



# INSTRUMENTS & COLLABORATIVE INTELLIGENCE







A gaggle of wings give form to the thermal during the Paragliding World Cup in Brazil in mid April.

To fly a paraglider safely, you don't need to have an instrument. This is rare in the world of aviation! Nonetheless, modern varios are becoming more and more efficient in helping us to increase distances and the time we spend in the air. In this issue, amongst other things, we'll take a close look at some instrument innovations...

Translation by Ruth Jessop

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# INTRODUCING THE EONA 2 EN-A

WWW.SUPAIR.COM



<sup>2</sup>hoto:Luc Otrement/Niviuk

# FIRST TEST NIVIUK ARTIK 5

The Artik 5 is now available. Philippe Lami has flown it a few times and gives us his first impressions...

🂓 @freeaero 🎾

t has the maximum amount of high technology! The Artik 5 behaves like a gem! The Catalan manufacturer has used every trick to improve performance and the full-on glide. Every detail shows a clear drive for excellence and I really think that it will be difficult to do better as far as the quality of assembly, finish and research into the details are concerned.

As standard, it has nitinol rods in the SharkNose, little rods on the Cs, three and a half lines (small line of Ds), tight cells, mini-ribs and 3D shaping, of course. The velcro at the wing tip is no more, in its place, a simple slit which lets the air escape. As far as the accessories are concerned, we note that the magnetic fastener has been replaced by an 'old style' fastener. The aspect ratio hasn't changed. It's still 6.1 flat with 66 cells.

#### THE ARTIK 5 ACCORDING TO NIVIUK

Best performance and maximum 'accessibility'. With the Artik 5, Niviuk say they have reinvented the class, 'XC wing - grand tourism'. According to the manufacturer, its handling and intuition make the Artik 5 the most accessible wing in its category, whilst pushing the flying experience to the highest level of performance for an EN C.

NEW instagram.com/free.aero

Photo: Philippe Lami



Fast little flights, before a full test. The inflation is easy, and it comes up with no tendency to overfly. The load take up is immediate and, when flying, you feel straightaway that the wing is very solid, monolithic and really taut. The controls are frank, a bit physical, with obvious authority, given the immediate reaction to travel.

The glide ratio is, at first sight, excellent, and I found the same cohesion as on the Peak 4, which I know well.

Very favourable conditions, obvious thermals then a big convergence which pulled a bit everywhere. The Artik 5, used with hands up, then well accelerated, has the behaviour of a competition wing: it has an obvious bite, whilst being very comfortable in pitch. It pulls forwards continuously, without asking for a lot of effort from the pilot...

During these first flights, I go everywhere, with ease, speed and comfort. I take a thrashing when landing, but the wing doesn't even flinch a wing tip... We'll do a more comprehensive test later, of course. But the initial impression is already very positive, with this feeling of a very fast wing, identifiable and comfortable at the same time.

To be confirmed during future XCs...  $\mathcal{P}$ 

ARTIK 5 TECHNICAL DATA					
MANUFACTURER: NIVIUK					
www.niviuk.com/product.asp?i=eng&id=∏=JNNNMSF0&news=					
DATE	2018	2018	2018	2018	
SIZE	22	24	26	28	
CELLS	31	31	31	31	
FLAT SURFACE AREA [m <sup>2</sup> ]	22.2	24	26.3	28.8	
FLAT WINGSPAN [m <sup>2</sup> ]	11.83	12.30	12.87	13.47	
FLAT ASPECT RATIO	6.1	6.1	6.1	6.1	
ALL UP WEIGHT [kg]	60-80	75-95	90-110	105-125	
WEIGHT OF THE WING [kg]	4.3	4.7	5	5.3	
WEIGHT OF THE WING [kg] EXTRA LIGHT	4.05	4.45	4.75	5.05	
CERTIFICATION	С	C	С	С	



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## NEWS SUPAIR EONA 2

he Eona 2 is the new school wing by Supair. Certified EN A, it is available in 3 colours (Fluor, Volcano and Grass). Thanks to its 5 sizes (XS, S, M, M/L, L), it covers an all up weight range which is 'larger and more coherent'. Compared to the previous version, this new wing offers better, more progressive and regular inflation and a simplified internal structure and lines which are less cluttered making it easier to set up and giving it better performance.

Also worth noting, the weight has been reduced by 300 g and it is also safer thanks to the large brake travel and the risers being thinner and easier to manipulat

http://www.supair.com/en/produit/eona2/



The EN A Pioneer 3 by Independence

# NEWS INDEPENDENCE PIONEER 3 SKYMAN ROCK2

he Pioneer, a high performance EN A wing for beginners up to fun XC flights, has come out in version 3. In comparison to the previous model, the passive safety, the behaviour at take off and the glide ratio have been improved. For more information:

www.independence.aero/en/products/paragliders/pioneer3-LTF-EN\_A.html

The main characteristics of the EN A lightweight Rock 2 from Skyman are its perfect behaviour at take off and its dynamic manoeuvrability. It's speed and effectiveness are totally adapted to the needs of 'hike and fly', for more sporty flights, for travellers or for vol biv. Despite its low weight, its performance has increased in comparison to the previous model. It is made from the exclusive Skyman D10 fabric, which is very light and robust.

For more information: www.skyman.aero/en/paragliders/The-Rock-2\_LTF-EN-A.html The EN A Rock 2 by Skyman







### NEWS

# HIGHADVENTURE BEAMER 3 RESERVE

he acro pilot Françoids Ragolski always flies with a Beamer 3 reserve. We have already reviewed this steerable parachute several times. Francois has thrown it for real 11 times. Some deployments filmed using a GoPro have been put together in a short YouTube video.

François confirmed that none of these sequences were provoked voluntarily, so they are therefore serious incidents, but having a lot of height clearly allowed this acro pro to keep smiling (or almost) the whole time.

www.highadventure.ch/en/beamer-3-en.html





Light 2016 - FreeAero



### NEWS PARATROC TUBE BAG + COMPRESS BAG

aratroc have launched a new product: a tube/compress bag which is light but very solid, with UV protection (silver inside). Here are some technical details from the manufacturer:

- Riser pockets
- Double zips
- Ventilation mesh
- Pouch for storing the concertina bag
- Length 2.7 m
- Weight: 250 g + 10 g for the mini-bag.
- Quality buckles and reinforcements under the stitching

http://www.paratroc.com/en/tube-bags/13328-paratroctube-bag-compress-bag-250gr.html









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Discover the most Amazing Adventures on our Facebook and Instagram:



**EN/LTF C** 

facebook.com/Niviuk



instagram.com/Niviukparagliders



# NEWS

#### **PROJET UNGRAVITY VARIO**

A Russian pilot and engineer has started a project to manufacture a new solar powered mini instrument. Advertised as weighing only 21 grammes, it will record tracklogs in IGC format and will be able to be interfaced with a tablet via Bluetooth 4.1.

The advertised differences compared to existing instruments are: it will be water resistant (IP 68, 30 minutes at 2 m), and an acoustic accelerometer will be able to convert G values into sound for acro pilots.

Nicolay Malkov needs 150 clients to start production of this vario which could cost  $190 \in$ .

For more information:https://ungravity.store/ 🎗









# DOLOMITI SUPERFLY 2018

he first edition of the Dolomiti SuperFly took place last year. It was the first international hike and fly event to take place in Italy and was along the lines of the Red Bull X-Alps. The Dolomiti SuperFly 2018 will be a unique event, as this year marks the centenary of the end of the First World War, a conflict, during which, the Dolomites unfortunately played a front line role. The front line of this devastating trench war was here and you can still find traces of the conflict in these mountains.

The competition will follow a route linking the most memorable sites of the war, bringing together people from different countries to fly together in a spirit of peace. The pilots have to pass turn points on foot placed in significant historical and flying locations. The 250 km route will be more difficult than in the first edition. Q

https://www.dolomitisuperfly.com/



### FLOW ALIGNED RIBS FAR more than ever before





APCO J

STANDARD WING AIRFLOW CROSSES BETWEEN RIBS FAR wing RIBS ARE ALIGNED WITH THE AIRFLOW



RIBS ARE ALIGNED WITH THE P





EFFECTIVE PROFILE OF STANDARDWING EFFECTIVE PROFILE ON A FARWING



WWW.APCOAVIATION.COM Setting Future Standards since 1974 Flow Aligned Ribs (FAR\*) is a conceptual change in the way paragliders have been designed until today (Apco and the rest of the industry).

Traditionally, due to a paragliders curvature / anhedral, ribs progressively become less and less aligned to the angle of airflow on the wing as you move closer to the wingtip.

The FAR concept is, to gradually change the angle of the ribs so that they are aligned with the flow across the span of the wing. On wings designed using FAR, the ribs are positioned as normal on the centre of the wing, and gradually change direction towards the tips of the wing.

With the FAR rib layout, air flows over the wing without crossing ribs, and the flow "sees" the designed profile and not a distorted shape as it used to be until today.

Wings designed using FAR, result in the cleanest most efficient airflow over the glider, reducing drag, minimising turbulent airflow and therefore increasing lift / performance.

We believe that this concept will be embraced by the entire paragliding industry and that in a few years all wings will be designed in this way, as it is the correct way!

This concept will gradually be implemented into our entire range of wings!

The Flow Aligned Ribs is another example of Apco Aviation Setting Future Standards.



### NEWS

## NEO CONTAINER LITE

\*Patent Pending

he Container Lite, ultra-light version is available in 4 sizes: S, M, L and Tube. It comes as standard with the StayUp harness. This container is designed from ripstop dyneema fabric and is very strong and ultra-light, according to the manufacturer. Developed exclusively by NEO, this fabric is the answer for paraglider pilots who want to fly light!

http://www.flyneo.com/en/container-lite/



# ADD A LITTLE MORE COLOR TO YOUR SKIES

A pioneer in light weight flight instruments, **ascent** has been providing wrist and riser mounted varios since 2008. Now in five exciting new colors!

