

HI-TECH RIB JIG

by Doug MacBeth, #647



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The jig, along with one of the ribs fabricated in it, was on display in the Hatz Tent at Biplane Expo for Hatz Nutz. It certainly generated a lot of interest.

Now, EAA has asked that it be placed on display in the Wood Workshop tent during Air Venture '99. If you'd like to look it over, you'll find it there.

With traveling around with the jig, I may never get those ribs completed, but, you know, I don't mind at all. Gives me a chance to talk Hatz too! :-)

- Doug MacBeth, 6/15/99

I've always seen rib jigs made of wood with wax paper set into them to prevent the rib from sticking to the jig. It's messy, time-consuming, and a pain in the empennage. There had to be a better way.

It's funny what you can learn by reading the labels on stuff. Now, you, I, and everyone we know always read the labels completely, especially the safety information. But, when it comes to adhesives, I'm usually more interested in what they stick to rather than what they don't stick to. Well, right there on the label it said "Will not bond to polyethylene, polypropylene, Teflon, or other waxy materials."

Hm.

I was going to run some of the usual glue tests on wood-to-wood to see how well T-88 bonded (no, I haven't used T-88 before) and hit on the idea to try wood-to-plastic. Splitting my samples apart, I found that T-88 is an outstanding glue - it "pulled wood" every time. I also found out quickly that T-88 won't bond to acrylic plastic.

I had already trimmed my rib jig up close to the pattern to allow for the use of clamps around the perimeter of the airfoil shape when the decision was made to make a few additional changes to try out a few ideas.

The jig was made out of a flat piece of 3/4 inch ply with the rib pattern glued on a side.

I trimmed the jig edges precisely down to the pattern. I now had a Clark-Y airfoil shaped jig.

Stopping by the local hardware store, I bought a 4 x 4 foot sheet of 1/8 inch Acrylic Safety Glazing. The same stuff used for windows.

Rough-cutting a four-foot piece, I placed it on the jig, flush with the aft tip of the airfoil. At 50 inches on the chord, the forward two inches is just the tip of the nose-piece. I affixed the acrylic with countersunk screws into the wood.

A router formed the acrylic flush with the jig.

Taking two one-inch by four-foot aluminum flat-stock pieces, I placed a single length of two-inch wide woven Teflon tape (not the pipe thread stuff) along them on one side, folded the half-inch excess at both edges around to the back of each aluminum strap, and screwed each Teflon-coated aluminum strap along the top and bottom of the airfoil shape. By keeping the Teflon-coated aluminum straps flush with the bottom of the jig, it extended 1/4 inch above the pattern minus the 1/8 inch of the acrylic. This would hold my cap strip in place without interfering with my gussets and clamps.

I had picked up some 1/4 inch acrylic for the earlier glue testing and now that same scrap worked great to make the alignment blocks. Just cutting small pieces as needed to hold the cap strip in place, I screwed them down right through the acrylic overlay and into the plywood. For very small/cramped places, a little plastic glue worked fine.

When it was all done, as you can see in the picture above, it was the prettiest little jig on the planet. But would it build ribs?! Time to test it out.

I built a standard rib using spruce cap strip and mahogany gussets. My biggest problem was keeping the cap strip in the jig - it kept sliding out over that Teflon tape! Once I applied some spring-clamps,

things quieted down. With all the pieces cut, I lathered on the T-88 liberally, placed the gussets, and clamped everything in place using more 1/4 inch plastic pieces between the clamps and the gussets.

The next day, I removed the rib from the jig. There was minor sticking, but the T-88 let go with a little leverage. Out popped a good-looking rib from a pristine jig. Any T-88 that had run and puddled was perfectly flat and flush with the backside of the cap strip. My backside gussets could go right on without any prep or dressing of the rib.

The Hi-Tech Rib Jig is not only a great way to make your ribs, but it's a real conversation piece around the Wee Beastie Biplane Works. It's cheap to make and Y2K compliant too!

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