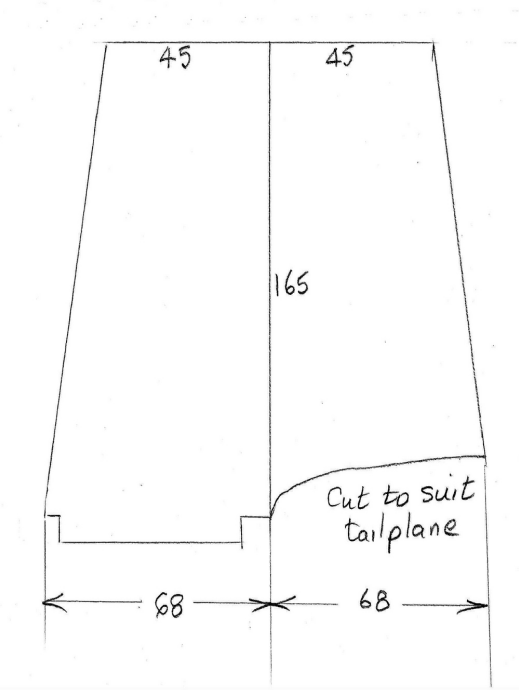
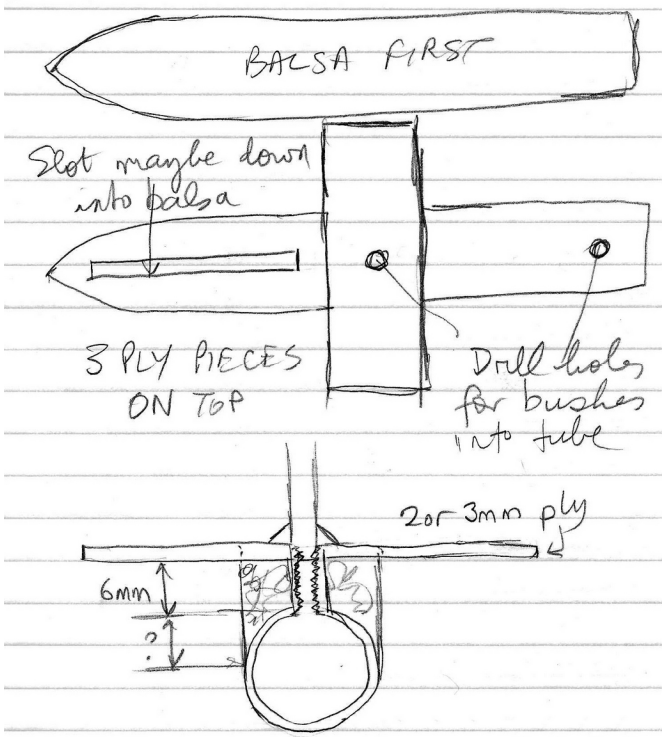
A new fuselage for old Graupner Amigo flying surfaces using a Sapphire fuselage

As this will be the only steering surface the rudder will have to be quite large. I copied the size and shape of the original fin and rudder and made them from lowish density B grain 5 mm balsa, sanded to cross-section and sealed with EzeKote. I painted them black with acrylic to match the boom, then sealed them with acrylic varnish. The fin is permanently fixed to the boom. I think a little extra weight at the rear will not matter. The snake exits the boom slightly left of top in front of the fin.

Detail sketch of fin and rudder



Detail sketch of fin and tailplane mount

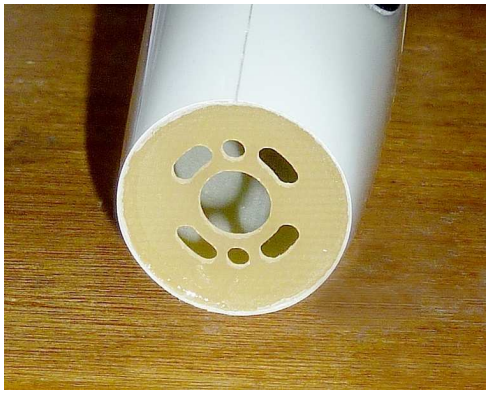


Fuselage

The fibre glass fuselage front is light so I wondered whether I needed to strengthen it inside with epoxy and fibre glass cloth with a few strip of carbon fibre tow. However I had to be careful not to add too much weight with the epoxy. So I decided that the cross pieces on which to mount servos, battery etc would add strength so left it at that. The fuselage front and boom were superbly finished. There were four holes fitted with M4 bushes ready to be used for wing retaining bolts. Excellent value for money.

I shortened the boom with a Dremel cutting disk. Mask on of course.

