

# NOVA

30 YEARS OF

# AIRTIME



**THE 30 TOP TIPS**  
for cross-country flying

**KNOW-HOW**  
buying a wing | maintenance | parachutes

**PORTRAITS**  
Toni Bender | Wolfi Lechner | Philipp Medicus | Niki Kurcz



Photo: Ingo Kallmeyer

# EDITORIAL

## 30 YEARS AND STILL A SPRING IN OUR STEP

Celebrating a thirtieth anniversary in an industry that is hardly older itself is something special.

If you look at the development of paragliding and that of NOVA, you can see that a lot of things happened in parallel. It is a given that a company is guided by the requirements of the market and the wishes of its customers. If not, the company will not be successful. However, the fact that a company influences the entire market is less common. NOVA has achieved this several times, both in terms of important innovations and technologies, and in terms of market developments (when and how you can read in the following pages). We're a little proud of that.

With this magazine we would like to thank our friends, partners and customers for 30 successful years. But don't worry, this magazine isn't full of just company history. We have made every effort to offer all paraglider pilots something of value - with practical tips and lots of useful and factual information.

The last 30 years included some wild times, especially at the beginning. Like in flying, there were some high and some low points. But no matter how it was going, our work has given us a lot of pleasure from the very beginning until today. We love what we do and it is a great privilege to work in the industry that is about the most beautiful

diversion in the world. Even if a lot has happened in the 30 years, at NOVA we are as passionate about paragliding as we were on the very first day. And we do our utmost to bring a smile to the faces of our customers.

**With this in mind, we wish you wonderful, safe flights and look forward to the next 30 years!**

**Happy landings from the entire NOVA Team**

»Tribute to Leonardo da Vinci« was the theme of the Coupe Icare 2019 and this photo was the NOVA contribution.



Photo: NOVA archive

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## IMPRINT

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[www.nova.eu](http://www.nova.eu), [info@nova.eu](mailto:info@nova.eu), Tel: +43 (0) 5224 66026, Fax: +43 (0) 5224 66026 19

Editor-in-chief: Till Gottbrath / Kern Gottbrath Kommunikation ([www.k-g-k.com](http://www.k-g-k.com))

Editorial assistance: Toni Bender, Luis Depping, Sissi Eisl, Fabi Gasteiger, Urs Haari, Nikolaus Kurcz, Wolfi Lechner, Linda Maier, Philipp Medicus, Paul Nagl

Photos: Luca Bayer, Mik Broschart, Philip Brugger, Wolfgang Deubzer, Mario Eder, Tobias Ehrmann, Christoph Feichtl, Roland Fugger, Fabian Gasteiger, Adi Geisegger, Till Gottbrath, Urs Haari, Ralf Heuber, Tommy Hofbauer, Heidi Insam, Kerim Jaspersen, Ingo Kallmeyer, Carmen Lechner, Werner Luidolt, Mario Mayr, Philipp Medicus, Berni Pessi, Vera Polaschegg, Pierre Rosén and NOVA archive

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Photo: NOVA, Fabian Gasteiger



# #NUMBERS #DATES #FACTS

## FROM 30 YEARS OF NOVA

**52\*** The number of countries where you can buy NOVA paragliders.

**10 times** (from 12 possible years) a NOVA pilot has won the world-wide standard class ranking in the [XCcontest.org](http://XCcontest.org) between 2007 and 2018.

**11** current paraglider models, in a total of 58 sizes, in the NOVA product range.

Nearly **80** different glider models have been launched by NOVA since 1989.

**850 grams.** The MENTOR 6 Light in size S weighs this much less than the standard version.

**250 metres** currently the approximate average total line length of a NOVA paraglider.

**73\* members** of staff at the NOVA production facility in Pécs, Hungary.

**804** the number of PHANTOM needle-eye ribs, as well as 99 cells and approx. 3200 cross ports in the profiles and diagonal ribs.

**WHITE** is the most commonly used cloth colour in glider production.

**151.299\*** YouTube views of the "Glücklicher Ikarus" (Happy Icarus) film about NOVA pilot Toni Bender's crossing of the Alps.

**5.92** The aspect ratio of the SECTOR, the lowest of all currently available EN C cross-country wings. Nevertheless, SECTOR pilots won the national sports class XC leagues in Germany, Austria and Switzerland in 2018.

**∞** the number of dents that NOVA management feel Toni Bender made in the "Toni on Tour" VW buses.

**18.000.000** (estimated) meters of lines used in all NOVA gliders produced so far.

**435 points** scored for the best flight with a NOVA glider to date, flown on 01/11/2016 by Joe Edlinger (AUT) with a PHANTOM in Quixadá (Brazil).

**17.003\*** NOVA followers on Facebook.

**252 years** of experience as paraglider pilots of all NOVA employees in the Austrian head office.

**1829 m** Altitude of the local NOVA flying site, the Rofanspitze at the Achensee.

**5 times** in the history of the XCcontest the winner of the standard class also won the sports class - all with a MENTOR: 2009 Urs Haari, 2013 Hans Tockner and 2014 to 2016 Berni Pessl.

**650 grams** was the largest amount of dirt we have ever shaken out of a used glider.

**44 hours** needed to sew an ION 5 canopy.



**243\***

NOVA sales and service partners which can be found online at [nova.eu/en/try-buy](http://nova.eu/en/try-buy)

**1650 grams.** The miniwing BANTAM weighs this little in size 12, making it the world's lightest certified glider with a double-surface.\*



**250 minutes** the NOVA computer calculates during automatic nesting. Nesting calculates the best possible arrangement of the fabric parts to be cut in order to produce as little waste as possible. If the computer is left to it, it would calculate the perfect nesting indefinitely.

**Over 100 times** Toni Bender has broken bones during his hang-gliding and paragliding career. He doesn't know exactly how many.

**75** test deployments over ground made during the development of the PENTAGON rescue parachute.

**4 times in a row** Berni Pessl won the worldwide standard class ranking of [XCcontest.org](http://XCcontest.org) between 2014 and 2017. A record.

**500 rotations** (at least) our designers spent in the G-Force Trainer while developing the VENTUS harness in order to test the deployment of the rescue reserve under load.

**25 %** more individual parts on the MENTOR 6 in comparison to the MENTOR 5.

**78** wings repaired for free in 2018 through our NOVA PROTECT guarantee, which is valid for one year from purchase.

**10** The average number of prototypes per new paraglider model since 1989.

\*valid: end of November 2019



**3 test pilots**  
work for NOVA

# XC

## EXTEND YOUR RANGE!

The 30 top tips for successful cross-country flying

Some of the world's best cross-country pilots are in the NOVA PILOTS TEAM. Here we have collated the 30 most important tips for successful cross-country flying.

Photo: Tobias Ehrmann



HEILIGKREUZKOFEL  
>FINAL GLIDE +3800 M<

KRONPLATZ

GRENTE

MENTOR 6

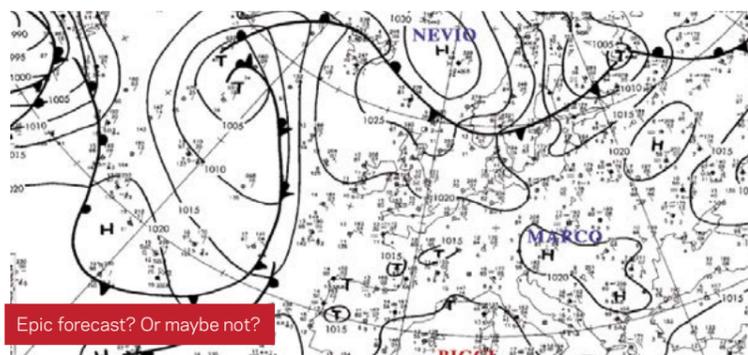
## 1 Don't make excuses - go fly!

It might sound strange, but the most important prerequisite for successful XC flying is to actually go out and fly. I know the predicament - many pilots don't have the time to go out to fly on every half-decent day. Work, family, everything needs to be accommodated. So you need to choose the good days carefully and make the most of them.

But instead of "epic day" you often read "late start", "windy" or "possible thunderstorms in the afternoon" into the forecast. What a shame, it doesn't look like such a good flying day after all. Or maybe it is?

The fact is that it is often easy to come up with arguments NOT to go flying and to wait for a better day. But then it could be that you look at the online contest in the evening, and loads of your friends have flown 150+km triangles and are happy about this wonderful flying day.

And you are annoyed about the missed chance and wait for the next perfect day. And it comes, but it's your son's birthday, your boss wants a presentation urgently or the car has broken down. **So don't let yourself be put off by a weather forecast that's a little on the pessimistic side or listen to your inner couch potato. By keeping your eye on the forecast, you can make the most even of a supposedly non-perfect day.**



## 3 Be patient

Everyone is climbing in the same thermal. The first pilots reach cloudbase and fly off. We're going for it! So best to chase after them as fast as possible! Even when you still need a few turns to top out of the thermal? If you are very lucky you will catch their next thermal. If not, you will arrive much lower and then might have to search for the lift - and in doing so the gap gets even bigger. You are unlucky, don't find the thermal and go down. So, don't get upset when others pull ahead of you. It is perfectly possible you will meet again during the flight.

You also need patience, when for example, there is some temporary cirrus. It is amazing how quickly thermals can weaken or switch off entirely. Conversely, what doesn't stop so quickly is a valley wind. The pilot who plans ahead positions themselves in a prime position on a soarable ridge just waiting for the sun to start the thermals again. This little trick can make the difference between a great day and being prematurely on the ground.

**So, patience and plan ahead. Don't be rushed.**

## 2 Bombard other pilots with questions

In 2006 I was a complete zero at cross-country flying in comparison to the sky gods. But those very sky gods would say to me "Tomorrow is an epic day, you'll fly 150 km." And, of course, I had a few questions ... So we discussed the route options, the crunch points, wind and weather development, a Plan B, a Plan C and then I did indeed fly a flat triangle of more than 160 km.

Talking to other pilots, including some of the world's best cross-country pilots, literally switched my desire for improvement to over-drive. Even today, I am never embarrassed to ask for advice. Whether it is about cross-country flying, some trivial question like where the local house thermal is or if there are any hazards. Bombard other pilots with questions! Asking questions is not a sign of weakness, but it shows you are interested and willing to learn. **By the way ... this principle also applies when people ask you questions. Some friendly advice can make all the difference.**



Photo: Chris Feichtl

## 4 Have more than a Plan B

To have a Plan B you have to have a plan in the first place - which is always a good idea. These days there are pilots who spend bad weather days or long nights with planning tools like XC-Planner or Thermix. But it is not just critical how meticulous the planning is - it needs to be flexible as well.

For example this Hochfelln triangle: The plan is for an ambitious 250 km FAI triangle from Hochfelln to the Kreuzjoch, Gastein and back. For some reason the pilot decides to turn east at the Thurn pass. It would be useful to have an instrument with you that can display your triangle sectors. What it will not show you is any other possible crunch points on the new route. So you need a Plan B! And when suddenly the north-west wind blows very strongly - too strong for the headwind battle on the last leg to be worthwhile, then Plan C is needed. In this case, head east and go for open distance into the Enns valley.

**This shows that a well-thought out plan is great, but don't become a slave to it. Stay flexible and have alternatives worked out.**

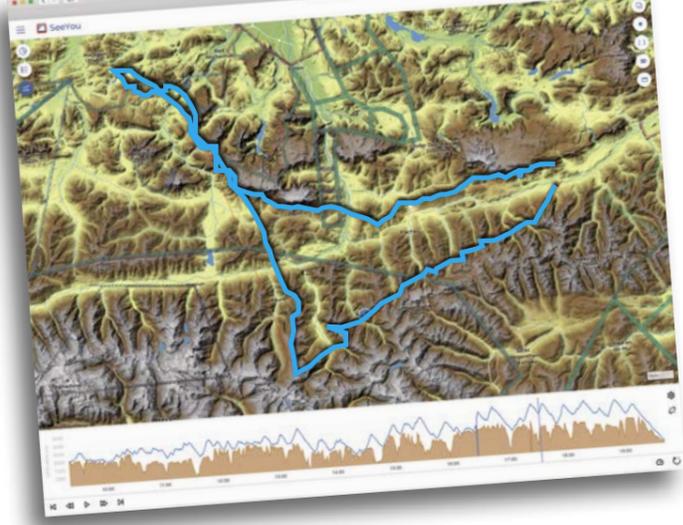


Photo: Heidi Insam

# think positive!

5 These days mental training is an integral part of top level sports. So why not use some of these techniques for cross-country flying? Anyone who has had a low save during a long XC flight will know from personal experience how euphoric this makes you feel. If you look at this objectively, you actually lost time which has cost you valuable kilometres. But subjectively, you avoided going down, you're still in the game and you are as excited as a little kid. A great feeling!

Mental training can have a similar effect on athletes. The aim is to visualise (partial) successes, movement sequences, breathing techniques, constructive approaches and increase motivation as well as to reduce any fears and stumbling-blocks. Especially when it gets stressful, this really pays off! Mental training can also help you to work through negative experiences like a parachute deployment or a crash. **It's worth a try - imagine yourself landing after successfully closing a 200 km FAI triangle. Before the next take off, think back to a particularly nice flight and praise yourself for small partial successes while you are in the air.**



## 6 Use the winter – physical fitness helps

In autumn and winter many pilots don't go out because "it's not worth it". And if you don't get on a plane to fly south to get some airtime, you can quickly find your glider has been packed away for a few months. But as soon as spring comes, the thermals return and with them the first ambitious cross-country pilots.

I have experienced this a lot. The thermals can be small and punchy. It is demanding flying, but normally you can already centre in the thermals. The first 200 km FAI triangles of 2019 were flown in March!

It used to happen to me regularly that on my first flights of the year I got tense or had aching muscles the next day. Since I started doing a lot of cross-country skiing in the winter, I don't experience that.

**It doesn't have to be a full gym workout every day, but to stay active in winter and maybe do a bit of ground-handling definitely helps. Then you are ready for spring.**

## 7 Keep a log book – analyse your flights

There is a big difference between someone telling you about something or you experiencing it for yourself. Anything you experience is more easily accepted and the resulting learning will be more profound. A detailed log-book is therefore a very good method to make the most from your own experiences. BEFORE a flying day, write down what your expectations for the day are. Collate screenshots and weather maps from your favourite forecast sites so that you can analyse your predictions AFTER your flight.

Was your plan a good one? What could you have improved? Should you have changed your plan completely? What did others do better? Did the weather develop as expected? How were you feeling? You can also use the Air Buddy feature to compare your flight with other pilots.

**If you regularly analyse your own flights, you will be able to see for yourself what you have learned and will be able to incorporate it into your future development. Yes, it's a lot of work – but it is worth it.**

## 8 Always enjoy yourself

**Why do you fly? Most will answer: "because it's great fun". Secondary reasons will be experiencing the outdoors or concentrating on the here and now. What hardly anyone immediately admits is that recognition also plays a role.**

Of course it is nice when you look at the XC league and you are ahead. But is this more important than the actual flying? I know a few pilots who are so ambitious that they often forget to have fun. If you sit down for a beer with them in the evening, they are in a bad mood – just because they didn't make the planned 250 km or somebody flew further than they did. It becomes even more extreme when one's own desperation for success is at the expense of safety.

In the NOVA Pilots Team there is a clear instruction that we always want to put sanity and safety before success. I share this belief. If it weren't for that, the fun would literally fall by the wayside. So, when a friend has a long face at the end of the day because they didn't break the world-record, maybe it would be helpful to remind that person why they started flying in the first place. And anyway, you can always fly again. There's always tomorrow!



## 9 Let it go

**"You guys just sit around and occasionally pull some strings. That's not a proper sport."** My neighbour, a passionate cyclist, has very fixed ideas about what "sport" actually is. And no idea about flying. Even if I don't have an average pulse rate of 175 bpm for six hours, as he likes to, I'm pretty exhausted after a long cross-country flight – physically and mentally.

But as for my neighbour, drinking is also of primary importance for me. I never used to think much about it. I just flew. And at some point I had a really dry mouth. I did notice that. What I didn't notice was how my concentration suffered and so I repeatedly made tactical mistakes – and bombed. It reminds me of a really busy day at the office. I get so engrossed in a project, I forget to eat and drink. At some point I get a headache (I notice that) and my concentration suffers (I don't notice that until I consciously think about it). So I have something to drink.



But if there's a lot going in, there's got to be a lot going out. And that begs the question ... how? In "Thermik" magazine there was once an article about this and I think it was the Italian XC ace Kurt Eder who said very meaningfully: "I would never buy a second-hand harness." OK, but there are options:

■ **Freestyle:** I once encountered a pilot in the air who was hanging like Jesus on the cross. When I got closer I realised he was trying to pee. But he didn't twist 180 degrees, like I would try to on a glide, but flew straight at me. After witnessing his performance, I am not convinced of this technique. Maybe it was Kurt Eder?

■ **You're never too old for nappies!** Incontinence nappies are suitable for men and women, but they do not make for a sexy bottom, and you have to find a discreet place to get dressed and undressed. And I was told it is better to practise before the real event. So hang up the harness in a kid's swing and try to go. Because it's quite possible you won't be able to go.

■ **Pee condom kit:** I think we cross-country pilots are the horror of every mountain railway toilet on a promising XC day because we occupy the toilet for ages. But a pipeline needs to be routed properly. If it is not, you get a warm and humid present in the genital area whilst in the air. If it has slipped off or there is a bend in

the tube – both is annoying. Here too a dry run at home is recommended (which by the way is by no means a dry matter). My boys thought it was hilarious to watch their dad in his harness clipped into the garden swing and fertilising the lawn ...

■ **Pee bottle:** I have heard again and again that there are pilots who have a pee bottle on a string in their harness. I can imagine that it would work on long glides in calm air. But it must require a lot of fumbling around: taking your gloves off, zips down, "docking", etc.

It's much easier to eat in the air. I know pilots who never eat. They don't seem to need to. One of our local French pilots likes a nice baguette sandwich. For me a crunchy bar is enough when my blood sugar levels fall.

**In summary: dehydration will affect your concentration and you need to practise peeing in the air.**



## 10 Listen to your intuition

I have been flying since the end of the 1980s and just like when driving a car, I have developed a kind of “sixth sense” when flying. I’m sure you know the feeling. You’re driving towards a junction and something seems strange to you – and suddenly someone cuts you up. But you are aware and can compensate for other’s mistakes.

When flying this kind of stuff happens to me too. For example, when it comes to right of way when everyone is piling into a thermal – everyone has experience of that. **I don’t know how it works, but I always listen to my intuition. This can even result in me not even taking off, even if it doesn’t look so bad and others are flying quite happily. But at that moment it has to be right for me and if my gut says “no”, then I trust that instinct.**



Photo: NOVA archive



## 11 All birds fly high – high – high

In his book *Cross-Country* ([www.thermikwolke.de](http://www.thermikwolke.de)), Burkhard Martens recommends always flying as high as possible. Even if the guys ahead are already chasing to the next thermal or if you have the feeling that everyone is flying much faster than you ... The higher you get, the higher you will arrive after the next glide, and maybe even over the next ridge, where the next thermal is waiting for you. Of course, flying far means flying fast. But the first rule is: don't land.

**Especially at the beginning of your cross-country career (or at the beginning of the season) you should concentrate on flying as long as possible.** If you're in the air for ten hours or more, you'll go a long way. Speed only becomes relevant much later. By then you will already know the crunch points and know which thermals are strong and consistent – or which ones are just weak bits of lift.

## 12 Concentrate on the crunch points

There are particular cross-country routes that are particularly suitable for flying really long distances. Long-standing XC pilots will think of places like Fiesch, Mornera, Fanas, Scuol, Stoderzinken, Stubnerkogel, Grenteam or Hochfelln. All these classic triangle places have long stretches where you can “boot it”. Where bits of the route run along mountain ranges that are very favourably oriented towards the sun. Mostly there are house thermals and it is unusual to sink out there. And then there are transitions where you can be on the ground fast and involuntarily. Observe the sky gods when they make these transitions, because they know where to get up again.

For example at the Grente: select the longest flights from this site in the XCcontest. In the list you will see the same names coming up again and again. These guys know how to fly this area. What line do they take over the Staller saddle and into the Defreggen valley? How do they cross the Tauferer valley? How do they get over Sterzing? And in particular, how do they cross the Lüsener Alm? In which wind do they fly to which point during the transitions?

**When you are doing your planning, concentrate on the crunch points that connect the easy bits. This will give you the best chance of getting around the course and you're not standing on the ground prematurely.**



A 300 km triangle in the Valais, shown on Thermix

## 13 Tools with addiction potential

There have been cases of relationship breakups because one partner was addicted to XC Planner. At least that's the rumour in my club.

No question that the two planning tools [xcplanner.appspot.com/](http://xcplanner.appspot.com/) from Tom Payne and Thermix from Bernd Gassner [berndgassner.de/thermix/](http://berndgassner.de/thermix/) are potentially very addictive for cross-country pilots. A mouse-click on your turn points and the tool will tell you how many league points this flight will earn you. In addition there is airspace information, skyways, the graphical representation of the turn point radius and above all, useful thermal information to help you achieve your dream 100/200/300 km flight. Last but not least, you can download the planned routes in various data formats (e.g. .gpx) and transfer them to your own flight instrument.

**XC Planner** is easier to use as it focuses on the essentials: the skyways show where most people fly as a graphical overlay over the selected map. Thermal info is presented as a heat map based on KK7 data ([thermal.kk7.ch/](http://thermal.kk7.ch/)) for January, April, July and October from sunrise +4, +7 or +10 hours. This helps a lot! But what you should also know is that this thermal info is based on past data, from real flights other pilots have submitted to a league. So it is by no means the case that in the immediate surroundings of Annecy, Andelsbuch or Kössen the thermals are “best”. It is just that that is where most people fly.

**Thermix** offers everything XC Planner has – and a lot more. For planning purposes, you can limit the data to April to September. Official take-off and landing areas can be displayed. You can also filter the KK7 data and display the “best” thermals as individual points. Thermix also displays the thermal info from the DHV-XC (Leonardo) – even with filter options according to wind direction and thermal quality.

The Thermap data is great for pilots who want to “break new ground” – this is a theoretical model for the thermal probability as a function of slope inclination and solar radiation (i.e. according to selected time of day and season). Since Thermix also allows the import of GPX or IGC files to your instrument, you will be amazed how good the thermal predictions are when comparing theory and practice.

**A real source of inspiration for new routes and a great tool to do a lot with! But please don't neglect your partner ...**

## 14 Become your own weather guru

Many pilots in the German-speaking world miss Stefan Hörmanns' subscription gliding forecast called "Gleitsegelwetter". It was the perfect forecast for meteorology philistines like me, because no prior knowledge or experience was necessary. Green = good, amber = so-so and red = rubbish. An epic day in the Valais? Get yourself out there!

But if you are involved in the cross-country scene for long enough, you will discover that the top guys and girls are not only excellent pilots, but also know a lot about the weather. That's the reason they go to the right site on the right day and make the right decisions during the flight.

How come? They have read the books on meteorology. They go to weather talks organised by their local clubs. They have spent years comparing the forecast and actual weather. They not only save their tracks, but also supplement these with screenshots of the actual weather and forecasts and subsequently analyse flight and weather. The pinnacle is becoming your own weather guru and being able to do your own forecast using charts and other weather info.

To fly far, it isn't essential to have experience and theoretical knowledge of the weather. You can just get lucky. But they're a great help to that luck. So back to those meteorology books!

## 15 The sun is your best friend

"Tomorrow we will fly the Stoderzinken triangle. At the weekend we will go to the Grente. Someone will fly 250 km." Or, "We'll do the Pinzgau amble from the Schmittenhöhe!". Which ambitious XC pilot has not heard those, or similar, statements before?

All promising triangle flights have one thing in common: exposure to the sun. In the morning head to the east or southeast, around noon to the south, in the afternoon to the southwest or west. You should consider this especially if you don't just want to follow the common routes, but are ready for something new.

And en route it can also be smarter to wait patiently until your friend, the sun, shines on the next stretch again.

## 16 Set goals

Cross-country flying is just like any other aspect of life – if you don't set any goals, you won't achieve them. Whereas in real life goals are often vague, in XC flying they are very well defined. The first 100 km flight. The first 150 km FAI triangle, etc. When the pilot is ready for these achievements depends on their individual learning journey. And if you don't immediately achieve that 100 km flight? Then you try again. And again and again.

Of course you need to balance thinking big with a healthy dose of realism. There are some really naturally gifted pilots, like NOVA Team Pilot Christoph Feichtl ([www.xcontest.org/world/en/pilots/detail:Burgschmied](http://www.xcontest.org/world/en/pilots/detail:Burgschmied)). In the 2016/17 season he submitted his first cross-country flight. In the current 2018/19 season he is classed as one of the best XC pilots of the world! Others need a little longer to fulfill their goals. NOVA Pilots Team captain Till Gottbrath has been flying since 1986. After flying a 162 km flat triangle in 2008, he set himself the goal of flying 200 km. He achieved this in 2019. Both pilots are rightly pleased with their success, despite the different development tempos.

