Musings by Tom Arnold

Editor's note: Another reprint from Tom Arnold, from June 1988.
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A while back we ran a couple of articles on the use of basswood to replace balsa in certain areas of model building. Jere Robinson had been using the stuff for years and had nothing but sweet things to say about it. His Wildcat was a prime example of it with basswood stringers, spars, and leading and trailing edges. You all remember the weight calculations the articles went through to show its almost negligible weight difference (1-2%) in a finished model. Well, the editor finally felt it was time to poop or get off the potty as the saying goes, and use the stuff himself to see if Jere was a genius or just plain crazy. The subject picked was a 24" span Fairey Firefly of WW2 fame to be built for the FAC NATS. Sheet 1/32" basswood was cut into 1/16" wide strips with a steel straight edge (balsa strippers cannot handle it) and it was used as stringers, laminated tail surfaces, wing tips and spars.

To save you the suspense, let me say, the stuff is fabulous. It worked magnificently and I could not be happier with it. I broke no stringers due to rough handling during the construction phase as I usually do. Sanding was so much easier as again no stringers snapped and no stringers got "eaten thin" by the sanding and subsequently weakened. The basswood stringers went on very nicely giving nice, smooth loft lines to the fuselage without the usual waviness with high and low spots like balsa strips often do. After covering, the basswood did not pull in either, giving that wavy "starved horse" look to a fuselage. The basswood also had enough rigidity to hold its position against the pull of a tight covering when one side of the stringer had tissue attached but the other side did not. However, all the above was really to be expected. After all, basswood is three times as heavy as the hardest balsa. The crucial thing was the final weight. While I hooked my framework up to a gram scale, it was not without a bit of anxiety. While the strength was certainly there, was the price going to be too high? As the needle on my scale mockingly swung back and forth, I wiped the nervous sweat off my lip. As the pointer finally, reluctantly settled on the magic number of 40 grams, I was truly amazed. Here I had a covered, doped framework with a completely sheeted nose (for strength and weight) on a 111 in. sq. wing for a mere 40 grams! This may not be impressive to many gentlemen of the craft but for me who normally builds these awful lead sleds that hit cars and up-end them, this weight was almost unnerving. After checking my scale and assuring myself it indeed, was working, I popped a cold beer in celebration. After a bit of reflection, I think I have found basswood's two major strengths
— 1) It is heavier but stronger than balsa wood much like aluminum is heavier but stronger than wood. Just as full size aircraft moved from wood construction to thin metal and experienced a weight savings, so did I move from wood to "metal" (the basswood) and experience not necessarily a weight savings but greater strength for the same weight.
— 2) Basswood is more consistent in its strength than balsa. Balsa has to be very carefully selected first by weight-than by cut to get the strong but light stringer. To be quite honest, I find it very difficult to consistently get good stuff. It's easier to just pick the lightest sheet of basswood from the hobby shop as its strength is so good that any cut is okay.

As a postscript, I feel the wise use of basswood is the key. Balsa remained the wood of choice for bulkheads, for stringers not bearing side loads (as in the "'cracked" wing ribs) and for areas in which bulk was required as well as strength such as leading edges and nose fill. I also used balsa as the middle of certain laminations such as the wing trailing edge. It was felt the basswood would hold a sharp edge better when the elliptical trailing edge was sanded down. Balsa was also used as the outside lamination on the tail surfaces to allow a rounded edge to be sanded. A final serendipity as far as construction went was that it is extremely easy to use a sharply folded piece of sandpaper to saw an exact 1/32" wide notch in a bulkhead.

In building the Firefly, I realized that there were a number of uses for 1/64" basswood, too. As models get smaller, the 1/32" sheet is really too thick as a square cross-section stringer is really not as strong against side loads as a rectangular one of the same weight. Besides, it's hard to cut less than 1/32" with a steel straight edge and razor. As a result, the editor came up with a sanding jig of sorts to sand 1/32" sheet down accurately to 1/64" thick. A hard surface which will accept CY A glue is used as a base (I used a piece of kitchen counter top with a hard formica-like surface). Lay two pieces of music wire of .015 diameter parallel to each other and wide enough apart to accommodate a piece of sheetwood and CYA them to the base (use the thin CYA. Now lay the wood between the wires and sand it down with a sanding block big enough to straddle the music wires. When the wood is sanded down to the right thickness, the sanding block will start riding on the wires and you know you've gone far enough. Now just slice your new super skinny stringers. If .015 thickness is too much for your needs, any diameter of wire can be used. Just be sure you mark the baseboard with the size.