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WORLDWIDE PARAGLIDING AND PARAMOTORING MAGAZINE. FOR FREE.
ASYMMETRIC COLLAPSES
Photo: Nova

Photo: Franck Simonnet

THE SAME BIG FAMILY

There is lots of paramotor news in this edition which will perhaps surprise some free flying purists. It doesn't prevent us all being (more or less) equal when it comes to collapses, whether we are propelled by gravity, thermals or a motor. It's worth remembering that paraglider manufacturers are using more and more ideas gleaned from the paramotor domain to improve wings designed for thermals. What we all especially dream about is the incredible stability of reflex wings which cross turbulence at 70 km/h as if there was nothing there.

The manufacturers are increasing the amount of reflex in the free flying wings as well and using it to move the centre of lift forwards. It isn't necessarily visible in the raised trailing edge which characterizes the reflex profile in the minds of most pilots. But as the aerodynamic engineer in our editorial team Sylvain Dupuis pointed out, profiles are becoming more and more auto stabilizing even amongst reflex profiles.

And it isn't by chance that the problems which have occurred with the folding lines used for certification in paragliding wings resemble the problems faced by paramotorists ten years ago, when asked how to test collapses on a wing such as the Paramania Revolution…
We're all part of the same big family…

By Sascha Burkhardt
Translation Ruth Jessop

CONTENTS


FLYING
FREELY
SKIN
Mini wings · EN 926- 1
The Skin is a single surface glider that will captivate you for its design and behavior. It is as easy to fly as an entry level school wing but designed for pilots looking to pursue daring adventures. Able to take off from any spot, blessed with superb landing abilities land and as efficient and performant as all other Niviuk gliders. The versatility of the new Skin glider will surprise you.
niviuk.com

DUDEK: THE SNAKE WITH A SHARKNOSE

The Snake from Dudek will now also be available in an XX version. It isn't a simple update, but a model with significant differences.

Amongst other things, the profile of the Snake XX has a SharkNose. Dudek will be using this technology from now on in all the models in the XX range such as the Nucleon XX. Another common feature in the new range is the four elements design on the wings signifying air, water, earth and fire.

A nice promotional video of the Dudek Snake XX.
https://www.youtube.com/watch?v=zHUNOSAVBcs

Photo: Lojak

The Snake XX has a higher aspect ratio than the classic Snake (still being produced). In its smaller sizes it is designed to be used more heavily loaded (6.5- 9 kg/m2) and is principally aimed at slalom competitors.

Pilot Jérémy Pénone from the French Dudek team has just won the first round of the 2015 Slalomania circuit at Montauban on his serial Snake XX 16.

Photo: Dudek


Photo: Dudek

DUDEK SNAKE XX
TECHNICAL DATA FROM THE MANUFACTURER

Manufacturer: DUDEK Address : **ul. Centralna 2U, 86-031 Osielsko, Poland** **Website:** http://www.dudek.eu/en/					
Size	15	16	18	20	22
Number of cells	60	60	60	60	60
Wing area flat (m^2)	15	16	18	20	22
Wing area projected	12,94	13,81	15,53	17,26	18,98
Wingspan flat (m)	9,40	9,71	10,30	10,86	11,39
Projected wingspan (m)	7,62	7,86	8,34	8,79	9,22
Aspect ratio flat	5,90	5,90	5,90	5,90	5,90
Aspect ratio projected	4,48	4,48	4,48	4,48	4,48
Sink rate (m/s)	min = 1,3 +/-0,2				
Speed (km/h)	min= 30 ; trim = 46-60 ; max = 75 +/- 5				
Lines + risers length (m)	5,64	5,83	6,18	6,52	6,83
Total lines length (m)	251,41	260	276,43	291,96	306,74
Take-off weight (kg)	90-135	95-145	110-150	120-160	130-170
Canopy weight (kg)	4,4	4,6	5	5,3	
Approval	DGAC pending	DGAC pending	DGAC pending	DGAC pending	DGAC pending
Lines	Edelrid A-8000U: 050; 090; 130 / Liros TSL: 090 & 140 & 190 & 280				
Cloth	Porcher Sport 38 g/m2 / Dominico tex 34 g/m2 / Porcher Sport Hard 40 g/m2 / SR Scrim / SR Laminate 180g				

MOJO 5

The Mojo Legacy continues… The all new Mojo 5 is lighter, easier to launch and fly, and more comfortable in the air than the Mojo 4. The Mojo 5 may be the 5th in the series, but this iteration is completely new, and was designed from the ground up to redefine this specific class of wing. The mission was to offer the highest level of performance in the beginner category without compromise in the safety and ease of use. Passive safety is even further improved over the Mojo 4, and at the same time we have refined the launch behaviour and upped the glide performance. From new school graduates to relaxed paragliding veterans, the Mojo 5 provides the most relaxing platform in the Ozone range for all-around fun flying, and basic XC missions.

Moab, UT, USA - photo: **Loren Cox** pilot: **Cade Palmer**

APCO

THE LIFT EZ

Photo: Bugy/Apco

Photo: Bugy/Apco

The Lift, from the Israeli manufacturer Apco, which came out in 2012, was already a very stable wing in roll and pitch, which was reassuring for beginners taking up paramotoring. We have tried it and can confirm this. The Lift EZ (for Eazy), that Apco have just launched, should go even further in terms of accessibility.

According to Apco, it is a totally new model. For the profile, the manufacturer is said to have tested several options, including a SharkNose, but finally chose not to go for that but, instead, chose a profile derived from the NRG Pro. The concept, therefore, goes deliberately against the current trend.

The result should be, compared with the previous model, 'a *wing which takes off even earlier and with less speed, which glides better as well as having better handling and is even easier to land*."

The improvement in handling is obtained, according to Apco, by reworking the Tip Steering (specific brakes on the stabilos). A little pocket forms on the stabilo, and the drag on the wing tip should be greater than on other Tip Steering systems.

For more information:
http://www.apcoaviation.com

Photo: Apco

The wing is primarily designed for paramotors, but it can equally be used for paragliding.

An Apco Lift EZ in the Israeli desert.

Photo: Apco

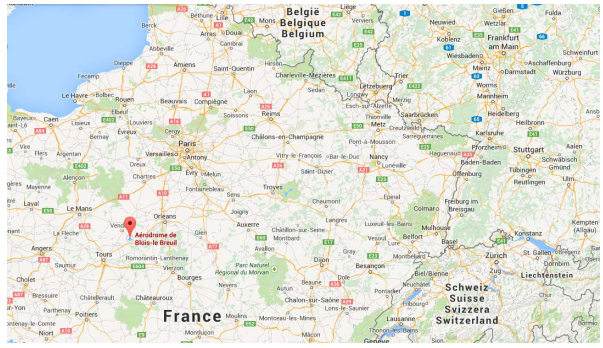
The Lift EZ, a wing that's easy enough for anyone to launch without requiring training? A fictitious scenario, but very original...
https://www.youtube.com/watch?v=2HwadPjhCWE&feature=youtu.be

APCO SPLITS IN TWO

The manufacturer announced it. The new paramotor harness is now on sale with high points as well as low points. It won't even weigh 1.5 kg and is distinctive thanks to the separation of the two thigh straps (reminiscent of harnesses of yesteryear or the most recent ultra light ones for paragliding hike and fly).

This concept brings, according to Apco, increased comfort, easier take off and landings, as well as better handling.

Photo: Apco



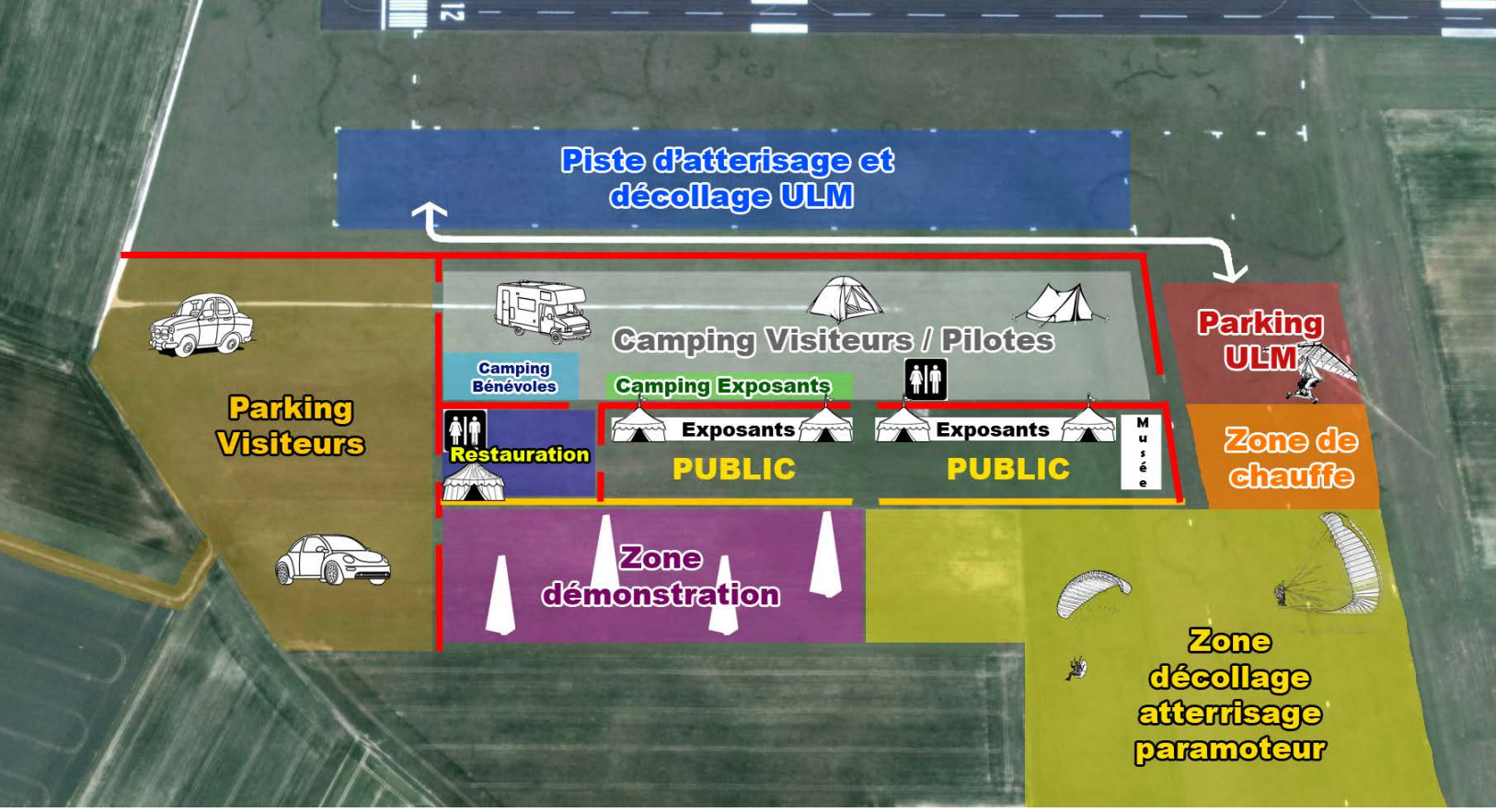
https://www.google.fr/maps/place/Aérodrome+de+Blois-le+Breuil

BLOIS
THE WORLD OF PARAMOTORING

Decided at the beginning of 2015, therefore very last minute for this size of event, The World of Paramotoring at Blois will bring together the paramotoring world from Thursday the 18th of June to Sunday the 21st of June.

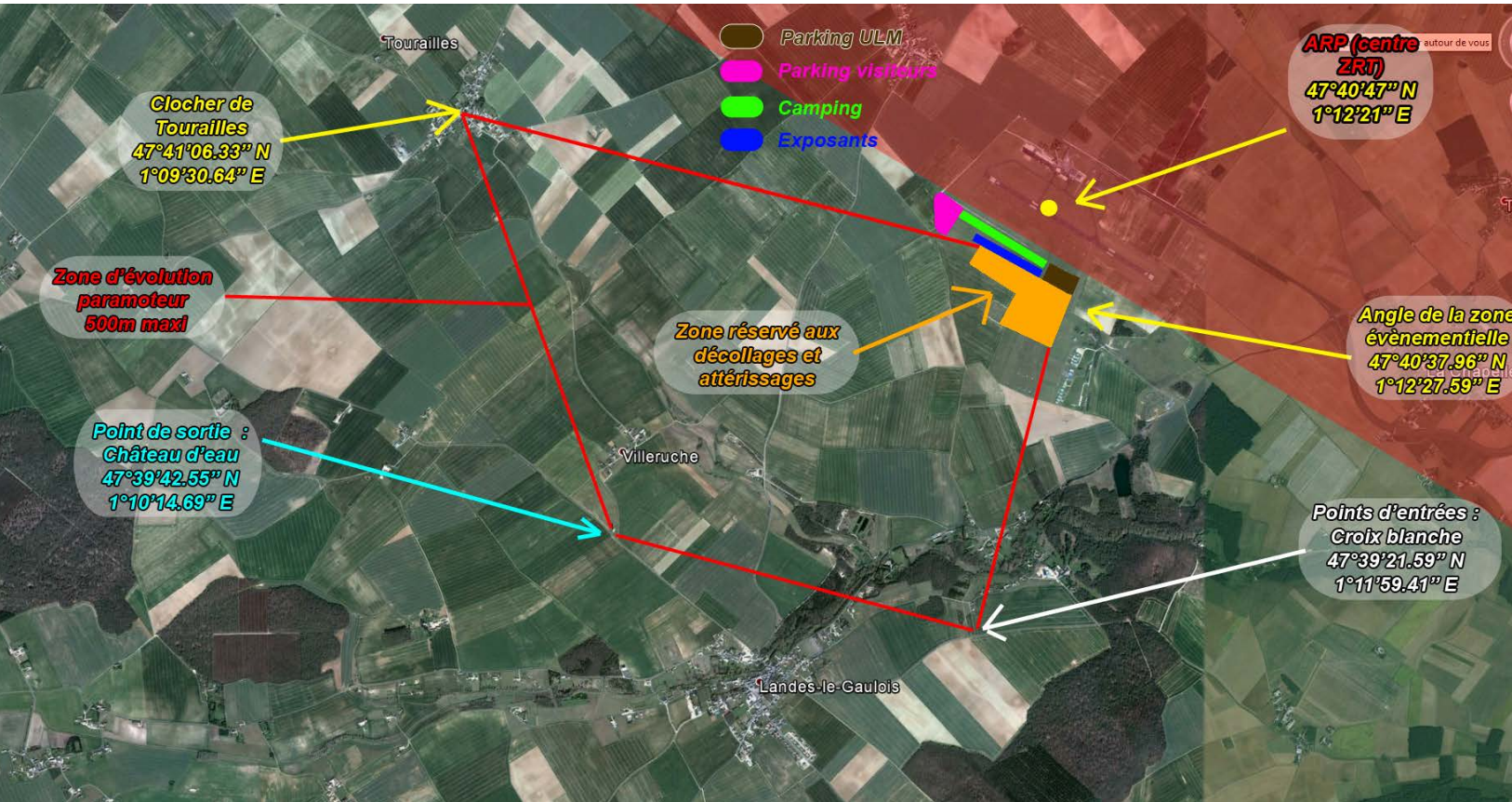
Already about fifty exhibitors are expected for the premier of this event. Before, a few paramotor stands were integrated into the Blois microlight exhibition (multi-axis, weight shift) in September. From now on, our rags will have the place they deserve, with their own separate giant room!

