Varieze Nose Art

December 2004

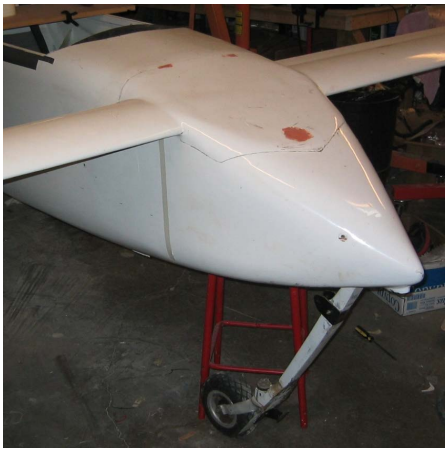
These are the steps I took to replace a well used nose on a Varieze. In the land of Canardians there are two camps, those who say what Burt designed shall not be modified by mere mortals and those who feel free to experiment as they deem fit. I fall into the latter group in this case since the long nose has been done successfully by many VariEZe and Long-EZ builders.

I give credit to Eric Cobb with the process you see here. Eric was very helpful in describing the process he uses. His site has an excellent article on Nose Art, a term that he originated as far as I know. Eric also has several EZ video's on his site that are excellent! How does Eric keep the floor of his hanger so clean? Does he pick up before taking pictures?

Before you take a saw to your nose, understand that some knowledgeable EZ guys do not approve of the long nose especially on a Varieze. Either for aerodynamic or aesthetic reason (or both). I researched the issues and I concluded for my purposes it is safe and I prefer the look of the long nose over the short.

Several factors weighed on my decision, including underlying structural problems that needed to be addressed. Here are the top ten problems and issues that I had with the existing nose:

- The NG-30 plates had been hacked up by a previous owner. Extensions from some unknown type of foam were poorly glassed into place in an effort to strengthen the NG-30 plates when an electric nose list was installed.
- I wanted to replace the existing lift with a lighter electric lift made by Jack Wilhelmson that does not penetrate F22.
- The aircraft is fitted with an O-235 and was carrying quite a bit of ballast in the nose. To eliminate as much of the ballast as possible and make up for the weight reduction of the nose lift the battery needed to be moved forward.
- Access to the nose area was poor and required removing the canard by reaching in from under the instrument panel. The battery could only be accessed by removing the Canard.
- The nose had delaminations around the nose bumper and NG-30.
- Very limited access to the rear of the instrument panel, also required removing the canard.
- The F22 canard alignment pin holes in the canard were elongated and the guide pin bushings were missing.
- The canopy was a replacement and was not fitted correctly and required replacement. I believe the forward deck and nose are easier shaped as a pair, I also wanted a more rounded forward deck. The instrument panel was very short because of the flat forward deck.
- The area of the forward canopy was long per-plans. This has been shortened by other builders and successfully solves the forward canopy lifting problems.
- The "Cool" factor. The long nose just looks cool!

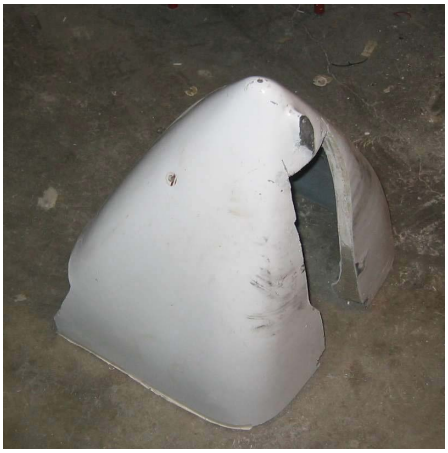


The original nose, functional but not sexy in my opinion.

All these reasons add up to major surgery. So I carefully measured, placed some masking tape to define the cuts and thirty minutes later the nose was laying on the floor looking just like the nose of a decapitated shark. The total project not including the canopy fabrication required about 37 hours over three weekends.

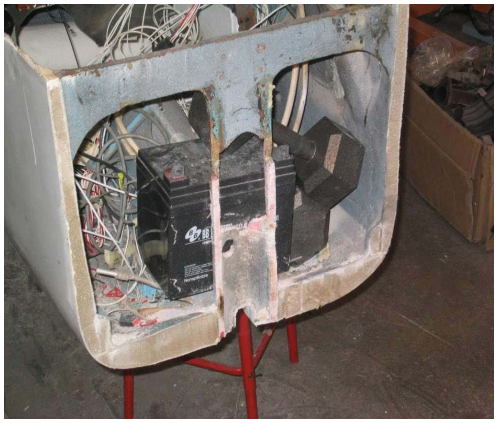
This was my third nose job. The first two were on my Long-EZ. The same procedure I describe here was used for the Long-EZ also. Having carved three noses I can say, you definitely get better with practice. I did not like my first nose on the Long-EZ, so much so that I did not even glass it. I'm not much of an artist or sculptor and it took careful study of nose's that I liked to imprint that picture in my mind. When it came time to do nose two and nose three I had it down. This is nose three and the best yet.

