

MANUAL



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Congratulations, for choosing to fly a NOVA BION. You have got a glider, to experience exiting and safe flights for many years.

This manual contains important information and instructions to use your glider. Please read the following pages carefully before your first flight. For questions and suggestions please contact us: info@nova-wings.com.

To find further information about this or other products please visit our website: www.nova-wings.com

To fully use all our maintenance and guarantee services you have to register your glider on our website. (click LOGIN & REGISTRATION)

For more information on our guarantee services have a look here:
<http://www.nova-wings.com/english/nova/guarantee.html>

Now we wish you many nice ours in the air and a safe landing at the end of every flight.

NOVA Team

NOVA

Since the company was founded in 1989, NOVA has become one of the world's leading paraglider manufacturers with their head office in Terfens/Austria.

NOVA consists of a highly qualified team and most of the team members share the passion of flying with those pilots, who decided to fly a NOVA glider.

This passion and our Know-How are the fundamental parts of our work. By now, the passion and the Know-How are continuously growing. This is why we are for example pioneers in the area of air flow simulations, which allows us to predict certain properties of a new wing quite accurately on the computer.

Last but not least we have outstanding test pilots who provide a substantial contribution to make every new wing an unmistakable NOVA glider, which impresses in every aspect.

But NOVA doesn't only just stand for the development and the design of paragliders. We also want to take the responsibility for the manufacture of our gliders. That's why the production of NOVA-glidern takes place in our factory in the Hungarian town of Pecs. This allows us to influence important factors, for example quality assurance during the whole production process. Furthermore we can guarantee fair working conditions for about 100 NOVA-employees in Hungary.

We are convinced that the customer benefits from better employee working conditions, in terms of high-quality products.

What we want to achieve are happy and enthusiastic pilots, because the future of our sport depends on the enthusiasm of the people who are part of this wonderful sport.

The BION

The BION is a complete new development and is suitable for professional tandem pilots as well as recreational pilots in search of maximum safety, high performance and minimum stress.

Short technical description

The BION has 43 cells. Four of those cells are closed stabilo cells on each side.

There are four layers of lines. The first layer, the A-lines are red. B, C and D lines are yellow. The brake layer, which is not one of the four line layers, is orange. (The stabilo lines are orange as well.)

The risers consist of 5 belts. On the first two belts (red) both A stem lines are attached. On the next three belts the B, C, and D stem lines are attached. Further more the trim system and a “Big Ears” fixation is mounted on the D-belt.

Safety

The BION stands out for its easy launch behaviour, its high stability and the very smooth handling characteristics. This leads to a very high safety level in any situation. The EN / LTF test protocols show the very big safety margins of the glider. The BION is definitely not at the limit of its certification class. (EN B)

Handling Characteristics

We are especially proud of the balanced handling characteristics. The BION stands out for its smooth and agile handling characteristics. Even with a low wing loading, the glider will precisely follow the pilots steering inputs.

The combination of well balanced handling behavior and high stability allows enjoying long thermal flights without tiring the pilot.

Performance

In best tradition of Nova, the BION offers a very good glide ratio. Due to the high stability the glide performance can be comfortably used also in rough

conditions. When thermalling, the smooth handling makes it easy to climb efficiently. Even with a high wing loading, the BION doesn't tend to „dive“ in sharp turns.

New Features:

- Split A-risers with magnet fixation.
- Dirt holes on the stabile.
- New position and fixation of the brake pulleys for better ergonomics
- A vector band behind the cell openings maintains a very good shape of this important part of the wing.
- New developed carbon spreader bar.

Target Group

The BION aims to appeal to a wide range of pilots. On one side there are professional tandem pilots who want an easy launch behaviour and maximum longevity. On the other hand there are recreational pilots who are looking for a glider to enjoy nice and long thermal flights. These pilots will like the BION for its smooth handling, its speed and its glider performance.

The high safety level is important for both groups of pilots.

Pilots requirements:

The BION is very easy to fly. Due to the high responsibility of every tandem pilot we think that a superior flying technique and a solid level of experience are essential. Further more it is important question before each take off, if it is safe to fly in the given conditions.

This means, that the pilots have to be able to decide if their skills and equipment is adequate for the respective conditions. The BION offers superior safety but even on such a glider with maximum passive safety, misjudgements may have serious consequences.

The best way to avoid misjudgements is a defensive approach to the sport. Some times it makes sense to pass on a flight, instead of getting yourself into

conditions you cannot handle. Regular training improves your skills and enables you to enjoy your flights, even in more difficult conditions.

Please consider these thoughts!

General information bevor implementing

First flight

Every NOVA glider has to be flown and checked through a NOVA dealer. This flight (date and pilot) has to be entered on the stabilo of the wing.

