

Graecalis Build Part 4

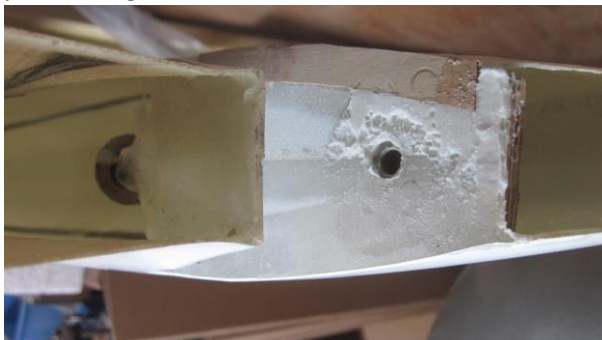
Tailplane is fixed with CF rod (see previous log) and the nylon screw and blind nut shown below.



The blind nut is fitted to the ply plate with epoxy and microballoons. Plate is shaped to be a good fit in the rear of the fuselage.



I used the bolt to hold the ply plate in place while the glue was going off. This ensures perfect alignment.



This is the tailplane seat after the ply plate has been fitted. The shims are necessary for correct alignment of the tailplane. I'll neaten it up later.



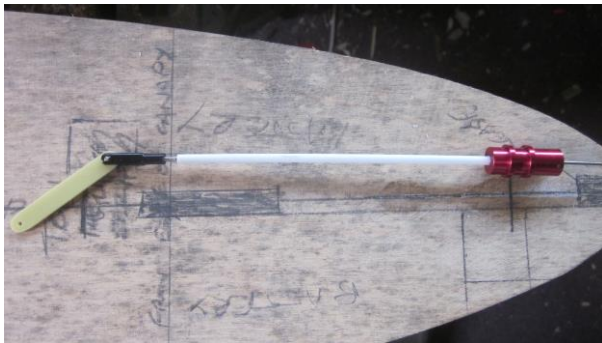
And here it is all put together. I'd be pleased with this if it weren't for the fact that the servo is too small and will have to be rethought!



This is the finished template for the crutch, and the piece of $\frac{1}{4}$ " plywood that I've been carrying around for at least 20 years in the expectation that it might sometime be useful.



The crutch is (intentionally) a tiny bit undersize (glue's got to go somewhere!), so that the line is above it. Fortunately, it is reasonably uniform from nose to tail. The other good thing is that it is possible to get it in and out again. Correct placement will be ensured by the fittings for the aerotow in the nose, and for the bungee release amidships.



Graupner aerotow, with plastic tube guide, and a G10 actuator arm to convert the rotary motion of the servo arm to linear.



Template for 1/2 former which will carry the bungee release. The piece of cereal packet is at 30 degrees to ensure correct angle.



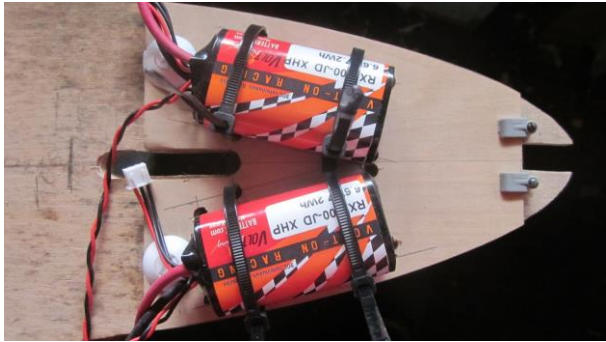
Trial fitting of former and release. The release is a piece of chestnut I had lying around the workshop.



Here's the business end, with bungee pin in place. I'll probably grind off the thread from the pin. It is a 70mm piece of chrome plated steel that I found in a box labelled "Interesting metal".



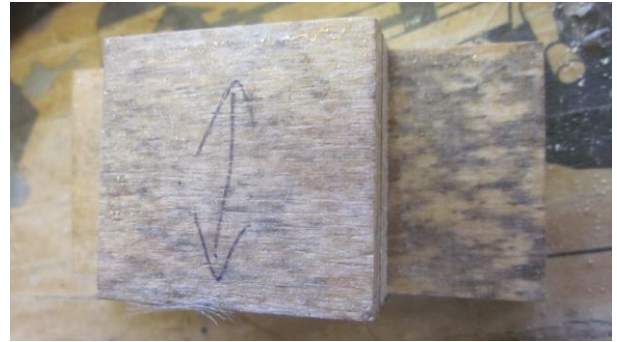
Some lightening holes (also good for access and wire runs), adjustment of angles and glue and the release is done. The top will need narrowing to get the level of the crutch right.



Here's the removable plate that fits in the nose, and carries batteries and nose weight. It's secured with two nylon bolts into blind nuts in the crutch, and those two plastic cable ties, that I modified to take the plate. They are screwed and glued to the crutch, and the plate slips under them. Note the holes for the tow release (right) and its actuation system (left).



I had to rout out a couple of channels to accommodate the ties that hold the batteries to the plate.

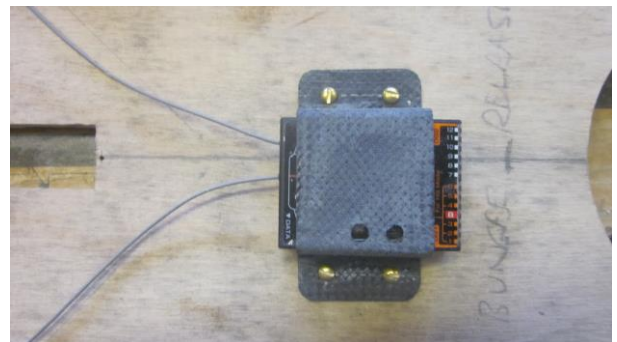


A mould.