For more information:
http://www.mondialairparamoteur.com

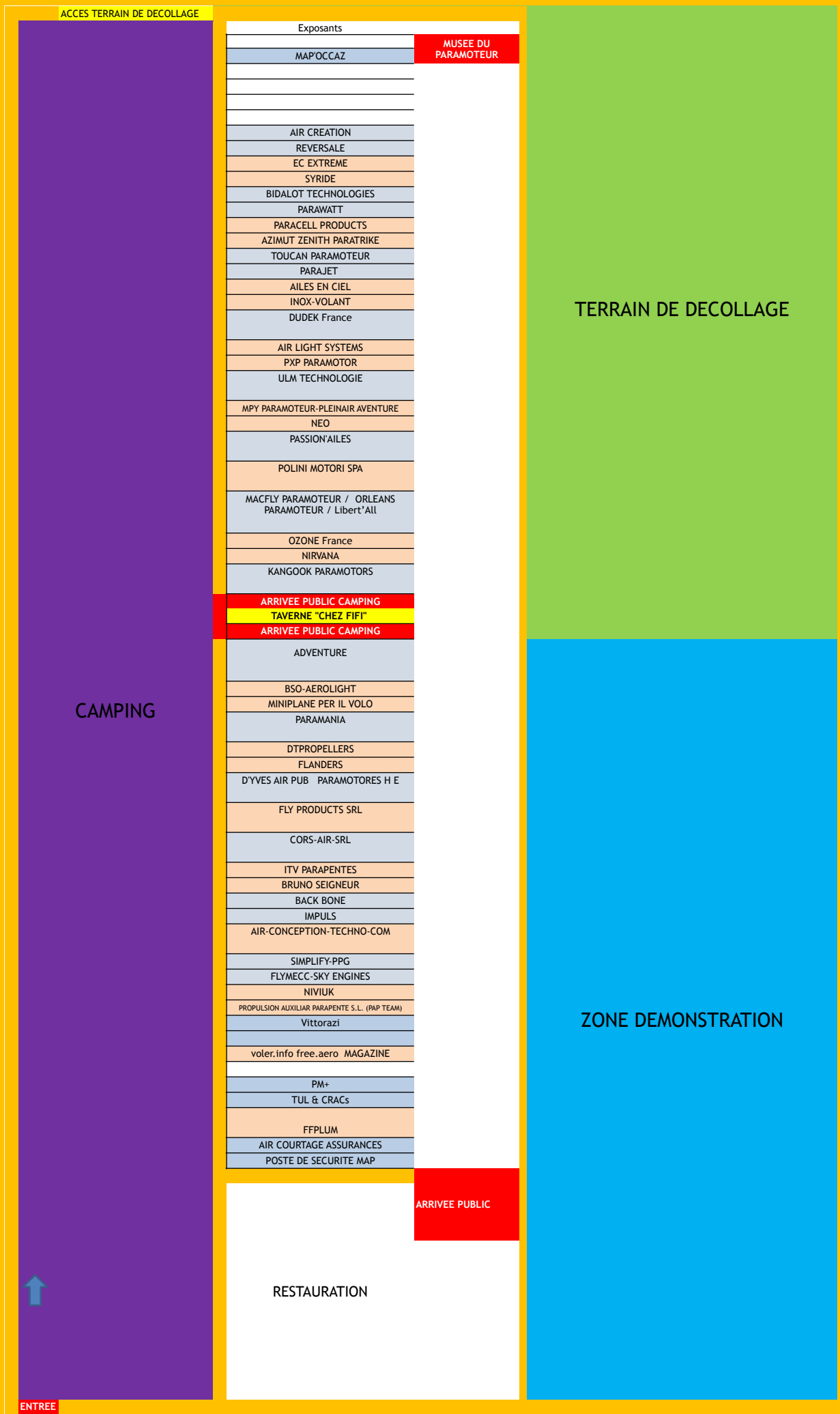


Overall plan

Detailed plan



Provisional plan



https://www.google.fr/maps/place/Verkehrslandeplatz+Ballenstedt%2FQuedlinburg

BALLENSTEDT

A week after The World of Paramotoring, there is another important event: the DMP at Ballenstedt in Germany. This exhibition is organized by the German paramotor federation, but it is more of a get-together with a reasonable budget and the stands for the exhibitors are less expensive than at other trade shows. In general, it has almost a family feeling to it.

Photo: Franck Simonnet

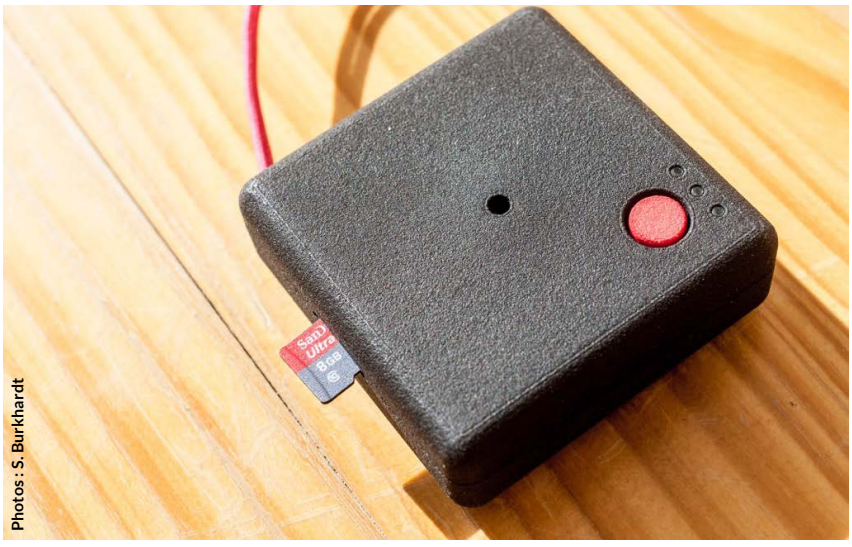
The DMP is also a friendly competition a kin to the arrival of an aerial rally: whoever comes from the furthest away point by air wins.There is also a small aerial film festival.

Dates 26th to 28th June.
www.dulv.de/Deutscher-Motorschirm-Pokal/K218.htm

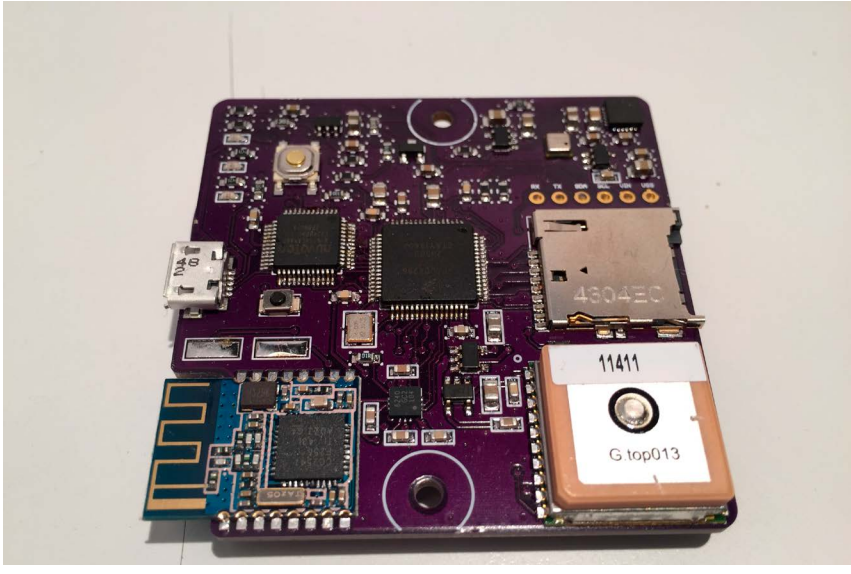
Top left photo: The propeller manufacturer Helix provides the majority of the world's paramotor manufacturers with carbon propellers. At Ballenstedt, in previous years, he carried out repairs and rebalancing for pilots who were there.
Photos : Sascha Burkhardt

Obviously the German manufacturer Fresh Breeze has a good spot. On previous occasions, in a vehicle workshop, Fresh Breeze offered servicing and repairs on machines of their own make.

XC TRACER : THE DIRECT VARIO



Photos : S. Burkhardt



Koni Schafroth is a long time paraglider pilot and Swiss aerodynamics engineer who works for Gin Gliders amongst others. For him, the current varios aren't advanced enough as far as showing lift is concerned. Most instruments only measure the barometric differences so that you can deduce height gain or loss. To get a usable reading manufacturers are obliged to smooth out the signal, which results in a slight delay between the beginning of the climb and the 'bip'.

His device integrates an accelerometer, a gyrometer and a magnetometer. The values of these sensors are used in calculations normally used for artificial horizons and allow the instrument to give an immediate response to each vertical movement.

The instrument also has a GPS to record tracklogs and communicate via Bluetooth LE with smartphones or tablets.

Eventually, it should be compatible with the majority of apps made specifically for paragliding, such as FreeFlightPro, Thermgeek, SkyLogger, Air Navigation Pro, XCSoar, PPGpS, FlyMe...

The development has been financed via the participative site Indiegogo. With about 31 000 € by the end of April, he has raised 137% of the minimum anticipated. The final instrument will be delivered in August 2015 and will cost 330 €.

For more information:
www.indiegogo.com/projects/xc-tracer

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KANGOOK: THE KOMFORT TANDEM TRIKE AND THE VIKKING RANGE VIDEO

The trike KX1 now also exists in a tandem Komfort version. With this version, Kangook hope to provide a response to the growing demand for lightweight tandem trikes that can be dismantled. It is possible to update existing KX1 trikes.

The tandem kit includes, amongst other things, a pair of aluminium spreaders (T6-6061) with security straps and a pair of fork extensions as well as a reinforcement system.

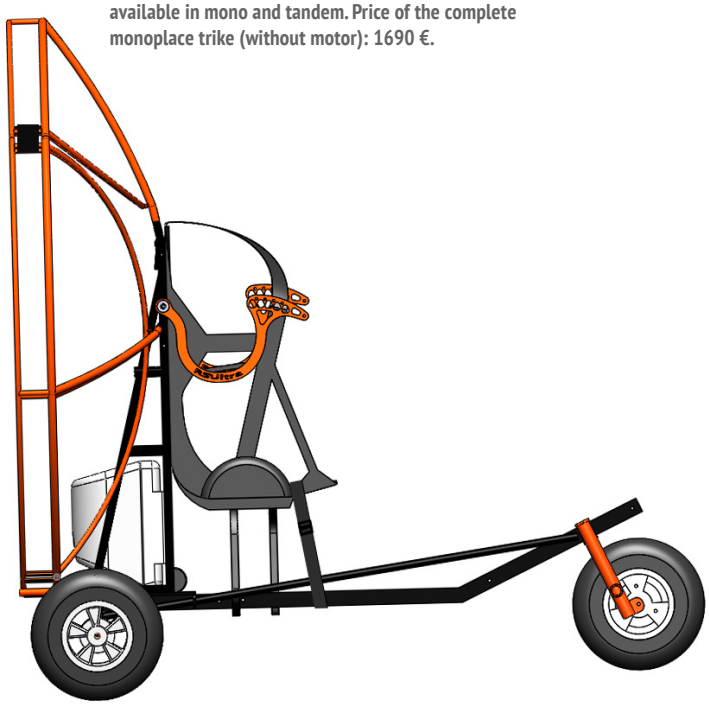
A Komfort KX1 mono trike can be changed into a tandem one at a cost of 1990 €. The full trike costs about 3990 € without the motor.

To modify it, amongst other things, the chassis is lengthened, the front fork modified and a reinforcement hoop is installed.

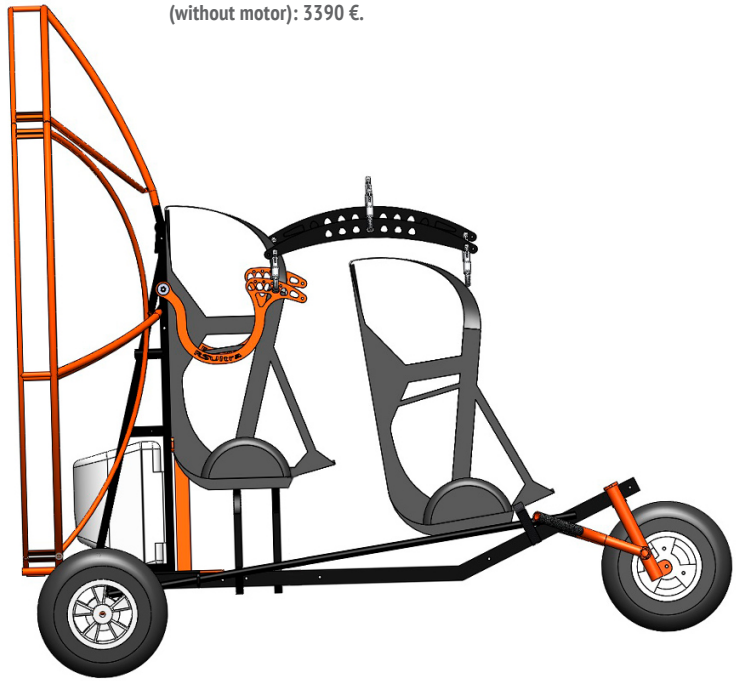
All the Kangook chassis can be adapted to this tandem trike. RSUltra advise a Polini 250 engine if you are using it regularly as a tandem.