Registration

To get all warranty and service features, you have to register your glider on our Homepage. Please choose “LOGIN” and follow the advice for registration

Scope of delivery

The BION is shipped with a rucksack, an inner pack sack, a riserbag, a tandem spreader bar, a windsock, the manual and a patch.

Modifications on the glider

Any modification (e.g. change of line lengths, changes on the speed system) causes a loss of certification. We recommend that you contact NOVA before performing any kind of change.

Adjusting the length of the main brake line

Especially if you use your glider with a motor it might be necessary to lengthen your main brake line. You have to make sure, that the length of both brakes is always the same. Further more you have to use a palstek to mount the brake handle to the brake line. (see picture below)

If you adjust the brake lengths for motor use, do not forget to shorten it again before flying the wing without a motor. Otherwise you might experience serious problems at take off.

The brake line must not be shorter than the original length. The black mark has to be always visible like shown in the picture below.

If the brake line is shorter, this might affect the safety of your glider.

Palstek:



Suited harnesses

The BION is approved for any harness of the class “GH” (without diagonal bracing). This means almost every harness which is currently available.

The choice of the harness has a big influence on the flight characteristics of the BION. There are harnesses which allow very effective weight shifting on the one hand, but which tip to the side in turbulences quite undamped on the other hand.

Other harnesses don’t allow extreme weight shifting, but they will give the pilot a calmer feel in turbulent conditions.

A good flying school can help on this topic with individual advice.

Weight range

Each size of the BION is certified for a certain weight range. The weight refers to the “overall take off weight”. This means the weight of the pilot, the passenger, the glider, the harnesses and all other equipment.

If you fly the BION on the lower half of the weight range, the agility decreases and the glider will be more damped. In strong turbulences the wing tends to

deform and to collapse slightly more than with a higher wing loading. If you fly the BION with very little wing loading, we recommend to not completely close the trim system. (open it by at least 2cm)

If you fly the BION on the upper half of the weight range, the agility and the stability in turbulences will increase. Also the speed will increase slightly. The self damping will decrease in turns, as well as after collapses.

Flying the BION

We suggest performing your first flights with a new wing in calm conditions to get used to the flight behaviour without any stress.

Launch

Before every take off the pilot has to ensure that the equipment is in a proper condition, especially the glider, the harness and the reserve system.

Just before launch we recommend a check routine, which should be performed carefully. (Many accidents at take off could be avoided by a proper check!)

We recommend the following routine:

- 1.) Strapped up (Leg strap and chest strap on the harness and helmet strap all done up. Pilot and Passenger)
- 2.) Clipped in (Risers untwisted and connected to the karabiners, speed system attached and karabiners properly closed, tandem bar properly connected)
- 3.) Lines (A lines on top, all lines sorted, brake line unlooped between brake handle and pulley)
- 4.) Glider (glider lies arched with opened cell openings at take off.)
- 5.) Wind and airspace (wind suitable for launch and airspace in front of take off free of other gliders)

The BION has a very well balanced and easy take off behaviour. Corrections are easy to perform at any time and no special advice is needed for forward or

reverse launches. We recommend performing launches with closed trimmers. (So with the slowest setting)

Normal flight

If you release both brakes (“Hands up”) and if you close the trimmers the BION glides at the so called “trim speed”. At this speed, the glide ratio reaches its maximum.

If you fly into a headwind or through sinking air, you should use the trim system. If you use the trim system in very turbulent conditions, you have to consider more demanding reactions in the case of a collapse. This is why you should keep more distance to the ground if you fly accelerated.

If you fly in strong turbulences we recommend applying both brakes slightly. This increases the stability and you get good feedback through the brakes, which is necessary to fly your wing actively.

Flying actively means permanent control and correction of the angle of attack in turbulent air. If you fly from lift into an area of sinking air, the angle of attack will decrease and the wing will pitch down. A good pilot will realise this even before the wing pitches down, by a reduced brake pressure. The right reaction would be to apply the brakes more and thereby increase brake pressure to prevent the wing from pitching down or even from collapsing in turbulent conditions.

Flying from sinking air into lift is just the opposite: Without any pilot action, the angle of attack would increase and the wing would pitch up. The pilot can feel this, by an increased brake pressure. In this situation, the pilot should release the brakes to reduce the pitch movement.

To generalize:

If the brake pressure decreases and if the wing pitches down, the pilot should apply more brakes. If the brake pressure increases and if the wing pitches up, the brakes should be released.

With proper active flight control, the pilot can avoid most of the collapses and keep control in every moment. The best way to learn this is of course flying,

but ground handling definitely helps to improve the feeling for the glider. A good training exercise is to stabilise the wing above your head with the brakes, without looking at it. This helps as well for improving the forward launch.

Turning

A smooth turn is an interaction of inner brake, outer brake and weight shifting. The difficulty is finding the right amount, which is important if you want to climb efficiently in thermals.

