

free aéro



SPRING MAGAZINE. FOR FREE.



PLAYING
WITH WINGS!





Cover:
 Photographer Guillaume Galvani
 followed Jean Baptiste Chandelier
 during his road games...

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Translation by Ruth Jessop

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Mini Wing EN 926-1

ROLLER

**Remember when
you had no limits**

The new Niviuk speedflying glider aimed at those looking for new ways to experience fun with a multifaceted paraglider. Speed, precision and easy handling are some of the characteristics built into this model, which is suitable for a wide variety of pilots. Excitement awaits you.



PLAYING ON THE GROUND

Jean-Baptiste Chandelier in action at the Dune...

Ground control and adrenaline filled flights close to the terrain: we provide a few reminders about the basic techniques and ask Jean-Baptiste Chandelier and Mad Mike Küng's advice...

Controlling the wing perfectly on the ground, and playing and kiting with it when there is wind, doesn't just guarantee safer take offs but also better control of the paraglider in the air. Most professional pilots agree with this: one hour on the ground is worth several in the air... At last a flight shaving the ground, whether on a paraglider or a paramotor, it's a unique sensation. A pilot is rarely as close to being a bird as when he skims the ground only to then fly away freely, with the slightest, almost imperceptible operation of the controls.



Photo: Team Jean-Baptiste Chandelier

JEAN-BAPTISTE CHANDELIER

Jean-Baptiste Chandelier, the maestro of playing with aerodynamic forces, is becoming increasingly well known by the general public too: here he is at work in an advert for Seat.



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1st of november 2016 Konrad Görg - CEO of AirCross - flew 446km XC with the U Cruise in Brazil:

"... the stability of the glider, the extraordinary glide and especially its high speed, allowing me to enter thermals even with headwind, helped me to achieve this record flight. A feeling beyond words after flying for almost 11 hours!"

www.aircross.eu

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 Included when purchasing a glider from AirCross



Photo: Blue Max Media

JEAN-BAPTISTE CHANDELIER

These types of images show, more than any others, the degree of freedom that we enjoy with our wings...

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THE
LEAD**

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JEAN-BAPTISTE CHANDELIER

Jean-Baptiste also works well away from the terrain...

When he isn't flying, he helps develop free flying wings for the Polish manufacturer Dudek, such as his Mach 1 in the photos. (59 cells, 17 m², aspect ratio 5.60, height of lines 7.03 m, weight 5.6 kg, all up weight 55-110 kg).



A paraglider with a yellow and purple wing is flying over a mountain range. The sky is blue with white clouds. The mountains are rocky and covered with green vegetation. The paraglider is in the upper right quadrant of the image.

ZENO

by OZONE

WORLD CUP PERFORMANCE, SERIAL CLASS WING

The Zeno represents the cutting edge of OZONE paraglider R&D. We started out calling this wing a baby ENZO, but the fact is that it's more like the ENZO's kinder twin brother. Luc Armant recently flew this new serial class wing to a podium finish at the PWC St. Andre, and the glide and speed performance clearly rivals the top CCC wings on the market, including the ENZO 2. This exciting yet user-friendly new design is meant to allow Mantra series pilots to step comfortably into the 2-line performance world.

WWW.FLYOZONE.COM



“Where you look is very important. You need to look where you are going and not at the wing tips.”

JEAN-BAPTISTE CHANDELIER THE WAGA VIRTUOSO

Jean-Baptiste Chandelier is one of the most gifted 'players'. With his inimitable style, he gives the impression that paragliding really is child's play, turning the pilot into a veritable Peter Pan.



ARE YOU
ready
to touch
the clouds?



Yes
I am.

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www.woodyvalley.eu



INTERVIEW...

free.aero: Jean-Baptiste, what do you like about playing near the ground, why have you made it into a form of art?

Jean-Baptiste Chandelier: In fact, I'm still a child at heart, I can't bring myself to train for hours in a repetitive fashion. The only way for me to train is if it's fun. So, every day I need a new challenge, a new game and one that lets me improve with a smile on my face. I never force a manoeuvre but instead work progressively until it happens smoothly, all by itself. I always remember that it must look light and fluid. That's perhaps why some people call it art.

free.aero: What advice would you give a pilot who wants to play and do wagas near the ground?

Jean-Baptiste Chandelier: The first bit of advice would be to do huge numbers of inflations so that you get to know your wing perfectly. The only way to be precise is to know and anticipate the trajectory of your wing as it flies, and also to anticipate the air mass in which you are going to fly. Therefore you need to start off in calm

air, either a ploom or beside the sea, and repeat the parts near the ground, never forcing it, getting nearer and nearer until you achieve your goal. Another essential piece of advice is that it's really important where you look. You need to look where you are going and not at the wing tips or anything else.

free.aero: Which is the best manoeuvre to start off with?

Jean-Baptiste Chandelier: Top landing is a terrific exercise to begin with. This allows you to discover your wing's trajectories. Then, little by little, land on smaller spaces at take off.

free.aero: You do all that on your Dudek Mach 1. What makes a wing ideal for doing acro and playing close to the ground?

Jean-Baptiste Chandelier: The wing must, amongst other things, be very reactive and have a large capacity to retain energy, because near the ground, it's this ability to keep its momentum which gives us freedom in 3D!

free.aero: Talk us through, step by step, in a few words how you do wagas so that you can let go of the brake and touch a spectator's hand with yours, or touch the ground?

Jean-Baptiste Chandelier: First of all, you need to get yourself into the right position so that you can reach your objective very precisely. I always try to arrive a little bit high so that I can initiate a pitch movement towards my target. During the conversion, I let go of a brake. Having enough speed gives me enough control through the harness and the outer brake so that I can exit towards the outside if the trajectory isn't good. As far as touching the ground with my hand is concerned, the approach is the same but with less acceleration. Once near the ground, I lean towards the hill in the harness to get my hand near the ground, and manage the direction with the outer brake. If I want to fly back towards the hill, I release my outer hand, if I want to go further away from the hill, I brake a bit more with my outer hand. 🙄



Released two years ago, the film Touch was a worldwide success with three million people watching it on YouTube alone. This film also very clearly shows how JBC strokes the ground during these long skimming sequences.
<https://youtu.be/L62faWn-sa8>







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Cocone X-Alps 2,4 kg



Front container 230g



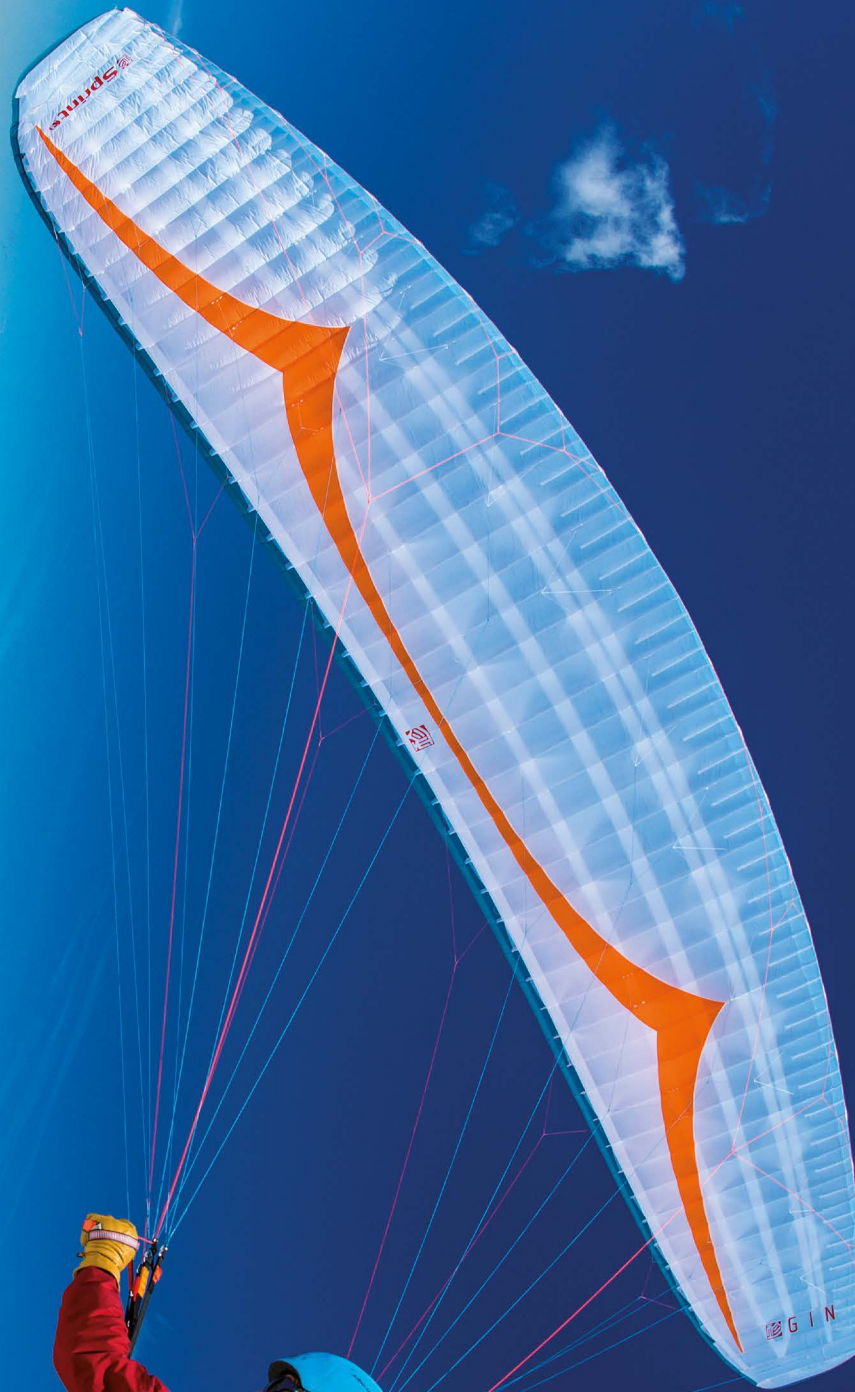
UltraCross 100
975g

www.skyman.aero

CrossAlps EN/LTF C
4,0 kg (Size M)



GIN



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TECHNIQUE: 'TOUCH' FOR EVERYONE

It's within reach of almost every pilot with a minimum of experience to approach the slope so that they can touch somebody's hand.

- If possible choose laminar conditions, dynamic lift with little or no thermals.
- Choose a trajectory within the into wind leg (the wind is rarely exactly perpendicular).
- Do lots of top landing training beforehand, as Jean-Baptiste advised.

