

ATTACHING WINGS TO BIPLANES

by Mike Stuart

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Editor

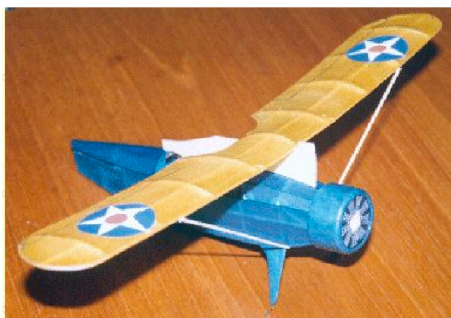
This is great piece from Mike's fantastic UK internet site, <http://www.ffscale.co.uk>. For novices at building bipes it relates in detail his method for gluing the wings to a new model with great results first time out. Try it, and you'll like it, I guarantee – Editor.

One thing that puts some people off building biplanes is the difficulty in attaching the wings, ensuring the incidence angles are correct, and verifying that everything is square. The method described below is now my standard procedure for biplanes. It is fairly simple and pretty well foolproof, so maybe it will encourage you to build that extra set of wings!

As an example, I will take my Dime Scale Stearman 76, which features a one-piece upper wing, and two lower wings butt-joined to the fuselage sides (*Typical construction on many authentic ten-cent bipes - Ed.*).

Using a photocopy of the plan with the correct incidence angles drawn in, a template was cut out, representing the space between the bottom of the upper wing center and the top of the fuselage. The position of the wing leading edge was marked by a step, and the position of the fuselage formers, plus the front of the cockpit noted. The paper cut from the plan was glued to a bit of thin card stock, then tacked onto the fuselage, along the top stringer, using a couple of dots of PVA glue (*polyvinyl acetate - aka Elmers White Glue - Ed.*). (PFFT Ed: *Rubber cement is easier and cleaner to remove*)

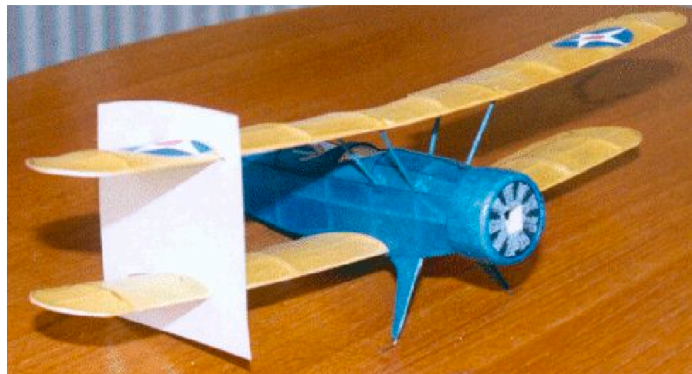
When dry, the wing was tacked to the top of the template along the center rib, again with PVA glue, positioned with the leading edge at the correct location. To keep the wing level when viewed from the front, a pair of temporary hard balsa struts were tacked into place, from the lower fuselage to somewhere under the outer wing panels. (*It doesn't matter where the temporary struts are attached to the wing so long as they are of equal length and attached the same distance from the wing center. Again, rubber cement is the better attachment glue for this.*)



You now have a sort of parasol arrangement, which will be rigid enough to stay in place while you add the four center section struts one at a time. The model plan calls for 1/16" sq. balsa for these, but I used "cocktail" sticks for strength. These had been previously covered in blue tissue, to match the fuselage, and were attached using cyano glue.

Once the struts were fully set, the jig and temporary supports were removed after softening the PVA glue with a wet paint brush (*if you glue the struts in place with a Duco type cement, soften it with a brush wet with acetone – Ed.*)(PFFT Ed: *If you use rubber cement you can just gently pull it off after taking a scissors and cutting the center template in half.*)

To correctly space the upper and lower wings and set the stagger, another jig was cut out to slip over the tips of both wings. This also keeps them at the same incidence while the lower wing is glued to the fuselage side. Don't forget to view the model from above to check the wings are parallel.



At this point, the wings will still have enough spring in them to allow the later addition of the hard balsa interplane struts, though it is best to slip the jig over the wings again once you have done this to recheck the angle and spacing.

If you are building a model where the lower wing is a one-piece affair that passes under or through the fuselage, then this will be fitted in place before the upper wing. This means the second wing-spacing jig will probably not be needed (though you could still make one to check the relative incidence angles of the wings). In the photo below, my Boeing F4B-2 has its upper wing mounted on a jig, exactly as per the Stearman, but steadied using thin balsa strips connecting it to the previously attached lower wing. Two of the centre section struts had been already added when the picture was taken.