- Only 83 g with riser strap
  (98 g with wrist strap)
- Only 8.3 cm x 5.4 cm x 1.5 cm (Yes, it's that small...)
- Free software updates for life.

The **ascent h2** gives you everything you need and want in a compact, affordable and lightweight package.

reach for the sky



# ADVANCE DAYPACK 3

he Daypack 3 by Advance is now available in the same colour combinations as the paraglider bag, the Comfortpack 3, from the Swiss manufacturer. The ergonomic straps and the back partially in mesh assure maximum comfort during transportation. The new colour, pacific blue/fusion yellow completes the current combination of colours, anthracite/fired red and pacific blue/spectra green.

https://www.advance.ch









# Windstiders fr Mountain&Flight

### **Ethic and awesome**

Reversible Jackets, Lady, Hybrid, Thermik Light, Yéti, Nosleeve, Everest.

# NEWS KRUSHEVO OZONE OPEN 2018

l Power 700 cuin

he 1st Ozone Krushevo Open will take place from July 22-28, 2018. This competition is designed in the spirit and model of the Legendary Ozone Chabre Open, a stress-free paragliding cross-country competition with an emphasis on fun and learning through in-depth XC coaching and setting achievable tasks.

- Paragliding

Down Jackets

ight Muffles

This event, like the Chabre, is aimed primarily at pilots with some XC experience, who want to get more into competition or further hone their XC skills. Daily briefings and debriefings by Jocky Sanderson set the stage for a week of intense learning in a perfect location for fun XC flying.

Classes include Fun, Recreation, and Sport, which are governed by your wing's aspect ratio. There is also a Rookie, and Women's class.

The Krushevo region has a long history of successful competition tasks. Late July is ideal for XC flying weather, and the history of the location suggests that many kilometers will be flown – join us!

Registration is open now at: krusevoadventure.com





### NEWS

# AIRTOUR 2018 COMPETITION OR ADVENTURE?

he St Hil Airtour will take place this year from the 9th to the 17th of June. It's an endurance race which combines paragliding and hiking. The pilots and their supporters cover a course of more than 300 km which covers four departments: Isère, Savoie, Drôme, and Haute Alpes. New route: three circuits of increasing difficulty.





#### NEW CONCEPT

The Airtour in adventure mode: only your position is shown on the live map.

The Airtour in competition mode: the rules are the same as in previous Airtours. You have to complete the circuits in the following order: green, then blue, and to finish, the red.  $\searrow$ 







## NEWS EXOMO INTEGRAL

he Integral model with electric motor is available on the Macfly chassis (above) and on the Impuls chassis (opposite). The prices for EXOMO Integral paramotors, complete with chassis and harness, start at 11 900 €.

For more information: http://aeronature.com/electric-paramotor-set-exomo/





### SEVEN VIRGIN SUMMITS **ANTARCTICA**

At the end of last year Juraj "Ďurifuk" Koreň and Michal Sabovík started the first part of a unique seven-part project - seven unclimbed summits on seven continents, which they wanted to climb and fly down from on a paraglider. Linking together earth and air, and a third one, water, by using a sailboat, kayak or raft.

> A virgin mountain called Wild Spur 1057 metres, climbed 11.1.2018 in 7 hours by Juraj Koreň. and Michal Sabovčík, descent by paraglider in 7 minutes!

Michal Sabovčík Juraj Koreň rvovýstup: "Ží ot je Life" lad a sneh do 90 stupu od hladiny mora: Fh



Mountaineers, in a similar fashion to paraglider pilots, discover places, logical lines, where not everyone can go, especially if the summit is a long way from the base camp. Glacier cracks, seracs, tricky avalanche slopes, areas of scree and tiredness - those are the worst and very often the most difficult parts of every expedition. Therefore, we, paraglider pilots are often looked at with envy enhanced by the feeling of sore knees. Fly down from the summit and soar silently and effortlessly back to base camp, car or freshly prepared dinner that's many a mountaineers dream. Many would love to climb with a backpack just 2kg heavier. Pioneers of this sport like Igor Pap, Ueli Steck or Jarýk Stejskal and a few others inspired us to make this combination possible. A combination of flying and climbing which requires a lot of experience in

both sports. Therefore, I, Juraj Koreň, a paraglider pilot with little knowledge of climbing, approached novice paraglider pilot and experienced mountaineer, Michal Sabovík: "Teach me to climb and I will teach you to fly..." And during two seasons of joint climb&fly training in the Tatras and the Alps, an idea was born and matured in our minds – to make the project, Seven Virgin Summits, come true.

ANTARCTICA WAS THE FIRST ONE AND HERE'S OUR STORY... Antarctica was the first one we had the chance to do. Our base camp was in the form of a 17-m long sailboat, the Altego 2, under the command of Jiří Denk. We sailed out from Ushuaia in late December through the Beagle Channel, heading to Cape Horn and then on further through the Drake Passage towards the Antarctic Peninsula.



After six days of sailing through the Draeke Passage, Antarctica is finally on the horizon!



We chose an easy mountain for our first flight and walked in with our skis.

It was the most difficult and the most complicated access to a face I, and even Mišo, have ever experienced. I spent six days being seasick and delirious lying down in the lower deck. At the end of the voyage, we finally saw thousand metre high faces rising directly out of the icy cold water. Clean, high and proud, beautifully untouched. Antarctica. During a short stay at the Chilean Gonzales Videla Base on continental Antarctica, we met our first penguin rookery, amazing and cute animals, which, however, smell so much of fish. Fish leftovers cover this whole part of Antarctica, where I take my first steps as we anchor the boat. Mission complete, I return to the boat dirty from the penguin sh\*t.

#### YES, IT'S POSSIBLE TO FLY HERE!

The weather is fantastic and so, as soon as possible, we climb the nearest summit, which is about 600 m high. Using our skis and crampons we reach the summit in less than three hours. The wind is perfect on the summit, and down there, far below our feet, light fog is spreading romantically out across the sea. We see fantastic scenes of sea bays surrounded by virgin mountains with steep faces. Looking at them, our hearts beat with desire. And we fly straight into this beautiful landscape and enjoy our first flight in Antarctica. It's a very emotional experience indeed, enhanced by the wild terrain passing under our feet. Yes, it's possible; we're flying, flying in Antarctica! The last doubts vanish and we can start looking for our virgin.



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#### **DISCOVER THE MOST VERSATILE**

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First mountain for flying we choose easy one, by walking terrain and use skitour.

Sailing to the next place where we could anchor in Port Lockroy on the Wiencke Island took us the whole day. As we sailed we kept our eyes peeled, looking for possible ascend lines, take offs and landing spots on the glaciers at the foot of two approx. 1,000 m high mountain ridges on the Wall Range stretching along the whole island. In the morning, grabbing our skis, we set out to reach the base of the face with our big backpacks with paragliders, climbing equipment, tent, sleeping bags, food and cameras, each weighing maybe 15 kilograms. We reach the foot of the face around noon, put our tent up and take off our skis. We start to climb, but are forced to return after two hours. The sun has turned the snow into an unusable mash, avalanches are tumbling down, one after another. It won't work like this.

#### TAKING OFF INTO THE ANTARCTIC SKY

We march towards another mountain on the next ridge, another 10 km, build the camp again and manage to get a few hours of sleep. January in Antarctica is awesome, there's no difference between the days and the nights, so it's not strange at all that we set out at 2 am. No head torches are needed, daylight 24/7. We climb an approximately 850 m high mountain, and despite the fact that there were low clouds under the mountain's summit the whole time, around noon we're lucky enough and take off from the summit into the Antarctic sky. The fly down takes a few minutes and I can still feel the happiness. Did we manage it? The joyous feelings are blunted by certain bitterness, as during the ascent into the saddle we found fixed ropes and pitons, so there was clearly the possibility that somebody else had reached our summit before us. Moreover, 850 m was not enough for us. We wanted a four digit number.

We returned to the boat, and anchored in a real Antarctic storm, experiencing the katabatic wind, with a speed of 57 knots, we spent a dramatic night after which we left the Island of Wiencke. We sailed through the bays of the Antarctic Peninsula and discovered a beautiful mountain with a superb climbing line, and moreover, it was on continental Antarctica, around 1,000 m high. Ideal, beautiful, amazing. We tried to find it on our maps, its data, name, and altitude, finding out as much about it as possible. We couldn't find much though, on our maps it's the highest peak in the Wild Spur ridge on the continental part of the Antarctic Peninsula.





Playing with the wind on an AirDesign Susi 3.

We don't even know its altitude, we just see its beautiful symmetric shape and Mišo is admiring its clear, logical and challenging climbing line. I'm busy studying the flight conditions for the take off, flight, wind and landing. Using binoculars, the captain is looking for landing possibilities – 3 km to the right of the mountain, where the glacier face meets the sea, seems to be a good place.

#### TRIAL NO.2

Having learnt from our previous experiences, we get up at 2 am, with the captain starting the motorboat and setting out through the bay, surprised by its real width. We sailed for maybe an hour. Approaching the face over the glacier takes another hour. As we climb the sun rises and creates low cumulus clouds in the blue Antarctic sky. Our hearts jump for joy at the sight of these clouds! Unfortunately the wind chases the clouds the other way! We probably won't manage to take off, but, anyway we climb. Our line is a direct icy couloir, which is in some places as steep as a vertical face ending with a snowy overhang.

The rocky parts are completely weathered, broken, with no possibility of quality belaying in the rock. We manage to climb the face and after a short ridge passage we stand on the summit, the GPS says 1,057 m AMSL, we have climbed for 7 hours. Happiness, smiles. Only one thing is left – to take off.

Sailing back through the Draeke Passage we 'enjoy' 55 knot winds.





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In our edition about Instruments, reread articles about collaborative flying or the traps when flying over water

#### CLIMBING

In our edition about Sharing, reread articles about sharing flights and our test of the Niviuk Takoo 4.



In our edition about Light&Bivouac, reread our article about softlinks and single skins.



