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Photo: Philippe Humblet/Antipodes

PARAGLIDING WORLD CUP SUPER FINAL 2016
PILGRIMAGE: FLYING WITH GEESE
INSTRUMENTS: LIGHTER STILL
AIGUILLE DU MIDI: A MOUNTAIN AT YOUR FEET
TEST: NUCLEON XX

Photo: Philippe Humblet/Antipodes

The joys of soaring with skis on your feet on the flanks of Etna: well known pilot and mountain guide Zeb Roche had, as he often does, his light weight Skin with him when he took skiers on this off piste expedition. Ready to make the most of it as soon as possible...

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Translation by Ruth Jessop

Governador Valadares in Brazil: In January this site once again proved to be a worthy venue for the Paragliding World Cup Super Final. Photo : Organisation

PARAGLIDING WORLD CUP SUPER FINAL 2016

A real class struggle?

The 2016 Paragliding World Cup Super Final took place from the 18th to the 28th of January 2017: The winners were Aaron Durogati and Seiko Fukuoka Naville. The success of the all new Gin Boomerang 11 and the combination of 3 certification classes were all very interesting.

Photo: Laura Sepet / Organisation


THE LEGEND
IS REBORN
New Skin 2 (EN B)
& Skin 2 P (EN B)
niviuk.com

FROM LEFT TO RIGHT:
4th Petra SLIVOVA, Czech Republic, Gin Boomerang 10
2nd Nicole FEDELE, Italy, Ozone Zeno
1st Seiko FUKUOKA NAVILLE, France, Ozone Zeno
3rd Laurie GENOVESE, France, Ozone Zeno
5th Klaudia BULGAKOW, Poland, Ozone Enzo 2

Photo: Goran Dimiskovski

FROM LEFT TO RIGHT:
2nd Adrian HACHEN, Switzerland, Gin Boomerang 11
1st Aaron DUROGATI, Italy, Gin Boomerang 11
3rd Charles CAZAUX, France, Ozone Zeno

Photo: Laura Sepet

Super Final Champion Aaron Durogati is the first pilot to win the Paragliding World Cup Super Final twice. (The first time was in January 2013 in Roldanillo in Columbia).
Photo : Laura Sepet/PWCA

The all new Gin Boomerang 11: there were only seven in the competition and they took places 1, 2, 4, 7, 11 and 46 out of the 123 wings competing. Photo: Philippe Broers

Photo: Goran Dimiskovski

2. TEAM: AIR'G PRODUCTS
Hernan PITOCCO, Ozone EnZo 2
Felix RODRIGUEZ FERNANDEZ, Ozone Zeno
Xevi BONET DALMAU, Ozone Zeno

1. TEAM: GIN GLIDERS
Torsten SIEGEL, Gin Boomerang 11
Aaron DUROGATI, Gin Boomerang 11
Petra SLIVOVA, Gin Boomerang 10
Michael SIGEL, Gin Boomerang 11

3. TEAM: OZONE
Luc ARMANT, Ozone Zeno
Honorin HAMARD, Ozone Zeno
Seiko FUKUOKA NAVILLE, Ozone Zeno
Russell OGDEN, Ozone Zeno

At the 2016 Paragliding World Cup Super Final in January 2017, there were two familiar faces on the podiums: Seiko Fukuoka Naville (Ozone Zeno) and Aaron Durogati (GIN Boomerang 11).

It was also evident that the wings in the competition were almost exclusively made by Gin and Ozone, spread over three certification classifications: former CCC (Enzo 2), new CCC (Boomerang 11) and serial class certification EN D (Zeno).

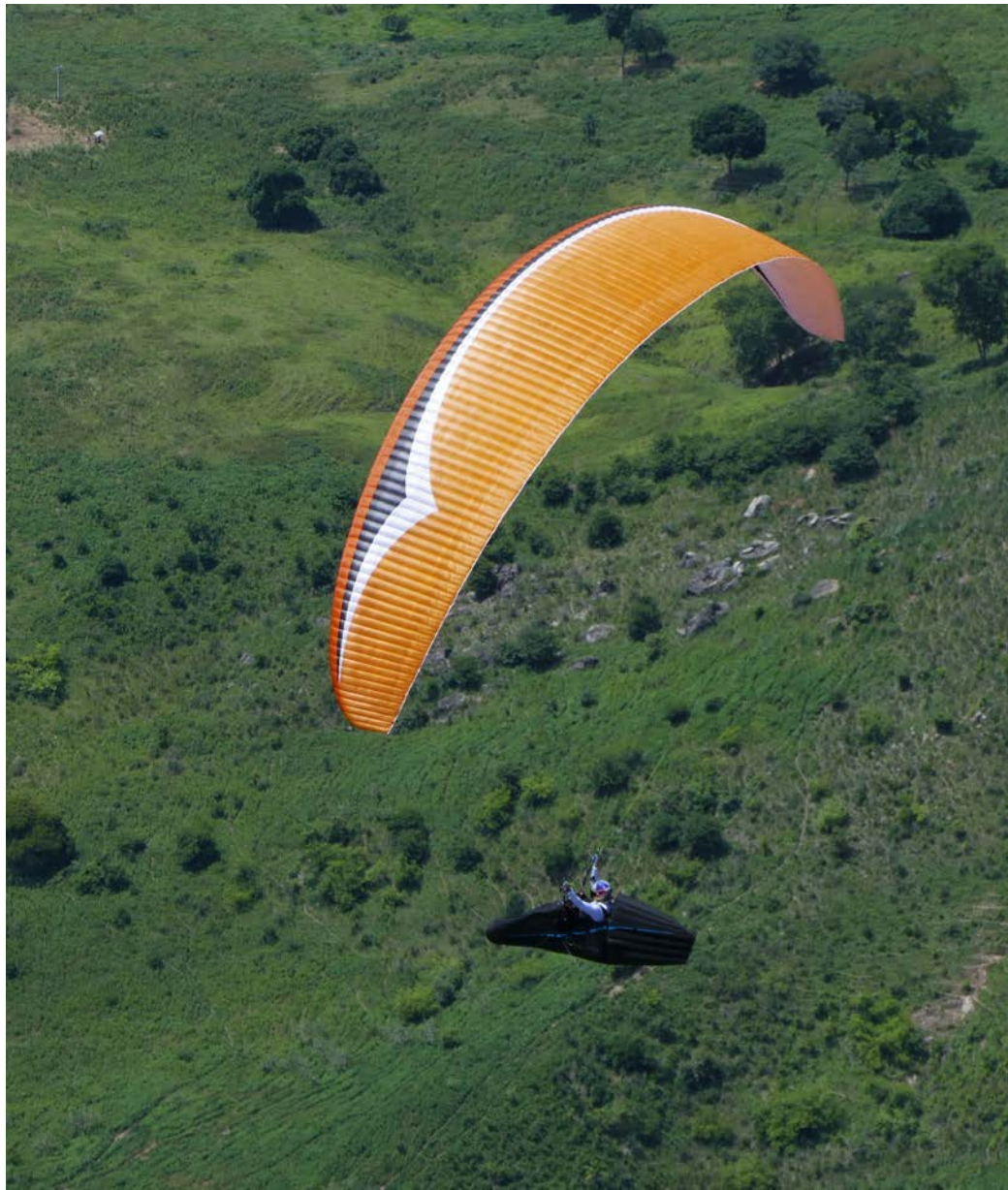
It was interesting to note that for a serial class wing the Zeno was as highly placed. Admittedly it isn't an EN D for everyone; it's more of an EN D+'.

But a bet seemed to have been won: a slightly mellower wing, with a lot lower aspect ratio, which makes it nicer to fly, letting competitors push more and thus fly better.

Photo: Philippe Broers

Michael Sigel from Team GIN, during the last task, on his way to 4th place on his Boomerang 11. Photo: Jan Sterren

Winner: Aaron Durogati on his Boomerang 11 where the large number of cells clearly contributed to the creation of a very smooth upper surface. Photo: Goran Dimiskovski



Fortunately it's a trend which is also spreading, particularly into the world of recreational wings. More and more pilots are changing from EN C to EN B wings and managing to do just as big XC distances, or more, by being able to overcome the stress caused by a more demanding wing.

It was therefore interesting to see the same logic incorporated for the first time in a competition of this type. Unfortunately there was a card which the Zeno couldn't play: being mellower allowed it to fly faster, but during this Super Final, it wasn't speed which paid off. Neither the speed, nor the boldness of the pilots was of any use as they all stayed pretty much grouped together in the gaggle.

However, to make the competition more exciting and interesting for the spectators the organisers tried to encourage the pilots to lead out on their own. The radiuses around the turn points where deliberately chosen to be large, giving more possible routes. Another way of encouraging risky tactics was the possibility for pilots to drop their poorest tasks thanks to the discard system. But when flying over rolling hills, as was the case during the Super Final, it was evidently wiser to stay with the gaggle where it was easier to spot the best places to go.

The Boomerang 11 made an amazing debut in this Super Final: it was the wing flown by both the winner and the winning team (except for Petra's Boomerang 10).

A Gin Boomerang 11 taking off. It has a lot more cells than the Boomerang 10: 109 in the current version. Gin still haven't communicated all the technical details of the Boomerang 11, this model still being subject to possible changes. The model in Brazil was one of the first models to be certified according to the new version of the CCC norms. Photo: Laura Sepet

Apparently Gin have improved the glide and its ability to climb in all conditions. In addition, its sensitivity to nearby thermals is particularly good. It appears that the glide ratio remains very good across the whole polar curve which is fairly flat and only drops at maximum speed which is very high on this model. The wing was certified according to the new CCC norm which gives more options for flying fast.

Everyone is now looking forward to the duel between the Boom 11 and the Enzo 3, which should theoretically take place for the first time at the World Championships this summer. It will also be interesting to see how many of the Zeno pilots will move onto the Enzo 3 at that point to make the most of the top level performance which will inevitably be better on a wing with a higher aspect ratio.

How many will have chosen the Zeno as the temporary solution until the Enzo 3 comes out? How many will stay, even in 2017, on the Zeno and try to make the most of its comfort and maximum speed to compete against the B11?
Answers this summer…

Petra Slivova was part of Team Gin, but as there isn't a Boomerang 11 in size small yet, she flew a Boomerang 10. Photo: Goran Dimiskovski

The Ozone Zeno: a serial class wing certified EN D, placed between the Mantra 6 and the Enzo. According to Ozone, it was the fruit of, amongst other things, the current Enzo 3 R&D. The Zeno has 78 cells and an aspect ratio of only 6.9, compared to the 101 cells and 7.5 aspect ratio of the Enzo 2. In theory, one of the strengths of the Zeno is its speed: thanks to its better behaviour it can be accelerated to much higher speeds.

It was well represented amongst the top places. Out of the 123 wings in the competition, 46 were Zenos, and the best placed came 3,5,6,8...

Photo : Goran Dimiskovski

The Ozone Enzo 2: 101 cells and an aspect ratio of 7.55. There were exactly the same number of Enzo 2s as Zenos, 46 of each wing, but the Enzo 2s were less well placed, (9, 10, 13, 14, 16,17 ...).

Some pilots are no doubt eagerly awaiting the arrival of the Enzo 3, expected this summer.

Photo : Goran Dimiskovski

Three 'older' Gin Boomerang 10s: out of the 123 wings, 20 were Boomerang 10s..
Photo : Goran Dimiskovski

Apart from the Boomerangs, Enzo 2s and Zenos, there were a few rare more 'exotic' wings: a Dudek Coden Pro (here in the photo with its 7.5 aspect ratio and 98 cells), a Skywalk Poison X-Alps and an Ozone Mantra 6.
Photo : Goran Dimiskovski

OVERALL SCORES

RANKING	ID	NAME	Country	GLIDER	SPONSOR
1	0006	Aaron DUROGATI	ITA	Gin Boomerang 11	FLY GIN DR ZIPE Red Bull Salewa AeCi Dynafit
2	0019	Adrian HACHEN	CHE	Gin Boomerang 11	Gin Gliders
3	0030	Charles CAZAUX	FRA	Ozone Zeno	Morzine l Ozone l Merrell l Naviter
4	0022	Michael SIGEL	CHE	Gin Boomerang 11	Gin Gliders, Jack & Jones Tech, Naviter
5	0001	Stefan WYSS	CHE	Ozone Zeno	skywings.ch / SPÄLTI / Ozone
6	0005	Xevi BONET DALMAU	ESP	Ozone Zeno	Ozone-Alamair-Naviter-Alfapilot
7	0018	Torsten SIEGEL	DEU	Gin Boomerang 11	Gin Gliders, Pets Premium, Naviter
8	1110	Jurij VIDIC	SVN	Ozone Zeno	Agring d.o.o., Naviter
9	0009	Jean Marc CARON	FRA	Ozone EnZo 2	ABAC-Niviuk-SNCF-CG de l'Ain-Julbo
10	1112	Primoz SUSA	SVN	Ozone EnZo 2	Naviter, paraclinic.at, niceclouds.si
11	0069	Idris BIRCH	GBR	Gin Boomerang 11	Gin Gliders
12	0046	Miguel DIAZ RUIZ	ESP	Ozone Zeno	Ozone- Alamair
13	2424	Pierre REMY	FRA	Ozone EnZo 2	Hautes Pyrénées-Midi Pyrénées-AXA Wailly-VLB-VLPD
13	0292	Xavier PUJOL BARRICARTE	ESP	Ozone EnZo 2	Club Alaire
15	0031	Tilen CEGLAR	SVN	Ozone Zeno	Naviter | High Adventure Switzerland
16	0051	Antoine GERIN-JEAN	FRA	Ozone EnZo 2	Aerogliss SupAir CDLB
17	0291	Hernan PITOCCO	ARG	Ozone EnZo 2	Redbull-Ozone--Weber-Saint Gobain
18	0423	Jacques FOURNIER	FRA	Ozone Zeno	Parateam, Le Bip Bip, Woody Valley
19	0025	Jonathan MARIN	FRA	Ozone Zeno	ABAC, Niviuk, XC Tracer,Sans Le Vnt du Pilat
20	0017	Tim ROCHAS	FRA	Ozone EnZo 2	ProvencePara_Compass_Praloup_Ubaye_Bringdal famil
21	0033	Stephane DRYesN	FRA	Ozone Zeno	Conseil General 73/ PCHT/ 4eme Dimension/Syride
22	0071	Thomas GURY	FRA	Ozone Zeno	SPORT PASSION - SDAG - INTERMARCHE - AXA - NETIZI
23	0010	Christian BIASI	ITA	Ozone Zeno	Trentino / Montura / Aire / AeCI ITALIA
24	0631	Cody MITTANCK	USA	Ozone EnZo 2	Ozone Gliders, Bozeman Paragliding
25	0302	Damien LACAZE	FRA	Ozone Zeno	SUP'AIR / Elite Hautes-Alpes / WAA-Ultra
26	0397	Julian ROBINSON	GBR	Gin Boomerang 10	UK Airsports, S&W
27	0702	Franz ERLACHER	ITA	Ozone Zeno	Aire-Cornizzolo, Hochganghaus, AeCI
28	0483	Gleb SUKHOTSKIY	RUS	Ozone EnZo 2	Crimea-Paragliding.com
29	0059	Martin REBORD	FRA	Gin Boomerang 10	Module.be/Sup'air/Crest-Voland Cohennoz/Volatiles
30	0270	Yigit YILDIRIM	TUR	Ozone EnZo 2	Reaction Paragliding
31	0011	Luc ARMANT	FRA	Ozone Zeno	Ozone
32	0032	Seiko FUKUOKA NAVILLE	FRA	Ozone Zeno	Addactis - Ozone - Certika - Compass - One Day
33	0718	Brendan REID	GBR	Ozone EnZo 2	The Sick and the Wrong
34	0213	Nicole FEDELE	ITA	Ozone Zeno	Compass Italy, Zanier Gloves, AeCI
34	1277	Jan STERREN	CHE	Ozone EnZo 2	pixon-ch.com
36	0015	Russell OGDEN	GBR	Ozone Zeno	Ozone
37	0036	Maxime BELLEMIN	FRA	Ozone EnZo 2	http://blog.maximebellemin.com
38	0087	Francisco MANTARAS	ARG	Ozone EnZo 2	Ozone Argentina, SupAir Argentina, ProAirex.
39	0074	Emmanuel NICOLAS	FRA	Ozone Zeno	REDBULL SPECT EYEWEAR Domtom
40	0410	Erico OLIVEIRA	BRA	Gin Boomerang 10	ActionFly Rio, Niviuk BR, CSCVL, Mormaii
41	0898	Peter NÄGELE	DEU	Ozone Zeno	Apollo 11
42	0002	Julien WIRTZ	FRA	Ozone Zeno	Ozone, Certika
43	0492	Téo BOUVARD	FRA	Ozone EnZo 2	Ressources Parapente
44	1181	Yongtae AHN	KOR	Gin Boomerang 10	GIN GLIDER
45	0016	Felix RODRIGUEZ FERNANDEZ	ESP	Ozone Zeno	OZONE - NACEX - CERTIKA - JULBO - ALFAPILOT
46	0035	Tim BOLLINGER	CHE	Gin Boomerang 11	zorro.ch, gingliders.com
47	0004	Alexandre JOFRESA	FRA	Ozone Zeno	Ozone
48	0054	Laurie GENOVESE	FRA	Ozone Zeno	Axa Assurance - Les Passagers du Vent - Bergans
49	0373	Gildas BEN	FRA	Ozone EnZo 2	
50	0407	Simon PELLISSIER	FRA	Ozone EnZo 2	Pôle espoirs font romeu/Orcieres 1850/Resources P
51	0057	Gianbasilio PROFITI	ITA	Gin Boomerang 10	Aero Club d'Italia (AeCI)
52	0226	Yury MISHANIN	RUS	Ozone EnZo 2	
53	0029	Yoshiaki HIROKAWA	JPN	Ozone EnZo 2	JPM Hamanako Paraglider School / Netflowers inc
54	0003	Luca DONINI	ITA	Ozone Zeno	AireCornizzolo,Vola Bass Molveno,Woody Valley,AeC
55	0048	Thibaut LAVOLÉ	FRA	Ozone EnZo 2	top meteo
56	0013	Lucas BERNARDIN	FRA	Ozone EnZo 2	
57	1115	Moonseob LIM	KOR	Gin Boomerang 11	GINGLIDERS
58	0233	Martinho RIBEIRO MORAIS	BRA	Ozone EnZo 2	Ynovar - ARTCON - Ildemari Tecidos
59	0316	Stanislav MAYER	CZE	Gin Boomerang 10	Aktualne.ce,Kernun, Gin, HighPoint,LAA CR,Certico
60	0023	Biagio Alberto VITALE	ITA	Ozone EnZo 2	AIRE,DMDCONDIZIONAMENTO.IT,CORBELLI ,AECI,DIGIFL
61	0374	Clement HOELTER	FRA	Ozone Zeno	
62	0101	Petra SLIVOVA	CZE	Gin Boomerang 10	GIN GLIDERS