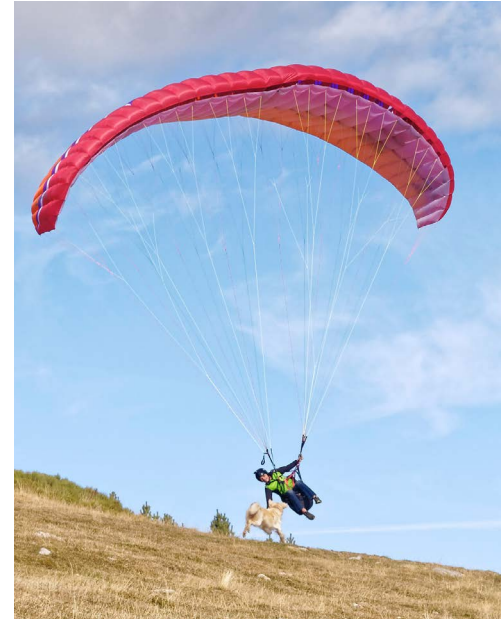


"TOUCH" POUR TOUT LE MONDE

Get into a good position. Often, it takes several goes.



After picking up speed, steer through your harness to get near the ground, and with your hand on the brake to go further away.



Use the brake to steer away from the hill. If necessary, it can be used to give a little pitch to regain a few centimetres of height.



Missed, no, he's not giving his paw...



...but he still wants to play. Here, a thermic gust lifts the pilot back up.

TECHNIQUES FOR FLYING NEAR THE GROUND

WEIGHT SHIFT TOWARDS OR AWAY FROM THE SLOPE?

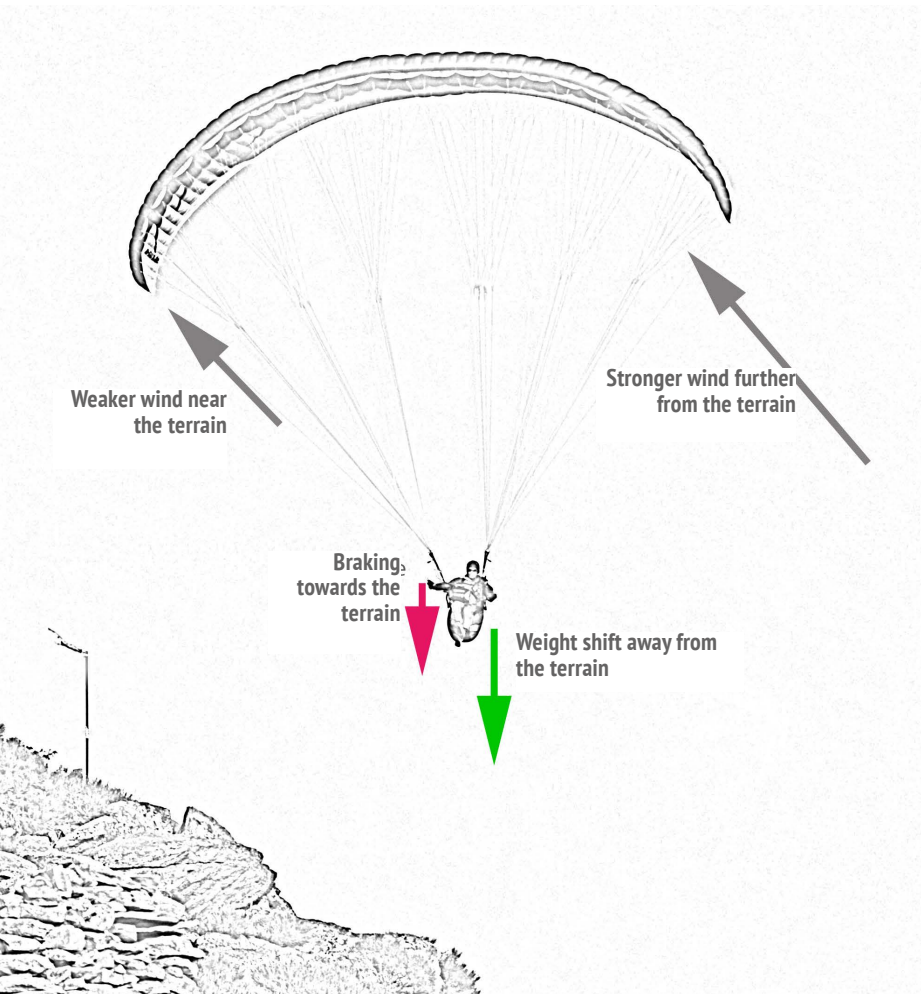
For games like 'touching the ground', as Jean Baptiste Chandelier explained, the pilot weight shifts towards the slope at the lowest point.

During a flight with weak dynamic lift on the other hand, to keep the wing flat, the pilot can lean the other way and fly with the brake near the ground.

This allows, amongst other things, to counter the constant tendency to roll towards the slope. In fact, the wind gradient near the ground means that the wing tip which is furthest from the ground is often lifted up by wind and gusts which are a bit stronger than on the other side. ⚡



Photos: Véronique Burkhardt Pilot: Sascha Burkhardt



WEIGHT AWAY FROM THE SLOPE





On the previous pages we played on an Independence Zippy. What makes it different are the air brakes on the upper surface, which you can deploy before the flight by opening the 'zips'. They should reduce the glide ratio by 2 points and increase the sink rate by 0.4 m/s, making lots of manoeuvres easier for beginners. We are testing one at the moment and will let you know our findings as soon as possible. So far, the wing has pleasantly surprised us. In 'braked' mode (which was the case on the previous page), the wing could still be used for soaring or going up in thermals, but was more stable, even at lower speeds, and thus more precise for playing near the ground.

Innovative design and flying pleasure



Bird

The new intermediate wing available from

www.trekking-parapentes.fr



CLIPPING IN FACING THE WING

When there is wind at take off, it is best to clip in straightaway facing the wing. The techniques for getting it right are simple, (which riser on which side, which way to turn) if you follow a system. Here's a reminder.

After inflation, the pilot in our example will turn towards his right, in other words, clockwise. The direction the risers are turned and the order must be reversed for pilots who want to turn the other way.

VERSION 1 THE CLASSIC



The lines are untangled, the risers are parallel and not twisted.



The left riser (in the right hand) has been given half a turn clockwise...



...and fixed to the left karabiner.

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www.advance.ch/epsilon



ADVANCE EPSILON⁸

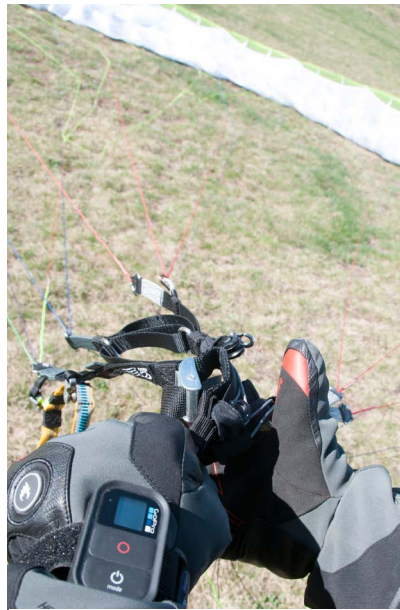


The right riser is passed over the other one...

...and also given half a turn before being attached to the right karabiner.



VERSION 2 A QUICK SHORT CUT



A very quick and efficient way of clipping in facing the wing: both the risers are parallel, side by side, in the right hand.

With the left hand, the pilot twists this whole bundle half a turn clockwise and then puts it like this into his right hand.

All you have to do now is put, without any extra turns, the loop which is on the left in the left karabiner and the right loop, still without any extra twists, onto the right karabiner. Ready!



STEERING WITH THE REAR RISERS

A VERY USEFUL TECHNIQUE FOR GAMES ON THE GROUND: USING THE REAR RISERS.

This also lets you take off for a couple of metres and then land again straightaway. Pulling on the rear risers stops the flight very cleanly, contrary to pulling on the brakes which often causes a little surge, initially lifting the pilot up a few metres before the lift disappears.

STEERING WITH THE REAR RISERS



With the front risers, bring the wing up when it falls back.

With the rear risers, stop the wing when it overshoots or when it risks lifting the pilot up.

Going from the front risers to the rear risers and vice-versa requires a lot of practice.





Initially the pilot can leave the brakes clipped to the riser or otherwise put the brake handles around his wrists, as shown here, to be ready to steer with the brakes in case of a real take off. Disadvantage: the 'bundle of risers' in front of the pilot isn't as clear. In addition, the pilot is less free to move and depending on how the brakes have been adjusted, can unwittingly brake the trailing edge whilst pulling a single line or riser.

STEERING USING THE REAR RISERS

After leaving the ground, the most difficult thing is to stop the wing's tendency to untwist the pilot.

On a wing with four risers, he can use the Cs and the Ds, it is less efficient for steering, but easier to stop it untwisting, and the stall is less abrupt.

On the other hand, on a wing with three risers, as pictured here in the photo, the stall is very clean.

When the pilot goes from little hops to real flight, it is best if he turns back round so that he can see where he is going and goes back to flying with the controls as normal. 🙄



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CONTAINER ,MULTI'

ACCESSOIRES



DON'T FORGET...

No matter what the preferred technique for inflating, in an emergency, there is only one reflex, whether on a paraglider or a paramotor: grab the rear risers and gather them as near as possible to the pilot, taking wraps if necessary. The wing will fight, it will flap in the wind, but it has lost all its harmful power.



INFLATE LIKE AN AUSTRALIAN...



Sometimes called the 'Australian technique', this way of controlling the wing is characterised by its lack of symmetry. The pilot takes the front risers in one hand and the back (C+Ds) in the other.

The brakes should stay either clipped to the risers, or the pilot should already have them in his hand (preferable). The pilot controls the rise of the wing with the front risers, ready to brake it again with the rear risers.

If the wing comes up asymmetrically, all you have to do is move your hands laterally to correct it; this works just as well with the front risers as with the rear risers.

This technique can be combined with the 'Cobra' when putting the wing at the edge of the window, (see following pages).

OTHER TECHNIQUES

ANYTHING GOES

The pilot can pull a few lines on their own, a group, or the brake line - anything goes.

The advantage of using the brake line rather than the brake handle is that it is more direct.



REMINDER OF THE POSSIBLE CONTROL TECHNIQUES ON THE GROUND

CONTROLLING USING THE BRAKES

Good feeling for the wing's reactions. Less physical. Strong increase in lift, late stall: makes it more likely that the pilot will be lifted up and take off unwittingly. When the wing comes down, it will exert a strong pull.

CONTROLLING USING THE REAR RISERS

The handling will be a little less obvious. Average physical effort required. Little increase in lift, stall fairly clean: the risk of unexpected take off is less.

Pulling on the C and Ds (for wings with four risers). Unusual handling. Fairly physical. Very efficient. Increase in lift very low, stall very clean: very effective against unwanted take offs, being lifted up and the risk of being dragged.



A lack of wind means that the pilot uses the brakes and not the rear risers to climb up onto this bale of hay. These bales are a great place to play!

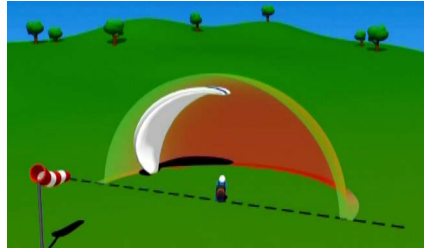
THE COBRA INFLATION...