The BION turns quite sensitively, so only small inputs are needed for performing precise turns. Tight and quick turns or fast changes of turning direction without unwanted pendulum movement are quite complex and take some training. It should be the goal of every pilot to master these skills perfectly.

Attention:

If you can't use the brakes for steering the glider you can use the D-risers instead. (This might be necessary for example, if the brake lines tangled up due to a bad pre-launch check or less likely, if the main brake line tears).

The BION can be turned quite well with the D-risers combined with weight shifting. You can also land the glider nice and smooth just with the D-risers. Don't pull the D-risers too much, to avoid a deep stall!

Landing

Landing the BION is very easy. In turbulent conditions we recommend applying brakes (approximately 20% of the available brake travel) during the whole approach. This will increase the stability of the glider and the feeling of the wing.

Just before touch down you should apply more brake. Many times it makes sense to induce a stall.

Attention:

A deep stall in just 2 meters height can cause a quite violent touch down. Make sure to not fully apply the brakes until you are close enough to the ground.

Manoeuvres for fast decent

Big ears

To do big ears, pull the outer A-line (attached on a separate belt) on both sides.

Clamps on the D-risers allow fixing the ears effortless for a long time. Before using the clamp you have to remove the neoprene cover from the clamp.

As long as you keep both outer A-risers pulled, the wingtips will be folded and the sink speed will increase. We recommend to additionally opening the trimmers to increase the sink speed further and to also increase forward speed. The drag of the folded wingtips increases the angle of attack. By opening the trim system, this effect is compensated.

To end the manoeuvre, release the A-risers. If the wingtips don't open automatically, you can inflate them by applying the brakes with a short impulse movement.

Caution:

You have to make sure before every take off that the neoprene-cover completely covers the clamp. Otherwise it might happen, that the brake line gets fixed in the clamp, which might lead to serious accidents.

B-Stall

Due to the short B-risers and due to the high load on the B-riser, the B-stall is not practicable.

Deep spiral

The deep spiral is the most demanding of the three manoeuvres for fast descent. (Ears, B-Stall and Deep Spiral) You should only fly deep spirals with the BION if you perfectly perform the manoeuvre with your solo glider. Due to the longer lines on a tandem glider, the g-force tends to be higher, than on a solo wing.

Entering a deep spiral can be divided into two phases:

First, you fly a turn by applying one brake and by shifting your weight to the same side, the glider will bank up and increase its turning speed. This phase ends at a sink rate of roughly 8m/s – 10m/s. (depending on the wing loading)

Then at the beginning of the second phase the g-forces increase rapidly and the leading edge will lean towards the ground. In a fully developed deep spiral, the leading edge is almost parallel to the ground. The maximum sink rate with the BION can get up to 25m/s and more.

The first attempts to fly a deep spiral should be stopped clearly before reaching the second phase to get used to the quick rotation and to practice the exit without pendulum swinging. The exit should be performed by simply releasing the inner brake with a neutral weight-shift. The BION will then decrease its bank angle and go back to normal flight. To avoid a pendulum movement, the inner brake has to be pulled in the moment the wing wants to reduce its bank rapidly.

By applying the inner brake again, you force the glider to exit the spiral movement not rapidly but during two or three rotations. It is very important to master this exercise before continuing to the second phase of the deep spiral.

The pilot will feel the entering of this phase by the suddenly increased g-force. In this moment, the pilot is being pushed to the outer side of the harness. It is important to not counteract. So the pilot should lean to the outer side to avoid a stable spiral. (See below)

If the pilot weight shifts to the outer side, the spiral movement will get slower as soon as the pilot releases the inner brake. The rest of the exit works as explained above for the first phase of the deep spiral.

If the pilot shifts his weight clearly to the inner side, the BION might stay in a deep spiral, even when releasing both brakes. In this case, it helps to apply the outer brake, or both brakes and of course to shift the weight to the outer side.

Please don't underestimate the difficulty of learning the deep spiral. The sink rates are a lot higher than what you are used to from other manoeuvres and the fast rotation might lead to disorientation. The high g-loads of up to 3g make the manoeuvre even more demanding as you might have problems like the so called "black out", where you temporarily lose your vision due to the g-load. It is very important to get a feeling for the reactions of your body to this manoeuvre.

If you practice it well, it is a fun manoeuvre that enables you to loose height faster than with any other manoeuvre.

C-Stall

This manoeuvre can be found sporadically in some paragliding literature. This manoeuvre can't be performed with the BION.

Collapses

Asymmetric collapse

If you fly in strong turbulences, one side of the glider might collapse. This happens if one side of the wing doesn't produce lift anymore, due to a low angle of attack. If there is no lift, the lines get loose and the wing deforms or collapses.