RANKING	ID	NAME	Country	GLIDER	SPONSOR
63	0056	Francisco Javie REINA LAGOS	ESP	Ozone Zeno	Ozone - Alamair
64	0232	Deonir SPANCERSKI	BRA	Ozone EnZo 2	
65	0328	Michele BOSCHI	ITA	Ozone EnZo 2	AeCI - Digifly - Neonoptic
66	0229	Cristiano RICCI	BRA	Ozone EnZo 2	Nafar Academia / SMEL/ Black Bird
67	0222	Kiyoshi NARIYAMA	JPN	Ozone EnZo 2	up wings/Happiness
68	0012	Honorin HAMARD	FRA	Ozone Zeno	Naviter-Altitude Eyewear-Ozone-Manche-4fight Icar
69	1141	Jungman CHOI	KOR	Ozone EnZo 2	Ozone Korea
70	0708	Klaudia BULGAKOW	POL	Ozone EnZo 2	Lukoil / Zanier / Salewa
71	0231	Jan Richard HANSEN	NOR	Gin Boomerang 10	Epizoom Multimedia Design
72	0050	Andreas MALECKI	DEU	Ozone Zeno	MWZ 24, Flugschule Chiemsee, DHV, DOC Life Suppor
73	0043	Clement LATOUR	FRA	Ozone Zeno	SUPAIR FFVL LT PRODUCT
74	0243	Olivier HENRY	FRA	Ozone EnZo 2	
75	0204	Bjornar TRONDSEN	NOR	Gin Boomerang 10	
76	0279	Joerg NUBER	DEU	Ozone Zeno	Apollo 11
77	3137	Alexey BYSTRITSKIY	RUS	Ozone EnZo 2	www.asa-fly.ru
78	0014	Joachim OBERHAUSER	ITA	Ozone Zeno	Airecornizzolo Superfly360 Arcteryx Mormaii AeCi
79	1511	Arnaud SECHER	FRA	Gin Boomerang 10	Kortel Design/Gin
80	0037	Maxime PINOT	FRA	Ozone Zeno	France Herboristerie,Les Passagers Du Vent,Bergan
81	0078	Patrick VON KAENEL	CHE	Ozone Zeno	schnittlau.ch Airwear/cloud-7.ch/born to fly.ch
82	0096	Marc WENSAUER	DEU	Ozone EnZo 2	GIN GLIDERS / Adventure Sports
83	1113	Durali KARACA	TUR	Ozone EnZo 2	GOSBF
84	0238	Joel LOIRE	FRA	Ozone Zeno	LOIRE - OZONE
85	0092	Keiko HIRAKI	JPN	Ozone EnZo 2	API / SKY ASAGIRI / falhawk / Kojitsu / Nagao
86	0619	Marco BUSETTA	ITA	Ozone EnZo 2	Salvatore Marchesano, AeCI
87	0245	Oguzkan SADEER	TUR	Ozone EnZo 2	GinTurkey-ISUK-Vertigo-GOSBF
88	0112	Murat TUZER	TUR	Ozone EnZo 2	ÇANHAVK
89	0008	Guy ANDERSON	GBR	Ozone Zeno	Anciano Wine, Frontiers Paragliding,
90	0511	Cyril LAMBERT	FRA	Ozone Zeno	
91	0086	Soheil BARIKANI	IRN	Gin Boomerang 10	Salomon - Suunto
92	0379	Heinrich BRETZ	DEU	Ozone Zeno	Yellow Cross
93	0085	Rafael SALADINI	BRA	Ozone Zeno	
94	0257	Russell ACHTERBERG	ZAF	Gin Boomerang 10	Jurumani
95	0218	José Luis Sudbrack GUIMARAES	BRA	Ozone EnZo 2	Ligui Laser
96	0111	Yael MARGELISCH	CHE	Ozone Zeno	J&J, Sutech, Comina, ONEDAY, Naviter
97	0376	Pierre MULLER	FRA	Gin Boomerang 10	AIR REUNION
98	0974	Mathias IOUALALEN	FRA	Ozone Zeno	
99	0611	Gaspard PETIOT	FRA	Ozone Zeno	Parastick, Sup'air
100	0090	Yoann CHAVANNE	FRA	Gin Boomerang 10	SUPAIR / GIN France/ Archamps/ Salève Airlines
101	0020	Yoshiki KUREMOTO	JPN	Ozone EnZo 2	FieldPro/Falhawk/Lasportiva/Kenn/Millet/CEBE/ECRX
102	0252	Pablo RODARTE	BRA	Gin Boomerang 10	Cumulus Escola/ParaglidingShopping/CCOVL
103	0777	Richard PETHIGAL	BRA	Ozone EnZo 2	BASE / CVLBH /TIRANTE A
104	0295	Léo HAMARD	FRA	Ozone EnZo 2	
105	0064	Yassen SAVOV	BGR	Ozone Zeno	Borovets Ski Resort
106	0365	Eugene CLAASE	ZAF	Ozone Zeno	Cape Nomads
107	0628	Méryl DELFERRIERE	FRA	Gin Boomerang 10	Gin France/Resources Parapente/XC Tracer/Acteragl
108	0209	Samuel NASCIMENTO	BRA	Ozone EnZo 2	Sol - Piloto Safo - Nossa Forma
109	0242	Denis CHOURAQUI	FRA	Ozone EnZo 2	
110	0332	Lionel LANG	FRA	Ozone EnZo 2	Adrenaline
111	0247	Semih SAYIR	TUR	Gin Boomerang 10	ISUK/GOSFB
112	0941	Antonio GOLFARI	ITA	Ozone Zeno	AeCI
113	0075	Manuel QUINTANILLA	MEX	Ozone EnZo 2	CONCEPTOQ.COM
114	0264	Hugo LARONZE	FRA	Gin Boomerang 10	Faya Bun Dem /#DirectDansLeJoint
115	0409	Moises SODRE	BRA	Dudek Coden Pro	Dudek
116	1272	Reiner BRAUN	DEU	Skywalk Poison XAlps	Skywalk
117	0808	Benedicte SAURY	FRA	Ozone Zeno	me and no-one else
118	0109	Nao TAKADA	JPN	Ozone Mantra 6	
119	0061	Julien BRUNG	FRA	Gin Boomerang 10	NEO/GIN/LAZER/Ligue Champagne Ardenne/PAP08/CDLB
120	0881	Sandy LAMBERT	FRA	Ozone Zeno	
121	0105	LYess GERIN-JEAN	FRA	Ozone EnZo 2	Aerogliss - SUP'AIR
122	0463	Davide LICINI	CHE	Gin Boomerang 10	Jack&Jones TECH, BESTSELLER.com
123	0403	Antoine CABIAC	FRA	Gin Boomerang 10	LOT, MIDY PYRENNEES, MAIRIE DE BERGERAC

A tactic which paid off during this Super Final: the gaggle faired better than the individual.
Photo : Goran Dimiskovski

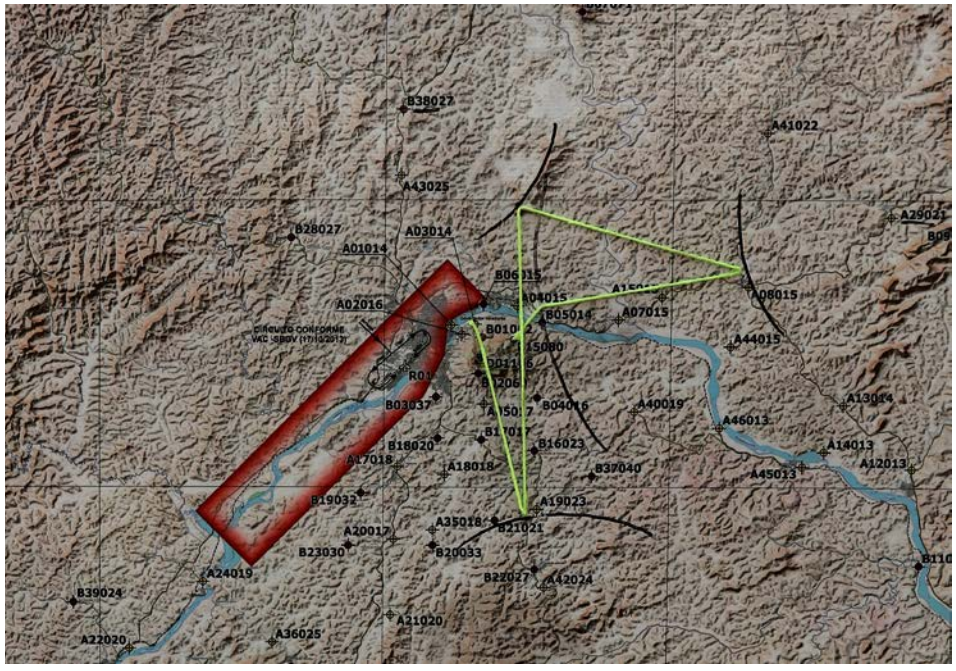
The take-off at Governador Valadares: a mountain which dominates the rolling countryside around it.

Photo: Goran Dimiskovski

The detailed briefing before the task...

FUTURE EVENTS IN THE 2017 WORLD CUP CALENDAR

France, Coeur de Savoie
20/05/2017 to 27/05/2017
Serbia, Nish, Sicevo
17/06/2017 to 24/06/2017
Switzerland, Disentis
05/08/2017 to 12/08/2017
Brazil, Pico do Gaviao
02/09/2017 to 09/09/2017
Ecuador, Guayaquil - Bototillo
28/10/2017 to 04/11/2017
For more information:
www.pwca.org



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Explorer

XC Tracer Mini acoustic vario and watch to measure the altitude: an ultra light but efficient combination.

MINI INSTRUMENTS: EVOLUTION

Little varios are evolving: there are more and more models, GPS are apprearing and solar is back...

Photos: Véronique Burkhardt

GPS-BIP

After the BipBip, here's the GPSBip. The company Stodeus have integrated a GPS into the same case, all still fed by a solar panel. Another very interesting advantage: the GPSBip talks (in several languages). It thus partially compensates for the biggest lack in small acoustic varios: they can really only communicate about the rate of climb and descent.

As soon as the GPSBip is switched on, it gives information about the battery level in a nice, relatively neutral, voice. Not surprising: the manufacturer works closely with developers who are active in audio implementation for pinball machines. In the air, every time the pilot taps the box, the altitude and the current speed are spoken. It really is very practical. You can also set the instrument so that it will give automatic announcements every x kilometres or at certain levels of altitude.

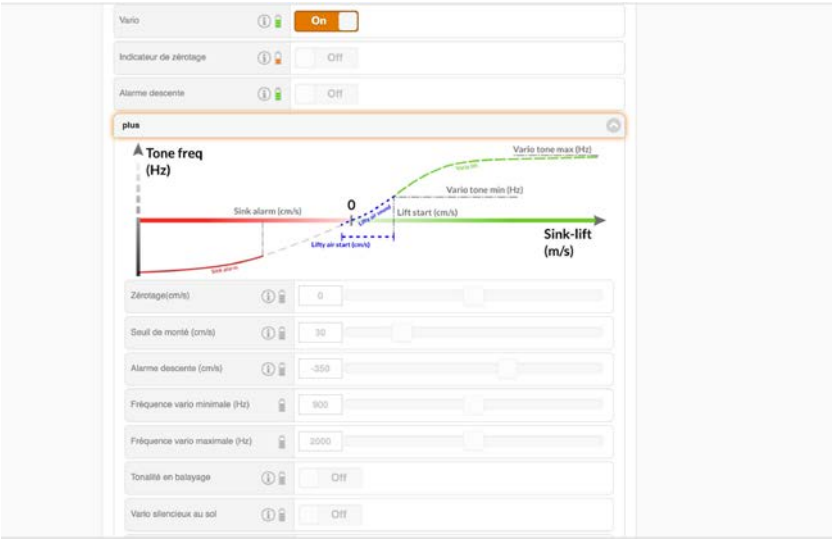
All the settings, including adapting the acoustics to your individual needs, are managed via a little 'programme' in HTML format which is in the instrument's memory, accessible by plugging into a computer's USB port. Therefore, this configuration tool works on any computer with an up-to-date web browser. The application allows the pilot to carry out all the changes very intuitively.

