

SWOOP 2 version 2026-08-18

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Let's describe main changes in the new Swoop2 in relation to Swoop1. In general, since we know that Swoop1#1 flies well, would not be necessary to make many changes! If we add many changes the result can be unpredictable, for better or for worse!

All the parameters of the paraglider are related to each other, and the important thing is to find the right combination. Since it is very complex to numerically model the aerodynamic behavior of the wing pressures, most designers (like me) work with good geometric models, with corrections if necessary, and using tricks that have worked well, in previous models or in other paragliders.

The overall geometry and external appearance of the Swoop 1 and 2 are almost identical. Only a very small correction of angles and lines. The main changes are in the position of the anchor points and the internal structure.

1) Putting "B" in midle point between "A" anb "C"

From a theoretical point of view, it is better to place anchor B closer to A, rather than placing B midway between A and C. This is because the vertical aerodynamic forces are not uniform along the chord, and are much greater in the first half of the profile. It is interesting to place chords where the greatest vertical forces are.

If we use a speed variation system with a rigid bar, we can anchor points A, B, C in the same proportion as they are on the wing and achieve two advantages:

- Structural optimization (better transmission of vertical forces to the profile)
- Variation of angle of incidence without deforming the profile (or with small deformations)

But for practical reasons it may be useful to place B midpoint between A and C. This is useful for using three-rise velocity variation systems, where riser B has exactly half the vertical displacement of C.

Comparative Moustache - Swoop1 - Swoop2:

	A	B	C	Brake
Moustache	11.1	38.2	66.16	95
Swoop 1	10	37	72	100
Swoop 2	11	39	67	95

2) Brake section not at trailing edge

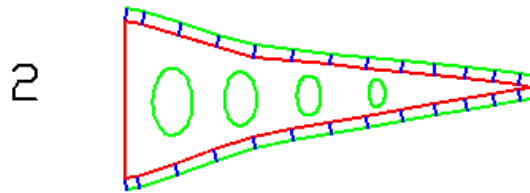
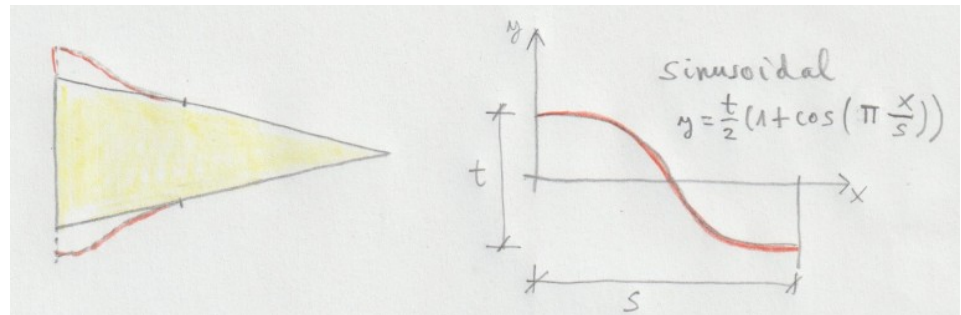
Works better for reflex? Example: Hegala

Yes, we set it to 95%.



3) Trailing edge miniribs

Swoop2 use new option with smooth transition, and holes inside miniribs



4) Longer nylon nose rods

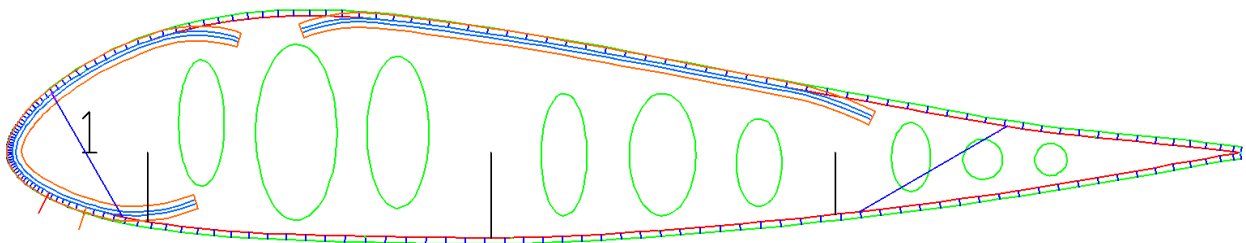
Yes, "type 1"

	Init % (extrados)	Fin % (intrados)
Nose jonc Swoop 1	10	14
Nose jonc Swoop 2	18.5	15.5

5) Uppser sail rods.