For more information: www.kangook.ca/en/

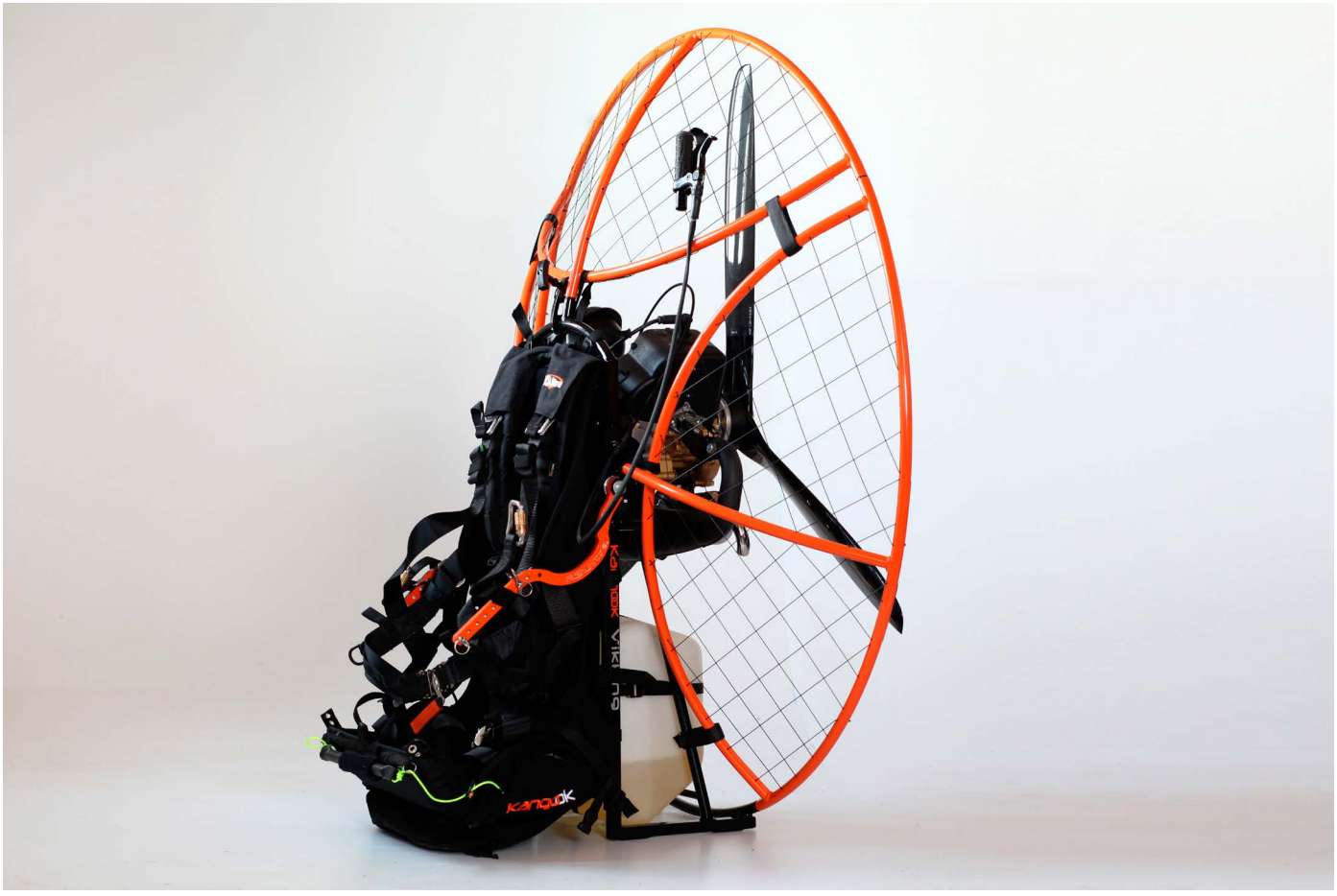
The basic version of the trike, where the harness is attached directly in the monoplace and by using spreaders in the tandem, instead of roll bars, is still available in mono and tandem. Price of the complete monoplace trike (without motor): 1690 €.



Price of the complete tandem trike (without motor): 3390 €.



VIDEO: THE VIKKING RANGE



In a very well made presentation video, Kangook explain the impressive modularity of the Vikking range with different options for the cages, attachments and motors etc.
https://vimeo.com/118266302

NEWS NIVIUK
THE PLUME ON APPROACH

The P series are lighter models for hike and fly. The Artik P 23 only weighs 3.8 kg compared with 4.9 kg for the Artik 4 23. The Skin P in size 18 weighs 1.95 kg, compared to 2.6 kg for the classic Skin in size 18.

At Niviuk, the models 'P' for 'Plume' (feather) will be available very soon. It's a slight move away from the classic models. For the moment, only the Artik and the Skin benefit from this option for hike and fly. Other models will apparently follow in the near future. The Skin P (on the right) is available in three sizes (16, 18 and 20) and in two colours (Sunlight and Atlantic).
For more information:
http://www.niviuk.com/product.asp?i=eng&id=&prod=JNMOLQQ8&news=

The Artik P (photo below) is available in four sizes (21, 23, 25 and 27) and in two colours (Navy and Lychee).
For more information:
http://www.niviuk.com

Photos : Niviuk

AN FAI TRIANGLE ON THE SKIN BY NIVIUK

Photo: Niviuk Luc Hentsch

On the 7th of May, Kurt Eder proved that single skin wings can actually be used like classic wings. On his Niviuk Skin 18, he completed an FAI 80 kilometre triangle in seven hours, with an average speed of 11 km/h. His reaction: 'what a fun machine!'

http://www.xcontest.org/italia/voli/dettaglio:Targa/7.5.2015/09:41#fd=comment

PARAMOTOR TANDEM RECORD

Karen Skinner and her husband Jason Whitehead have set a new world tandem record on the Niviuk Takoo 3.

The two pilots broke the world record for the length of time taken to climb to 3000 metres in a tandem paramotor, taking only forty minutes at the controls of a Takoo 3, thus beating the previous record by 20%.

Karen and Jason have been waiting for this moment since November 2014 when they got to 2 300 metres, but had to abandon their objective due to strong turbulence.

NICOLAS AUBERT
FIRST PODIUM OF THE SEASON

Nicolas Aubert, a Niviuk team pilot and son of the owner of PAP, got third place on his Doberman at the first Slalomania event in 2015 at Montauban.

GARMIN GOES X-ALPS

The manufacturer Garmin, which was one of the pioneers in the mobile GPS market, will be sponsoring the 2015 X-Alps. Amongst other things, the competitors will be equipped with VIRB Elite action cameras. These cameras include a GPS, a barometric sensor and an accelerometer. All these values will be recorded at the same time as the film, allowing the information to be easily integrated into the videos.
The VIRB elite costs 399 euros.
www.garmin.com

ADVENTURE : FLEX-ONE

A completely new model for beginners is available from Adventure: the Flex-One. This wing with a reflex profile was designed to 'make life easier for beginner pupils as well as their instructors'. Its main characteristic is its unrivalled simplicity: the phases of inflation, often a source of failure in the beginning, will become 'a simple formality'.

For this, Adventure have put the emphasis on centring the wing by only using the brakes. Lateral movement of the pilot isn't necessary. This behaviour, which is very suitable for beginners foot launching, is obviously also an important bonus when using a trike.

Photo: Véronique Burkhardt

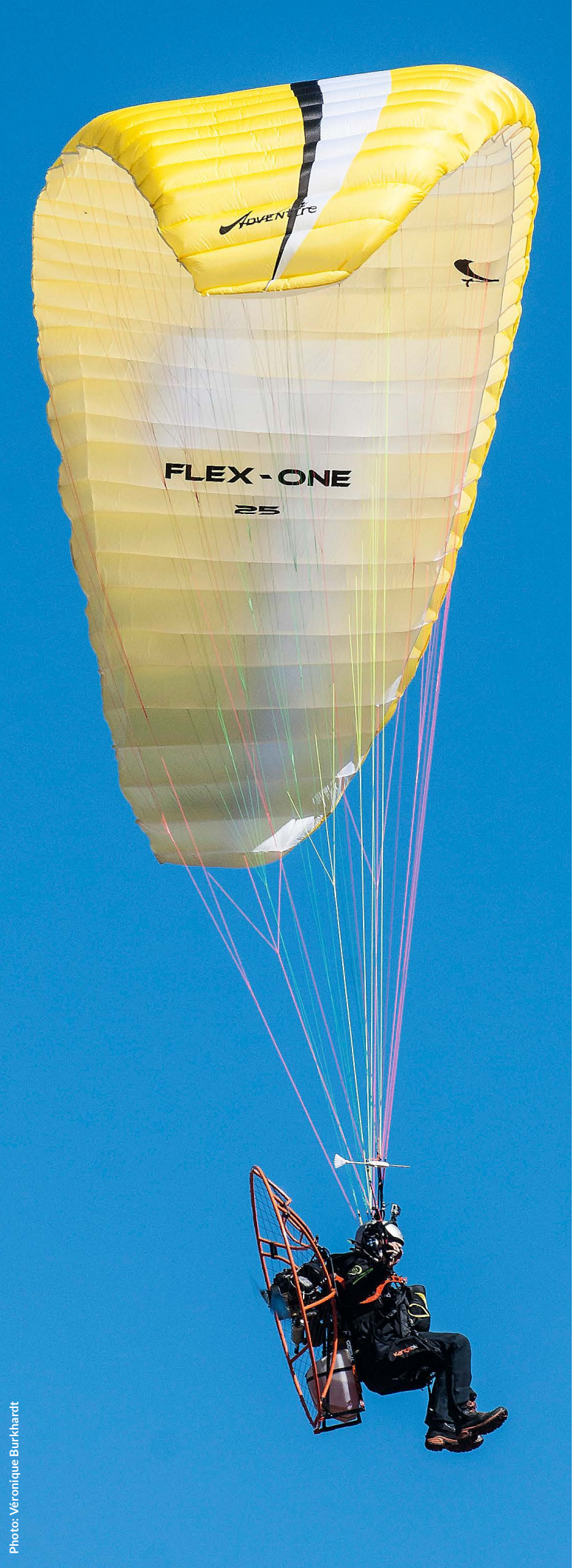


Photo: Véronique Burkhardt

A new video filmed in Tunisia by Adventure:
http://www.3six.fr/?p=684

The wing has just been EN certified for free flying, with all As!

At free.aero, we have one of the first models to test so you'll be able to read a detailed report in our next issue.

For more information:
www.paramoteur.com

ADVENTURE FLEXONE
MANUFACTURER INFO

Manufacturer: ADVENTURE - 7 rue de la Chasière - 78490 Méré - France
Mail : http://www.paramoteur.com Tél : +33 (0)1 34 57 00 00

SIZE	M	L	XL
FLAT AREA (M²)	25	28	32
SPAN	11,4	11,9	12,4
ASPECT RATIO	4,7	4,7	4,7
ROOT CHORD	2,79	2,95	3,13
ALL UP WEIGHT (KG)	70/90	80/105	95/125
MAX ALL UP WEIGHT (KG)	125	145	165
OPTIMAL ALL UP WEIGHT	85	95	110
TRIM SPEED (+/-2KM/H)	39	39	39
TOP SPEED (+/-2KM/H)	50	50	50
MIN SPEED STALL (+/-2KM/H)	23	23	23
MAX GLIDE (+/-2)	7,9	7,9	7,9
MIN SINK RATE (+/-0,1M/S)	1,15	1,15	1,15
CERTIFICATION	DGAC - EN	DGAC - EN	DGAC - EN

Photo: Tristan Shu

SKYWALK THE CAYENNE 5 AND THE SALEWA COLLECTION

Skywalk Cayenne 5

The Cayenne 5 (above) has just been certified EN/LTF C in size small (all up weight 85-105 kg) and M (all up weight 95-115 kg). With this new version of the Cayenne, Skywalk say they have integrated the qualities of a competition wing into an EN C paraglider designed for XC.

The aspect ratio is 6.4, the wing is made up of 69 cells, includes 3 line technology and is equipped with a SharkNose. The designer, Alex Höllwarth told us 'it flies as if it is on rails, with a light accelerator system, but at the same time it feels like a competition wing in the way it transforms the slightest pressure on the brakes into a climb'. Its potential energy allows it to pass progressively from flat turns to steep turns.

Although it is nearer to being a competition wing than the Cayenne 4, the Cayenne 5 will offer greater security. Its behaviour will still be in the middle of its EN C class, well below the acceptable limits.
According to Skywalk, despite its responsiveness to the brakes, the Cayenne 5 keeps a good margin before stalling. One of the reasons for this safe behaviour is the use of the Jet Flaps loved by Skywalk.

For more information:
www.skywalk.info/cayenne5

Skywalk and Salewa at the X-Alps

For the Red Bull X-Alps 2015, the manufacturer Skywalk has got together with the technical clothing manufacturer Salewa, to bring out a range of clothes specially designed for the X-Alps and also for the current trend sport of hike and fly.

The pilot Paul Guschlbauer is going to be racing in the X-Alps for Skywalk. During training he has already largely tried, tested and approved these trousers and warm, breathable tops.
The collection is now available for all pilots.
For more information:
www.skywalk.info/xalps

NOVA INVERTO AND MONTIS

At Nova it's also "long live light and hike and fly". The Montis harness embraces the spirit of ultralight material started by Kortel, using Dyneema adjustable 'straps' without metal buckles thanks to mechanisms based solely on the friction of the lines.

The Montis harness only weighs 320 grammes in M (pilot height: 165-180 cm) and 340 in L (pilot height > 195 cm).