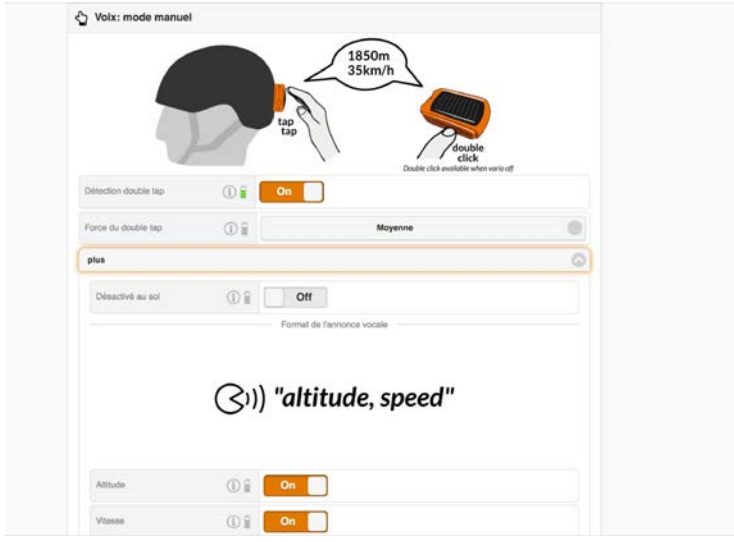
As far as plugging it in is concerned, the manufacturer hasn't included a Bluetooth connection, but an Android smartphone or a Kobo tablet can be connected thanks to a supplied cable. This possibility will be the object of a future article on tablets and telephones.

In the air, the GPSbip does its job perfectly. It is pretty reactive, but it could, of course, increase its reactivity by using algorithms integrating information from a gyrometer/accelerometer present in the case. But the designer, Timothée Manaud, still hasn't 'released' any such internal software upgrade, despite several announcements. The reason is perhaps his perfectionism which is reflected in the flawless operation of the existing functions and configurations.

With this type of algorithm the GPSBip should be able to compete with the XCTracer which has an advantage: it has a magnetometer (electronic compass),

The GPSBip, right, has the same format as the basic BipBip (left): ultralight and compact. Ideal for hike and fly...





The configuration tool: very practical.

which is missing from the GPSBip. Integrating the values from the compass could, theoretically, make it more precise.

The GPSBip saves flight tracklogs equally in both KML and IGC format. The latter is officially validated by a G-Record and therefore recognised by all XContest type servers. Adjusted to the most precise and finest resolution, the GPSBip stores 5 points per second, with greater precision thanks to the simultaneous use of GPS and GLONASS satellites. The precision is such that, according to Timothée, the Ozone R&D team use tracklogs produced by the GPSBip to measure the glide of their prototype wings.

For 'normal' use a lower resolution is sufficient. Then, the GPS-vario consumes less, and is perfectly capable of powering itself with its solar panel without drawing on the battery. It's an amazing leap forward: no need to recharge the vario although it has a GPS, it beeps loudly and clearly and regularly gives the speed and altitude vocally...

A beautiful jewel in the technology crown, ultralight and compact, for a price which is perfectly reasonable!

BIPBIP	
DIMENSIONS (cm)	5.5 x 3.5 x 1.5 cm
VISUAL DISPLAY	-
SOUND	3 volume levels
WEIGHT (g)	25
NUMBER OF BUTTONS	1
GPS	-
REGISTERS TRACKLOG	-
OTHER SENSORS	-
INTERFACE	
BATTERY LIFE	100 h
POWER SUPPLY	Solar, internal battery
PRICE (€)	99
WEB	http://www.lebipbip.com/solar-vario/

GPSBIP	
DIMENSIONS (cm)	5.7 x 3.6 x 1.7
VISUAL DISPLAY	1 LED
SOUND	3 volume levels, configurable, voice in several languages
WEIGHT (g)	35
NUMBER OF BUTTONS	Only 1 On/Off, plus touch sensitive
GPS	Module GPS/GLONASS/Galileo
REGISTERS TRACKLOG	Yes, IGC (G-record valid) and KML
OTHER SENSORS	Pressure, accelerator and gyroscope sensors
INTERFACE	USB (communication + mass storage)
BATTERY LIFE	30 h default mode, 5 hours in ultra precise mode
POWER SUPPLY	Solar, internal battery
PRICE (€)	250
WEB	http://www.lebipbip.com/legpsbip-solar-vocal-gps-alti-vario/

Buzz Z5

SharkNose Performance, Legendary Comfort

The Buzz Z5 has become the standard for the Intermediate Class with the perfect balance of performance and safety for pilots who fly 30-50 hours per year, or for experienced pilots seeking a wing with high levels of passive safety and comfort. Contact your local OZONE distributor for a test flight to feel the confidence for yourself.

WWW.FLYOZONE.COM

SKYDROP

A very small screen, but nonetheless the information is visible if you attach it to the risers.

SKYDROP	
DIMENSIONS (mm)	98 x 57 x 19
VISUAL DISPLAY	Graphic screen/text
SOUND	Adjustable
WEIGHT (g)	68 g
NUMBER OF BUTTONS	3
GPS	Yes
REGISTERS TRACKLOG	Yes, IGC (G-record valid) and KML
OTHER SENSORS	Digital compass, accelerator and gyroscope sensors
INTERFACE	USB, Bluetooth (Classic)
BATTERY LIFE	7h-13h
POWER SUPPLY	Battery 900 mAh
REMARKS	
PRICE (€)	225 €
WEB	http://www.skybean.eu/skydrop

The new version (left), the old one (right): the screen is a lot better now.

The Slovak company SkyBean makes and develops this rather unusual instrument. The screen is a bit small, but with the instrument fixed to the riser, the display is readable. There are numerous configurable display fields. In one screen, the instrument displays a graphic curve of the rate of climb and sink over the last few seconds - very practical.

In an all new version of the firmware, there are new displays of the wind speed and direction but we haven't managed to test their accuracy yet. There will also be the possibility of uploading geographic relief profiles so that height above ground can be displayed.

An airspace map isn't anticipated for the moment.
Connection to smartphones and apps like XCsoar will be the subject of another article.

Everything is readable, although the altitude could be a bit clearer.

As far as the design is concerned, the Slovak company are confident.

XC-TRACER I & II

The XCTracer Mini behind and the XCTracer classic in front.

XC - TRACER I	
DIMENSIONS (mm)	57.5 x 57.5 x 19.25
VISUAL DISPLAY	LED
SOUND	Adjustable
WEIGHT	61 g
NUMBER OF BUTTONS	1
GPS	Yes
REGISTERS TRACKLOG	IGC, KML
OTHER SENSORS	Barometre, gyrometer, compass and accelerometer
INTERFACE	USB, SD-Card, Bluetooth LE
BATTERY LIFE	14 h
POWER SUPPLY	internal battery
PRICE	265 €
WEB	https://www.xctracer.com

We have already tested the XCTracer and seen how promptly it reacts, thanks to the AHRS system, which it pioneered.
http://www.free.aero/en/contentsHTML/instruments-e/?page=51

The improved reactivity is clearly useful especially in weak conditions and coming out of thermals. In 'normal strong' conditions, the difference is less noticeable.

The acoustics can be parameterised in the configuration file.
The recording of the tracklogs is precise (1/s for IGC, 5/s for KML).

Via Bluetooth LE, the XCTracer can communicate using a smartphone, a tablet or even Recon Jet sunglasses. We'll review this aspect in a future article.

Version II, Spring 2017: there is also a solar version.
We'll test it as soon as possible. Price 295 €.

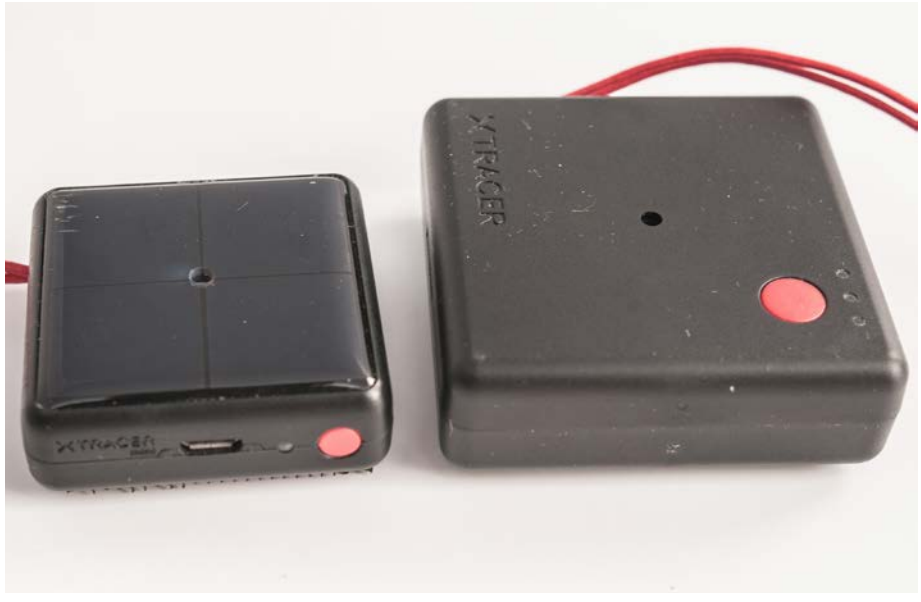
XC-TRACER MINI

XC - TRACER MINI	
DIMENSIONS (mm)	44.5 x 44.5 x 16.5
VISUAL DISPLAY	1 LED
SOUND	4 volume levels
WEIGHT	30 g
NUMBER OF BUTTONS	1
GPS	-
OTHER SENSORS	Barometre, gyrometer, compass and accelerometer
INTERFACE	USB to charge and edit the sound configuration
BATTERY LIFE	Without sun 8h - 12h
POWER SUPPLY	Solar, internal battery
REMARKS	
PRICE	170 €
WEB	https://www.xctracer.com

The XC-Tracer Mini offers practically the same AHRS algorithm as the 'full' XC-Tracer and it consistantly reacts just as quickly. However, there isn't a GPS, even though it would theoretically contribute to calculations on the full XCTracer.

Hence, the XCTracer mini is a lightweight version of the XCTracer, but never gets a flat battery thanks to its solar panel. It is a lot smaller and lighter, to the point of being able to stay permanently attached to the shoulder of the harness (don't put it on the helmet as this position is not good for inertia measurements).

XCTracer Mini and XCTracer classic.



A vast subject: the connection of minature varios via Bluetooth to tablets and/or smartphones to transfer barometric and variometric values (including AHRS).
We'll look at this in a future edition.

Ich, the owner of XCTracer testing a Kobo tablet, two XCTracers, an XCTracer II and an XCTracer Mini.
Photo: Koni Schafroth

WINNING COMBINATION

Sophisticated mini instruments aren't just useful for hike and fly. A top of the range instrument like the C-Pilot Evo can be used in conjunction with an XCTracer Mini for example: the C-Pilot can do everything except use the AHRS algorithms with its vario as there is no gyroscope.

The XCTracer therefore takes care of the ultra-reactive 'Beep', whilst the C-Pilot Evo does all the mapping and navigation work.

NANO

A pretty instrument with a difference: there are no buttons. You switch it on either by touching it, or by bringing it into contact with a magnet like those on the brake handles. This was our preferred method.

To change the volume or the thresholds, you need to open it up and change the potentiometers. The maximum volume is a bit feeble, but the sound is very high pitched and therefore more audible. It's also very sensitive.

VARI UP - NANO	
DIMENSIONS (mm)	63 x 35 x 13
VISUAL DISPLAY	No
Sound	climbing threshold (0 m/s à 1m/s) Sink alarm (-1m/s à -5m/s) Sound volume
WEIGHT (g)	15,5 g
NUMBER OF BUTTONS	0 (!)
GPS	-
OTHER SENSORS	-
INTERFACE	shock, magnetic field
BATTERY LIFE	150h flying/3 years on standby
POWER SUPPLY	Battery: Type CR2032 3V
PRICE	49.90 €
WEB	https://www.variup.com

P-Series

KLIMBER P

Naturally competitive, designed for your adventure

The result of our obsession to create the perfect balance between super-lightness and unrelenting performance.

SKYTRAXX TWEETY

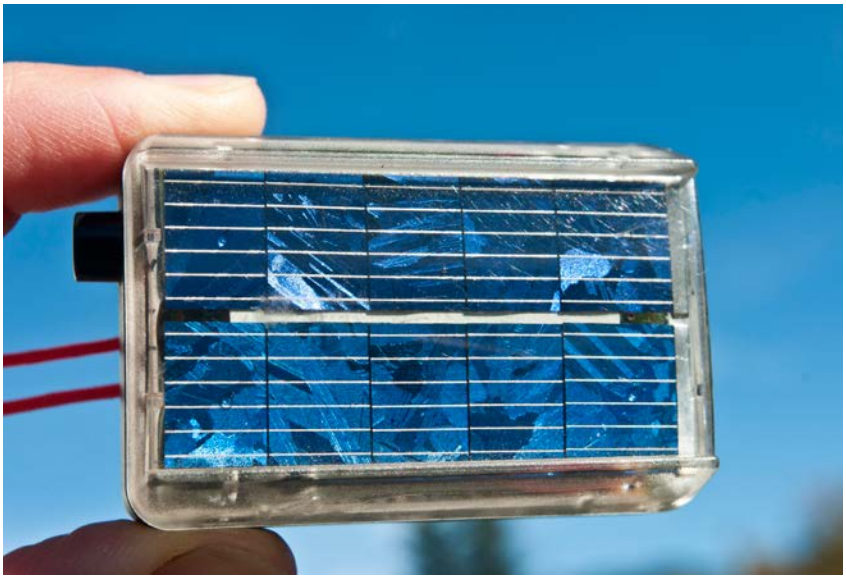
SKYTRAXX TWEETY	
DIMENSIONS (mm)	3,5 x 6,5 x 1,1
VISUAL DISPLAY	No
SOUND	Volume constant climbing: > 0.3m/s sinking: < -2.5m/s or off
WEIGHT (g)	23
NUMBER OF BUTTONS	1
GPS	-
OTHER SENSORS	-
INTERFACE	-
BATTERY LIFE	200 h
POWER SUPPLY	CR2450
REMARKS	
PRICE (€)	45.90
WEB	https://www.skytraxx.eu/shop?product_id=290

In response to popular demand, the manufacturer Skytraxx has brought out a small, simple instrument which they have kept as cheap as possible. It is a sharp contrast to the very hi-tech instruments like the Skytraxx 3.0 (that we will test in detail in a future edition).

The Tweety is very cheap, light and very simple. You can switch on/off the sink alarm and the volume remains constant, at an average level.

After switching it on, it takes a few seconds to get going and then it is very reactive.

RENSCHLER SOLARIO BLUE



Left: the oldest minivarios have existed since 1993...
Nearly twenty five years later, a new version is about to come out... There are no photos yet, but we already know a few technical details: GPS, Bluetooth, AHRS (gyrometer, accelerometer and compass), voice output and speed measured by pitot tube (interesting).