Modern gliders always have this upper sail rods Yes, we have added a longer nose bridge and a new long bridge to the extrados. In theory this should improve the shape and stability of the profile

Yes, new extrados rod "type 4" from 23.5% to 70%.



6) Max geometric torsion

	Max washin (wingtip)
gnuC 1 & 2	6.0
Swoop 1#1	6.0
Swoop 1#2 (Thierry) & 22 m2	4.5
Swoop 2	5.0

Washin is the difference between the geometric angles of attack between the center and the wingtips. It is not exactly the real washin, which depends on the orientation of the airfoil relative to the trajectory. However, in general, reducing geometric washin should improve speed (and glide ratio) and worsen wingtip stability.

Since the Swoop 1#1 has good wingtip stability, I decided to reduce a little the 1#2 (Thierry's) and the 22 m2 project, which was to be built in China. Swoop2 uses 5°.

7) Neutral calage

	Max washin (wingtip)
gnuC 1	30%
gnuC 2	33%
Swoop 1#1	30%
Swoop 1#2 (Thierry) & 22 m2	35%
Swoop 2	32.5%

As a precaution on Swoop 1#2 I increased the calage to 35% thinking that maybe Thierry will also use normal fixed risers. Maybe at 35% the glide ratio is better, although we don't have exact data. In a parakite this value is not critical, as it changes constantly in flight, and it is necessary to experimentally adjust the minimum and maximum range of the risers. Swoop2 would use 32.5%.

8) Lines design

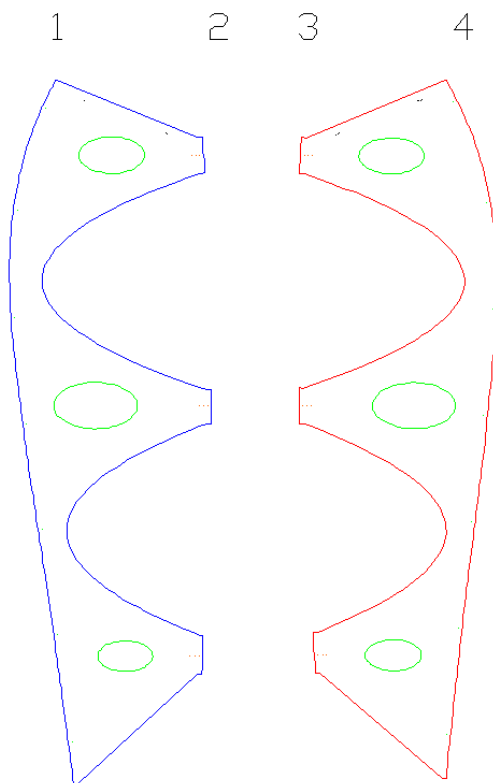
The line design in Swoop 1 and 2 is the same. The only differences are the position of the anchors A, B, C and the lengths of the upper branches, which are slightly shorter.

9) New internal structure

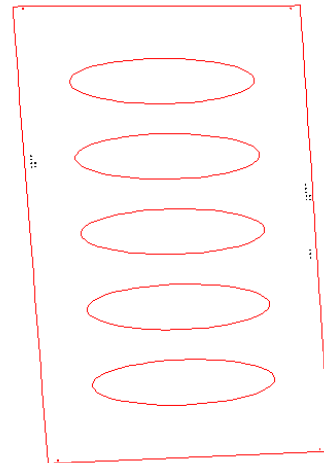
We have replaced the individual diagonals type 16 with complete diagonals type 15. In addition to the parabolic holes, we have added some elliptical holes to the diagonals, in accordance with the new options of the LEparagliding program version 3.29 which has been developed in parallel with Swoop2.

