REED FUSELAGE FORMERS FOR FAC SCALE

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Most rubber scale fuselage construction comes in one of two basic types. No.1, the traditional "halfshell" found in most of the early kits and designs from the 1930s up until the present; and No.2, the "box with formers" style, which came into vogue as modelers became more concerned with the relationship between model weight and flight duration. Beyond these two basic categories, there are probably as many other fuselage construction schemes to retain strength and build in lightness as there are modelers.

My particular venture into an alternative fuselage construction method was prompted by a fellow club member who brought in a lifetime supply of reeds, which he got at a local craft shop. The reeds had a circular cross-section, nominally about 0.070 in diameter. Their light weight, flexibility and strength got me to thinking about how they might be used for round or oval fuselage formers for those sleek World War II designs that I love.

To enhance the naturally flexibility of the reeds and allow them to be bent to a very small diameter, I decided to soak them in water. I have some plastic tubes that used to house 36-inch lengths of piano wire and have plastic end caps, so the reeds were stuffed into the tubes, the tubes filled with water, and everything just allowed to soak until needed.

The construction method I developed using reeds has very distinct steps to it, so I'll try to describe each step clearly enough so that anyone can duplicate the process. Hopefully, the accompanying photos will also help. Before starting, the materials you will need are a sheet of 3/16-inch foam poster board (white foam overlaid with cardboard on both sides); a piece of 3/4-inch blue foam insulation, a bit longer and wider than the fuselage you intend to build; a length of 0.062 music wire as a skewer for the bulkhead assembly; and, of course, a supply of 0.070 reeds.

Step 1: I use a simple CAD program to draw the cross-sections of each bulkhead and mark them with vertical and horizontal centerlines for the important alignment process to come. They are then printed out, and pasted onto the 3/16-inch poster board. My little jigsaw cuts them out to size, leaving room for the 0.070 reed and the balsa stringers. A bit of touch-up sanding evens out any saw kerfs or waviness. *(Ed. Note: For those luddites like me who have no CAD program, you can often accomplish the same thing from the plan, or in some cases, an enlarged 3 view which has the cross section at various stations.)*

Figure 1: The bulkhead formers are cut from 3/16-inch foam board, allowing the reed to be glued and wrapped around them as shown. Note the vertical and horizontal lines important in the alignment process before stringers are attached.

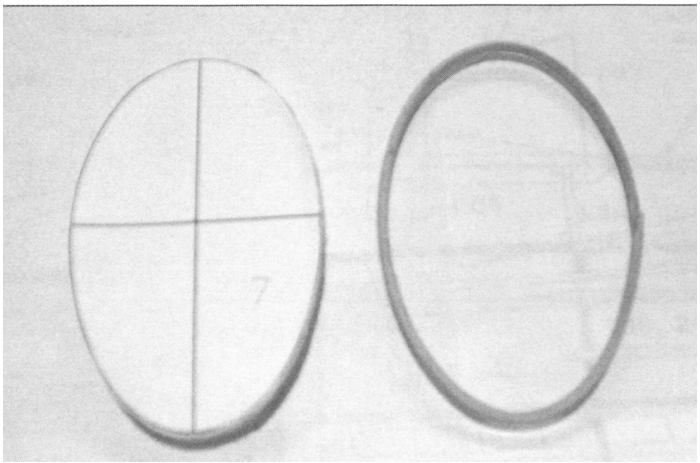

Figure 1

Step 2: The reed is wrapped around each bulkhead and marked where it overlaps. It is then taken off the form and a diagonal scarf joint is used to glue the reed into a closed circle. It is put back onto the form to fully dry. If it is too loose, it is removed, recut and re-glued to get a slight "push fit" back onto the form. If it's too tight - well, you have plenty of reeds!

Step 3: Using the blue foam plank *(ed note: it must be flat of course*) as a platform to hold the bulkheads in alignment, I

draw a centerline and perpendiculars at each bulkhead location. I use my bench drill press as a router and fabricate a slot for each bulkhead. The blue foam gives good perpendicular support to the bulkheads as you begin adding the stringers.