In our edition about Competitions, reread our article about the new racing machines and our test of The Skywalk Poison X-Alps



SHARING

In our edition about Playing with Wings, reread our article about the ndependence Geronimo 2 and playing at ground level.



In our edition about Safety, reread our article about reserves and collisions.





Sea, Icebergs, rocks, snow...unusual terrain for flying, but yes, Antarctica!

My advice is to descend 100 m and try to take off into the wind, then turn towards the saddle which involves flying into the lee. That will be a tough nut to crack, but our paragliders are made for such extreme situations. Just to be sure, I communicate via the radio with our floating base camp and ask for information on the wind direction. With the reply "the wind direction is the same as the direction of the boat" we just smiled because, we could barely see the boat from such a distance. So we must rely just on ourselves. I hold my breath while Mišo takes off, I'm worried about him flying in the lee, will he manage it? Because if something happens, no one will save us here. This is not like in the Tatras, where you can land anywhere and in a few hours you are back in civilisation. Here in Antarctica, there's only one possible place to land safely. There's no one to find you, no way to return on your own, and if you happen to fly a hundred metres further, into the sea, you're dead in a few minutes.

Mišo disappears behind the edge in the lee. I take off a few minutes later, I am a bit scared as to whether he's managed it as I can't reach him on the radio. After passing the edge, I see the paraglider spread out on the snow and Mišo lying there, not moving at all. Damn it! I hope that the paraglider hasn't collapsed, and he hasn't fallen, we don't have any reserves, or back protectors. I'm shouting into the radio and he replies that he's just enjoying the descend orgasm and that he's seen an avalanche falling in the adjacent couloir.



#### ANTARCTIC VIRGIN CONQUERED

I'm really enjoying flying along the face we've just climbed, only a few metres away from it, doing wingovers and turns. What an amazing feeling. We've done it! The Antarctic virgin is conquered and I'm flying down along those fantastic, wildly shaped rock pillars, massive ice seracs, in places where no man has ever climbed or flown before. The feeling of being a pioneer, discoverer enhanced by the adrenaline, and endorphins during the climb and flight.

Landing is followed by celebrations, smiles, handshakes and the enthusiastic planning of further challenges in our project Seven Virgin Summits. Half an hour later it starts to rain and snow, we managed it just in time. It seems that those who are prepared and brave, are lucky.

We go to the beach, calling the sailboat to pick us up. The captain welcomes us with the words: "Guys, I've sailed the world, people say I'm insane, but I don't dare to think what you are ..." We were separated from the safety of the port at "the end of the world" - Ushuaia (Vino tinto, Argentinian Chorizo) by the Drake Passage, whose huge waves, strong wind and sea currents has sunk dozens of ships. So, we had to wait for the forecast to improve, hidden behind Melchior Island. We passed the time by doing short trips to see the penguins and seals. We were trying to get out of the boat onto the floating ice floes to pay a visit to the Argentinian base with very kind and hospitable crew, when the captain commands "Sailing out". We unfasten the ropes and raise the anchor. Orcas are surfacing in the bay to say goodbye ...

A 550 nautical mile-long sail across the Drake lies ahead of us, and the Drake didn't give it to us for free. With winds of 30 to 50 knots, and waves around 7 on the Beaufort scale, we push forwards at a speed of around 10 knots towards Cape Horn and then on to the Beagle Channel. Ultralight equipment was an important part of our success.





#### NEW MATERIALS OPEN NEW POSSIBILITIES

Progress in material design opens new possibilities in all sports. New, ultra-light textiles enable the creation of paragliding gear lighter than 2 kilograms. It's absolutely fantastic and gives us the possibility to try ultimate adventures, where the volume and weight of the gear are the crucial factor for success. Such adventures include solo bivouac adventures in the Himalayas, hike and fly contests like X-Pyr or climb and fly challenges, like ours.

Thanks to ultralight material, excellent design work

and cooperation with top paraglider pilots, all the gear and equipment can be packed into a normal climbing backpack along with ropes, crampons, belay devices and ice axes. Of course, climbing with a bigger and heavier backpack is a bit more difficult, but the vision of a fast and safe descent is worth it. In an emergency you can use the paraglider for bivouacking, so we don't have to carry sleeping bags, weighing approximately the same.

A huge thank you goes to all the sponsors, families, supporters and everyone who supported us and believed that we could do it.

#### **MIŠO AND DURO**

"Deep in the heart of each and every climber there's an inseparable companion to all fights – passion. It has various names – emotion, pleasure of conquering... it's a funny feeling, which is worth suffering for and giving up a lot. Those, who have felt it, know what I'm talking about."

Avalanches were our constant companions in Antarctica.







OZONE's Instagram feed is full of great stories from team pilots and stunning images from their adventures. Follow along and get a daily dose of flying inspiration! **INSTAGRAM.COM/OZONEPARAGLIDERS** 



RUSHE

The Rush 5 is a top of class Sport-Performance-Intermediate wing developed with Enzo 3 and Zeno technology. Next-gen 3D shaping, a refined OZONE SharkNose, a new low-drag line plan, and an enhanced internal structure have taken the speed, glide, and solidity to a level not seen before in this class.

### WWW.FLYOZONE.COM



For the pilot high up, far from the relief, it's difficult to determine the climb/sink rate without a vario. Photo Michael Nesler/Profly

## FLYING WITH AND WITHOUT COLLABORATIVE HITECH INSTRUMENTS

Fly by feeling, by sound, with a screen, collaboratively or in a network. Paragliders are one of the few aircrafts where all of these are possible...

aragliders are one of the few aircrafts where no instruments are necessary. You don't even need an airspeed indicator, virtually essential for every multi axis machine. Because as long as the pilot isn't sitting on his hands, you don't normally fly slowly enough to stall. In a plane, on the other hand, that can happen very fast. In a paraglider you can't fly too fast and break the equipment. Our pendular stability prevents us from exceeding a certain angle of attack and diving. This unique feature of our wings gives us unexpected freedom which makes us the envy of aeroplane pilots.



#### ION 5 – Evolution of a Legend EN/LTF B paraglider: the Adventure Intermediate

Do you want to fly far in a relaxed way? The ION 5 is the wing for you. Like its predecessors, it is safe, comfortable and uncomplicated. But it will convince you with even better performance and more precise handling. Basically, a real ION.

Three-liner – 51 cells – aspect ratio 5.16 semi-light construction (4.65 kg, size S)

www.nova.eu/ion-5



#### IN THERMALS

Near the terrain, when soaring, there is no need for a vario to go up: the visual references combined with the air movement are enough for a pilot with average experience to see where it's going up best. Great! You can really fly freely like the birds, just using the feeling through your harness, hands and nose.

Far from the relief it's different: as for the amount of acceleration you can feel, the change from -3 m/s to -1 m/s is theoretically the same as the change from 0 m/s to +2 m/s.

Some very experienced pilots claim to remain effective without a vario, even very high and far from the relief. The air doesn't move in the same way when you go into a thermal or when you come out of one. In particular, top level wings with a very large wingspan, 'talk to us about the air,' thanks to the way they move.

Competition pilot, Maxime Bellemin, told us about a flight which taught him a lot: having bought an integrated helmet, he couldn't hear his vario very well during the first flight that he did with it and rediscovered 'flying by feeling.' Since then, the day before a competition he often flys without a vario so that he can 'readjust the sensors in his body.' In a competition, he nonetheless gives himself the best possible chance and uses his Naviter Oudie 4, not just for navigating between the turn points, but also to show the thermals.

#### NEW GENERATION VARIOS.

For quite a few years, a new generation of varios have been becoming increasingly popular. They have integrated sensors, such as an accelerometer, to detect thermals. Here we explain the principle.

A real AHRS system requires a gyrometre, accelerometer and magnetometer and to detect thermals even earlier, the manufacturer of the XCTracer claims to have also integrated values like the bearing from the GPS in their algorithm. (Not the absolute climb rate measured by the GPS which would obviously be way too inaccurate).

Other manufacturers say that they have done a lot of trials along these lines before giving up, as they weren't effective enough. Syride even removed the Gyroscope from their instruments and have, for a long time, offered an 'Instant Vario' function, based only on the barometer and accelerometer, which is amply sufficient according to numerous pilots. Then Syride reintroduced the Gyro in the Sys Evolution. This was a commercial necessity, because more and more pilots wanted the functions of a little 'inertial unit' on their instrument?

It's clear that locking into weak thermals seems a lot easier with an instrument like the XCTracer which beeps as soon as you lift it up a few millimetres. This has also been confirmed by numerous top level pilots. But what if it's only a placebo effect giving us wings?



Our explanatation: how does a vario work using AHRS algorithms?

The XCTracer uses all sensors (magnetometer, gyrometer, accelerometer, barometer) for the vario function.



The Skydrop 'only' uses the gyrometer, accelerometer and barometer for the vario.





The algorithm will certainly have to be very exact and demand a lot of skill from the person using the vario. It has taken a long time to develop: we noticed that the first XCTracers sometimes gave false positives when turning in zeros. This problem seems to have now been solved.

#### **OTHER SENSORS**

For a long time, manufacturers like Flymaster have been working on another sensor which could theoretically improve detection: the thermometer. A bubble of hot air should be found by temperature too. Flymaster did this with their TAS probe, but the 'Thermal Sniffer' function is now on standby, as it isn't effective enough. But perhaps one day...

On the other hand, with a thermal imaging camera, you can see which parts of the landscape are hot. Armin Harich from Skywalk tested it in the Namibian desert, he was able to identify the hottest zones fairly well and use them successfully. In the more northerly latitudes on the other hand, the humidity and the irregularity of the countryside prevents this method from functioning, he told us.



Trials by the German pilot Harich in the Namibian desert with a thermal imaging camera module clipped to his iPhone.