In short, it doesn't matter how distant the goal is, the important thing is to have a goal in the first place. Just flying around aimlessly will not get you any further in your pilot development. With patience and diligence it will work out sometime. And once you have achieved your goal, this will motivate you even more to achieve your next one!



Photo: NOVA archive

## 18 Split big goals into attainable targets

Success motivates, apparently. But you don't have to win a championship title to get some positive energy. As you prepare for your "personal best" goals, you can set small or more spontaneous daily goals. For example, to be one of the top 3 pilots who launched from the same place that day. To fly all the way round a nearby lake. To be the last person to land on a particular day. To try to be the highest pilot for two hours at your local site. Set yourself a mini out-and-return task of maybe five kilometres and try to fly it as many times as possible or as fast as possible. Also really motivating: to fly home and land in your own garden.

It could also mean setting and reaching intermediate goals on a long triangle flight: first turn point? Absolutely! Well flown and that turn point in the bag. Praise yourself for small successes – you have earned it!

If you divide a big goal, which at first glance seems almost unattainable, into smaller individual goals, these become more attainable in themselves. And in the end, you achieve the big goal!

## 17 Get to know your wing

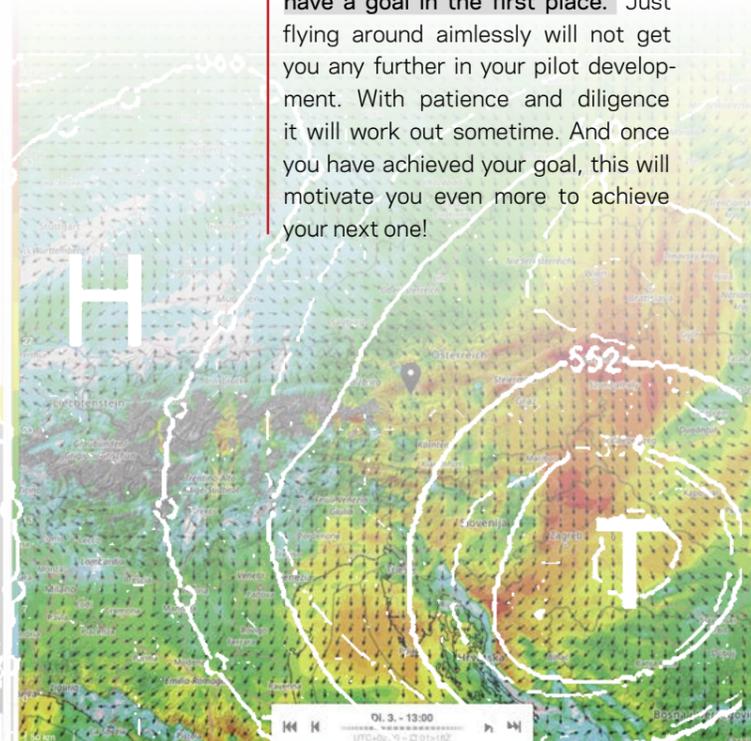
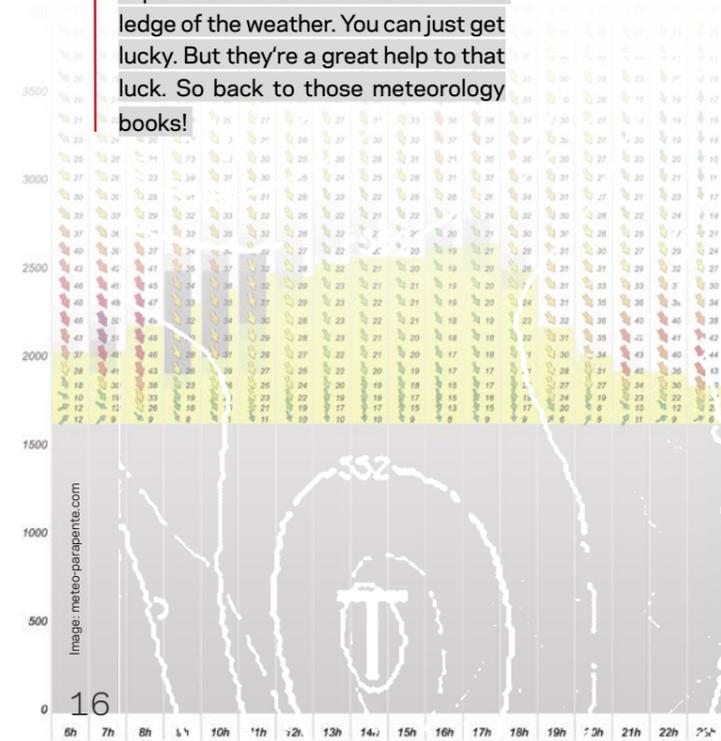
The early afternoon when the thermals are at their strongest, it is important to use even quite rough thermals as effectively as possible. Climbing faster is often a better strategy than gliding faster. In the late afternoon or early evening, the thermals become wider and weaker and now it is critical to take every bit of lift, no matter how small, to gain the last metres of altitude and get the last XC kilometres out of the day

This means: to get the maximum from your wing, you need to know it as well as you can in all conditions.

Think about the following:

- How tight does it turn at how much brake line input and how strong is the sink?
- How does it react to weight-shift without or in combination with how much brake line input?
- What effect does the outer brake have when turning (also in relation to the inner brake)?
- How do you achieve a 360° turn with minimal sink?
- Have you ever tried weight-shifting to the outside of the turn?
- Have you tried turning with asymmetrical use of the speed-bar? (doesn't work with all speed-bars)
- How does the glider react to steering inputs with the rear risers (Speed Brake Riser)?
- How do you achieve best glide (with most modern gliders it is slightly accelerated) and least sink?
- Try out min/sink and max/glide when flying straight.

When trying all this out, use still morning or evening flights, or make the most of your time in autumn and winter. Just keep trying out things with your glider.





Berni Pessl feeling good on an XC flight from Quixadá on his ION

## 19 Fly a wing with a feel-good factor

One of the great success factors for flying far is the feel-good factor of the glider. Those who want to break the 100 kilometre mark will stay in the air for about five hours (presumably they will not yet achieve a high average speed), and those who are aiming for the 200 kilometres will do so much longer.

In parallel to their own development as pilots, many ambitious pilots switch to higher class gliders. This might sound like a logical progression, but it doesn't necessarily have to be like that. **In the NOVA Pilots Team (but not only there) there are a lot of pilots who have been very successful for many years and still "only" fly an EN/LTF B glider like the MENTOR or PHANTOM.**

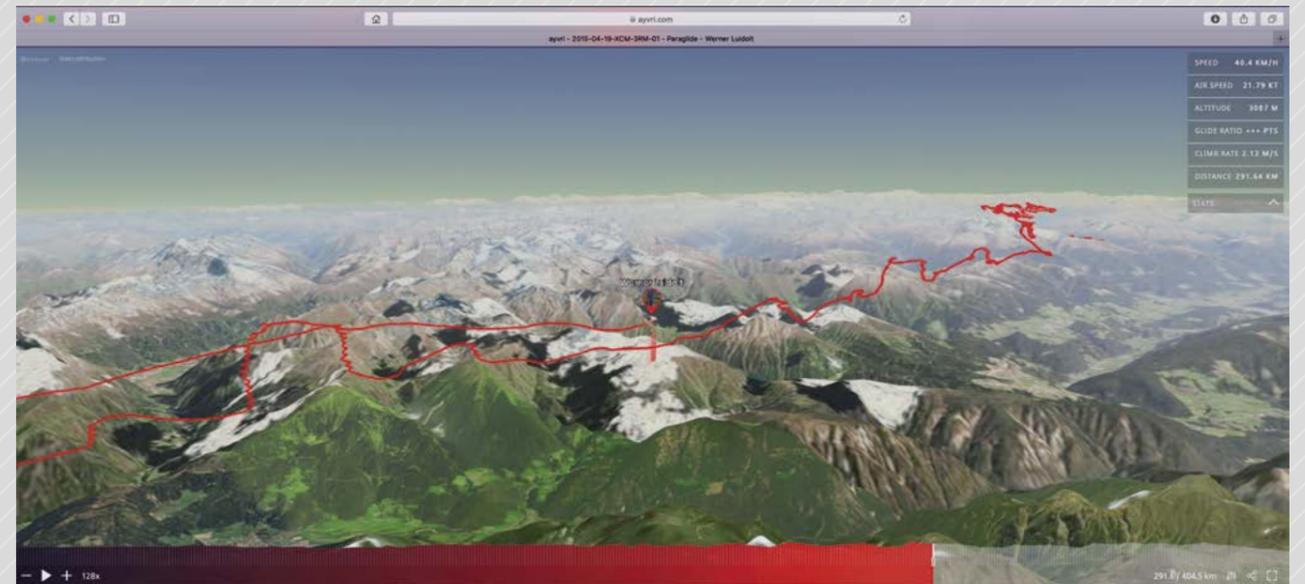
The reason is the higher passive safety of an EN B wing. The other often quoted reason is the ability to concentrate. If a significant part of your attention is drawn to keeping the glider open and above your head, you are more likely to reach the point during the flight where you lose concentration. You will make a tactical error and go down. To fly far, you need to fly for a long time. That means to delay your landing for as long as possible. If you can stay in the air for 10 hours, you will go a long way.

If you are flying a glider that is simply "there" without you having to actively pay attention to it, the prerequisites for a long flight are given. Which wing category is the one that makes you feel most comfortable is, of course, a matter for each individual pilot. **But it is perfectly possible that less (classification) is more (distance).**

## 20 No fear and no deadlines

From my own experience I know that two things really hamper a long XC flight.

1. The fear of bombing out... i.e. if I am already thinking of bombing out when I am still flying. People talk of a **self-fulfilling prophecy**. If you think about bombing out, you're already half-way there. Better to turn that around and persevere and think about all the low saves you achieved in the past! You've only landed when you are standing on the ground with both feet. Until that moment you always have the chance to get up again.
2. **Evening commitments are a killer for XC flights.** If you are already worrying about getting home on time, if there will be public transport, how long it might take you to hitch back to your car ... you are really increasing your chances of a short flight.



## 21 Try some virtual flying

Have you ever played with the [ayvri.com](http://ayvri.com) (previously Doarama.com) or [soaringlab.eu](http://soaringlab.eu) websites? These allow you to upload your or other pilot's IGC or GPS tracks and play them in 3D. Which route did they take? How effective was that route? Where were the best thermals? You can also compare the glides of different models using these websites.

**The 3D display of flights is especially useful when going to a new, unknown flying area.** From one of the online XC leagues, download several flights of a local skygod someone who often flies in the respective area. That pilot will know where the house thermals are located. This will give you a good idea of the local terrain. Once you are on the take-off, the area will not seem as unfamiliar to you.

And after your flight, you can compare it to the flights of others on the same day. This is a wonderful opportunity to see what others did better than you – or you did better than them.

## 23 Have an equipment checklist

What a horror scenario: it's an epic forecast, you are free and standing on the right hill, ready to take off and you notice you have forgotten your gloves! Or your battery is flat, you forgot your GPS, etc.

**Pack your bag the night BEFORE, using a checklist.** You can make your own list or download the NOVA XC checklist from here:

[www.nova.eu/fileadmin/user\\_upload/service/download/en/xc-gear-list.pdf](http://www.nova.eu/fileadmin/user_upload/service/download/en/xc-gear-list.pdf)

## 22 Less haste, more miles

This tip might sound trivial, but experience has shown that it is pretty important. Take your time when aiming to fly cross-country.

- Get to the flying area the day before if it is a long way from home. Getting up at 3am to travel to the right hill is less than optimal.
- Take your time for a proper weather check and route plan.
- Sleep for as long as possible to be refreshed when you get to the take-off.
- Get there early.
- Get your equipment ready in a relaxed manner. All this will give you time to talk to other pilots about their plans for the day and maybe get a few good tips as well.
- Before launch, have some quiet time to go through your flight in your head and visualise yourself landing later that evening safe and sound, with a big smile on your face.

**Taking your time will not only bring greater success, but it can avoid mistakes or in extreme cases, even accidents.**





Urs Haari over the Aletsch Glacier

## 24 Learn to core effectively

Anyone can fly straight (at least to some extent), but it is much more difficult and therefore extremely important to center in thermals correctly. Master pilot Chrigel Maurer has stated: **“When you are in a thermal, you spend half the time flying in the wrong direction!”** Therefore you should try to minimise the number of turns in a thermal and the amount of time you are climbing in one.

The importance of effective turning can be seen in this mathematical example: if your wing has a glide angle of 1:10, we can calculate how much time you need for a glide and to thermal back up to the starting altitude and therefore how long it takes to fly 20 km.

Isn't it amazing how much time you gain if you can climb faster? If you gain altitude faster, you get a better average speed and fly further.

### How can you improve your climb rate?

- Practise at your local site. Climb, spiral down, climb again.
- Always try to be the highest pilot at your local site. This increases your awareness of the best places to climb.
- Observe your surroundings. Are other pilots climbing faster in another thermal? Are birds climbing nearby? They generally have the best idea where to get high. When scratching on the ridge, observe the leaves. Are the trees moving? Can you see the lighter underside of the tree leaves?
- Observe and analyse the thermal you are currently in: is it tight or wide? Weak or strong? Smooth or rough? Straight up or drifting? And if it is drifting, how strongly and at which altitude?

SPEED	TIME TO GLIDE 20 KM	AVERAGE CLIMB RATE	TIME THERMALLING	TOTAL TIME NEEDED TO FLY 20 KM
30 km/h	40 min	1 m/s	33:20 min	1:13.20 h
		2 m/s	16:40 min	56:40 min
		3 m/s	10:06 min	51:06 min
40 km/h	30 min	1 m/s	33:20 min	1:03.20 h
		2 m/s	16:40 min	46:40 min
		3 m/s	10:06 min	41:06 min
50 km/h	24 min	1 m/s	33:20 min	55:20 min
		2 m/s	16:40 min	40:40 min
		3 m/s	10:06 min	35:06 min

## 25 Make friends with the (valley) wind

Above you read that it is important to fly high and stay high. Altitude means the least danger of bombing out – but this doesn't always guarantee the fastest possible flight, **because wind direction changes at altitude.** For example, if you want to return from the Goldeck to the Emberger Alm in the evening, there may be a very strong headwind, whereas down in the Drau valley a lovely valley wind is helping you along.

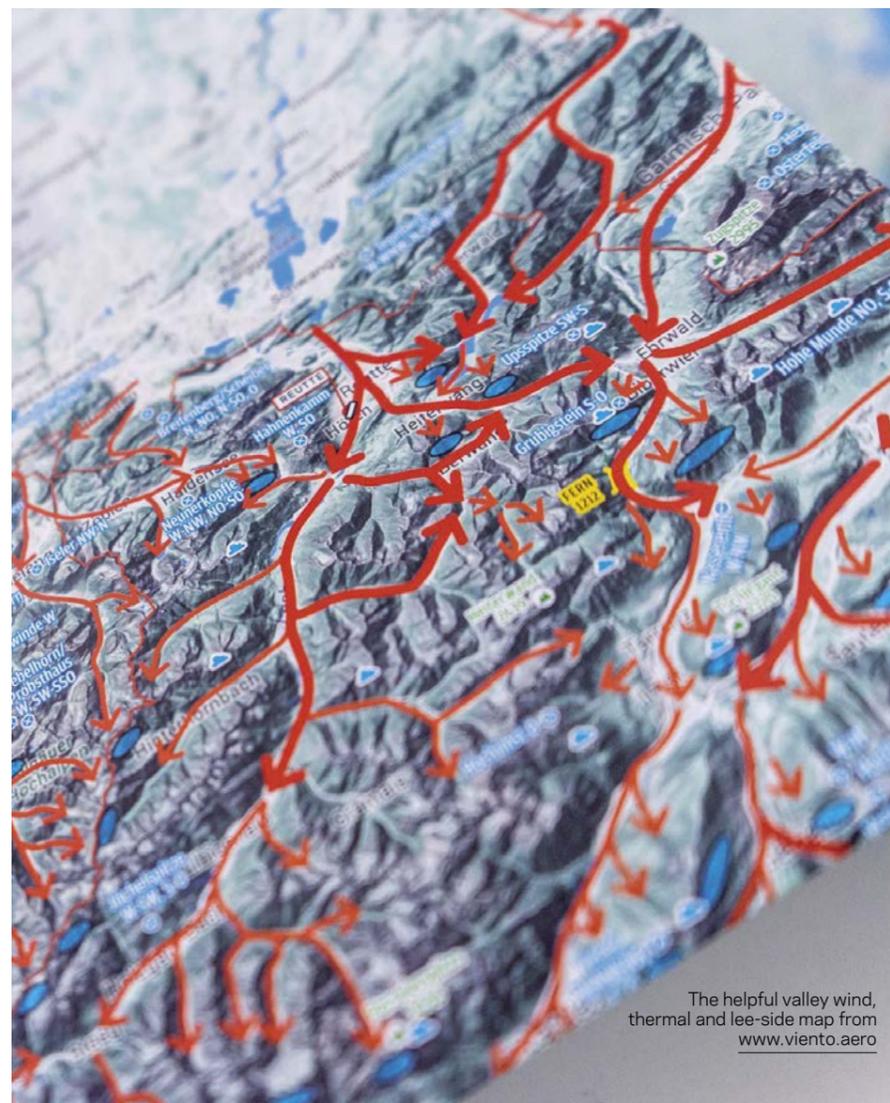
**Modern flight instruments calculate the direction and strength of the wind while circling in a thermal.** At cloudbase it may tell you for example, 272° / 12 km/h. But you should also check what the values were at 500 or 1000 metres lower. This will assist you with choosing the optimum glide altitude.

An excellent resource on valley winds in the Alps are the valley wind maps available from [www.viento.aero](http://www.viento.aero). With a high reliability they indicate the mostly prevailing valley winds.

**You should ask experienced pilots about soarable ridges and convergence lines.** A gift to the XC pilot is for example, the famous wall over the Kufstein. You can arrive there at 50 metres above the valley floor and soar casually up to the pyramid peak at over 2000 metres. Convergences set up when two (valley) winds meet. Often you can spot them when there is a continuous cloud street over a valley. Weaker convergence may not be marked. You just have to know from experience where it is.

## 26 Be organised

Above we mentioned route planning with the assistance of online tools such as XC Planner and Thermix. **Get used to storing all information about your flight planning systematically right from the start.** This applies to screenshots of planned routes, the corresponding waypoint files and possibly also the thermal data. Well organised bookmarks in your web browser for all relevant weather pages, webcams, live weather data etc. also help. Why? Order in your filing and filenames makes you more effective at planning. You need to search less and save time. This is the case whether you are planning an XC flight or doing your tax return.



The helpful valley wind, thermal and lee-side map from [www.viento.aero](http://www.viento.aero)

## 27 Find and use the best lines

Within the NOVA Pilots Team there are a few pilots who have a very special gift: **people like Berni Pessl, Hans Tockner or Ferdi Vogel almost always find the best line to reach the highest possible point after a valley crossing.** If you ask them how they do it, you get the predictable answers – they pay attention to the clouds, where a little lift might be found to minimise the sink and they choose their lines so that the valley or prevailing wind will have least negative impact. The catch is that in principle, all other pilots do the same. Maybe it's just a feeling – but more probably training yourself to become more aware.

## 28 Should I stay or should I go? Using thermals

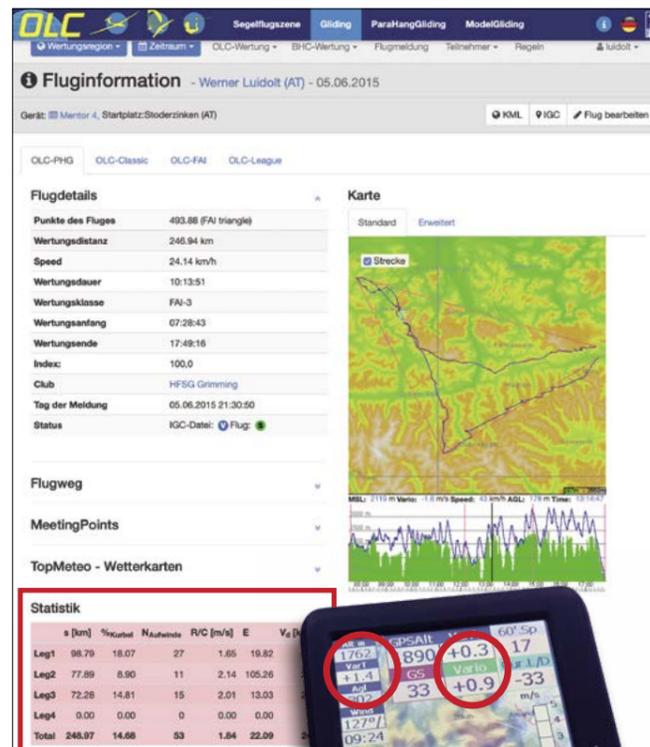
**If you want to fly far, you need to fly fast.** In addition to using the speed-bar, effective thermalling and line selection, leaving weak thermals for stronger ones is a good way of increasing your average speed.

**To improve your skills in this area, you first have to analyse how much time do you actually glide and how much time are you turning?** The [www.onlinecontest.org](http://www.onlinecontest.org) calculates the percentages for you. This platform is primarily aimed at sailplane pilots and only a few paraglider pilots use it. This is a shame, because this resource offers options other platforms do not. It is particularly useful if you can compare your flight with one of your "Air Buddies" on the XContest.

When planning a cross-country flight in an unknown area, working with thermal data in Thermix (see above) is also very useful. So you know better where you have a good chance of climbing again after long valley crossings, even if there are no other pilots with you. And when you're struggling not to bomb out, it makes more sense to fly directly to a thermal trigger than to fly around aimlessly hoping to get lucky.

And during the flight? In your local area you presumably know where the local thermal triggers are. And in an unknown area? Modern flight instruments now indicate the average climb of the last (or several previous) thermals. If the climb rate in your current thermal is clearly above the previous one(s), it's good. If the climb rate is lower, then you should leave the thermal - at an appropriate height, obviously.

Also take note of the different climb rates at different altitudes during your flight. If the bottoms of thermals are always hard work, then avoid getting low at all costs. If the thermal peters out at the top, then it is a waste of valuable time trying to get the last 100 metres of altitude.



Display of the average climb rate on a Naviter Oudie

## 29 Survival mode and mile-eater mode

**The time of day and altitude have a great bearing on flying style.** If the thermals are weak in the morning or evening, it is better to fly defensively: take every bit of lift and get maximum height. The same generally applies when you are low. In this situation it is far more important just to stay in the air, never mind flying fast.

If, on the other hand, the thermals are booming and regular, and if you are high enough, you can switch to the mile-eater mode. Kick that speed-bar and go! Forget the weak thermals, just turn in the strong ones.

If you are high, let the clouds determine your route. Your focus is above - what line should you fly to lose as little height as possible? Which cloud is building, which one is decaying?

In survival mode, when you are low, the focus is more below. Where is the thermal trigger, or where might the thermal be? Which ridge can I soar to stop me from bombing out?



Photo: NOVA archive

In accelerated flight, many pilots correct pitch and roll movements via the C-area. But this causes a performance limiting crease in the profile. If the C-riser of the NOVA Speed Brake Riser (SBR) is pulled back and down, this results in the B-area also being pulled down up to 50% via a pulley - without the performance killer crease.

Video about the SBR: [www.youtube.com/watch?v=dcILUJcA80](http://www.youtube.com/watch?v=dcILUJcA80)

## 30 Effective active flying

**A paraglider has the best performance when it is flying straight without any input. Any roll, pitch and yaw movement negatively affect performance.** Also, the safest position of the wing is directly above the pilot. However, since the air moves in three dimensions and the airflow velocity varies all the time, the pilot must fly actively. This means: using the brakes, the speed-bar, the rear risers or systems such as the Speed Brake Riser in such a way that the glider remains over the pilot without much unnecessary movement.

From day one of instruction, a pilot is familiar with the brakes. They are the most important and most effective type of pilot input. But not always the best ... When the brakes are pulled, only the trailing edge is affected and the profile is created. Drag increases.

The situation is similar with three- and even more so four-liners, when corrections are made with the aid of the rear risers. This also causes a performance limiting crease in the profile. The specially added C-handles on some three-liners don't change this either.

Systems like the NOVA Speed Brake Riser (SBR) make more aerodynamic sense. It is designed to compensate for pitch or roll movements in accelerated flight by shortening not only the C-area, but using a pulley, also the B-area. This results in a change in the angle of attack over the whole profile.

**Even more useful are angle of attack corrections via the speed-bar.** It is an elegant and highly effective way to reduce pitch movements. This type of active flying doesn't work equally well on all gliders. There are wings that initially dive before accelerating when the speedbar is applied quickly. However, the with the current versions of the ION, PHANTOM, MENTOR and SECTOR this works really well.

