

## **Vacuum bag the lower airframe**

So I have been absent for a few weeks from posting, but things are progressing. In this installment I will vacuum bag the lower airframe.

I like GL phenolic tubing since its light however somewhat brittle. But if I add a few wraps of fiberglass that makes all the difference. I will use one layer of 9oz E glass and top that with 3oz satin weave for a nice surface finish. Using a vacuum bag allows is tight efficient layup with minimum resin and very flat. It finishes well and is a great surface to prime and paint. Before I glass I will incorporate a Kevlar anti-zipper feature into the airframe.

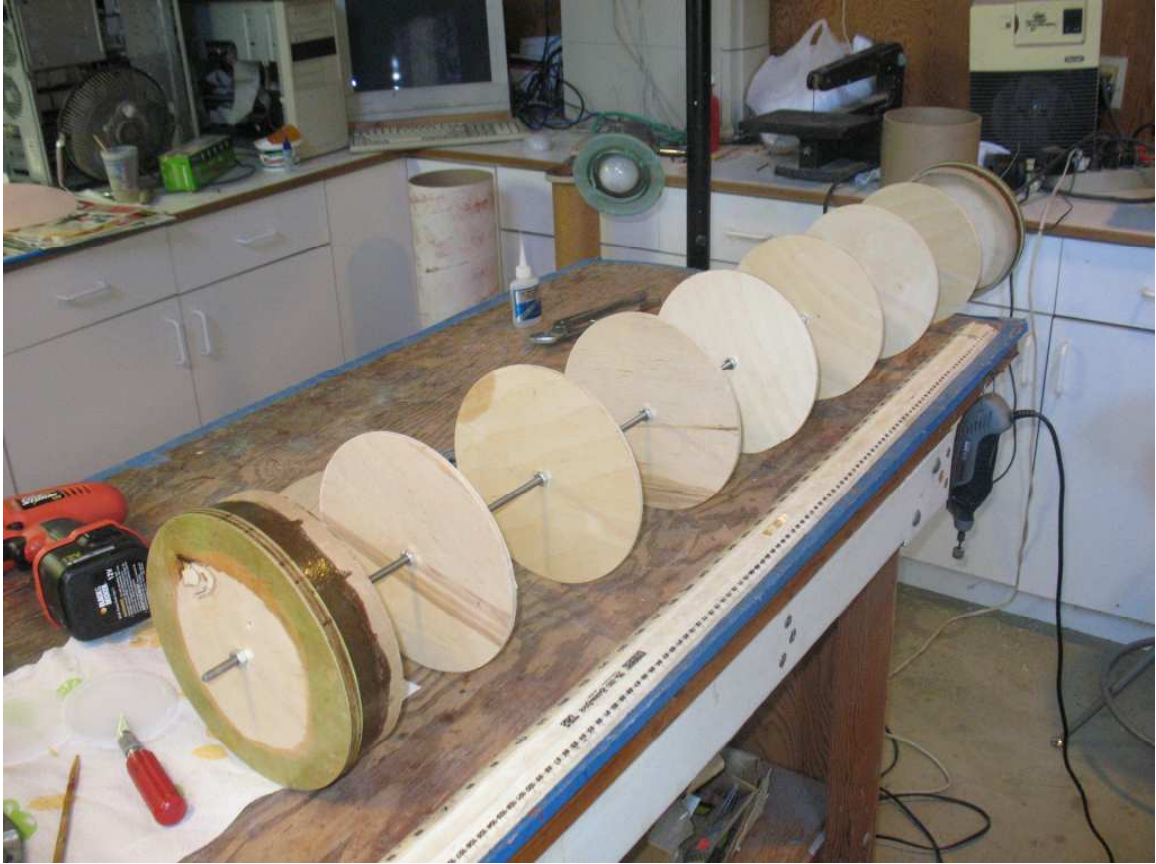
But before I do any of this that there is quite a bit of tooling and a few jigs that need to be made. One important feature I build into my airframes is a Kevlar anti-zipper band. For this I need to route a 5/16" shoulder into the end of the airframe using my router. I remove about 1/2 the thickness of airframe. For this I need a jig to stabilize the tube on the router table.

Other tooling needed is end-caps, and a series of reinforcing disks to go inside the airframe to assure I don't crush the tube once I pull the vacuum.

On to the pictorial...



First I make the end caps. For this I cut a couple of  $\frac{1}{2}$ " ply end caps the exact diameter of the outer airframe. Then I glue a 1.5" long piece of coupler centered on the ring so there is a shoulder to keep the cap from being sucked into the tube. I coat the coupler and ply with a coat of epoxy to seal it. I then paint these surfaces with PVA mold release so I can get them out after glassing. Don't forget this step!



To reinforce the airframe against being crushed I made a series of disks cut to the inner diameter of the airframe. I position these on a piece of threaded rod (several of them) at regular intervals. This shows all the disks and the end caps in place.