Here are the extensions that were grafted onto the NG-30 plates. They were easily (and I mean easily) broken off with just my hand. It was at this point I decided that the entire nose was coming off to properly repair this area. I could have fixed it in place but sometimes it is just quicker to start over.



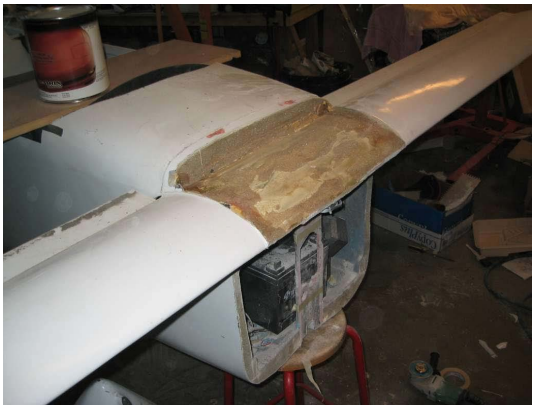
Dant dant... dant dant... anyone see Jaws? This is going on the wall of my hanger.

I used an 11 inch Sawsall blade to cut just forward of F22 and around NG-30.



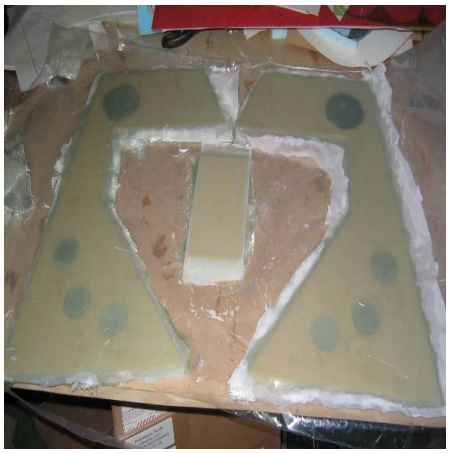
What is left of the "front-end". You can see here where the F22 bulkhead was cut to install the electric nose lift. The Wilhelson lift does not require a hole in F22.

Battery and the 20 pound barbells keeps the nose down while the process unfolds.



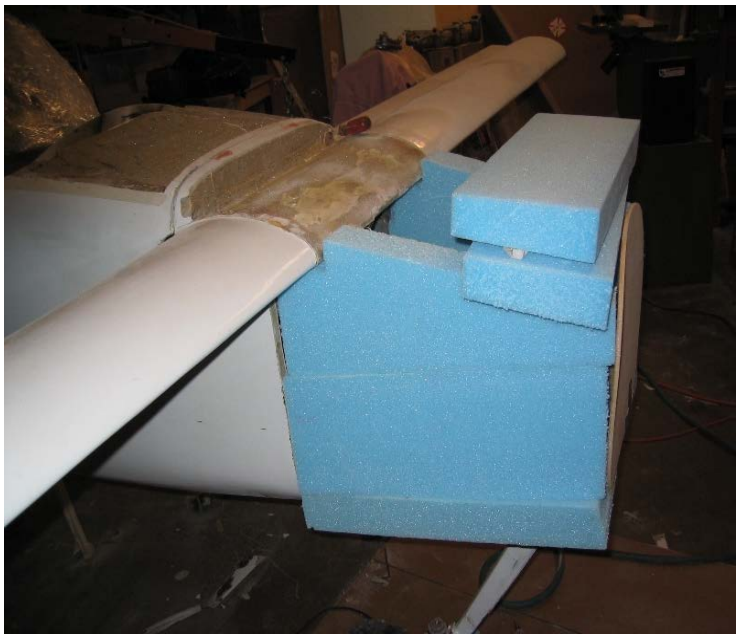
Here is the canard after carefully removing the cover. The forward deck aft of the canard was also carefully and completely removed(not shown).

New NG-30 plates layed up per plans with multi-ply glass



hardpoints.