**What is certain is that the SBR or speed-bar are aerodynamically more favourable than inputs via the brakes.** You have to learn and practise these techniques - and be happy with them. Within the NOVA Pilots Team there are some real Speed Brake Riser fans as well as speed-bar aficionados. **My advice:** work out what technique works best for you.

# In conclusion

the great thing about cross-country flying is that you never stop learning. Even the most experienced mile-eaters will tell you that they learn something on every flight. So with these 30 "best" tips we hope to encourage you to continue to enjoy learning and paragliding in general.

**We wish you a lot of success and enjoyment - happy landings!**

Service, events and idea exchange are important to our clients and us.

# PIN BOARD: GOOD TO KNOW!

Photos: Till Gortbrath



## NOVA Hike & Fly Days HAPPY AUTUMN

For several years now, autumn has featured the NOVA Hike & Fly Days. Organised by our Team Pilot Vera Polaschegg, we meet in a less crowded flying area and end the season in a very relaxed way. The routes we attempt are not extreme and the main focus is enjoyment.



More information at  
[www.facebook.com/pg/novawings/events/](https://www.facebook.com/pg/novawings/events/)

## A festival in your area? TONI ON TOUR

Your club can book Toni on Tour? Normally it is flying schools which invite Toni Bender and his VW van full of demo wings. He also loves to visit clubs (so long as they are enthusiastic and not just a couple of people turn up). It's completely free for you.



Info about Toni on Tour is here:  
[www.nova.eu/en/service/toni-on-tour](https://www.nova.eu/en/service/toni-on-tour)



## Register your wing at myNOVA ONLY ADVANTAGES

In a world where data sharks like Facebook, Google & co collect all digital information in order to capitalise on it, one is careful when one registers information online. Despite this, we recommend owners of a NOVA wing to register this at [www.nova.eu/en/my-nova/](https://www.nova.eu/en/my-nova/). The data is exclusively used to assist the pilot and to help with the future development of our wings.

## MY NOVA

Advantages for you:

- When buying a new wing: if you register your wing at myNOVA within 14 days of purchase, you are provided with one year fully comprehensive insurance (see [www.nova.eu/en/service/nova-protect/](https://www.nova.eu/en/service/nova-protect/)).
- This gives you access to all the inspection and maintenance reports of your wing.
- As a manufacturer, we can evaluate safety-relevant data.
- And if there were ever any serious issues, we would be able to contact you immediately.
- If your wing gets stolen, with a little luck it can be identified thanks to the central registration of its serial number.
- Online printout of the service schedule with NTT and NFS deadlines.



## NOVA XC Team Challenge FOR TEAM PLAYERS



Have you ever heard of the XC Team Challenge? This unique competition format focuses on teamwork and "helping each other". Four participants are assigned to a team leader, usually a NOVA Team pilot, who then tries to fly as far as possible with their "chicks". In 2020, the event is expected to take place from 30th April to 3rd of May 2020 on the Emberger Alm, Austria: save the date! [www.xc-team-challenge.com](https://www.xc-team-challenge.com)

## NOVA Protect FULLY COMPREHENSIVE INSURANCE



1 YEAR

NOVA Protect offers complete cover for your new NOVA paraglider: after timely registration (no later than 14 days from date of purchase) at myNOVA, it is protected against the cost of accidental damage for one year. Whether the damage was self-inflicted or the fault of a third party, we will replace lines and replace panels. This is subject to a 50 euro excess, postage and packaging costs and VAT. After repair, we will check the trim of your glider. If your wing is irreparably damaged, we will deduct the current value when purchasing a new NOVA paraglider. NOVA Protect can only be used once in the initial year after purchase.



More information at  
[www.nova.eu/en/service/nova-protect/](https://www.nova.eu/en/service/nova-protect/)

## NOVA custom colour configurator (UN)LIMITED COLOURS

On the website of every NOVA glider model there is a colour configurator, with which every pilot can put together their personal desired combination. This does incur an extra charge. However, all colours are not available. Why not? In different models we use different fabrics and not every cloth is available in every colour. We have to buy each cloth in each colour ourselves and have this available for many years to come in case someone sends us a wing for repair. This is also the case for fabrics which are only used in very few glider models, for example D10 in the DOUBLE-SKIN. This ties up capital and must therefore be carefully considered.

## Bigger wings glider better SIZE MATTERS

The performance of a small wing (a wing that has been scaled 1:1) is worse because:

- The larger wing is favoured by the larger Reynolds number, because the ratio of the lift-generating area to induced drag is more favourable. Even a large aircraft/ship/windmill is always more efficient than a fully scaled down one.
- The line surface (and thus the line drag) does not decrease proportionally to the wing's surface. Neither is the drag of the risers, hang loops, etc.
- Certain unavoidable creases on the XS (seen in absolute terms) are the same size on the XL. But this makes them larger on the XS in relation to the overall wing size.
- The pilot and harness forward-facing surface is not reduced to the same extent as the paraglider surface. A 50 kg pilot has more than half the forward-facing area of a 100 kg pilot, who can fly a glider double the size.

## NOVA in social media INFORMATION AND ENTERTAINMENT

Many people do not engage with social media like Facebook, Instagram, Twitter, etc. At NOVA we use them with care - for entertainment and above all for information. We are convinced that that is a better strategy than to misuse them only as sales tools. Have a look for yourself and follow us:

[www.facebook.com/novawings/](https://www.facebook.com/novawings/)  
[www.instagram.com/novaparagliders/](https://www.instagram.com/novaparagliders/)  
[www.youtube.com/user/NOVAwingsVIDEOS](https://www.youtube.com/user/NOVAwingsVIDEOS)





# NOVA Trim Tuning: more safety, more performance, better handling FAR AHEAD OF ITS TIME

The lines of a new paraglider shrink or stretch – particularly in the first 15 to 20 flying hours (and actually much sooner than by the normal two year check interval). The NOVA Trim Tuning (NTT), is a cloud-based procedure for checking and optimising trim on a glider. You can read here exactly what's involved and what advantages it offers you as a pilot.

Since paragliding was invented, there have been discussions about how the airworthiness of the wing should be checked and assured in the long term. When and how often should a paraglider be checked? And how? From a legal standpoint, the manufacturer must ensure that their gliders fly "safely".

This is done by the manufacturer, or an authorised partner, "inspecting" the wing. This inspection includes:

- Checking the trim
- Measuring the line strength
- Measuring the porosity of the cloth
- Component check (cloth, seams, risers, lines, maillons, etc.)

### Why have the NTT?

In the past (until about 2005), the porosity of the cloth was the most important criterion for the timing of the first check. At that time, some cloths had already reached their operating limits after two years of intensive flying. The check interval of two years, which is still the most common today, also dates from this time.

Based on our large database of measurements, we found that the cloths were becoming more durable, but that

changes in trim occurred much earlier – especially at the beginning of a line's operational life, and then much less frequently. Cyclists will recognise something similar: a new set of wheels soon needs to be rebalanced. If this is done correctly, you have peace of mind for a long time.

Based on this knowledge, in 2006 we developed the NOVA Trim Tuning together with the flight instructor and mathematician Ralf Antz. The NTT is a standardised procedure for checking and optimising the trim of a paraglider.

The checker first signs into the system and logs the glider (therefore every pilot should register their NOVA glider at [www.nova.eu/en/my-nova/](http://www.nova.eu/en/my-nova/), no matter whether it was bought new or used). The measurement of each individual attachment point is then carried out in a specified sequence – under load by laser with an accuracy in the millimetre range.

The system then makes suggestions on how to optimise the trim of the glider as a whole. If a pilot submits their wing for an NTT, their glider will have optimal take off, performance, safety and handling characteristics.

In the years after the introduction of the NTT, there were rumours that NOVA had a line problem and the NTT was a means of solving this problem. This was complete rubbish! Then as today, there are only three major line manufacturers (Edelrid, Liros and Cousin) and the majority of paragliding manufacturers use their lines. Any trim deviations therefore affect all manufacturers. Good news for all pilots, these days other brands are also recommending early trim verification and are offering NTT-like procedures.

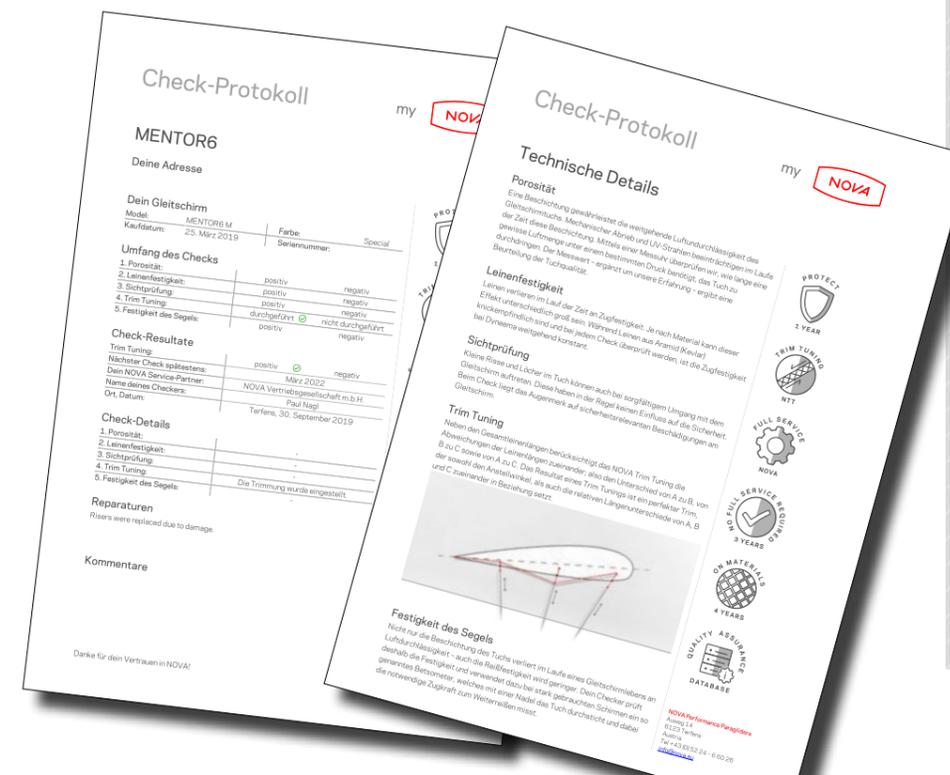
### When should an NTT be performed?

On our website we recommend doing the first NTT at the LATEST after 100 operating hours (i.e. flying, ground handling and practise slope) or one year. But it makes sense to perform it after 15 to 20 hours, because line length changes happen mainly at the start. We recommend that you then immediately send the wing to us or an authorised partner.

### What are the advantages for the pilot?

- After the NTT your glider has optimal take off, performance, safety and handling characteristics again.
- If the first NTT is carried out according to our specifications, your glider will only have to go to the first NFS (NOVA Full Service, the complete inspection) THREE years after purchase.
- If you have the first NTT and the first NFS performed according to our specifications, the warranty is extended to 48 months! (The legal warranty period is only 24 months).
- The NTT is standardised and is performed as a NOVA COS (Computerised Online Service). This ensures a high inspection quality and consistency, because the checker is guided by the program.
- Centralised documentation of all tests and work on the respective NOVA wing is held on the NOVA server.

**Important to know:** the NTT can only be performed by an authorised NOVA partner. These partners have completed in-house training and know exactly what they are doing. You can find a worldwide overview map of these partners at [www.nova.eu/en/try-buy/](http://www.nova.eu/en/try-buy/)



### Overview

#### NTT - NOVA Trim Tuning

Trim check after 100 operating hours or one year at the latest (according to the deadline in the service schedule).

#### NFS - NOVA Full Service

The NFS is the classic "inspection", at NOVA. This consists of an NTT, line strength test, porosity measurement and a ten-point component check. For NOVA wings, the first NFS is only required after THREE years – but only if the NTT was performed in accordance with the service schedule.

#### COS Computerized Online Service

Each time an authorised NOVA Service Partner performs a check or work on a NOVA wing, it is performed as a COS (Computerised Online Service). Everything is documented online and centrally on the NOVA server.

More info at [www.nova.eu/en/service/nova-trim-tuning/](http://www.nova.eu/en/service/nova-trim-tuning/) and [www.nova.eu/en/service/](http://www.nova.eu/en/service/)





# Bucket List

## 30 EXPERIENCES NOT TO BE MISSED

1



Find a spot where you can land, take your clothes off and go for a swim



Photo: Chris Feichtl

2



Coastal soaring in Denmark

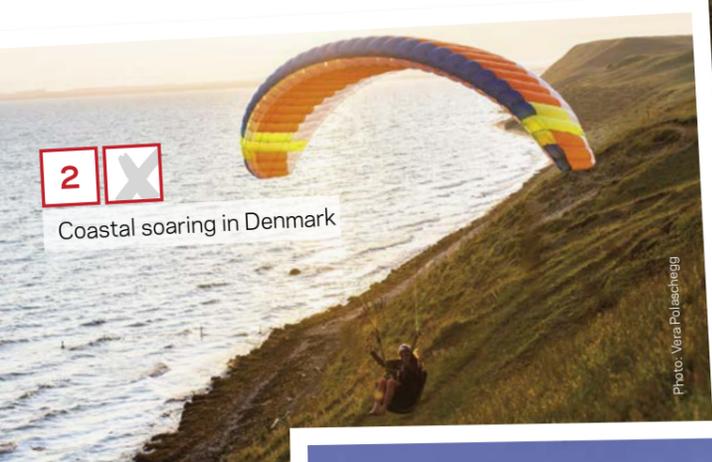


Photo: Vera Polaschegg

3



Fly in shorts and T-shirt on the South African coast



4



Take part in a paragliding competition



5



Fly off a 4000-metre peak

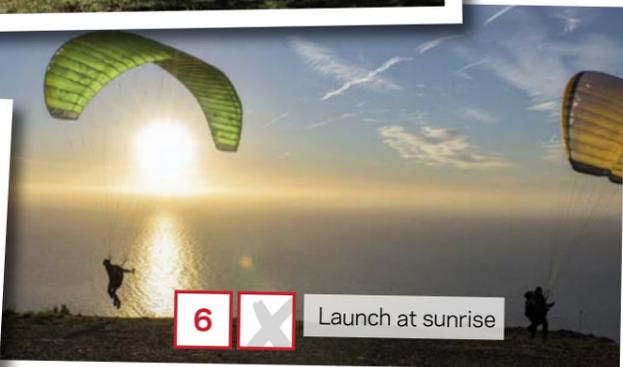


Photo: Joris Hart

6



Launch at sunrise



7



Bring popcorn and a beach chair and spend some time at a paragliding hot spot, watching people launch and land

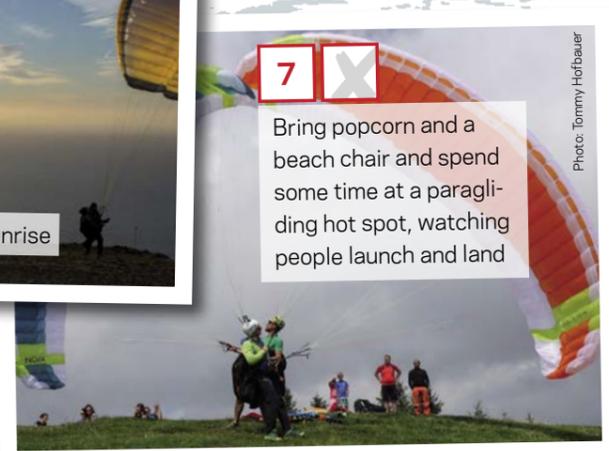


Photo: Tommy Hofbauer

8



Manage the lowest low save you've ever done



9



Fly in so called "magic lift" (restitution)



10



Make a hiker's day by greeting them while flying by



Photo: Chris Feichtl

11



Go XC without a vario

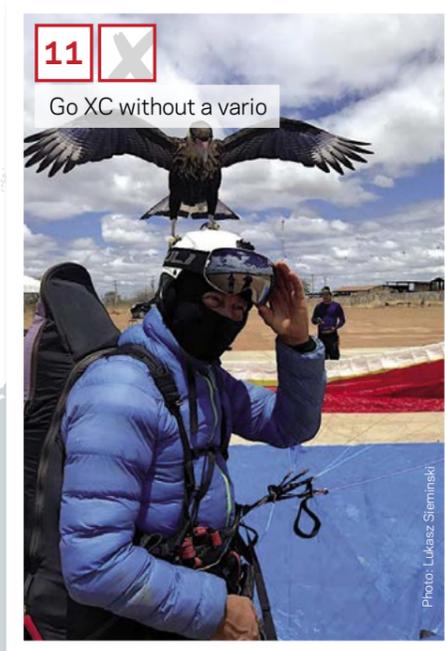


Photo: Lukasz Sieminski

12



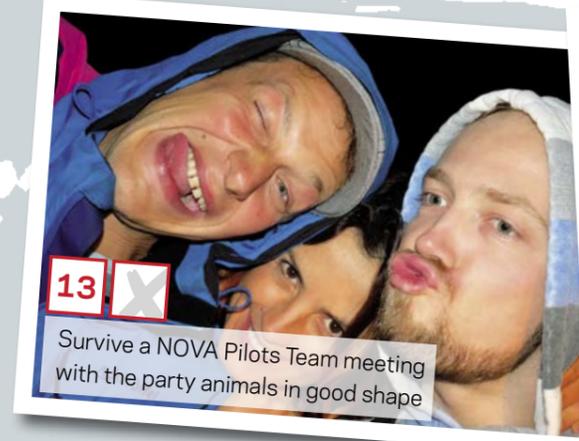
Pee while in the air



13



Survive a NOVA Pilots Team meeting with the party animals in good shape



14



Complete a 200 km triangle



15 X

Immortalise yourself artistically via GPS track.



16 X

Own a garden, which is big enough to land in



22 X

Buy a stranger a beer at the landing zone



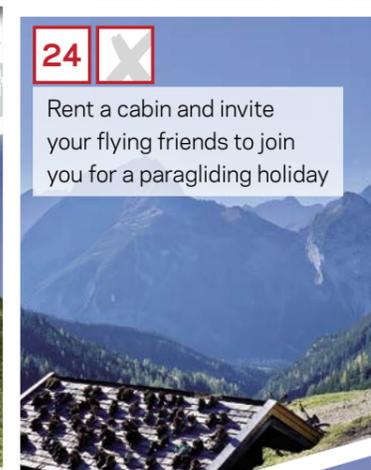
23 X

Try an EN A wing again after ten years of paragliding



24 X

Rent a cabin and invite your flying friends to join you for a paragliding holiday



25 X

Don't give up after hours of "parawaiting"



26 X

Fly along the coast and watch whales in the water below



27 X

Do some bare foot ground handling on a sandy beach



17 X

For once DON'T forget to rub sunscreen on your ears



18 X

Find out how many pilots and glider bags you can squeeze in your car



19 X

Stay overnight on top of a mountain and fly down for breakfast



21 X

Be delighted by an old, melted chocolate bar in your harness when very hungry



28 X

Throw your parachute during an SIV course



29 X

Give someone with a tandem flight as a present



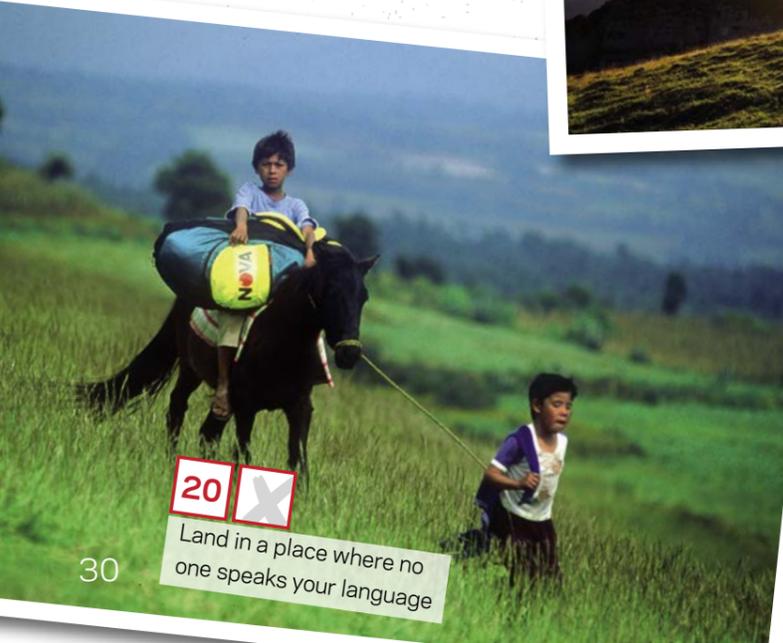
30 X

Invite the retrieve driver (m/f) for dinner



20 X

Land in a place where no one speaks your language





30 years of co-operation: the factory in Pécs (Hungary) is more than just a production facility. Our friends and partners work there!



Thanks to intensive staff training and strict quality control, there is no difference between gliders from Hungary and Vietnam.

Hungary and Vietnam - where and how does NOVA manufacture?

# PARAGLIDERS, POLITICS AND A COMMON GOAL

Towards the end of the 1980s, paragliding was booming. Wind-surfing became less popular and flying was where it was at. Paragliding companies shot up like mushrooms. At first, nearly every company had neither business experience nor knowledge of how to design wings. One of those mushrooms was NOVA ...

**T**he company was founded and the first wing was sewn in the cellar – the “only” thing left to do was to find a production site. The sewing workshop had to be reliable, quality-conscious, fast, flexible, affordable and uncomplicated to work with. Sensible criteria, which haven’t changed to this day. For NOVA to find such a company wasn’t easy though.

At the time, as colourful and promising as the paraglider scene appeared, it was nevertheless still small in number. Everyone knew everyone else. Wolfi Lechner, one of the company founders remembers: “We got to know Olesko. I don’t remember his first name. He was from Upper Austria and he was also looking for somewhere to manufacture wings. Olesko knew a Hungarian aristocrat, Thomas Güttler, and he knew that there was a company in Pécs in Hungary which could sew paragliders.” This company did

actually exist. This was a state-owned company called Mecsek Ballon KFT. Lots of very different goods were produced here: extremely tough and robust clothing for miners and also hot air balloons, which are light and fragile.

### Adventure on the other side of the Iron Curtain

Olesko and Lechner phoned Mecsek Ballon and then drove to Pécs. In those days it was like travelling to another world. There were holes in the Iron Curtain, but it was still firmly in place. At the border you had to slalom around concrete bollards and on the bad roads there were almost no cars, but lots of horse-drawn vehicles.

**B**ut it was worth the journey because Mecsek Ballon already had experience of making paragliders. Strictly speaking, making ONE paraglider. They manufactured this wing for an Italian company, but had never been paid for the work ...

Unsurprisingly, these potential new customers from Austria were received with a healthy dose of scepticism. “I don’t really know why, but they still said yes” explains Lechner. Hannes Papesh cut out the stencils of the newly designed CXC at home and together with Reinhard Federer drove to Pécs, to show the Hungarians how sewing is done – despite his own ignorance. Although the CXC was more complicated to construct and manufacture than the Italian glider before, thanks to their great experience with the hot air balloons and the paraglider, production worked well right away.

Meanwhile, some of the 20th century’s most serious political developments were taking place. The fragile Iron Curtain fell and the existing socialist systems of the Eastern Bloc ended. Perestroika and Glasnost arrived. The East opened up. What may sound like the “liberation of the people” on the surface, however, also brought much uncertainty about the future. Many state-owned companies were threatened with closure, including Mecsek Ballon. This was 1991, maybe the last year the company would exist. But the employees were not ready to put down needle and thread. To the surprise of NOVA, the management of Mecsek Ballon came forward and asked if they wanted to re-establish the company with them. A decision that still forms the cornerstone of a profound relationship of trust.

Was this really going to happen? Without a doubt, the joint founding of the sewing company did not go as planned, because

despite initial successes NOVA was still a delicate little plant and financial break-even was so far away that today no bank would lend them even one euro.

### Taking a leap of faith together

Looking back, Lechner says that “Of course it was a big risk, but really we didn’t have an alternative.” And there were two important factors in favour of the venture. Lechner: “On the one hand, our relationship with the people in Pécs was good right from the beginning. And on the other, we just had a really good feeling about this.”

Alongside Antal Notheisz, the then company director, as well as Valentin Leib, the manager of the tailoring workshop, NOVA re-established Mecsek Ballon. They bought and renovated the former administrative building of the closed mining enterprise, which served as company headquarters. They refurbished. And they sewed until the needles glowed, because NOVA was starting to fly high.

The production facility in Hungary is located in the former administration building of a now closed mining company.