We're looking forward to seeing and testing it.

www.renschler.de

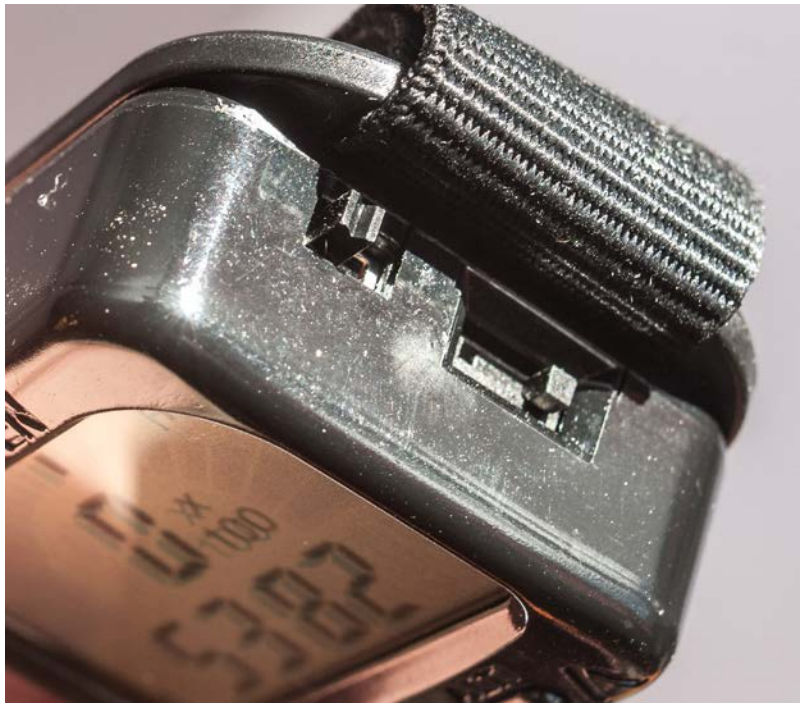
ALTIVARIO FAIRHAVEN

This instrument, which is designed to be worn on the wrist, is easy to read from every angle.

MICRO ALTI PLUS	
DIMENSIONS (mm)	37 x 37
VISUAL DISPLAY	Figures and graphic segments
SOUND	Adjustable menu
WEIGHT (g)	28 g
NUMBER OF BUTTONS	3+2
GPS	-
OTHER SENSORS	Accelerator
INTERFACE	-
BATTERY LIFE	< 5 days
POWER SUPPLY	100 mAh LiPo
PRICE (€)	140 approx
WEB	www.altivario.com

A very unusual instrument: very small and light but nonetheless equipped with a nice contrasty screen. It is designed to be attached to the wrist like a watch. The sound threshold is altered using the menu, and can also be switched off thanks to a mechanical button.

Making changes via the menu is done using three buttons. It isn't very intuitive but you get used to it. The designer evidently comes from an aeronautical background: in the standard setup, the altitude is in feet, so you may want to change it to metres. But above all, you can adjust the altitude using QNH/QFE pressure: just like in a 'real plane'...



The 'On/Off' and mute buttons are fairly classic.

For paramotorists, there are two other functions: an adjustable countdown to give an idea of how much fuel is left, and the possibility of plugging in external headphones for the vario sound.

On a paraglider it isn't necessary, as this vario is one of the noisiest.

It can display maximum values encountered, including Gs from the integrated accelerometer.

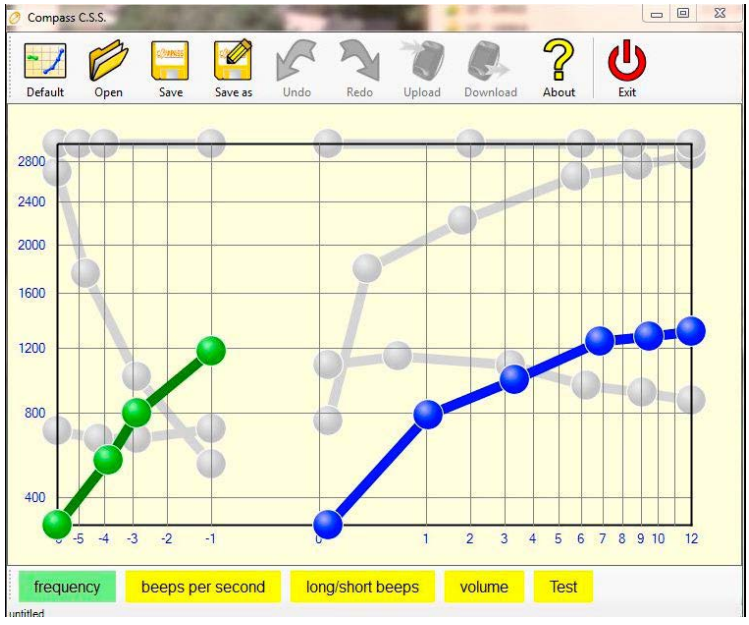
An interesting instrument which is very universal and also good for hike and fly.

www.altivario.com

COMPASS BEEPER

COMPASS BEEPER	
DIMENSIONS (mm)	67 x 42 x 19
VISUAL DISPLAY	No
WEIGHT	35 g
NUMBER OF BUTTONS	2
GPS	No
REGISTERS TRACKLOG	No
OTHER SENSORS	No
INTERFACE	USB
POWER SUPPLY	Solar
PRICE	99 €
WEB	http://www.compass-italy.com/product.php~idx~~~3~~Beeper~.html

The Compass Beeper is a pioneer amongst sun powered acoustic instruments.
It has another characteristic: via USB, you can load the accoustic profiles made on a C-Pilot Evo or on the Compass Sound System software. Therefore it's a mini instrument with sound which can be customized just like a top of the range instrument.



SKYBEAN

SKYBEAN	
DIMENSIONS (mm)	28 x 62 x 15
VISUAL DISPLAY	LED
SOUND	Configurable on a PC
WEIGHT	24 g
NUMBER OF BUTTONS	1
GPS	-
OTHER SENSORS	-
INTERFACE	Can be configured with a Skybean PC USB
BATTERY LIFE	250 h
POWER SUPPLY	Button battery CR2032
PRICE	60 €
WEB	http://www.skybean.eu/skybean-variometer

The Skybean, here in a special 'wooden case' version, is very small and practical. Interestingly: the audio configuration is done via a special PC interface, given that the box doesn't allow a classic USB connection... It's beautiful, practical and reactive. The volume of the sound is fairly powerful.

SYS'ONE

SYRIDE - SYS ONE	
DIMENSIONS (mm)	53 x 43 x 14
VISUAL DISPLAY	Yes, LED
SOUND	Adjustable volume Thresholds adjustable: from +0.1 m/s to +0.5m/s and from -0.5 m/s to -2.5m/s can be zeroed from -0.1m/s to +0.1m/s
WEIGHT (g)	19
NUMBER OF BUTTONS	3
GPS	-
REGISTERS TRACKLOG	-
OTHER SENSORS	-
INTERFACE	-
BATTERY LIFE	290 h
POWER SUPPLY	Battery: CR2450
PRICE	69 €
WEB	https://www.syride.com/en/instruments

We've already reviewed it: it's a very light vario which fixes either onto the wrist with a velcro bracelet, or onto a helmet using a velcro sticker.

Its distinct feature is the visual display of climb and descent rates by LED: it's effective on a paramotor for maintaining level flight. The volume of the sound is average.

SYS'NAV V3

SYRIDE - SYS'NAV	
DIMENSIONS (MM)	10 x 61 x 1.7
VISUAL DISPLAY	Grayscale screen
SOUND	parametrable
WEIGHT (G)	91
NUMBER OF BUTTONS	3
GPS	Yes
REGISTERS TRACKLOG	IGC/KML
OTHER SENSORS	accelerator
INTERFACE	USB
BATTERY LIFE	45 h
POWER SUPPLY	Rechargable Lilon battery
PRICE	399 €
WEB	https://www.syride.com/en/instruments

In general, it shouldn't be in this article because it isn't a minivario but instead, a real top of the range instrument which even offers navigation functions, heights above the ground and a display showing simplified maps. But as it really is very small, very light and can be easily attached to the riser (this is even ideal), here it is, once again: the excellent SysNav V3 in figures...

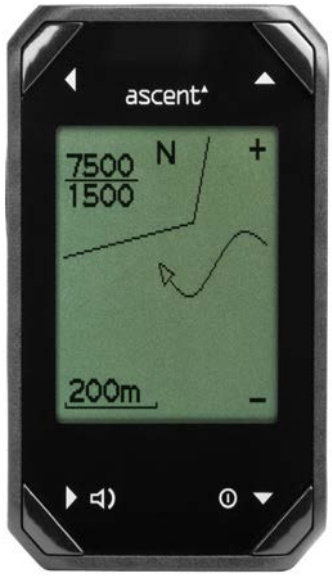
FLYNET XC1

FLYNET XC1	
DIMENSIONS (cm)	65 x 65 x 20 mm
VISUAL DISPLAY	LED
WEIGHT (g)	51 gr
NUMBER OF BUTTONS	1
GPS	Yes
REGISTERS TRACKLOG	Yes
OTHER SENSORS	Barometer
INTERFACES	Bluetooth 4.0 low energy, Bluetooth 4.0 standard, USB
BATTERY LIFE	15 h
POWER SUPPLY	interne
PRICE (€)	342
WEB	http://www.flynet-vario.com/

The ASI Flynet was one of the first lightweight acoustic varios which communicated by Bluetooth. After the XC1 version, the manufacturer stopped the series.

ASCENT

ASCENT H1+H2	
DIMENSIONS (cm)	8,34 x 5,5 x 1,49
VISUAL DISPLAY	Yes
WEIGHT	93 g
NUMBER OF BUTTONS	4
GPS	Yes
REGISTERS TRACKLOG	IGC,KML
OTHER SENSORS	-
INTERFACE	USB
BATTERY LIFE	10 h
POWER SUPPLY	Lithium-Ion 830 mAh
PRICE (€)	300
WEB	www.ascentvario.com



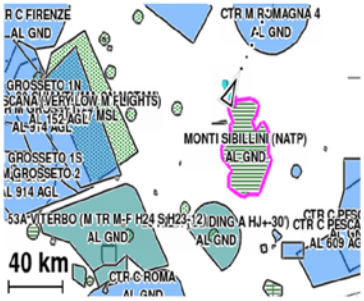
Also one of the pioneers of ultra-light instruments with a GPS. With the H2, they're back with a new version: A faster and more sensitive GPS, improved USB connector, memory doubled from 4 MB to 8 MB and acoustics modified to give better battery life. The screen is more robust and replaceable. Graphic display of airspace from Spring 2017. The price remains unchanged.

COMPASS

The more you know the less you take risks

IMPROVED SOFTWARE

IMPROVED MAPS



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AIRSPACES

NEW TOPOGRAPHIC VECTORIAL MAPS

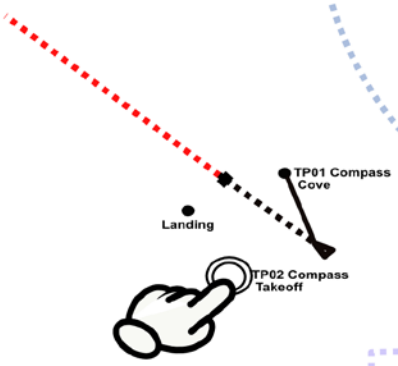
Cities, rivers, lakes, names and altitude of mountains

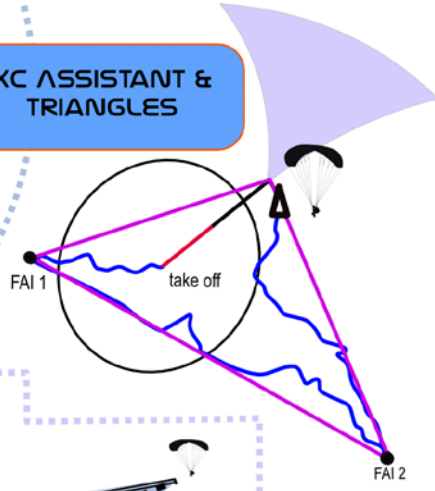
LONG LIFE BATTERY

NEW HARD GLASS

NAVIGATION BY TOUCH

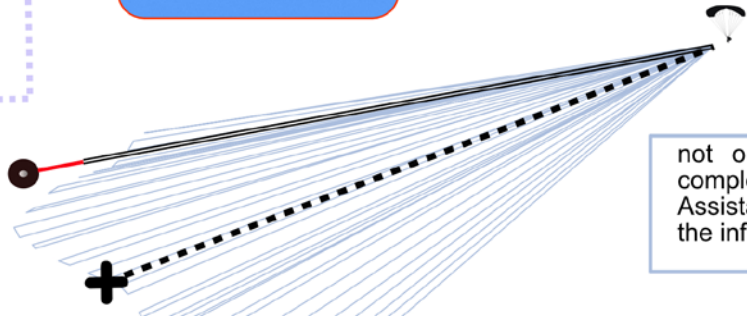
XC ASSISTANT & TRIANGLES





GLIDE OVER TERRAIN

choose a "goto" by a simple touch in the map. Move and zoom the maps



not only triangles ... a complete XC flight Assistant to give you all the informations needed

watch in real time where and at what altitude your transition will end considering the terrain: crossing is much more easy!

The XC - Instruments

Designed for the Cross Country Pilot

We give you all the data to let you take the best decisions

A hole in the piston: as a general rule, this is the result of over heating, if the motor runs too lean for example.
Photo : Christian Reuter

CHT-EGT
VALUABLE READINGS

Monitoring the temperature of a motor can save it.

The Motomonitor instrument (see following pages) is trying to make inroads into a market where numerous manufacturers have only had limited success: monitoring engine temperatures. Often technical problems have marred their smooth running: for example inconsistent readings being displayed for the revolutions per minute, or the difficulty of attaching a temperature sensor for the exhaust gas.

The question is: which values are really important?
In 'grown-up' aviation, it would be inconceivable not to monitor all these temperatures. But for paramotorists, it's very rare to measure the exhaust gas temperature, EGT.

On the following page there is a summary of some of the important variables.

Some more or less 'historical' measuring instruments.

A popular instrument with pretty good performance: a Flymaster M1. It can operate stand-alone but is, above all, effective for transmitting readings to an instrument in the Flymaster range, all of which are compatible.

REV COUNTER

The display of revolutions per minute helps, amongst other things, to monitor throttle efficiency. On full throttle, the pilot can see if the machine reaches its usual maximum power. The sensor is easy to attach: often, it's just a wire wrapped around the H.T. lead, which measures the number of pulses.

A rev counter sensor: a wire wrapped around the H.T. lead.

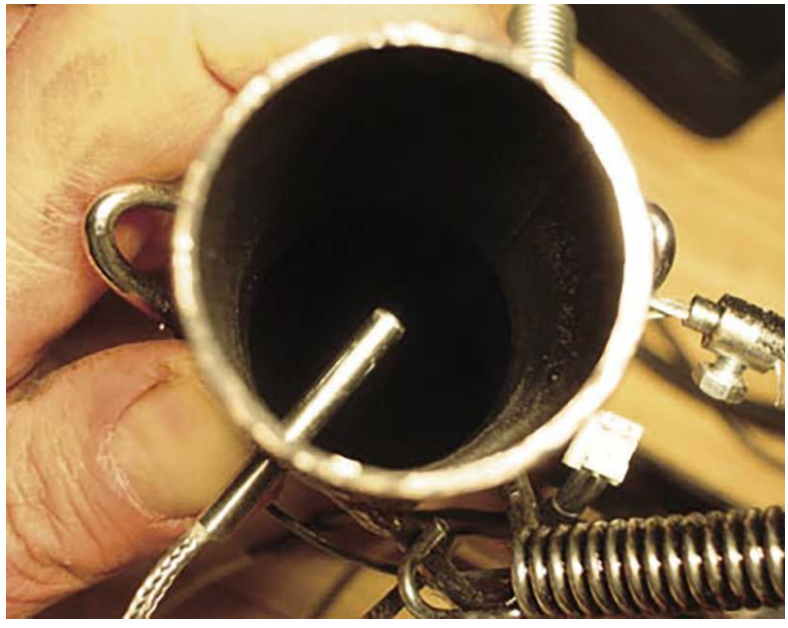
CHT : CYLINDER HEAD TEMPERATURE

This is relatively easy to measure, with a sensor attached around the thread of the spark plug. The normal temperature depends heavily on the engine; you need to know it. Often it's about 200 °C but, in engines like some Simonini Mini 2s, it can remain around 160°-180 °C, whilst others operate at around 240 °C. Monitoring the reading can save an engine: if the temperature increases abnormally, the pilot can stop the engine in time. One possible reason for overheating: the carburettor gives a mix of fuel/air which is too lean. When it is working normally, the engine is partially cooled by the evaporation of a certain quantity of unburnt petrol at the cylinder exhaust port. If it is insufficient, the motor heats more.