The success of the ultralight harnesses launched by Kortel has spread abroad. The Nova Montis only weighs 320 g.

The Inverto is a 60 litre rucksack weighing 985 grammes. In a few seconds it transforms into back protection for a Montis harness from the same manufacturer.

What's unique is that this airbag not only protects your bottom, but extends from your thighs to your neck.

The harness and airbag together weigh only 1.3 kg. The numerous pockets in the Inverto allow the pilot to store a water bottle, camera, etc. An external fastening for an ice axe has also been included.

The whole thing is aimed at those who love hike and fly with high demands for passive safety.

www.nova-wings.com

You can learn all about this harness by watching this little video:
https://www.youtube-nocookie.com/embed/vl4qSoKDDhA?autoplay=1&rel=0

NOVA COMPRESSION BAG

A new totally water tight bag from Nova for hike and fly, only weighing 120 grammes. Inspired by the bags used for water sports to keep clothes dry, it is supposed to protect the wing from rain and sweat, whilst folding up compactly.

By emptying the air out and closing the valve, the pilot gets a bag which stays flat. It can be used with a rucksack or a reversible harness.

The volume of 35 l limits its use to mountain wings and mini wings. The Mentor 3 light and the Ion 3 light also fit in, but only in size XXS and XS.

Warning, don't store your wing for long periods in this bag.
Price: 30 €.

https://www.nova.eu/en/shop/

THE ADVANCE FASTPACK
THE QUICK FOLDING BAG

The new Fastpack from Advance is more than a simple stuff sack, it is a real backpack, with adjustable shoulder straps so that you can alter the centre of gravity for comfortable carrying. Weighing 900 g the Fastpack is light, but nonetheless robust.
Price: 139 euros
http://www.advance.ch/en/products/bags/fastpack/

Photo: Christoph Frutiger/Advance

ITV LAUNCH THE FURY

The Fury version 2 has just been certified DGAC in two sizes, 17 m² and 18 m². According to the manufacturer, this wing was initially designed for slalom, but its 'excellent resistance to turbulence and its fuel economy' made it a winner. In the expert hands of Fred Mallard, it became World PL2 classic competition category champion, French slalom PL2 champion, and World speed record holder Japanese style in the last world championships.

The Fury is therefore a multipurpose wing, but it is still primarily aimed at competition and experienced pilots.

www.itv-parapentes.com/en/

Photo: ITV

TRIPLE SEVEN NEWS ACCESSORIES

Above: a reversible harness with thigh straps, weight 1.6 kg. Soon to be available in two versions, reversible or non reversible.
Left: the 70 l mini sac, 560 g with an attachment for carrying walking poles and an ice axe. It comes with several pockets and is intended for lightweight wings or speedriding. This sack would be very good for hike and fly.

Reserve parachute, the Keeper FG+
It has a special nozzle system which prevents oscillation.
Sink rate 5m/s. Weight 1655g in size M.

Keeper FG+ Reserve
Manufacturer Info

Manufacturer: Triple Seven
Address: 777 jadralna padala d.o.o.
Ulica IV. prekomorske 61 - 5270 Ajdovščina, Slovenia, **Mail :** info@777gliders.com
website : http://777gliders.com/

Size	FG+ 31	FG+ 35	FG+ 39
Area	31 m²	35 m²	39 m²
Weight	1450 g	1600 g	1880 g
Max all up weight	90 kg	110 kg	130 kg
Total height	530 cm	530 cm	
Sink rate	5,1m/s	5,1m/s	5,1m/s
EN Certified	yes	yes	Not anticipated
Panels	16	18	20
Price in euros	550	580	610

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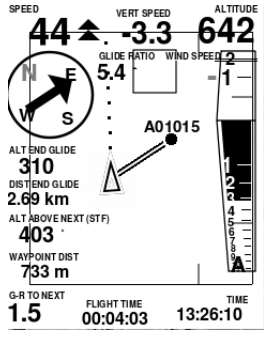

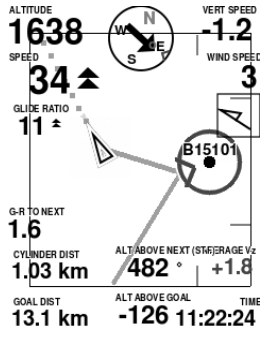

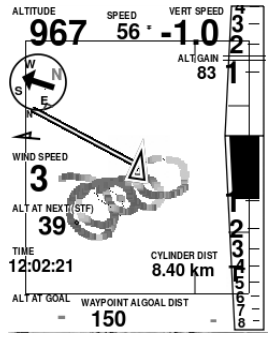

PRICE: € 599,00 EU tax included

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ASYMMETRIC COLLAPSES

Photo: Profly

Photo:

What can lead a flexible profile to collapse?

COLLAPSES: THE BASICS

SYLVAIN DUPUIS LOOKS AT WHAT CAN LEAD A PARAGLIDER TO COLLAPSE...

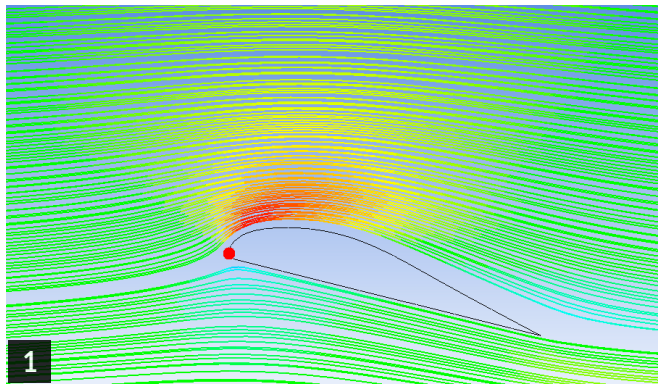
Our colleague Sylvain Dupuis is an aerodynamic engineer, paraglider pilot and paramotor acro pilot.

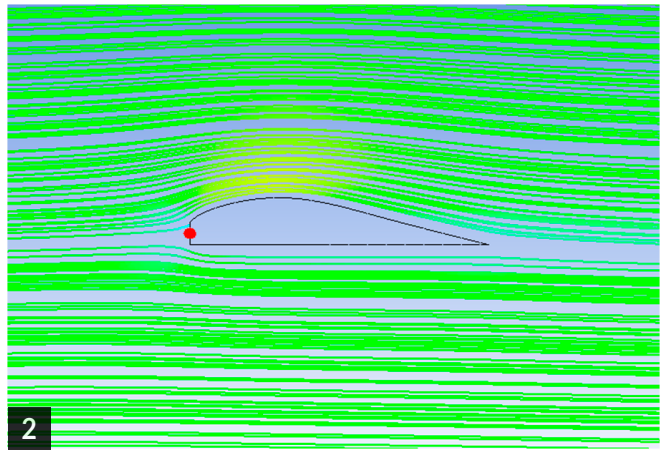
Let's recall the aerodynamics around an aeroplane wing as far as the angle of attack is concerned. The angle of attack is at +10° (image 1), the red zone represents the zone of greatest speed of air flow and thus the low pressure zone. That's where the aeroplane is lifted.

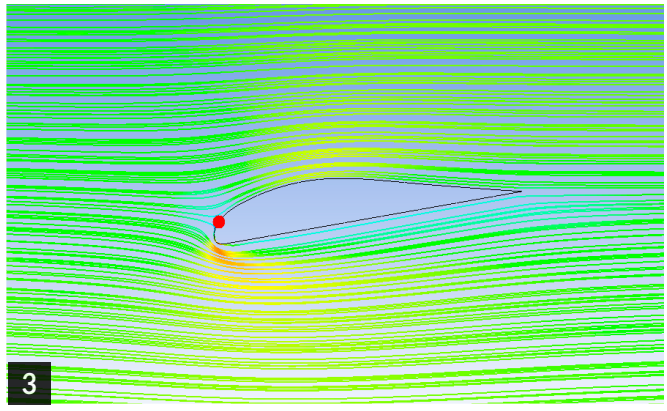
When the angle of attack is zero (0°) (image 2), the lift drops to be almost zero. As the profile isn't symmetric, there still remains a little positive lift; the plane is still lifted a little.

When finally the angle of attack is negative (-10°) (image 3) the lift reverses and the plane is no longer sucked upwards but downwards. That's how acrobatic planes fly on their backs!

On the diagrams, the red dot symbolizes what we call the 'stagnation point'. It is the point where the air has no speed. It is also and above all, the point where there is the greatest pressure.

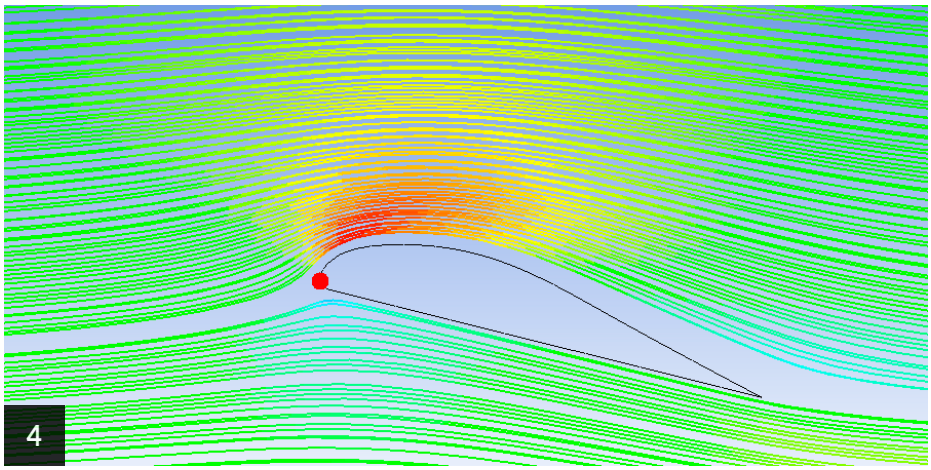






We're going to see what happens, no longer in the case of an aeroplane, but in the case of a paraglider, when the angle of attack is too low.

The angle of attack is +10° (image 4), nothing changes compared to the aeroplane. When the angle of attack drops strongly (4-5°), the lift diminishes. You can possibly spot a little dent on the leading edge, because a paraglider is flexible. Look at your leading edge when flying normally, then look at it again when you are flying on full bar. You will notice a dent between the cells in the leading edge. This is where your stagnation point is. The angle of attack is low; collapses will be lying in wait for you.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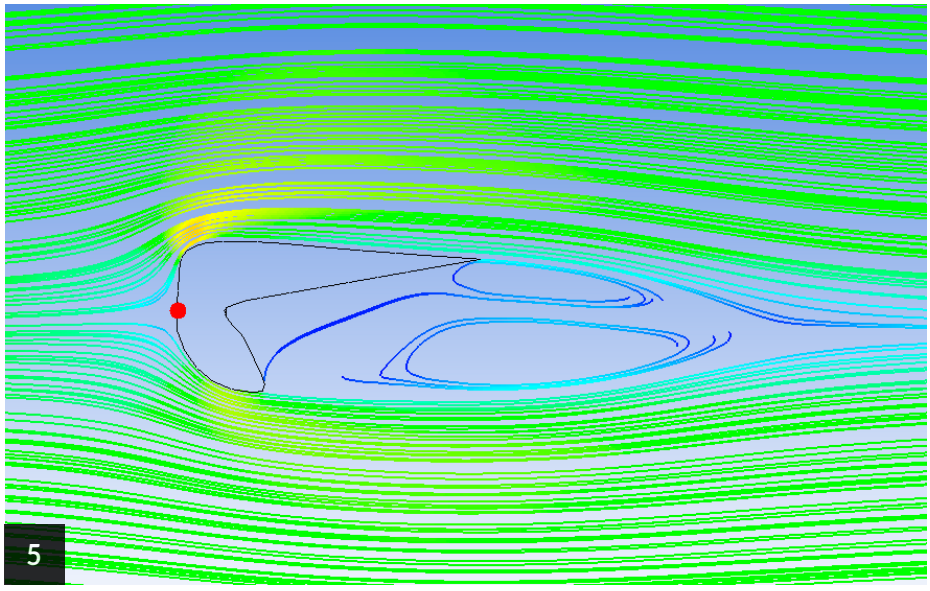
If the angle of attack continues to drop, the air will push harder and harder on the upper surface just above the leading edge, until the internal pressure in the paraglider can no longer stop the fabric from folding up. Time for a collapse. (Image 5)

We can also observe the enormous turbulence caused by a collapse in this same image 5; the vortex is clearly visible.

This turbulence is an aerodynamic brake, and this is the reason that whilst you have half the wing collapsed, the paraglider starts to turn very violently, to the side where the wing is closed.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FLYING IN THERMALS

Here we are going to look at why it is possible to have collapses whilst thermalling. It's at the edge of thermals that you will have the greatest risk of encountering a collapse.

In fact, coming out of a thermal, you may pass very quickly from a zone of rapidly rising air to a zone of rapidly descending air, which will then cause big variations in the angle of attack of your wing, sometimes right up to a negative angle of attack and thus a collapse.

ANALYSIS OF THE DIAGRAM

1 and 2 : The paraglider is in the core of the thermal, which is going up uniformly. The situation is stable.
3 : The paraglider is at the edge of the core of the thermal.
4 : The paraglider comes out of the core. Here the zone is still going up, but less strongly. The wing has a little surge whilst naturally looking for the speed that it has just lost.
5 to 8 : The paraglider goes away from the core. The intensity of the thermal drops more and more but the paraglider continues to climb.
9 : The paraglider crosses a static zone. The air isn't going up any more, but neither is it descending. For the wing, this transitory phase corresponds to a lack of air flow and a little surge takes place.
10 and 11 : The paraglider is still in the static zone, the situation stabilises itself due to a pendulum effect
12 : The paraglider enters into a zone of descending air.
13 : The zone of descending air is going down just as strongly as the thermal was going up. To regain its speed, the wing surges massively.
14 : If the pilot doesn't react, the surge and thus the decrease in angle of attack, can be so strong that the wing collapses.
15 : The wing generally reopens very quickly, especially if the pilot is active.
16 and 17 : The situation stabilises itself. The paraglider is in the zone of descending air.