Here's a reminder of this very useful and elegant technique, where the wing comes up asymmetrically at the edge of the wind window, and then the pilot corrects it.



Photo: Veronique Burkhardt

Photo: Dmitry Petrenko - Fotolia



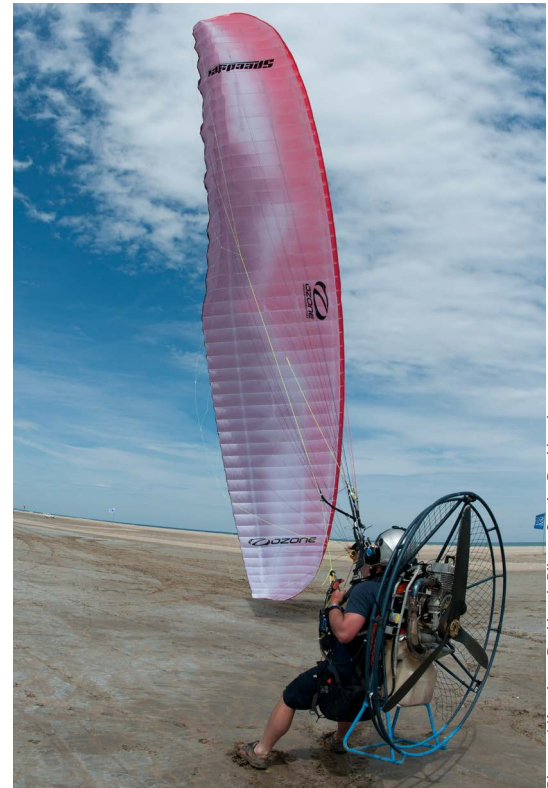
The advantage: do as kite experts do, don't bring the wing up in the middle of the wind window, where it pulls with all its force, but instead at the edge. It's less physical, and the risk of being pulled off your feet is less (within limits of course, if the wind is very strong). The Cobra in detail: by setting the wing up at the edge of the wind window, the pilot forces it to come up asymmetrically which he accentuates by pulling on the As on the side which is coming up, whilst preventing the wing, with the help of the brake on the same side, from turning back round and facing the ground. So therefore the pilot works just with the riser and the brake on one side of the wing. The French company Kitchen Production has, for several years had an excellent training DVD about ground handling. It is still available (apprendreleparapente.com) and the above diagram comes from it. ☺



The Cobra also works very well with a tandem...



...and with a paramotor.



Photos: Véronique Burkhardt Pilote: Sascha Burkhardt



LESS IS MORE

P-Series 

New lightweight models: Ikuma P & Hook 4 P

niviuk.com



Photo: Mia Knoll

MAD MIKE KÜNG THE PIONEER OF REAR RISER STEERING

One of the pioneers of the rear risers technique is "Mad Mike Küng". This pilot, who was also one of the first acro pilots in the history of paragliding, loves to 'kite' his wings, climb on obstacles and fly like a seagull from rock to rock.

STEERING WITH THE REAR RISERS



Photo: www.profly.org





Photo: www.profly.org

MAD MIKE KÜNG

free.aero: 'Mad Mike Küng' has almost become a trade mark for climbing vertical walls with the help of your wing. It's a technique that you teach, amongst other things, in your courses. Roughly speaking, how do you climb cars and bunkers like this?

Mad Mike Küng: This sort of work involves understanding your wing really well and its behaviour in the wind, you need to practice using it like a kite. To climb up onto an obstacle, you need wind of course and also lift from braking the wing.

Normally, we work a lot with the rear risers but, for obstacles, the brakes can be an advantage because they increase lift.

I get myself in front of the obstacle, almost up against it, then I brake, and at the same time, with my legs, I give a push backwards. I use the resulting lift to climb onto the object. It takes a lot of practice.

Very important: if the obstacle is large, you can very easily remain trapped by the brake lines which curve towards the object. 🙄



NEWS: THE MAD MIKE KÜNG HARNESS
Mad Mike Küng is working on a harness specifically designed for freestyle, acro and ground handling, as well as paraglider test flights.

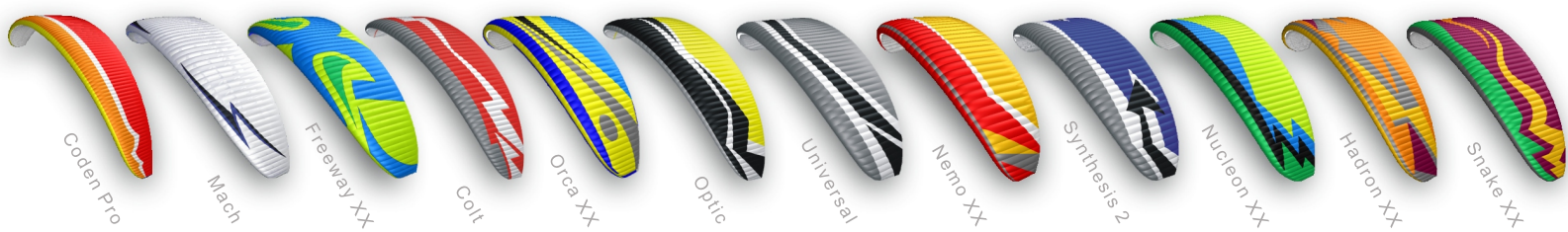
In the words of the manufacturer, this harness is 'very simple, very robust and above all, very sensitive to being steered by weight shift'.

<http://www.madmikekung.com/>



A few years ago, Mad Mike Küng launched a training DVD (17€); unfortunately it's not in English. You can still view the trailer on his site. <http://www.madmikekung.com/news/playgroundrevolutions-mmks-neuer-film>

full range of freeflying & paramotor wings



NEWS



NIVIUK
ROLLER

Niviuk have just launched their speedflying wing, the Roller. As it obviously works well for playing near the ground, we're happy to publish in this edition the beautiful photographs that Team Niviuk brought back from the Dune de Lokken (also have a look at the [article in this issue](#)). According to Niviuk, the Roller is a 'go everywhere wing which is remarkably flexible', characterised by its speed, its precision and its agility.



Photos: Niviuk





Photos: Niviuk

ROLLER - TECHNICAL DATA

Manufacturer: [Niviuk](http://www.niviuk.com) - Web : www.niviuk.com

	2016	2016	2016	2016
DATE	2016	2016	2016	2016
SIZE	14	16	18	20
FLAT ASPECT RATIO	4.3	4.3	4.3	4.3
ALL UP WEIGHT [kg]	60-90	70-100	80-110	90-120
WEIGHT OF THE WING [kg]	3	3.3	3.6	3.9
CERTIFICATION	EN-926-1	EN-926-1	EN-926-1	EN-926-1

SPEED WING:

OZONE FAZER 3

Ozone have just brought out a new wing which is very suited to playing. According to the manufacturer, the objective of the Fazer series is to offer a speed wing which is as flexible as possible and just as easy to launch on foot as on skis. The Fazer 3 should be the ideal wing for foot launching in summer and at the same time, the newly modified trimmers give it much greater angles of attack and offer increased stability for winter speed riding.

<http://flyozone.com/speed/fr/products/gliders/fazer-3/info/>

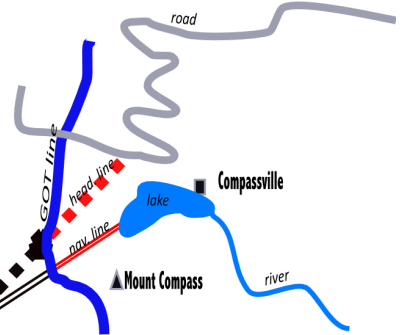
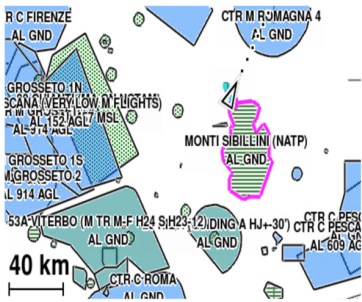
OZONE FAZER 3 - TECHNICAL DATA

OZONE FAZER 3 - TECHNICAL DATA				
Manufacturer: Ozone - Web : http://flyozone.com/speed/fr/products/gliders/fazer-3/info/				
DATE	2016	2016	2016	2016
SIZE	8	10	12	14
FLAT WINGSPAN [m]	5.23	5.85	6.41	6.93
FLAT ASPECT RATIO	3.43	3.43	3.43	3.43
ALL UP WEIGHT [kg]	Depends on the pilot's skill level			
WEIGHT OF THE WING [kg]	2.1	2.4	2.75	3
CERTIFICATION	EN-926-1	EN-926-1	EN-926-1	EN-926-1



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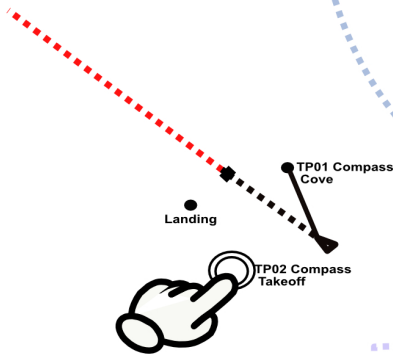
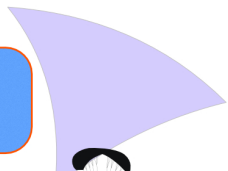
ALL-IN-ONE

NEW HARD GLASS

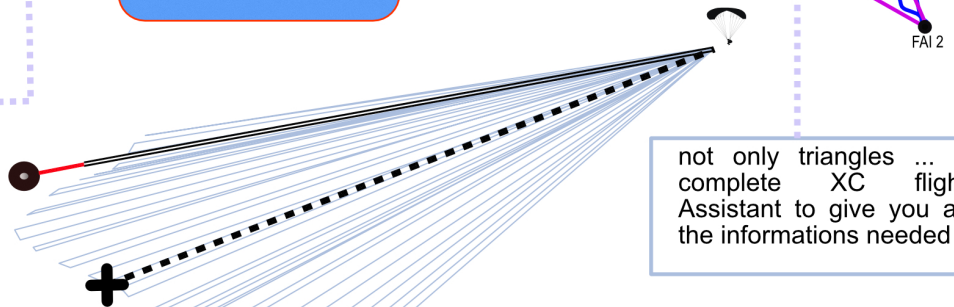
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LØKKEN, THE DANISH DUNE

One of the most beautiful sites to 'play' is undeniably the Dune du Pyla. But there is a rival within Europe: the Dune de Løkken in Denmark.

The lighthouse at Løkken, with its foundations in the dune is an increasingly visible symbol in this playground. Compared to Pyla, one big advantage is that there are fewer people. The relief

is about 30 to 90 metres high but the topography changes. The front part of the dune has been smoothed by the wind. At the lighthouse for example, the take-off becomes less obvious. But along the length of the twelve kilometres of coast line there are lots of places to play peacefully. The dune faces west/northwest but, in contrast to Dune du Pyla, in certain places you can also fly in an easterly direction.