#### THERMAL FINDERS

The first thermal finder was on the Top Navigator by Aircotec, twenty years ago, from 1997 onwards, well before the others. On its screen, thanks to the GPS, it plotted a point to indicate every thermal encountered. Thus, it made a 'geographic map of the thermals.' It was revolutionary. Today the principal has spread and become more sophisticated amongst most manufacturers. One variation is an arrow pointing in the direction of the last thermal, sometimes combined with a curve of vario or altimeter readings from the last two minutes of flight.

But rather than knowing 'where I got lift two minutes ago,' it is perhaps more efficient to know 'where there is generally lift in this sort of terrain.' For this, thermal databases (see following page) are useful and can be integrated into instruments. The main problem, reducing this information to be streamlined enough for a small gpsvario screen, is very difficult. No manufacturer offers it 'ready-made', but numerous pilots download the house thermals as 'waypoints' onto their instruments.

#### OTHER FLYING BEINGS

Other thermal indicators: birds and other pilots. Birds are often misleading and seem to enjoy leading us astray. Other human pilots, however, are very useful. Some tasks have become boring because everyone remains in the safety of the gaggle with one hundred visual markers in it. In the Paragliding World Cup, the organisers have even had to tweak the rules and the routes to reward pilots for being brave and encourage them to leave the gaggle.

As the pilots use each other as mutual references, this can be described as collective intelligence. A group of individuals will fly much further thanks to information from the others.

The vario manufacturer, Skytraxx are developing this idea and have put in place, with undeniable success, an electronic communication system which takes the idea of the gaggle a step further, and over a wider area. We'll explain the principle over the next few pages...



Three thermal assistants: the Polygone (in mauve) in the XCSoar app for Android, above right, the 'little ball' from Flymaster (under the arrow) and, below, the thermal assistant on the older Skytraxx 2.



The Skytraxx 3.0 thermal finder: the instrument calculates, amongst other things, the probable position of the core of the thermal and indicates it with a circle. The clear blue line is the probable trajectory if the pilot continues at the same angle. It must stay in the circle.

> The Naviter Oudie 4 thermal finder offers, amongst other things, coloration of the track as a function of the climb rate.







Two pilots on their own watching each other flying: it's the minimum basis of collaborative flying. Photo: Michael Nesler/Profly

**Thermal database** Sites relating where there are thermals work according to several methods: the simplest analyses flights and shows all the places where there is lift. Collective flying after all! In the beginning, the KK7 model worked like that, but it now tries to find, from the tracks, the origin of the thermals on the ground. This helps pilots to anticipate them depending on the wind. Finally, Thermap calculates the possible sources of thermals as a function of the relief. According to the pilots using these maps, they work well, but of course, they aren't essential to enjoy your flight.



http://www.kk7.ch uses the flights declared on the server (above) to calculate the possible thermals (below). Now, taking into account possible drift, they even try to plot the thermals back to their origin on the ground.





Bernd Gassner from Thermix took the KK7 values (above), but in addition, he added his own 'Thermap' model, calculating the possible thermal sources, on the relief (below). https://berndgassner.de/thermix/



facebook.com/freeaero



A gaggle in the Paragliding World Cup in Brazil. Nearly 100 thermal markers in real time. Photo: Goran Dimiskovski/PWCA



Ist 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



### air Cross

WITH EN B GLIDER







A Skytraxx 3.0 equipped with a FANET/FLARM antenna to enable it to communicate with other FANET instruments and with stations on the ground, as well as aircraft equipped with FLARM.

# SKYTRAXX FANET

For several months Skytraxx has integrated, as an option, a FANET receiver/transmitter in their instruments. The first trials show that the 'collaborative flying' function is very effective.

he idea of a 'peer to peer' network, allowing aircraft to communicate amongst themselves, isn't new, they already do this by vocal communication over the radio. For several years, the FLARM system has spread and now all sailplanes are equipped with it. They are boxes in sailplanes which mutually send, on a radio frequency, data such as their position, bearing and current speed. Each FLARM equipped plane automatically knows if there is somebody nearby, and if there is a risk of collision. This is the main reason for FLARM: it's an anticollision system, with an automatic calculation of the risk, thanks to data known about the others.

FLARM is also used to track aircraft thus equipped. Stations on the ground, in particular the association 'Open Glider Network', receive the FLARM positions and make them available over the internet. But those participating in FLARM can't send messages between themselves.



## WHO CAN SEE WHO AND WHEN?


After years of development, this technology has resulted in the FANET system by Skytraxx, who now encourage other manufacturers to integrate it into their instruments, without having to pay any royalties.

Our colleague, Stefan Ungemach, has thoroughly tested the system integrated into the Skytraxx instruments and reported that it works perfectly. On one hand, and perhaps the most important aspect, groups of pilots have performed better, flying without a doubt further than they would have managed to do otherwise.

When pilots fly in the same thermal, it isn't necessary as visual contact works better. When other pilots are too far away (the range can be 40 km or further), it obviously isn't any use either. But when flying XC in a normal group, with pilots generally separated by between 500 m and 2 km, information, in real time, about the thermals encountered by the others was very useful and often helped them to make the right decisions.

But the system can be even more useful: the transmission of messages between participants also functions very well. Before the flight, you can, moreover, save pre-recorded messages which are easy to select when flying. To enter these messages at home, you can connect a computer keyboard to the Skytraxx USB port (On-The-Go).

You can also plug in a WiFi stick, to enable it to communicate with a Smartphone, and thus receive the information from OGN (Open Glider network), thereby giving the position of all the planes equipped with FLARM in the vicinity. There is a delay of 1-3 seconds before the information arrives, so it can't be used to actively avoid another FLARM aircraft.

FLARM aircraft on the other hand see the vario in real time, because the FANET+ emission by Skytraxx is repeated by a FLARM emission (it's on the same 868 MHz frequency).

So, each Skytraxx thus equipped is also a 'passive' FLARM beacon. It's undeniably a safety feature, bearing in mind that even the Swiss REGA helicopters have this system on board.



The pilot must enter the type of aircraft (so that it can be recognised in the network), as well as state whether they want to be tracked or not.





Thus, the FANET+ system includes a variety of safety and comfort features. You can also be tracked externally via the Open Glider Network. And the system will get even better: FLARM compatible weather stations are going to be put on various sites, letting us see, on the vario screen, the wind readings in the vicinity.

Another point: all FANET+ instruments relay messages containing the positions of other pilots. This peer to peer network increases the range and also allows communication when there is no direct radio link, for example when one of the group is in the bottom of another valley. If he is visible by at least one other member of the group in the air, he can continue to be part of the 'sky chat' group.

Watch this space... 🧟



FANET pilots are marked on the screen and the colour represents the climb rate.

The 480 x 272 screen on the Skytraxx 3.0 is remarkably high quality, even in full sunshine, as shown here. The instrument is powered by Li-Ion 3.7 V 6800 mAh batteries and the dimensions of the instrument are: 110 mm x 120 mm x 27 mm for a weight of 300 g. The Skytraxx 3.0 also contains all the necessary sensors for AHRS calculations and integrates them, according to an adjustable value, in the tone of the vario.





Collaborative flying by every possible means...



The Skytraxx 2.0 plus is still available. It costs 469 € without the FANET/FLARM

option and 559 € with

it.

The option can be added later as well  $(149 \in$ , and requires the instrument to be sent back to the workshop in Germany).

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The Skytraxx 3.0 costs 859 € with the FANET/FLARM option and 769 € without.

The option can be added later as well (149 €, and requires the instrument to be sent back to the workshop in Germany). www.skytraxx.eu





The co-author of this article, Stefan Ungemach, is a specialist in flying instruments and software developer of the very elaborate flight log, Paraflightbook (Windows, English and French).

He is also a consultant for schools who want to organise trips to South Africa or to other wilderness countries.



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### **XC TRACER MINI II GPS**

An XC-Tracer Mini II GPS, an XC Tracer II and, behind, an XC Tracer Mini

## THE XC-TRACER FAMILY IS GETTING BIGGER.

he XC-Tracer instruments are pioneers in integrating sensors such as the accelerometer and gyrometer so that they can detect the slightest thermal.

Completely new since the 20th of May: the XC Tracer Mini II GPS. It integrates all the functions of the 'big' XC-Tracer in the format of the XC Tracer Mini. It uses all the sensors imaginable:

- •GPS
- Barometer
- $\bullet Gyrometer$
- Accelerometer
- Magnetometer



Both XC Tracer II and the new XC Tracer Mini II GPS on the right communicate via USB, Bluetooth and LED. Both are powered by their solar panel. The XC Tracer II GPS will replace the bigger XC Tracer II.

facebook.com/freeaero



This multitude of values, processed by a new floating point unit (FPU), doesn't just allow an improvement in the necessary calculations to detect the thermals, but now allows a much more precise calculation of the speed and direction of the wind, according to the manufacturer.

The goal of the exercise: to transmit this information to tablets running software such as XCTrack or LK8000, which you can already plug in via cable or USB.

Numerous very high level pilots such as Chrigel Maurer and Meryl Delferriere fly with an XC Tracer and find it efficient, especially in weak conditions.

XCTRACER www.xctracer.com					
MODEL	XC TRACER II GPS	XC TRACER MINI II	XC TRACER MINI II GPS		
YEAR	2017	February 2018	May 2018		
POWER	SOLAR	SOLAR	SOLAR		
BATTERY	LiPo 800mAH	LiPo	LiPo		
AUTONOMY	20h to infinity	20h to infinity	20h to infinity		
DIMENSIONS [mm]	57.5 x 57.5 x 17.5	44.5 x 44.5 x 16.5	44.5 x 44.5 x 16.5		
WEIGHT [g]	60	30	36		
BUTTONS	1	1	1		
DISPLAY/LED	3 LED	1 LED	1 LED		
SOUND	customizable over USB	customizable over USB	customizable over USB		
GPS	yes	-	yes		
ACCELEROMETER	yes	yes	yes		
GYROMETER	yes	yes	yes		
MAGNETOMETER	yes	yes	yes		
BLUETOOTH	yes, BLE 4.0	-	yes, BLE 4.0		
WIRED CONNECTION	USB	USB	USB		
RECORD TRACKLOG	yes	-	yes		
DOWNLOAD TRACK VIA	USB	-	USB		
UPDATE	over USB	over USB	over USB		
IMPROVEMENTS SINCE LAST VERSION	solarpanel, processor, algorithmes, autonomie	processor, algorithmes, autonomie	scratch resistant solar panel, power consumption		
REMARKS	communication of GPS+vario values over cable or BLE to a tablet/smartphone		communication of GPS+vario values over cable or BLE to a tablet/smartphone		
PRICE	295 €	170 €	305€		



# NEWS GPSBIP AND CAPTIVE SENSORS

o trigger the beep on the vario, the GPS Bip now integrates, in a preliminary version of its firmware, the accelerometer and gyrometre readings (there is no magnetometer). This version which is currently being tested is available on the manufacturer's website.