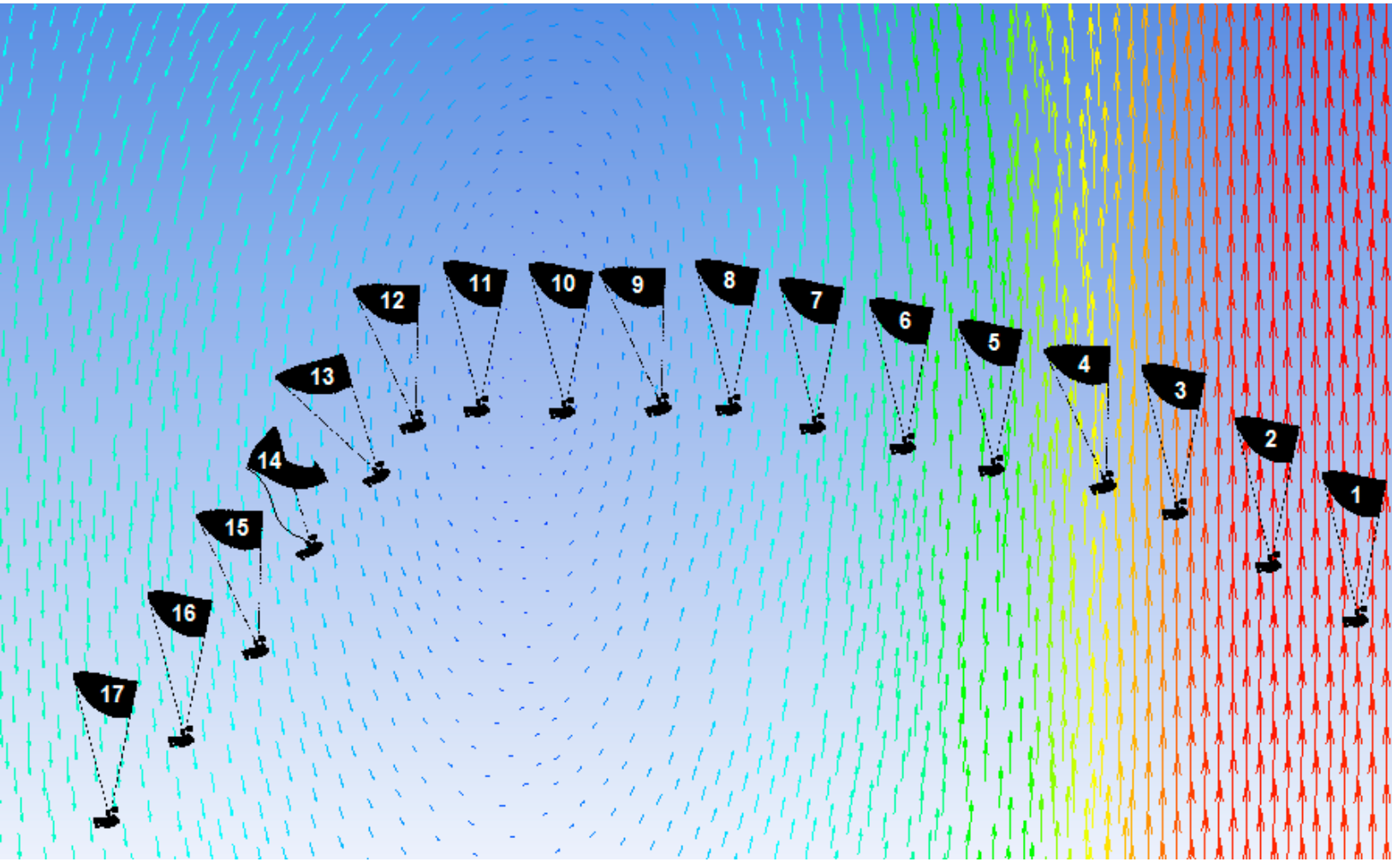


PHOTO SEQUENCE

We are going to analyse a little asymmetric collapse over the course of a sequence of photos.

Here, the collapse is initiated by hand, by pulling on the front risers, which brings the wing to a very low angle of attack on the side where the pilot pulled.

As the wing collapses, the pilot feels himself falling to the right side of the harness. This is due to the assymmetry of the lift. He therefore needs to compensate for this assymmetry by immediately leaning to the left side. The pilot holds tightly onto the riser and doesn't brake! Pulling brake on the left side of the wing to compensate for the turn could lead to a stall because the pilot is flying with less surface!

Once the situation is stable, when the wing has no more residual rolling or pitching movement, the pilot needs to concentrate on his course. Simply by weight shifting in the harness, he can easily turn right or left, without using the brakes.

When the situation has calmed down and the obstacles have been avoided, the pilot can concentrate on reopening. A safe wing will already have started to reopen without the pilot doing anything. On more advanced wings, it is possible that the wing won't reopen all by itself.

To accelerate the wing reopening, it is sufficient to pump on the right brake at a rate of one pull per second. No need to pull the brake very low, putting a little bit of pressure on the brake will suffice.

A few pulls on the brakes...

...and the wing has completely reopened.

The incident is over.

As a general rule, smoking is worse for your health than a collapse.

ASYMMETRICS

COLLAPSES IN ALL THEIR GLORY

An asymmetric collapse doesn't just happen after turbulence, and doesn't always resemble a 'text book' collapse. Here's a little résumé of the reasons and the reactions.

By Sascha Burkhardt

The biggest problem with collapses is that, without a doubt, those encountered in turbulent air rarely correspond to those provoked during certification tests. Pulling on the risers (or a folding line, see article further on) isn't the same as having a gust hit you from above or in front. This is why those experienced by pilots for real, are often different to what they expect.

Let's recall the possible reasons for a collapse:

A gust hitting you face on : all that is necessary is to have the angle of attack outside the stable range for the profile.

Gust from above: the same thing but more clear-cut. This happens, for example, coming out of a thermal.

Leeside rotor: similar to a gust. Easy to avoid: don't fly in the lee of an obstacle.

Wake turbulence: it's quite rare to have a collapse due to your own wake turbulence. In free flight it can happen in the surge after coming out of a spiral and in a paramotor when doing circles at a constant height.

A badly executed wingover: it is possible, that in a wingover, the wing can 'slide' towards the inside of the turn due to a lack of speed and cause this wing tip to collapse.

Too much speed during a manoeuvre: this happens more often than you would think. For example, in a wingover, if the pilot doesn't properly control the outer part of the wing, this part can fly too fast and collapse. The problem is that this type of collapse can be very violent and unexpected because the wing immediately starts to turn in the opposite direction.

A succession of collapses: these are collapses which you often encounter during accelerated flight, sometimes violent and subject to cravats. For example, the wing collapses on the left side, it goes into a left spiral, whilst diving forward.

The 'open' side dives forward and in turn collapses, and so the wing starts to turn around this collapse in an unexpected direction. This chain of events can also happen by countering with too much brake.

A good example of a series of asymmetric collapses, followed by a spiral in the opposite direction compared to the initial collapse.
https://www.youtube.com/watch?v=ktGZT8-z1RM

Depending on the angle the behaviour when it collapses can change completely.
Photos : Simon Winkler/DHV

A collapse on the right followed by a collapse on the left: a sequence recorded by the DHV pilot Simon Winkler.

HOW TO AVOID THEM

To avoid collapses, you need to fly actively and manage changes in angle of attack. The instructor Pierre Paul Menegoz sums it up with the famous slogan 'fly with 400 grammes'. Always keep about this amount of pressure on the brakes, this will make it automatically react correctly. If the wing dives forward, the pressure in the brakes will lessen and you will need to brake to get back to 400 grammes. When, on the other hand, the wing pitches backwards, let up on the brakes to reduce the pressure on the controls. Obviously, it can be necessary to let up on the left and brake on the right if the movement is assymmetric. All of that can be easily learnt by practicing on the ground, see our previous issue.

The Italian champion Nicole Fedele having a twist and a cravat during a paragliding instructor training course, and showing how to correct it all in the air.
https://vimeo.com/127696899

THE MATERIAL

Modern wings are often more stable and collapse later, amongst other things thanks to SharkNose and reflex profiles. Techniques such as 3D-shaping or leading edge rods have a similar influence on a wing's behaviour during a collapse, so it's really a combination of factors. For example, leading edge rods can theoretically increase the risk of a cravat, but certain professionals have noticed that instead they decrease the risk because, in some cases thanks to them, the wing tips slide the length of the lines rather than threading between them.

THE REACTION

Wings behave differently so pilots must adapt their reactions. The problem is that each wing reacts differently, so it is difficult to give universal instructions. It's up to each wing's manual to advise exactly what to do with that precise model.

Example: according to Joël Mailhé, a very experienced SIV instructor, recent wings with a SharkNose, or indeed a reflex profile, collapse a lot later. In some cases, it wouldn't even be wise to prevent them from diving, because by braking, you break the reflex stability, and it would collapse more easily than if you hadn't reacted. On certain wings, it is therefore strongly advised to work on the Cs to prevent collapses.

Be careful, on wings where the rear risers are only attached to the central part of the wing, that can give other problems, the ears can dive towards the front whilst the pilot slows down the centre.

Once the collapse has happened, the manufacturer and acro specialist Michael Nesler noticed that modern wings cope less and less well with counter braking and risk collapsing on the other side. 'But this behaviour isn't checked during certification,' he criticized.

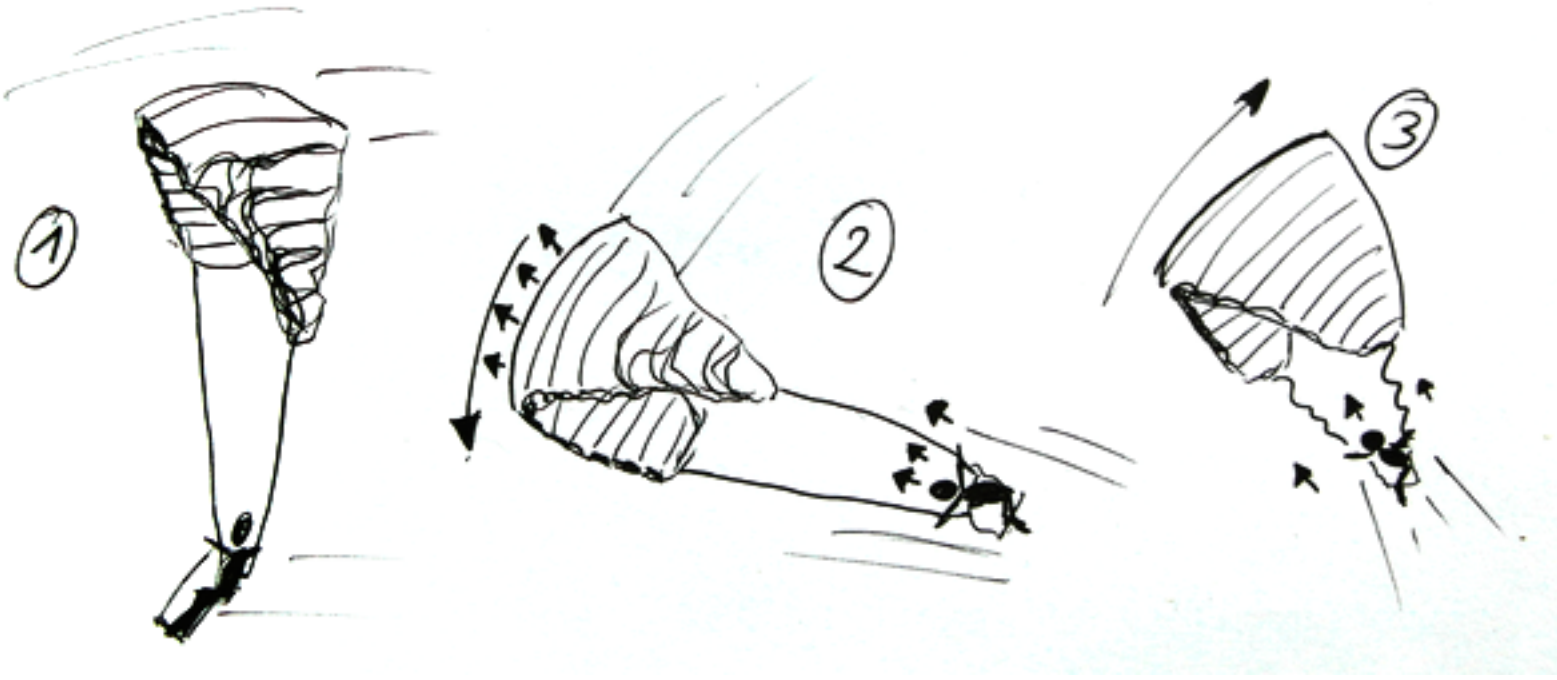
Advice given to pilots on how to react in case of a collapse is therefore constantly changing, but is roughly based on the following:

- Bring your legs close in to the harness
- Counter with the harness
- Possibly counter brake, but just the strict minimum necessary.

As for this last point, lots of professionals advise holding onto the riser on the opposite side from the collapse – the risk of countering too much is thus avoided. In addition, doing this will automatically lead to countering by moving the centre of gravity.

Others advise to hold on instead to this riser with the inside of your elbow – this leaves a certain minimal margin to counter brake, without risking braking too much which could lead to a stall and a cascade on the opposite side.

A collapse which turned into an unwanted SAT...
https://www.youtube.com/watch?v=j5wAjycjiqM



Drawn by Lucian Haas - lu-glidz.blogspot.de

According to the instructor Ralf Kehr-Reiter, after a collapse, whilst flying on full bar, it can be preferable to keep the speed bar on for several seconds before releasing it, so that you aren't catapulted into the wing. Explanation...

THE ELASTIC EFFECT
THE CATAPULT COLLAPSE

During our SIV courses we regularly see violent reactions after collapses in accelerated flight, even under wings at the low end of EN B certification. This is, amongst other things, due to the growing performance of this type of wing, but also due to poor reactions from the pilots.

