

HOT BENT WOOD

By Dave Rees

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Every now and then, I run across a technique for making rubber powered scale models that has almost vanished from our repertoire today and deserves to be put back into it. One of these goes back to my boyhood days in the banana oil era: hot bent wood. I can remember wingtips and even whole stabs and rudders made from bent bamboo, much like our indoor FAI ships use today, only on larger outdoor ships. So I had a talk with Walt Eggert, current SOTS president, who was designing kits for Megow in the 30's and was very active in model aviation in those days. He showed me how it was done and I've been using it ever since.

Hot bent wood, after you have mastered it, will become the best way to make certain structures without all the tedious laminating and making of templates. Wingtips, stabs and rudder outlines for World War I fighters, golden-agers, lightplanes and homebuilts are particularly well suited to this technique, as it best simulates fabric-covered tubing. One can expand on this even further. Bulkheads for round stringer-type fuselages can be made entirely from bent wood, resulting in a stronger, lighter framework with much more rubber room than in conventional bulkhead designs. A sheet can be bent to a rib contour and ribs sliced from it like pieces of salami. Each one identical and stronger than conventional slit ribs made from sheet balsa. You may think of even more uses yourself. The method depends on one principle for its success, and that is simply that the grain of the wood is always parallel to the curvature, resulting in maximum strength for minimum cross section and weight.

Not all woods can be bent with satisfactory results. By far the most easily bent with heat is bamboo. It's not truly a wood anyway, being classified botanically as a giant grass! Balsa is also a good bending wood, but is more easily snapped and therefore dependent on the type of balsa and grain structure. Some can, and some just can't be bent. Basswood and spruce are almost impossible to bend, but their strength to weight ratio is much less than bamboo anyway and their use in rubber scale models is limited. If you want to learn the age old skill of hot bending, begin with bamboo. Let's walk through it.

A porch screen is the best source of bamboo because it has already been sliced for you into segments approximately 1/16" X 1/2" in cross section. Perhaps your club could buy one a yard or so wide, and give everyone some, thereby keeping the cost, to a minimum. Take a single slat and firmly cut with an X-Acto knife starting at one end, trying to maintain an even square cross section for as long as you can on the piece you are paring off. Don't lay it on the bench; do it freehand in the air. You will notice the strong tendency for a knife blade to follow the grain until you come to a natural growth ring. Don't worry, pieces longer than 12 inches are seldom needed. Pare down a number of sticks just to get used to the feel of the medium. They can always be slit again or used for practice bending. The material is so much stronger than balsa that a smaller cross section than you would expect can be used. A 1/32" square of bamboo may equal a piece of 3/32" square balsa in strength. I have a good friend who slits perfect 010" square-bamboo sticks for spokes in vintage wheels that look gorgeous.

The sticks should be bent around a soldering iron of 75 watts or so, using water to prevent burning the surface of the wood black. Float the sticks in a pan of water for 10 minutes before bending them. The soldering iron should be held in place with a vise or C-clamp so it won't move while bending the wood over it. Now comes the technique part. Holding both ends of the stick, one in each hand, move it across the iron while keeping pressure against the iron. Keep at it until a nice radius is formed, then remove from the heat and hold until cool and firm. Don't hold the stick still against the iron or a kink

will be formed – keep it moving slightly at all times. Very small radii can be made for things like corners of WWI stabs. Long term spring back is minimal too. With a few sticks for practice, I'll bet you will be bending all sorts of shapes in very little time.

After you feel comfortable bending bamboo, try balsa next. Wood selection is important here. Medium weight straight grain cut seems to bend more easily. Keep the balsa moving faster on the soldering iron as there is a greater tendency to burn the wood black. If it dries off before forming is complete, re-dip in the water. Smaller radii are more difficult with balsa than with bamboo too. This is a knack which you cannot learn by reading about it . you need hands-on experience.

For some reason, cyanoacrylates won't stick well to bamboo, so use either Ambroid or Tite-bond to glue the bent wood into the adjoining parts of the airplane. It must be the natural oiliness and lack of porosity peculiar to bamboo. Have fun with this technique from the past.