The NG-31 bulkhead is enlarged, Here is a cad drawing that can be used to properly size it.

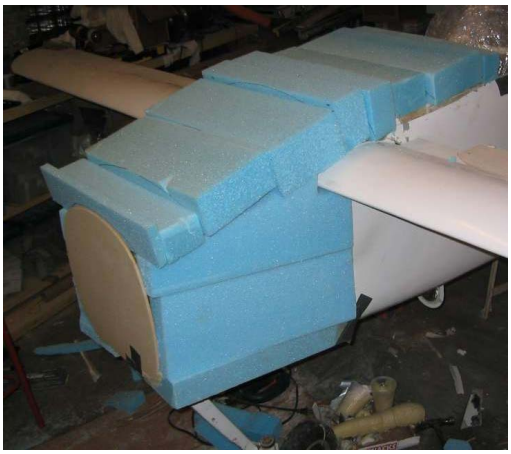


The NG-30 plates are installed per-plans. I used a temporary NG-31 that was glassed with one ply only to stiffen it a little. The NG-31 gets cut a little later in the process.

Once NG-31 is attached to the NG-30 plates you grab some blocks of blue foam and start cutting.

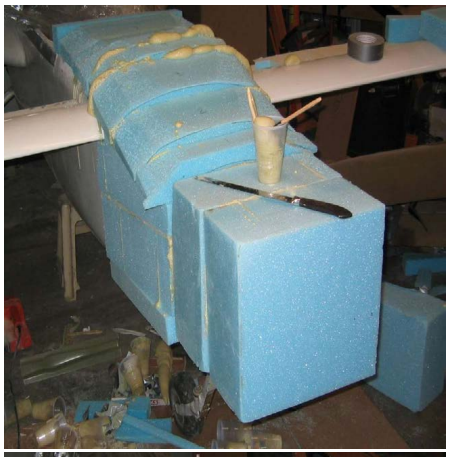
The bottom and sides are cut from blue foam and glued in place using pour foam first. Then add the top pieces.

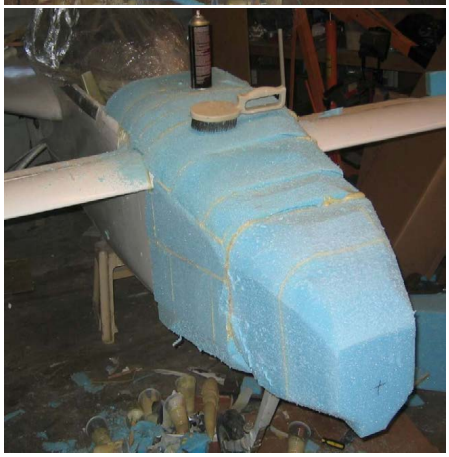
I used softer urethane foam for nose one. Eric Cobb suggested using the blue foam and I highly concur. It makes the job much easier. The urethane foam besides being messier is too soft and cuts too easily. Either foam is very messy, expect to have the stuff floating around for days.



Eric recommended pour in place foam from Hastings Plastics Co. 310-829-3449. I agree that the pour foam that Hastings sells is much better than other types.

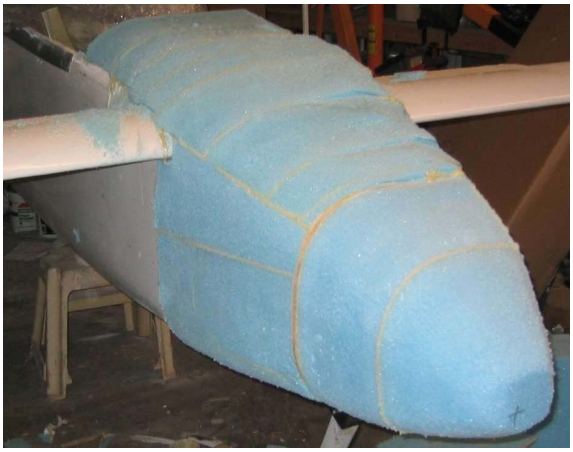
The tool of choice for rough shaping is a butcher knife and hand saw.





