

Flight test: **Advance PI 3** SEAN POTTS REPORTS

When the original Pi was released in 2012 its main vocation was to replace Advance's first lightweight glider, the Alpha Hike, as a specific mountain/hike and fly wing. By 2016 the Pi 2 offered a wider size range, a shark-nose profile, slight weight savings and a more sophisticated feel.

Originally viewed simply as 'mountain wings', lightweight wings are becoming increasingly common and being put to more varied uses. Many manufacturers now offer lighter versions of most models. The reduced weight confers technical advantages as well as a lighter load to carry to take-off or squeeze into the weight restrictions when travelling. However it is important to remember that these wings require a little more care than regular wings. They are inevitably slightly less durable, especially when subject to abrasion or poor drying techniques.

In its third incarnation the Pi has evolved considerably. It can be considered for an impressive range of roles: lightweight beginner wing, everyday thermal wing, mountain wing or even very nimble mini-wing. This versatility is achieved by marrying a modest aspect ratio (4.5:1) to precise wing loading guidelines, and a well-calculated split certification over six different sizes (the only Advance model to do so).

Wing loading

These are Advance's wing loading guidelines:

< 4.5kg/m²: Thermal flying, hike and fly, beginners

4.5 - 5kg/m²: More dynamic, sporty-feeling wing to suit the tastes of more experienced pilots

> 5kg/m²: Dynamic flying qualities for experienced pilots (notably with 16 and 19 sizes)

Construction

The four larger sizes are constructed principally with the very popular Porcher 27 29g/m² cloth (32g/m² for the leading edge), whereas the 16 and 19 sizes employ Dominicotex 10D (25g/m²) cloth for the entire upper and lower surfaces, along with shape-retaining Nitinol leading-edge rods. The same lightweight Dominicotex 10D fabric is used on Nova's Doubleskin, and partially on Ozone's Ultralite 4.

Advance forewarn that the Dominicotex 16 and 19m² wings will require more care than the Porcher ones and will not be as durable, though the Nitinol rods should be more resistant to the inevitable bending from ultra-compact packing for mountaineering use.

Risers are made from narrow 1cm webbing, with lightweight Dyneema softlinks rather than metal maillons. The 16 and 19 sizes differ again, with simplified 0.5cm webbing risers without the dedicated big ear sub-risers of the larger sizes. Unsheathed colour-coded Edelrid Aramid Pro Dry lines are humidity-resistant, and said to be

highly resistant to altering in length with time. Ceramic rings retain the control lines, and all models have a speed-bar operated speed system rather than trims.

Covid winter flying

Under Covid the French government stopped ski lifts operating, ostensibly to avoid encumbering the hospitals with broken skiers. It was still acceptable to fly or ski but you had to earn your turns by hiking up, usually with touring skis or snowshoes. Some lower sites were accessible by vehicle, but in mid-winter driving time outweighed flying time. Ski touring was the way to go to test-fly the Pi 3.

Which size?

As most of my local sites around Chamonix entail around 1000m of climbing, a lightweight set-up was essential. My choice was the Pi 3 19 at 2.15kg (150g heavier than the Ozone Ultralite 4 19) and a Supair Everest 3 harness, giving a sack weight of 2.6kg. An all-up weight of 85kg (including touring skis, boots, poles, etc) gave a wing loading



All photos: Sean Potts

Supple Dominicotex cloth and short shark-nose reinforcement rods make for a very compact and light package

of 4.5kg/m² – at the top end of Advance's hike and fly weight range and the bottom of the 'dynamic' range.

Heading up

The wing comes with a slender 24-litre rucksack weighing 368g, minimalist but very comfortable, featuring numerous simple elasticated pockets and one small zippered one. The supple Dominicotex tissue and short shark-nose reinforcement rods (solely at the leading edge) make for a very compact and light package.

Whilst it was a tight squeeze when packing the extra layers required for flying in -10 C whilst ski-touring up, overall the volume was perfect for my requirements. It might however be worth considering the 32-litre rucksack provided with the 21 - 27 sizes if flying with a larger harness, reserve, etc. Although the lack of a back ventilation system means sweaty T-shirts after big climbs, I have

never found ventilated backpacks to be very effective and the increase in weight and bulk is of little benefit.

I liked the minimalistic low-bulk approach and accept the compromise; others may disagree. The humble inner bag has evolved into the well-thought-out lightweight zippered Compressbag that really helps with fitting the wing into the rucksack with space to spare.

Launch

Sorting the colour coded lines (with protective mini sheaths at the riser connectors) is easy. The braiding technique means that the lines are smooth, avoiding the snagging that can occur with stitched lines.

