

TAMING WING WARPS

By George White

I don't recall who told me about this technique, or where I read it, but it's something which is worth being added to the collective "knowledge" that we all value.

It's no surprise to any of us that putting tissue on wings, water shrinking and doping very often results in warps which are less than welcome. Here's the sage advice I got that I've followed with reasonably good results with wings that are ready to be covered, applying tissue to one panel at a time.

This technique may be used with either dope or glue stick as the tissue adhesive. It may work with white glue, but I'm not smart enough to know how.

Using whatever type of adhesive you choose, apply it to all the ribs, spars, tips, leading and trailing edges. If the wing has undercamber, you'll need to put several coats on the bottom ribs and spars — in fact some folks coat these bottom contact surfaces with thinned Duco or Ambroid to ensure the tissue doesn't pull loose when it's shrunk. I haven't had good luck with glue stick when it comes to holding the tissue on an undercamber, although that's my preferred tissue adhesive everywhere else. Whatever adhesive you use, let it dry thoroughly.

If the wing has undercamber, you'll need to apply the tissue in the regular manner, ensuring that it is adhered to every spar and rib on the underside of the wing. If there is no undercamber, apply the tissue by laying it on the bottom of the wing and using a brush apply dope thinner or acetone to the tissue ONLY on the periphery of the wing panel. Do not adhere the tissue to the spars or ribs except the root rib of the panel. Repeat the same procedure for the top surface of the panel. If you're using glue stick, make sure you've let the glue dry at least overnight after doing this.

Find some balsa or hardwood sticks of uniform thickness and lay them on a very flat surface a few inches apart as chord-wise supports for the wing panel to keep it off the surface. Spritz water on the tissue and pin or weight the wing down on the sticks. If you intend to add washout, now's the time to add shims on top of the support sticks to have that set. Allow the tissue to dry. Some folks let that dry several days but, I confess, I don't have the patience to let it set more than a day.

Once the tissue is dry, take a brush or Q-tip and run dope thinner or acetone over every rib and spar on both sides of the panel (if you've used glue stick, this obviously has to be 91% isopropyl alcohol instead of thinner). Put the panel back on the support sticks and weight down overnight.

Once the adhesive on the ribs and spars is good and dry, you can apply the finish of dope, Krylon, Floral Spray or whatever floats your boat. When I do that, I also put the panel back on the support sticks overnight just to let it dry with the proper flatness and washout I intended. If I'm using dope to finish the job, I've found that the use of a Preval Sprayer (available at O'Rielly's

Auto-parts store and others) works wonderfully to apply 50% thinned dope. Whatever method you use to apply dope, you need to be cautious about applying it too heavy in one coat to avoid loosing the tissue if you used dope as a tissue adhesive. The same caution applies if you used glue stick and want to use Floral Spray (which is a form of alcohol).

This procedure results in your wing having small panels locked in between ribs and spars which makes warping a lot less likely. One other precaution — regular nitrate dope such as you find a hobby shops will continue to shrink over time and give you real problems. One method of avoiding that is to use Non-taughtening Nitrate. I buy clear nitrate by the quart from Aircraft Spruce Company. They will ship quart size cans without the hazardous shipping charges. They also carry nitrate thinner, which by the pint is much cheaper than what you'll pay at a hobby store. The website for dope is: <http://www.aircraftspruce.com/menus/cs/randolphcoatings.html>