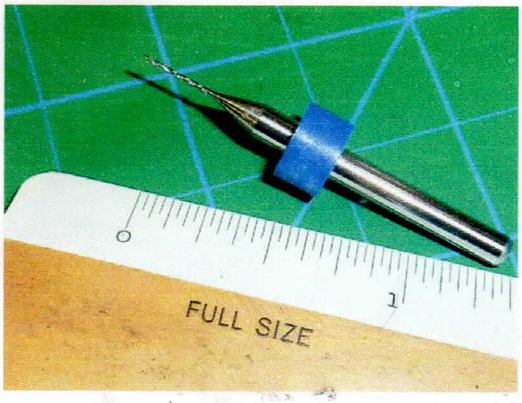
Here are some materials to experiment with the 'Q-Tip props'…

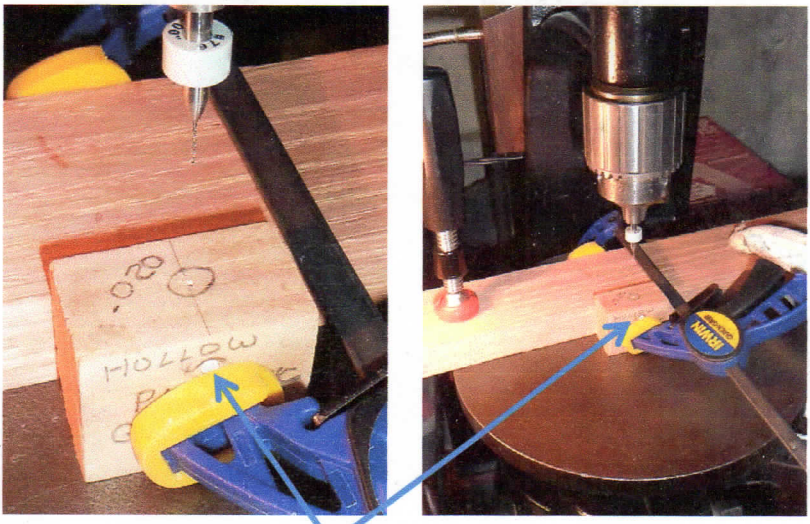
- **Hollow plastic Q-Tip hubs** drilled for 020 wire prop shafts. These are standard Q-Tips available at the pharmacy or local supermarket. Just make sure the label says plastic, rather than the conventional style solid fiber. I also included one aluminum hub if you would like to try that as well.
- **Tamiya extra small cotton swabs** PN 87105 used as prop spars. Got these at Hobby Lobby craft store. Tamiya has two sizes… this is the smaller one that will fit into the plastic hubs; the other size they sell is too large.

- **One set of typical blades**… I have experimented using balsa, plastic yogurt containers and plastic cups. All seem to work.

- **A blade pitch gage** I use to 'eyeball' the pitch setting. I simply align the prop shaft parallel to the axis on the paper, turn the blade so I am looking down on the gage and gently twist the blade shank to the desired angle. Then repeat for the opposite blade. Then as a sanity check, I hold the nose block still and rotate the prop to see if each blade is symmetric…works quite well.

Here are a couple of photos showing the drill setup for the hubs… the 020 drills are tiny….and delicate!





Plastic Q-Tip Shaft,
centered in drill jig block

Completed prop for Waco Cabin biplane you saw at Glastonbury

A few things I have found helpful…

- I roughen plastic blades to improve adhesion of the CA glue
- I bind the 90deg bend of the prop shaft to the plastic hub with thread… had one bond let go, makes for unwinding the rubber really fast!
- Insert the Tamiya cotton swab as far as comfortable… I occasionally will shed a blade but not often.

I like this arrangement because the hub allows experimenting by simply changing blades… blade pitch, different diameters and planforms all can become plugins. It also makes repair of blade damage as simple as plugging in a spare blade. It allows fine tuning of blade pitch to optimize the flight profile for a given motor. I have discovered that small changes in blade angle can sometimes have dramatic impacts on rate of climb turning an otherwise lethargic climber into a skyrocket.

Enjoy and let me know what you discover!

Doug

PS: By the way, there is another way to use the Tamiya shanks. You will notice that the bare shank without the swab fits nicely within the hollow Q-Tip hub. It is too loose by itself, but the shank can be made to swell by wetting the shank. The only problem I encountered is that once the moisture dries out, the blade will no longer hold its pitch. So that is why I chose to use the swab end as an insert.