A CHT sensor attached under the spark plug.

EGT : EXHAUST GAS TEMPERATURE

This is more difficult to measure as you need to make a hole in the exhaust pipe to insert the sensor. The reading is very valuable: in heavier aircraft it is used throughout the whole flight to regulate the richness of the fuel/air mix depending on the altitude. On a paramotor, it can be an early warning of a problem, because it increases immediately, with less inertia than the CHT. The absolute value depends heavily on the position of the sensor in the exhaust pipe; it can run at around 500 °C-600 °C, but also reach 700 °C. When the pilot knows the value which corresponds to the configuration of his engine, he can monitor the variations.



An EGT sensor in the exhaust pipe, near the cylinder exhaust port.

Adventure's Tiger is one of the Simonini type engines which only rarely ever have temperature problems: Adventure take great care to only sell engines which 'don't require constant monitoring'.

In any case, no amount of monitoring gives a 100% guarantee: even in the manufacturer's testing laboratory an engine can 'die' through overheating, even though it is under close surveillance...

The rev counter on an Adventure motor: a TTG.
Adventure remain loyal to these reliable instruments, even though the throttle has changed shape.

MotoMonitor

MOTOMONITOR

The MotoMonitor from the Polish company FlyElectronics is very small and light but nonetheless very powerful.

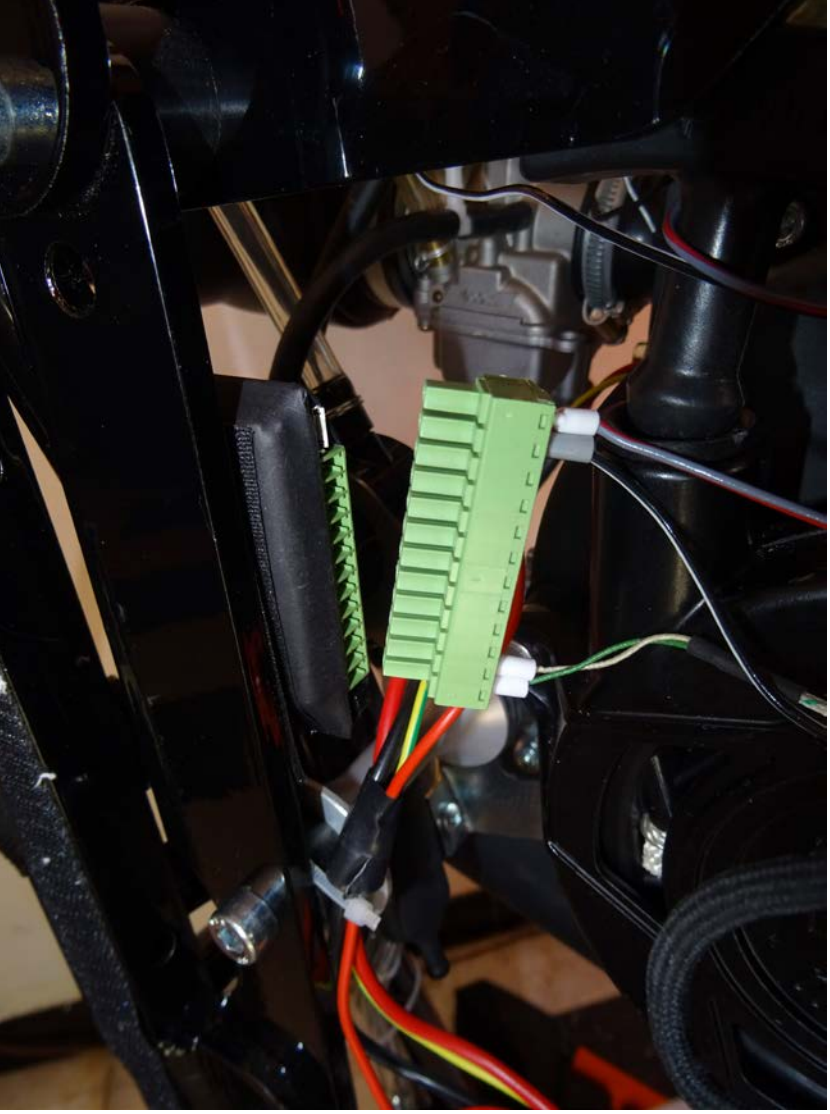
The instrument has an integrated GPS and can display the speed over the ground and is able to define and follow way-points.

But its main function is to monitor engine parameters. It comes with the three main sensors: rev counter, CHT and EGT. Different sensors for measuring the quantity of fuel in the tank are optional (not tested).

On the machine we tested, we didn't want to put a hole in the exhaust to measure the EGT, but the other sensors were attached within minutes.

The sensors are connected to a little unit fixed onto the chassis, from where the readings are transmitted wirelessly to the instrument.

The little unit linked to the sensors. It transmits the information wirelessly.



A connector allows the sender unit to be separated from the sensors, for example to charge it using its USB socket. It can also be fed directly from the battery.

Even the sensor cables are already stripped and equipped with terminals.

The new generation CHT sensor. The first ones were more fragile.

During our test, this connection was always made perfectly upon starting and worked without any interruption, contrary to other instruments tested in the past.

The instrument's colour screen is particularly bright. The data is very readable and the three display pages are well thought out. They can be reconfigured. Adjustments are done using four buttons on the edge of the instrument.

A very small case with four buttons to navigate through the menus and an incredibly bright screen.

PPGps type software (www.ppgps.info).

CONCLUSION

Very easy to fit, very light and compact, very practical to use once you've learnt how) with a very visible and informative screen: for monitoring the motor, it's without a doubt the most effective instrument that we've tested.

It remains to be seen how reliable it will be over time but, given that the designer clearly thought through the numerous details on this instrument, we're not that worried.

399 € complete with CHT and EGT sensors.

http://www.flyelectronics.eu/

399 € complete with CHT and EGT sensors.

They can be reconfigured. Adjustments are done using four buttons on the edge of the instrument.

After consulting the manual (essential for certain operations) and once you get used to it, using it becomes second nature, and the menus guide the pilot efficiently through most of the pages.

The CHT measurements and the rev counter worked in a coherent fashion, the display reacts quickly and the graphic representation in colour is particularly good.

Amongst the functions based on the GPS, the speed over the ground is, without a doubt, the most useful throughout the flight, but it is often already included in more comprehensive navigational instruments (such as a smartphone with

Photo: Jerome Maupoint/Gin

HIGH MOUNTAINS AT YOUR FEET

AIGUILLE DU MIDI

Photo: P. Pindqvist

Hike and fly isn't the only way to discover unusual take-offs. The Aiguille du Midi take-off, for example, just short of 4000 m, is easy to get to by cable car, especially in winter...

The Aiguille du Midi is one of the rare places in the Alps or the Pyrenees where 'real' high mountains are very easily accessible to everyone, from pedestrian visitors to pilots with their hands in their pockets, looking for a top to bottom flight, or more. Up there, the tourist in trainers rubs shoulders with the climber starting an ascent of Mont Blanc (via the "Trois Monts" route) – an interesting mix of people.

In winter, often between January and May, lots of skiers go up the Aiguille to ski down the famous Vallée Blanche route: 20 km of skiing through fabulous scenery.

As a result, the arête that leads down from the top station to the take-offs is equipped with ropes, thus making it more accessible: a good opportunity for an unforgettable top to bottom flight at a time when thermals are still rare.

Photo: Sascha Burkhardt

A vantage point 2800 m above Chamonix, built onto Mont Blanc: the viewing platforms on the Aiguille du Midi.

Photo: Sascha Burkhardt

Photo: Sascha Burkhardt

The arête leading down to the north and south take offs (indicated by arrows): there is no room for error, especially if it still hasn't been equipped for the winter season, as was the case in this photo taken on the 1st of January 2017.

In summer, it is never equipped: right, in September 2011. Crampons, ropes and knowledge of the necessary techniques in the big mountains are, more than ever, essential.

In any case, in July and August, taking off from the Aiguille du Midi and flying over it is forbidden.

The best time to fly off the Aiguille is therefore at the end of the winter. The cable car nevertheless works all year round, with an annual closure (5/11 – 16/12/2017).

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Price: Single 49 €, return 60 €.

http://www.montblancnaturalresort.com/

Photo: Pascal Tournaire

Photo: Pascal Toumaire

As soon as the Vallée Blanche is skiable the arête is secured so that skiers can access this famous off piste route, which isn't technically very difficult.

Therefore, this is often a good time to access the take-off.

But despite the very sophisticated security, with a double rope on the valley side, the professionals advise, on principle, using crampons and having your own personal rope. It's up to everyone to make their own decision.

Flying over the Vallée Blanche: whilst skiers zigzag their way down between the crevasses, the pilot flies above them with total freedom. Be careful however not to have to land-out: on foot, the crevasses are more dangerous than on skis. Fortunately, with the glide ratio of our current wings, it's no longer a major feat to avoid getting trapped...

Photo: Jerome Maupoint/Gin

Theoretically in their upper part, neither the north take-off nor the south facing one are particularly difficult to launch from, as long as the wind is correctly orientated, stable and is neither too weak nor too strong, thus allowing a quick take off.

The north take-off becomes dangerous after a few steps towards the void: the slippery terrain becomes very steep and there is no room for error. That's why pilots need to be very sure of themselves and their technique.

From the south take-off it's a bit less brutal, although there are crevasses. It's essentially a take-off on a glacier. In any case, you need to bear in mind that there is less lift at this altitude. Be careful, if the wind is from the west; the take-off will be in the lee of the Aiguille and can give the false impression of the wind being correctly oriented.

The Plan de l'Aiguille is a classic site at 2300 m. Both the Aiguille du Midi take-offs at 3700 m, are very high mountain sites.
Wind speed and direction on the Plan de l'Aiguille: Pioupiou
Wind speed and direction on the Aiguille du Midi : Meteonews
Aiguille du Midi Webcam: Panocam
Site guide for the Chamonix Valley: Vol au Pays du Mont-Blanc

Taking off facing north: very quickly the slope becomes steep and slippery. There is no room for error, otherwise the slide will end up about 1000 m lower down. On the other hand, if there is a nice breeze, the pilot will be airborne sufficiently early. Careful: it's still a glacier with the possibility of crevasses.

Jerome Maupoint/Gin

Jerome Maupoint/Gin

In winter doing a top to bottom, it's nonetheless an amazing experience to glide the length of the Chamonix Needles along the valley, whose westerly entrance is visible here under the pilot's elbow.

The northerly flight is very vertiginous; the pilot has 2700 m of sheer drop beneath his feet if he takes a step forwards towards the valley. From the south take-off, you follow the Vallée Blanche and lose sight of civilisation in the Chamonix Valley.

In winter, when the cross-country skiing routes are open, you can land on the triangular field, which is a little enclosed. Otherwise, there is the landing at Bois de Bouchet, 500 m nearer the centre of Chamonix. In a southerly, there can be a slight Foehn effect in the lower layers.

Flying from the Aiguille is therefore very committing, due to both the access and the take-offs, but it is one of the group of almost mythical flights, even done as a top to bottom on an anticyclonic day in winter.

TAKING OFF AND FLYING IN THE HIGH MOUNTAINS: WHAT CHANGES...

In very high mountains the sites are more exposed. The winds are often stronger and gustier, and they can change direction very easily. So the aerology is sometimes more complicated.

The air is less dense: the lift at take-off is less, and you need to run faster. At an altitude of nearly 4000 m, the minimum speed of the wing (and therefore take off), is noticeably more. The speed increases by about 5% for every 1000 m of altitude gained. Example: a wing whose minimum speed is 25 km/h at sea level, will see its minimum speed at an altitude of 4000 m increase by 5km/h, reaching 30 km/h (in a standard atmosphere).
In nil wind, you therefore have to run a lot harder. But fortunately, high up, there is often a minimum amount of wind.

At the same time, the maximum launchable wind, measured with an instrument with blades (and not an instrument with a pitot tube!), increases by the same proportion. Nevertheless, you need to allow a good margin...

When soaring on sites above a big flat glacier like the Jungfraujoch (see further on), it's important not to forget possible rapid changes in the aerology. The lift can therefore suddenly become weaker and force the pilot to land on the glacier, with the risks that come with crevasses. What can also obviously change is that the cold can easily reduce the pilot's abilities.

Jerome Maupoint/Gin

The take-off on the south side. Certainly less committing than the one on the north side but, all the same, it's on a glacier and the pilot can slide into a crevasse.

Photo: Jérome Maupoint

After taking off on the south side, the pilot follows the Vallée Blanche east, passing by the Envers des Aiguilles and comes back towards Chamonix.

Photo: Sascha Burkhardt

New on the Aiguille du Midi: the 'Tube', a footbridge on the south side, which opened last summer.

Photo: Sascha Burkhardt

AIGUILLE DU MIDI

Every type of tourist imaginable rubs shoulders, from walkers, to paraglider pilots and climbers. The latter use it as a starting point to climb various summits surrounding the Vallée Blanche, as well as for numerous routes on the glaciers.

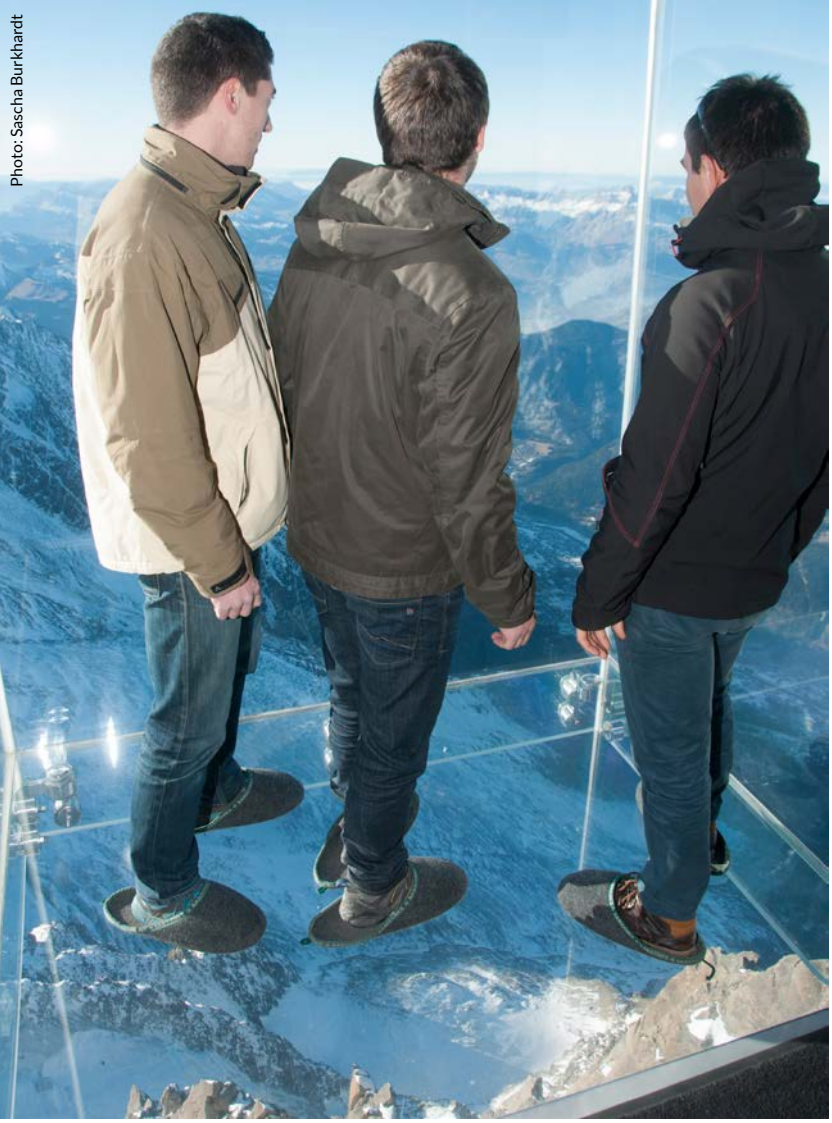


Photo: Sascha Burkhardt

'Stepping into the Void', the armchair version is an interesting and impressive experience, especially for 'non flying' friends or family members. It's included in the lift pass.