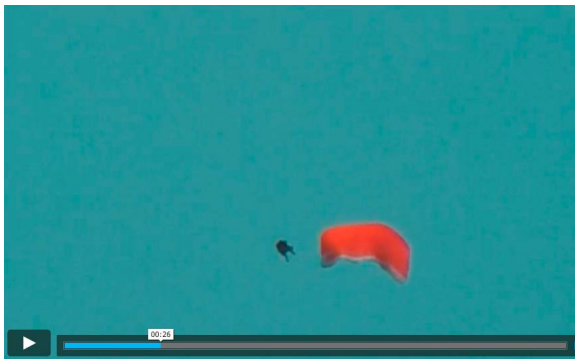
This is especially the case after big collapses (>70%) and with a big angle (>45°). As a general rule, in two seconds wings can dive a long way and turn more than 90°.

If at times like that, the pilot releases the accelerator, the wing will reopen in an explosive fashion. The lift returns in force, but as it is horizontally orientated, the pilot is pulled towards it like a weight in a catapult and often passes near the wing.

The lines are unweighted and twisted due to the rotation of the wing. All that often ends in a twist, cravat or cascade, making a reserve throw necessary.

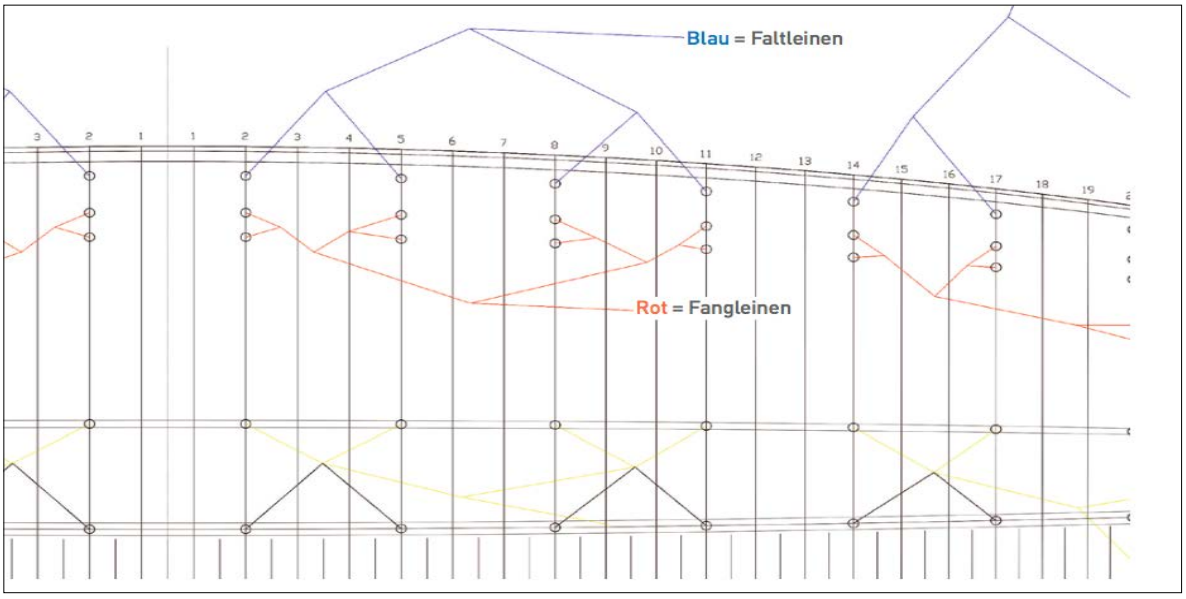
To top it all, the pilot often needs to throw his reserve the length of his leg downwards to avoid getting it tangled up in the wing. For this reason I advise keeping the accelerator on for the first two seconds of the collapse.

After that, once the dynamics of the incident have settled down, I release the accelerator. You will always lose at least 100m – another reason to only accelerate more than 300m above the ground.



Vidéo: https://vimeo.com/99825963
The video that Ralf Kehr-Reiter has produced to back up his arguments. During their first collapses, pilots release the accelerator too early ("zu früh"). Next, pilots release it later, considerably reducing the dynamics of the manoeuvres.

FOLDING LINES



The folding lines on a two line EN D wing in a document from the DHV: drawn in blue, they are the exact replica of the As (in red) but further forward.

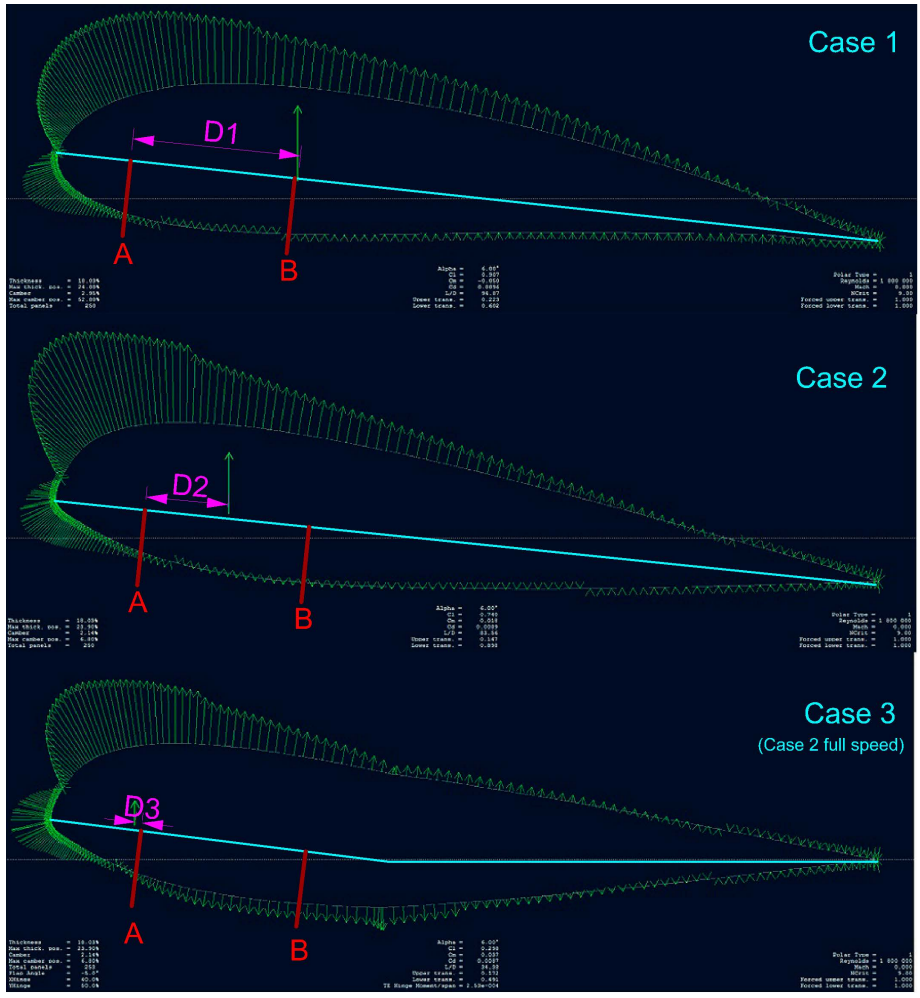
Below, a nice collapse: it is becoming more and more difficult to produce the angles required. Using folding lines is sometimes essential.
Photo : www.profly.org

To certify the wings, you have to deliberately collapse them. For that, the test pilots sometimes have to use folding lines. What are they, and why are these lines the cause of so much discord?

By Sascha Burkhardt

In the past, for older paragliders, it was enough to quite simply pull more or less hard on the A riser to collapse a wing so as to simulate a collapse with a view to analyzing and noting the behaviour of the wing. But with modern profiles, this is becoming more and more difficult to do. The leading edges don't fold up as they did in the past and they resist more and more.

One of the reasons for this is that the profiles are more stable, indeed self stabilising (the reflex profiles are almost impossible to collapse), and the attachment points of the A's being further back makes this simulation even more difficult.



A document provided by Ozone to illustrate the manufacturer's arguments. The first profile corresponds to a more classic profile. The centre of the upward pressure (green arrow) is far enough back, offering a big enough leverage (D1) so that the test pilot can collapse the profile. The second drawing corresponds to a more modern profile. Amongst other things, its upper surface is more convex at the front and its lower surface is flatter. Its centre of upward pressure (green arrow) is further forward, it is more stable and the leverage smaller if the pilot pulls on the As. The third diagram corresponds to the same profile accelerated. The As and the centre of upward pressure (green arrow) overlap. The pilot can hang on as much as he wants but he won't be able to collapse it by doing this. It's a shame because this profile is, in principle, better...

As Fred Pieri from Ozone explained very well with the aide of the diagram opposite, the point where the maximum lift is concentrated (the centre of upward pressure), has moved forward in modern profiles to the point of being confused with the As. The result: if the pilot hangs under the As, that changes nothing on the profile, it won't collapse.

This increase in stability is good news in itself, because it makes the wing safer, but it prevents the correct simulation of a collapse using the As. But a collapse can never be ruled out on a flexible profile no matter how self stabilizing it is. It therefore has to be simulated at all costs.

A solution quickly appeared: Extra lines attached in front of the As allowed the test pilot to apply more 'devastating' force to collapse the profile, because the leverage is in front of the centre of upward pressure. For a while, more and more manufacturers and testing labs used these lines, until the new norm EN 926-2 came out on the 13th of December 2013.

It forbids the use of folding lines except for EN D wings. An A, B or C doesn't collapse with the risers? Refused or revised to EN D. This new rule has found a lobby in the German Federation the DHV, the British Federation as well as some German manufacturers.

Their argument: folding lines allow cheating at certification. The test pilot would be able to favour behaviour which conforms by cleverly using these lines, whilst the same wing collapsed in a real situation would be refused because it behaves violently.

Fred Pieri, one of the designers at Ozone. A joint battle, with competitors like, for example, Olivier Nef from Niviuk, for folding lines in the name of progress. 'Folding lines should not only be authorized in all certification classes but they should almost be obligatory given their efficiency in producing collapses which are even closer to reality in turbulent conditions', he confided provocatively.

Photo: Sascha Burkhardt

'Not true', retorted Ozone. According to the manufacturer which invented the SharkNose, it is becoming quite simply impossible to certify modern very safe wings with very stable profiles because it is in their nature not to collapse after pulling on the As.

"*It's true that a test pilot with the wrong intentions could try to cheat by provoking gentler collapses', indicated Fred Pieri. 'But in that case, the collapse wouldn't show the angles and closed surfaces required by the norm, and it's easy to check, for example on the video…*"

Indeed, for the certification tests, the wings need to be collapsed according to the angles and with predefined sizes and in line with the marks on the underside of the wing. Between 2005 and 2013, there were slight changes in the requirements, but the principle stayed the same.

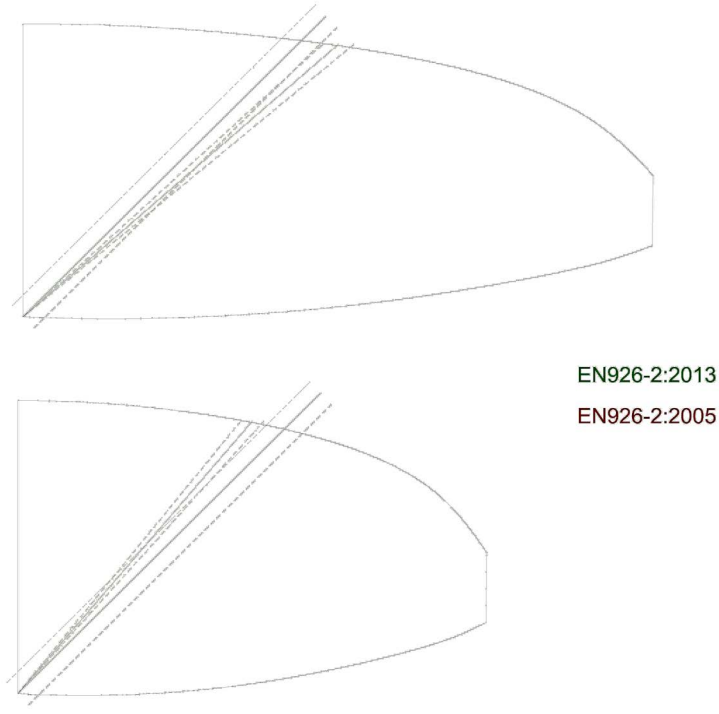
According to Ozone, no matter how you get there, folding lines or not, if the collapse is where it should be, then it is representative.

So why are certain federations and manufacturers still against it? One explanation is that under some wings which are difficult to collapse, using all their strength, the test pilots have managed to induce fairly violent collapses which don't conform.

By dint of having their As overloaded, these wings accelerate on that side and start to go into a spiral. Indeed, if the pilot can then collapse it, this accelerated half-wing won't behave at all like a wing which has been hit by a gust from above 'for real'. It's a fact, which even the critics of folding lines, such as the DHV, admit.

For the designers at Ozone and other manufacturers, the new rule is counter productive and prevents progress in developing high performance safe wings.

The definition of asymmetric collapses required has slightly changed. Above, everything in red must disappear in the 'big' EN 2005 collapse, with a tolerance (in green). Below, comparing the old and the new collapses. The principle remains the same in the 'new' EN. On the other hand, it forbids folding lines as a way of achieving this, except for EN Ds. Photo: Gudrun Öchsl/Profly



Photos: Simon Winkler / DHV

A little collapse provoked by the DHV test pilot, perfectly following the mark defining the correct angle. It's a real art...