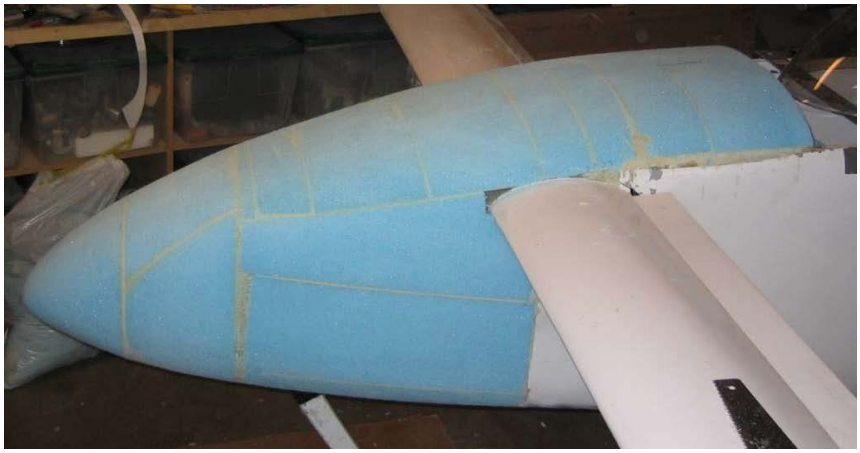
Here is the new nose at the end of the hacking phase. The wire brush that is sitting on top is used at this point to further define the shape you want.

No templates are needed to shape the nose, just carve away anything that does not look like the nose. Be careful to watch the symmetry.

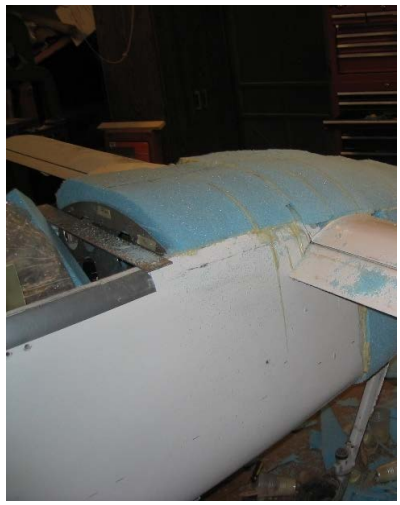


A hour or so of brushing gets us to this stage. Work from the center out and top down. Visually check your lines as you go. Take your time at this point since it is harder to add material. If you do get a low spot use pour foam to glue a new piece of foam on the spot.

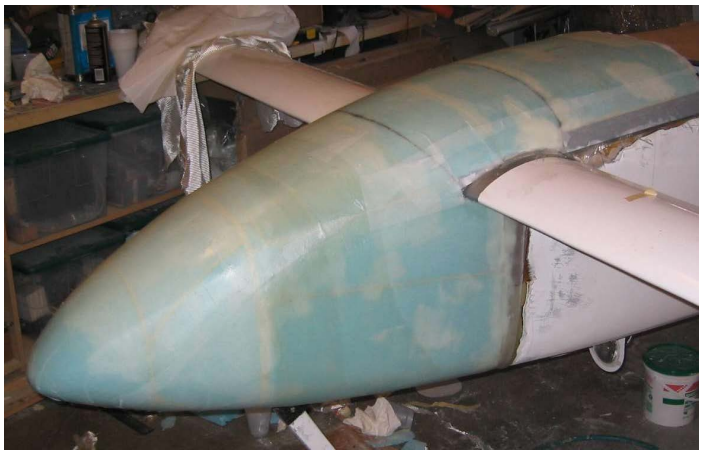
At the last stage I switched to 40 grit sandpaper to carefully shape the nose.



End of day 1. The nose/deck looks just like what I wanted. The forward deck is 1.5 inches higher, and shortens the canopy deck by 3.5 inches.



The carving is not complete, but you can see how much more panel space the rounded forward deck provides.

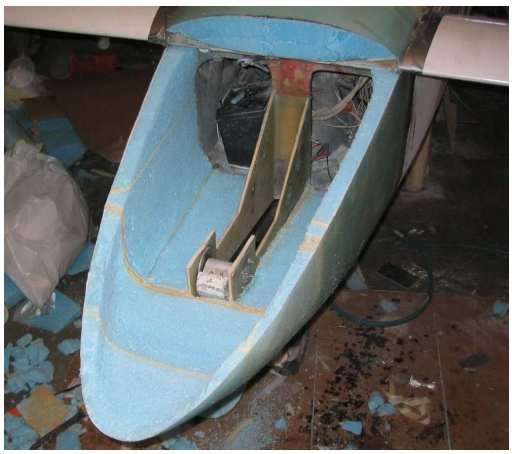


The nose with carving finished and glassed. I like the rounded look much more than the flat look of the original.