Photo: NOVA archive



What began as an adventure slowly grew into an economic success. To this day Mecsek Ballon is housed in the now listed building, and the Leib family remains a partner. Valentin's grandson, Peter Leib, works in the business and manages the fabric cutting with the laser cutter. There are seamstresses who have been on board since the beginning and some families where the second generation now works for Mecsek Ballon

### Head or heart?

With the economic upturn of Eastern Europe and subsequently joining the EU, labour costs naturally went up. Should NOVA continue to invest in Hungary? Having our own production facilities always raises fundamental questions of capacity utilisation, capacity limits, flexibility, risk and, above all our responsibility towards our employees. For NOVA, Mecsek Ballon is not just an anonymous production site - it's people and partners that NOVA has a great deal to thank for. Wolfi Lechner: "With great courage, energy and dedication our

colleagues in Hungary have contributed a lot to the success of NOVA. Without them, the company would not exist. We must never, and will never forget this." In order to meet this self-imposed requirement, NOVA decided to always fully utilise the production capacity in the Hungarian plant. Only what exceeded the capacity there was given to other producers: Aeroman in China, Skysports in Sri Lanka and Advance in Vietnam. But flexibility in production sites has a price. Occasionally there were little and sometimes bigger problems of various kinds: sometimes the wrong materials were used, sometimes the quality of the workmanship wasn't up to scratch or the delivery deadlines and reliability left something to be desired.

The solution to this problem came from another partnership. Since 1990,

Sadao Hangai is the NOVA importer in Japan. As with Mecsek Ballon, there is also a relationship of trust that goes way beyond pure business. He is our partner and friend. In addition to his work as our importer and flight school operator, Hangai-san ("San" is the polite address in Japanese which is added to a first or last name) began to sew. He started making bags, rucksacks, mountaineering and outdoor products and later paragliding harnesses. His company Mt. Dax (later Aerotact) initially manufactured in China and then relocated to Vietnam. Today, Aerotact is a very large sewing factory that works as a so-called ODM producer (original design manufacturer - the actual manufacturer of the products of another brand) for a number of large companies in the sports and outdoor industry. Since 2015, Aerotact also makes NOVA wings.

### Welcome support from the Far East

Wolfi Lechner explains: "This was another step with some risk attached. That we could rely on Hangai was without question. But Aerotact had no experience with making paragliders. We were a little sceptical if and how, or how soon, this could work." As is often the case, it was the people that made the difference to success. Hangai-san and Miyuki Tanaka, a former world-class pilot and Hangai's right hand person, once again proved to be the dependable partners they have always been. Niki Kurcz, who studied aeronautical engineering and has been responsible for production at NOVA since 2014, also showed incredible dedication to ensuring that production in Vietnam was up and running in a very short time. Bea Bognar also made a big contribution. The active paraglider pilot manages the sewing division in Hungary and spent several weeks training local employees in Vietnam.

Niki Kurcz says: "I do not think anyone can spot the differences between wings from Vietnam and those from Hungary, if they don't know beforehand what to look for. In Vietnam, the screen prints of the paraglider names are a bit more

shiny and in Hungary the felt-tip pens for marking the length of the lines are a bit thinner. But the seams are identical." With great organisational talent and the support of his local team, Niki has standardised all processes.

The quality control mechanisms are also the same. Nevertheless, all wings made in the Far East go to Hungary and are once again carefully checked, because we do not permit any differences under any circumstances - especially not with safety-relevant criteria.

### Healthy ambition in questions of quality

Wolfi Lechner concurs: "Of course, Vietnam is competition for the plant in Hungary. They want to prove they are better. But at Aerotact they also have their top people making our wings. Not every employee is qualified to make paragliders. These staff are also better paid. So, this gives them big motivation. Now both production sites are phenomenally good. Niki and Bea make high demands on themselves and their work, so we have found two managers who do a great job. Without embarrassment, I dare to suggest that the quality at NOVA is one of the best in the world."

There is still the question of the rising labour costs in Hungary. Presumably, every management consultant would recommend that NOVA close the production site in Hungary. For NOVA shareholders Wolfi Lechner, Christian Wehrfritz, Philipp Medicus and Niki Kurcz this is completely out of the question. Lechner: "We have a great social responsibility. The people in Hungary are our friends and partners. As long as it is somehow feasible, we will continue to produce in Hungary."

Importantly, NOVA's headquarters in Terfens geographical proximity to the Alps, by far the most important flying area in the world, also offers a number of advantages:

- developing and testing prototypes is faster and the process smoother.
- The staff are extremely highly qualified.
- The day-to-day operations are much less complicated with a country that is an EU member.
- Even the most complicated repairs are carried out so professionally that you usually can't tell what was repaired where.
- Shorter transport distances also offer ecological advantages.

With this set-up, NOVA sees itself best prepared for the future. In terms of motivation, the team has definitely lost nothing since its founding. Just the opposite: now the formerly little company from Austria can also boast a lot of experience.

Every detail must be right - at every single step.



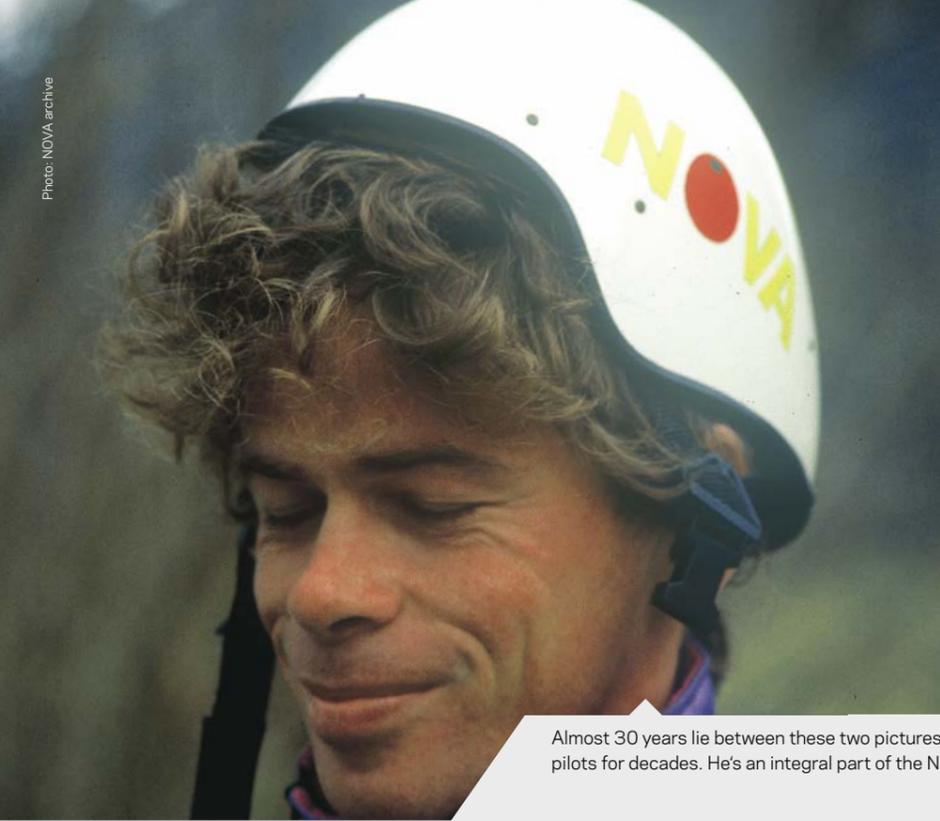
The precise sewing of the thin and rather slippery paraglider cloth requires a high level of craftsmanship.



All Photos: NOVA archive

During the sewing process every single glider is checked again and again and inflated for the final inspection.





Almost 30 years lie between these two pictures: Toni has been inspiring pilots for decades. He's an integral part of the NOVA team.



Photo: Till Gattbrath

## Portrait of Toni Bender – 30 years at NOVA THE LIVING LEGEND

Growing up by Lake Starnberg, Toni Bender started windsurfing whilst still at school. When Mike Harker made his famous hang-gliding flight from the Zugspitze in 1973, the then 15-year-old Toni happened to be in Garmisch-Partenkirchen and was absolutely fascinated.

Flying – that would be even better than windsurfing. Toni simply approached Harker and was able to persuade him to ask a friend to bring a hang-glider over from the USA. Officially the sport did not exist in Germany yet, and only a handful of “madmen” flew with mostly self-built, adventurous constructions, which hardly deserved the name “hang-glider”.

“Mike Harker took 20 minutes to explain to me how hang-gliding works,” recalls Toni, “and with this knowledge and my hang-glider, I fooled around on the hills around Ammerland until I thought I could fly. In 1974 I made my first high-altitude flight in Kössen”.

From the early days, Toni was involved in competitions. “This was for a very trivial reason – there was no Internet or other sources of information at that time. Competitions were the only way to see new things, to get to know other pilots and develop.” The latter he did very well: “At that time it was all about duration of the flight and spot landings. And because there was only one size of hang-glider, as a featherweight I was pretty good from the start.”

At the same time he was finishing high school and started an economics degree. But the flying bug stopped his academic career before it even began. Toni became an instructor and soon

opened his own flying school. When paragliding started in 1986/87, the simplicity of the machine fascinated him. He bought a wing as soon as possible and completed instructor training in Switzerland. Germany wasn't ready yet. The German Aero Club (DAeC) and the German Hang-Gliding Association (DHV) were busy arguing over who “owned” paragliding. For this reason there were two German paragliding championships in 1987. It didn't matter ... Toni won both and the hang-gliding one as well.

With his nose in the wind, Toni opened a paragliding school, because “the sport was booming!”

### Sixty people at the taster day

At the same time Toni was a team pilot at Ailes de K and also a test pilot for the DHV. At some point this led to an awkward situation: as a DHV test pilot he was responsible for the Ailes de K Genair losing its certification.

“That was super stupid. After all Ailes de K were paying me very, very well. But the wing had closed outer cells and was clearly dangerous. My conscience then decided that the wellbeing of all pilots was simply more important than my wallet.” So the co-operation broke down, Ailes de K soon launched a Genair with slots in the outer wing – and Toni found his way to NOVA.

He and Wolfi Lechner had already known each other for a while. “At some point he invited me to Innsbruck so I could try out my new wing, which was supposed to fly super well. The thing was elliptical and had a very low aspect ratio, but it really did fly exceptionally well.” It was a prototype of the CXC, NOVA's first wing. And so it came to be that Toni Bender joined the company in its founding year – 1989.

In these halcyon years, top pilots were paid good money to fly certain brands, because the wings that won competitions sold very well. In the end, there were no wings especially for beginners or intermediates. “Unlike today, winning a competition was worth cash! I made a good living from flying competitions. At the Verbier Open, there was 10,000 Swiss francs in prize money and a watch on top, which was the same value.

These days you have to pay to be a competition pilot!”

### World-renowned

Toni Bender achieved worldwide fame through the TV programme “Der glückliche Ikarus” (The Happy Icarus). This Bayerischer Rundfunk channel film documents a flight from Brauneck to Bassano del Grappa and explains how thermal and cross-country flying works. “Der glückliche Ikarus” is the most successful documentary ever produced by the Bayerischer Rundfunk. In 2019 the film was translated into Japanese.

Despite all his successes, Toni Bender's career was not only accompanied by high flights. Altogether he has broken “about 100 bones” in numerous accidents with various toys. The worst crash nearly cost his life. “It happened in Morocco after testing a glider. I played around with a camera, was cocky and unfocused – and then crashed very hard into the rocks.” Toni broke his spine in five places. It took four years before he could walk again.

The main constant in Toni's life is NOVA. “This was and is mainly due to the high moral values and ethics of the company. From time to time NOVA also had a glider which later turned out to be less than ideal. But Wolfi's concerns were always to put the health and wellbeing of pilots first. NOVA still plays with open cards. I really support that.”

Toni Bender is really happy about the developments in recent years. “The gliders are now extremely safe and still fly really well.” And he is still as infected with the flying bug as he was when he met Mike Harker: “I'm looking forward to the developments in electric flying. My Atos, a rigid wing, already flies 400 kilometres without thermals – only with the electric motor. It is only a matter of time before paragliding with the electric motor becomes available for a wider audience.”



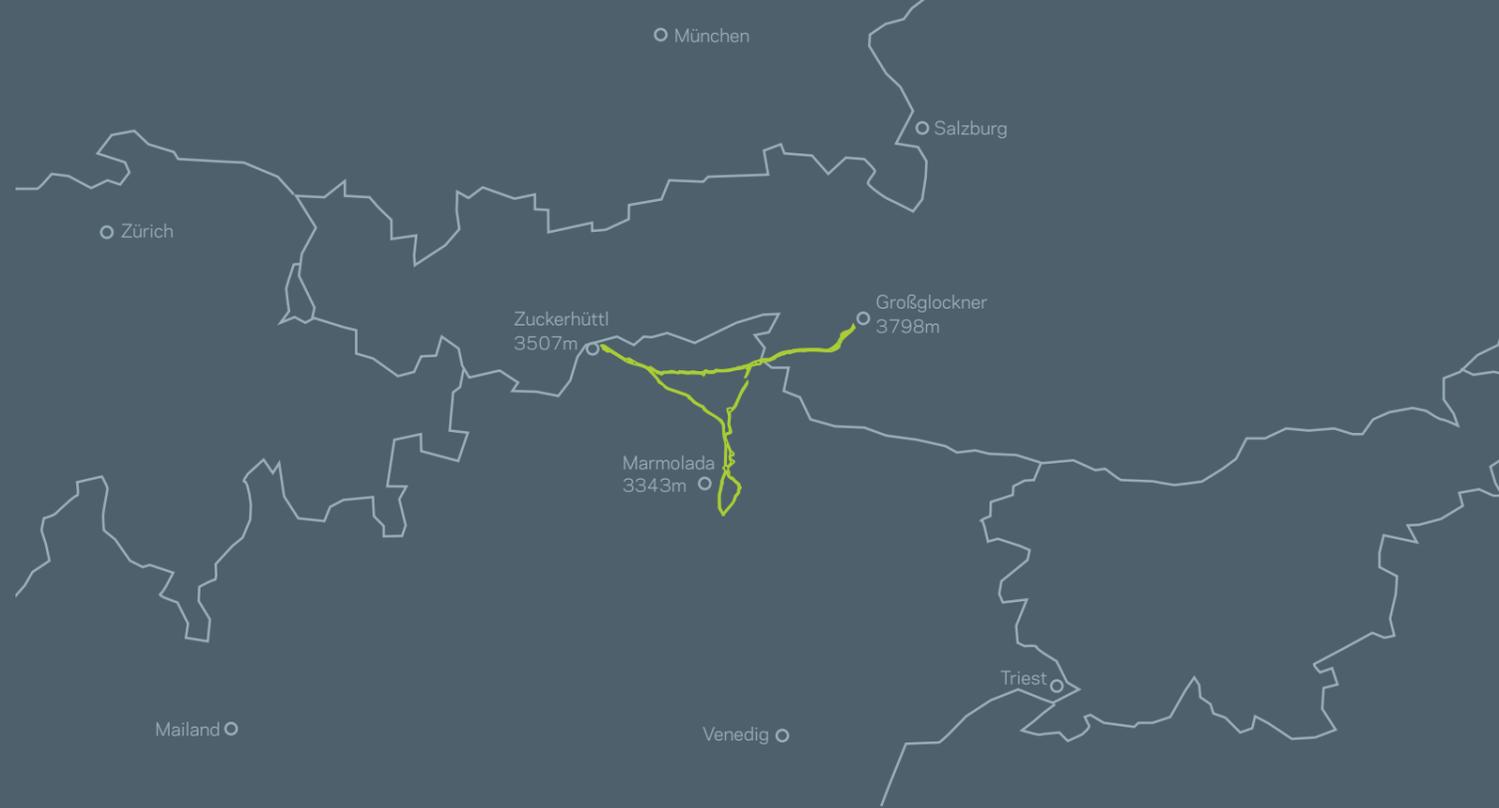
Photo: Vera Polaschegg

# 300KM

The first 300 Kilometre FAI triangle on an EN/LTF B Wing

## BERNI PESSL CRACKS THE 300

Photos: Berni Pessl



For many years the world's top cross-country pilots talked about the first 300 kilometre FAI triangle. On the 7th June 2014 Tom Walder, an Austrian from the Zillertal, achieved the first 300 km+ triangle – on a competition wing. Only a few days later Berni Pessl repeated this amazing feat, but on an EN B wing. From the Grente in the Antholzer valley, the NOVA Team Pilot flew an unbelievable 300.6 km on his MENTOR 3. To this day this flight has not been bettered.

### A brief review with Berni.

**Berni, how did you plan that 300 km flight?**

Well, the whole paragliding scene had been thinking about and discussing it for ages. There were a number of pilots who had planned various triangles ... some thought it was impossible and others that it would only be possible with a competition wing. And then there was the issue of the ideal route. Either way, 300 km is a crazy distance. Everything has to be absolutely right: little wind, high cloud-base, optimal terrain, long days and lastly the pilot can't afford to make any mistakes. There simply isn't time to dig yourself out of a hole.

**So how did it go on the 8th June 2014?**

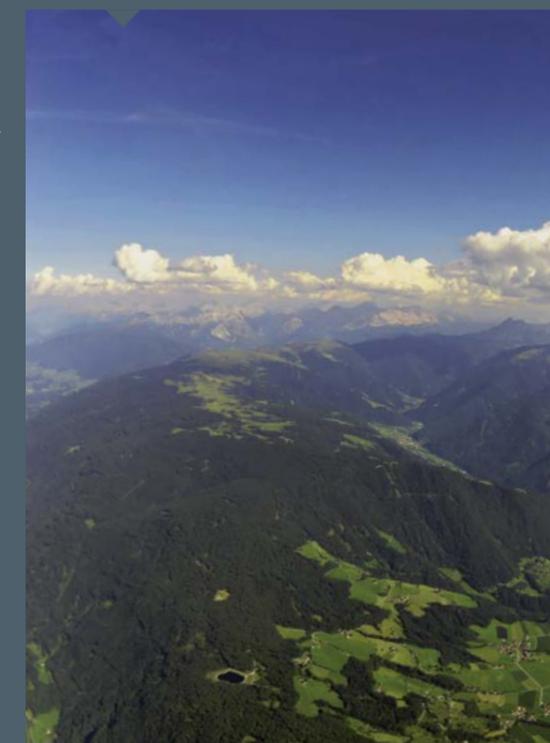
This flight wasn't my first attempt at the 300. I had tried for the first time during my previous visit to the Grente. I diverged

from the standard route, flew over the Plose and then failed miserably! This time I considered everything carefully and adapted my strategy to the weather forecast. I tried to fly the first two legs very fast in order to have enough time for the final turn point. That worked very well. Thanks to the very dry airmass, it was possible to extend the triangle far to the south.

**You were in the air for more than 12 hours. The final three and a half hours you were struggling through the valleys at low altitude. Were you sure you could complete the triangle?**

Not at all. It was a real nail-biter! There were moments it was going up and I was optimistic that there would be enough time. But there were also moments when I was happy just to see a landing field in reach.

Standard route over the Lüsener Alm (pictured) or Plan B over the Plose? Berni tried both.





# MENTOR EN/LTF B

All Photos: Berni Peisl

A high cloudbase favoured Berni's record flight. He reached nearly 4500 metres.

A lot of traffic on the XC race track in the Puster Valley



Until the upload on the Online Contest server, he was not quite sure whether it really was 300 km ...



Photo: Till Gottbreith

Right until the end it was very exciting. I only flew 300.6 km. At the 300 km mark I was only about 60 m above the ground. The 300 km mark is just so far out, even if lots of people talked about it and the day before Tom Walder flew 325 km on a CCC wing.

### What were the determining factors in you achieving this amazing feat?

It was a huge puzzle made from many small pieces. Like I said... everything has to be just right! What helped me a lot was that I had met lots of nice people whose tips and experience really assisted me. That really accelerated my development as a pilot. I also invested a lot of time to become mentally strong, so that I would be ready for the 300 km day when the weather was right. This factor should never be underestimated.

The previous season you were flying an EN D wing and had only just "traded down" to the MENTOR 3.

### How come? And how do you view cross-country flying with a low category wing?

In 2013, Tockner Hans took me with him on cross-country flights. Like me, he is from the Steiermark in Austria and for many years he has been one of the world's best XC pilots. I thought that with a high-performance wing, I would have no problems keeping up with him. But I really was mistaken. I had to work really hard to somehow keep up. The seconds I gained with the increased speed I lost very quickly in the thermals. A wing with high aspect ratio and a high trim speed displays clear disadvantages when you are trying to dig yourself out of a hole in weak thermals. I stepped down because I get better results by being able to more effectively exploit thermals and avoid the "road works".

### OK, that was in 2014. Is it still true today?

Yes and no. In my opinion there isn't a definitive answer to that question.

A lot of innovations are being developed simultaneously.

- The performance of wings is getting better regardless of which classification they are.
- There are now high-performance wings that are very manageable so long as you don't fly in really turbulent conditions. They demand less of the pilot than even five years ago, at least in normal flight.
- General knowledge about cross-country flying and good XC routes is continuously improving.
- There are many very good pilots. A lot of them started flying when they were very young and have developed a fantastic feeling for their wings. They have been able to develop their skills continuously and are capable of controlling a high-performance wing for ten hours or more.



NOVA rewarded Berni's record flight with 10 euros for every kilometre flown. Berni donated his 3000 euro prize money to the charity "Christina lebt", as a way of thanking his colleagues for letting him take time off at short notice on great XC days.

Because of this, there are more high-performance wings at the top of any day rating in the XC leagues. Whereas on epic days that's relative. What use is crazy top-speed if I am too scared to hit the speed-bar in strong thermals and associated turbulence. The most important thing hasn't changed: regardless of which wing you fly, if you want to fly far or for a long time, you have to feel comfortable on your wing in any situation.

**But 300 km+ flights in the Alps are still very rare and nobody else has achieved this on an EN B wing to date.**

Yes, you're right. But EVERYTHING has to be right. When I look back, I invested a lot of time and was extremely focused on achieving my goal. I was just waiting for the right weather conditions. And I feel that the weather in the last few years has been less favourable for cross-country flying. Conditions like in June 2014 where people were flying excellent distances in different places over four consecutive days seem to be

rarer these days. I hope that the weather will soon play ball for all those pilots who are ready for the 300 km+.

**And what about your flying future?**

Regardless of what I am doing in the air, for me it's about enjoyment and positive experiences. That's the most important thing. I am less keen on extreme kilometre chasing. I am more interested in trying new routes and areas. Occasionally everything comes together. If I land in the evening after a long flight and if it was also new route in a new flying area, I feel the same emotions as on landing after the three hundred ... Paragliding is and remains the most beautiful hobby in the world!

**Thank you for the interview and we wish you more great flights.**

## EN B 300KM STATISTICS:

Launch: 08:59

Landing: 21:07:48

Flight duration: 12:09:36 h

Average speed: 24.79 km/h

Max. altitude: 4564 m

**Link to the flight:**

[www.xcontest.org/2014/world/en/flights/detail:bernhardp/8.06.2014/06:59](http://www.xcontest.org/2014/world/en/flights/detail:bernhardp/8.06.2014/06:59)



## Portrait of Nikolaus Kurcz, Production Manager/R&D at NOVA HAPPY COINCIDENCE

He may look young and innocent, but in actual fact he's a real bright spark. Niki Kurcz has a Master's in Aeronautical Engineering and is listed as the Production Manager/R&D on the NOVA web site.

**T**his makes him responsible for both the production facilities in Hungary and Vietnam, with approximately 150 employees. He designed the PENTAGON parachute (for his Master's dissertation) and works with Philipp Medicus on wing design. The BION 2, IBEX 4 and PRION 4 are also from his "pen".

Niki's life is shaped by three things: enthusiasm, initiative and the resulting "luck" of being in the right place at the right time. Born in 1988 in Tübingen, Germany, Niki's enthusiasm for paragliders and parachutes began at a young age. Initially using paper and plastic foil and later real cloth, he developed and made his own parachutes. In the search for suitable lightweight fabrics he "stumbled" onto NOVA for the first time.

With his grandfather coming from Hungary and speaking Hungarian himself, he discovered that NOVA has its own production facility in Pécs. During a holiday to Lake Balaton, he persuaded his parents to call in and to also buy some cloth.

At some point his designs worked so well that Niki founded a company that manufactured and sold mini parachutes for rockets, weather balloons, etc. Talking about initiative, this was actually his second company. "When I was 14 or 15, I started an IT consulting company just for fun. I was interested in IT and it was easier to make money that way than to have a paper round. Although apart from my mother, who is a lawyer, I didn't really have any customers."

After the visit to Pécs, Niki's development ran in parallel to NOVA's. The contact became closer and closer. He did work experience and learned how to perform paraglider inspections, sew lines and other practical things. He later completed a four-month student internship in Pécs, had his own projects sewn at NOVA during his studies and finally did

his Master's internship at NOVA. "I then wanted to be hired by a big company. But it was just too tempting. It was obvious that my professional future lay with NOVA."