Most of these collapses are rather small – they only affect a small part of the wingspan. In such a case, the BION continues to fly almost unaffected. If the collapse affects 50% of the wingspan or more, the wing will react considerably:

Due to the increased drag of the collapsed wing, the glider will turn to the collapsed side. Furthermore, the glider will pitch down because of the increased wing loading. (The glider has to increase its speed because of the reduced area – that's what causes the pitching down.)

The pilot can prevent the glider from pitching and turning, by applying the brake on the non collapsed side of the wing. If a collapse occurs close to the ground it is essential to react properly. The proper reaction should be taught at high altitude, ideally under professional guidance.

As explained above, most of the collapses can be prevented, if you fly actively!

Front tuck

A front tuck occurs, if the angle of attack gets too low on the whole wingspan, then the whole leading edge will collapse. After the asymmetric tuck, the BION will go back to normal flight automatically. The pilot can expedite the opening process by slightly applying both brakes.

Stall manoeuvres

Spin

If you pull one brake too much, you might induce a so called spin. The centre of rotation is no longer far outside the wing (like during a normal turn), but it moves inside the wing. Furthermore the rotation speed increases. The BION will go back to normal flight, if the pilot releases both brakes. The BION's spin behaviour is easily manageable: It takes a lot of brake travel to induce the spin, and then the pilot has quite some time to react and release both brakes.

Fullstall

If you pull both brakes too far, the wing will perform a so called full stall. The wing suddenly stops its forward motion, but the pilot is still moving forward. So from the pilots view, the glider will tilt backwards. It is very important to not release the brakes in this moment. Otherwise the glider might surge forward below the pilot.

The Full Stall is a complex manoeuvre and the perfect execution can not be explained in this manual. If you want to learn a proper full stall, it makes sense to do this under professional guidance.

The available brake travel before stalling the wing depends on the size. It is approximately 60cm for the BION 19, 63cm for the BION 21, 66cm for the BION 23, 70cm for the BION 25, and 73cm for the BION 27. Those numbers are just a rough indication. (The publication of the brake travel is claimed by the EN 926.)

It would be dangerous to use the brake travel according to those numbers, because it is not practicable to measure the brake travel during flight, and in turbulences the stall might occur with less brake travel. If you want to use the whole brake travel of your glider safely, it is necessary do many intended spins and full stalls to get a feeling for the stall behaviour.

Deep/Parachutal stall

The Deep Stall, or Parachutal Stall is kind of the pre stage to a Full Stall. The wing has no forward motion and a high sink speed, but it is almost fully inflated. The pilot can enter the Deep Stall by applying both brakes. It is very difficult to keep the wing in a Deep Stall: If you pull the brakes a little too

much, the glider will enter a Full Stall. If you release the brakes too much, the glider will go back to normal flight. To practice a Deep Stall, it is necessary to master the Full Stall first.

A very old or worn out glider with a porous cloth or with a changed trim (due to many winch launches, or deep spirals) might stay in a deep stall even after releasing both brakes. Do not apply the brakes in such a situation, because the wing would then enter a full stall ! You can exit the deep stall by pushing the speed bar, or by simply pushing the A-risers forward. If you fly through rain, the risk of a deep stall is higher. We strongly advice against flying in rainy conditions. If it happens, that you get into rainfall, we recommend not performing a B-stall or Big Ears. Our recommendation is to leave the rain as soon as possible and to fly with both brakes released, or even accelerated, as this reduces the risk of a deep stall. (The available brake travel before entering a deep stall may be reduced significantly.)

Cravates

After a big collapse or after a badly executed Full Stall, a part of the wing might be tangled up in the lines, and won't reopen automatically. This is what you call a cravate. During our extensive test flights with the BION we never experienced a cravate but this situation can not be eliminated with any paraglider.

In case of a cravate we recommend the following actions:

- 1.) Counter steer: Probably the wing wants to turn to the side of the cravate. In some cases, the turning happens quickly and will end in a stable deep spiral without the pilot's action. So it is important to react quickly by counter steering.
- 2.) Opening the cravate by applying the brake with an impulse movement: Some cravats can be opened with this method. It is important to keep the wing in straight flight by pulling the other brake all the time.
- 3.) Pulling the stabilo line: Some cravats can be opened by strongly pulling the stabilo line. (It is the orange line on the B-riser. Have a look at it or grab it every once in a while and you will be able to react quicker in a moment of danger.)

- 4.) Full stall: Many cravats can be opened by using the Full Stall. But of course you have to have solid experience with this manoeuvre to be able to use it properly.
- 5.) Reserve: If you loose control or if you are not absolutely sure that you have enough height for further attempts to recover, immediately use your reserve!

Many pilots wait way too long before using their reserve. Some don't use the reserve at all if they lose control of their glider. We strongly recommend to at least mentally practice the use of the reserve from time to time: Grab the handle of the reserve in flight, like you would do it in case of emergency. Many clubs or schools offer to throw the rescue for example in a gym. The most realistic way of training is to use the reserve in real flight. Many SIV Clinics offer that as part of their training.