Three layers of carbon cloth and loads of epoxy in a vacuum bag.

What have you got?...



... a strap to hold down the receiver.



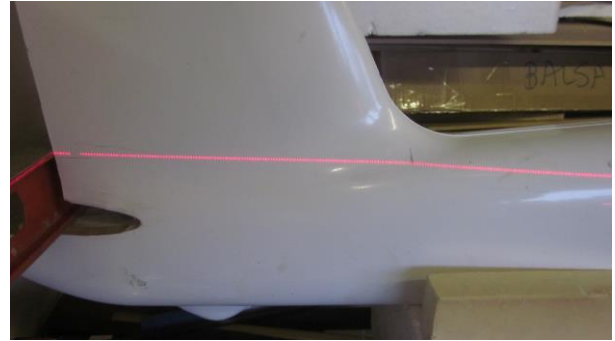
The crutch with most of its fittings. Top left: battery and nose weight plate and aerotow release. Top right: Powerbox switch/regulator thingie and receiver. The big hole is for lightning and also to allow the bungee release to be fitted after the glue laden crutch has been manoeuvred into place. Bottom left: Closed loop. Bottom right: back end.



Here's the whole thing, viewed from the rear end, and a shot of the bungee release in position under the crutch.

And now for something completely different....getting the exit holes for the closed loop wires in the right place. I have never known how to do this except by eyeballing a ruler, followed by a stab in the dark with an undersized drill. It occurred to me though that the laser would be useful, if it were set up to indicate the plane in which the wires are expected to run. In fact, it turned out to be doubly useful, because I was able to use it to make sure that the holes on each side were in a plane at right angles to the centreline of the fuselage. Here's how:

First, set up the laser and the fuselage, so that the laser indicates where the wires will run:

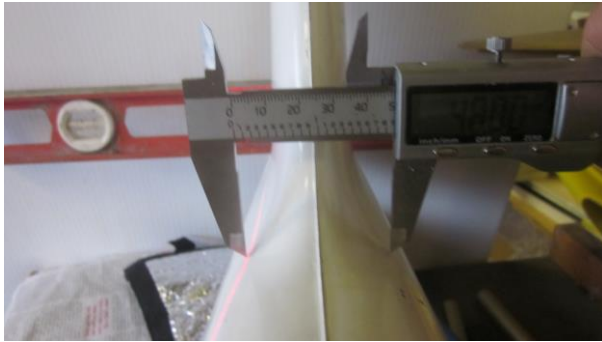


The next bit is the most difficult. With conventional parallel wires, which would need to be 85mm apart and would exit the fuselage about half way between the fin and the canopy. So I decided to fit t the wires crossed, so that the left arm of the actuator setup is linked to the right rudder horn, and *vice versa*. I needed to find the place, where the distance between the wires is equal to the distance between the two exit holes. I did this mostly by trial-and-error, with a bit of long-division thrown in. I finally wound up marking the fuselage at a place just at the front of the fin, where the long-division told me that the wires would be 48mm apart, as you can see in the picture. Fortunately, it all came out rather well.

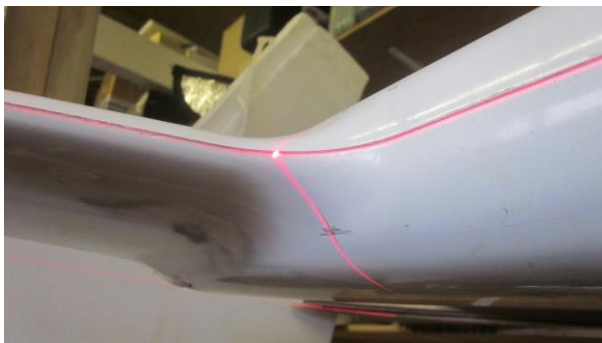
Next, set a pair of calipers at 48mm:



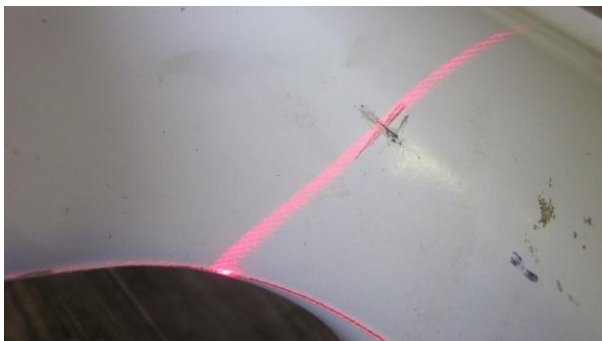
And rest one point on the intersection of the mark on the fuselage and the laser line. The fuselage seam should be 24mm horizontally from this point. Now a bit of caliper abuse: scratch the other side of the fuselage gently to mark it:



Finally, set up the fuselage, so that the horizontal beam of the laser lines up with the seam and the other beam runs through the marked side:



The mark for the other side should be made where the scratch made earlier crosses the laser line:



Job done!

I'm resting the Graecalis project for a short while now, because I've got a LOT of model repairs to do, but I'll be back.