SKYTRAXX

Two Skytraxx paragliding instruments are shown. The left one is a Skytraxx 3.0 with a top display of 829 and a map. The right one is a Skytraxx 2.0 Plus with a top display of 854 and various flight data: 0.0, 28, 10, 50 m, 56, 23, and 22°C.

WITHOUT COMPROMISE
www.skytraxx.eu info@skytraxx.eu

www.free.aero



DUNE DE LØKKEN PRACTICAL INFORMATION

DUNE RULES

http://www.free.aero/common_free/Flyvebrochureengelsk.pdf
http://www.free.aero/common_free/kmz/lokken.kmz

TWO CAMPSITES

Camping Klitgaard
With a take-off on the dune:
<http://www.gl-klitgaard.dk/>

Camping Løkken Strand
Near the beach and the take-offs:
<http://de.loekken camping.dk/>

TOURIST INFORMATION

<http://www.loekken.dk/>

DANISH FREE FLYING FEDERATION

dhpu@dhpu.dk
www.dhpu.org/

WEATHER FORECASTS

https://www.meteoblue.com/fr/meteo/prevision/semaine/l%C3%B8kken_danemark_2617443
www.dmi.dk/vejr/
www.vejrcentral.dk/



Unlike the Dune du Pyla, the back of the Danish dune is relatively clear. If the wind turns round you can continue soaring...

Photo: Niviuk

THE DUNE DE LØKKEN



Photos: Karsten Kirchhoff



FLYING TECHNIQUES

NEAR THE GROUND ON A PARAMOTOR

A paramotor is the ultimate aircraft for flying close to the ground. For some pilots, getting high on flying low is even their primary motivation for doing our sport...



Photo: Francis Cormon

With its low speed and low moving mass, no other aircraft could let you play so easily at ground level. A "touch and go" on a bale of hay is available to most pilots. Ideal: calm weather without any thermals and with low wind. On the other hand, don't forget that, in France for example, flying at ground level is officially forbidden except when taking off and landing. In Spain and Italy on the other hand, it is no problem at all.

Soufflez, Inspirez



ADVENTURE



By keeping the same altitude, turns close to the ground are relatively easy but thrilling nonetheless. It is best to choose soft ground such as sand or snow. Don't go back into your own wake: change trajectory before doing a full 360° turn! The nearer you get to the ground, the more technical it becomes, see next page.





STABILO ON THE GROUND

The former World Champion Pascal Vallée explained to us how he performs his spectacular 'touches'...

“On a paramotor, the ‘touching the tip’ manoeuvre isn’t very complicated but gives a big adrenaline rush due to the risks.

The technique which seems to be the safest for what I do, is to use the least amount of brake possible whilst accelerating in a spiral. This is where the brakes at the wing tips are useful. To avoid going too near the ground and the cage actually touching, I flare at the same time as I touch with the stabilo!

The manoeuvre is done in two parts:

1- Pick up speed in a spiral (I often use the bar), I position myself to limit the sink rate and touch the maximum amount of ground. Here the controls at the wing tips are efficient; the outside brake works well to adjust the trajectory without using up too much speed and thus energy.

2- When my cage and my wing tip are nearest to the ground I check that the span of my wing is perpendicular to it, and at that exact moment I use the conversion of the wing by pulling on the inside brake (I am no longer on the wing tips but on the normal brake). The tip goes down and can then touch the ground whilst the cage goes back up. It takes a fraction of a second and you have to be ready to use the outside brake very quickly (know how much) so that you don’t descend which, in this case, would mean crashing.

I have already hit violently thanks to misjudging the ground (wheat) and my wing stayed attached. The surface which is the easiest will always be sand which you can slide along and the least dangerous is water, but that requires having the services of a safety team!





PLAY!

Photo: Elna Sirparanta / Parabatix

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Komfort
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Always unforgettable, whether on a trike or foot launched: following the coast, skimming the ground, for several kilometres... Careful, only do 'barefoot' over the sea if you are accompanied by a second pilot and stay very close to the shore.



TOUCH!

SKIMMING FLIGHT: THE INFLUENCE OF THE WIND

Normally, flying straight, the direction of the wind doesn't influence the aerodynamics of the wing. When level, whether you fly into the wind or with the wind on your back, there is no perceptible difference, it's the same. Except near the ground: lots of pilots are surprised that when flying shaving the ground there is less lift, therefore they use more fuel to maintain level flight when flying with the wind on their back.

Explanation: near the ground, there is often a strong wind gradient. It blows stronger at 12 metres than at 9 metres above the ground.

When flying level, we are, in principle, part of the air mass, but in this case, we are at the limit of two different air masses. The upper surface isn't in the same air mass as the lower surface.

Into wind, this accentuates the difference in speeds between the upper and lower surfaces and increases the lift, and downwind it decreases the difference and thus decreases the lift. ⚙️



Photo: Véronique Burkhardt

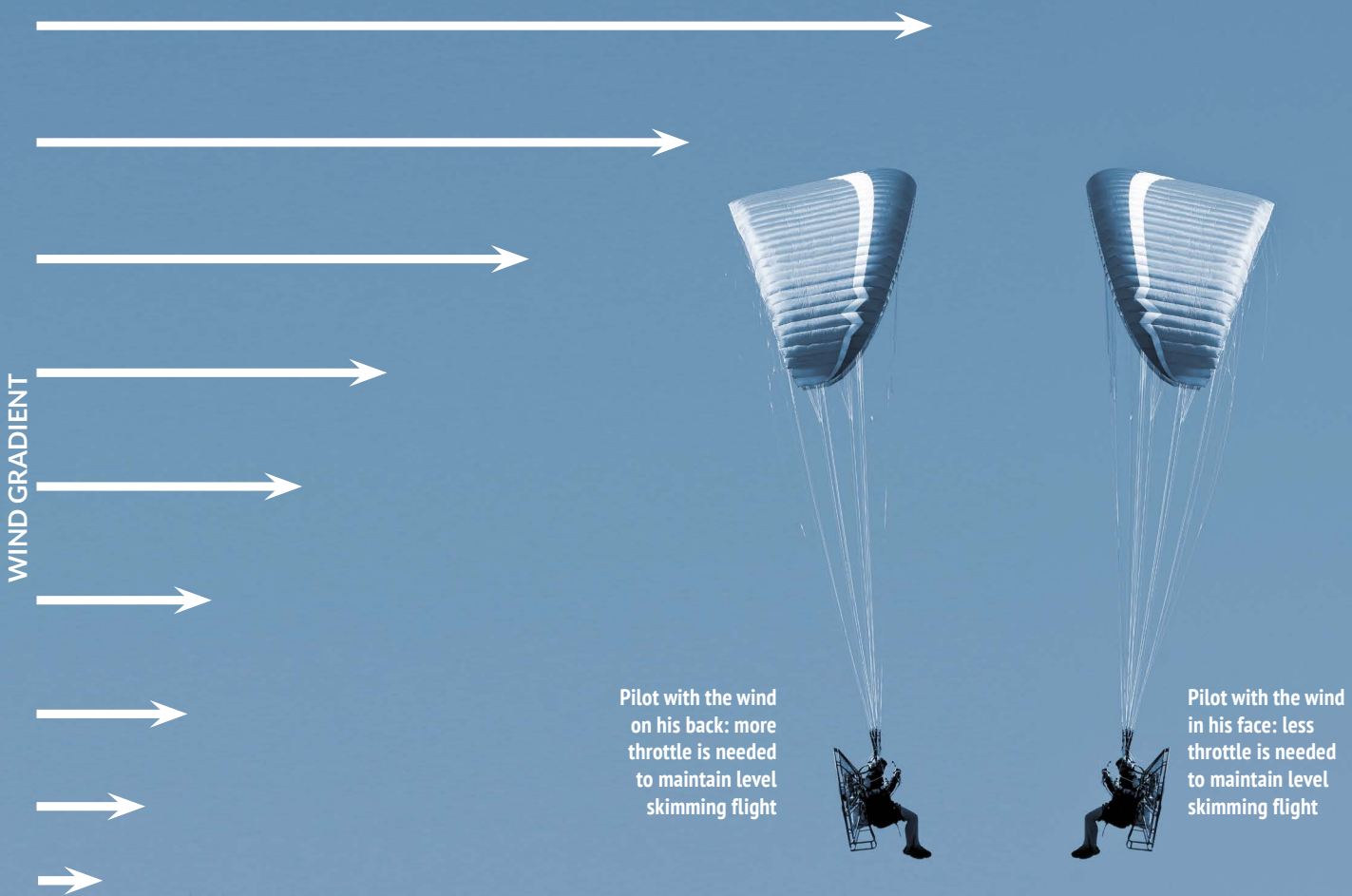


Photo: Véronique Burkhardt



ADVANCED TECHNIQUES USE ALL THE CONTROLS FOR SLALOM TURNS

By Sylvain Dupuis

In a slalom, to save time, the turn must be as short and tight as possible and without a surge when exiting! It's very technical and requires an educated use of all the controls:

- Throttle
- Wing tip controls
- Brakes
- Speed bar

If you are a very experienced pilot and you practice above a metre of snow or another very soft surface, you can work on optimising your turns like the competitors.

ON THE STRAIGHT

On the straight, well before getting to the pylon, you'll be on full bar, with approximately $\frac{3}{4}$ throttle to maintain level flight at maximum speed. Whilst you are on full bar, you mustn't touch the main brakes. Above all use the wing tip controls (=Tip steering).

GOING INTO THE TURN

The pylon is there, you need to start turning! Start by using your wing tip control, still on full bar. The effect is immediate because you

have the speed: the wing starts to tilt in a roll and yaw, the turn has started. Now you need to think about tightening your developing turn as much as possible! No problem, you're at full speed, you've got lots of energy! Release the bar in one go and in the fraction of a second which follows, brake with the main brake to increase the roll. Pay attention to the order in which you do this, first of all release the bar and then you can brake. With all this accumulated energy, you will need very little brake to get on your side, and you're there, right in the turn!


TIGHTENING THE TURN

At this point, you can put the motor on maximum to give you even more energy, and additionally limit the radius of your turn. It's the power which allows you to maintain your altitude in a strongly banked turn. So you're on full throttle, on your side and you turn. Go on, you can turn even tighter! Use the pendulum effect of the paramotor and make it pitch backwards by pulling strongly and symmetrically on the brakes. In a turn on the side, the effect is therefore an even smaller turn radius! Some pilots even get close enough to stalling to

shorten their turn by the maximum amount. When the turn has been done well, you feel really crushed in the harness, a sign that the turn was both fast and tight.

EXITING THE TURN

That just leaves managing the exit. A nice exit is also pretty technical. Full throttle, you've got energy in the bank and if you are happy to simply release your brakes, you'll have a nice conversion coming out of the turn, which will lose you time. So release your brakes and when you start to regain your direction as you exit, push down on the bar again whilst putting your throttle back to $\frac{3}{4}$. Counter the possible roll with your wing tip controls, whilst fine tuning your direction.