Motor mounting plate 30 mm diameter

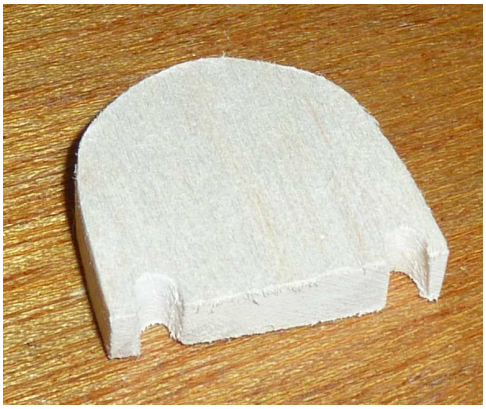


Snake fixing

I debated only fixing the snakes at the rear end of the boom. In the end I decided that, to avoid play, both ends should be fixed and made a balsa bulkhead to push into the fuselage on which to glue the snakes. I screwed a self-tapper into the middle of the bulkhead, which made it easier to manipulate using a pair of narrow pliers.

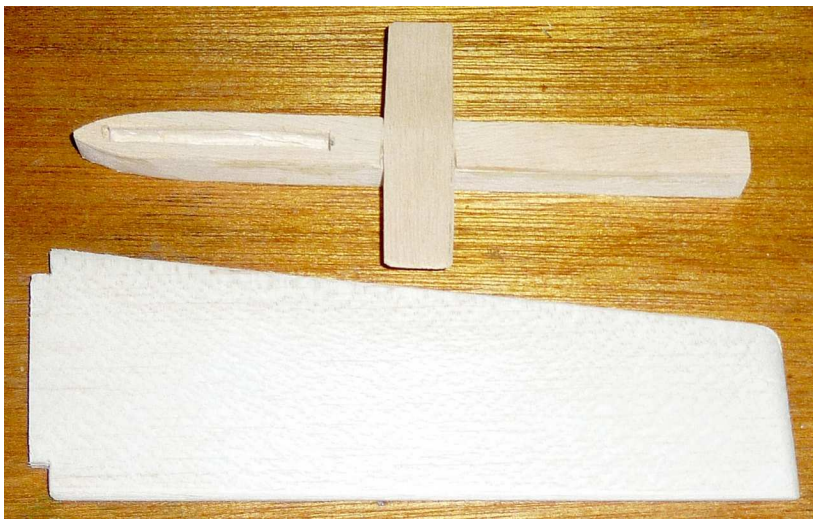
I loose assembled the front and boom with the snake outers in place so I could mark them to length for shortening. Feeding the rudder snake into the mount gave me a moment’s concern, then I realised I could push a piano wire down from the front and use it to steer the snake into place from the rear.

Snake bulkhead

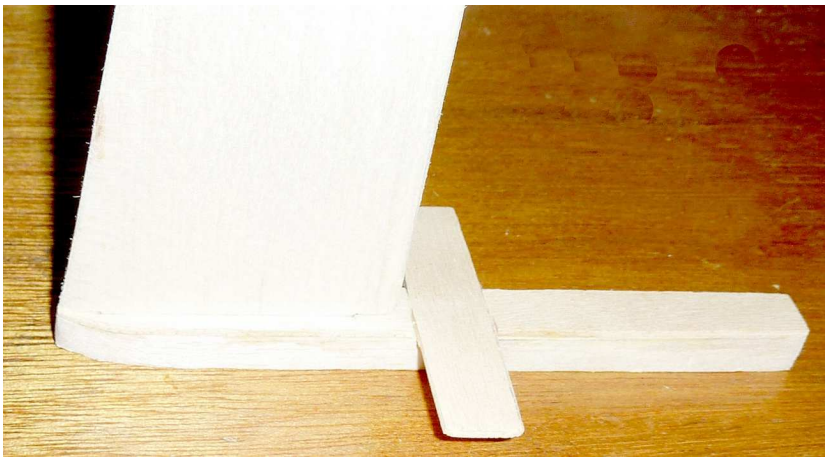


Tail end assembly

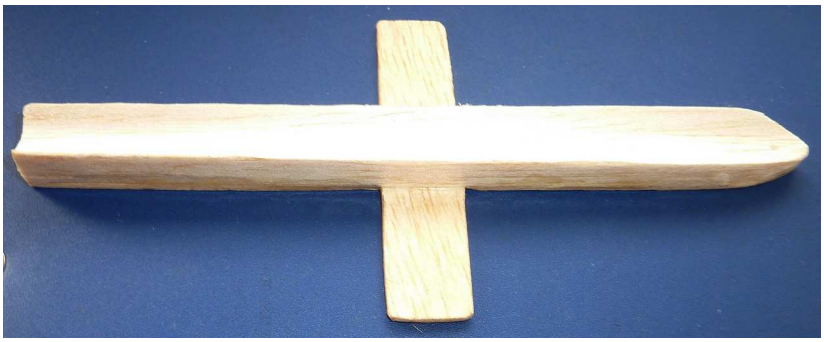
Here are the tail support components sealed with EzeKote ready for painting and varnishing.