The narrow webbing risers are far easier to manage than the Pi 2's more radical string-like Dyneema risers. Comfortable lightweight control handles are attached with small and lightweight but effective poppers – useful when preparing to fly at a technical and windy launch.

Ceramic rings for the control lines, and partially on the speed system, are well



Photo: Sean Potts

Riser set for the 19 (and 16) sizes; simplified 5mm webbing and without the dedicated big ear sub-risers of the larger sizes

suited to this lightweight wing. However, to forestall unnecessary friction wear it's best to avoid an arms-out position when making control inputs. The minimalist approach means there's no dedicated line for big ears on the 19 (and 16), making for lighter and more compact risers.

The 19m wing is compact, and the comparatively short lines mean that you can prepare in relatively small areas. Nil-wind launching is very easy and progressive without any overshooting; even if launching off-centre the wing is simple to re-centre and tolerant of brake input. Despite its small size, the Pi 3 generates lift quickly without the need for excessive speed at launch.

In the air

Once airborne I found that the wing reacted directly to control input in a progressive, linear fashion – a very satisfying feeling. It was reactive from the

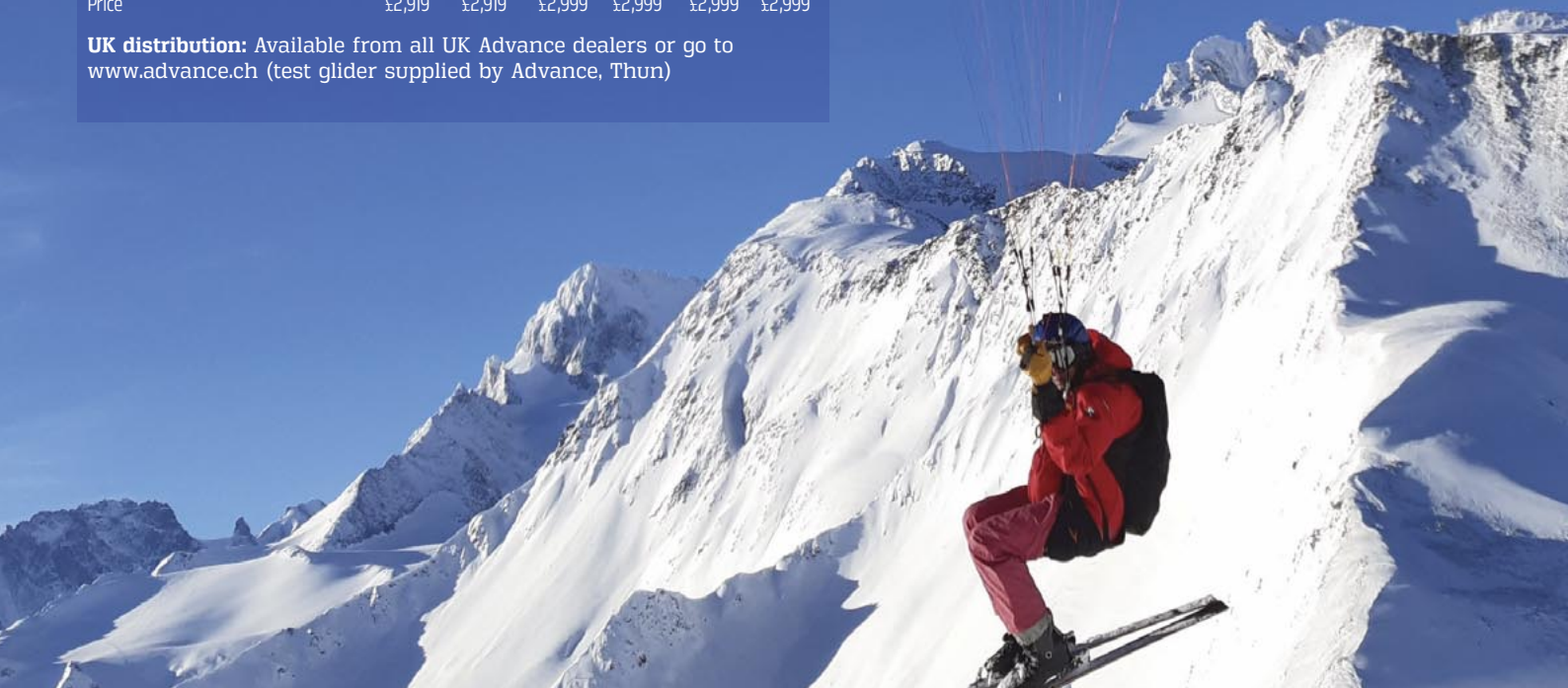


When ski-launching, where manoeuvrability is limited, I found it best to use a cobra technique