With a bit of work, you'll be able to do turns high up which are perfectly constant, entering and exiting at full speed, whilst having a turn with the smallest radius possible. Try it progressively and don't forget that a small error is unforgivable at this altitude and speed. This is also why Slalom competitions are now organised over water... 

PORTFOLIO

AXEL JAMGOTCHIAN

Axel is a young eighteen year old pilot who loves playing... In these remarkably aesthetic pictures, he takes us with him for a couple of acro flights. He's obviously having fun... Acro is an activity that we'll look at more closely in a future edition.





Axel Jamgotchian


Axel Jamgotchian



Axel Jamgotchian




Axel Jamgotchian



Axel Jamgotchian

Axel Jamgotchian



PLAYING PERFECTLY: DON'T TRY THIS AT HOME



In the "Don't Try This At Home" series of videos, the Paragliding Acrobatic World Champion François Ragolski and his friends, give us some nice lessons about playing in the air!

The videos are on the site:
<http://francoisragolski.fr/#medias>





PLAYING PERFECTLY: DON'T TRY THIS AT HOME



TEST

INDEPENDENCE

GERONIMO 2

THE HIGH END EN B



The Geronimo 2 by Independence is advertised as high end EN B with impressive cross country potential and good handling. We tested one in almost all imaginable conditions and compared it to wings in the class above.

Test pilot: Pascal Kreyder



I took off at Saint André les Alpes on the first of September 2016, the day before the start of Paragliding World Cup. The base wasn't very high (2400m) and the forecast was for storm development in the middle of the afternoon.

I quickly untangled the glider. The new lines slid across the Southern Alp's stones without snagging. The wing came up very easily, without much acceleration, even at the end, despite a 25km/h breeze.

I was surprised by how much the wing slowed down once it had passed over my head, which saved me having to excessively brake it, giving a violent lift-off.

Compared to the competitors who were there, I felt as if I was taking off with at least 10km/h less wind. With my friend Joël on his Ozone Delta 2, we decided to fly to Montagne de Coupe in some well established thermals between 2.5 and 6m/s. I immediately noticed the damping of the wing compared to the Ozone Delta 2. All the movements were filtered and attenuated, on both the pitch and roll axes. As it was very comfortable I could play exaggeratedly with the speed bar without being apprehensive.

On the first transition hands up, the Delta 2 had slightly better performance.

STRONG CONDITIONS

The thermals were in cycles and chopped up by the westerly wind. Joël struggled to keep his wing pressurised above his head, whilst I concentrated on using feeling to centre and optimise the thermal. I came out at an altitude of 2500 m.

I flew with maximum acceleration across the 5km transition and never had to correct my trajectory with the brakes or the rear risers. Little adjustments through the harness were generally enough, despite the wind and the thermals I went through.

Being used to the reactions of C or D certified wings, I was really surprised by how comfortable it was. The situation wasn't the same for Joël, who had to manage his roll.

WEAK CONDITIONS, OPTIMISATION

Joël joined me in a convergence of +0.2 m/s. He had his hands up, overtook me in a more disorderly trajectory, but seemed to find the zones of lift more easily.

Clearly visible: double 3D-Shaping in the leading edge, a SharkNose and internal tension bands.





The risers: Split A risers and the Bs in different colours with 4 lines. The Cs are also in different colours both for the 3 lines as well as for the risers. The stabilo line is also in a different colour.

Still keeping a close eye on it, I let the Geronimo 2 fly by itself, its trajectory remained straight. But it wasn't as good as the Delta. During our twenty minute 10 km out and return, I lost nearly 100 m of altitude. I tried every type of turn: flat, engaged, with weight shift outwards, with more or less force through the harness, the wing had no faults when inclined or in its yaw behaviour.

STRONG AND EXTREME CONDITIONS

On the 3rd of September we decided to try doing an XC out towards Dormillouse. I took 3 kg of extra ballast. The forecast was for strong thermals and a 3700 m base.

The transition towards the valley de la Bléone was classic in a relatively stable air mass. I made the most of being in the company of a Mentor 4 to compare performance. I positioned myself next to his wing tip and we left Cheval Blanc together. Sometimes I was higher, sometimes the Mentor 4 gleaned a few dozen extra centimetres.





Above, unsheathed lines.



The sheathed lines in the lower part.

In the stable air the Geronimo 2 gave less feedback than a wing in the class above. I spent more time working the thermals than the wings certified in the class above.

PAY ATTENTION ALL THE TIME

When we got to the Crête du Cadun the air mass changed radically. The thermals were strong, narrow and tilted to the south west. On occasions, when we left the thermal leewards before getting to base, we had to fly our wings very assertively. In this game of strength, the Geronimo was easier to control. The corrections required only one action, whereas the Delta required precise timing and amplitude, otherwise it would collapse on the opposite side.

As we quickly passed from one thermal to another, going through descending air in between, I had more difficulty knowing my exact position in the air mass. The pitch damping on the Geronimo reduced its ability to cut into a +7m/s thermal that I met later.

FLYING FAST

During the transition to Dormillouse, we cloud hopped, +4 m/s followed by -4 m/s. The Geronimo's pitch could be managed with the speed bar in a very precise fashion. This stability gave me enough confidence that I let go of the controls and ate my lunch, without releasing the accelerator bar.

When we got to Maurel at 2370 m I noted that the polar curve on the first bar of the Independence was very good and comparable to that on an EN C.

In total I covered 113km, at an average of 21.3 km/h, which is only 2.7 km/h less than my fastest flight on an Ozone Delta 2. That day it was the best performance of any EN B.

EARS

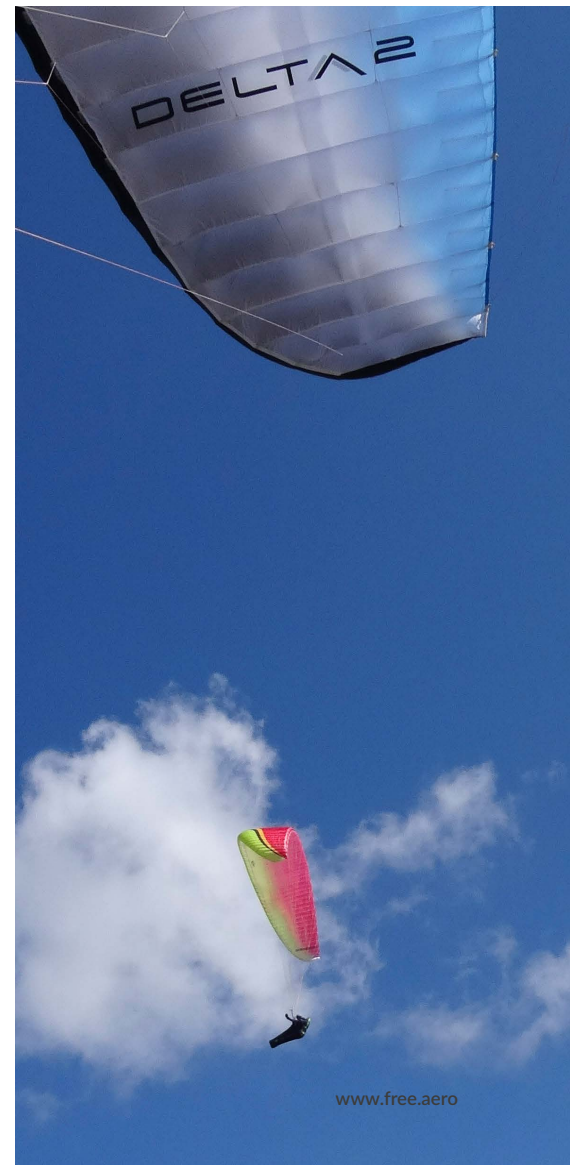
The ears are easy to put in with the special riser. They stay in place until the first light 'pump' without the accelerator and a stronger 'pump' with the accelerator. The ears don't flap and don't distort the wing. The pitch damping is even more marked. The wing can be flown through the harness.

AVANTAGES

Comfortable in (almost) any situation, easy to fly and take off even in strong conditions and with intuitive turning proportional to the force on the controls. The profile is tolerant in both the amplitude and timing of the pilot's actions. The pitch management with the accelerator is extremely educational. Weight.

FAULTS

Lack of bite when entering (very) strong thermals.



FORCE II

NEW

Seductive Strength

The new Force II has been redesigned from the ground up. Featuring ABS® - Automatic Balance System - an industry first, pioneered by APCO.



ABS® is a system which automatically and gradually pulls down the tip steering as you release the trimmers and push the speed bar. This action stabilizes the wing, cancelling roll movement, "planting" the pilot under the center of the canopy.

The Force II is a well rounded package which offers the best of both worlds; a highly agile, fun wing together with never before seen stability when flying cross country at high speeds.

SETTING FUTURE STANDARDS

1974 APCO launches serial production of hang gliders

1984 1st generation paraglider hits production

1995 Bagheera the glider of champions

2004 1st paramotor world records

2016 FORCE II the latest creation



T-40

T-30

T-20

T-10

NOW

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WHO IS IT FOR ?

This wing is aimed, for example, at any pilot who wants to go down a certification class, coming from an EN C. It is well suited to cross country pilots who don't want to be bumped about all day long any more. The Geronimo 2 is also well suited to a pilot at the beginning of his flying career who wants to do longer XC's. Of course, for this high end EN B, you need to know how to manage roll and pitch movements in medium to strong conditions.

CONCLUSION

The EN B Independence Geronimo 2 lets you do all the XC's that other equally

competent pilots are doing on EN C certified wings, even in very strong conditions.