The queue in front of the summit lift is often, unfortunately, one of the hazards.

STEPPING INTO THE VOID

'Stepping into the void', the paraglider version: here, after taking off from the Aiguille, flying over the Envers des Aiguilles on a beautiful day at the end of summer.

Photo: Jérome Maupoint

The take-off on the south side is flatter.

Photo: Les Ailes du Mont Balnc

Pictured here, former paragliding World Champion Sandie Cochepain, founder of the school Ailes du Mont-Blanc, soaring the south side with a passenger. A crevasse can be clearly seen under the arête.

Photo: Sandy Cochepain

Sandie with a passenger flying over the Vallée Blanche; the take-off is far behind the Aiguilles.

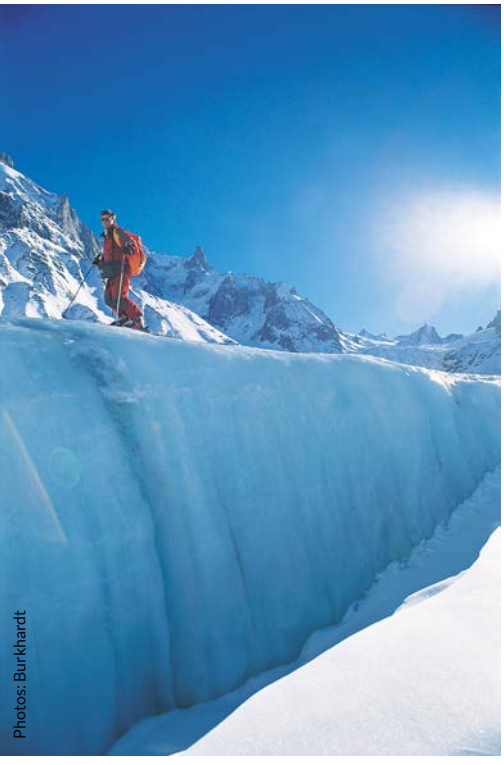
The organisation "Les Ailes du Mont-Blanc" where Sandie works with, amongst others, Claire Mercuriot, Lætitia Mescoff and Jérémy Picq, offers instruction in the Chamonix Valley and offers services such as tandem flights and guiding.

For pilots who don't want to set off on their own, a supervised high mountain flight, Grands Montets or Aiguille du Midi, in a group, costs 150 €. A tandem flight from the Aiguille, for a non flying family member for example, costs 295 €.

http://www.lesailesdumontblanc.com/en

Photo: Sandy Cochenain

Skiing the Vallée Blanche: also an unforgettable experience.



Photos: Burkhardt

Photo: Les Ailes du Mont Blanc

If the conditions higher up are not good, and if the snow isn't too soft or deep, there is always the Plan de l'Aiguille take-off at 2 233 m, giving a height difference of 1233 m down to Chamonix. The main take-off is a few minutes walk from the middle cable car station. It is west facing, but with a meteo wind from the west to southwest, the wind comes more or less left across the slope, therefore pilots take off towards the left, almost facing Mont Blanc. Watch out for the high tension line 50 m south of the southwest take-off . In winter, the take-off is starved of wind due to the release of thermals, and often there is a light back wind.

The other take-off, which takes a north easterly, requires a good glide to get off.
http://www.lesgratteciel.net/pages/Plan_de_laiguille-2393536.html

Photo: Monica Dalmasso /ODT Chamonix

Even for those who already know Chamonix well, every visit is an immersion in the very special ambiance of this climbing capital.

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

Photo: Gilles Lansard /ODT Chamonix

Photo: Monica Dalmasso /ODT Chamonix

OTHER WAYS TO CONQUER THE MONT BLANC MASSIF…

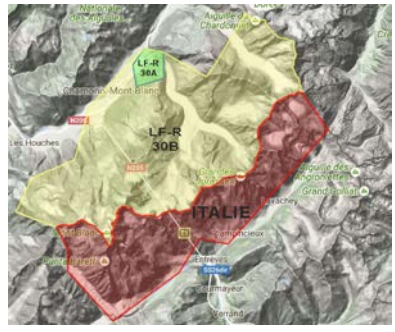
In summer, a much more technical and sporty way to get up the Aiguille du Midi, and indeed Mont-Blanc, is by XC from a site such as Plaine Joux. In this photo Stéphane Boulanger is at about 3700 m, on the 13th of September 2016, during a 38 km out and return from Plaine Joux. https://airtribune.com/11079/tracks__68470 - Photo : Stéphane Boulanger, https://www.facebook.com/StephaneBoulengerPhotographies

(PS : Stéphane, who has always loved sharing his flights through his photos and videos, and the advice that comes with them, wants to become an instructor and has set up a fund: http://www.leetchi.com/c/projets-de-stephane-15429398)

Jerome Maupoint

REMINDER: MONT BLANC FROM THE AIR

Since 2003, the increasing performance of wings, and especially the meteorological conditions which are increasingly favourable, have made it possible, more and more often, to fly over Mont Blanc and to land on it, as was the case here on the 19th of August 2012. A record breaking day saw a hundred pilots from different sites such as Plan Praz or from Italy above the roof of Europe, with at least fifty landing up there. Unfortunately, since 2015, a ban on flying over the massif on the Italian side in August, added to the one which has existed for a long time on the French side (July/August), has seriously reduced the flyable window. On the right, a diagram of the forbidden zones last summer (Italy: 4th of August to 15th of September 2016).
For more information: http://www.lesgratteciel.net/



THE WEATHER ON THE 19TH OF AUGUST 2012

If at least 50 paragliders could land, it was because the conditions were perfect. Let's have a look at them and hope that similar conditions will be repeated outwith the 'forbidden' dates.

- The arrival, down to the lower layers, of hot and dry tropical air which came from the south - southwest. This air was dried above Spain and the South of France. In the centre of France, temperature maximums of 40° were reached.
- An anticyclone which caused the mass of air to descend down to the lower layers (subsidence). The result was a good gradient.
- The gradient was 0.7 to 0.8 °C/100 m in the layer 2000-2 500 m, above it was better still, up to 0.9 °C/100 m.
- Very dry air: relative humidity in the Valais and at Chamonix of less than 20%. As a consequence there was not much cloud and maximum sunshine.
- There was a very weak inversion below 2000 m.
- Maximum temperature: 35.6 °C at 1000 m, 3-4 °C at 4 000 m, -1 °C at 4800 m, slight cooling at high altitude in the evening.

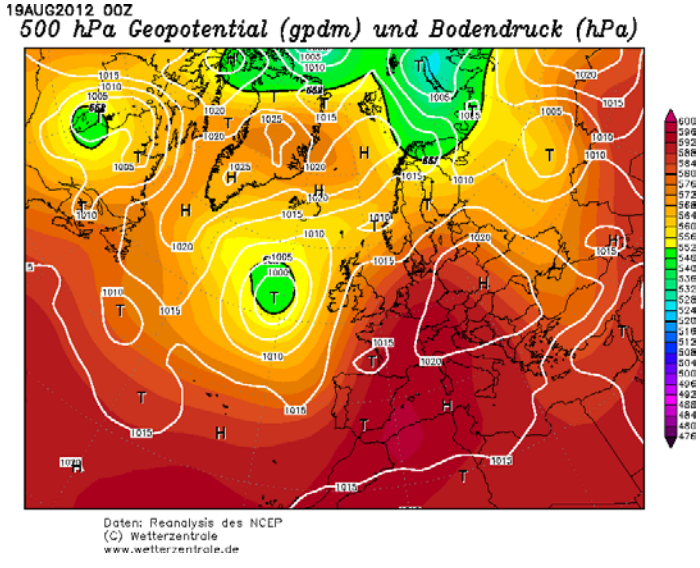


Photo: Greg Blondeau

Above Mont Blanc and the Chamonix Needles on that famous 19th of August 2012, a photo taken by Greg Blondeau at nearly 5400 metres, above Stéphane Boulanger who also landed on the summit.

Photographe: Olivier Laugero /Ozone - Rider: Matt Gerdes

SPEEDRIDING CHAMONIX

The Chamonix Valley is also a Mecca for Speedriding: a few photos playing between skiing and flying under the watchful eye of Mont Blanc.

In the Vallée Blanche
Photographer: Olivier Laugero/Ozone
Rider: Matt Gerdes

In the Vallée Blanche
Photographer: Olivier Laugero /Ozone
Rider: Matt Gerdes

Domaine de Balme
Photographer: Olivier Laugero
Rider/Pilot: Jean-Charles Blanc

Photo: Niviuk

Domaine de Balme

There are Speedriding spots pretty much everywhere: Aiguille du Midi, Brevent, Grands Montets. There is also the Domaine de Balme at the end of the valley, near the Swiss border: a great place to learn, for example with Caroline Brille's school, Absolute. She was French paragliding champion many times and won the World Cup. (http://www.absolute-chamonix.com/).

Another school: Jean-Charles Blanc's Air Sports Chamonix, he's the rider on the previous page.
http://www.airsportschamonix.fr/

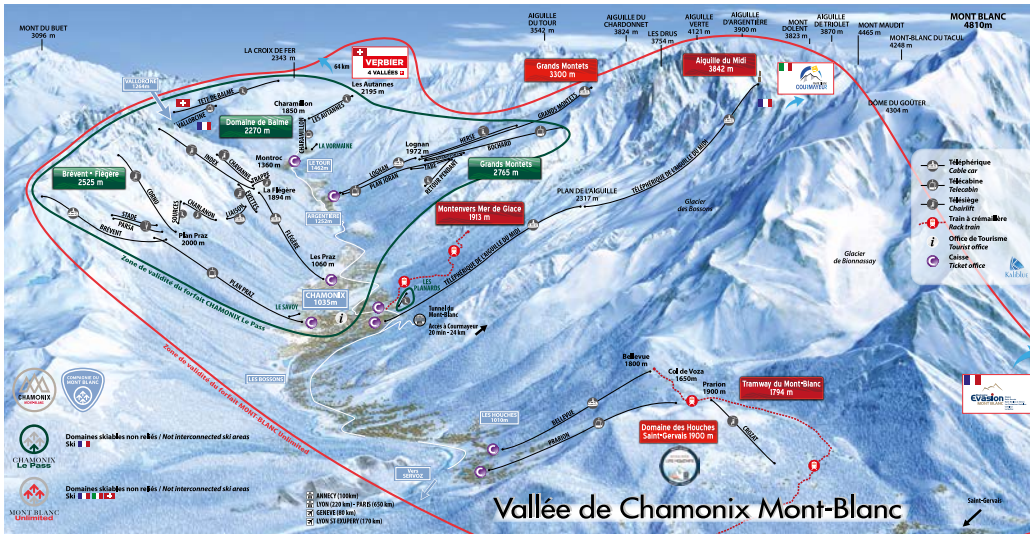


Photo: Jérôme Maupoint /GIN

JUNGFRAUJOCH

In Switzerland, not far from the north face of the Eiger, there is another high mountain take-off which is easily accessible: the Jungfraujoch. A rack and pinion train traverses the north face of the Eiger, and takes the pilot directly up to this col.

The take-off is near the highest railway station in Europe at 3454 m. It's easy to access and from a technical point of view, average. It's a relatively flat glacier followed a fissure. If you have a problem, make sure you stop your take off in time! Watch out for the crevasses. As far as the weather is concerned, it's high mountains: the wind direction and strength can change quickly and good conditions are relatively rare.

http://www.paraglidingmap.com/sites/jungfraujoch

Photo: Jungfraujoch.ch

Going up by train costs about 64 CHF (60 €).

One of the many possible landing fields is at Lauterbrunnen.

Take-off: 3485 m
Landing: 793 m
Height difference: about 2700 m

Fact sheet for the site with GPS coordinates:
DHV database

On the right of take-off, the North Face of the Eiger, at 1800 m, it's one of the highest faces in the Alps.

Photo: Jérome Maupoint/GIN

The cable car. In parallel, a new cable car is being built; watch out for the new cables if you take off to the east. Photo: Jorge Brissimtzis

PETIT CERVIN

Another top to bottom flight in the high mountains: the Little Matterhorn is in a similar position to the Matterhorn above Zermatt, but isn't on the same mountain. The "Matterhorn Glacier Paradise" cable car goes up to 3883 m. This is the highest point accessible by mechanical uplift in the Alps. On the west side, there is a ski station which is open all year round. The west take-off in the station is relatively easy. The east take-off is more vertiginous, but a bit easier than the north take-off on the Aiguille du Midi. In both cases, the wind must be correctly orientated and the readings on the wind talkers are often below the real values because there is a venturi effect on the take-offs.

For more information:
http://www.paragliding-zermatt.ch/pilotinfos/index-d.php

Take-off: 3806 m
Landing: 1620 m
Height difference: about 2200 m

Fact sheet for the site with GPS coordinates: DHV Database.

Photo: V. Burkhardt voler.info magazine / Pilote: S.Burkhardt

Photo: V. Burkhardt voler.info magazine / Pilote: S.Burkhardt

A while ago we tried one of the wings made for Dudek's 20th anniversary: the Snake XX. Today, free.aero *looks at its sister, the Nucleon XX, more accessible whilst having the same DNA.*

NUCLEON XX

Test Pilot: Sylvain Dupuis

CONCEPTION

The Nucleon XX, obviously has a SharkNose; this air inlet in the shape of a shark's nose was the initiative of competing manufacturer, Ozone. Initially it was only found on free flying wings, but most manufacturers now incorporate it into their reflex wings. The SharkNose allows the stall speed to be reduced and increases the maximum speed, thus reducing the risk of collapse at lower angles of attack. In short, the gap between minimum/maximum speed is even larger, which adds to the advantages of a reflex profile. For the rest, it's fairly classic: Porcher Sport 40 g/m² fabric and Edelrid lines. The risers are the same as on the first generation Nucleon - complex!

They are the most complex risers to be found on any serial class wing:

- Accelerator
- Trimmers
- Brake handles that work on two lines (centre of the wing for one, wing tip for the other, known as the '2D' system).
- TST handle (braking at the wing tip for

Another modern component: 3D-Shaping to improve the profile stability at the top of the leading edge.

The leading edge rods can be easily changed if necessary.

Photo: V.Burkhardt voler.info magazine

turns with the accelerator bar).
• PK System (invented by Paramania, allowing the management of the angle of attack of the wing across the whole range by using the accelerator).