Specification

Model	16	19	21	23	25	27
No. of cells	38	38	38	38	38	38
Span (projected, m)	7.0	7.6	8.0	8.4	8.7	9.1
Area (flat, m ²)	16.0	19.0	21.0	23.0	25.0	27.0
Aspect ratio	4.5:1	4.5:1	4.5:1	4.5:1	4.5:1	4.5:1
Max. chord (m)	2.34	2.55	2.68	2.81	2.93	3.05
Glider weight (kg)	1.85	2.15	2.55	2.75	2.95	3.15
Certificated weight range EN A (kg)			60-85	70-95	80-105	92-115
Certificated weight range EN B (kg)		50-95	85-100	95-110	105-120	115-125
Certificated weight range EN C (kg)	50-90					
Guarantee	3 years materials and workmanship					
Price	£2,919	£2,919	£2,999	£2,999	£2,999	£2,999

UK distribution: Available from all UK Advance dealers or go to www.advance.ch (test glider supplied by Advance, Thun)



start of brake input, becoming reassuringly firm, then firmer still but remaining communicative. I immediately found it easy to make the turn that I wanted, and was able to place the wing where I needed to, including precision touch and goes. Usually it takes a while to get a feel for a new wing but the Pi 3 felt almost instinctive. It was straightforward to land and could be flown like a regular-sized wing, with no real sensation of increased speed on final unless I wanted to play.

Airspeed felt good, though perhaps slightly less than I expected for a 19m wing at my loading. The wing was very tolerant of symmetrical deep brake input, and even deliberate, rapid, heavy-handed asymmetrical braking such as a stressed pilot might make. (Playing around with low airspeed is relatively comfortable when flying with skis a few metres above deep powder snow on a gentle slope.)

Overall, given my wing loading, I felt that the wing belied its 19m size. In flight you could imagine that it was really slightly bigger, yet possessing the weight/bulk advantages of an even smaller wing. I was unable to accurately measure the airspeed, but I believe around 42 - 45km/h hands-up, and around 55km/h accelerated, is realistic at 85kg all-up.

In stronger winds the light fabric certainly wants to inflate quickly. When ski-launching, where manoeuvrability is limited, I found it best to use a cobra technique, or to initially inflate just one half of the wing – it is predictable and simple to place in this way. When reverse launching on foot in strong winds you need to ease towards the wing when inflating to avoid overshooting.

The Pi 3 does like flying, even once landed, and in very strong winds a good deflation technique or a helping hand is useful. This applies to all lightweight wings, though the Pi 3 is easier to manage than some because of its stability and precision.

Soaring with the 19m wing was a delight: precise, fun and totally rewarding. Flying with skis means no access to the speed system, so you need good awareness if the wind is increasing. Altitude is best controlled by big wingovers, something that the 19m excels in, being easy to initiate and control. I am not a fan of big ears, particularly on lightweight wings, but the Pi 3 is stable in big ears and comes down nicely whilst retaining its airspeed. A crabbing descent with just one big ear works nicely too.

The 19m wing enters spiral dives directly and can descend quickly with gentle 360s – there is no need to turn hard to produce a high sink rate, and the wing recovers spontaneously without any particular dive.

With light brake input and subtle, coordinated weight shift the wing can be turned very flat. Coupled with its precision, and surprising capacity to fly slowly, the wing flew well in weaker soaring conditions. As soon as turns become more banked the higher wing loading takes its toll – a useful quality when soaring in strong conditions.

Photo: Advance/Thomas Ulrich



The Alps offers few thermals in mid-winter, but I was pleasantly surprised to find that, despite my wing loading, I was able to thermal in the few narrow thermals I encountered, thanks to the flat turning and manoeuvrability of the wing. I lent the wing to a 50kg pilot (thus giving a 3kg/m² loading), who found she was able to thermal very effectively – validating Advance's wing-loading advice.

The glide performance felt good, roughly similar to that of the Advance Alpha 6 24 in light wind conditions. Gliding side by side with a similarly-loaded Ultralite 4 showed the Pi 3 to have very slightly better sink rate and glide.

Turbulence and certification

In mildly turbulent conditions the Pi 3 19 feels quite rigid, communicating with small-amplitude movements that are easy to follow. The few minor wing tip rustlings that I experienced never amounted to any hint of a turn or cause for real concern. You can feel the wing slicing through buffets and converting them to lift, undoubtedly an effect of its mild shark-nose profile.

