

SECRETS OF CARVING FOLDING BALSA PROPS

By Mark Sexton

An article published in the September 2005 issue of The Bat Sheet, the newsletter of the now defunct Seattle Strat-O-Bats, Chris Weinreich, Editor

Bat Sheet Ed. Note: In attempting to carve a couple of prop blades I decided to do some research and this article popped out of the woodwork. It appeared in the Jan. 1995 *Bat Sheet*. At the time Mark was a mere youth, but a good flyer. Ten years later, he is now a rapidly aging adult but still a pretty good flyer.

"To date, we have found no ready made substitute which could take (the) place of (a) hand carved balsa prop. We wonder why some of you hesitate to carve props. The job is comparatively easy if you follow a definite system."

Frank Zaic - 1940 Yearbook

These words ring true today as they did 54 years ago.

My goal in preparing this material is to provide basic information for the average modeler on carving folding props. I chose the prop used on Simmer's Gollywock as representational of all aspects typical of a folder. The information presented can then be used as a bench mark for other models, changing material sizes as appropriate to the project.

Rather than an excruciating blow-by-blow "how to", I have chosen instead to outline the basic procedures, providing comments where appropriate to illustrate important details. And remember, there is no substitute for practice!

1. Use balsa in the 8-10 lb. range. I look for wood which is soft enough to comfortably carve but hard enough to produce a durable, stiff prop.
2. A jig saw is invaluable here.
3. I make up a 1/64 ply hinge plate template. Hinge slant angles calculated from the time-honored formula:

$$\text{Pitch} = \frac{\text{dia} \times 3.1416 \times 1/2T}{W}$$

T= thickness of block W= width of block

The hinge slant is 1/2 of pitch. Use an angle template using the side of the hub as a reference to sand in the hinge twist to the hub bottom. Bend plate to fit. The twist is also calculated out as 1/2 pitch.

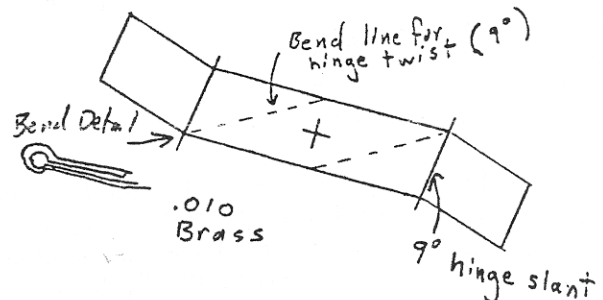
4. A comment on carving knives — easiest is a long X-Acto carving blade. Also good is a carbon steel paring knife, found still cheap at grocery stores. Honed to a sharp edge, these knives last for many years.

Carve with the intent to remove minimal wood per cut. Pay attention to grain. Keep the prop's final shape in mind. Don't worry too much about undercamber — what little necessary (1/16" or so) happens naturally. When carving down the top surface, keep in mind how twist resistant the blades are becoming. Softer wood means thicker blades. Experience is the best teacher here.

5. A few different curved sanding blocks are helpful here - exact curve is not critical! I made mine from french curve shapes.
6. Use a cardboard template, orienting template on reference marks predetermined on blade blanks.
7. Use iron wire, available at hardware stores. Tack in place with CA, then epoxy fillet.
8. The moment of truth!! Thread wrap the hub for additional strength.
9. Use whatever turns you on — sanding sealer, clear dope, K&B primer. Go for a smooth, durable finish.

Basic Procedures

1. Layout blank. Mark & drill prop shaft hole.
2. Cut blank to carving dimensions.
3. Make up hinge plate, prepare hub & glue hinge in place.
4. Rough carve blades, carve undersides first.
5. Carve & sand to final *blank* shape.
6. Carve & sand to final *blade* shape.
7. Install hinge wires & hardware.
8. Cut hub joints for fold.
9. Finish.



Bend over .045 piano wire to form hinge wire hole - use .040 Iron wire