Please use these possibilities: There are already too many pilots, who almost forgot that they have a reserve they could use, which is a very bad precondition to use it without hesitating in a dangerous moment.

Winch launch

The BION is very easy to launch on the winch. You should start to climb at a flat angle.

We recommend the use of a towing device which accelerates the glider during the winch launch.

Speed system

The Bion has a trim system. The standard setting is a "closed" trimmer. This means that all risers have the same length. To accelerate, you can open the trimmers.

Using the accelerator in flight

If you fully apply the trim system, the angle of attack decreases and the speed increases by about 10km/h. This is helpful to cover more distance in headwind or in sinking air.

Please consider, that the wing behaves more dynamic if a collapse occurs in accelerated flight. You should be aware, that you might need more height to recover to normal flight!

Measurements of the speed systems (publication required by EN 926)

	A	A1	B	C	D
Trimmers closed	370	370	370	370	370
Trimmers open	370	370	400	445	490

Service and maintenance

General advice

To keep your glider in good condition for many years, please consider the following advice:

- Don't expose your glider to unnecessary UV radiation – for example by leaving it on the landing site unpacked.
- Don't fold the nylon rod reinforcements at the cell openings too hard.
- If you pack the glider when it is wet or just damp, it has to be dried later. Don't leave it packed in a wet condition!
- When you practice ground handling, avoid crashing the glider hard on the ground with the leading edge, as this might lead to damage.
- Avoid unnecessary dirt or sharp stones touching the lines and the cloth. Don't step on the lines if they are laying on a stony surface!
- Humidity combined with dirt can lead to shrinking of the lines and thereby to the wrong trim on your glider.
- Sand and Saltwater (sweat) may damage the lines in the long run.

- To store your glider for a longer time, avoid a humid or a very hot environment. (Like in a car during hot summer days)

Cleaning

To clean the wing, only use water and a cleaning cloth. Never use any solvents. If there is sand, dirt or small stones inside the canopy, you should remove them because they will damage the coating of the cloth and the seams in the long run.

Repair

Repairs may only be performed by authorised service centres or by NOVA.

You can repair small holes or tears in the cloth (smaller than 5cm) yourself with a special self adhesive repair tape. (You can order it at NOVA or in any service centre.) If you are not sure about the damage, or if the damage affects parts of a seam, please contact NOVA. (info@nova-wings.com)

Check

We suggest a trim inspection (Nova Trim Tuning NTT) in the first year after the date of purchase (new glider). In the case that the NTT is done, the next full check (NFS: NOVA full service) has to be done 3 years after purchase (new glider).

In the case of commercially used gliders, (tandems or school gliders) the NFS has to be performed every year.

In the case that the NTT is not done, the wing needs a full check after 2 years. The check expert can define the next check interval on the basis of the wing's condition. In areas where conditions are harsh on the material (i.e. by salty air next to the coast), an annual complete check (NFS) is strongly recommended! The check has to be confirmed with the check-stamp on the stabilo. All necessary documents for the inspection can be found on the NOVA homepage (<http://www.nova-wings.com>): Downloads: Check.

The date of purchase of the new glider is decisive for any deadline concerning NTT and NFS, as well as for guarantee.

Independent from the deadlines mentioned above:

A check (NFS) has to be performed not later than after 200 hours of flight, or after 400 flights. (Depending on what happens first.)

More information about our check system:
http://www.nova-wings.com/english/info_zone/ntt.html

Environment friendly behaviour:

Apart from self-evident things, like not leaving your rubbish behind, we would like to appeal for a thoughtful behaviour towards animals, like birds of prey or game animals. If you notice, that your fly by affects those animals (like causing a shortening reaction) please increase your distance.

Disposal:

Disused paragliders need a proper disposal. If you are not sure about the correct removal, please send your glider to NOVA.

Technical data

Size		32	36
Zoom Factor		1.15	1.22
Number of cells		43	
Projected Wingspan	m	10.67	11.32
Projected Surface area	m ²	32.4	36.44
Projected Aspect Ratio		3.52	
Flat Wingspan	m	14.18	15.05
Flat Surface Area	m ²	39.1	44
Flat Aspect Ratio		5.14	
Line diameter	m m	1.1	2.15 / 3.15
Line length	m	7.76	8.14
Line consumption	m	426	452
max. profile depth	m	3.47	3.66
min. profile depth	m	0.71	0.75
weight	kg	7.5	8.5
Legal take of weight LTF/EN¹	kg	(100-200)	115-230
Places		(1-2)	1-2
Certification LTF		(B)	B
Certification EN		(B)	B