The Pi 3 is effectively a variety of wings, offering different experiences subject to wing size and, more importantly, wing loading. Most of my flying was in winter conditions on the 19 size at 85kg (i.e. 4.5kg/m²), but I was also able to make two-

foot launched thermic flights on the 23m wing, putting me towards the top of the 'ideal thermal flying' range (and within the EN A certification).

Punchy Alpine spring thermals with climbs of up to 5m/s did not faze the wing, which felt comfortable and very reassuring. Again the Pi 3 was intuitive to fly, communicating the entry or exit of thermals clearly but without excess, and showed itself to be very nimble – unless making very flat turns where a little more space and subtle piloting were required.

Having previously owned a Pi 2 23 and been a little underwhelmed by the light, slightly disconnected feel of the controls, it was a pleasure to find that the Pi 3 23 offered a firmer and more direct/reactive feel, whilst still offering friendly, long control inputs for the low-airtime pilot. Sink rate was good and it was easy to climb quickly. The speed bar, relatively light in action, was smooth and progressive. It immediately offered a nice increase in speed without degrading the sink rate. On fully using the ample travel it really picked up speed, but with a noticeable descending trajectory at full bar. However the wing continued to feel very solid.

Other opinions

As the Pi 3 has been available for some months I was able to quiz a few owners and pilots who had flown the 19m size. A 60kg intermediate pilot found inflation easy and



Mountain wing: regular or single-surface?

SEAN POTTS EXAMINES THE PROS AND CONS



forgiving and said, 'It felt like a normal wing – with more speed and determination than my Masala 2'. An experienced pilot, flying at 62kg, said, 'Reassuring, reactive and precise, and an effective speed bar'. Another experienced pilot, flying at 85kg, said, 'Great slow flight capacity, and easy to launch and fly in strong winds.' A 95kg Omega XAlps 3 owner summed up the Pi 3 thus: 'Simple, intuitive, precise, efficient and very fun.'

Conclusion

The Pi 3 19 proved to be the perfect tool for ski-touring and flying adventures during the winter, and excelled in soaring conditions. If I wanted to be flying upwards, or to have a lightweight compact travel wing, the 23 would be a better option for my weight. The 19 is so small and compact, it encourages you to plan your next adventure as soon as your feet touch the ground!

It is however really important to decide which size suits your flying requirements and abilities. The range of possibilities is wide, from mini-wing, though climb and fly and hike and fly to thermalling. It is important to understand your own requirements, and choose carefully by consulting the Advance website or speaking to their dealers.



Light, compact, fun and rewarding to fly.



Probably will not last for ever (16, 19m² lightweight cloth). Requires good ground handling technique to deflate in strong winds. Not cheap!

Each evolution of lightweight mountain wings has seen reduced weights, lower volume and more pleasant handling. Single-surface wings are even lighter (the lightest is under 1kg) and have evolved substantially; they are very tempting, but the pilot does need to carefully consider the intended use before committing.

Although launching a single-surface wing in nil wind is incredibly easy, this ease of inflation becomes a nuisance when preparing in light winds, and can be very technical in strong winds.

Single-surface glide performance has improved but remains less than that of double-surface wings. This is not a concern if flying down from a high mountain, but compounded by the lower airspeed of the single-surface, the glide really suffers when flying into wind, especially if it is strong.

Single-surface wings do not really pitch forwards in light turbulence (or at launch) and have a different feel in comparison to regular wings: they make frequent small, low-amplitude movements. It's a little unsettling at first for an experienced pilot, but actually reassuring for the novice who can be excused piloting as actively as with a double-surface wing. Probably due to the lack of pitch movement, single-surface wings have a very limited flare capacity – landings are less forgiving than double-surface and can sometimes be firm.

Current single-surface wings are EN B or higher. Along with the perceived (but unjustified) lack of solidity, many pilots will prefer to fly with a reserve – something not necessarily the case with regular mountain wings. An ironic situation when considering the single surface for its low weight and bulk!

Modern regular mountain wings offer weights and compactness that are very reasonable and facilitate take-offs that are easily manageable, even in brisk winds or on tight mountain-top launches. They have good airspeed, handling is reassuring but still rewarding for the pilot, and landing is straightforward.

I feel that regular mountain wings currently offer the best compromise for most flying conditions. The hardcore mountain climber who values every gram and low volume will understandably have a different viewpoint, and will revel in the possibilities offered by the single-surface, as might a trail runner who looks to fly down in silky-smooth light wind conditions.

Designs of both regular and single-surface wings are constantly evolving and it will be interesting to see what the future brings – who, a few years ago, would have imagined a sub 1kg wing?

Sean Potts is an FFVL paragliding instructor and tandem pilot. He has lived and flown in Chamonix-Mont-Blanc since 1991.