Remember that the GPSBip is the first GPS vario of such a small size which is powered by a solar panel. At the moment, it is also the only one to offer perfect vocal synthesis, of values such as the current altitude and air speed, as well as the average vario in the new version.

The GPSBip costs 220  $\in$  (and is, without a doubt, well worth it).  $_{\bigodot}$ 

https://www.lebipbip.com/



The GPSBip: very small despite its many functions.

Configuration is easy thanks to a web application.

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The instrument doesn't have a Bluetooth connection, but connects easily via a USB cable to a smartphone or tablet (USB 'On-The-Go' compatible).





Some examples side by side. The Sys'Evolution (touch screen), the MipFly (not touch screen), the Flymaster (not touch screen), the Naviter Oudie 4 (touch screen and in colour!), the Skytraxx 3.0 (not touch screen, colour) and the Volirium P1 (touch screen).

Photos: Sascha Burkhardt

READABILITY

n in-flight necessity: being able to see at a glance all the important information displayed, even in full sunshine. For years, we have tested and compared numerous instruments. The conclusion is simple: manufacturers have understood the importance of this aspect and radically improved their screens. One reason which has pushed them to do this: more and more pilots are cobbling together solutions using a GPS and a readable tablet, such as the Kobo, thus producing an instrument with a big screen which performs very well, and which vario manufacturers have to compete against. E-readers use electronic ink, consume very little and work perfectly in full sunlight.

Classic LCD touch screens are all particularly difficult when it comes to contrast, due to the extra layers necessary. The colour touch screens are even more delicate. You can see it with smartphones: most of the middle of the range instruments are very difficult to read in full sunlight.

This is why Skytraxx have dismissed the idea of a touch screen and it's been worth it. For a colour screen, the 3.0 is exceptional in terms of readability, no matter what the angle of view.

Evidently, the 6 inch touch screen (800 x 600 pixels) from the Syride Sys'Evolution, based on e-Ink technology, offers excellent readability, even when viewed at a flat angle.

Clearly a champion: the MipFly. Whatever the angle, the black is very black. Also visible: the faults on this pre production model (marked on the right).





An Oudie 4: the readability of the 480×272 screen in the sun has been improved, but as it's touch sensitive, there is a limit to what can be achieved. This photo was taken in the shade.

The Compass C-Pilot Pro: it's touch sensitive and offers a very high resolution of 640 x 480 pixels; it is therefore not very easy for the manufacturer to make it very contrasty.





XCSoar on the Super AMOLED 2048 x 1536 screen of a Samsung Galaxy Tab S3: from certain angles, it has very good readability.





## LEGIBILITY: LCD IN SEGMENTS

To obtain good readability, manufacturers have long used a simple formula: prewired screens arranged in segments. They naturally have more contrast than the versatile displays with pixels but, on the other hand, you can't draw graphics or display other unanticipated characters. Increasin-



gly often, manufacturers mix both types of display in the same screen. Segments for the numbers and pixels for the graphic fields, just as they already did with this old Bräuniger (the lower part is graphic).



An example of a mix: an old Bräuniger IQ Motor

The new, simple and very light, bottom of the range, Vario LS from Flymaster, also mixes the types of display. A nice screen! Weight: 89 g. Price: about 180€, https://www.flymaster.net/variols or, in France, from www.paratroc.com for example. We'll publish a more detailed test very soon.





## MIPFLY ONE

ust as we were finishing writing this article we received the first example of the MipFly One, an instrument made in Romania by a company which also works in autonomous drones. After the first prototypes in 2016, MipFly are now ready to start marketing an 'Early Bird' version. The initial models will cost 320 €. However, the price of future models hasn't been fixed yet. The readability of the screen in full sun is excellent and the contrast is very impressive. In the future, the instrument will definitely come with a protective film on the screen which will slightly reduce this aspect of its performance, but it will remain, without a doubt, at the top of the range. The refresh rate of 20 Hz is also worth something.

The resolution isn't especially high:  $240 \times 320$  pixels on a screen of 4.4 inches (about  $90 \times 67$  mm), but in the standard version, without changing the screen which is freely configurable, all the information is clearly readable and has been judiciously grouped.

The instrument can be operated either by using its three fairly classic buttons or by using a Bluetooth remote control which can be fixed onto the brake - very original!

We will test this instrument after installing the most recent version of the operating system, which is based on a Debian Linux kernel and which should remain Open Source.

The instrument comes with all the components necessary for very advanced management of the vario and has all the sensors including a gyrometer. In the version we tested with the classic algorithms, the reactivity of the vario was already very good.

The internal USB ports will be able to receive extensions such as WiFi and Bluetooth.

MipFly also want to offer, in the short term, collaborative flying functions, on screen weather information and easy upgrades.

We'll publish our conclusions very soon. http://www.mipfly.com/







he Ascent vario is also great to read, amongst other things due to being mounted on your arm or the riser, but also thanks to its screen. A new version came out in 2017, the H2. At the moment, the manufacturer is progressively adding airspace, which has got a bit behind schedule.

www.ascentvario.com 🔗



The Ascent fixes onto your wrist or the riser and costs about 300 €.

# ASCENT H2



Paraglider database. The history of our sport. All the gliders since paragliding time began. Technical information. Test archives.



www.para2000.org

\* \* \* \* C Gérard Florit \* \* \* \* \*

Photo: Nic Petropoulos



### PARAMOTORING

Good readability of the screen is very important when paramotoring too, when the pilot is navigating over long distances, using the mapping.

Shown here, Nic Petropoulos navigating in South Africa during the Icarus X in March, with a black, e-Ink type, screen.

For more information on 'The World's toughest paramotor race', the Icarus Trophy, as well as its little sister, the 'Icarus X', have a look at some of the amazing images in our 2016 article.

The lcarus Trophy which will take place this summer across South Africa: https://www.icarustrophy.com/.

There will also be 3 events, each known as the "Icarus Academy" (one in the UK and two in Italy).

www.icarustrophy.com/icarus-academy/

ACK Day

Light 2016-Icarus Trophy





# SYRIDE SYS'EVOLUTION

The Sys'Evolution is the top of the range instrument from Syride: an e-reader type tablet. The contrast and the screen's visibility are particularly good, no matter what daylight quality or viewing angle. The Sys'Evolution is 100% made in France.

First test of the Sys'Evolution, an instrument shaped like a tablet designed from start to finish for flying...

he Syride team worked on this tablet for nearly three years before starting to commercialise it in 2017. At first glance, this instrument resembles an e-book, like a Kobo or an Amazon Kindle. But in reality, the electronics and the operating system (written in the C language, which gives direct access to the electronics) was designed from the ground up for use in flight and has therefore been optimised for pilots. The Syride beside one of the pioneers of top of the range instruments: the Compass C-Pilot Evo, which is a reference for professional pilots. It weighs 544 g on our scales, the Syride half that: 276 g. The thickness also goes from double to half: 1.5 cm for the Syride; it looks almost like an iPad...



The development has been done progressively, with more and more functions being added. The last important step is to show airspace on the 3D display of the surrounding countryside.

Explanation: like more and more modern varios, the instrument contains a topographical database which allows you to calculate the pilot's height above the ground and show the relief.

At first glance, most pilots considered the 3D display of the landscape as just a pretty gimmick. But with air space displayed, the pilot obtains a perfect visualisation of his position below and beside the authorised limits. The first tests went well and we'll do more extensive ones in the future.

In the medium term, the team also hope to integrate a representation of the thermals mapped using the KK7 database. Unlike the other Syride instruments which don't have a gyro, this vario has all the sensors imaginable on board (barometer, magnetometer, accelerometer, gyrometer, and obviously a GPS) for all the new AHRS type algorithms, which the team would like to include. As Syride master each line of code in the 'home made' operating system, the possibilities for developing the Sys'Evolution are enormous.

Sascha Burkhardt

@freeaero

### PHILIPPE LAMI'S OPINION

I have been testing this all singing, all dancing, super vario in tablet form for more than four months now. My reference up until now was the Compass C pilot Evo with its probe, the C-Probe. A very coherent package, but a bit heavy in the flight deck and it had several bugs (although there are regular updates).

With the Syride, I find I have virtually the same functions, the same possible configurations on the screen, for a record weight of less than 300 grammes and above all, the screen is perfectly readable, even in full sunlight. This screen lets you personalise the display over several screens for your fingers to flick through (even with thick gloves on). In flight the sound is very audible and clear and the vario is very reactive.

Downloading tracks from the flight log is done using the inhouse software, via your computer, either with a cable or via WiFi. The Syride software (PC or Mac) takes care of it automatically.



Above: the representation of a mountain and the original just behind.

Opposite: two comparisons between a representation of airspace on Google Earth and on the Sys'Evolution screen.

This function is, in fact, very useful for positioning yourself relative to prohibited zones.

Below: the zoom on the excellent 800 x 600 pixels 16-level grey scale screen.







SYS'EVOLUTION







FIRST I CARRY IT, THEN IT GARRIES ME. PRESS STREET THE PERFECT SOLUTION FOR AN XC FLIGHT AFTER THE HIKE UP.

