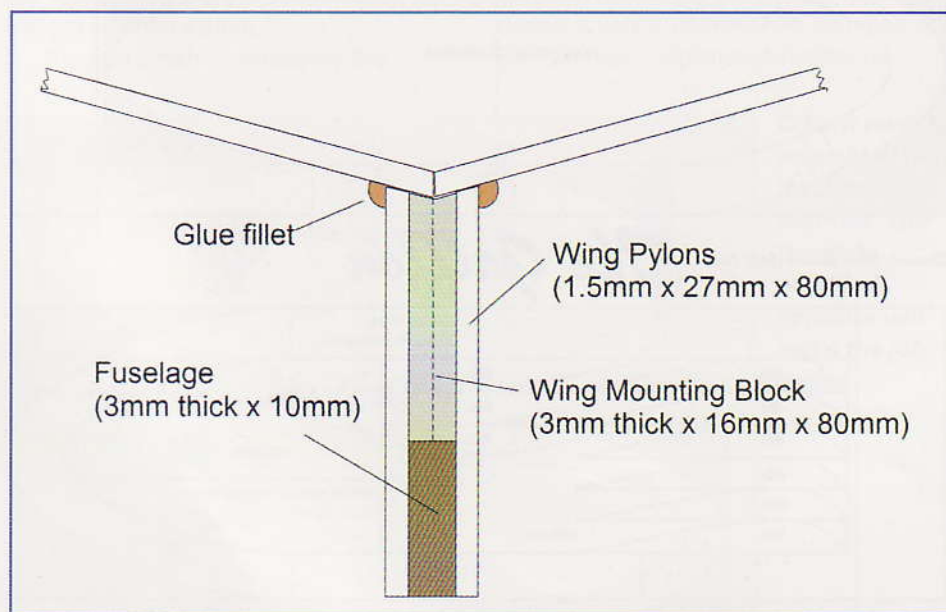
Assembly and test flights

Attach the wing assembly about one third down the fuselage with masking tape. The glider must now be balanced by adding

weight to its nose. Add modeling clay or Prestik until the plane balances when the fuselage is held lightly under the wing joint at about 1cm from the front of the wings. The final position of the wings and exact amount of weight required are found by test flying on a calm day. To test the glider, aim the nose at a point level with the launching height about 10 metres away. If the wing position and weight are right, the plane will glide long and flat. If it climbs and then sinks back on its tail, add more weight or move the wing back. If it dives,

move the wing forward. When you are happy with the glider's performance, glue the wing in place on the fuselage.

Involve your child in the construction of this model – not only will he or she enjoy flying the glider, but they will have the satisfaction of having participated in its construction. They will also have learnt something along the way. 



① Graphic 2. Assembling the wing structure.



① The completed glider on its test flight.