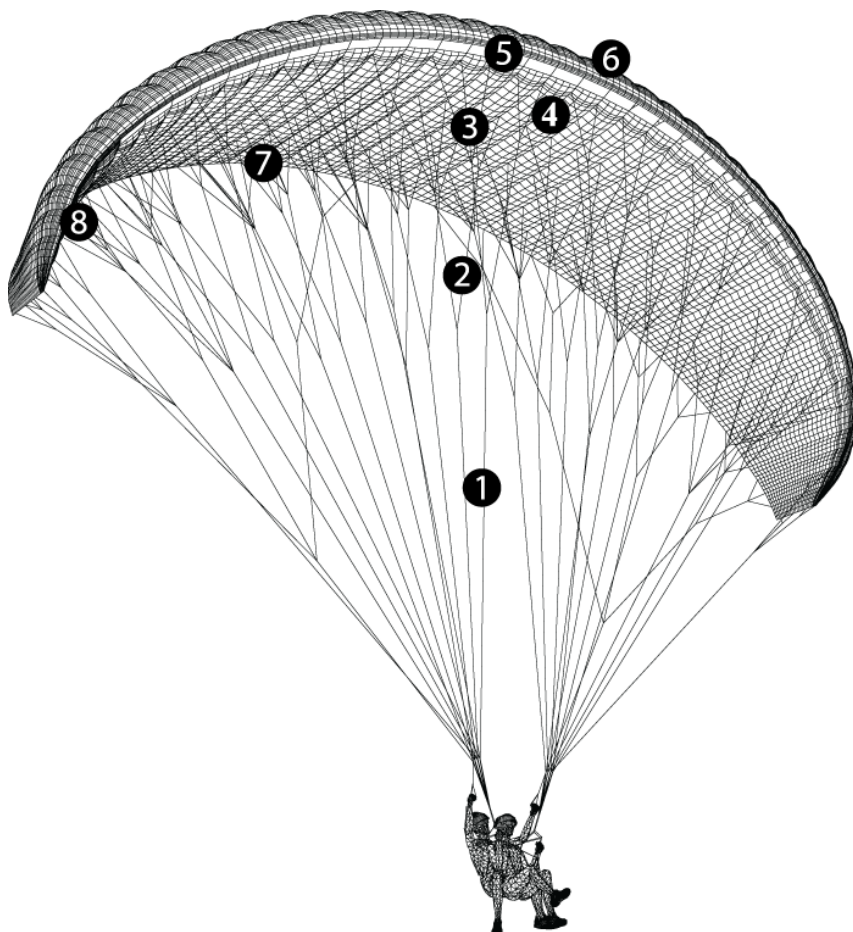
¹ Pilot + passenger + total equipment

Overview risers



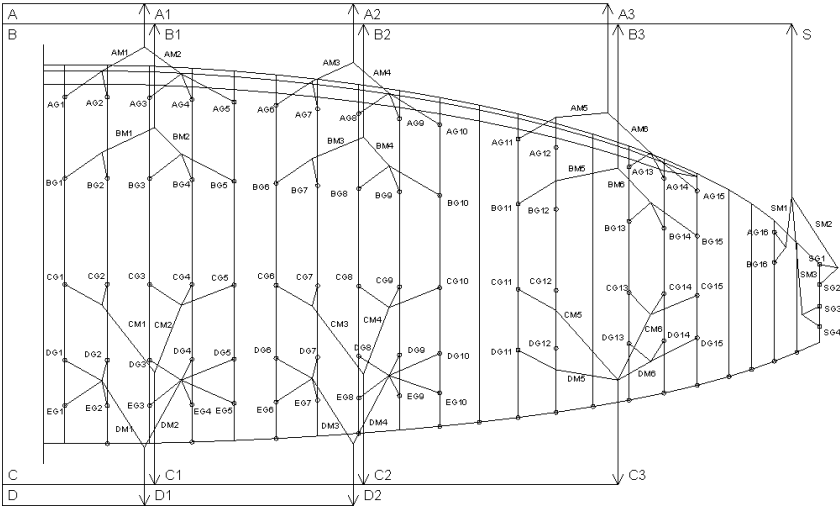
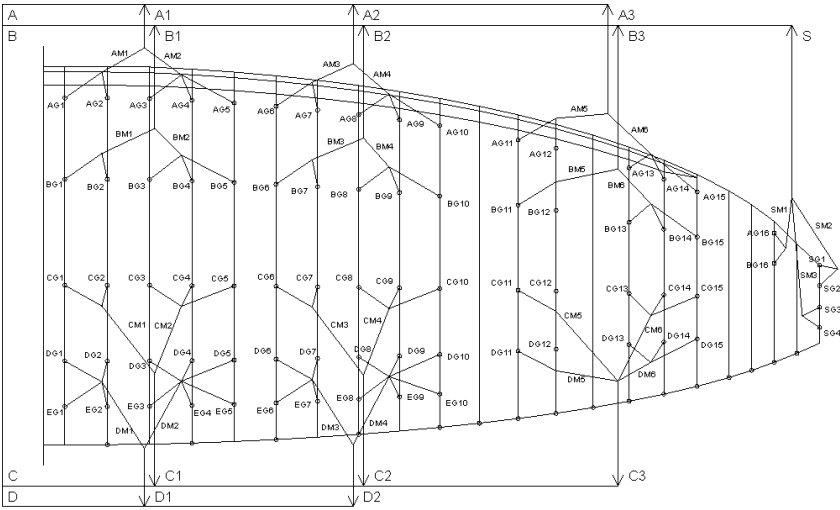
- | | | | |
|---|-----------------|---|----------------------|
| 1 | A1-riser | 6 | Main suspension loop |
| 2 | A2-riser (EARS) | 7 | Trim System |
| 3 | B-riser | 8 | EARS clamp |
| 4 | C-riser | 9 | Clamp cover |
| 5 | D-riser | | |