There is almost no difference compared to a wing in the class above, except for the speed and glide on the second bar into wind. The few km/h of lost speed are compensated for by an increase in comfort and calm throughout every stage of the flight. The entry into turns as well as the bite going into thermals are less pronounced than on a wing in the class above. ☺

Pascal Kreyder



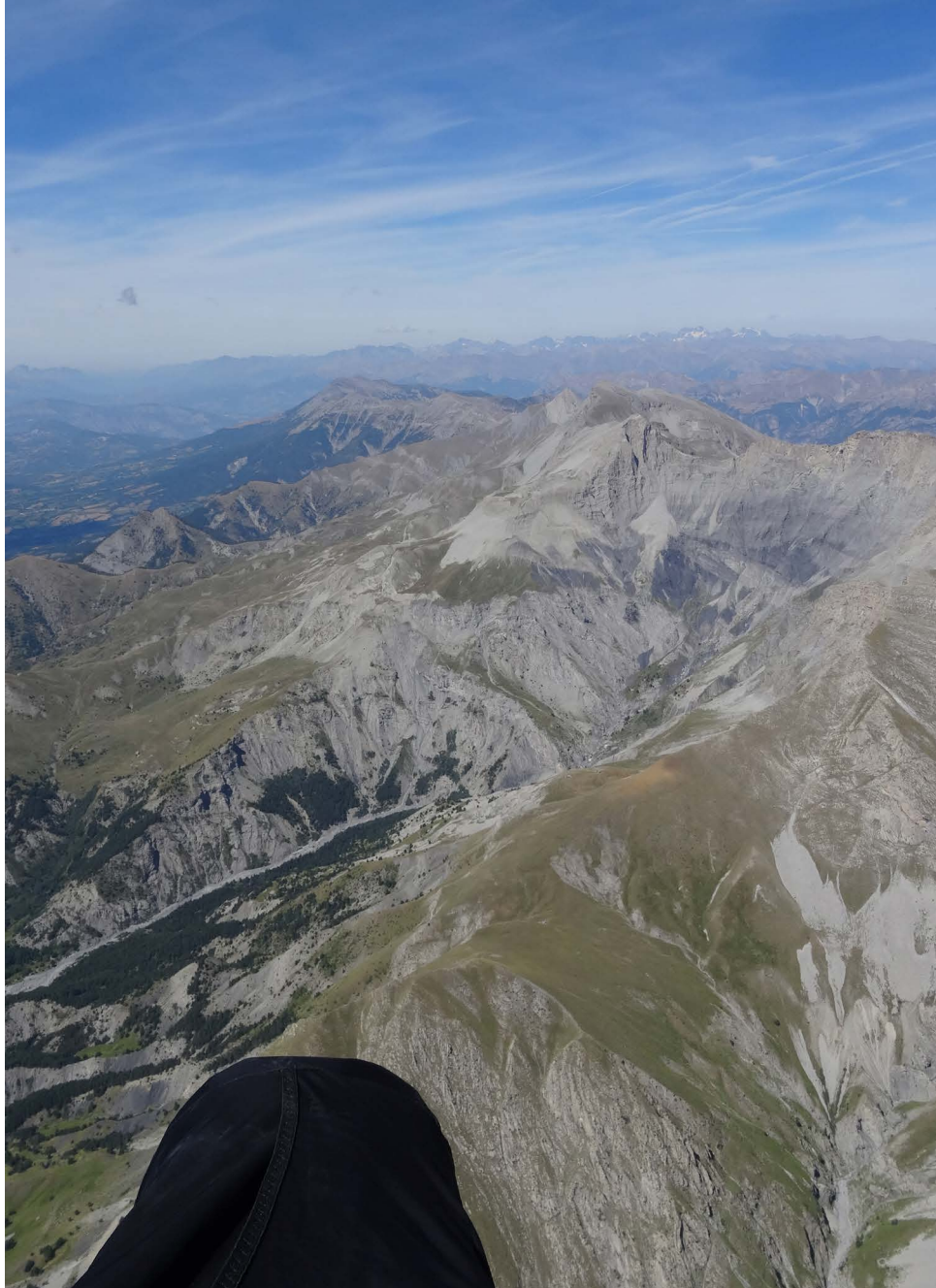
GÉRONIMO 2 - TECHNICAL DATA

Manufacturer: Independence - Web: <http://www.independence.aero/>
Mail: info@independence.aero Tel: 00.49/(0) 83.64/98.33.0

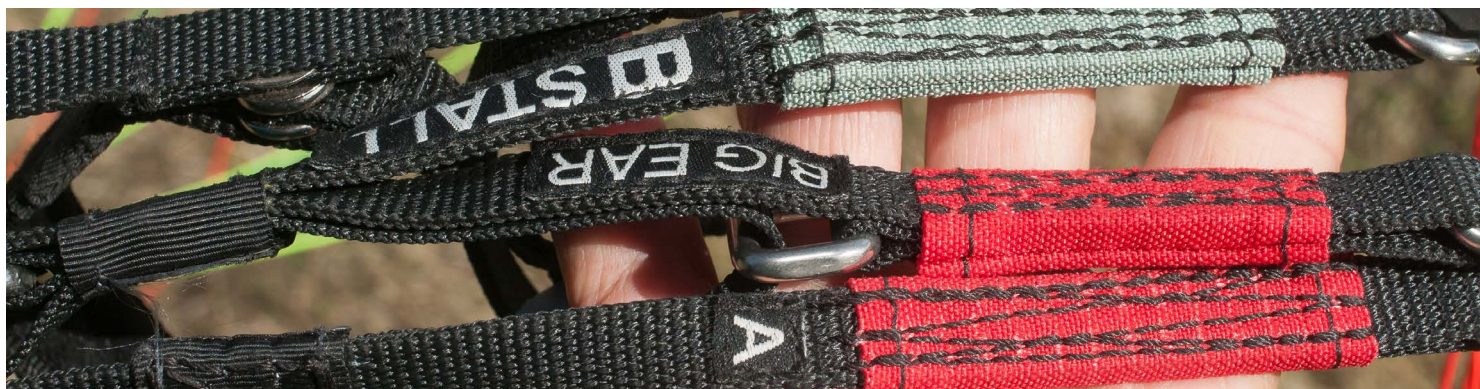
DATE	2016	2016	2016	2016
SIZE	XS 23	S 25	M 27	L 29
CELLS	59	59	59	59
FLAT SURFACE AREA [m ²]	23	25	27	29
PROJECTED SURFACE AREA [m ²]	19,37	21,06	22,74	24,43
FLAT WINGSPAN [m]	11.33	11.81	12.27	12.72
PROJECTED WINGSPAN [m]	8.75	9.12	9.48	9.82
FLAT ASPECT RATIO	5.58	5.58	5.58	5.58
PROJECTED ASPECT RATIO	3.95	3.95	3.95	3.95
ALL UP WEIGHT [kg]	55-80	65-90	80-105	95-125
WEIGHT OF THE WING [kg]	4.6	5	5.3	5.5
CERTIFICATION	B	B	B	B
MATERIAL	Upper surface/lower surface Dominico D20, Ribs D30 FM Hard			
PRICE [€]	2950	3000	3050	3100
HEIGHT OF LINES (M)	7.04	7.34	7.64	7.91



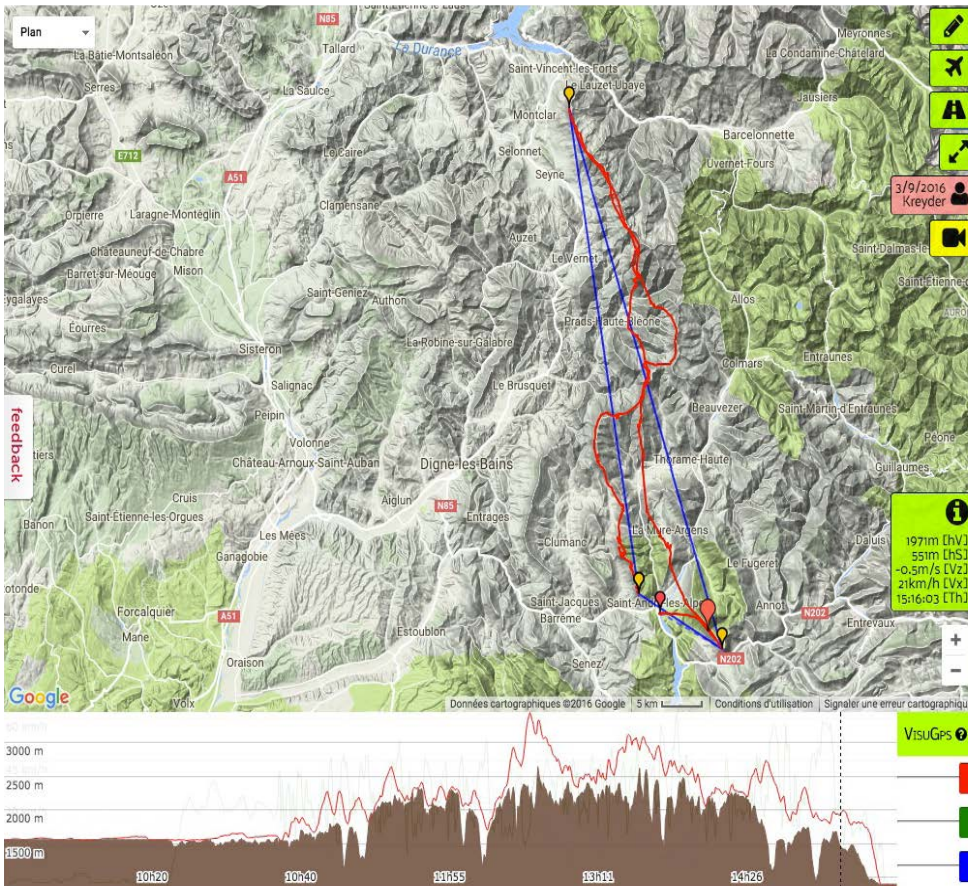
Even on this type of wing, the left/right risers are clearly marked. Also, as is the current fashion, the risers are shorter above the loop.



During one of our test flights, coming out of the 'Trauma' thermal: +7 m/s at 3 500 m...
Photo: Pascal Kreyder



Very visible differentiation between the risers: perhaps not essential for a high end EN B, but not totally unnecessary.



Flight on French Server 03.09.2016

Independence Geronimo 2 S (25m²), (load 90kg)

Launch : Chalvet Ouest

Landing : Saint-André-les-Alpes le lac - Total distance : 113.10 km

bd : Saint André les Alpes

b1 : Saint André les Alpes

b1-b2 : 48.79 km

b2 : Fort de Dormillouse

b2-b3 : 56.35 km

b3 : Pic de Chamatte

b3-b1 : 10.93 km

ba : Saint-André-les-Alpes

.Points : 135.72 pts, Flight time: 5h19m, avg. speed 21.3km/h

<http://parapente.ffvl.fr/cfd/liste/2016/vol/20200312>





GROUND HANDLING WINGS

Eleven years ago we tested the first wings which were designed purely for ground handling. Now a whole new generation is emerging...

In October 2016, we tested the Furia by Icaro. This wing which will be called the Kiwi in its final version is a completely new creation just for ground handling and hops. Here, it sits nicely all on its own in the wind.



Photos : Véronique Burkhardt

The forerunners during our test back in 2005: Ground handling wings.

Eleven years ago the manufacturers brought out wings which were just for playing on the ground. The advantages: not expensive (about 550€ at the time), these wings, between 12-15 m², taught us how to play in strong wind and handle a wing in these conditions. The disadvantages: they were a bit twitchy and, above all, we clearly couldn't fly with them! As a result, they were quickly replaced by mini wings for speed riding and speed flying, activities which were born at the same time. Then, came the 'real little paragliders' like the Nova Ibx in 2007, the 'do everything' wings, including flying in thermals.

Nevertheless, some of the pioneers are still on the market, as they are not expensive. On the right, the ITV Papoose (about 700€ today) is identical to the Independence Trainer (not in the photos).





The Kiwi in 2016 (prototype: Furia), is a real little paraglider, but only for on the ground and hops. The wing can be controlled easily with the rear risers ...