JOMINIK ASTEINER MANAGER HARNESSES HIKE & FLY FAN



# CUMEO

LTF09: B I EN: B

#### PURE PASSION FOR FLYING **O** skywalkparagliders skywalk.paragliders www.skywalk.info

When used in competitions, getting the tracks is also very simple. In its current version, the Sys'Evolution already works well for me, although it is still missing at least one important function advertised: the Bluetooth connection to the embedded smartphone which would take care of live tracking, sending of SMSs and the display of information from weather stations live on the map. The instrument already represents a revolution, due to its format, it's readability, its light weight and its evolution. Its 20 hours of battery life is very good. More to follow..." 📯

Philippe Lami



# SKYWALK syride



At the bottom of the screen: a cross-section view of the relief underneath the pilot's flight path, if he continues to fly in a straight line. This is the standard configuration, but the pilot is free to change it thanks to the Syride configurator.

# CROSSCALL ACTION X3

The French telephone specialist, 'Outdoor', have brought out a new model: The Action X3 is less expensive and even more robust than the Trekker X3, but with fewer sensors.



s we noticed in 2017, more and more smartphones have taken on an 'outdoor' look, becoming watertight and shock resistant up to a certain limit. To have a hardcore survival telephone, the only specialists are Crosscall and Caterpillar.

After the Trekker X3, Crosscall offer the Action X3. It's a lot less expensive:  $350 \in$  instead of  $550 \in$ . However, it does have several advantages: IP 68 instead of IP 67, robust according to the military norm MIL STD 810 G (although the latter doesn't say a lot about the specifications of the product in detail), a bit lighter, not as thick and a later version of Android (Nougat).



An Action X3 left and a Trekker X3 right, both running XCTrack: at first glance, there isn't much difference.

instagram.com/free.aero

On the other hand, compared to the Trekker, it doesn't have the gyrometer, barometer, thermometer and hygrometer sensors. The last two weren't necessarily very useful, although the absence of a barometer to transform the telephone into a full vario is disappointing.

But with a saving of 200 €, you can almost buy an intelligent vario like the XCTracer and connect it via Bluetooth to the telephone. An ideal solution to make the most of sophisticated thermal detection, together with the display of topographical maps and airspace.

On the other hand, there was a big drawback during our test: XCTrack worked no problem but XCSoar refused to work on the Action X3, in all its variations available on the Playstore.

A very positive point on the Action X3: its new attachment system, the X-Link. The telephone is held magnetically by this connector (a car accessory you have to buy ( $49 \in$ )) which can also be used for charging and transmitting data to a USB plug.

In summary, the X-Link connector is very practical, the price is low and its weight and bulk tilt the balance more towards the Action X3. A safety and extra comfort argument: by foregoing an SD card (you have to make do with 32 GB of memory), you can add a second SIM card so that you can use the coverage of two operators in the mountains.

Linked to an XCTracer, the Action X3 displays, amongst other things, the precise values of this vario.







The magnetic plate in the Car-Kit accessory can also work when placed flat in the cockpit, and then in the car on the way home.

This connector can replace the USB connection. It is more practical than the 'charge by induction,' on the Trekker X3, which is much slower.







## **CROSSCALL TREKKER X3 VS. CROSSCALL ACTION X3**

There are lots of positive arguments for using the Action X3 for paragliding in this comparison, in addition to its lower price. The absence of sensors can be compensated for by a link via Bluetooth or cable with a GPS vario such as the XCTracer or GPSBip.

MODEL	CROSSCALL TREKKER-X3	CROSSCALL ACTION-X3
OS	Android 6.0.1 Marshmallow	Android 7.1.2 Nougat 🗫
DISPLAY	5" Gorilla Glass 4, Wet touch	5" Gorilla Glass 4, Wet touch
RESOLUTION	Full HD 1920 x 1080 pixels 🗫	HD 1280 x 720 pixels
RAM	3 Go	3 Go
FLASH-MEMORY	32 Go	32 Go
MICRO SD	Yes	Yes
CAMERA	16 MP 💎	12 MP
FRONT CAMERA	8 MP 🗫	5 MP
VIDEO	Full HD, 1080p@30fps 🔊	Full HD, 1080p@24fps
GPS	GPS (A-GPS) + GLONASS + Beidou	GPS (A-GPS) + GLONASS + Beidou
BAROMETER	Bosch BMP280 🗫	-
ACCELEROMETER	Bosch BMI160	KIONIX KXT2
GYROMETER	Bosch BMI160-	-
MAGNETOMETER	AKM AK09916	AKM AK09916
THERMOMETER	STM HTS221 🗫	-
HYGROMETER	STM HTS221	-
SIM 1 / SIM 2	nano SIM / -	nano SIM /nano SIM 🌮 either SIM+SD or double SIM
NFC	Yes	Yes
PORTS (IN/OUT)	USB Type-C (OTG), Bluetooth 4.1 LE	X-Link 🐥 , USB Type C (OTG), Bluetooth 4.1 LE
BATTERY	Li-Ion 3500 mAh	Li-Ion 3500 mAh
AUTONOMIE	Veille: 20 jours Communication: 31 h GPS: 9h	Veille: 24 jours Communication: 35 h GPS: 10h 🔊
DIMENSIONS [mm]	81,8 x 155,7 x 14,3	79 x 152,5 x 12,5 💎
OUTDOOR	IP 67	IP 68 ("60 min / 2m"), MIL STD 810 G
WORKING TEMPERATURE	-10°C/+50°C	-25°C / +50°C 🕫
WEIGHT	230 g	213 g 🗫
PRICE	550 €	350 € 💎
INFO	https://crosscall.com/en/trekker-x3/	https://crosscall.com/en/action-x3/
REMARKS	no incompatibility reported 🔊	App XC-Soar not working

TOP OF THE RANGE SMARTPHONES IN FLIGHT





Our test of the Trekker X3 is, of course, still available.

www.free.aero

🅦 @freeaero





As for the robustness of the new Crosscall smartphone, that isn't a worry. Its predecessor, the Trekker X3, not only survived being dropped many times during our tests on site, but even survived being run over by a car in the landing field.

Film maker Tim Green used a Trekker X3 during his expedition to Norway and confirmed that it worked well without the slightest problem.

The manufacturer has promised that the new Action X3 is even more robust.



Flying a drone and family photos with the Trekker.







# TIME FOR CHANGE

Rebellious, fun, and enlightening. Not just talk, the Punk actually tells you the truth about the air. Stay informed, make your own choices, fly the Punk. DESIGN

09

www.flybgd.com

## CATERPILLAR, THE CALL TO WORK

he American group, Caterpillar, make construction machinery such as diggers. They also sell watertight and shock proof telephones which can serve as 'outdoor' telephones. With their IP68 and MIL 810G norms, the Catphones offer resistance to falls of up to 1.8 metres and are waterproof to immersion, depending on the model, of between 1.2 and 3 metres. Therefore, they are equal to, or slightly superior in performance to the Crosscall Action X3.

Some of the Catphone's functions are not that useful in our sport. The most recent model, the S61, anticipated for June 2018, integrates a laser range finder.

Its integrated thermal camera, produced by the specialist FLIR and already present in its predecessor, the S60, could possibly help to detect thermal sources on the ground.

http://www.catphones.com





# WARNING TRAPS IN THE WATER

Water, especially the sea, is great to fly over but can also be a trap. Some reminders and solutions...



hether at sites by big lakes or the sea, aquatic surfaces bring lots of benefits to light weight flying. Remember, the wind is more laminar and regular and the limit of what is acceptable is lifted: it is safer to fly in a smooth 30 km/h wind than in a wind of 10 km/h with gusts up to 25 km/h.

The second advantage: in summer, the coast creates its own favourable wind. The sea breeze phenomenon works well wherever there is sufficient temperature contrast between the water and the land heated by the sun, at the edge of the sea, but also around big lakes.

The third advantage, water is honest. There is no better indicator of the direction and strength of the wind than the sea or a lake, visible from afar and from very high up.

The fourth advantage, and particularly the case around lakes: water works as a motor for restitution.

In the evening, when the thermals stop, the restitution takes over. The water has stored the heat gathered during the day and releases its energy into the relatively cold evening air, thus creating gentle, but generous, thermals, Some good examples: evening flights at lake Annecy and at Organya in Catalonia. This 'magic mountain' allows long flights until nightfall thanks to, amongst other things, dams down river.



# augmented reality



Corsica is a great destination for combining family and paragliding holidays, here at Capu Rossu on the west coast.

One of the best places to play and not just for Jean Baptiste Chandelier: the Atlantic Dunes fed by a daytime breeze and/or meteo wind.





Blue everywhere. However, the pilot managed to get up to 2000 m thanks to his motor. A very light northwest wind increased the length of time to get back to the island.

### THE TRAPS

The first trap: the breeze can temporarily overcome the meteo wind blowing in the opposite direction. Therefore, you have to remain vigilant in case the breeze drops and the meteo wind returns and pushes the pilot out to sea. This can happen even at Dune de Pyla. A pilot can be at more than a hundred metres above the Dune, when the meteo wind takes over and the dynamic lift gives way. In the length of time it takes for him to get down, he will have drifted towards the sea, forcing him to land on the Bancs d'Arguoin.

On the islands in the Atlantic such as La Palma, you often fly in the sea breeze, in the lee of the trade wind, which has already caused fatal accidents by pushing pilots out to sea. The solution: find out from the locals where the meteo wind bypasses the breeze and keep away from these traps.

The second trap: under estimating the force of the waves. Even small ones can easily sweep away a pilot attached to his wing.

The danger at some sites: the sea breeze creates a nice thermal in the confluence with the meteo wind. But if the pilot ventures too far out over the sea, he'll find himself in the meteo wind and be carried out to sea.