Übersicht Schirm



- | | | | |
|---|----------------|---|---------------|
| 1 | Stammleinen | 5 | Zellöffnungen |
| 2 | Mittelleinen | 6 | Obersegel |
| 3 | Gallerieleinen | 7 | Hinterkante |
| 4 | Untersegel | 8 | Typenschild |

Line plans



Line lengths:

	BION		Leinentyp
	33	37	
A1			Edelrid A6843-340 red
A2			Edelrid A6843-340 red
A3			Edelrid A6843-340 red
AM1			Liros PPSL160 red
AM2			Liros PPSL160 red
AM3			Liros PPSL160 red
AM4			Liros PPSL160 red
AM5			Liros PPSL160 red
AM6			Liros PPSL160 red
AG1			Cousin Ultimate095-85kg red
AG2			Cousin Ultimate095-85kg red
AG3			Cousin Ultimate095-85kg red
AG4			Cousin Ultimate095-85kg red
AG5			Cousin Ultimate095-85kg red
AG6			Cousin Ultimate095-85kg red
AG7			Cousin Ultimate095-85kg red
AG8			Cousin Ultimate095-85kg red
AG9			Cousin Ultimate095-85kg red
AG10			Cousin Ultimate095-85kg red
AG11			Cousin Ultimate095-85kg red
AG12			Cousin Ultimate095-85kg red
AG13			Cousin Ultimate095-85kg red
AG14			Cousin Ultimate095-85kg red
AG15			Cousin Ultimate095-85kg red
AG16			Cousin Ultimate095-85kg orange
B1			Edelrid A6843-340 yellow
B2			Edelrid A6843-340 yellow
B3			Edelrid A6843-340 yellow
BM1			Liros PPSL160 yellow
BM2			Liros PPSL160 yellow
BM3			Liros PPSL160 yellow
BM4			Liros PPSL160 yellow

BM5			Liros PPSL160 yellow
BM6			Liros PPSL160 yellow
BG1			Cousin Ultimate095-85kg yellow
BG2			Cousin Ultimate095-85kg yellow
BG3			Cousin Ultimate095-85kg yellow
BG4			Cousin Ultimate095-85kg yellow
BG5			Cousin Ultimate095-85kg yellow
BG6			Cousin Ultimate095-85kg yellow
BG7			Cousin Ultimate095-85kg yellow
BG8			Cousin Ultimate095-85kg yellow
BG9			Cousin Ultimate095-85kg yellow
BG10			Cousin Ultimate095-85kg yellow
BG11			Cousin Ultimate095-85kg yellow
BG12			Cousin Ultimate095-85kg yellow
BG13			Cousin Ultimate095-85kg yellow
BG14			Cousin Ultimate095-85kg yellow
BG15			Cousin Ultimate095-85kg yellow
BG16			Cousin Ultimate095-85kg orange
C1			Edelrid A6843-340 yellow
C2			Edelrid A6843-340 yellow
C3			Edelrid A6843-240 yellow
CM1			Liros PPSL160 yellow
CM2			Liros PPSL160 yellow
CM3			Liros PPSL160 yellow
CM4			Liros PPSL160 yellow
CM5			Liros PPSL160 yellow
CM6			Liros PPSL160 yellow
CG1			Cousin Ultimate095-85kg yellow
CG2			Cousin Ultimate095-85kg yellow
CG3			Cousin Ultimate095-85kg yellow
CG4			Cousin Ultimate095-85kg yellow
CG5			Cousin Ultimate095-85kg yellow
CG6			Cousin Ultimate095-85kg yellow
CG7			Cousin Ultimate095-85kg yellow
CG8			Cousin Ultimate095-85kg yellow
CG9			Cousin Ultimate095-85kg yellow