Again, everything came together ... NOVA was looking for a new production manager. And there was this young guy we knew, who knew Pécs and NOVA, who had a Master's in Aeronautical Engineering - and even spoke Hungarian. For him it was a huge opportunity. "Without knowing too much, I had a lot of responsibility. At that time we produced our wings in Hungary, but in parallel we also had external production at Skysports in Sri Lanka and Advance in Vietnam. Together with our long-standing partner Aerotact, we were also setting up a second production facility of our own in Vietnam. They let me do it, and I really wanted to do it. I worked extremely hard, but it was just good for me and I realised I could do it." Niki Kurcz did so well that he has been a NOVA shareholder since 2016.

# The NOVA wing designs from 1989 until today

## CHANGING TASTES

### The 1980s: Colourful chipmunks

"As long as it's colourful" was the motto in the eighties. The brighter, the better - but initially there were only different colours along the cells. By the way, fluorescent colours were not only a must for the gliders, but also for harnesses and clothes.

### The 1990s: First design seams

The colours remained brilliantly bright, but increasingly there were now designs that went beyond the different colours of the cells. For the first time there were seams only for their eye-catching effect.

### 2000: The NOVA Swoosh

Nike calls its logo the "Swoosh". In the year 2000 we introduced the NOVA Swoosh. Coloured upper surface, white lower surface with a Swoosh. Later the Swoosh migrated to the leading edge.

### 2004: Heartbeat design

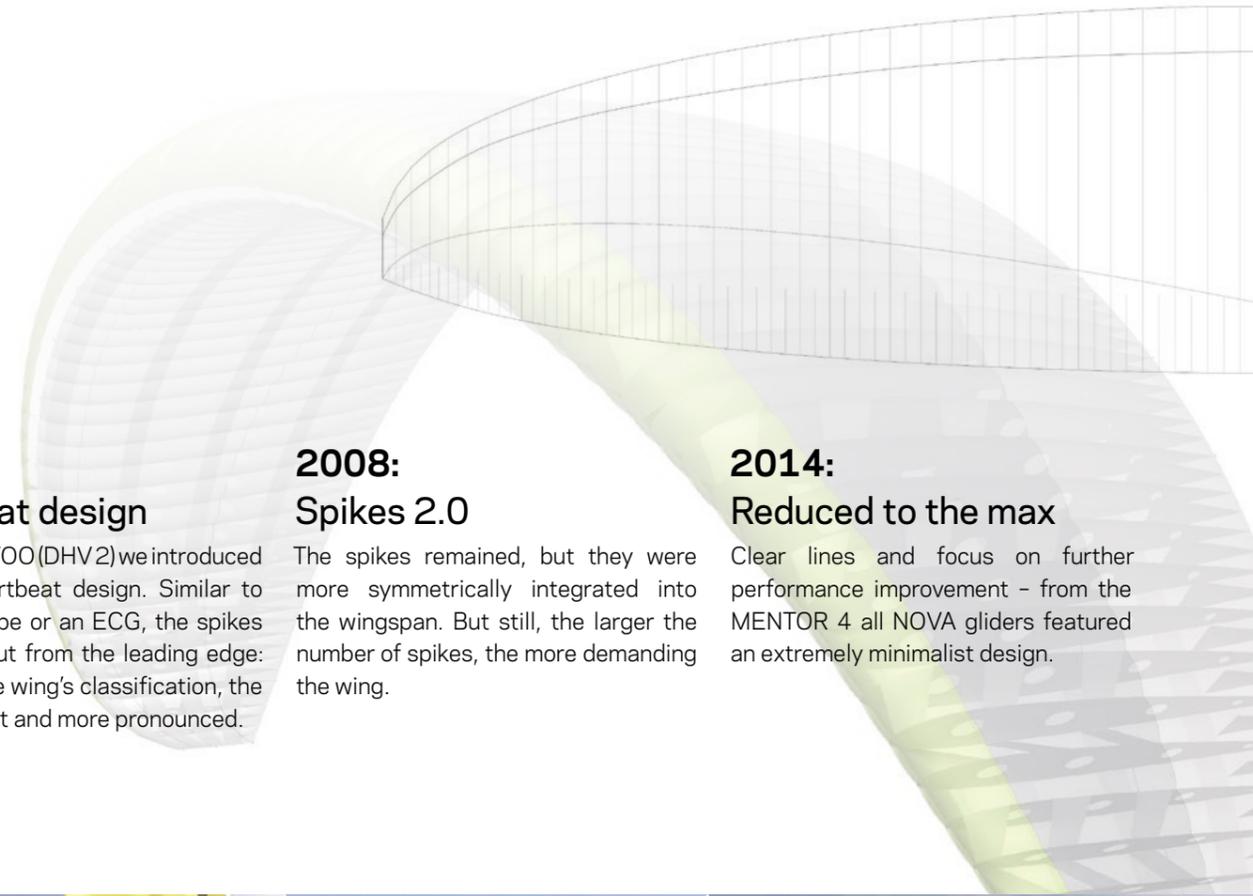
With the TATTOO (DHV2) we introduced the first heartbeat design. Similar to an oscilloscope or an ECG, the spikes zig-zagged out from the leading edge: the higher the wing's classification, the more frequent and more pronounced.

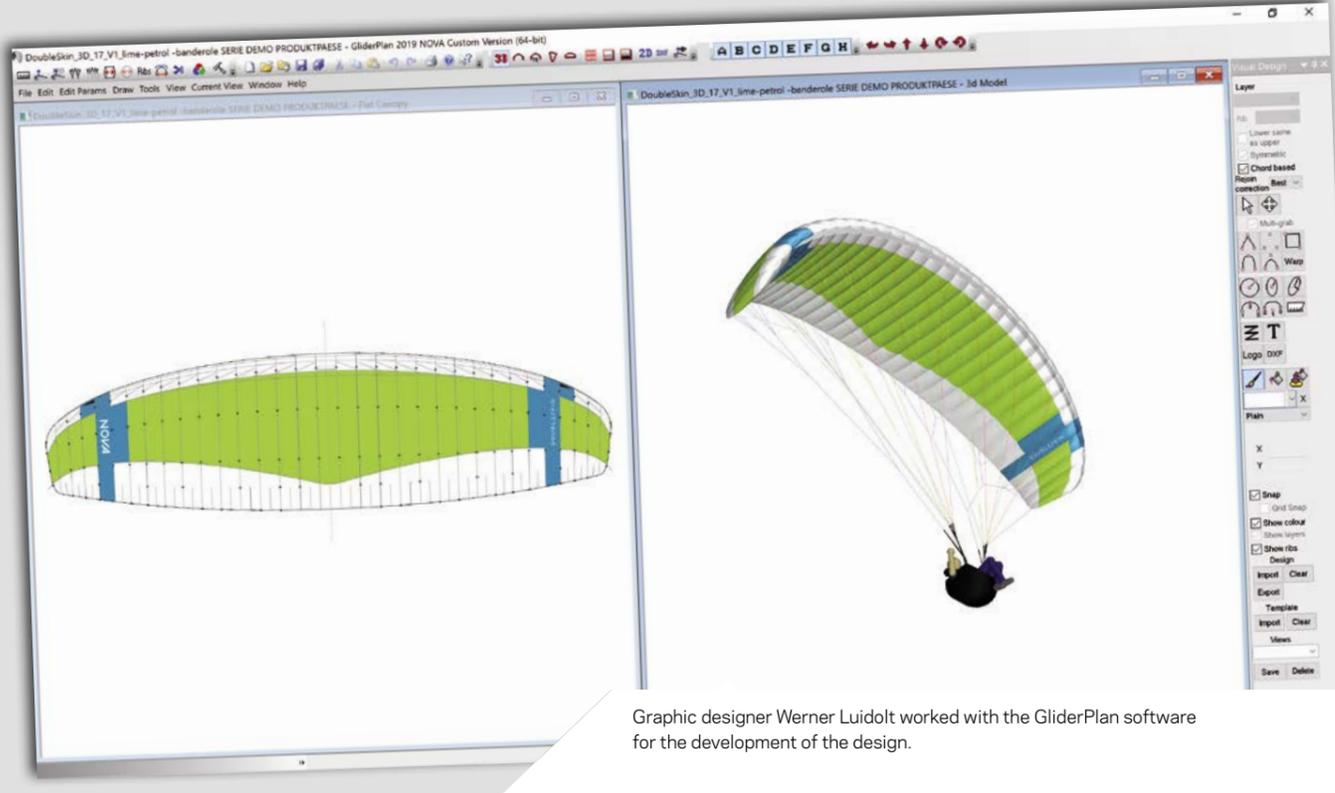
### 2008: Spikes 2.0

The spikes remained, but they were more symmetrically integrated into the wingspan. But still, the larger the number of spikes, the more demanding the wing.

### 2014: Reduced to the max

Clear lines and focus on further performance improvement - from the MENTOR 4 all NOVA gliders featured an extremely minimalist design.





Graphic designer Werner Luidolt worked with the GliderPlan software for the development of the design.



Easy on the eye: the new design optically emphasises the aspect ratio – as with the new AONIC (high-end EN/LTF A), which will be launched in early 2020.



In 2019, the BANTAM (pictured) and the DOUBLESKIN where the first wings with the new design to come onto the market in 2019.

## 2019: Sweep and banderole

NOVA has never invested so much time and energy in the systematic development of a new design: more optical aspect ratio, better recognisability and the possibility of varying the design details on different models.

The decision to develop a new wing design was made in summer 2017. "Since then, the entire team has made many proposals, voted, rejected, redesigned, tested and finally agreed. The now implemented design was developed in close cooperation with Werner Luidolt, who invested a lot of time and passion into the project. Now we are looking forward to feedback from the paragliding community," explains Sissi Eisl, Managing Director of NOVA.

And this is merciless. There are experts for everything ... doctors for health, tax consultants for trouble with the tax office, lawyers for legal problems, etc. – but there are also areas in which EVERYONE thinks they are a specialist. For example in colours and design. Every paraglider pilot knows colours and designs and thinks they know everything, or know everything better. Therefore NOVA was really excited to see how the new design would be received by pilots and curious how the discussions about it would go. There were many reactions to the Facebook post about the new design: within a few days it reached over 43,000 people with over 14,000 interactions.

Werner Luidolt was clear that the task to develop a new basic design for NOVA would be a tricky one. Werner is a long-standing NOVA Team pilot, an outstanding cross-country pilot and a qualified graphic designer. And Werner is a man with a lot of patience. He needed it, because the NOVA team

is just like the paragliding community ... when it comes to colours and design, it took a long time for everyone to agree. Ultimately, the new design was a two-year process and we now think it was well worth the effort. After all, the basic requirements were clearly defined right from the start.

The new design should

- not cause polarisation in the community. With the last designs this was the case. Many found the spikes too aggressive, the strongly reduced design too square or even boring.
- to "optically increase" the aspect ratio of the wing. The majority of pilots find a high aspect ratio wing to be sporty, elegant and aesthetically pleasing.
- not require too many additional seams. Because many individual fabric panels and the associated seams not only increase production costs, they also mean potential points of wear and tear and do not improve aerodynamics (exceptions: 3D shaping and mini ribs).
- are suitable for all paraglider models – from the rather chubby all-rounder to the higher aspect performance wing.

- offer a high recognition factor. Every manufacturer would like to have a "look" or certain features that make the brand of the glider clear – close up, as well as from a distance.
- through particular features allow you to recognise the glider model, or at least the category (as with the two previous spike designs).

**The result:** the central element of the new design is the sweep, which is based on the sweep of a bird's wing. It accentuates – with corresponding colour contrasts – the aspect ratio of the paraglider and, together with the colour-contrasting banderoles on the outer wing, ensures identifiability. In future, product and brand names will be placed on the banderoles. What is special about the banderoles is that their placement and composition across several cells will vary slightly from model to model. The design is also functional in that the front seam of the sweep also serves as a 3D-Shaping seam and often forms the transition between two different materials. It is therefore a technically necessary seam that has become part of the new design.

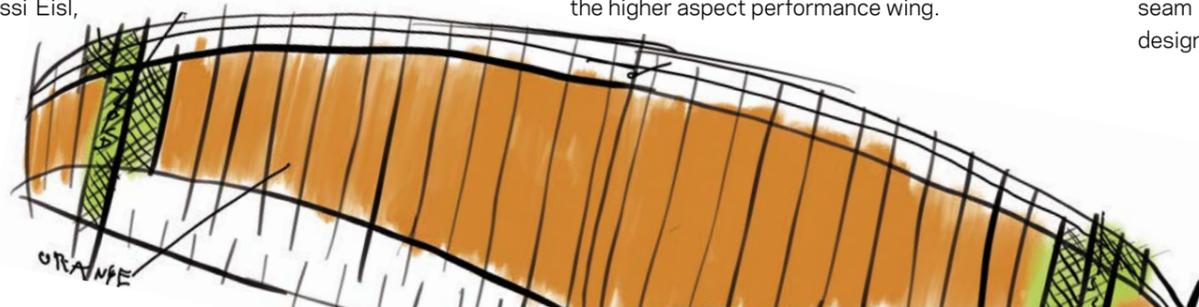
"I never thought it would be so complex,"

says Werner, "but it was actually great fun and I learned a lot! In the end I found it difficult to choose just one design." Werner worked with the GliderPlan software for the development of the design. With its help, he could project, rotate, turn, tilt and view his proposed designs of any NOVA model from any possible angle. "It was a special moment when I saw the prototype fly for the first time and the new look became real, rather than existing only on the screen. But I also noticed that reality is still different from the virtual model. It was good that NOVA decided to build several prototypes – until it was perfect".

Another, almost equally important topic is colours. The two largest cloth suppliers Dominico and Porcher offer certain standard colours. Depending on capacity, season and also luck or bad luck, the delivery time ranges between immediately and in the worst case, up to six months. If you want to have an exclusive colour, it takes up to an additional to eight weeks for colouring, UV and colour fastness testing and other tests. The paraglider manufacturer also has to consider minimum quantities.

And additionally, the decision as to which colours to use for a model is made very early in the project process – about a year before the glider comes onto the market, immediately after the decision as to which fabric to use has been made. It is hardly possible to respond to short-term trends. Introducing a new colour is therefore not as easy as most pilots think. It takes a long time and must be thoroughly thought through.

So far, at NOVA we are more than satisfied with the first reactions to the new design. Of course, not everyone likes it, that was always going to be the case, but the vast majority do. And Werner Luidolt says: "I was excited recently when I sat in my harness looking up and imagining the sweeps in the wing design as an extension of my arms. A simple approach, but I liked it!"





Shore reached, testing the flare with the BANTAM.



Besides working on the computer, Pipo Medicus is out and about a lot. Photography is also part of it.

## Portrait of Philipp Medicus, Head of Research & Development at NOVA

# A LOGICAL PROGRESSION

Even as a child, Philipp Medicus was enthusiastic about everything that could fly – from paper airplanes, to remote-controlled model airplanes, to proper sailplanes at the age of 16.

A few years later, by chance, he discovered paragliding and obtained his Austrian PG license. Despite the kit weighing 15 to 20 kg in those days, he soon developed a passion for hike & fly. As the weight of the equipment got less, his enthusiasm grew even more.

Due to his technical interest, Philipp decided to study mechanical engineering after graduating from high school. At some point, because of a technical question, he contacted NOVA. "I was flying a NOVA wing, but as a person from Innsbruck, I didn't even know NOVA was based in the same city. I only realised several emails later." Around 2003 he started to occasionally join Walter Holz-müller and Mario Eder during test flights.

This relaxed getting to know each other resulted in various student jobs: website, articles, photos, glider inspections, etc. He was also more and more involved in testing. "My work for NOVA developed organically and without being strategically planned. But I was really interested

and it was really fun. And at some point I realised that I could do this as a job." Today he is the head of the development team at NOVA. What he appreciates most about his work is the interlacing of theory and practice: "Flying without the technical reference would be less fun for me. Conversely, I would find working on the computer less exciting without the possibility of being involved in practical testing."

**Apart from the smallest and largest sizes, Philipp tries nearly all prototypes himself.**

"As the designer, you have a different view of details and a different understanding of technical connections.

The disadvantage, however, is that concrete expectations can cloud your view. This is why the team work with the test pilots is so important. They perform the bulk of the testing. Despite all the possible simulations, careful test flights and fine-tuning are absolutely essential."

As logical as it is that the passionate pilot enjoys flying so much, it is hardly surprising that it is rather non-job-specific things that make it less fun: administrative stuff, documentation, internal company issues – or even tidying up the office ...

When you ask Philipp about the future of paragliding, he smiles. "The more detailed and long-term a forecast for the future is, the more wrong it is in most cases. I therefore remain vague and suspect that the paraglider will continue to develop as an aircraft for quite some time to come. For starters, it is still a relatively young aircraft – in comparison

to a sailplane, for example. Secondly, it is a very complex design and as such offers great development potential. And thirdly, paragliding is a real niche sport and therefore the resources invested are rather small in absolute terms compared to other sectors."

With regard to his own future as a pilot, he is more definite. "The majority of my airtime in thermals is at work. In my spare time, the big draw of paragliding for me is in combination with mountaineering. Because the wing extends the range of possibilities, when descents or valley crossings on foot are no longer necessary.

**Last year he climbed a total of over 100,000 metres.**

My current hike & fly equipment is a BANTAM 10 and a MONTIS harness. Altogether that weighs 1.85 kg and thus a tenth of my first equipment I used for

hike & fly! Even if the weather is dubious, I take the wing with me. If I have to walk down, the extra weight is negligible. But if I can fly, the advantage is huge."

Oftentimes these were only short hikes from the front door. Sometimes mountains further afield in the Innsbruck area. The highlight was a spontaneous non-stop tour of Mont Blanc with harness developer Luis Dep-ping.



Revolutionary: the CXC



Snazzy: Toni Bender



Brave: the factory in Hungary



Dominant: in the middle of the 1990s, NOVA dominated the Paragliding World Cup.

The highlights of 30 years of company history

# OF HIGH FLIGHTS AND A LOW SAVE

NOVA was founded in 1989. Together with Advance, Apco and ITV, NOVA is one of the oldest existing paraglider manufacturers. At [www.nova.eu/history](http://www.nova.eu/history) you will find a chronological overview of the company history and our most important paragliders. In order not to bore you with too many details, we have picked out a few important moments here – highlights, but also a real low point ...

1988. Wolfi Lechner was a climber. Like almost all climbers and mountaineers at that time, paragliding attracted him immediately. Flying was cool and could easily be combined with climbing. The importance of proper training was not particularly appreciated at the time. You knew someone, who knew someone – and somehow, by half teaching yourself, you suddenly became a pilot. There were also flying schools where if the person assured them that he could already fly, the pilot's license was included in the scope of delivery when they bought a new glider ...

Flying achievements at that time were maximum airtime and precision landing. "We trained a lot at the Patscherkofel – especially spot landings. up, down, up, down", remembers Wolfi. He was 30 years old at the time and worked in sales for a food manufacturer.

At some point he met Hannes Papesh, who was then studying biology and because of a lack of money had sewn his first wing himself, using his mother's sewing machine. Soon word got around that Hannes' glider flew well and Ernst Steger made a contract with him, the result of which was the legendary "Comet". Since Hannes' strength lay more in designing than negotiating contracts, this agreement turned out to be largely in favour of Steger ... Above all, Steger planned to give a sub-licence to a surfing manufacturer ... When Hannes learned of this, he sought help from Wolfi, who knew business better. Wolfi: "We talked directly to the surfing guys and really gambled on the outcome. I proposed a one-off payment of one million shillings and they would have accepted it without a grumble."

We were surprised and I thought if this is such a good market, why aren't we doing this ourselves?" But how, without money? First they hatched a plan. Hannes was to be the designer, but first they had to buy him out of the contract with Steger.

## Big plans, little cash

Wolfi and Hermann Habe, new to the team, were to take care of sales, production and marketing. Reinhard "Felix" Federer was earmarked as test pilot. But the latter didn't work out, so Wolfi brought Toni Bender on board. At the time Toni was the high flyer in hang-gliding and paragliding, but he injured himself a short time later and dropped out. Under the guidance of Toni, Wolfi suddenly became the test pilot, a role he didn't really like: "Firstly I am not a great pilot and secondly I was always really scared."

The four business partners came up with costings and a business plan. According to the break-even calculation, they would

have to sell 400 gliders to make any money. Was this correct? Reinhard and Hannes were more cautious, Hermann and Wolfi more optimistic. In the end, the business plan was so convincing that the four found a bank that granted them a loan. NOVA was finally founded in 1989.

Over the next few years, a number of factors came together that worked in their favour. Literally, paragliding was flying high. With the production in Hungary, NOVA had a real stroke of luck. Last but not least, the still young brand developed important innovations that are still used in all paragliders today, such as the closed leading edge with ventilation from below or the first diagonal cells.

This boom time for paragliding was characterised by eye-watering fluorescent colors, some odd designs in search of maximum performance and a lively competition scene.

In 1995, NOVA completely dominated the competition scene with the XENON. During the PWC, XENON pilots amassed twice the number of points than the whole of the other competitors put together. The NOVA competition team literally "flew up, up and away" from their competitors and for years NOVA won the PWC constructors' championship.

## Competition success – total dominance

Wolfi remembers: "The XENON won everything there was to win. Without a XENON you couldn't win a competition! We had planned to certify the wing, but in the end it wasn't possible. So we developed the XYON from it – a kind of more manageable and controllable certified XENON. It not only performed very well, it also flew beautifully and offered a relatively high passive safety. The XYON developed into one of the most commercially successful gliders in NOVA's history."



Would be illegal today: flight over the oracle of Delphi for an advertising photo shoot.

In the early days of glider development, the approach basically was “the competition glider of the previous year becomes the school glider of the following year if not too many accidents happen”. This was followed by a phase in which the gliders were specially designed for the then categories 1, 2 and 3.

When NOVA introduced the CARBON in 2001, the commotion brought a lot of excitement to the scene – and a real boost to the 1-2 class. It reached a performance level that was previously reserved for high performance wings. Now everyone could go cross-country even on an intermediate wing. Wolfi remembers: “Our order books were so full we could not fulfill demand due to delivery problems of our cloth manufacturer.”

#### The cloth disaster in our worst year

But not only that ... in 2002 there was a situation that could have meant the ruin of this so far successful company: the Carrington catastrophe. NOVA suddenly received reports of CARBON wings turning parachutal. Wolfi Lechner: “Initially we had absolutely no idea why. In the beginning we thought of individual rogue wings, gliders exposed to too much sun or that had been pulled through sand. But we got more and more of such complaints.”

The precise and routine cloth testing during the production run provided no hints of faults. The problem with the cloth only became apparent after lengthy use. Finally it turned out that Carrington, the cloth supplier at that time, who no longer exists today, had solved their supply bottlenecks by purchasing two colours from another weaving mill. And the quality was not adequate ... The coating was anything but resistant to aging – the cloth got an “orange peel” and the gliders went into a deep stall.

It took a while until NOVA found out that only two colours were affected and of course not all CARBONS were made in these colours. “It was hell,” Lechner recalls today, “we knew that we had delivered gliders that weren’t OK and were potentially life-threatening for the pilots – but we didn’t know which ones. We didn’t cause this error, but it is important to be honest with customers. The question “what should we do?” was quickly answered. Be honest, take responsibility for the mistake and to try your utmost to get the gliders out of service and to get the customer a replacement.”

NOVA released a safety notice for the 1440 sold CARBONS and recalled all of them. It had to be certain that none these wings would cause an accident! In the end, NOVA replaced 65 wings sewn from the defective cloth free of charge.



With the introduction of the new design for the DOUBLESKIN and BANTAM models in 2019, a new era began for NOVA: all future models will come in the new look, like the high-end EN A glider AONIC pictured.

When Wolfi Lechner looks back on this disaster today, the reaction in hindsight is very interesting: “We were by no means the only manufacturer that used this cloth and was affected by the problem. But we were the only ones who communicated this openly and actively recalled all the gliders. But for a long time people said NOVA has a problem with their cloth. But there were also flying schools and pilots who really appreciated our attitude. In a situation like that you learn who your friends are ...”

#### NTT – not a problem, but innovation and logic

Something similar happened with the introduction of NOVA Trim Tuning (NTT) in 2008. The NTT was a logical response to the fact that the lines of a paraglider shrink or stretch with use. Generally, A and B-lines stretch, whereas C-lines shrink. As a result, the wing flies slower and the handling is less agile. All lines are subject to shrinkage – regardless of which material they are made from or which manufacturer produced them.

The described consequences therefore affect practically all paraglider manufacturers.

Together with flying instructor and mathematician Ralf Antz, we developed NTT, a standardised cloud-based procedure for checking and optimising trim, to ensure complete enjoyment of flight and maximum safety. Many pilots were incredulous that the shrinkage or stretch of the lines happens within the first 15 – 20 hours of the glider’s flying life. After that not much changes. Therefore, it is still the case today that you should have your glider checked with an NTT after about 28 hours – at the very latest at 100 hours or one year.