Great: soaring in a regular and predictable breeze. It's also a rare occasion to test the 'pure' reactions of the wing to the actions of the pilot, without the movement of the air having any influence. On the other hand, when the thermals weaken, watch out for the zone where the waves break, even if they are small.

On the 9th of April 2018, an Austrian pilot was killed in Portugal. She landed on the sand but in a 'wet' zone which some waves could still reach; one caught her and swept her out to sea. Two other Austrian pilots, who went to help her, also drowned. Solution: on a beach, land far from the area where the waves are breaking.

And if it is really impossible to reach the coast, it is sometimes better to go back out to sea and land far from this zone. In breaking waves, even an inflated life jacket can be insufficient.

If you know you are going to land in water, unclip whilst you are still in the air. If it's too late, let the wing hit the water without any brake on, far in front of you and leading edge first. This way it will float longer and stay a bit further away from the pilot.

It is always impossible, even in calm water, to swim tangled up in the lines. According to Antonio Fernandes, president of the Portuguese federation, interviewed after this accident, a good knife is essential for pilots flying at the coast, so that they can free themselves quickly.



### AND WHAT ABOUT THE EQUIPMENT?

Landing in fresh water generally doesn't do a paraglider any harm. Salt water, on the other hand, attacks the fabric. It will need to be rinsed thoroughly with fresh water.

For reserves on the other hand, the professionals warn that some low-cost reserves are completely unfit for water landings because their coating will be damaged when they come into contact with water. This will result in severe porosity which will massively increase the sink rate. We are following the subject closely...

A pocket knife costs about 15 € with a strap cutting blade, so that straps and lines can be cut quickly.



Two Adventure paramotors above the Atlantic in Portugal.

And above all, don't try to save your equipment in the waves. The worst part is that those who witness a water landing can often be left helpless.

Following this accident which was also fatal for the two rescuers, Antonio Fernandes warned: 'From the beach it is almost impossible to save another pilot in an area with strong breakers.' A very harsh observation...

For paramotor pilots as well, it is obviously very ill advised to skim the waves, even, and especially, near the water's edge. When going 'barefoot,' it is preferable to choose a smooth stretch of water, only a few centimetres deep. And even that, without a third person watching, may not be enough to avoid an accident.

> Cool and exhilarating: walking on water and surfing 'barefoot'. During competitions a boat is ready to intervene.



Photo: Adventure





An Agama float which can be fixed to the chassis. Price: 300 € approx.

### TECHNICAL SOLUTIONS.

Obviously during an SIV course with a high possibility of landing on water, there must be a boat ready. Wearing a life jacket is essential and indeed obligatory in places like Roquebrune. Above Lake Garda in Italy, it is even obligatory for all flights. This sort of gilet can be found in ship's chandeliers from 60 – 80 €. Pilots are strongly advised to buy something which inflates automatically, no matter whether it's a lozenge mechanism or hydrostatic. So, when it comes into contact with water, the jacket activates even if the pilot is unconscious.

Normally, life jackets are also designed to automatically keep the pilot's head out of the water, but a harness with back protection can act against this, by making the pilot's lower limbs float, putting him in a position where it is difficult to keep his head up. This is yet another reason for getting rid of your equipment!

The extra weight when flying is acceptable: from about 700 g. The gilet should be put on before getting into the harness. For paramotoring, there are special floats which attach to the cage and which have already saved lives. One could however, point out that being attached to the motor, they don't encourage the pilot to get rid of his equipment as quickly as possible, when they think they are going to land on water...

The pilot 165 life jacket from Plastimo, used in particular for sailing, can also work for free flying pilots and costs about 80 €. Weight: 700 g.



A mixed automatic/manual release trigger and its CO2 bottle.





A 75 N floatation aid: It's less than a

life jacket, but sufficient, as long as

you get rid of the harness and wing.

# TEST RESTUBE SPORT

For pilots who are looking for a lighter, more compact solution than a real life jacket: the Restube Sport is a floatation aid, which fits into a little pocket attached to the waist belt.

This device was designed for swimmers or windsurfers for example, who wanted to take with them an inflatable buoy, attached with a light belt or directly to the harness. The Restube can be immersed no problem (the bottle of CO2 is protected against rust) and inflates after being manually activated. All you have to do is pull on a tongue to free the buoy and start inflation. As this doesn't happen automatically on contact with water, it won't protect a pilot who is unconscious, which is a disadvantage.

On the other hand, the Restube only weighs between 270 and 330 g according to the method of attachment, less than half the weight of a real life jacket, and a lot less bulky. On the other hand, this sausage only offers 75 N of floatability, which is about half that of a real life jacket. Therefore, it's an aid to keep you out of the water, but not a life jacket. Nonetheless, even when wearing clothes, swimming with the Restube turned out to be not too tiring during our tests. It allows the pilot, without a doubt, to wait for the rescuers more calmly after landing in water in the middle of a lake or the sea.

2 is protected ther being maee to do is pull y and start inpen automatither, it won't ascious, which
Restube only B0 g according t, less than half t, and a lot less is sausage only which is about Therefore, it's water, but not een when weah the Restube ing during our recalmly after lle of a lake or









To trigger it, you have to pull on this tongue.

Folding it is easy.

Once used, folding the sausage and rearming it takes ten minutes. The 16 gramme bottles of CO2 cost about  $4.50 \in$  each. The Restube Sport tested costs 99  $\in$ . There are less expensive versions, but the Sport is better adapted with its robust pocket which can be fitted to the harness.

### SUMMARY

For paraglider pilots who fly regularly over lakes or by the sea, but who don't want to be weighed down by a real life jacket, this little accessory offers proper aid in case of a water landing, and can be forgotten about in the air and on the ground, even during the walk in. You really can take it everywhere!

But this accessory doesn't offer the same guarantees as a life jacket, which can automatically trigger upon contact with water, and possibly hold an unconscious pilot's head out of the water.

The Restube can also be used for other activities such as kite surfing or even swimming..  $\Im$ 

A packet of two spare cartridges costs about 9 €. The Restube Sport ready to use costs 99 €. http://www.restube.com





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### Tandem like never before

The Takoo 4 meets the most stringent demands of tandem pilots and is one step above the rest thanks to greater performance in all aspects of the flight. Discover the most Amazing Adventures on our Facebook and Instagram:



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# SWING ARCUS RS & RS LITE

Over the last few months, Philippe Lami has flown the Swing Arcus RS regularly, in both the classic and the lightweight version. He has also used it in school. Here's his initial assessment.

Test Pilot: Philippe Lami





he German manufacturer Swing now equips its whole range with their in-house RAST technology, developed by their R&D team, led by Michael Nesler. It first appeared at the Coupe Icare in 2016 on the school wing, the Mito; see our article below.

In the beginning, in the first version of RAST, the cell wall let the air flow continuously through via a slit above and below. In the current version, as in the Arcus RS, the cell acts as a valve and seals the back part more efficiently after the initial inflation.

In size M, the RS lite tested weighed 4.3 kg with classic riser straps, compared to 4.1 with the dyneema risers, and 4.85 kg in the classic version. The Lite is made from Porcher Skytex 27 g/m2 and 32 g/m2 on the leading edge. The lines are sheathed low down, and unsheathed high up, and are nice to manipulate and easy to untangle.

### FIRST INFLATION!

The Swing Arcus has a moderate flat aspect ratio of 5.25. I noticed, during the course of multiple test flights, that the wing never overflew! In fact, the scoop was done in 2 steps, without any heaviness. The first part of the profile took shape, developing a small amount of lift but keeping a lot of drag. The back part filled in a delayed manner, assuring, after a fashion, a provisional reflex profile. The distance to take off, without wind, therefore seemed a bit far. Inflations in strong wind were calm and safe. The wing inflated 'in the middle of the window' without pulling and without any particular inclination to pitch. Excellent ! Compared to a wing without RAST, the inflation is gentler, more progressive but, in the end it's not as fast. You just need to change your habits a bit and let the wing finish filling whilst it gathers momentum. That works really well!

Naturally, the lightweight version has less inertia as it comes up... Which is an extra bonus.

### HOW THE RAST SYSTEM WORKS



Two years ago, SWING explained how the RAST system (version 1) worked, in a video in English.



The second version of RAST has been made in a way which forms a valve, open on the left and closed on the right.





With the Mito, Swing offered for the first time a production wing equipped with RAST technology (version 1). In 2016, we reviewed it in detail and tested this very good EN A wing!







Clearly visible at take off: the late inflation of the back section. It's also an advantage when paramotoring and something which we will test.

In the air, the glide ratio is good, definitely sufficient to fly everywhere uninhibited. compact plan form. The brake travel is enormous and the pressure through the controls massively increases when you pull down with your hands towards the lower hooked into nicely, with a pretty good response to the controls in the middle of the brake travel. The inclination isn't linear. The Arcus RS slows sharply without really tilting at the start of braking. At the beginbrakes provokes the closure of the RAST back of the wing along the whole wingspan, by physically increasing the air pressure. It's an observation which is clearly evident.

It was also really calm in deliberately induced collapses! In fact, only the front part of the leading edge crumpled. The rear part remained inflated and prevented the collapse from biting deeply into the chord. Less depth equals less rotation, indeed none.

The wing is very clean, taut and with a speeds. The first thermals I encountered, it ning of the travel it shows a real firmness in braking (a bit less on the RS Lite than on the classic RS). This pressure at the back of the wing could be clearly felt and gave a feeling of confidence. The action of the valves and reinforces the structure at the Whether during an asymmetric or a frontal, the RAST system clearly softens the behaviour of this Arcus RS Lite, already damped due to the lightweight materials used..





The wing doesn't shoot on its own. To get it there, you have to do a very dynamic manoeuvre. Clearly visible: the mini ribs in the trailing edge.

whilst ot of aps in cient; behatient; the this ifficaame I d and t for same same same same the bout a detithey the bit

The second consequence of the RAST system: during a symmetric collapse, as with an asymmetric collapse, the wing, whilst remaining fully inflated develops a lot of frontal drag which spontaneously keeps in check any nose-diving. It's very efficient; the wing doesn't dive. It is very well behaved, and gets quickly back on course.

