

Swift - small bird glider

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VIEW IN BROWSER

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Summary

Glider in shape of bird called swift

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Overview :

One of my favourite bird is common swift. The true kings of flying. It is the only species that spends most of its life in the air including eating,

drinking, mating and even sleeping. They can spend up to 10 months in the air and stop only to raise youngs. They don't even have legs strong enough to walk normally.

I always like watch how they fly. They are fast and agile. Inspired of their shape i designed my glider.

My goal was to designed small flying model that will fly well and will be is easy to print. Beyond that I wanted model that will work with my Ultimate Plane Launcher

https://www.printables.com/pl/model/415098-ultimate-plane-launcher

I scaled down shape of swift by half and started to tweaking it. After a doznen of iterations finally I achieved model that satisfied me and consider shape, look and flying ability.

Print setting

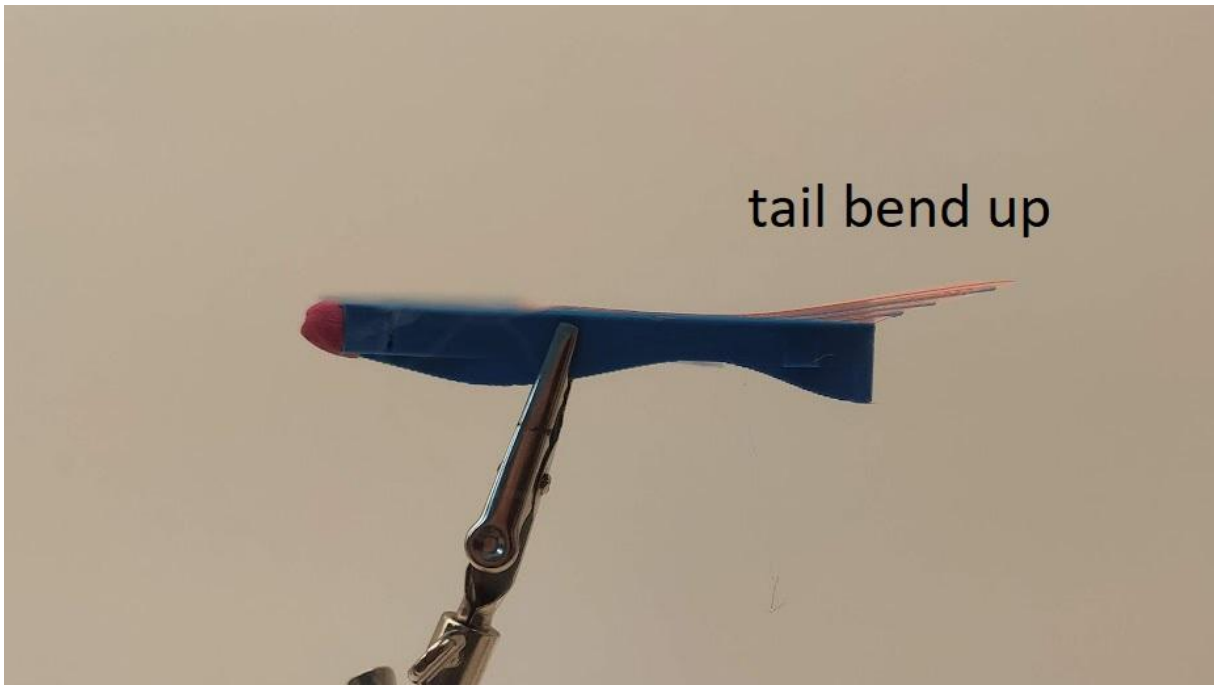
Tested with Prusa mk2, PLA, 0.6 mm nozzle, 0.2 layer height. Good first layer calibration is very important as wings have only one layer 0.2 mm.