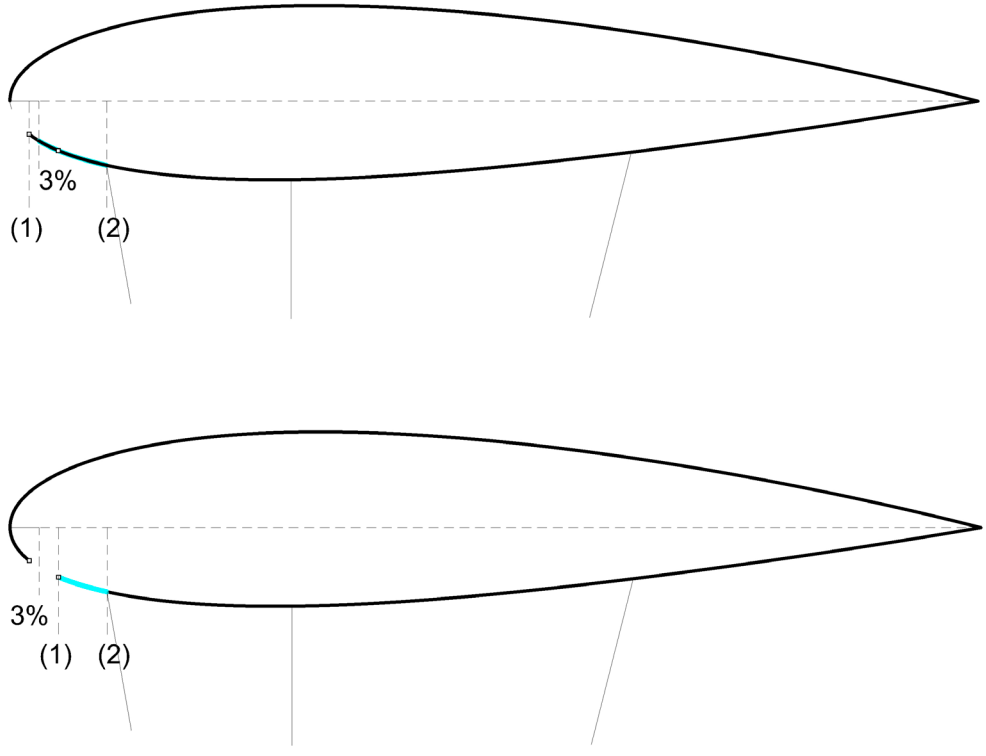
The same wing in a 'big' collapse. Here the DHV pilot managed very well without folding lines – but is it feasible for all modern wings?

The trend is clearly going towards moving the As and the air intakes further back, the SharkNose being one of the best examples, and that's the case in all the classes. Obviously, a two line competition wing is even more impossible to collapse by using the As.

But some wings of this type wouldn't even pass as a D because according to the new norm, the position of the folding lines mustn't pass certain limits, which cannot be achieved for wings with air intakes set right back.

In the meantime, the DHV and other members of the working group drafting the norms are standing firm on the new rules and demanding time '*to see if the folding lines won't actually let wings which are less safe to pass the tests to the detriment of pilot safely*'.

Understandably, it's a very frustrating situation for the designers....



Even for an EN D, it is more and more complicated to pass with folding lines, because according to the new norm, the lines mustn't be fixed further forward than 3% of the chord and, in any case, in or before the air intakes. The limits are situated between points (1) and (2) on these diagrams. Understandably with the air intakes being put further and further back in modern designs, the margin (in blue) where the lines are allowed to be attached, is shrinking fast.

A CASCADE OF COLLAPSES

These images from the film www.vimeo.com/23406622 by David Muzellec show a series of two collapses which put Sandrine Muzellec on the deck, fortunately without serious consequences.

The wing wasn't at fault according to the pilot:

'*It's only when this wing is detrimmed that it becomes fully reflex. Here, I was in neutral which allowed me to turn correctly and I thought I had enough stability to be able to accelerate fully. But passing through the lee of the pylon it collapsed which wouldn't have happened if I had detrimmed*'.

Sandrine arrived with the trim in neutral and accelerated with her feet.

A collapse in the lee of the pylon.

The right side of the wing brakes.

The wing seems to recover...

...and fly almost normally...

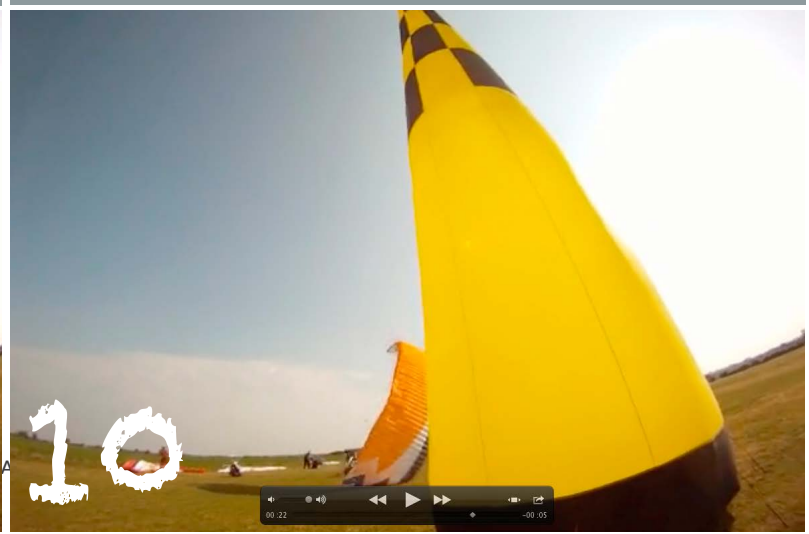
...but the dynamics of the manoeuvre finish in...

...a front collapse.

At this altitude...

...the ground is inevitable.

Sandrine only got a few bruises!



CORRECTING A COLLAPSE WITH A MOTOR...

In this film by Italo Sassu, of the Las Candelas 2012 (www.youtube.com/watch?v=ITztBcAkYHg), the pilot has two collapses. But he avoids going in the water by increasing the power after the collapse. It's a risky game, only for the toughest of pilots because, over dry land, if a pilot increases the throttle at the wrong moment, the impact can be harder, with serious consequences...

Accelerated flight

Start of the collapse

...the wing is braked on the right...

...killing the rotation

Temporary recovery

...but this movement in the wing...

...weakens the leading edge

A new collapse!

The pilot gives it more throttle...

...and manages to climb despite the collapse...

...whilst still staying on course.

His perseverance pays off...

...the pilot reduces the throttle...

... end of the incident.

The Paramania GTR: a successful model combining reflex stability and handling in an astonishing way.

The Dudek Nucleon: another full reflex model which has contributed to the spread of this technology in the paramotoring world.

REFLEX WINGS. THE UNCOLLAPSABLE PROFILE?

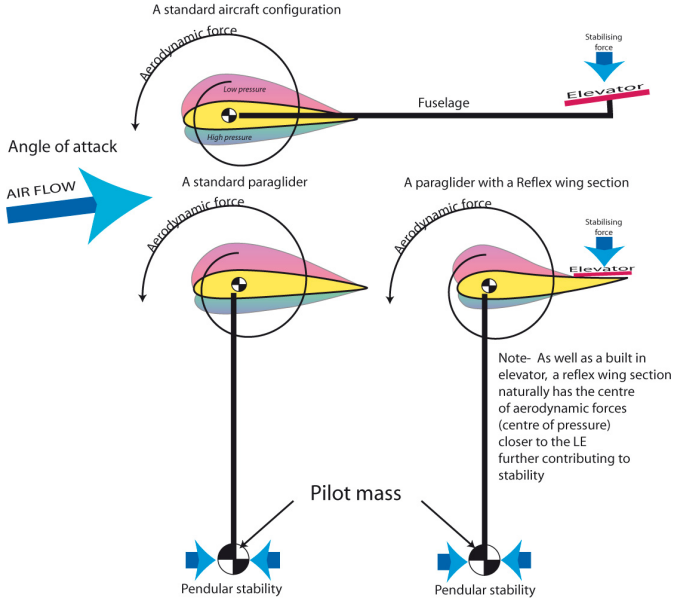
The auto stable profile, that today we call a 'reflex profile', is an invention dating back to the Second World War. In the beginning, this profile was intended for gliders like the Horten, allowing them to drop the horizontal tailplane.

Numerous paragliding manufacturers maintain that they have always used a certain amount of reflex in all their 'creations'. But it is undeniable that Mike Campbell-Jones, father of the make Paramania, was the first manufacturer to really integrate, from 1994 onwards, a full reflex profile into his paramotor wings. He therefore became the pioneer of this technology in our flexible wings. Today, numerous makes have followed suite and integrated this type of profile in their paramotor wings.

It is undeniable that these profiles are incredibly stable when faced with turbulence. Each diving movement is automatically compensated by a correction of the wing, stopping any collapses.

So that's why we see paramotor pilots crossing 'aerological minefields', as if nothing was there. Even more amazing: by detrimming certain models, they become even more stable in turbulence because the reflex can fully play its role. It won't stop you having a collapse at 70 km/h (they can never be totally excluded), which will be very dynamic. That is why, despite everything, numerous pilots on full reflex still slow the wing down if it starts to really hit hard. On a paraglider, the use of full reflex profiles is more difficult, because their sink rate is often very high. But some manufacturers are currently developing compromises which will be usable in free flying....

Why a parafoil wing with reflex is more stable in pitch



UNDOING A CRAVAT

A cravat can be the source of a cascade of incidents. What follows can be surprising and varied. The advice for recovering from a cravat also varies depending on the pilot. Here is how to sort out the problem, according to Steve Riguer.

Simon Winkler from the DHV encounters a little cravat during a test.

A cravat is when a part of the wing tip gets stuck between the lines. Depending on the configuration, it is sometimes irreversible and can lead to a rapid spiral. But often you can get it out with the right technique.

WHEN DOES A CRAVAT HAPPEN?
In rough aerology, during acrobatics or after an incident, in particular following a collapse. A wing with a low aspect ratio is less likely to have a cravat than a wing with a high aspect ratio, but that isn't the only reason. In fact, the curve of the wing, the plan form as well as the load in the air, also plays a role.

HOW TO MANAGE A CRAVAT:
Everything in its time. Make the right decision in a measured fashion and don't act without knowing what is happening. Don't stress or act with pointless haste; you must be ready for a cravat just like any other incident.

First of all, recognize the situation. All you need to do is look up. Stay in the 'hands up' position to avoid over piloting, unless the wing starts to surge in which case you will need to immediately damp, and by the correct amount.

Then you need to stabilize the wing and keep on course by countering in the harness and without touching the brakes. You should be looking at the horizon and take the time necessary to stabilize yourself. Sometimes, if you do a U-turn straight after a collapse and cravat, it can be a good idea to leave a ¼ or a ½ turn before stabilizing the wing and direction.

Near the ground it's different. That requires an efficient and instant counter in the harness to avoid, at all costs, finding yourself facing the relief. When high, this same handling of the harness will stop you going into a spiral.

If this can't be stopped, the only thing left to do is throw your reserve. If, on the other hand, the wing is flying in a straight line or almost, it may be possible to land like that. Be aware that the brake on the closed side should be used sparingly.
Finally, you can at last deal with the cravat. We are now stabilized, flying a straight line, without touching the brake and with a big cravat.

THE STABILO:
Start by locating the stabilo line (at the wing tip). But finding it in a cravat configuration isn't always easy and requires a little bit of experience. This line is sometimes a different colour. Remember that it will no doubt be longer than the others. Take it as high up as possible and pull once or twice cleanly downwards and outside. If that doesn't remedy the situation, no point in tugging. Evidently it isn't the right solution.

THE BRAKE:
A large quick movement is better than lots of little pulls on the brake. Be careful not to brake on both sides! That would cause a cascade of incidents. That doesn't work? Let's go onto the next one.

THE COLLAPSE:
There is no point in doing it half heartedly, take 2 or 3 front lines firmly fairly high up (on the cravatted side of course), bend your wrist and pull downwards, then release. Stabilise, get back on course, control. Damn, the cravat is still there.

AVOIDING ACTION:
This often turns out to be very efficient. It just means starting a turn. If the cravat is on the right, pull on enough brake and hold it (down to your thighs) on the right long enough to do maximum half a turn, then release. The part of the wing in the cravat is thus unhooked for an instant. It will probably be necessary to manage a surge backwards and then damp the wing.

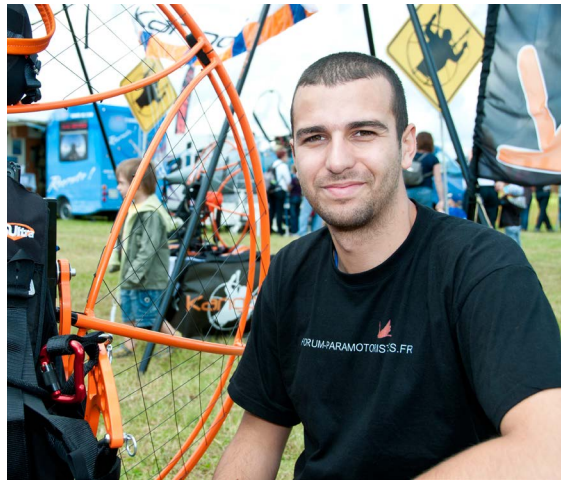
Be careful, the idea here is not to let the wing dive as in a dynamic turn. This must, above all, be in the yaw axis. The braking must be instant, and weight shift to the left in the harness, held in, will stop the wing from diving.

STALL:
The stall is a delicate manoeuvre which shouldn't be undertaken lightly. It is essential to have already practiced it in a safe environment before considering doing one. If that's the case, check your remaining height. Below 200m it can become risky. A stall correctly done takes about 100m of height but can be done in less. Keep 100m spare in case of further incidents and to make another decision such as throwing your reserve.

An essential point with these techniques is not to over pilot. With a clear head that seems obvious, but when flying and you're in this situation, the slightest bit of brake on the open side could start a cascade of incidents.

In fact, the wing isn't far off a deep stall. If it doesn't have speed it is close to a spin and a sudden stall. There is a risk of it yawing, twisting up, attacking obliquely or surging asymmetrically.

In cases where the wing is too cravatted, irreversible, unmanageable, or when you are just too low, you need to think of the end game: throw your reserve.
Of course, an SIV course with all these manoeuvres, is strongly advised.



Steve Riguer flies paragliders and paramotors, he also works for Kangook and is editor of the forum: http://www.forum-paramotoristes.fr.

ACTIVE FLY SIMULATOR

For nearly ten years an engineer from Munich has been working on a paraglider simulator. The aim isn't really for fun, but to train current pilots in such a way as to avoid incidents, then to learn how to react correctly if, despite everything, they have a collapse.

The pilot sits in a harness facing a screen showing a model of the countryside being over flown. The lines from the harness are linked to powerful motors – their movements simulate the movements of the wing in turbulence and are also able to release several centimetres at a time to simulate the unloading of a riser following a collapse.

The brakes that the pilot holds in his hands are also equipped with motors which simulate the changing pressure in the controls as a function of the situation or the flying incident.