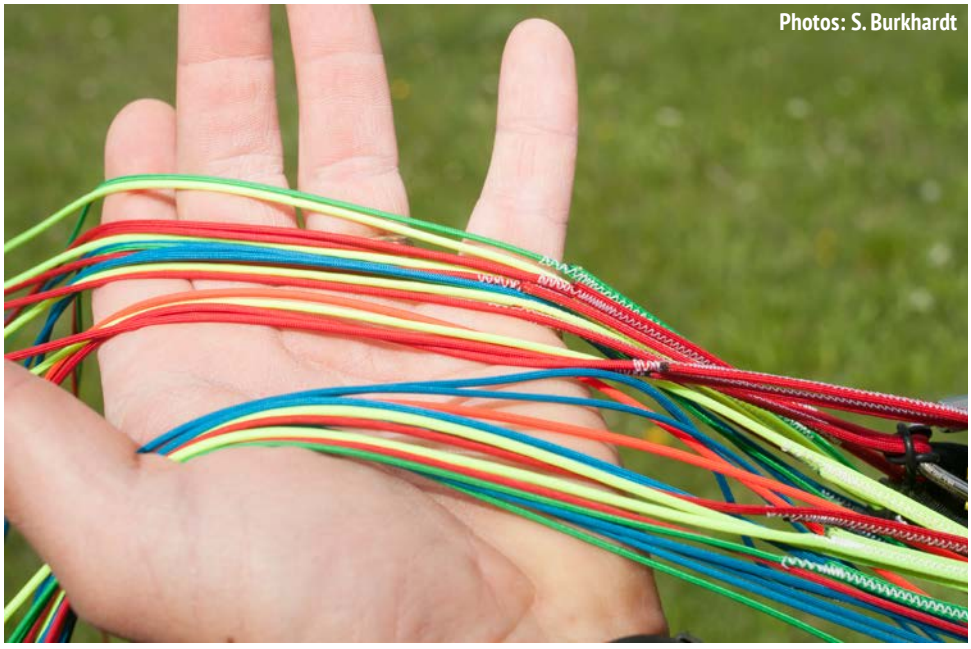
You therefore need to refer to the user manual to get an idea of the configurations which are not permitted and how to use each control.

IN FLIGHT

There is no wind this morning, the conditions are similar to those a beginner would fly in. I therefore get ready to do a forward launch without using the motor and trimmed: pulling on the front risers and also using my body, the Nucleon comes up. Without being difficult, the inflation isn't one of the easiest despite its small size of 22 m². You do, all the same, need to be fairly strong when there is no wind. The take-off run is about average for a wing with this reflex surface. The little Top 80 that I use for the test is ample enough, the Nucleon performs well in level flight, it's even fast! What you lose in ease of take off you therefore gain in speed during level flight. The Nucleon XX is playful and doesn't suffer from any lack of manoeuvrability! The brake travel is pretty long, but braking is light. If the previous generation Nucleon was very damped on all the axes, the XX is totally different in this respect because, when trimmed, you don't really have the impression of flying a reflex wing. It has a tendency to show the air mass and minor turbulence. With trimmers off, the speed increases very noticeably and the controls become stiffer. The XX remains manoeuvrable and fun. If I was expecting yet another battering ram which would crush the turbulence flying at this speed, I was mistaken! The Nucleon XX gives lots of feedback about the aerology even during this type of flying. It's pretty surprising for a wing designed for long distance flying.

Photos: S. Burkhardt

Photo: V. Burkhardt voler.info magazine /Pilote: S.Burkhardt



Strong in every respect

When folding it, obviously try to look after the leading edge with the rods.

The Nucleon XX combines the reflex profile with a SharkNose which you can make out in this photo.

Photo: V.Burkhardt voler.info magazine / Pilote: S.Burkhardt

With full bar, the speed increases even more. The countryside now flashes past at high speed! My Top 80 is still sufficient, which is a good sign, the XX is very efficient across its whole speed range. On the other hand, it still gives as much feedback about the aerology today despite it being fairly calm. It's all part of its new profile. Efficiency therefore comes at the price of comfort.

The XX works pretty well for slalom! Obviously it isn't a slalom competition wing, but it is manoeuvrable, precise and very fast. It's a good way to get started! Gain a little bit of height to check the lower and upper speed limits by doing a series of wingovers. There is no tendency to collapse or deflate if the timing is correct and the energy accumulates very quickly. Landing is easy, just make use of the lovely glide the XX offers, it's like landing on eggs and there are no surprises.

CONCLUSION

Surprising! The only thing that the Nucleon XX has in common with the Nucleon, is the name. It's clearly less damped, more playful, a lot more fun and so, in the end, it's more like a paragliding wing with extra speed! With its new profile, the performance is very clearly higher, but it doesn't have the indestructible side to it that the very first Nucleon did, and which, moreover, made it so successful.

ION4 - TECHNICAL DATA

Manufacturer: Nova Manufacturer Web: https://www.nova.eu/fr/parapente/ion-4/ Mail: info@nova.eu
Tel: +43.5224.66026

SIZE	20	22	24	26	28
CELLS	60				
FLAT SURFACE AREA [m²]	20	22	24	26	28
PROJECTED SURFACE AREA [m²]	17.08	18.79	20.49	22.20	29.91
FLAT WINGSPAN [m]	10.58	11,10	11.59	12,07	12,52
PROJECTED WINGSPAN [m]	8,39	8.80	9,20	9.57	9.93
FLAT ASPECT RATIO	5.60	5.60	5.60	5.60	5.60
PROJECTED ASPECT RATIO	4.12	4.12	4.12	4.12	4.12
ALL UP WEIGHT PPG [kg]	75 – 110	85 – 120	95 – 130	105 – 145	115 – 160
DGAC	Yes	Yes	Yes	Yes	Yes
MATERIAL	Porcher Sport 38 g/m2, Dominico tex 34 g/m2, Porcher Sport Hard 40 g/m2, SR Scrim, SR Laminate 180 g/m2 Lines: Edelrid A-8000U: 050 / Liros TSL: 090 & 140 & 190 & 280				
PRICE [€]	3350	3420	3460	3520	3580

Dudek deliver the Nucleon XX with numerous accessories.

FLYING THOUSANDS OF KMS TO HELP BIRDS

Sacha Dench flew thousands of kilometres by paramotor to help birds. Here's an interesting account of her adventure.

The flyway from the Russian arctic across Europe to the UK, is used by hundreds of thousands of ducks geese and swans, as they migrate south for the winter and return to the north to breed in summer.

Photo: WWT/Ben Cherry

Photo: WWT/Ben Cherry

Happy but exhausted after almost 3 months of flying.

Photo: WWT

Take off, fully loaded home made flight deck and paratent attached to the fuel tank

Sacha Dench is a former free-diving champion, who then moved to paramotoring. Australian, but now living in Britain, she's heavily committed to protecting birds, especially the Bewick's Swan, a Siberian subspecies of the Tundra Swan. To raise awareness about the decline of this species, Sacha accompanied these migrating birds on her paramotor from Russia to England, covering about 6000 km. She set off in September 2016, and landed in mid December near London where she then handed in a petition in support of the swans, signed by more than 13000 people, to the British Prime Minister's office.

A rare flat sand take off as I take on the great wet forests called the taiga. Locals watch on and soon after the police arrived, also just to watch.

Photo: WWT

An important part of the trip involved visiting schools to inform and educate people about the decline of the swans. Sacha stopped at 54 schools!
After landing in a very isolated village: When I took my helmet off, the little girls said 'Wow, can girls fly?'

The flying and the journey itself were both very committing. Even though there was a very good team on the ground, she often had to be capable of managing on her own.

She achieved her goal and, remarkably, managed to overcome an accident during take- off. The injury to her knee forced her to abandon foot launching and to attach the motor, on to a Russian made trike by tying lines around the chassis tubes.

She therefore had to learn to handle a trike during the journey. Sacha, who had only had limited experience on a paraglider and on a paramotor before this voyage, became a seasoned pilot. We interviewed her when she got back from her journey which culminated in crossing the English Channel…

Crossing the taiga with only the narrow road as landing option, the ground crew did their best to keep up.

Photo: WWT/Ben Cherry

Entering limestone country of gorges and caves beneath thick forest of Pinega. Shortly after this shot, I turned around and landed on the river bank – the air was turbulent and road narrowed into gorges with no landing options, I wanted to try to follow the river as an alternative. The local man that ran over and helped gather my wing from the mud, offered that if I flew along the river and came down on a sand island or bank and needed rescue, to text my location and he'd come straight away. The Russians were awesome every day. Their attitude was never 'ridiculous foreigners with no idea', but 'how can we make it happen?'

voler.info: How far away from the birds were you flying? How often did you see them?

Sacha Dench: I wasn't trying to follow a particular flock, as they migrate in small family groups or bigger flocks of adults, over a period of months and all taking slightly different routes. I was following online the progress of 6 birds wearing GPS collars, and wherever possible I would fly over a site which we knew they were using (e.g. 1000 feet) to see what I could tell from the air – how many swans they were with, why they might be using the site. One of our tagged swans Leho was doing a lot of movement around Dvina bay in Arkhangelsk, which wasn't thought to be an important site on the autumn migration. I took the data from the collars and flew a triangle over the region and saw about 2000 swans in groups of about 100 – showing us that Dvina bay was clearly a very important site. I flew close to swans only when they approached flying overhead. Several times I flew underneath them which was magical! To see them from about 50 metres below was great, even better they totally ignored me, and I noticed that they were flying sometimes in mixed flocks with geese which was new to me (geese that hunters are allowed to shoot at, which might be one of the problems for the swans!)

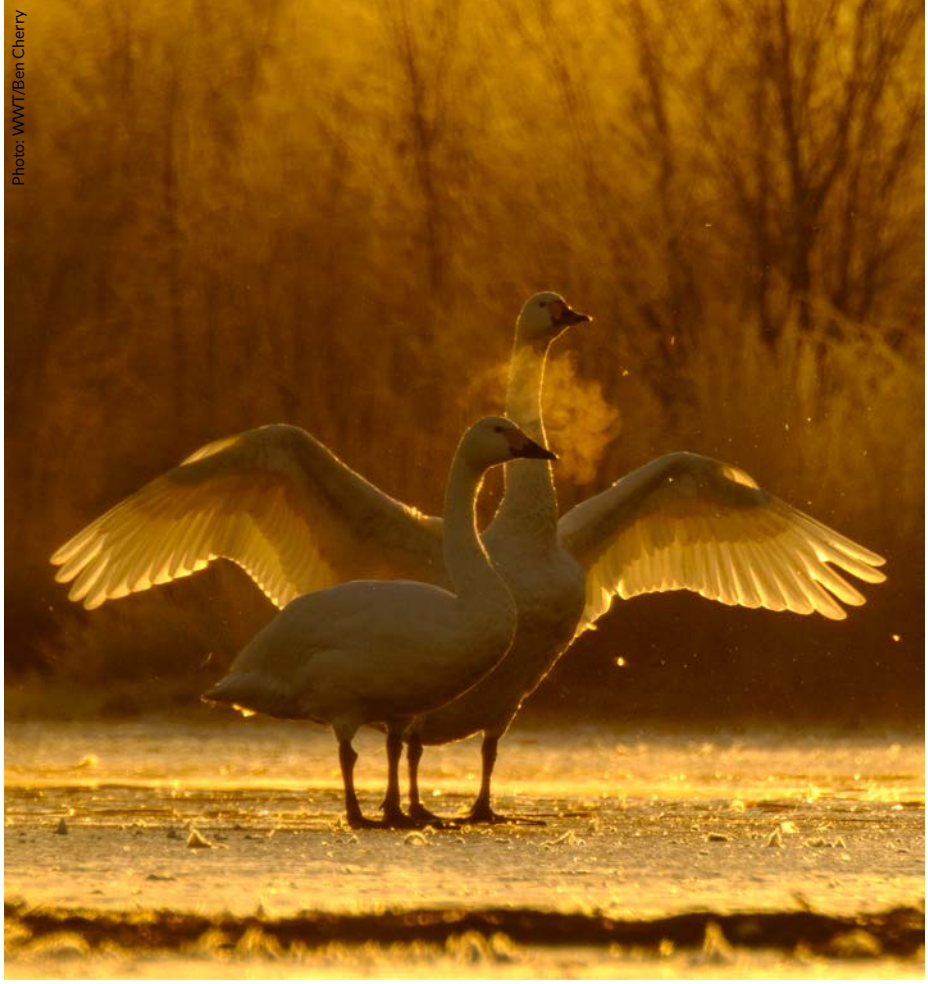


Photo: WWT/Ben Cherry

The psychedelic ever-changing colours of the tundra. Every half hour I would fly low for a while to see what colour ground was the best for landing on...and perhaps to play a bit ;-)

Photo: WWT/

Photo: WWT/Ben Cherry

The Inmarsat phones were my connection to researchers and the team at HQ whilst crossing the tundra. They could give updates on where the collared birds were, and discuss observations.

voler.info: What altitude did you mainly fly – max and min?

Sacha Dench: Minimum – almost foot dragging across the tundra having fun. It was so beautiful out there and the colours and smells were all new. Maximum - 3,500 feet over the channel.

voler.info: What was your longest flight?

Sacha Dench: About 3 hours, but I haven't pored over flight logs as yet, this project was all about the birds and the people so they were, and are, my focus.

voler.info: What sort of temperatures did you encounter during the flight?

Sacha Dench: Down to about -25° taking into account wind chill. On the ground, the coldest it got to was - 6°.

Bewick's swans are the smallest of the swans, and each one can be identified by its bill pattern. WWT has named and painted or photographed 10,000 swans in the past few decades.

Photo: WWT/Ben Cherry

voler.info: Was there much turbulence? How did you handle the turbulence? What was the worst thing that happened in the air?

Sacha Dench: Some flights were turbulent, and some were calm. Some stretches of the tundra when the sun was out gave off small really punchy thermals (I guess because the whole area is a network of water and patches of dry land of different colours). Two flights stay in my mind as the worst – one across Belgium where none of the Belgian pilots decided to fly but I had to make progress, and the air was horrendously turbulent and thermic with some very rapid descents and ascents, particularly at the start of the flight where we were downwind of some large wind turbines. Every flight in uncomfortable air or with drizzle or eye-slicing sleet that suddenly dumped from a cloud helped to make me a better pilot, so none of that was bad. The worst for me was probably flying over a remote community that had no roads to it, somewhere in Russia. I had intended to land but the wind had picked up to such a strength that I didn't think I could safely take off again. I circled the town a couple of times and it seemed everyone was out waving and then waving me down. A little girl looking up at me with mouth open kept covering her eyes with her hands and then taking them away as though she didn't believe her eyes...either that or she was blowing kisses... I wanted to land but really had to make the next settlement that day so with a heavy heart I waved as hard as I could and flew off into the distance.

Photo: WWT/Dudek

Pure bliss along a river somewhere in Russia, with the SENA Bluetooth headset delivering music to my ears. I can now listen to the playlist and it takes me straight back to the tundra and taiga.

Photo: WWT

As we journeyed west, the taiga slowly gave way to flat lands and agriculture.

voler.info: What was the best thing that happened in the air?

Sacha Dench: White-fronted geese were flying in the same direction as me, but about 100 m away. They are on the same migration path as the swans and many other birds which I was already thinking was great. Then they veered slightly and started heading towards me. Just as I was about to make an emergency left turn worried they could not see my lines and would get tangled, they tucked in behind my right wing tip and flew there for a while. It can only have been 5 minutes max but I was laughing and crying with joy (or perhaps the open spaces of the remote tundra or those mushrooms were starting to get to me).

voler.info: How did you hurt your knee?

Sacha Dench: I dislocated it as I turned to take off. Twisted my foot slightly and next thing I was on the ground screaming in pain.

Each had 3 outlets so I was constantly charging Garmin, phone and had another outlet in case I needed to recharge Bluetooth headsets in flight (they were great and recharge quite quickly...once I learned how to take the tiny units off and on with thick gloves)

voler.info: Did you really learn to launch a trike for the first time during this journey?