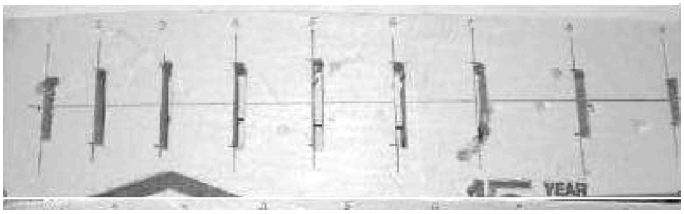

Figure 2

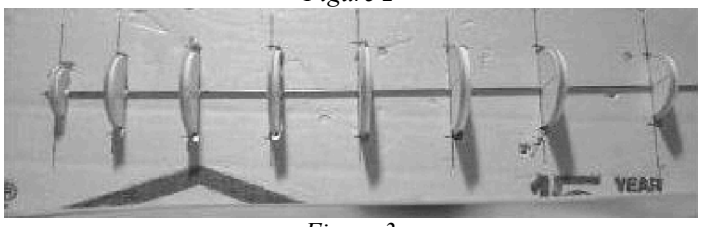

Figure 3

Figures 2 & 3 show the blue foam base slotted for the bulkheads at each drawn location. The centerline down the middle of the foam base allows the 0.062 *music wire to be pinned to the foam once the bulkheads are skewered at the juncture of their respective vertical and horizontal reference lines.*

Step 4: I spear the center of each bulkhead with the 0.062 music wire, and then insert the bulkhead "shish kabob" into the slots in the blue foam platform. The music wire skewer is pinned to the foam for stability and the bulkhead horizontal and vertical centerlines are lined up.

Step 5: Now comes the rewarding part. The jigged assembly allows me to pin down and glue in place the centerline side stringers, so at least I start with two perfectly straight stringers along the centerline of the model. After the top half of the stringers are installed, the assembly is pushed out of the foam base. By now, it's pretty rigid as seen in Figure 4 and the remaining stringers are added "in the air."

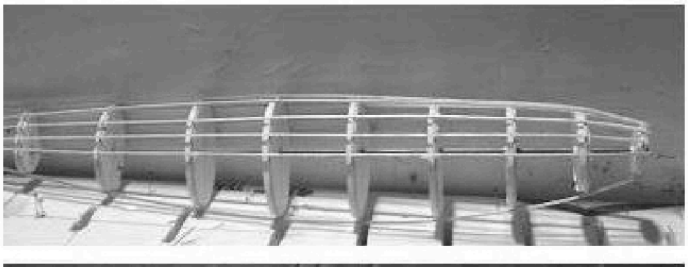

Figure 4

The fuselage has the top stringers in place and has been removed from the foam platform ,although note the straight fuselage centerline stringers that are installed first as a reference for the addition of the other stringers, and to keep the assembly straight. Note also the downthrust built into the nose bulkhead at the far right, and the bulkheads and music wire skewer are still in place.

Step 6: When all stringers are installed, the music wire skewer is removed and the bulkhead forms are freed from the reed formers. There may be some glue spots that have to be dealt with if too much CyA was used initially, but the reed is very strong and can be used as a prying surface to remove the foam board forms.

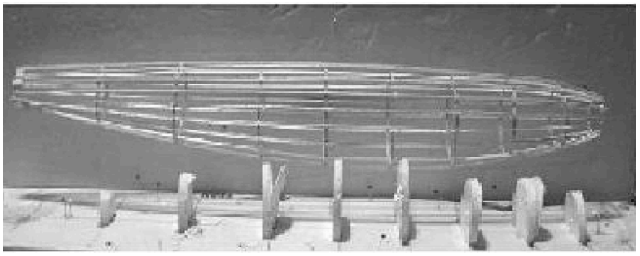

Figure 6

The basic fuselage structure is complete with all bulkheads, alignment jigs and wires removed. The scarcity of structure is evident in this photo, and as a *plus, strength has been increased because of the toughness of the reed formers.*

So far, I've done a fuselage for a 24-inch span *Macchi-Castoldi MC-72* Schneider Cup Racer (the fuselage weighed 6 grams), a *Henschel P87* pusher canard bomber, and a *P-39 Airacobra* using this method, and I'm pleased with all of them.

At one point I tried sanding the reed to a flatsided cross-section after it was joined and before it was put on the form. I was able to save a grand total of a half-gram on a total of 10 formers, which seemed futile given the care and effort needed to complete the sanding process. As I noted in the opening paragraph, there are multiple methods of fuselage construction that have become favorites of individual modelers. This method lets me work with simple tools and materials and feel confident that I can make a light, strong model every time.

Ed Final Note: It would appear that this method may be simpler to accomplish than Tom Arnold's "lost foam" method. It would also appear to be a technique which could be substantially aided by Buzz Trabbic's Building jig,
(See http://www.rockytopmodels.com/rta-004_details.htm)
Note also that cane reed is available from:
http://www.caneandreed.com/reed.html#ROUND%20REED