And in the following year you heard people say that NOVA has a problem with their lines. In fact, all paraglider brands use the same lines from Edelrid, Liros and Cousin ... Meanwhile the prophecies of doom have stopped, and NOVA pilots can be happy about the NTT, which, carried out in time, makes the full inspection only necessary after 3 years

and extends the warranty to a full four years. And a number of other manufacturers have recognised that the NTT is very useful and offer something similar themselves. (See also the article on the NTT on page 26.)

#### Cross-country and hike & fly take off

Since 2006 there have been several simultaneous developments that still stand today. Competition gliders became more and more demanding to fly and the majority of pilots became less and less interested in the competition scene. Meanwhile, cross-country flying gained popularity and proved what the CARBON had indicated: the performance of intermediate wings improved from generation to generation.

And another trend started about the same time: hike & fly. After paragliding equipment had become so heavy and cumbersome that the ascent on foot was almost impossible, the idea of “hike & fly” slowly blossomed. Lighter harnesses,

reversible harnesses, smaller parachutes – many pilots were thirsting for them – including many who did not want to climb the mountains on foot.

Always with an eye to the future, NOVA launched the first IBEX in 2007, a glider specially designed for mountaineers and hike & fly. It presented a completely new paraglider concept: a small glider that can also be flown under high loads due to its safe profile. The smallest IBEX (15 m<sup>2</sup>) already weighed less than 3 kg at that time, although it was deliberately not sewn from the lightest materials to ensure durability. For experienced pilots, it offered a lot of fun because of its high agility and it had a wide range of applications – from high alpine descents to soaring flights where the wind is a little too strong for a full-sized paraglider. With a normal wing load the IBEX was a good-natured and versatile wing. So it became the inspiration to an entire fleet of miniwings.



Photos: NOVA archive

Versatile: the ION 2



Another revolution: the PHANTOM



Photo: Carmen Lechner

Wolfi Lechner's wild years are over. The passion for flying remains ...

When the BANTAM is released in autumn 2019, it will continue this tradition – and is (as of November 2019) the lightest certified glider with upper and lower surface (1.65 kg in size 12).

For NOVA, after 2008 came the golden years – despite completely withdrawing from the competition scene – thanks to “MENTOR mania”. The first MENTOR generation brought something like the final breakthrough of the standard class. So many long distances were flown that many a high performance pilot wondered why s/he was hanging under a demanding glider at all. The first MENTOR generations dominated the XC scene to such an extent that the entire high-end EN B category was finally referred to as the MENTOR class.

An interesting side effect: there was also something like the social acceptance of flying a standard class wing. EN B paraglider pilots were no longer patronised in the landing field, because some high performance glider pilots had to fear that an intermediate wing pilot had left them behind en route ...

In the public's perception, the MENTOR was of course always in the lead – and its little brother ION in the low-end EN B class was rather in the shade. However,

this glider was and is ideal to gain your first cross-country flying experience – and far beyond!

In the low-end EN B class the performance is continuously improving. To demonstrate the performance potential of the new low-end EN B ION 2 and to encourage good pilots to try long cross-country flights on this class of wing, we devised the “ION 2-Hundred Challenge”. The first 200+ km FAI triangle of the 2012 season flown on an ION 2 was rewarded with a 2000 euro prize. On the 10th May 2012, Werner Luidolt achieved the magic 200 km distance with a flight from the Grenteam, South Tyrol.

**A lot of safety  
PLUS a lot of performance**

And Joe Edlinger (AUT) flew his 99-cell PHANTOM, also a low-end EN B, an amazing 435 km in Brazil (see more on this wing in the article on page 76)! No question at all that you can also fly very, very far on a low-end EN B!

To date many national XC league wins and records have been set with the PRION, ION, PHANTOM, MENTOR and SECTOR models. In 2014, Austrian Berni Pessl flew the still unsurpassed 300 km FAI triangle with a MENTOR 3.

The following year, NOVA Team pilot Robert Schaller managed the first 200km FAI triangle with an EN A glider (PRION 3). In 2018 the SECTOR pilots Werner Schütz, Armin Leitner and Urs Haari won the national cross-country championships in Germany, Austria and Switzerland. A huge achievement for a brand new wing.

We consider ourselves well prepared for the future: with Philipp Medicus and Niki Kurcz we have two extraordinary paraglider designers on board. When it comes to harnesses, Luis Depping and Marcell Schrittwieser are in charge. The team at NOVA headquarters in Terfens consists of a healthy mix of “old hands” and “young wild ones” and is consistently made up of people with both high professional qualifications and great passion for flying. Our team pilots successfully transmit this passion into the paragliding community. Our production facilities in Hungary and Vietnam are really well established. Our new wing design has been very well received. In short, we are looking to the future with joy and look forward to the next thirty years.

## Portrait of Wolfgang Lechner THE SOUL OF NOVA

Wolfi Lechner has more spare time now. Time for himself and his wife Carmen, time for the mountain hut on the Weerberg, which he is extending with a lot of love and constantly improving craftsmanship. Time also to fly more himself.

Wolfi Lechner comes from Wattens in the Inn valley, which is clearly evident from his idioms – he is definitely Tyrolean. Wolfi is one of the NOVA founders and still one of the owners. When NOVA was born in 1989, he worked in sales for a food manufacturer.

He remembers: “In those days we didn't really have a clue about anything. Looking back, I have to say that we often didn't know what we were doing. But somehow it worked out. I'm very grateful for that.”

**His way into flying was according to the trial & error method**

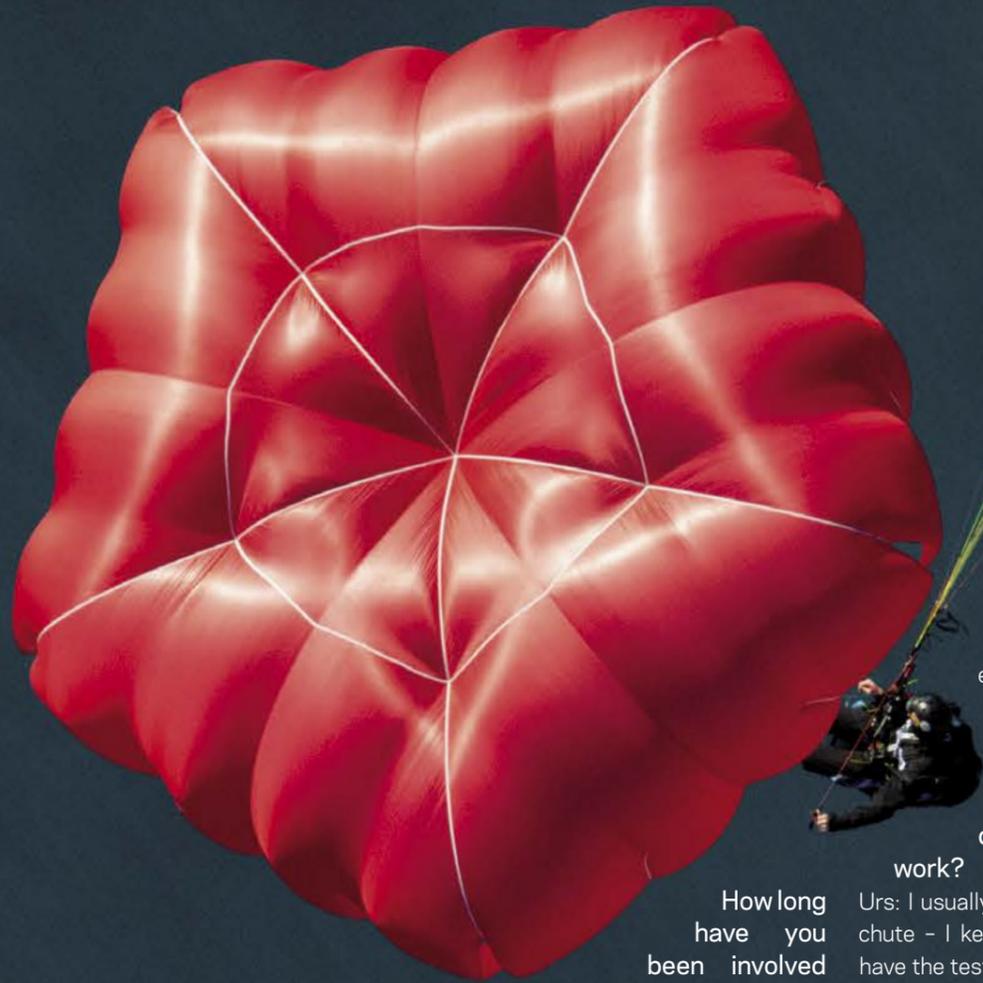
In 2019 Wolfi turned 60 and retired from his position as managing director of NOVA. He handed over the management of the company to Sissi Eisl – the first woman to be the managing director of a paraglider manufacturer. Wolfi is now only working part-time and is still responsible for sales in Austria. Principally he is passing on his experiences and contacts to the next generation.

The paragliding scene is small and very open. There from the beginning, Wolfi has become a real industry fossil, so to speak. Those who know him better – many of his business partners are now friends – appreciate him immensely. Because Wolfi has qualities that are becoming increasingly rare today – decency, fairness, respect for others and complete trustworthiness. His heart is huge and his word is his bond.



Parachutes – what you need to know from reassuring to scary

# THINK BIG – THINK HEAVY



Most parachutes are purchased, installed and forgotten. At best they are remembered by their owners at regular packing intervals. However, this is actually a really important topic. You will see why when you read this interview with “parachute guru” Urs Haari.

**And how often have you deployed one?**

Urs: I have been intensively involved with them, i.e. designing them, since 1994. I guess I've thrown a reserve about 400 times in total, 95 percent of the time over ground – and only once in a real emergency situation. That was at the world championships in Verbier in 1993.

**A parachute deployment is never without risk. Are you ever scared?**

Urs: Oh yes, I always feel a bit uneasy. However, the problem is not so much the parachute, as the lack of large cultivat-

ed areas where we are based. There are houses, streets, power lines everywhere – and that is simply difficult with a non-controllable parachute.

**How does one of your deliberate deployments work?**

Urs: I usually don't throw the main parachute – I keep that as a reserve – but have the test chute “loosely” with me, so to speak. After the deployment, I stay connected to the paraglider for a few hundred metres and look at how the system behaves. This phase corresponds most closely to real-life situations and personally that interests me the most. Then I release the paraglider to see how the parachute behaves on its own. This phase corresponds to the certification process. High-precision loggers record the data and are used for the subsequent video analysis.

**The PENTAGON is an unsteerable rescue with five corners and the BEAMER is a pre-braked, steerable Rogallo. They have different designs but you like both. How so?**

Urs: Both parachutes are very good, but they appeal to different target groups. Many pilots don't want to engage with the details of parachutes to a large extent. The PENTAGON is ideal for them. I worked with NOVA on the design of the PENTAGON and undertook the practical part – packing, testing and certification. At that time we tried and compared various cruciform and round parachutes. From this experience I know that the PENTAGON has the most pendular stability of all current non-steerable chutes. You can see this on the internet yourself. There are no PENTAGON videos where the parachute swings or oscillates. From start to finish the PENTAGON stays steadfast as a rock in the pounding waves.

## PENTAGON

The **PENTAGON** is an unsteerable five-sided parachute. Thanks to its asymmetrical number of corners, the glider offers excellent pendulum stability, but also very short opening times and low sink rates. It is easy to pack and is especially suitable for pilots who don't want to do a huge amount of research on buying and deploying a parachute. The PENTAGON is available in sizes 100, 120 and 145.

More information at [www.nova.eu/pentagon](http://www.nova.eu/pentagon)

In addition, the PENTAGON is extremely easy to pack. I would say it is the chute that is the most simple to pack of all the models currently available on the market. Even inexperienced packers are able to pack them into the small volume required by most containers today. My compliments to Niki Kurcz, who developed the PENTAGON. Really good work!

**And the BEAMER?**

The first BEAMER was launched in 1994. It is still a Rogallo wing, which means it is basically steerable and generates a certain amount of lift, which further reduces the sink rate. The original BEAMER had 38 square meters and was built according to parachute standards. It weighed 2.9 kg, was 100% suitable for free-fall and is practically indestructible. I know pilots who still use this parachute today – and who can do so with confidence.

Generally the BEAMER has considerably more surface area than all other parachutes, which reduces the sink rate per se. The crux of the BEAMER 3, the current version, is the fact that it is packed “pre-braked” so to speak and does not develop much forward speed at all. According to our measurements, it flies just 3 to 4 km/h faster than a cruciform or round canopy when the brakes are applied, but comparably sinks up to 30% slower. By the way, all parachutes drift or glide a little. Round canopies also develop forward motion due to the opening impulse and in most cases fall below the maximum sink rate of 5.5 m/sec required by the EN standard for this reason alone.

I myself will only fly with a BEAMER. I recommend that pilots should make themselves more familiar with the scenario of having to actually throw the parachute in reality.

\_100  
\_120  
\_145



The **BEAMER** is a steerable parachute. This Rogallo wing opens extremely quickly and has an exceptionally low sink rate, but requires some experience and is more difficult to pack. The unique thing about BEAMER is the fact that it is pre-braked after opening. It is available in three sizes (100, 130 and 170 kg). More at [www.highadventure.ch/en/beamer-3-en.html](http://www.highadventure.ch/en/beamer-3-en.html)

**So, you recommend the PENTAGON for pilots who want to stay more passive after the rescue deployment, and the BEAMER for those who don't want to leave anything to chance. What exactly do you do after you deploy a parachute?**

Urs: You deploy your chute because your paraglider is no longer in a flyable state. So after deployment, the paraglider and parachute "fight" with each other. As soon as the parachute is open, the paraglider must be prevented from flying immediately - this applies to all systems. The best way to do this is to use a B or C-line stall or even a full stall. One-sided interventions are counterproductive. In this configuration, the pre-braked BEAMER also sinks almost vertically and with extreme pendular stability; the sink rates remain extremely low. Other interventions are not necessary.

I like to talk about the "basic required procedure" and recommend every pilot undergoes training in this at the beginning of their flying career under expert guidance. If you remain passive after deploying your chute, no matter what system you have chosen ... you can still experience surprises.

With sufficient height, you can now follow the "advanced procedure" with the BEAMER. With your free hand (the other is holding the stalled paraglider) a brake line of the BEAMER can be operated to avoid any obstacles. Because the opposite brake line remains in the pre-braked opening position, the BEAMER can be steered in all directions with just one hand. Until landing the other hand remains firmly on the risers or brakes of the paraglider.

If I have quick-outs or a hook-knife, the full potential of the BEAMER can be exploited by disconnecting the paraglider completely. Naturally that requires some practise.



QR-Code for [www.youtube.com/watch?v=-q9e-JoXZ\\_-E&t=9s](https://www.youtube.com/watch?v=-q9e-JoXZ_-E&t=9s)

**A question about the size of the parachute. How large should it be?**

Urs: Two factors come into play - opening speed and sink rate. The current EN standard stipulates an opening time of four seconds maximum. In reality nearly all test chutes comply with this. It only gets tricky for tandem parachutes. Thankfully due to the designs and lightweight materials common today, opening times have generally become short.

## FIVE SIDES FOR MORE SAFETY:

The pendular stability of a parachute is one of the most important safety criteria, especially as strong oscillation can cause additional impact if the pilot crashes into the ground under the reserve. The asymmetrical construction of the PENTAGON with five corners prevents the whole system from oscillating, because each pendular movement is immediately arrested by pitching in a different direction.

## DANGER! WATER DAMAGE

Many pilots do not appreciate how much damage moisture can do to a parachute.

- The porosity of the cloth can be increased. This increases the descent rate and possibly also changes the geometry of the parachute, which leads to stronger oscillations.
- The length of certain lines can change dramatically if they become wet and are then dried. The resulting change in geometry can lead to greater oscillation, faster sinking and/or slower opening times. Both the BEAMER and the PENTAGON are made of water-resistant materials and can be deployed several times after a water landing and CAREFUL drying. This is not the case for all parachutes. To date the water resistance of the materials has not been stipulated in the parachute certification EN 12491 standard.



More information at [www.nova.eu/pentagon](http://www.nova.eu/pentagon)



The PENTAGON in moving pictures [www.youtube.com/playlist?list=PL0dDSW1EWZBBpQEZcNvrBQMhL0YaQKHj9](https://www.youtube.com/playlist?list=PL0dDSW1EWZBBpQEZcNvrBQMhL0YaQKHj9)

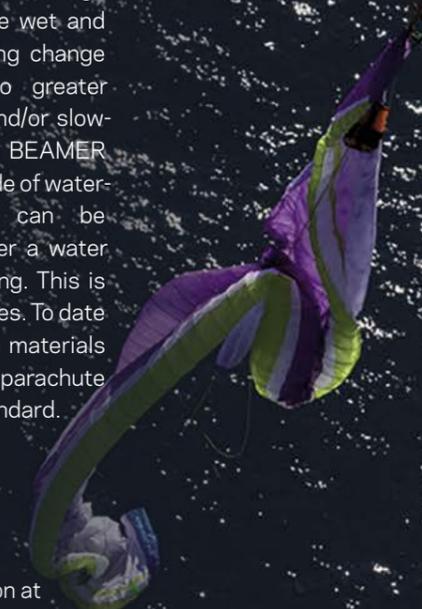
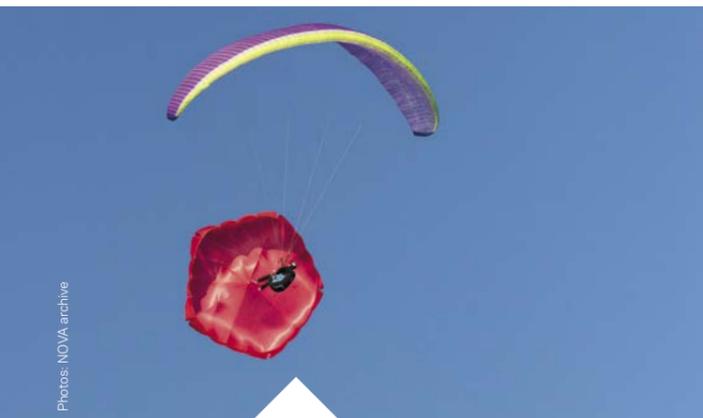
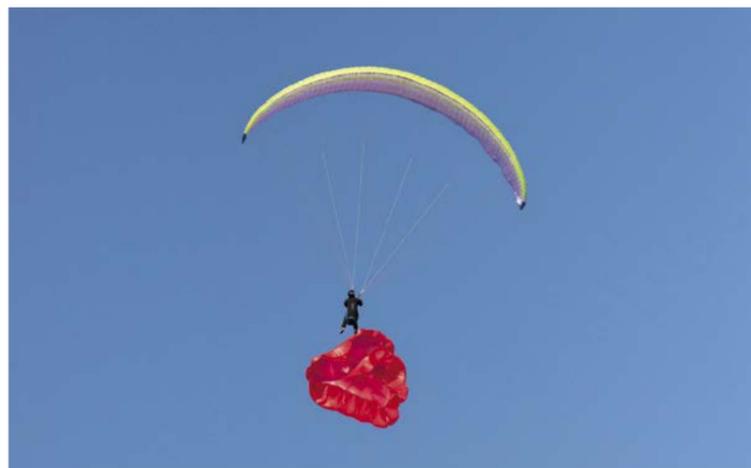


Photo: NOVA archive



Photos: NOVA archive

Photo: Urs Haari

## FIVE CORNER VENTS FOR FAST OPENING

Five corner vents assist inflation during opening. Opening is faster and more reliable than with conventional parachutes. This is not only critical when close to the ground, but it also reduces the risk of the parachute getting tangled in the paraglider's lines before opening.

By the way, with the PENTAGON and the BEAMER we could not determine different opening times for different sizes. The argument that a larger area takes much longer to open is completely outdated.

As far as the maximum sink rate is concerned, I strongly advise a rethink on this. The EN standard stipulates a maximum of 5.5 m/s - at sea level (calculated on the basis of temperature, humidity and air pressure at the site). In reality, however, you don't deploy your reserve at sea level under laboratory conditions, but - and this is the essence of paragliding - mostly at altitude, in turbulent conditions and with the paraglider attached.

The formula used by the EN standard and the data available from weather stations make it easy to calculate the

maximum load at different heights - while a certain rescue parachute at sea level sinks at 5.5 m/s with a load of 130 kg, its maximum load for the same sink rate is 108 kg at 2000 m above sea level and at 3500 m only 92 kg! Therefore I recommend loading conventional rescue systems up to a maximum of 25 percent below the tested load capacity.

Due to the generally lower sink rates of the BEAMER (3.7 m/s at 130 kg according to EN measurement), the Rogallo can be loaded up to the upper weight limit without misgivings.

**On a different topic ... operational life. When do you need to change your rescue parachute?**

The manufacturer stipulates this. For most, it is ten plus two years (after an additional inspection), as is the case with

the PENTAGON. For the BEAMER it is twelve plus two years.

**Are there any differences between normal and lightweight parachutes in this respect?**

Absolutely! The current trend towards extreme lightweight rescue chutes is causing me some serious concern! The parachutes today are only half as heavy as five or six years ago. Everyone wants light, light, light and a tiny packing volume. We are now moving towards or perhaps even beyond the limits of what is acceptable.

I'm often at the certification centre when test deployments are performed. In the past there was hardly any occasion when a parachute tore; today the test chutes are damaged by the dozen. Our experience in the High Adventure

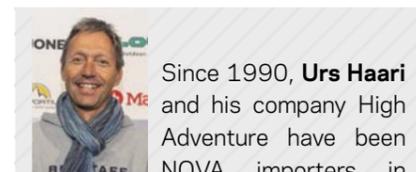
Swiss pilot Urs Haari has experience of over 400 deployments with various parachutes; most of them over ground.

workshop also confirms this: in the past when a pilot deployed his parachute and landed in a tree, the biggest problem was usually the resin in the fabric. Structurally the canopy remained sound. These days the vast majority are destroyed. In the case of unused super-light parachutes, we sometimes observe irregularities during packing even after just one or two years!

You should therefore never sit on the packed reserve and be extremely careful that it never gets wet or dirty (particularly with sand). That could easily happen at the launch or landing area. And if you landed in a lake during an SIV course, I would like to warn everyone about the risk of trying to dry a wet parachute by inflating and dragging it around. Wet lightweight chutes can be damaged even when it is hauled into the boat. When I imagine what the current super-light rescues will look like in ten years, I really worry!

My general message is this: go for greater square meters and don't push the upper weight limit. Subtract 20 to 25 per cent from the certified total take off weight, so that even a deployment at great altitude does not become a nightmare. And if you don't practice hike & fly regularly, you should always buy a normal parachute.

**Many thanks Urs for the honest words and we wish you happy landings - no matter if under the parachute or with the paraglider.**



Since 1990, **Urs Haari** and his company High Adventure have been NOVA importers in Switzerland. For many years Urs flew successfully in the Swiss national team and he completed the first 200+ km flight in the history of paragliding (already in 1990 with the original PHANTOM).

Today he is one of the best cross-country pilots in the world. Urs is the designer of the steerable BEAMER parachute, but he is also very enthusiastic about the PENTAGON.



# NOVA PILOTS TEAM

MORE THAN JUST GOOD PILOTS ...



# 2006

In 2006 we founded the **NOVA Pilots Team** (NPT). It still differs fundamentally from all other pilot teams: it is about cross-country flying, "normal" pilots, team spirit, but especially about wings for normal pilots. Till Gottbrath, "Capitano" of the team from the beginning explains:



In the 1990s NOVA was heavily engaged in the competition scene. The best competition pilots in the world were flying wings from Tyrol. They progressed with great success from one World Cup event to the next. For many years NOVA won the constructors' championships of the PWC. In 1995 the XENON's domination was so complete that NOVA pilots scored twice as many points in the PWC as the rest of the field combined! And ten years later we completely turned our backs on the comp scene. How come? What happened?

My own flying CV is almost exemplary for the developments that led to this decision. In 1986, I "played around" with the lines of a paraglider for the first time. I actually started flying (or should I say gliding down) in 1987. The early wings flew so badly that you "had to" fly a high-performance wing. The formula that applied at that time was: normal glider = land immediately; high-performance glider = land a little later. So I, like everyone else who didn't consider themselves a beginner any more, flew a high-performance wing.

When I think back to those times, I feel quite faint. Some gliders had risky designs, I had no experience, and I had no knowledge. But the worst aspect was that I wasn't even aware of these facts! Given this unhealthy level of ignorance, I was incredibly lucky: I not only survived this phase; I survived it without injury. But I was extremely lucky more than once, really I was terrified all the time ... and I was not the only one.

### Far from our rank and file

Meanwhile, the demands the competition wings made on their pilots continued to grow. This meant that the number of active competition pilots started to decline appreciably. Eventually it was just a few pilots who were interested in competitions. The top class distanced itself greatly from the rank and file. Too far for many.

