

# Laser-cut I-Beam Ribs for a Hatz Taperwing

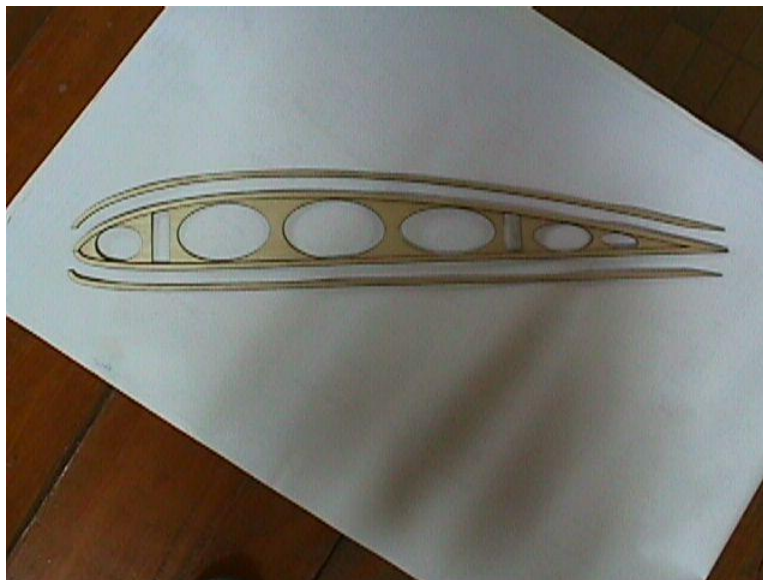
by Todd Mason

The laser-cut rib and taperwing concepts discussed here are just that, concepts. Todd is working through the development of both with an eye toward the possible use of them on his own Hatz. This information is presented here merely as a report on an interesting use of technology. They don't call our planes experimental for nothing.

Todd will be sending me a sample of the laser-cut rib after Biplane Expo, so watch for a review of the rib next month. - Doug

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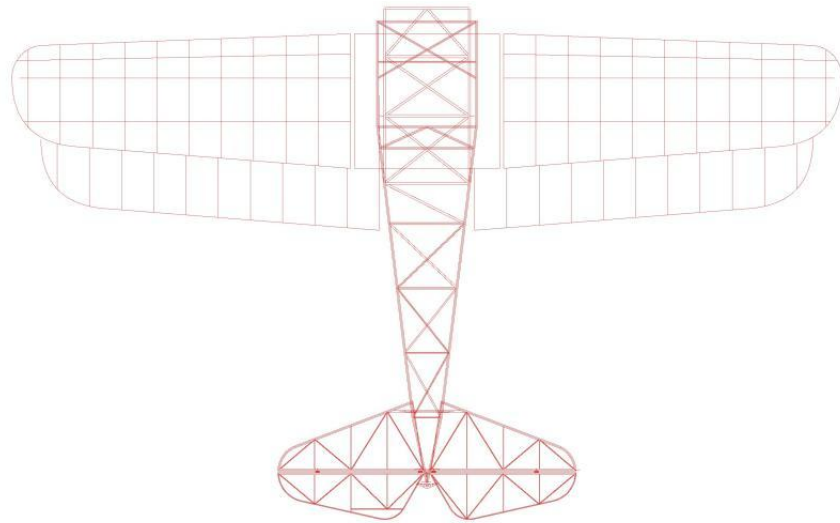
Attached is a file showing the construction method I have elected to use for the wing ribs. The ribs are constructed out of 1/8" plywood with 1/8" x 1/4" plywood cap strip stiffeners glued to each side top and bottom. Although this makes the rib cap strips 3/8" thick, the ease of construction ( glue four (4) pieces to the rib), the dimensional stability, and the added strength pay off. The best part of all is it takes a half hour to cut out all the ribs - I had them laser cut from a CADD drawing.



The image shows one rib and the separate 1/8" ply cap strips. The laser cutting made the cap strips possible. They claim that all cuts are within 0.002"!!! Fits like a jig saw puzzle.

As an engineer, I just can't help but mess with the design. I originally took my drawing files to the laser cutter to have the fittings and bell cranks cut. When they showed me they could cut

paper, cardboard, wood etc., the gears were turning fast! I have been too excited about building all those ribs and cutting all those gussets. I remembered that Bellanca used full length gussets along the top and bottom of their built up spars. I understand the thought was that the plywood would help retain the shape of the airfoil since the spruce cap strips can have a tendency to creep back or sag out of shape over the years. Anyway, to make a long story short, I decided to try a wood "I-beam" design. Then I realized that with the airfoil shape in the computer, I could easily scale down the section to create a taperwing.



I have enclosed an image file that was created from my drawing file. It should print ok. I feel the taper looks real good with the tapered horiz. stab. A close look at the fuselage might reveal why I have called Hatz 723 the Hatz T3. More on that latter.

As I'm sure you are aware, anytime a change is made, it creates changes all along the way. I still have a lot of work to go on the taperwing. By having the taper, the spars also taper. The result is that the spar will not be strong enough at the interplane struts. A rough calculation indicated that the wing tips would fail at the interplane struts in upward bending at about 5g's. Therefore, I will have to either reposition the spars more toward the center of the section to pick up some extra thickness, move the interplane struts out to redistribute the max. bending moment, or a combination of both. I am designing the wing so it can bolt to the standard fuselage. I'll keep you informed of my progress which might be some time. I am currently building the tail feathers and will next build the fuselage. I will probably construct the wings last to save room but will continue to build and design the components.