In addition, the machine is equipped with sensors which measure the pilot's weightshifting as well as the force applied through the brakes.

It is thus possible to simulate and to train in a very real, educational manner. Unfortunately, the system still isn't marketed internationally.

http://www.activefly.com

Photo: Stanislav Duben / Fotolia

A Steppe Eagle flapping its wings. In turbulent air, birds can also have collapses - up to three a minute.

COLLAPSES BIRDS HAVE THEM TOO!

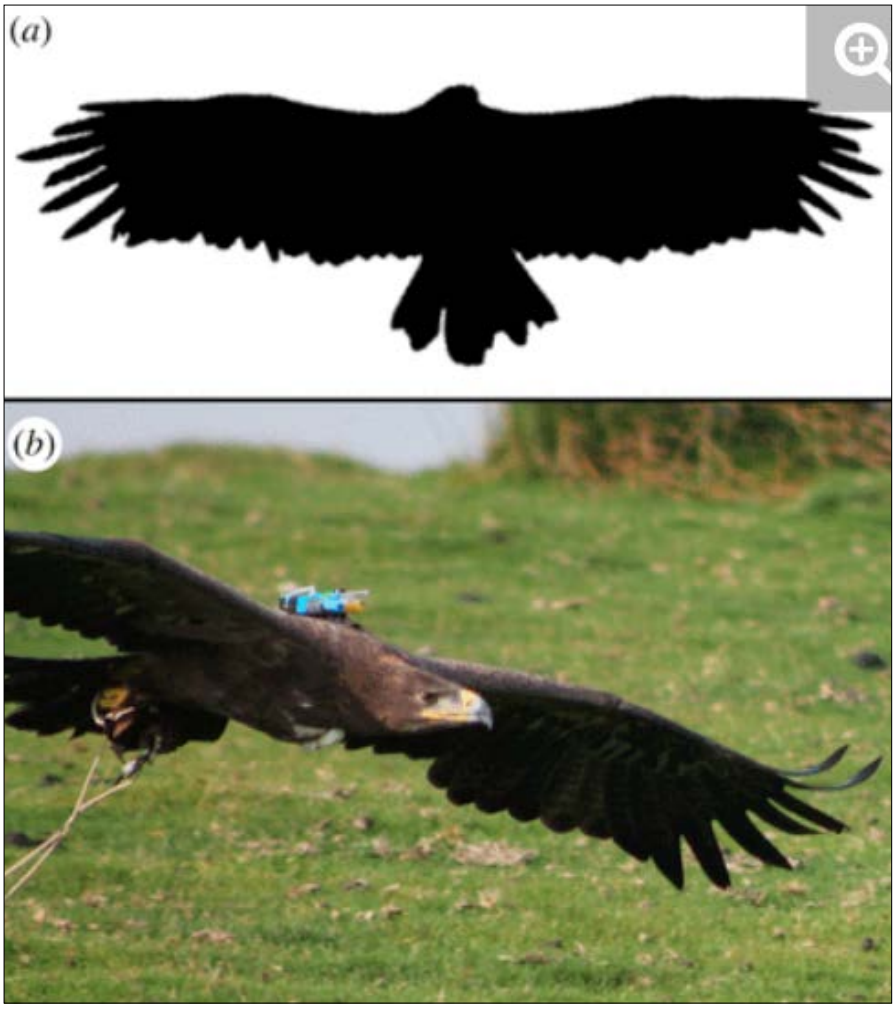
It isn't just paragliders which collapse in turbulence. Birds also suffer from 'collapses' according to a study by Kate V. Reynolds, Adrian L. R. Thomas and Graham K. Taylor published in the Royal Society's journal.

The scientists attached a device onto a Steppe Eagle to record GPS position, attitude, altitude and acceleration. They analysed 2594 collapses over 45 flights and noticed that in turbulent conditions birds often allowed one or both wings to fold up, this occuring up to three times per minute.

At first glance, this incident resembled a flap of the wings, but the difference to this was that the wing didn't come back up above the bird's body. It is therefore the same as for us; it folds downwards and comes back quite quickly.

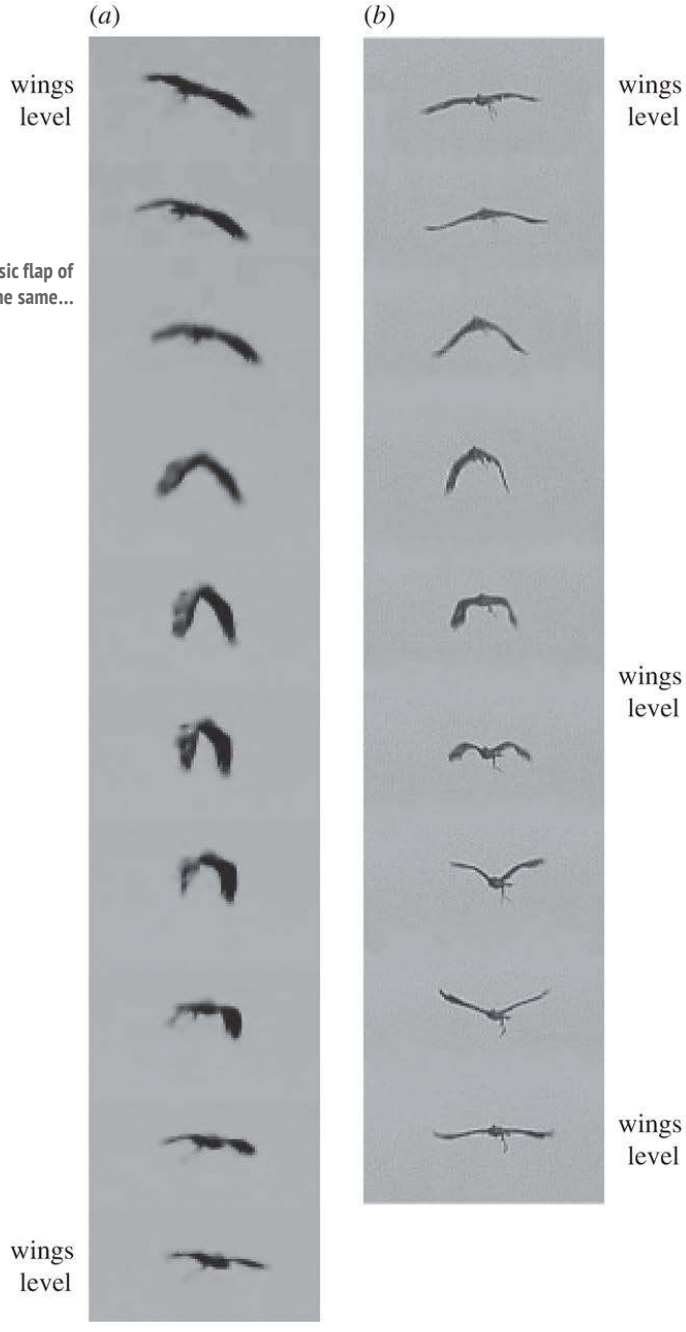
This collapse is generally preceded by a change in air speed, loading or angle of attack, a situation which could very well correspond to a head on gust – which is also one of the major causes of collapses on a paraglider.

A document from the study: the eagle is equipped with a flight data recorder.



Left, a collapse, right a classic flap of the wings. They are not the same...

Birds: a collapse vs. flapping wings



One of the scientists who took part in the study was Adrian Thomas, British paragliding champion in 2006, 2009, 2013 and in 2014 on his GIN Boomerang 9. He is also an aerodynamics consultant. http://www.zoo.ox.ac.uk/people/view/thomas_alr.htm

This behaviour protects the animal from injury and/or flying accidents. This shows us once again that a collapse isn't necessarily a bad thing in itself. It can be a healthy reaction by the wing when faced with mechanical constraints which are too great.

http://rsif.royalsocietypublishing.org/content/11/101/20140645

A video showing a collapse rather than wings flapping.
https://www.youtube.com/watch?v=YIh8bALVF10

TREE LANDINGS:

THE RESCUE TEAMS TRAINING

A LITTLE REMINDER ABOUT SELF RESCUE FROM THE TREE THAT SAVED YOU.

Regularly pilots finish their flight in the top of a tree. Often it's even preferable to hitting the ground. In the Lot in France, the fire brigade have organized an internal training course to learn how to better rescue pilots…

In serious cases, the impact after an accident is often less violent in trees (which soften the blow) than onto stony ground. If the pilot is in very strong turbulence with the risk of a major incident, it can be reassuring to head for a forest rather than above rocks. Some acro pilots do the same during their exercises. Conifers like fir trees have branches which bend downwards and break a fall more easily by giving way little by little, branch by branch, under the pilot's weight. On the other hand, they don't hold the lines as well, holding the pilot less securely suspended high up. Some pilots claim that bamboo forests in Asia are even softer and would be better than water for SIV! To be discussed…

THE FRENCH RESCUE TEAMS TAKE TO THE TREES.

When the French fire brigade assist in a paraglider rescue, it very often involves a tree landing. To be ready for this, at the end of April, the GRIMP* section of the Lot fire brigade in France, organized a training day around the specific problems related to this type of incident.

**Groupe de Reconnaissance et d'Intervention en Milieux Périlleux*

In this type of rescue, the GRIMP team is often called in once the initial rescuers at the site have assessed that they are neither equipped, nor trained to rescue a casualty suspended several metres above the ground.

It therefore seemed worthwhile to get together the relevant fire brigades and rescuers near sites, along with paragliding professionals, to pass on some advice about how to best cope with this type of accident. For the CDVL*, the president Roland Besombes and a student instructor from the federation took part.

** Les Comités Départementaux de Vol Libre*

Managing the wing in the wind when possible and understanding the different types of harnesses were some of the topics covered. The members of the GRIMP team also took part in actual cases using different techniques to manage the situation.

It was a day full of useful exchanges of information with the fire brigades from Luzech, Prayssac, Cahors, Castelfranc and Catus all taking part. The GRIMP team hope to do another similar awareness day soon with the CIS* from the north of the department.

**Centre d'Incendie et de Secours*

Written by François Gomez
responsible for SDIS* communication.
**Le Service Départemental d'Incendie et de Secours*

Thanks to this initiative teams trained how to rescue a victim.

The professionals climbing trees to rescue us...

The Lot fire brigade are trained in the specifics of our sport and our equipment.

PRACTICAL ADVICE FOR VISITING PILOTS FROM THOSE USED TO A SITE WITH LOTS OF TREE LANDINGS.

- Obviously choose the shortest tree, whose leaves or needles are darker indicating greater solidity.
- Avoid beech trees because their wood is more breakable.
- Aim for the middle bit.

FLARE:
-Brake as for a normal landing, but then release the brakes so that the wing and the lines come to rest above the tree thus securing the pilot from above.

NEXT
- Quickly grab the branches or the trunk and hold on. Ideally attach yourself using a cord or a strap which can be carried, easily accessible, in your harness. Carrying a tree landing kit containing a strap has indeed been made compulsory by some clubs which own sites in Germany.
- If you don't have one, or can't attach it, a solution can be to use the lines, or indeed to throw your reserve in such a way that it will hook onto a maximum number of branches.
- Don't unclip from your harness.
- Another cord, 20-30m long will enable you to pull up a proper climbing rope when the rescue services arrive.
- A whistle will help them find you because, visually, it can be surprisingly difficult for the rescue team to find a paraglider pilot perched high up.
- Don't try and climb down the tree without a belay rope. There have been fatal accidents as a result of a fall after a successful tree landing.

It can happen quickly. A few seconds after take off, the pilot ends up perched in the top of a tree.
https://www.youtube.com/watch?v=slJwOoui7c4

SAFETY ESSENTIALS

In the FFVL safety kit, there are, amongst other things, useful items in case you land in a tree: a whistle with an LED torch, a basic anchor cord (3 metres long, 5mm diameter), a basic hauling cord (50 metres long, 2mm in diameter). 15 €
http://boutique.ffvl.fr/index.php?id_product=8&controller=product

A good way of securing yourself, very solid and practical and weighing only 96 g, is a 22kN Edelrid sling, 8mm by 1.80 m with a lightweight 23kN Edelrid Pure Screw karabiner. 27.90 €
www.free-spee.com

A well thought out combination: this little cord allows you to hoist up a rope brought by the rescuers on the ground. Whilst waiting for them to find you, you can use the whistle which also serves as a weight economizing on the piece of lead which is normally used.
30 m cord, strength 70 daN.
13.90 €
www.free-spee.com

THE ARRIVAL OF AEF'S CAMELEON V3

Cameleon V2: soon upgradeable to V3

The first 'prosthetic throttle', which fitted onto a hand and was operated by one finger so that the motor was 'finger and eye' controlled, was the Cameleon by AEF. Boss Gerard Lésieux designed the first models more than a decade ago and invested 70 000 euros in the moulds amongst other things. On our editorial team, two pilots have flown with it for more than six years. When it came out, it was quite rightly said that the Cameleon is to classic throttles what the mobile phone is to smoke signals. For some time, the big manufacturers like Adventure have offered this throttle as an option (163 euros) instead of a classic handle. The Cameleon benefited from big improvements when it evolved from the V1 to the V2, such as the move from polycarbonate to a virtually unbreakable polyamide and adjustments to the sensitivity of the ON OFF switches.

From September 2015, AEF will be offering the V3 version of the Cameleon. It will give even more freedom for your hands and it will be possible to work it just as well with the index finger as with the middle finger. This freedom will allow the pilot to grab the front risers at take off facing the wing, as in free flying for example, or to grasp the throttle.
This new version will still be injected with polyamide, a material which isn't damaged by impacts thus improving passive safety.

It will also be compatible with the current V2, by changing the movable front part, available as a spare part. The owners of the V2 will therefore be able to easily upgrade to a V3.
For more information:
AEF
Website: www.mycameleon.fr
V2 Price: 154.17 Euros excluding tax.
Available in right or left handed models.

Cameleon, V3

free.aero

WORLDWIDE PARAGLIDING AND PARAMOTORING MAGAZINE. FOR FREE.

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Android development : Stéphane Nicole www.ppgps.info
Logo designed by Indalo: All rights reserved by Michael Sucker indalo@web.de
Magazine free.aero
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