Do you know who the current world champion is? Your national champion? European champion? In 2005/06 we asked ourselves these questions and we also asked our flying friends. Only very rarely did someone know the right answer. In my club, the Kampenwandflieger, nobody could give me the correct responses. And I bet that very little has changed even today. Be honest ... do you know who the current world champion is?

So at NOVA we asked ourselves this perfectly logical question: is it still actually worth being in the competition market? Especially once you consider that in those days we invested a good million Schilling per year in the competition team ... (for all the younger readers: that was the currency of Austria before the introduction of the euro, so in today's money it was more than 72.000 euros). I don't remember exactly who said it, but someone commented that "For the designer making competition wings is like gratifying yourself while burning banknotes."

At the same time there were two other developments: 1. Cross-country flying really took off. Recording flights was made so much easier by GPS than messing around with cameras and take off and landing witnesses. Simply register, record your track, upload, take part. As an independent cross-country pilot, you didn't have to spend whole weekends or even weeks at the location of a competition in dubious conditions, while the weather on the other side of the Alps was excellent for flying. Last but not least, when it comes to sporting ambition, you can still measure yourself against the pilots in the same glider class and even on the same mountain or the same day using the GPS track. It became clear to us at NOVA that cross-country flying was far more interesting to pilots than classic competition flying.

Development no. 2: in the meantime DHV 1-2 gliders (today EN/LTF B) flew so well that it was actually possible to go for distance with them. In 2003 with the NOVA CARBON, I had the feeling that I could fly further for the first time. I discovered flying anew and properly this time. Paragliding without fear and without skid marks on my pants!

### Finally flying without skid marks

What was apparent with the CARBON was confirmed in the following years with the ARTAX and was manifest with the MAMBOO (all DHV 1-2 gliders) and later with the MENTOR series. To my own surprise I also noticed that even with my limited abilities, I was able to fly further with these EN B wings than with a high-performance glider. How so? To fly far principally means to avoid landing as long as possible. If you're in the air long enough and don't just hang around at the

local site, you'll get reasonably far. With the DHV 2 or 2-3 gliders at that time I regularly found myself in situations in which I didn't feel very comfortable. Sometimes I felt so uneasy that I decided to land. Often I was just exhausted and couldn't carry on flying. The high-performance gliders demanded so much of my limited capacity to concentrate and as a result I took wrong tactical flight decisions. And in no time I was standing on the ground again. Bombed out. So much for the hoped-for long flight.

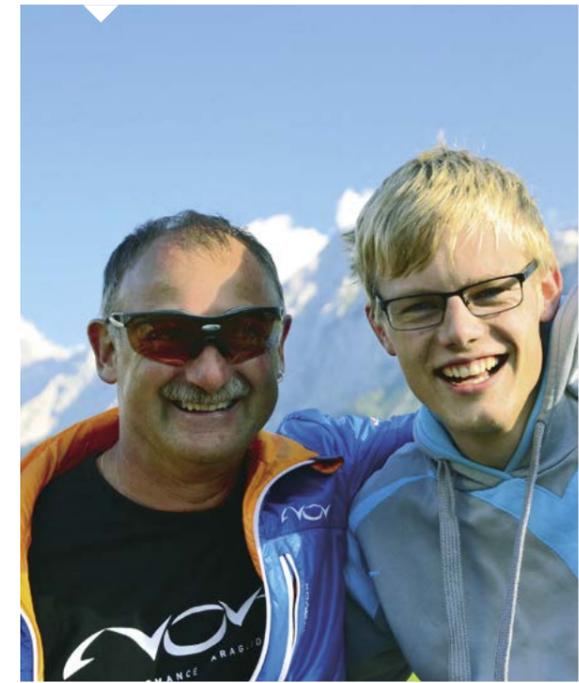
All this led to NOVA's strategic decision in 2005/06 not to participate in the competition scene anymore. We decided: 1. that NOVA is THE cross-country brand! 2. We would concentrate our resources on the development of gliders for "normal pilots" (today EN A to EN C).

We wanted to underpin this vision not only with accessible wings, but we also started toying with the idea of a NOVA Pilots Team. Without further ado, NOVA boss Wolfi Lechner made me team captain. In terms of flying I really wasn't qualified for the role, but Wolfi said: "It doesn't matter. You are good at organisation and communication and that is much more important. And the NOVA Pilots Team should generate stories, which you, as our PR person, can then communicate. It'll be alright". OK then ...

**DISCUSSION:** the exchange of ideas between pilots and with the wing developers is an important function of the NOVA Pilots Team.



**FRIENDSHIP:** The NPT connects several generations.



**SUCCESS:** Hans Tockner, Werner Luidolt, Michi Pohl, Mario Mayr and Joe Edlinger at the prize-giving of the Austrian National Championships





When choosing the "Pilots of the Year", NOVA considers not only their flying achievements but also their commitment, sportsmanship and team spirit. Here are the 2019 winners: Sissi Eisl (NOVA), Chris Feichtl, Stefan and Uli Lauth, Hermann Klein, Johannes Jakobi and Till Gottbrath (Team Captain) Not in the photo: Victor "Pope" Salinas (Chile).

The aim of the NPT was not to recruit a group of paid elitist top pilots. We were looking for pilots who also recognised how well DHV 1-2 gliders were now flying and could prove this with their long-distance flights. To this day we expect our team pilots to support fellow pilots (regardless of what brand of glider they fly) with experience, tips and advice. Pilots who passionately shared their fascination and enthusiasm for the simplest form of flying with others. Honest pilots who could also admit they were sometimes scared. And most importantly, nice "guys" (of either gender).

### More than measurable performance

It was and still is the case that our team pilots do not define themselves exclusively through measurable performance. Of course team pilots should be able to fly well, but their personality, commitment, whether they take good photos or videos, publish articles or are involved in social media, etc. are equally important. There are also other considerations, such as fairness, openness, honesty and willingness to help others.

At first, we didn't know if we were assessing market developments correctly or whether the NPT concept and vision would work. Initially we limited the NPT to the German-speaking world and only approached pilots who were already flying cross-country on NOVA gliders.

The team vision of friendly cooperation was an immediate success. Due to the careful selection of people, we immediately felt a great team spirit, a family feeling - only without the miserable old aunts. And the hoped-for flying achievements materialised. In June 2006 two flights made a huge impact on the cross-country scene: in the Wallis, Switzerland, two young Swiss pilots Marcel Dettling and Adrian Lutz flew the first ever 200 km+ FAI triangles with standard wings using MAMBOOs. And we realised we were backing the right horse! Cross-country flying became really popular and we had the right concept, the right pilots on board, and with the MAMBOO (and from 2007 onwards the MENTOR series) the perfect gliders in the program.

After our initial success, we decided to expand the team and make it international. Later we added the juniors (pilots up to 25 years old), a French sub-team, the High Adventure Serial Team (HAST) in Switzerland and the German flatland team in 2016.

### It grows and prospers

Again and again the juniors, in particular, gave us great pleasure. I feel a little like a proud father when I see what has become of "my" boys. Paul Guschlbauer, Aaron Durogati, Peter Gebhard, Simon Oberrauner, Theo Warden, Idris Birch, Markus Anders, Ferdinand Vogel - they all belonged to our junior team. Don't worry, I'm not as presumptuous as to believe that NOVA or I would have contributed significantly to the success of these guys. It was mainly due to their talent, their eagerness to train and their attitude. But perhaps we were able to imbue them with joy, enthusiasm, motivation and a pinch of common sense ... In any case, we are still friends, no matter which gliders they now fly. Friendship, respect and enthusiasm are more important than the brand you are associated with.

Running the NOVA Pilots Team requires a lot of work. Creating such a group and then forming it into an active team means "sticking with it", pushing, encouraging - over and over again. Daniel Tyrkas, one of the best competition and cross-country pilots in Germany, paid us a nice compliment when we took the cable car to a take-off: "Every manufacturer would love a team like NOVA has. You have a concept, flying success and your guys are really in good form." A nice compliment, because at that time Daniel worked in the marketing department at Swing

Flying an EN B wing is socially acceptable.

Personally, what pleases me is that with the NPT we have contributed to the fact that even as an EN B pilot you are taken absolutely seriously. Twelve, thirteen years ago at the landing field I was rather looked down on by the guys with the high aspect ratio wings: "Hey, kid, did you get to play with us today?". Nowadays no intermediate pilot is patronised anymore, because you can fly very, very far with the MENTOR & Co ... You can be an absolutely respected pilot without having to fly a high-performance wing.

From the point of view of a paraglider manufacturer this change of attitude also has an economic aspect: the number of active pilots in the Alps has remained relatively stable for years. New pilots are trained regularly, but almost as many give up. Some because their interests change, career, family, etc. But certainly some also because they have had unpleasant experiences. Experiences they might have been spared with a more well-behaved glider... In this respect we welcome and encourage pilots to accept each other, no matter which glider category they fly.

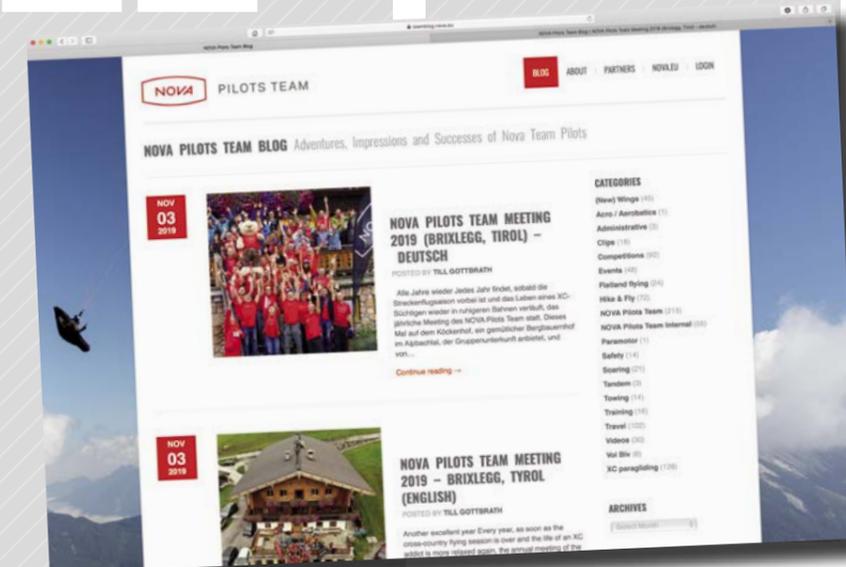
I see the NPT as a group full of solidarity and team spirit. You know each other, you value each other - and it's simply great to have contacts around the globe. Many pilots have been in the team for years and the annual team meeting on the first weekend of October is just as much a part of our calendar as Christmas and New Year's Day.

I would like to take this opportunity to thank my team colleagues for their wonderful co-operation. And thanks to NOVA, without which there would be no NPT. It's just really fun and I'm really looking forward to everything that lies ahead.

### (WO) MEN IN RED

Learn more about the NOVA Pilots Team at [www.nova.eu/en/pilots-team/](http://www.nova.eu/en/pilots-team/). Here you can read about the team's aims and values, members and a little history.

You can spend some time reading the NOVA Pilots Team Blog, which has been available since 2009. The team pilots report about their experiences and adventures there. A vivid testimony of team spirit. [teamblog.nova.eu/](http://teamblog.nova.eu/)



### HOW DO YOU BECOME A NOVA TEAM PILOT?

Many roads lead to Rome, or in this case Terfens, Austria. Good flying feats are the most obvious way to get into the team. But we are also happy to have people who take good photos and videos, write articles and get involved in social media. Important: anyone applying for the team must share our values and communicate them to the outside world. We expect commitment, honesty, integrity, reliability, enthusiasm, fairness, loyalty, helpfulness, commitment, good communication skills as well as team spirit. It goes without saying that you should like the NOVA brand.

Since the NPT has existed for so long, we are already a big team. With the exception of some countries where we still have gaps, we are widely dispersed. However, if you are convinced that you are exactly what we are missing, please send an e-mail to Till Gottbrath: [till@nova.eu](mailto:till@nova.eu)

PS: Being a team pilot also means giving, not just taking. People who are only interested in a discounted wing or their own advantage need not apply.

Some tips on buying a new or used paraglider

## BE PICKY AND LISTEN TO YOUR GUT!

On Facebook, by phone or email and when we go to festivals, we regularly get queries from pilots about buying wings. Here you will find the answers to the most important and most frequently asked questions.

The question on the best wing to buy is as old as the sport of paragliding. And of course, every manufacturer claims to make the "best" wing. NOVA does too. But the real question is for whom? Many factors play a role in the choice of the glider: good feedback from your flying friends, image, success in the leagues and online contests, tests in magazines and on websites, forums, competition victories, recommendations of your flying school, preference for a

certain brand, the trust already developed on the training slope, the design and the colour (oh yes, these factors, as trivial as they may be, should not be underestimated), and, and, and.

The "best" glider is the one whose characteristics best suit your goals as a pilot, that suits your local flying area and your flying style. There are wings which, depending on your view, are communicative or twitchy, damped or boring. When turning, they can be seen as agile or need a lot of active flying, lame or confidence-inspiring. It depends entirely on pilot preference. Armed with the knowledge of what you like, the next step is finding the right wing.

Don't let yourself be influenced too much by what others say - not by the manufacturers, not by biased posts in forums, not by chatter in the pub (who would admit that they don't like their new glider!?) and not too much by your flying school, because they will usually only recommend the brands they sell.

### Tips on glider testing

The ultimate criterion should be your own experience, gained from your test flights. There are a few things you should take note of:

- **Harness:** the harness and how it is adjusted has a significant impact on the "feeling" of the wing. Never change two things at the same time. Fly a new wing with your trusted harness.
- **"Free your mind":** basically you feel comfortable with the familiar equipment because you know it. Initially a new wing will feel strange and different. A test flight should last longer than a top-to-bottom.
- **Weather:** there are rough days with strong winds, shear layers, strong thermals or all of the above. Testing a glider on a day like that will probably result in you not liking the wing. On days like that, try to fly both your own and the new wing. That way you can compare them. On the other hand, you should also test the new glider on thermally active days. On calm days, nearly every glider feels nice! Again and again flying schools report that in May/June customers want to exchange and downgrade a new glider, which they loved in January. This usually means wasted money and a lot of frustration.
- **Wing loading:** this has a great impact on how the wing flies and feels (see more below).

At these festivals we regularly experience that people, who are not NOVA pilots, test our gliders and are enthusiastic about them. When you are trying wings don't think of the brand. Be open and you will find the right wing for you. The right wing for you and your flying style.

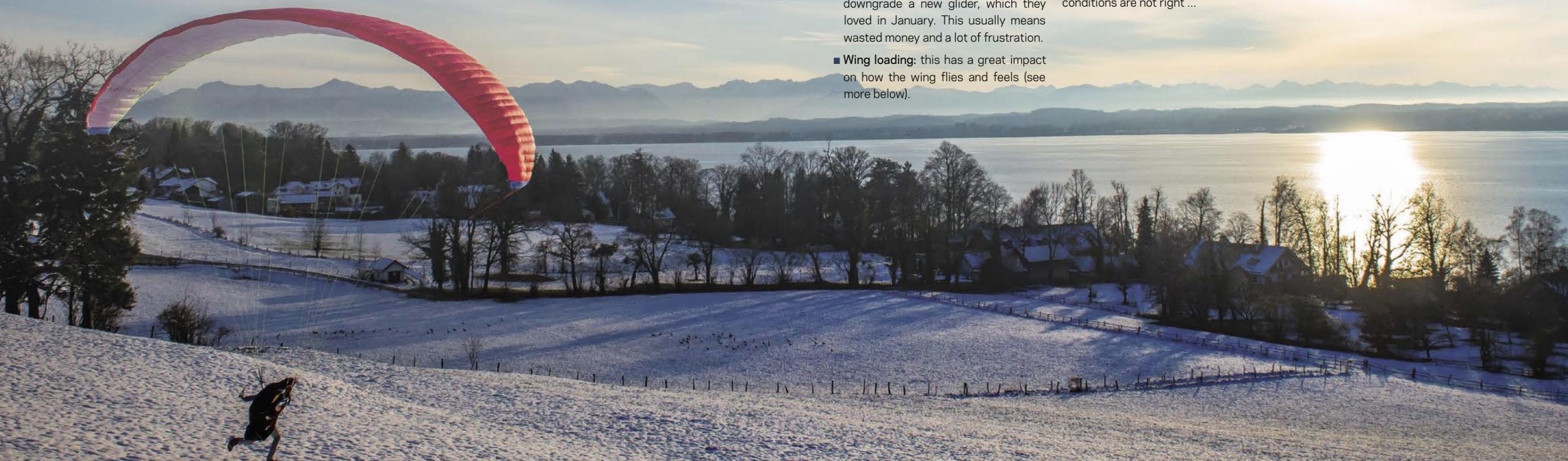
### What wing classification can/should I fly?

The EN/LTF certification categories A, B, C, D and CCC provide approximate guidance. However, there have been and still are wings which are at the extreme upper end of their class, while others are very good-natured representatives of their certification level.

**Tip:** stay on the safe side and fly a glider under which you feel comfortable and safe - even when the thermals are really banging! This will allow you to have more fun in the air and you will be more successful - especially when flying cross-country. The belief that one flies "better" or gets further with a higher classified glider is misguided. With the wrong glider it is not unusual to land much earlier or to tell oneself that the conditions are not right ...

### Can a beginner detect the differences between different glider models?

In the first few days on the practise slope, a beginner is occupied with so many things that they can say very little about their glider. Everything is new and unfamiliar. But after only a few hours flying experience, one can get a feel for the wing. During this phase, many pilots develop a preference for a certain model/brand, which they were able to cope with well on the practice slope. This is not a problem and completely understandable. One is excited and insecure and any distractions (and an unknown wing is potentially a distraction), should be minimised. On the other hand, it is important to be open in order to be able to develop one's own feeling for the wing. So yes, beginners can feel the difference between wings.





The pilot needs to be happy with the combination of glider+harness. Then they can really enjoy flying and be more successful.

## Should I buy my (first) wing from a flying school?

If you are buying a brand new wing, you will have to buy it from a school or dealer. None of the established paragliding brands sell direct to end customers. In return, they expect flying schools to offer a good service and really look after their customers.

Buying a second-hand wing is just like buying a second-hand car – if you buy a wing from a flying school, you can be pretty sure it is in good shape. And if there is a problem at some point, then a reputable flying school will make every effort to sort it out and make sure the customer is satisfied. If you buy from a private individual, it may be cheaper, but there is no follow up service and a degree of uncertainty about the wing's history. As the buyer, you have to decide that is most important to you.

## Wing loading: What size should I fly?

Legally, the glider must be large enough so that the all-up flying weight (= total weight of pilot + equipment, including glider) is within the certified weight range. Whether you're flying your glider at the bottom, in the middle or at the top of the weight range is a matter of personal preference and the type of flying you intend to do. In general, the following applies:

- High wing loading = more speed, more sink, more responsive to inputs, more brake pressure, more collapse resistance, but also more dynamic reactions if the wing does occasionally collapse.
- Low wing loading = less speed, better sink rate, slower responses to inputs, less brake pressure, more prone to collapses, slower and more manageable reactions in the case of a collapse.

We asked the pilots in the NOVA Pilots Team where in the weight range they fly. The majority fly at the upper end of the weight range. However, nearly all of them are cross-country pilots. On days when you can fly triangles of more than 200 km, the lower sink rate plays a lesser role, because the climb rate is good either way. But to fly 200 km you need to fly fast and occasionally into wind.

There are also team pilots who fly in the middle of the weight range. This is particularly the case with flatland pilots, because they generally fly open distance and the sink rate is really crucial. For a beginner, staying up is probably more a priority. They want to get as much airtime as possible.

At the end of the day it is a subjective, personal matter. **Tip:** just try out the respective glider in the two closest sizes for your all-up weight or experiment with water ballast up to the maximum weight limit.

## As a new pilot, can I check a second-hand wing myself?

The second-hand market is booming and with a little know-how and luck, you can get a real bargain.

A car has an odometer, but this can be manipulated. And anyway, the amount of kilometres done does not tell you the full story. A lot of cold starts, a fast driving style, many short trips, no garage or a lot of salt on the roads – all this is bad for the car. It is similar for a paraglider – the seller can tell you number of hours or numbers of flights, but how do you know if this is correct? And you don't necessarily know if the wing was flown in dunes or if it was left in the sun for hours on end.

But even as a new pilot you can perform various checks. For example: run two fingers along each line – does it have “lumps” or “holes” (= sheath OK, core is torn)? Are the splices and line seams OK? Look at the surfaces of the canopy carefully and look down each cell. Are there any tears, patches, repairs, open seams or loose threads? Hang the wing up so it is back-lit and look for irregularities. Especially carefully inspect the leading edge along the cell walls to see if there is any wear and tear. Is there any wear and tear where the risers connect to the maillons? Is the inside of the riser attachment point darkly discoloured from the carabiner (a lot of abrasion = intensive use)? Look at every seam and every attachment point of the lines. Feel the sail cloth and if it feels smooth as soap, the condition is presumably good. If it feels like parchment or paper, this means the wing has been used a lot and the coating on the cloth is worn (see more info below).

## How important are inspections, NTT, etc.?

Extremely important! The purpose of an inspection is to compare the actual condition of a glider with the “as new” condition and, if necessary, to return it to that condition. All checks and repairs are recorded.

Just like a good used car, a good second-hand paraglider therefore also requires the complete documentation of all inspections and maintenance work. Be suspicious if the seller can't produce this information.

At NOVA these documents include the registration of the new wing and then all NTTs (see page 26) as well as all inspections (NOVA Full Service/NFS). Our database contains all registered gliders, along with all the info about them including NTTs, inspections and repairs.

## What information can I get from the inspection reports?

An inspection usually consists of a visual check of the canopy, the lines and the risers, as well as a manual check of the lines (see also above, for those points which each pilot can check themselves). As a pilot, however, you cannot check the following because the required equipment is missing:

- Line lengths (trimming; see also page 26)
- Breaking load of the lines
- Tear resistance of the fabric, measured with a so-called Bettrometer.
- Porosity of the fabric

Should an inspection workshop give the detailed inspection report to the customer, even if the wealth of information may cause confusion? Or should the inspection report be limited to the essential information, even if this may not be detailed enough for some pilots. There are advantages and disadvantages in both. The NOVA workshop produces the latter. But on request NOVA will, of course, provide the full, detailed inspection reports.

## How critical is porosity?

This is the most important factor in determining the condition of a wing. Lines and risers can be replaced, but the sail cloth will determine the airworthiness of the wing. Therefore when reading an inspection report, pay particular attention to the measurement values of the porosity check. The porosity test is usually measured with the help of a special textile clock at four to five points on the upper surface and with some manufacturers also on the undersurface. The exact measurement points are determined by the manufacturer. JDC and Kretschmer are the two manufacturers of so-called porosimeters. They do not produce identical results. With JDC, the cloth is only fixed with a magnetic ring, so the device draws more secondary air. With Kretschmer, the specimen is firmly clamped into place.

## Porosity:

**Important to know:** all paraglider manufacturers determine the limit values for the respective tests themselves. What is regarded as “used condition” by one person may be counted as “borderline” by another. There is a reason for this ... There are gliders which react more sensitively to aging cloths and the result is a more difficult take off and greater susceptibility to deep stall. Other models still fly remarkably well, even if the sail is very porous. For NOVA wings the following applies:

Seconds using JDC	Seconds using Kretschmer	Evaluation of the porosity
>200	>800	As new
100-200	400-800	Good condition
30-100	100-400	Used condition
15-30	50-100	Intensively used
<15	<50	Not acceptable



You can borrow and test NOVA wings from one of our partners – see:

[www.nova.eu/en/try-buy/](http://www.nova.eu/en/try-buy/)



We also participate in a large number of festivals – see:

[www.nova.eu/en/service/toni-on-tour/](http://www.nova.eu/en/service/toni-on-tour/)



# 200KM



NOVA team pilot Robert Schaller flies a 209 km FAI triangle on a NOVA PRION 3

## CRACKING THE 200 KM BARRIER WITH AN LTF/EN A WING



Wings used in paragliding instruction are not suitable for cross-country flying and whoever wants to do well needs to “step up”. Really? Not necessarily. On a good day a good pilot can also go a long way on an EN A wing. On the 11th August 2015, Robert Schaller (GER) flew an FAI triangle of nearly 210 km on his NOVA PRION 3. To date, still the highest scoring flight ever done on an EN A paraglider.

The then 25 year-old student began his record-breaking flight at the Grente in South Tyrol – as part of a huge gaggle of XC hounds. Robert set his turnpoints at Huben in the Isel valley, just before the Wilden Freiger and the final one in the Abtei valley. After 8.43 hours he landed in St Martin in the Val Badia and did this flight with an astonishing average speed of 24 km/h!