The wings which we were testing in these photos taken eleven years ago are still on the market and are still regularly sold, in particular, to paragliding and paramotoring schools.

Independence Trainer

<http://www.independence.aero/en/products/paragliders/trainer.html>

ITV Papoose

<http://www.itv-parapentes.com/fr/>

Surprisingly, in 2016, Icaro Paragliders got into the niche of 'ground handling only' wings. We tested the unfinished prototype, the 'Furia', which will become the 'Kiwi' in its final form. Development on behalf of Icaro Paragliders is apparently in the hands of Mad Mike Küng.



Photos : Véronique Burkhardt





Relatively easy: pass from the Cs to the As and vice versa.



The rear risers are padded to give a nicer grip. Great, but it would have been better to have continued this protection right to the top.



KIWI - TECHNICAL DATA

Manufacturer: Icaro Web : <http://icaro-paragliders.com/de/>
 Mail : icaro@icaro-paragliders.com

SIZE	15
CELLS	36
PROJECTED SURFACE AREA [m ²]	12.4
FLAT WINGSPAN [m]	8.74
PROJECTED WINGSPAN [m]	6.67
FLAT ASPECT RATIO	5.1
PROJECTED ASPECT RATIO	3.58
WEIGHT OF THE WING [kg]	3.35
MATERIAL	Dokdo 30

Little reverse hops: obviously easy...

OUR INITIAL OBSERVATIONS

Yes, it could be a niche market, if the price remains relatively low. As opposed to the mini wings of eleven years ago, the Furia is made like a real paraglider, including leading edge rods. The wing is a lot less twitchy than the minis of the time.

The inflation is better damped too. The Furia stays nicely above the pilot and behaves like a real little paraglider whilst being well damped, despite its small size.

This is, without a doubt, the biggest challenge: giving a small wing the behaviour of a 'large one' but, at the same time, making it suitable for use in strong wind.

When we did our first test of this prototype, the goal seemed to have been achieved. Moreover, some of the details have been very well thought out, such as the clear colour differentiation of the risers and the lines according to their group and the padded C risers which act as a real 'handle'.

We don't know the final price yet: this is what will sway interest in buying this 'real little paraglider,' only for use on the ground... 🙄



Real 'Baby-A' risers for doing 'real ears'.



TEST

APCO LIFT EZ

THE FAST AND EASY REFLEX WING

A completely new version of the Apco Lift is now available, christened the 'EZ', which stands for 'Easy'. The 2012 Lift was already very accessible and easy. The Lift EZ is completely different, offers better handling and has impressive speed for this type of wing.

*Test pilot: Sylvain Dupuis
Photos: Véronique Burkhardt*



According to Apco, the Lift EZ, which is a reflex wing for beginners, should be the easiest reflex wing in the world. The Lift EZ isn't a modified Lift but, instead, a complete remake and therefore an entirely new wing. Moreover this wing remains relatively simple: no ultra complicated risers (great for beginners), and no SharkNose either. However, on the prototypes, the manufacturer did tests with a SharkNose, but found that the results were better without! More about this later.

On the other hand, it does have other modern technology such as openings on the leading edge; this is Apco's Hit Valve system which allows the wing to be supplied with air and thus keep its internal pressure, even when the angle of attack is very low. The Lift EZ is made, as always with Apco wings, from siliconised fabric which comes from Gelvenor in South Africa. Its trademark silky look is very nice. The general impression is one of very good quality and details which have been manufactured with great care.

AT TAKE-OFF

Nil wind on a hot summer's day. Perfect conditions for testing the flying capacity of this beast! I get ready to do a forward launch without using the motor and with the trimmers at neutral: a pull on the front risers followed through with my body, and the Lift EZ comes up effortlessly. Without hesitation, sticking point, or any tendency to go to one side, it gives no problems at all, despite its 25 m² and the lack of wind! In this respect it's great, I remember these wings (whether reflex or not) which were very heavy to inflate seven or eight years ago, with pilots staying on the ground waiting for a light breeze... Those days are definitely over with a wing like the EZ!





IN FLIGHT

A bit of throttle and my 125cc does the rest, I'm flying. Running is easy and the take off is fast, without being too quick. The Lift remains a pretty fast reflex wing, we'll see. A little pull on the brakes (originally adjusted to be long) will clearly shorten the take off run. As for the rest, it climbs quickly! With my 70 kg, the 125 cc is too much, an 80 cc would more or less do the job. When cruising I let off the trimmers. The Lift accelerates cleanly which is really nice for a beginner wing where, in general, the trimmers are almost unnecessary. Here, the gain in speed is really considerable as it exceeds 49 km/h. But it can go a lot faster. The foot accelerator lets it attain 62 km/h, which is really amazing, especially for a wing which was principally designed for beginners.

The Lift EZ goes through turbulence without appearing to even notice it, thanks to the reflex profile! In addition, it was noticeable that the rear risers weren't

APCO LIFT EZ TECHNICAL DATA

Manufacturer: APCO Web : <http://www.apcoaviation.com/>
 Mail : apco@apcoaviation.com Tel: +972 4 6273727

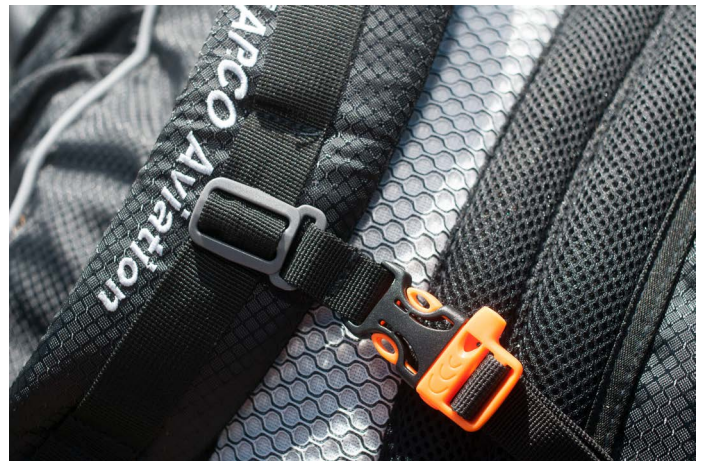
	2015	2015	2015
DATE	2015	2015	2015
SIZE	S	M	L
CELLS	42	44	46
FLAT SURFACE AREA [m²]	25,8	27,5	29,2
PROJECTED SURFACE AREA [m²]	22,3	23,5	25,1
FLAT WINGSPAN [m]	11,22	11,84	12,46
PROJECTED WINGSPAN [m]	9,15	9,65	10,17
FLAT ASPECT RATIO	4,9	5,1	5,32
PROJECTED ASPECT RATIO	3,8	4	4,2
ALL UP WEIGHT [kg]	70 - 100	85 - 120	110 - 140
ALL UP WEIGHT PPG [kg]	75 - 140	100 - 165	125 - 185
WEIGHT OF THE WING [kg]	5.5	5.85	6.1
CERTIFICATION	EN-926-1	EN-926-1	EN-926-1
MATERIAL	Sail Cloth : 42 g/m2 „Zero Porosity“ Ripstop Nylon - hybrid construction L/E Reinforcement : FLEXON® batten system		
LENGTH OF LINES [M]	301	321	346
PRICE [€]	3000	3000	3000



under a lot of tension at these speeds, proof that the profile really is 'auto stable' and is not just 'with a little bit of reflex'. The wing tip controls attached to little handles with magnets are very efficient and let the pilot do a quick change of direction without letting go of the bar.

Back down nearer to the ground to test the handling, with trimmers in neutral. Compared to the Lift back in 2012, which Sascha Burkhardt reproached at the time for not being very reactive, the Lift EZ is a lot more manoeuvrable.

We're a long way from the bus like wing, despite looking like a burger given its poor aspect ratio. By taking a wrap, the Lift EZ turns into a little bicycle.



There are lots of thoughtful details reflecting all the attention that Apco have put into its manufacture.

Video: Cédric Nieddu/Certika
<https://vimeo.com/182404102>





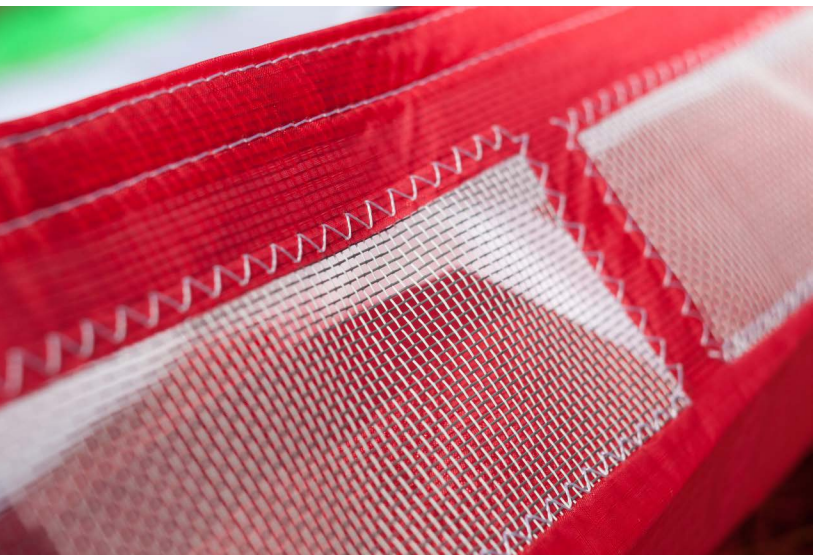
Metal pulleys, sturdy trimmers which are clearly marked, relatively easy risers and well thought out magnets on the controls. If you clip the brakes on the wrong way round, they will automatically turn themselves round to be correct - amazing!

A special feature with the secondary brakes on the stable: if you pull on them, a little pocket clearly forms increasing the drag at this point.





A very neat leading edge with efficient rods and valves for flying fast, to an impressive 62 km/h!



Of course it isn't a slalom wing but, for a beginner's paramotor wing, it's a good compromise and lets the pilot play easily. It's progressive and doesn't hold any nasty surprises.

It is also very precise and any object can become something to play round. You can arrive slowly above a ball, catch it with your feet and then a bit further on, drop it on a target. Or even touch the wind sock with your wing tip. Thanks to this wing the whole environment becomes a playground. A little bit higher and it's possible to tease a few wingovers out of the Lift EZ. By taking a wrap it goes into one easily. There is nothing particularly difficult but, like any real beginner's wing, it lets you know when you've made a mistake by collapsing if your timing is bad or you forget to brake a bit on the outside, for example. For landing, you just need to retrim, let it glide and flare as you learnt to do in school. The Lift EZ will stop and you'll land as if on egg shells.