The Kevlar anti-zipper reinforcement is made by winding Kevlar tow onto a shoulder routed into the airframe end. This shows the router cradle I made to stabilize the airframe on the router table. The airframe nestles right into the cradle and the airframe end butts up against the upper cross piece just over the router bit.





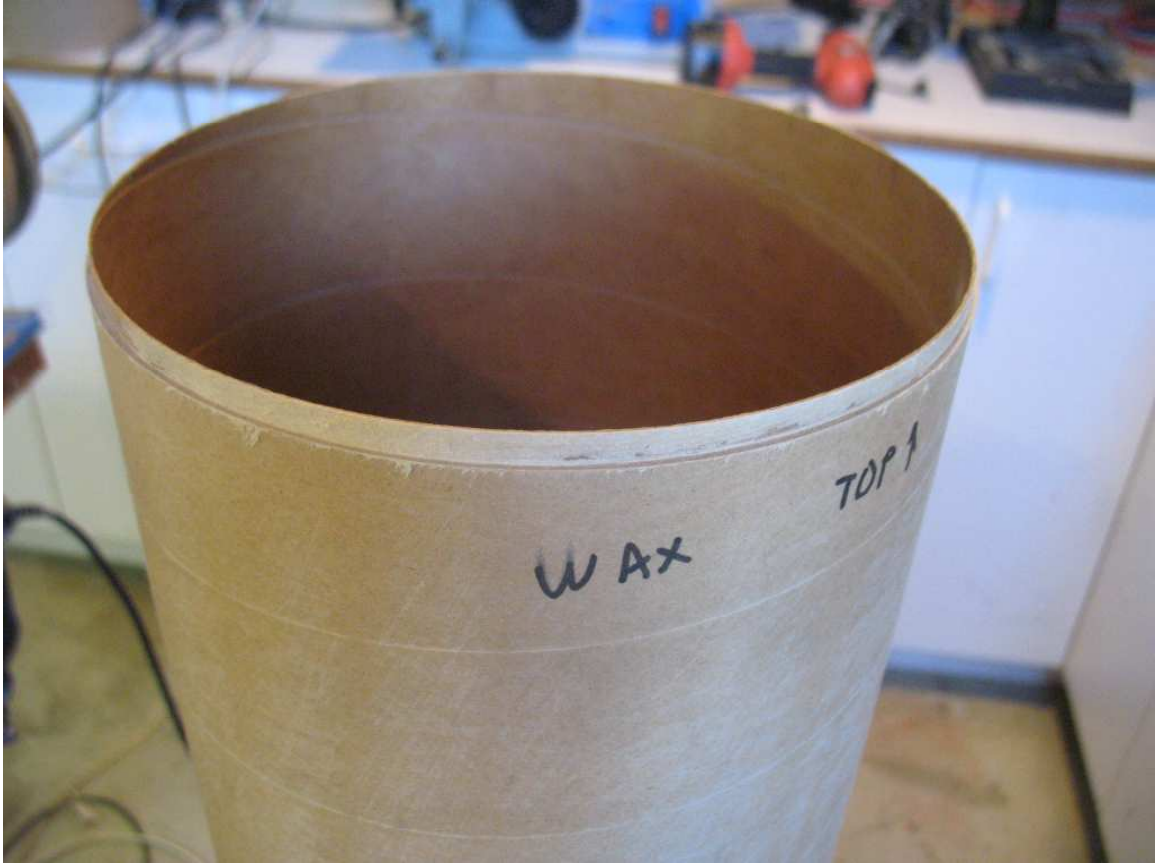
This is clamped at the right location for a 5/16 wide cut.



Now the airframe is placed in the cradle and the router turned on. Phil stabilizes the aft end.



Turn on the router and move it onto the head. Turn the tube slowly to cut the shoulder. Of course you first want to make sure you set the router bit to the proper depth!



Presto! A perfect shoulder is routed in the airframe. Kevlar will be wound into the shoulder before the glass goes on.





The reinforcing disks and end caps are installed and tightened. This is mounted on a couple of stands to get the airframe up off the workbench so it can be rotated easily.



I use CA to tack glue the start of the Kevlar tow. I use a heavy thread for this I got on Ebay. The airframe is then rotated while the Kevlar is wound on the airframe nice and neat. Two layers just fills the shoulder back to level.



Once the shoulder is filled up the end is again tacked with CA.



Next I did the layup and got it into the gag. Sorry, no pics. My hands were covered with resin and I was under the gun to finish it in 1 hr. It was a warm day as well so I had to hustle.





The next day I pulled it from the bag. Beautiful! Final steps are to cut the fiberglass just past the airframe edges. Then knock out the caps and trim. Don't forget your mold release or this last step may take surgery...



Here is the final result. The Kevlar anti-zipper reinforcement is incorporated directly into the airframe.

next up – Fin-jiggery with the fin alignment jigs.