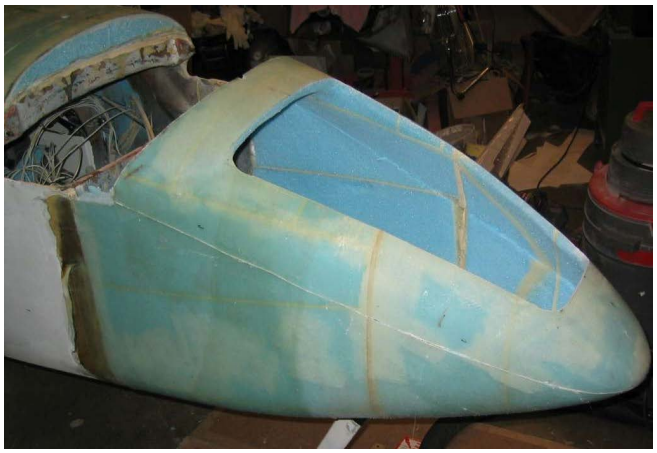
You have to cut into that great looking nose to finish the process. I placed a mark around the perimeter of the nose where I wanted to cut and used a jig-saw to cut through the glass. A large butcher knife finish's the cut.

Cut the canard cover from the forward deck while you've got the jig saw going.

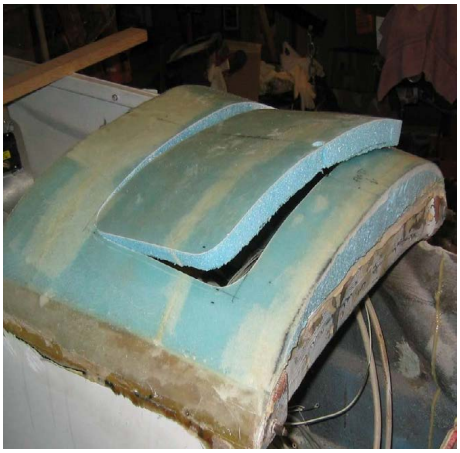
Notice the temporary NG-31 gets cut with the butcher knife... that is why you only glass it with one ply.



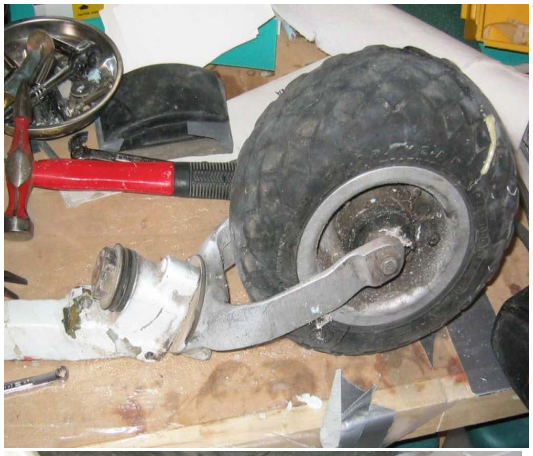
Making a canoe. Here is how the lower portion looks after using the wire brushes to carve out the nose. Top and bottom. I used a nail wrapped with duct tape as a depth gauge.



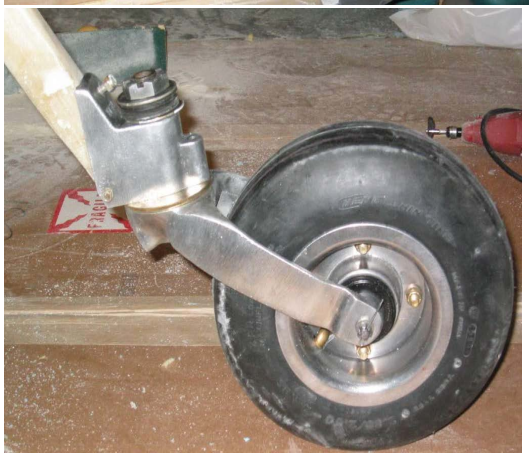
The forward hatch is cut from the top piece. Make sure it is large enough to remove the battery. The hatch will allow quick access to the battery and nose lift.



I also placed a removable panel over the IP. Here it the panel just after cutting with the jig-saw.