The upper diagonal straps are type 16 (as in the previous version but now include 4 elliptical holes each).

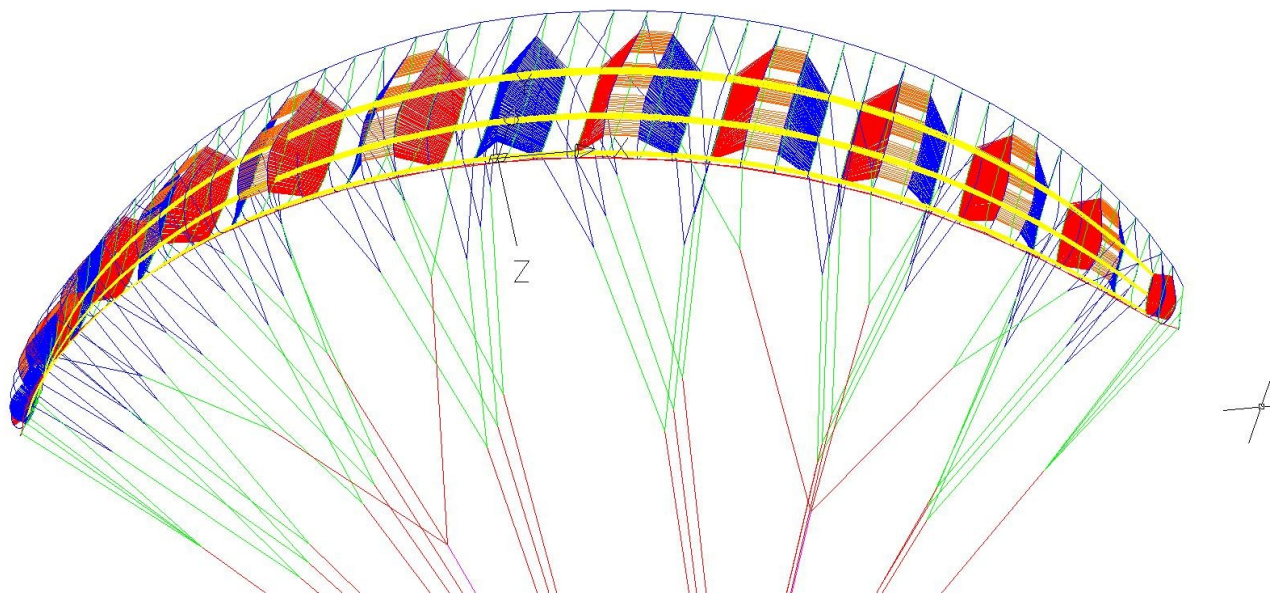
As mentioned, miniribs also include holes.



Type 15 V-ribs



Type 16 H upper straps



Internal structure

10) Wingtip steering

This remains an option. IF necessary, a new set of lines can be created that only act on the brake points, located further towards the tip of the wing. Pull the last outer 3-4 brake points than the whole brake gallery. The glider turns quicker.

11) Airfoil

We have kept the classic gnuReflex profile, as it has given good results. A shark-nose version of this same profile is left for other projects.

10) Resume

	Aspect	Decision	Notes	Justification
1	"B" in middle point between "A" and "C"	Yes	A=11%, B=39%, C=67%	Facilitates angle variation with conventional risers. But theoretically less adapted to load distribution
2	Brake section not at trailing edge	Yes	Brake at 95%	
3	TE-Miniribs	Yes	Using cosinoidal transition and holes	Smoother transition
4	Create longer nylon nose rods	Yes		Improves stiffness
5	Uppser sail rods	Yes		Improves stiffness
6	Max geometric torsion	5°	Swoop1 Tim 6 deg, Swoop1 Thierry 4.5 deg	
7	Neutral calage	32.5%	Swoop1 Tim 30% Thierry 35% (no info from Thierry yet...)	Swoop1 Tim 30% Swoop1 Thierry 35%
8	Internal structure	V-ribs type 11, 15 and 16 holes	Type 15 and 16 includes	
9	Wingtip steering	Yes	As option	