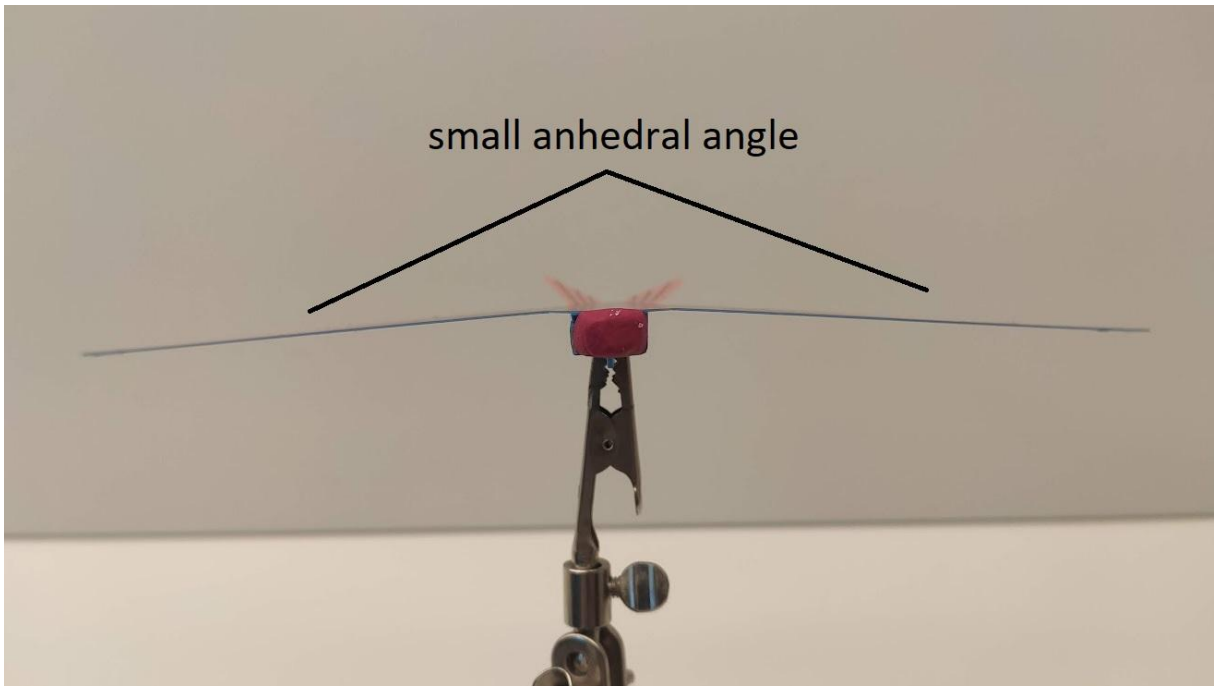
Importan information about use:

Swift has place in head to attach balast. Without balast it won't fly. The best balast is hexagonal screw M5 but single screw it is not enough. You have to seal it will plasticine or other similar mass. Plasticine make addicional balast nad make bumper that protect paint on the walls before making holes in it (I have very soft plaster on the walls and every hit by hard tip make small sign) . Together m5 and plasticine beak are perfect balast to fly indoors. Of course you can try attach to head whathever you want and experiment. Maximum balast that fit is screw m6. But this is intended to outdoors fast and far flights and you have to bend tail yet more and throw with maximum force.

Flying advise:

To fly you must slightly bend up a tail. You can also bend wings down a little. After some testing, I came to the conclusion, that bending the wings down (anhedral angle) gave a better result than bending up (dihedral angle). That was strange for me but I reminded that swifts glide in the same way and it works for them and unexpectedly for their model as well. That was amazing fo me, because other models required the wings to be bent upwards to lower the center of gravity :)





If your glider countinously turn in one direction try bend up opposite side of the tail a bit or lower the same side, in which it turn, a little down.

Model has to be thrown like a paper plane with moderate force.

It can glide really well after adding balast and apropriate bends but it demand good throw technique. Its behaviour in air is quite interesting because is quite similar to real swift. Fast and somethimes making nice maneuvers.

Scaling:

Model can be scaled down to 70 % and with anhedral angle it is smallest, good flying glider that I made what with its ratio 2,3 : 1 (width to lenght 14 cm:6 cm)) was quite impressive for me.

Scaling up is working too. I went to 150% but above 120% it starts to have 3 layers on wings. It add some weight and with that case it better fly with wings bend up (dihedral) and wings are more fragile.

Flights
It is hard to film so little model and there windy but here is a sample of flight.



I hit the only tree :)

Have fun :)

Model files



swift.stl

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