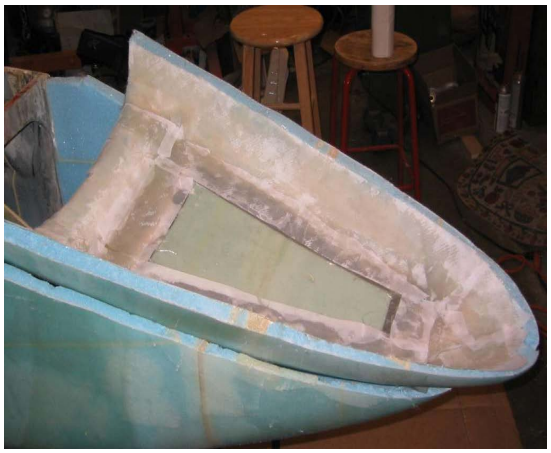
While I'm here I might as well clean up that ugly looking nose wheel. This Varieze is a rehab project and as you can tell it needed lots of re-hab.



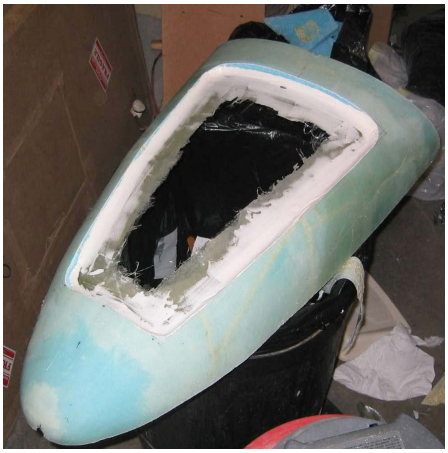
Here is the nose wheel after getting cleaned up and a new tire. I used a wire brush on a drill. After it was clean, I carefully checked for cracks. I also cleaned and repacked the wheel bearings.

Notice the early style foot. I plan to replace that with the newer version as some of these early castings caused a split in the nose strut.

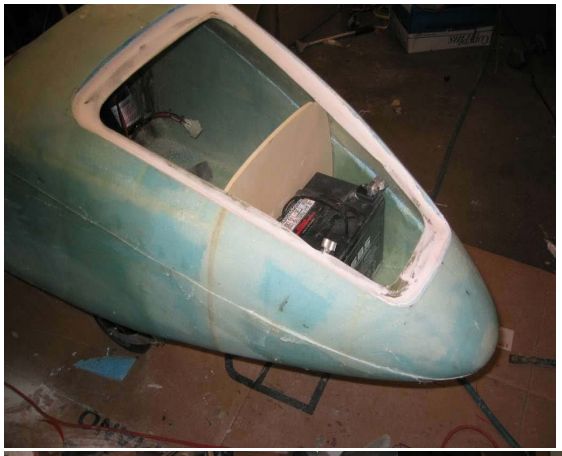
The smooth nose tire will also reduce debris that is kicked up into the prop.



Here is the layup for the hatch lip. Tape the hatch panel in place, cover the edges with duct tape. Spread micro in the gap and then layup three ply bid underneath.



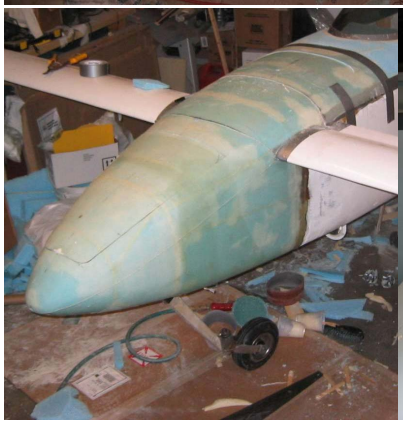
You pop off the hatch and the lip comes out looking like this.

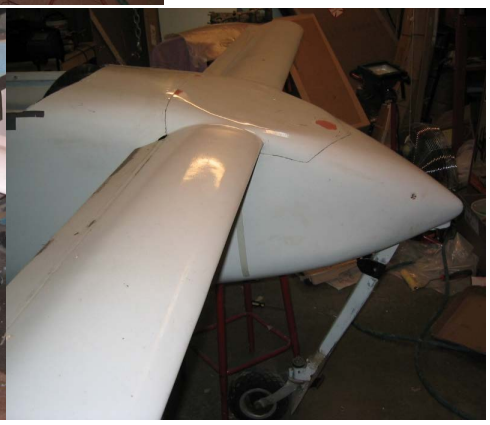


A jig saw and some 40 grit cleans the lip up nicely. Notice the battery will just slip out of the nose. There is room for other items, like ballast, if needed.

Once you are happy with the inside, a new NG-31 is glassed and the two half's are glassed.

Hinges and a hatch lock were added to finish it up.





The nose, before and after... looking like a mini-Berkut. I plan to do a new weight and balance once everything is done.

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