Sacha Dench: Yes, I had no choice. The motor and trike weren't ideal and there were no A-assists to begin with and I really struggled with the strength needed to hold the As through the prop-wash with the heavy trike that took a bit to get moving. By the end of the trip I was making it look reasonable easy and I launched in some challenging conditions, but the journey to get there involved some tears, hugs, and a few spectacular rolls.

voler.info: How many flights/hours had you done before this adventure?

Sacha Dench: I don't know. I will work it out some day. 100 hours? At a guess? But I really am guessing. I usually fly alone for photography or video which is part of my work.

voler.info: Can you give us a quick run down of the equipment you used?

Sacha Dench: The Fresh Breeze frames were ideal for expeditions. They are easy to deconstruct quickly to get under shelter or in the back of a vehicle, they can handle a few knocks and could be bent back if needed (thankfully, I didn't need to), and the Polini 130 handled the entire route from Russia including having a really heavy trike (about 26kg) added to my flying weight. The motors did get good care from Brian our mechanic when I met the ground crew. He modified the cruise control lever which could move in flight either pinning my thumb down or getting caught in trimmers/risers. A GoPro handle worked brilliantly as a replacement.

The Dudek Universal wing has become my best friend, and it's been through a lot with me, including sleeping with me as my only blanket when I was trying to cut down on weight and left my sleeping bag behind. I learned to take off in places I wouldn't normally have even attempted, because there were no options: running along a winding lane, uphill, jumping over heather and bushes, on a muddy river bank between saplings with a river in front. The great thing was that I never really had to think about the wing. It had a huge speed range even without the speed bar (removed for simplicity in case of needing to quick release). The wing could also be trusted to fly where you wanted whilst I concentrated on filming or photography. I will be sad to have to auction it off (as was the agreement with Dudek), or I will find I am the highest bidder!

I used a flight deck that I made myself from a Helly Hanson bag and carabineers. It shook in flight but was perfect for this trip and the amount I needed to carry. One of my favourite possessions is my Russian made paratent which was designed by Alex Bogdanov (who flew across most of Russia with me, translated for me, and pacified the authorities). It's lightweight, perfect for camping with a paramotor and quick to set up. Being a single skin tent I did have to empty 2 large snowballs worth of snow from inside it each morning before I packed it away.

The birds rely on wetlands in each country for roosting at night and for feeding. Since the 70s, the swans have started feeding on agricultural land as the wetlands are disappearing fast and can no longer provide enough food.

Photo: WWT/Ben Cherry

Photo: WWT/Dudek

In the air Sascha communicated with other pilots and the team on the ground thanks to an iPhone 6S, an INMARSAT ISatPhone 2 satellite telephone, a VHF 2M radio and another on an aviation frequency. As a paramotor pilot, Sacha knew the aeronautical phraseology and could communicate no problem at all with the air traffic controllers wherever necessary. In addition she had registered the paramotor in Germany so that she would have an official radio frequency. Flying over the countries was authorised in advance thanks to numerous volunteers who, in their respective countries, took care of the paperwork, wherever necessary. It was only at the Russian and Estonian border that she had to cross by car, and then take off 2 km further on.

Arriving in a town, the routine was to a) find a landing field, b) do interviews (there were usually media there within minutes somehow), and c) find local hunters/farmers/ politicians and talk swans over supper. Or just collapse from cold and exhaustion.

Robo-leg - The hinged brace that kept my knee together after I dislocated it.

The motor was fixed onto a Russian Zummer trike, made from stainless steel and aluminium by the company Paraavis.

Photos: WWT/Ben Cherry

Photo: WWT/Ben Cherry

The Milky Way above Sacha's bivouac. She never had to bivouac on her own, there were always other pilots or members of the ground crew who camped next to her. And very often, she was put up by locals or in the schools she visited.

Photo: WWT/Ben Cherry

Packing up after flying till last light and landing on the road. Thankfully, there isn't much traffic and if you fly up to 500 feet, you can see it coming from a long way off.

Photo: WWT/ Dan Burton

A small string of islands near Pskov where one of our GPS tagged swans had stopped. I flew out to see a couple of families sheltering in the sheltered lagoons and big groups of adults sheltering on the right of the island out of the strong winds. It was great to put real life information to the tracks on the map.

In cyan blue, Sacha's tracklog drawn by her SPOT tracker. It shows her having travelled about 5500-6000 km in the air.
Unfortunately, there was no IGC tracklog of this journey to be able to make an official declaration. The other tracklogs are those of four swans equipped with GPS trackers.

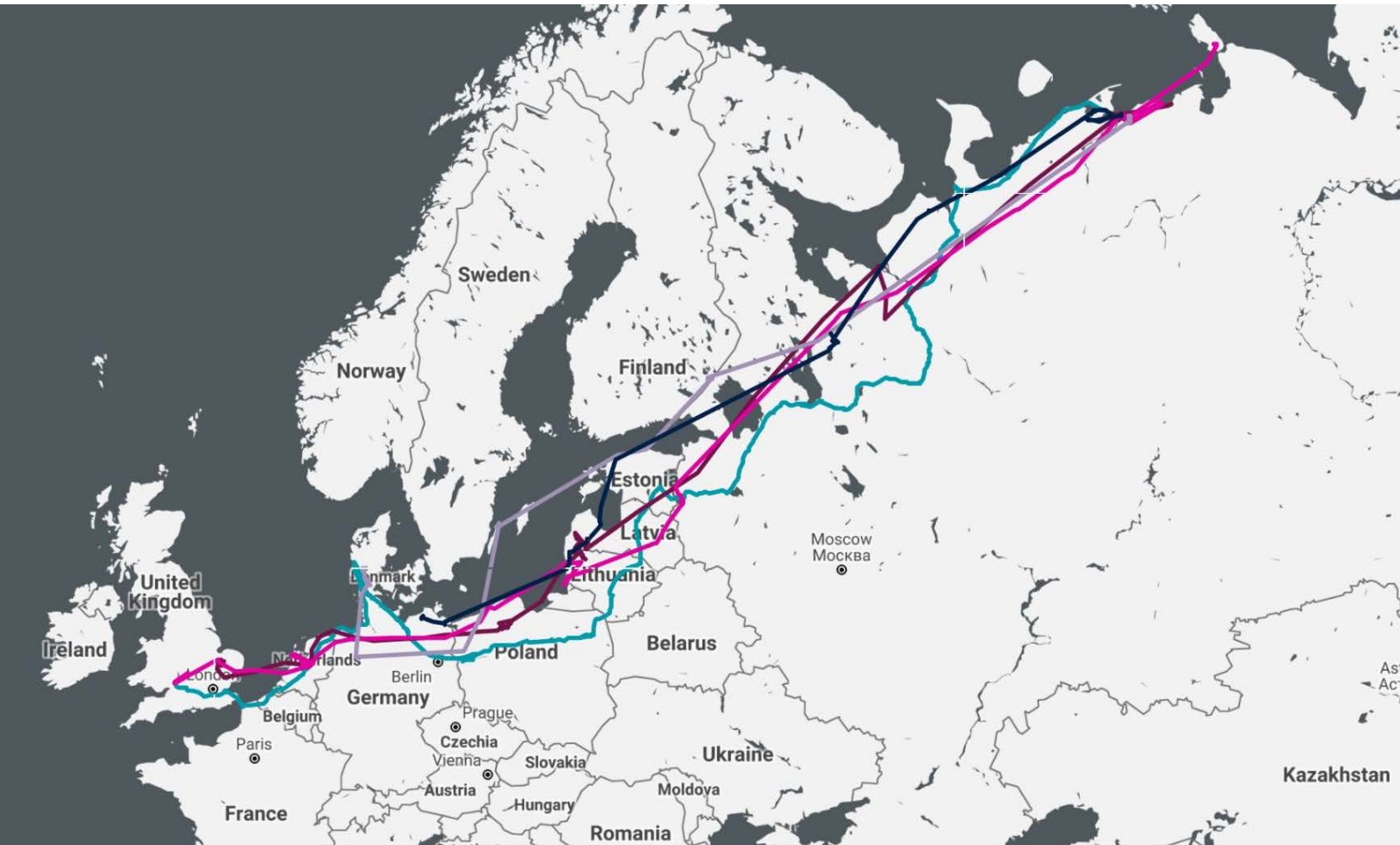


Photo: WWT/Dan Burton

I really hadn't wanted to go home yet...but when I saw the white cliffs for the first time it was very emotional.

Photo: WWT/Dan Burton

We had a beautiful day for the crossing, and Jocky Sanderson had agreed to go in the speed boat below so we had an expert in retrieving paragliders from the water (if we needed it).

'Human swan' crossing the UK, diverting around seas of mist.

Photo: WWT/Dan Bu

Photo: WWT/Ben Cherry

The birds migrate in little groups, which regroup in the evening in convenient places.

Sacha was often accompanied by other pilots like Stuart Savage, Dan Burton, Alexander Bogdanov and Ben Cherry. Here flying over the Thames estuary. This type of humid biotope is important for all types of water foul.

Photo: WWT/Dan Burton

Photo: WWT/Sam Stafford

100 pupils from a British school welcomed their champion.

Mission accomplished, including mobilising the media and the general public.

Photo: WWT

Sacha handing in the petition to the Prime Minister's office at 10, Downing Street...

Photo: WWT

Photo: WWT

Naryan Mar, September 2016: Sascha getting all the necessary equipment ready to fly across the tundra and a possible emergency landing in this humid desert.

An amazing team on the ground who were an essential part of this adventure.

Photo: WWT/Ben Cherry

Photo: WWT

Preparing for water landings. Testing powerfloat positions with a full tank, empty tank, in calm seas and in rough seas (they hadn't turned the waves on yet in this photo). Some local safety divers volunteered to support.

Photo: WWT

Sacha unnerving the safety divers being unusually calm underwater, adjusting kit. As an ex competitive freediver (apneiste) so can hold her breath.

The risks of landing on the water are under estimated by a lot of paraglider and paramotor pilots.

Photo: WWT

Initially it wasn't easy to find a sponsor for this 'mad project' amongst the paragliding and paramotoring manufacturers. Maybe if she had been a guy it might have been easier.

In the end, the German manufacturer Fresh Breeze volunteered two engines: two chassis with Sportix Schnappmatix attachments (see following page), one with a Polini Thor 130 and one with a Top 80.

Sacha used the Thor 130 virtually all the time which was more powerful. It became even more essential given that she had to fly most of the way with a 25 kg trike.

POLINI THORIX 130 TECHNICAL DATA	
Manufacturer (Chassis)	Fresh Breeze http://www.fresh-breeze.de/en/products/engines/thorix
Weight	env. 28 kg
Power	21,5 CV @ 8800 1/min
Cylinder	125 cm^3
Tank	17 l
Propellor	1,25 m
Carburettor	WB 37
Transmission	Clutch
Thrust (approx)	60 kg


Photo: WWT

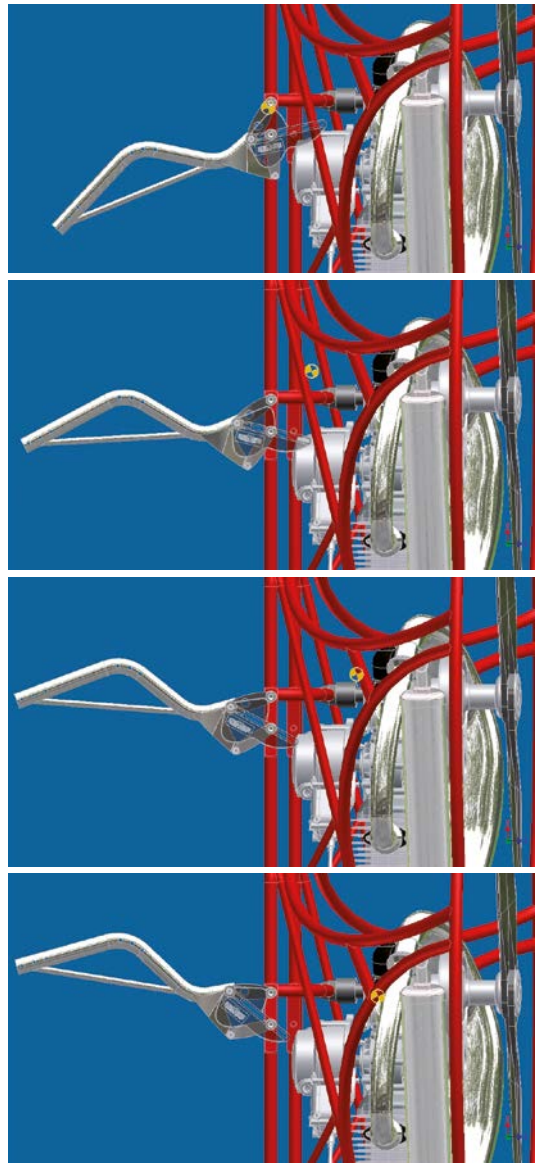
The second motor was a Top 80, also in a Sportix chassis.

FRESH BREEZE TOP 80 DONNÉES CONSTRUCTEUR	
Manufacturer	Fresh Breeze http://www.fresh-breeze.de/en/products/engines/top-80-sportix/technical-info.html
weight	env. 23 kg
Power	15 CV
Cylinder	80 cm^3
Tank	17 l
propeller	1,25 m
Carburettor	WB 37
Transmission	Clutch
Thrust (approx)	46 kg

Fresh Breeze Sportix Schnappmatix

The Schnappmatik system in the diagrams on the right, shows an original and fairly complex movement. The point of rotation of the rods isn't fixed, but moves as a function of the angle. At take-off, with the rods pointing downwards, this point (yellow in the diagrams) is near the pilot. The weight of the motor keeps the pilot in an upright position. In the air, when the pilot sits down, the rods point forwards and the point of rotation of the system moves towards the motor, superimposing on itself the point of gravity of the motor. The result is increased comfort for the pilot. During our tests, we noticed that the system seemed to be fairly efficient. The stability is good and the handling by weightshift equally good, all whilst remaining suitable for less experienced pilots.


Photo: Véronique Burkhardt



DUDEK UNIVERSAL

The Dudek Universal, which came out in 2013, was intended to be used equally for free flying paragliding (trimmers closed) as on a paramotor (trimmers open). It's an EN B, also certified DGAC.

It's strength is above all flying with a motor, the manoeuvrability being a bit less in free flight. It's great at take off, which was a real bonus for this type of journey.

Photo: WWT

UNIVERSAL - TECHNICAL DATA

Manufacturer: Dudek Web: http://www.dudek.eu/en/

DATE	2013				
SIZE	23	25.5	28	31	34
CELLS	50	50	50	50	50
FLAT SURFACE AREA [m²]	23	25.50	28	31	34
PROJECTED SURFACE AREA [m²]	19.83	21.98	24.14	26,72	29,31
FLAT WINGSPAN [m]	10.83	11.40	11.95	12,57	13,17
PROJECTED WINGSPAN [m]	8.71	9.17	9.61	10.11	10.59
FLAT ASPECT RATIO	5,10	5,10	5,10	5,10	5,10
PROJECTED ASPECT RATIO	3,83	3,83	3,83	3,83	3,83
ALL UP WEIGHT PPG [kg]	55-75	70-95	90-115	110-140	135-170
CERTIFICATION EN/LTF	B	B	B	B	B
MATERIAL	Lines: Technora 1.2 & 1.3 & 1.5 & 1.8 & 2.3 Dominico tex 34 et 41 g/m² Dominico tex Hard 40 g/m 2SR Scrim, SR Laminate 180 g/m²				

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