The Swing Arcus RS offers sufficiently precise steering, with hands low and a lot of brake travel. After a small amount of time getting used to it, I completely forgot this characteristic, appropriate for its classification. Wow, it's turbulent! All the same I keep my hands up, even accelerated and relax. And complete the route set for today. Admittedly not quite at the same speed as my friends and not at the same glide angles, but how relaxing!

The accelerator is comfortable and gentle. The wing accelerates steadily up to 48 km/h. The medium size has a trim speed of 38 km/h and stalls at about 23 km/h. Big ears are easy thanks to a dedicated riser. They reopen as soon as they are released, sometimes catching a little bit of the wing tip.



No problem for all the rapid descents: easy.

The Arcus RS loves low speeds. The wing parachutes really well, by falling behind its wing tip. A great tool for top landing at take-off.

I racked up at least ten hours flying time on this Arcus, alternating between the lite and the classic version. A little XC in Andalusia, near Ottivar. School flights at Saint André. It's definitely an easy wing and has sufficient performance to do everything.

The RAST concept is innovative, works very well and I really understand why Swing have gone for this solution across their whole range. It's a very reassuring goeverywhere wing. Classic: action on the brake reduces the length of the trailing edge.



Using different colours on the risers and for the handles, is very practical and useful, and not only for beginners.

The fabric of the RAST cell.



High up, the lines are not sheathed.










The line and riser plan.

							unt not
ARCUS RS/RS LITE							<b>A</b> 1
MANUFACTURER	SWING Web : ht	tp://www	v.swing.do	e/arcus-r	s-fr.html		
DATE	2017	2017	2017	2017	2017		
SIZE	XS	S	М	L	XL		
CELLS	42	42	42	42	42		
FLAT SURFACE AREA [m <sup>2</sup> ]	22	24	27	30	32		
FLAT WINGSPAN [m <sup>2</sup> ]	10.7	11.2	11.9	12.3	13		
FLAT ASPECT RATIO	5.25	5.25	5.25	5.25	5.25	-	- (
ALL UP WEIGHT [kg]	55-75	70-95	85-105	95-115	105-135		
WEIGHT OF THE WING [kg] Arcus RS/ Arcus RS Lite+riser lite	4.4/3.5	4.6/3.7	5/4.1	5.4/4.3	5.7/-		1
CERTIFICATION	В	В	В	В	В		(
LABO CERTIFICATION	EAPR	EAPR	DHV	EAPR	EAPR		
PRICE [€]	3500	3500	3500	3500	3500		





NRG XC II

# APCO NRG XC II

TEST



17.5 m<sup>2</sup>! That's all I was allowed to try of this little slalom racing machine. Slalom? And that's not all it's good for! The letters 'XC' figure in its full name, and we're going to see why.

By Sylvain Dupuis

### FLYING

With not much wind and a Top80 for such a little wing, I'll have to row! During inflation, the NRG XC2 isn't the easiest of wings. It's very light and certainly doesn't shoot up like a rocket that you have to damp. On the other hand, the slightest asymmetric force during take off will be felt when the wing is askew above you. However, given its low inertia, it repositions itself very well by advancing a bit and by lightly braking. So no magic required then. Throttle! Fully trimmed, I was pretty surprised by the load take up which is excellent for this size!

Much more than just a machine for slalom...

NRG XC II



# Flying, that's all.









The NRG XC2 is lively and precise and very nice to fly. The travel on the trimmers is fairly low and the speed isn't immense in this set up compared to other rival wings. On the other hand, all you have to do is push the bar to get a bit of a move on. The maximum speed then becomes very impressive, although my Top80 is almost on full power when flying level, for my 70 kg.

Slaloming, the NRG XC2 does well. Fast on the bar, precise and very lively, its failing is its lack of energy return in the pitch when The risers: complex, you release the bar. It enjoys the pylon less than the Dudek Snake, for example.

The trimmers are clearly marked.

as they are on all wings of this type, but nonetheless, comprehensible.





On the other hand, it is also a lot more comfortable and safe in turbulence since it doesn't suffer this balloon effect on the pitch axis.

It's a choice you have to make when you are buying. You can't have both characteristics on the same wing. When cruising, the NRG XC2 is therefore stable, both in roll and in pitch, in calm air and in turbulence, at low speeds and at high speeds.

Lastly, on the fun side, note that the NRG XC2 does amazing SATs which turn very quickly, and it doesn't need to be asked twice to go into barrel rolls.

Landing isn't a problem, it happens quickly but it flares well, like any wing of this size. Untrimmed, the flares are a delight.

#### CONCLUSION

Very nice! Here, Apco offer a very flexible wing which you can do slalom with, cross country with increased speed and also a bit of acro. The low consumption of this wing, despite having a lot of reflex, is an excellent point and works well with engines of average size for use by the majority of pilots. Reserved for a public who are well informed, have their eyes wide open and who have experience of this type of little bomb, it remains, all the same, fairly easy and accessible.



The system of magnetic clips has been well thought through: the handles 'stick' all by themselves in the correct position and at the right angle.

NRG XC II TECHNICAL DATA												
MANUFACTURER: APCO Web : https://www.apcoaviation.com/2018/02/02/nrg-pro-xc-ii/												
SIZ	E 16.5	17.5	18.5	19.5	20.5	22						
CELL	S 50	52	54	50	52	54						
FLAT SURFACE AREA [m	²] 16.52	17.5	18.48	19.47	20.5	21.8						
FLAT WINGSPAN [m	<sup>2</sup> ] 9.57	10.05	10.53	10.39	10.91	11.43						
FLAT ASPECT RATI	0 5.55	5.77	5.99	5.55	5.77	5.99						
ALL UP WEIGHT [k	g] 70-90	70-100	70-110	70-120	70-130	70-140						
WEIGHT OF THE WING [kg APPROXIMATE WEIGH	g] 4.18	4.45	4.72	4.92	5.21	5.57						
PPG CERTIFICATIO	N DGAC	DGAC	DGAC	DGAC	DGAC	DGAC						
PRICE [ŧ	2660	2660	2660	2660	2660	2660						



As with all Apco wings, it has an efficient leading edge giving a good scoop, but it is also aesthetic, with its coloured stripes along the leading-edge rods.





The brake lines at the level of the stabilo.







An APCO feature: valves which are supposed to increase the internal pressure when flying at very low angles of attack.

NRG XC II



# POWER WOMAN MARIE MATEOS

Paramotor champion Marie Mateos, photographed by Louis Garnier, talked to us briefly about engines, equipment and what it takes mentally.





## Which are your favourite tasks and your strengths?

That's a complicated question because, in general, I prefer ones where I have the best results, but that evolves as you train. I really enjoyed a fuel economy task on an axis in the training exercise in the last European Championships, where I had just enough petrol. I got the last turn point at the end of the race and then ran out of fuel. I was able to glide the last kilometre and land in the designated landing zone. Very nice! I couldn't have optimised it better! OK, I know this result came from a combination of training and luck.

You often get very good results in the overall rankings; it's amazing. But shouldn't women, in theory, all be able to be at the same level as men in paragliding and in paramotoring? Why isn't that the case? Once I'm in the air, I can't see why men and women aren't all on a level playing field. But it seems to me that studies have shown that commitment and taking risks are much more natural to men. In my opinion, above all, it's about mental attitude! Women's champion, Marie Mateos. Women's titles: Women's World classic champion 2016, French classic Champion 2017, slalom gold medal in the World Cup in 2017. Amazing results in the overalls: 2016: 5th place in her first classic World Championship. 2017: Silver medal in the French Championship. 2017: Silver medal in the European classic Championship.

This last result, is the one of which she is the proudest.





## You met your husband when you were a student. Didn't he train you?

I was flying hot air balloons when I discovered paramotoring. It was a friend from Touraine who introduced me to the sport, and who then introduced me to Alex. I think this friend has started a dating agency since then. Thanks Franck! Then, during my training, I actually had the 3 Mateos as instructors: Coralie, Jean and Alex. The crème de la crème or what!

## Do you fly a lot using instruments, or more just by feeling?

In classic competitions GPS is forbidden so I fly navigating using a map: I love that! Otherwise I use a Flytech 6000 instrument which I really like! Right: Marie in formation, in the middle of the competitors; she's on the 4th wing. Photo: Karen Skinner

Below: Marie and Alex Mateos in Egypt, Autumn 2017. The two champions got married on the 14th of May 2016.







#### Which engine do you use?

Whether it's the motor or the wing, I change my equipment every year so that I always have new equipment, but I use the same models. I fly with a MacFly Polini Thor 200, Hadron XX and Snake XX by Dudek. I really like this equipment, and I know it well now because this is my third season using it.

The positive points about Macfly: I am lucky to know the designer well (her fatherin-law, Jean Mateos, is the designer and owner of MacFly), so we are able to develop the equipment according to our tastes and needs, whether for competitions or for school use as an instructor. They have the same chassis: versatile, solid and lightweight. There are different models, standard or folding cage, and different diameters: 128, 138, 150 cm. I have a 138 cm folding cage but, at home, I sometimes use a 150 cm chassis which lets me use a bigger propeller. As far as my Polini Thor 200 is concerned, I am very happy, because it lets me take part in both types of competition (classic and slalom) although, like any self-respecting slalom competitor, I would always like a bit more power.

🅦 @freeaero



Why did you choose these wings?

I really like the Hadron XX for classic competitions, which combines precise piloting with it's 2D braking system, with brakes and tip steering toggles on the brake handle. It's also an excellent paraglider in thermals and I was able to improve my personal best by staying 5 hours and 45 minutes in the air during a pure economy task, during the last classic European Championships.

And I use the Snake XX for slaloms. At the moment I fly with 15 m2 but might move to 14m2 for the next competitions. Watch this space. In any case, in these small sizes, it's a very incisive wing: perfect for committed turns between pylons.



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