And assembled 7.43 g



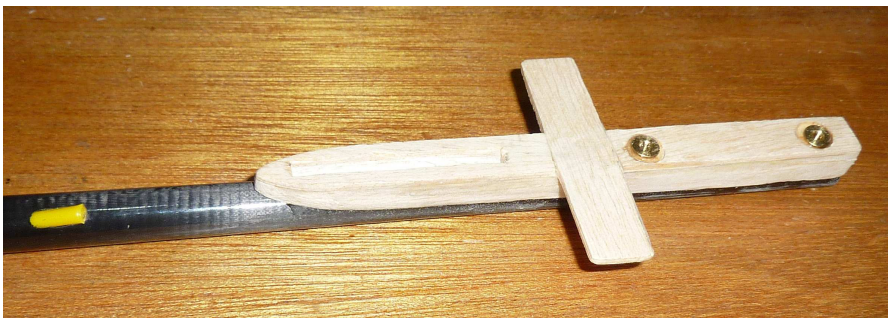
Underside of support shaped to fit boom 4.2 g



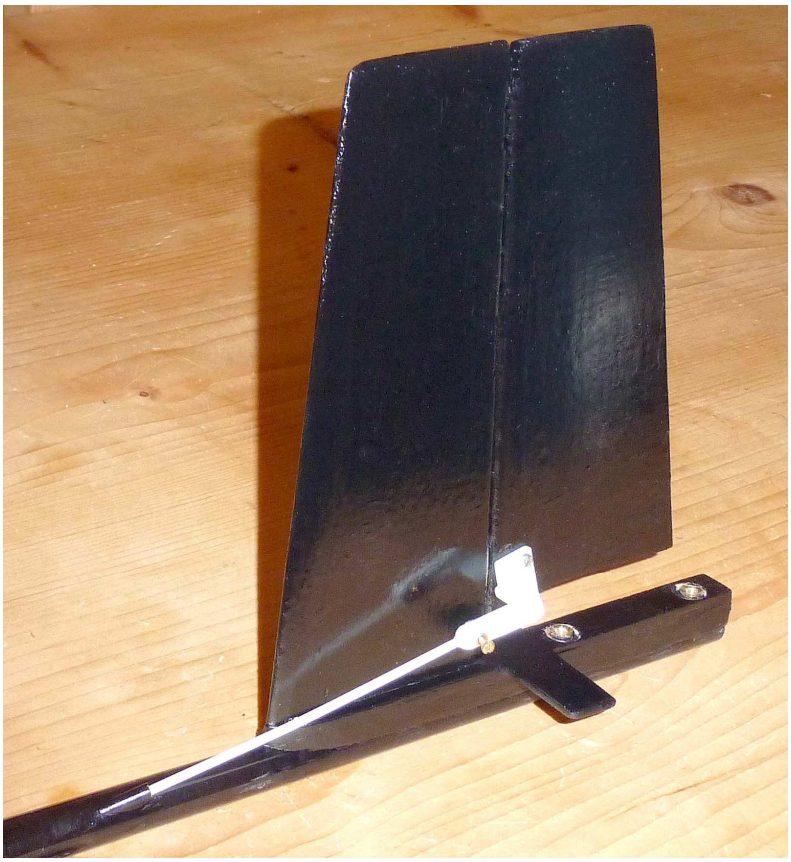
Rudder snake

The SLEC snake that operates the rudder emerges from the tail boom about 40 mm in front of the fin and slightly off centre to the left. It took a while to work out how to make the slot for it. I practised on the piece cut off the boom. After some messy mistakes I found that the best tools were two burrs in my Dremel runnning at fairly slow speed – 15 krpm. I used the ball burr first from the side, pressing down with the boom positioned with the required hole on top. When I had ground a small dent and hole I opened it up into a slot using the pointed burr. Mask on of course. The snake tube is epoxied in place.

Here you see the result before gluing the snake and painting the assembly. You can also see the M3 bushes glued into counterbored holes ready for the tailplane screws. I can easily change to a different tailplane or to remove the existing one for travel boxing.



Here is the finished setup.



Servos and servo mount

The fuselage is too narrow for the servos to be side by side. I therefore put them end to end but offset to give room for a full-size servo arm, as shown in the sketch. I used 2 mm birch ply and glued it on to spruce bearers glued to the fuselage sides. I added extra pieces of 2 mm ply under the screw holes for extra grip.