CG10			Cousin Ultimate095-85kg yellow
CG11			Cousin Ultimate095-85kg yellow
CG12			Cousin Ultimate095-85kg yellow
CG13			Cousin Ultimate095-85kg yellow
CG14			Cousin Ultimate095-85kg yellow
CG15			Cousin Ultimate095-85kg yellow
D1			Edelrid A6843-240 yellow
D2			Edelrid A6843-240 yellow
DM1			Liros PPSL160 yellow
DM2			Liros PPSL160 yellow
DM3			Liros PPSL160 yellow
DM4			Liros PPSL160 yellow
DM5			Liros PPSL160 yellow
DM6			Liros PPSL160 yellow
DG1			Cousin Ultimate095-85kg yellow
DG2			Cousin Ultimate095-85kg yellow
DG3			Cousin Ultimate095-85kg yellow
DG4			Cousin Ultimate095-85kg yellow
DG5			Cousin Ultimate095-85kg yellow
DG6			Cousin Ultimate095-85kg yellow
DG7			Cousin Ultimate095-85kg yellow
DG8			Cousin Ultimate095-85kg yellow
DG9			Cousin Ultimate095-85kg yellow
DG10			Cousin Ultimate095-85kg yellow
DG11			Cousin Ultimate095-85kg yellow
DG12			Cousin Ultimate095-85kg yellow
DG13			Cousin Ultimate095-85kg yellow
DG14			Cousin Ultimate095-85kg yellow
DG15			Cousin Ultimate095-85kg yellow
EG1			Cousin Ultimate095-85kg yellow
EG2			Cousin Ultimate095-85kg yellow
EG3			Cousin Ultimate095-85kg yellow
EG4			Cousin Ultimate095-85kg yellow
EG5			Cousin Ultimate095-85kg yellow
EG6			Cousin Ultimate095-85kg yellow
EG7			Cousin Ultimate095-85kg yellow

EG8		Cousin Ultimate095-85kg yellow
EG9		Cousin Ultimate095-85kg yellow
EG10		Cousin Ultimate095-85kg yellow
S		Liros TSL 220 orange
SM1		Liros PPSL 120 orange
SM2		Liros PPSL120 orange
SG1		Cousin Ultimate095-85kg orange
SG2		Cousin Ultimate095-85kg orange
SG3		Cousin Ultimate095-85kg orange
SG4		Cousin Ultimate095-85kg orange
FF		Edelrid 7850-360 orange
F1		Liros PPSL 120 orange
F2		Liros PPSL 120 orange
F3		Liros PPSL 120 orange
FM1		Cousin Ultimate095-85kg orange
FM2		Cousin Ultimate095-85kg orange
FM3		Cousin Ultimate095-85kg orange
FM4		Cousin Ultimate095-85kg orange
FM5		Cousin Ultimate095-85kg orange
FM6		Cousin Ultimate095-85kg orange
FG1		Cousin Ultimate095-85kg orange
FG2		Cousin Ultimate095-85kg orange
FG3		Cousin Ultimate095-85kg orange
FG4		Cousin Ultimate095-85kg orange
FG5		Cousin Ultimate095-85kg orange
FG6		Cousin Ultimate095-85kg orange
FG7		Cousin Ultimate095-85kg orange
FG8		Cousin Ultimate095-85kg orange
FG9		Cousin Ultimate095-85kg orange
FG10		Cousin Ultimate095-85kg orange
FG11		Cousin Ultimate095-85kg orange
FG12		Cousin Ultimate095-85kg orange
FG13		Cousin Ultimate095-85kg orange
FG14		Cousin Ultimate095-85kg orange
FG15		Cousin Ultimate095-85kg orange
FG16		Cousin Ultimate095-85kg orange

Over all line lengths:

You can find the overall line lengths (from the shackle to the loops on the bottom sail) on the homepage of the Para-Academy. (www.para-academy.eu) Please note, that you can not calculate the over all length, by just adding the single line lengths listed above!

Manual Tandembar:

The tandem bar stands out for low weight and high strength. Depending on the weight of the pilot and the passenger, the riser can be attached in the loops 1-3. A very light pilot should choose the loop (1) to avoid that heavy passengers will hang too low.

The reserve line has to be connected to one of the remaining two loops. If, for example, the riser of the glider is attached to loop (1), the reserve can be attached in loop (2) or loop (3).

Caution:

Make sure, that you use a proper shackle or soft link to connect the reserve to the loop. The shackle or soft-link has to surround the main belt of the spreader bar. (like the carabiner surrounds the belt in the picture above)

If you just mount the shackle from below into the loop, the strength might not be sufficient in case of an reserve deployment.

The pilots harness is always mounted in loop (4). If a passenger is light, the passengers harness can be mounted in loop (6). Heavier passengers should be mounted in loop (5).



1,2,3

4

5,6

Suspension loops for riser and reserve

Suspension loop for Pilot

Suspension loop for Passagier



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