Without question, the 11th of August 2015 was one of the best cross-country days of the year. On this date, more than twenty 200 km+ FAI triangles beginning at the Grente were logged in the XContest. Despite this it was not a day that could be described as easy. Firstly, the day started with a relatively strong ENE wind. Robert’s first leg from

the Grente took him eastwards over the Staller saddle and along the Defreggen valley, which meant he had to spur on his PRION 3.

As a reward, the second leg was towards the west. For the 100 kilometres between turnpoint one over the Isel valley and the second turnpoint at the end of the Ridnaun valley, Robert only needed roughly three hours. He was flying 33 km/h on average! It is worth comparing the tracks of the top flights on the DHV-XC league or on the XContest (better, because there are more uploaded flights) in detail. Robert Schaller and his PRION 3 are hardly (actually not at all) slower than the pilots on high-performance wings.

All pilots crossed the Ridnaun valley with a lot of altitude. A continuous cloud street, which worried some in case of overdevelopment, allowed them to progress quickly.

On the way to the southwest into the Dolomites, at an altitude of around 3900 metres, Robert decided to venture across the Kampelespitz to the Lüsener Alm. After about 14 kilometres straight flight he reached the parking lot at Zumis at the southwest end of the Lüsener Alm. With about 300 metres above ground he found his next thermal. It really is worthwhile comparing the tracks of the other pilots/other wings in detail.



# EN/LTF A PRION

Chasing kilometres in South Tyrol

Keeping eastwards along the southern flanks of the Lüsener Alm, the hitherto easy progress over the otherwise reliable ridge between St Vigil and St Martin came to a standstill: the easterly wind pushed the moisture condensing on the west flanks of the Kreuzkofel massif into the middle of the valley. So a lot of shadow, little sun.

## Switch to the backup

Additionally, Robert's main instrument now had a flat battery. Luckily his backup GPS was still working and the vario was still beeping. But the third leg of the FAI triangle was no longer displayed to Robert. He remembers: "I had precisely planned the first turnpoint. Originally I didn't want to fly to the end of the Ridnaun valley. Instead I wanted to turn after Sterzing in the middle of the valley. This would mean that with the south end of Kreuzkofel it would be pretty much a closed 200 km FAI triangle. But the Ridnaun valley looked so good and we were pretty quick with the previous two legs that I just could not resist.

In retrospect, this saved the "two" in front of the result, although the Kreuzkofel was in shadow."

Since Robert had studied the Grente triangle often and in all variations in the XCplanner, he knew where his third turnpoint had to be: over the middle of the Abtei valley at the little town of Stern. But first he had to actually get there. With difficulty he managed to regain some height in weak thermals, which were often shredded by the northeast wind. After a good ten kilometres to the south and at around 2500 metres, Robert reached the point which he thought turnpoint 3 was. And he was right. If he could make it from there back to the Antholz valley, that would mean a 230 kilometre FAI triangle. But now he was no longer sure how far he was and whether it would be enough for a 200 km triangle. In the meantime, Robert was desperate for altitude.

The hope of finding a thermal on the western flanks of the Val Badia remained unfulfilled. The few rays of sunlight only provided a reduced descent rate. Robert crabbed to the north and landed at St Martin in the Val Badia. Only when he downloaded the GPS track the following day he got the great news ... 209.2 kilometres – a world record for an EN A wing.

Of course, this begs the question as to why a top pilot like Robert Schaller even goes cross-country with a PRION. No, it wasn't a marketing stunt for NOVA. Robert explains: "I spent a lot of the previous winter travelling and I had missed a large part of the XC season already. Too much to get a high ranking in the overall XC league placings. So I was looking for another challenge: a 200 km FAI triangle on an EN A wing."

## EN A 210KM STATISTICS:

Launch: 09:59

Launch site: Grente

Flight duration: 8:43h

Average speed: 24.19 km/H

Max. altitude: 3974 m

Link to the flight:

[www.xcontest.org/2015/world/en/flights/detail:RobertSchaller/11.08.2015/07:59](http://www.xcontest.org/2015/world/en/flights/detail:RobertSchaller/11.08.2015/07:59)

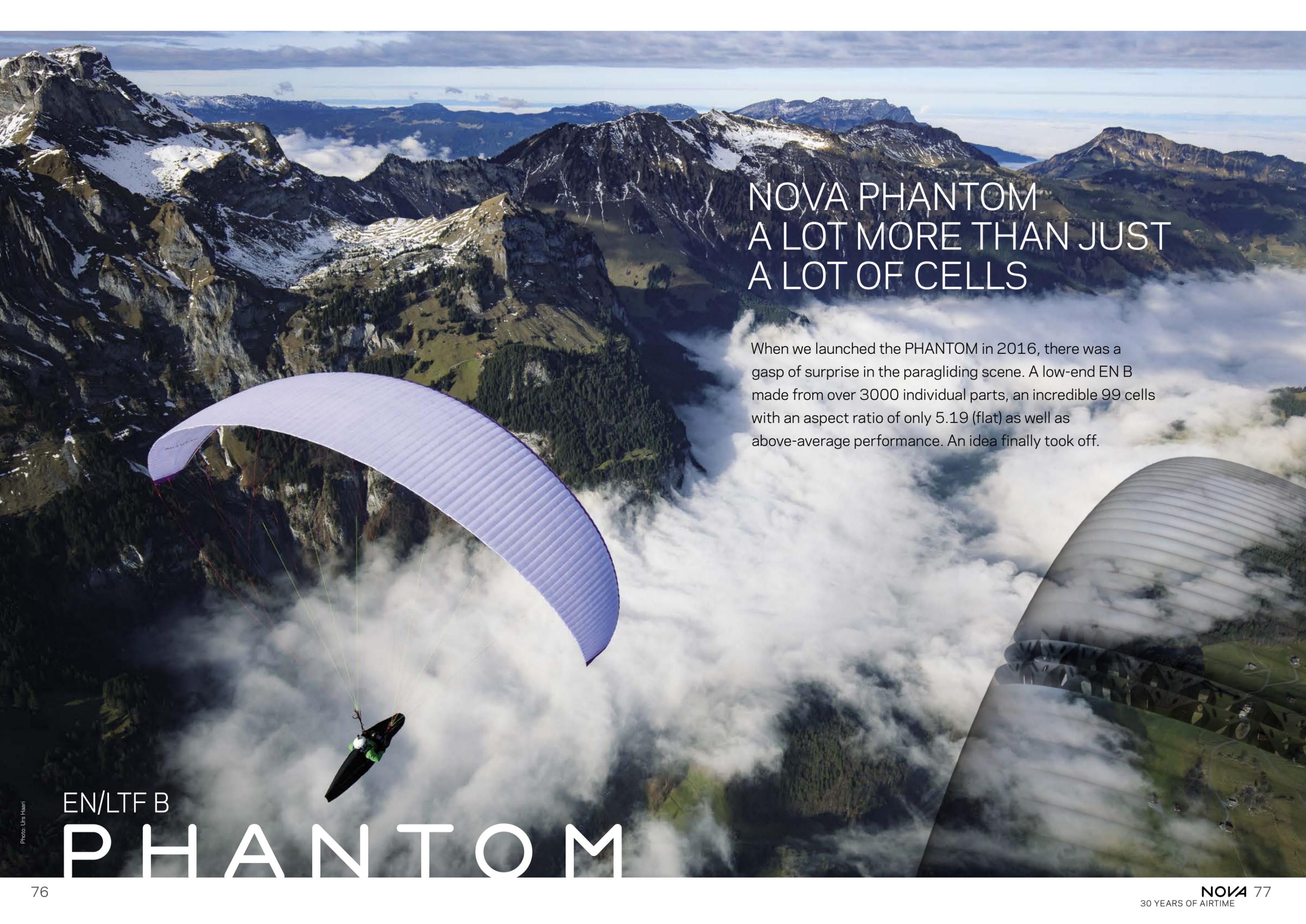


*always an interplay of wing, pilot skill and the current weather conditions – and all three must be judged in context to each other. If you tell a (novice) pilot that his glider is inherently "safe", because it is EN A certified, it just provokes the pilot into doing some stupid maneuvers or getting into weather conditions that are unmanageable for them."*

Impressive proof that it is absolutely possible to fly far with wings that offer maximum passive safety. At the time NOVA described the PRION 3 as the "The all-round wing" in publicity material. We wanted to express that the PRION 3 is suitable for training, but absolutely brings with it the potential for cross-country flying and that pilots enjoy it far beyond training.

Robert Schaller wrote this thoughtful comment about his flight: "What I want to say with this flight isn't "guys, fly more A wings" – absolutely not. Fly the wing that you can fly safely and that you enjoy. For everything, including a 200 km FAI triangle, the certification of the wing doesn't matter. QED". And he adds: "In my view safety is

This statement is still absolutely correct. And Robert still has the record. He is waiting for it to be broken at any time. Modern EN / LFT A wings glide better and have a shallower polar curve than even four years ago. And they are even more fun in the air: with the same level of passive safety that a PRION 3 offers, a PRION 4 is more agile and precise – but without feeling nervous. We will see how long Robert retains his record ...



# NOVA PHANTOM A LOT MORE THAN JUST A LOT OF CELLS

When we launched the PHANTOM in 2016, there was a gasp of surprise in the paragliding scene. A low-end EN B made from over 3000 individual parts, an incredible 99 cells with an aspect ratio of only 5.19 (flat) as well as above-average performance. An idea finally took off.

EN/LTF B

PHANTOM



Roland Fugger and his PHANTOM going distance in the Dolomites.

To this day, the PHANTOM is the most technically sophisticated serial paraglider ever built. When it comes to construction, the very fact that it has a low aspect ratio makes it so complex compared to high-performance wings.

When CCC wings have 100 or more cells, these are distributed over a much wider span. This means the individual cells are therefore larger. And competition wings only have two line areas and therefore fewer diagonal ribs overall.

The PHANTOM sets benchmarks in every aspect: in the development of the design details, in the production, and in the air.

In 2016 the idea was definitely not new. More than ten years ago our R&D team considered what it would be like to incorporate everything they had learned to improve a paraglider's performance in a low aspect ratio model. But at that time we abandoned those plans. We were not sure whether the market would embrace such a glider; we shied away from the extent of the development effort, and we knew that the glider

would become too heavy with the materials on the market at that time. Today lighter materials are available, we are much faster at progressing from the design on the drawing board to production, and our flow simulations give much more accurate results. At the beginning of 2016, this led Philipp Medicus and the R&D team to reconsider the idea of the low-end EN B multi-cell wing.

The results of the CFD simulations were so positive that we decided to build a prototype. That makes it sound so easy, but in reality it was a really big deal. In the sewing workshop in Hungary they threw their hands up in horror when faced with the complexity of the construction and the almost unmanageable multitude of individual parts. But, at the same time, they relished the challenge. We can do this!

A dream for pilots – a nightmare for the sewing workshop: 99 cells, 804 Needle-eye ribs, 3200 slots in the profiles and diagonal ribs as well as over 3000 individual parts

And then it was ready – the first PHANTOM prototype and somehow the wing caused a big stir throughout the entire company. It is something very special when you follow a completely new path and notice that something absolutely extraordinary, something unique is created and succeeds!

The concept of combining a low aspect ratio with the radical use of all design features that promise more performance, led to success. The test pilots were also abuzz. The first prototype was already perfect in the handling. Performance and safety, everything worked and was well balanced. The PHANTOM offered an unprecedented package of enhanced passive safety, performance, fun and comfort.

But that didn't mean we could just start serial production of the wing. Because there was the question whether we were in a position to achieve this? Bea Bognar, manager of our sewing workshop in Hungary and active pilot herself, has ensured that we can answer that question with a resounding "yes".

#### Scepticism and success

Under her guidance the sewing staff in Hungary and Vietnam learned how to sew the PHANTOM from its 3000 individual parts. The company's internal procedures also had to be recalculated, because the ratio of time required for sewing the wing to the time spent sewing the risers and splicing the lines is different. Due to the complexity of the design we also had to plan quality assurance processes differently. And especially, at the beginning we could hardly realistically calculate the price because we simply didn't know how well everything would work out (or not) and how long it would take to prepare the design for serial production.

The PHANTOM was hotly discussed in the various paragliding forums – initially with a certain amount of scepticism. The glider is extremely elaborately

constructed and therefore costs a lot. How good it really was, that was another question. The answer came soon, because NOVA Team pilot Ferdinand Vogel proved the performance of the glider at the Kaiser Trophy 2016 – in a manner that surprised many high performance pilots. Ferdi won second place in the serial class, 15th overall. After a 73 km task he came into goal just 2 minutes after the winner who was flying a CCC wing. ([www.livetrack24.com/tasks/3092/results](http://www.livetrack24.com/tasks/3092/results)). Soon after Joe Edlinger flew an incredible 435-km open distance on the PHANTOM in Brazil – until this day a world record in the EN B class.



[www.xcontest.org/2017/world/en/flights/detail:JoeEdlinger/1.11.2016/09:52](http://www.xcontest.org/2017/world/en/flights/detail:JoeEdlinger/1.11.2016/09:52)

The feedback from other pilots about their own experiences with the PHANTOM was also very positive and remains so today. We hear this again and again: "This is the perfect wing for me". The PHANTOM became a milestone in the history of NOVA and also in the history of paragliding. Its construction makes it unique in paragliding. A relaxed low-end EN B wing with plenty of horsepower, lots of comfort in the air and handling that feels as if it had a much higher aspect ratio.

Can we build on this success story? We are doing our best and together with all our PHANTOM fans we are looking forward to the PHANTOM 2.



## Statements on the PHANTOM

Hannes Doppelhofer (non-sponsored cross-country pilot):

"The best paraglider I have flown in my 15-year flying history."

Bea Bognar (Manager of the NOVA sewing workshop and active pilot)

"You always need brain power and craftsmanship, but a lot of passion was added to the mix. The most important thing was care and dedication when we decided to actually manufacture the PHANTOM!"

Gunter Socher (non-sponsored cross-country pilot):

"An amazing combination of performance and a feeling of safety. With this glider I had by far my most beautiful and longest flights – and all without stress!"

Joe Edlinger (NOVA Team Pilot, flew 435 km with PHANTOM in Brazil):

"When I was in Brazil I flew a lot with Portuguese pilots on high performance wings. We were all surprised with which ease I could keep up with them. I have so much confidence in the PHANTOM, that I flew full-speed almost all the time."

Ferdinand Vogel (NOVA employee and world-class competition and XC pilot):

"My first experience as a test pilot at NOVA was with the initial experimental PHANTOM project. After the development it was impressive to use the finished product in competition and to compete with serial class two-liners. I knew the PHANTOM flew well, but I was amazed how well. On launch a few pilots mocked me because of the low aspect ratio. But afterwards they were all silent."



Low porosity and high UV resistance: today even lightweight paraglider cloth offers a surprisingly long service life.



A lot of experience is required to choose the right lines for the best possible compromise between high performance, safety, ease of use and durability.

The best advice to keep your wing in good shape

## LONG LIVE YOUR WING!

One would assume that all pilots know what they should do to protect their wing from damage and wear and tear. For one thing, wings are not cheap, and secondly, the pilot trusts their life with it. But when you observe some of our colleagues at take-off or landing sites, you sometimes ask yourself if everyone really knows this ... Here you can read more about paragliding fabrics and lines. And especially, what you can do to maintain your wing as long as possible.

Sometimes we get gliders for checking that have 500, 800 or even more operating hours and are still in good shape. And we have others that look very worn after only 150 hours or less. The durability of a paraglider depends very much on how the pilot treats it. The operating hours include not only the time in the air, but also on the training slope, during ground handling or the times when the glider is spread out on the hill or landing zone.

### Our enemies: sand, dust and salt

Sand, dust and salt are made from very fine particles that can be hard and have sharp edges. They primarily attack the coating of the cloth. They literally rub it off and this increases the porosity of the wing. The operational life is reduced and the susceptibility to deep stall increases.

Additionally, the diagonal elasticity of the fabric also increases. What does this mean? A fabric consists of warp and weft threads. So it is basically dimensionally stable in these two directions. Diagonal to warp and weft, however, a fabric always has a certain elasticity – and this is anything but desirable in terms of aerodynamics. Since the coating “fixes” the warp and weft threads as it were, worn wings can no longer maintain their shape as they did previously. In extreme cases they develop actual bulges.

Salt, sand and dust not only shorten the operational life of your glider, they also reduce its safety and performance. The really bad thing about sand and dust is that it is nearly impossible to remove it from the wing. You may be able to get rid of coarser grains of sand if you hang up your glider with the leading edge downwards and try to brush and shake the grains out of every corner. Even then, it is impossible to remove every last grain. So it is better to try to avoid the wing coming into contact with sand and dust in the first place.

### Damage caused by damp or insufficient ventilation

Wet textiles start to smell and mildew stains can form. Everyone who has ever packed up a wet tent and forgot about it knows this. What also happens is a hydrolysis process that attacks the coating. Damp + heat + time are an unhealthy mix for PU coatings. A wing that was packed wet and is left in the boot of a car standing in the summer sun may well be affected! For a maximum operational life the following is recommended: wet or damp wings should be treated with care and hung up to dry as soon as possible.

### Out of the sun (and not just there)

Light consists of a visible and invisible spectrum, the UV light. This UV light is in the most energetic in the spectrum. UV damage can affect human skin, but equally paragliders. After a while the fabric is bleached, but it is also more prone to wear and tear. If the cloth feels smooth as soap to begin with, when it ages it feels like parchment.

In recent years cloth manufacturers like Porcher or Dominico have worked hard on continuously improving their fabric's UV resistance. The polymer polyamide 6.6 (the generic name for the brand name “nylon”) is no friend of the sun. The UV stability of pure PA 6.6 is insufficient for outdoor use. This means that fabrics made from PA 6.6 fibres have to be coated with UV protection. As described above, this coating can be weakened by unwanted external influences. For long-term joy with your wing the following applies: don't leave your wing lying around outside longer than is strictly necessary – even in shade or under overcast skies. Even then it is exposed to UV-rays.

UV-rays present no problems for your lines. Dyneema is generally very UV resistant. Aramid (brand names Kevlar or Twaron) on the other hand is very UV sensitive. But don't worry – the coating of unsheathed Kevlar lines or the sheath offers enough protection that using them for 1000 hours is no problem. However, in very old wings (over ten years) the strength does deteriorate. In this case you should have the glider professionally checked before flying it.

### Salty wing

Salt crystals not only attack the fabric (similar to sand and dust), but also the lines. When checking the line strength, often lines break just above the mail-lons, especially in wings used for instruction. Why? Firstly the lines are often bent and secondly, salt crystals scour this area. They are found even far away from the sea, when pilots ground handle without gloves. **Tip:** use cycling gloves.

## What is crazing?

Paraglider cloths always have a coating, usually polyurethane and/or silicone, sometimes only on one surface and sometimes on both, and of different thickness (depending on the application, e.g. double-sided and thicker for the cell walls). It makes the cloth (more) impermeable to air, increases UV resistance thanks to so-called stabilisers and fixes the warp and weft threads.

In the course of time, creases may appear white in the coating, which is crazing. These occur because the cloth is folded very tightly. This is even more noticeable in sail cloth that is made from dark colours with a thicker coating. Crazing is hardly noticeable on white or very light coloured cloth. Crazing is also not noticeable if the fabric coated on one side is sewn in such a way that the coated side faces inwards.

Crazing cannot be completely avoided in the long run – regardless of which fabric and from which manufacturer. But if you rarely pack your glider super tight and do not keep it that way, you can prevent or delay the phenomenon. Crazing is not a real reason for worry – cloth with crazing may look ugly, but it has no adverse effect on the airworthiness of the wing. Other factors limit the operational life of the glider much sooner.

## Frayed brake lines

In some lightweight wings we use ceramic rings to route the brake lines. For some pilots these low friction rings cause no problems throughout the entire operational life of the paraglider. With other pilots, over time these rings develop sharp edges and fray the brake lines or in the worst case, even break them.

Why? It isn't the fault of the rings, but the cause is the sand, dust and salt crystals on the lines. These sharp-edged particles initially act like sandpaper on the extremely robust ceramic coating of the ring. If the coating is worn off, the ring gets an edge and this frays the brake line. Thankfully this phenomenon occurs in a minuscule amount of gliders (i.e. every thousandth wing is affected); which is why we keep using the rings with absolute confidence. We deliberately only use low-friction rings in lightweight wings. In flying areas where there is a lot of sand and dust we recommend flying our semi-light wings. Additionally the direction of pull on the brake lines should be parallel to the risers. Spreading your arms wide is an aerodynamic no-no and also causes the fraying of brake lines, regardless whether the glider features rings or pulleys.

## Damage to the leading edge

Rarely but regularly, we get wings for repair where the cloth on the leading edge is worn or is worn through. The most likely reason for this (even if the pilot strenuously denies this) is that after landing they bunched up the glider and walked over tracks, stony paths or asphalt to an area where they could pack it. During this walk the glider was dragged on the ground – presumably without the pilot even noticing it. Because all glider models now feature nylon rods in the leading edge, a hard surface is scouring on a hard surface – and in between is the soft fabric. The damage is as marked as it is obvious. Unfortunately the repair is difficult and therefore expensive.

Fortunately, this type of damage can be easily avoided. Always carry your wing so that it never has any contact with the ground. This makes the wing last longer!

Similar damage can occur if you fully lay out your wing on a hard surface when packing it. The seams in the upper surface and cell walls are so stiff that they are also potential wear areas. An anti-ageing tip: when packing on a hard surface, choose a different packing method, like folding it from a cauliflower.

## What is the best method for packing my wing?

If you type "packing a paraglider" into a search engine, you will see a multitude of instructional videos. And every vlogger is convinced that their technique is the best one. We won't add yet another video, but here are some basic rules you should follow:

- Packing the wing loosely protects the fabric.
- When packing the wing, try to avoid dragging it over the ground where possible (see above).
- If you need to get the air out of the wing, push it towards the leading edge, instead of trying to press it out of an already rolled or folded wing. Pressing it down stresses the seams – and who likes to be stressed?
- Vary your packing technique, because always packing it the same way means always stressing the same places.
- For gliders with really long rods, the manufacturer usually provides guidance on the best packing technique for that particular model. At NOVA we don't use long or hard rods, which are at risk of bending. NOVA pilots can pack their wings as they wish. But we also recommend that the wing should be packed in a manner that the rods in the leading edge are not bent too much or are subjected to pressure.



Our Fast Packing Bag Cito is not a bad idea for this purpose. Did you know that when you buy a NOVA wing, you can choose between a fast packing bag instead of a rucksack at no extra cost?

## Storage: always keep it loose

For an eternal operational life it would be perfect if you could store the glider at zero gravity, in a dry, completely dark, well-ventilated, temperature-controlled room. Sadly, nobody has that option. But you can try to re-create those conditions as best you can. If you can't recreate weightlessness, you can at least minimise factors like dampness, tight packing, UV damage, poor ventilation and high temperatures (e.g. keeping it in the boot of a car parked in the sun).

## How do I remove stains from the glider?

A dirty wing not only looks ugly, but in the worst case, the dirt can harm the fabric or its coating. Try to protect your wing from aggressive acids as well as silage, cow pats, grease, oil, etc. If you do get stains on your wing, initially try to remove them with a soft sponge and lukewarm water – immediately if you can, rather than three weeks later. For more stubborn stains, you can try very diluted soapy water. If in doubt, we recommend you call us for advice.

**CONCLUSION:** don't worry about what you read above. These are worst-case scenarios. The majority of the wings sent to us for checking look in excellent shape (otherwise we wouldn't dare to extend the warranty to four years after a timely NTT). But every pilot should be aware of what they can do or avoid doing, to ensure they have an operational wing for as long as possible.

Regularly removing dirt from your glider will prolong its operational life.

## Tips for a long operational wing life

- Keep your wing away from dust, sand and salt.
- Only unpack your wing immediately before take off and immediately after landing.
- Never drag your wing over the ground, not even when packing or unpacking it – and never drag it over asphalt.
- If possible pack it loosely and vary your packing method from time to time.
- Hang a wet or moist glider up to dry as quickly as possible.
- Wear gloves (or in the summer fingerless cycling gloves), even when you are at the training slope or just ground handling.
- If you go to a dune and wing performance is secondary, then it makes sense to buy an old second hand wing that is still airworthy, instead of stressing your brand new cross-country wing.
- Store the wing loosely in a dark, dry, cool, well ventilated area.
- Don't store the wing in a airtight packsack for any length of time, especially not a compression packsack.
- When landing or ground handling, try to avoid hitting the leading edge hard on the ground.
- Take care with cloth and lines on stony ground. Never step on your lines.



Dear NOVA pilots,  
We are looking forward to many more  
years together – and we wish you  
wonderful flights and safe landings!

NOVA Vertriebsges.m.b.H. | Auweg 14 | A-6123 Terfens | Austria | T: + 43 (0) 5224 - 66026  
[info@nova.eu](mailto:info@nova.eu) | [www.nova.eu](http://www.nova.eu)

NOVA