CONCLUSION

A nice little wing! Flexible, fast and above all, safe! The Lift EZ gives confidence right from the very first flight. It's an excellent companion for doing scenic flights or for playing about using the natural terrain. The performance is very respectable for a beginner's wing; in fact it's even better than more advanced wings as far as speed is concerned. Being able to exceed 60 km/h clearly increases its potential! The Lift EZ is far from being ridiculous compared to other cross country wings, whilst offering a level of safety appropriate for a beginner type wing. Pilots starting their career on the Apco Lift EZ will, without a doubt, be able to keep it for quite a long time. ✈



ENGINE REVIEW

BIDALOT EOLE 135



A bit behind schedule, the Eole 135 from the French manufacturer Bidalot is finally available as a production model, initially with Kangook and Adventure. Here's our first impression...



Bidalot Technologies is a French motor manufacturer founded in 1988 by the engineer Jean Bidalot. Now successfully established in the two wheel market, they would like to offer, for their debut into the world of aeronautics, a reliable 135 cc engine, powerful enough to be placed in the 180 cc niche.

The first prototypes were very promising, but the thermal stability needed to be improved. 25 HP in a 135 cc engine requires good management of the cooling system.

Kangook and Adventure, the two manufactures which took part in the development, now have this engine in their catalogue. We tried the final version of the Eole 135 on a Kangook Trekk chassis.

The Bidalot isn't specially designed to be 'light', but a 25 HP engine weighing 14.5 kg (motor without chassis and with an electric starter) is fairly good.

The motor doesn't have a manual starter or a clutch. A belt reduction transfers the power to the specially made propeller, part of which has a large angle of attack to improve the cooling.

Often on two stroke motors, when you increase the throttle, there is a little 'gap' in the power in the middle, then it all comes at once.

Bidalot, of course, wanted to solve this problem and offer a very linear power curve instead.

To get to know the beast, we carried out our first test using a Kangook Trekk chassis with the second generation of the Trekk 'Fagot cage'. We'll give the full report in our next issue.





The membrane carburettor is, as always, difficult to adjust, but is requested (wrongly?!) by many clients. However that's another story...



The exhaust pipe: it took more than 15 prototypes to get the result they wanted.

To do this, the manufacturer, amongst other things, made the crankshaft heavier. They also worked a lot on the connection between the membrane carburettor and the exhaust system.

When we launched the test motor it started without hesitation every time. The idle is smooth, regular and sounds very nice. In fact, minimal noise is part of the specifications. There is little vibration and the heavier crankshaft no doubt contributes to this.

During our first tests with maximum throttle, we almost got the impression that it had 'enough power, but with none to spare.' The explanation for this misconception is that as the power increases evenly as the throttle is increased, you don't get the huge kick that you see on machines which are less linear. But when the throttle is suddenly released at full power, you can easily see to what extent it was pushing just before...

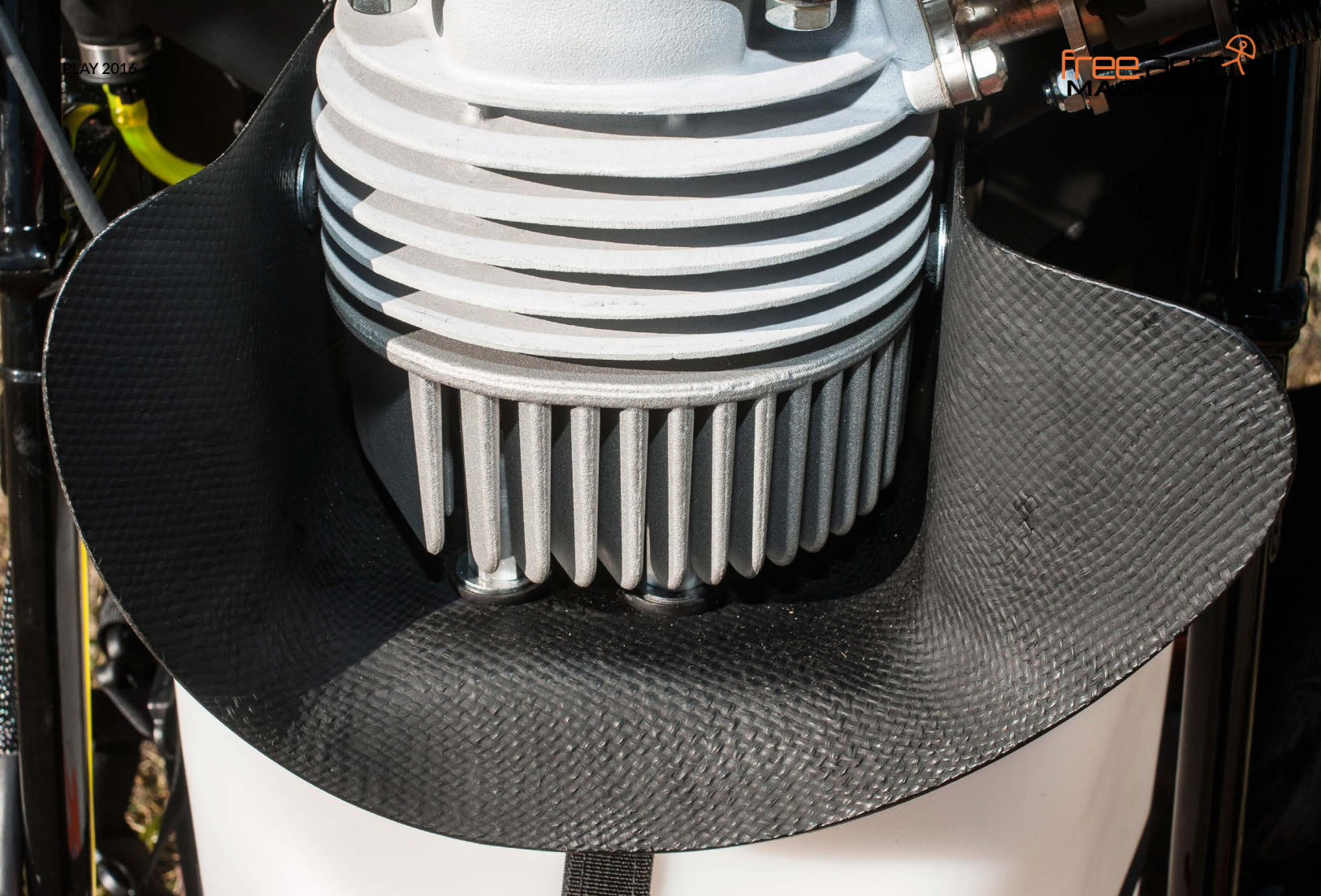
The linearity in the increase in power is therefore a great success. The pilot can

also see this when skimming the ground, where the motor has direct but gentle transmission from the throttle controls. We only had two little inconsequential 'hiccups' on half throttle, perhaps due to an air bubble.

At all revs the noise remained very nice, for the pilot, as well as for the spectators on the ground. Therefore this motor seems to keep all its promises.

Obviously the question of reliability comes up; that's the other major requirement for a motor. A Kangook dealer in Brittany observed a dozen Bidalot motors in use. On his own machine, he clocked up 70 flying hours, including a flight at the beginning of October where he got to 4670 metres above Morbihan (a department in Brittany). Other machines had flown 90 hours, all apparently without any problems. Very encouraging!

In addition, Kangook dealer Sébastien Pérez confirmed that, for him, the Eole 135 would be a good replacement for the Vittorazi Moster 185... ✈️

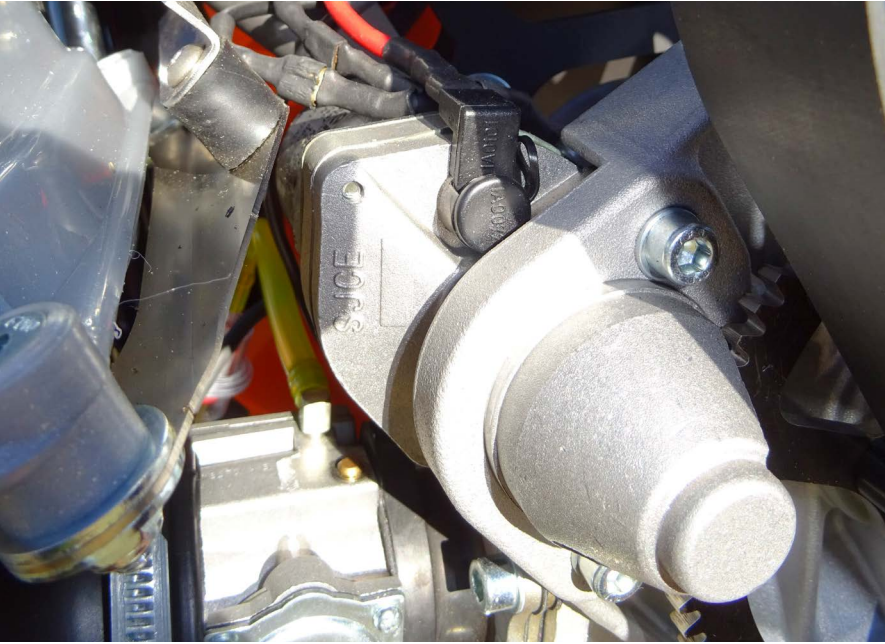


The asymmetric form of the 'hat' as well as the oblique orientation of the fins, have been calculated.

Bidalot design and assemble their engines in France, but make the components in Italy for example.







The electric starter is very reliable; it starts with a quarter turn. The pilot can therefore start the motor after inflating; this is an advantage for safety and compensates in large part for the absence of a clutch. On the other hand, the LiPo battery isn't recharged by the motor.



BIDALOT EOLE 135 TECHNICAL DATA

Manufacturer: Bidalot Technologies, Z.A. de Berroueta - F-64122 Urrugne
Mail : www.bidalot.fr

Model	2 stroke
Cooling	Air
Stoke and bore	54.5 x Ø56.0mm
Capacity	135.24 cc
Cylinder	Aluminium, 5 ports, Booster exhaust, with Nikasil coating
Piston	cast, high silicone aluminium in 2 segments
Compression ratio	10.5:1
Induction	By crankcase valve, with carbon leaves
Carburettor	Walbro WB37C
Air filter	Airbox with filter and sound insulation
Ignition/Alternator	Electronic/no
Fuel	Unleaded petrol 98 + 2% 100% synthetic oil
Reduction	POLY-V 3.15/1 BELT
Starter	Electric only
Propeller/rotation	125 cm (115 cm, 130 cm) anti clockwise
Mass of the complete motor	14.5kg
Maximum power	25HP @ 7300 rpm
Max revolutions/recommended cruising	8100 rpm / 6500 rpm
Maximum thrust	71kg
Price (bare motor with starter)	2 590 €

Adventure is one of two manufacturers to offer the Bidalot Eole 135 in their foot launch machines in the ranges X-Race and X-Race LT, with a 115 or 130 propeller.

Chief engineer at Adventure Paramotors, Emmanuel Layan, and his team have also contributed to the development of this machine.

The Eole 135 is placed in the same niche as the Tiger, but with more power for a similar weight
Tiger: 160 cc, 14.4 kg, 22 HP.
Bidalot Eole: 135 cc, 14.4 kg, 25 HP.

Photo : Adventure
www.paramoteur.com



EOLE

by **BIDALOT**

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