

# MANUAL



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# DIVA Owner's Manual

## CCC PARAGLIDER

### Welcome to Bruce Goldsmith Design

BGD is a world leader in the design and production of paragliders. For many years Bruce Goldsmith and his team have been developing products with world-beating performance for pilots who want the best. We apply our competitive knowledge to design top quality products that combine the highest performance with the safe handling our customers value and respect. BGD pilots appreciate our quality and reliability. BGD's world-class status is based on the skills and expertise we have developed in combining aerodynamic design with cloth and materials technology. All BGD products are developed and made with the same skill and attention to good design that are synonymous with the ultimate performance and precision required by paragliders.

### Congratulations on your purchase of the BGD DIVA

The DIVA is a high-performance competition paraglider, designed for experienced pilots for competition and cross-country flying. It is fast and performant, and demands a high level of pilot skill to fly. It is built to high standards of construction and safety, but it will only retain its optimal characteristics if it is properly looked after. Please read this manual carefully from the first to the last chapter to ensure you get the best out of your DIVA.

This manual has been prepared to give you information and advice about your paraglider. If you ever need any replacement parts or further information, do not hesitate to contact your nearest BGD dealer or contact BGD directly.

## 2. Introduction

The DIVA is a two-liner competition paraglider suitable for very advanced pilots offering a high level of performance combined with speed, which make this wing competitive but requiring a high level of pilot skill.

The use of this glider is limited to non-aerobatic manoeuvres.

This paraglider must not:

1. Be flown outside the certified weight range
2. Have its trim speed adjusted by changing the length of risers or lines
3. Be flown in rain or snow
4. Be towed with a tow-line tension in excess of 200kg

It is your dealer's responsibility to test fly the paraglider before you receive it. The test flight record of this is in the Servive Booklet towards the end of this manual. Please be sure that this has been completed by your dealer. Failure to test fly a new paraglider may invalidate any warranty.

In order to enjoy the full benefits of the BGD warranty, you must complete the warranty form on our website. For further information about the BGD warranty, please refer to the corresponding page on our website.

Any modification, e.g. change of line lengths or changes to the speed system, can cause a loss of airworthiness and certification. We recommend that you contact your dealer or BGD directly before performing any kind of change.

## 3. Preparation

1. Select a suitable take-off area determined by wind and terrain, clear of any obstacles that may catch in the lines or damage the canopy.
2. If your paraglider has been correctly packed, you should take it to the top of the take-off area, and allow the rolled canopy to unroll itself down the hill (if on a slope). This should leave the paraglider with the bottom surface facing upwards, the openings at the downwind end of the take-off area, and the harness at the trailing edge at the upwind side.
3. Unroll the canopy to each side so that the leading edge openings form a semicircular shape, with the trailing edge drawn together at the centre of the arc. The harness should be drawn away from the canopy until the suspension lines are just tight.

## 4. Pre-flight Inspection

The DIVA is designed to be as simple as possible to inspect and maintain but a thorough pre-flight procedure is mandatory on all aircraft. The following pre-flight inspection procedure should be carried out before each flight.

1. Whilst opening out the paraglider check the outside of the canopy for any tears where your paraglider may have been caught on a sharp object or even have been damaged whilst in its bag.
2. Check that the lines are not twisted or knotted. Divide the suspension lines into six groups, each group coming from one riser. By starting from the harness and running towards the canopy remove any tangles or twists in the lines. Partially inflating the canopy in the wind will help to sort out the lines.
3. It is particularly important that the brakes are clear and free to move. Check the knot which attaches the brake handles to the brake lines. Several knots should be used here or the loose ends may get entangled in the brake pulleys. Both brakes should be the same length and this can be checked by asking an assistant to hold the upper end of the brake lines together whilst the pilot holds the brake handles. The brake lines should be just slack with the wing inflated when the brakes are not applied. After checking the brake lines lay them on the ground.
4. Always check the buckles and attachments on the harness. Ensure the two main attachment maillons/karabiners from the harness to the main risers, and the six shackles which attach the risers to the lines, are tightly done up.
5. Before strapping in to the harness, the pilot should be wearing a good crash helmet. Put on the harness ensuring all the buckles are secure and properly adjusted for comfort.

Your paraglider is now ready for flight.

## 5. Flight Characteristics

This manual is not intended as an instruction book on how to fly the DIVA. You should be an experienced pilot, but the following comments describe how to get the best from your DIVA.

### Weight range

Each size of the DIVA is certified for a certain weight range. The weight refers to the 'overall take-off weight'. This means the weight of the pilot, the glider, the harness and all other equipment carried with you in flight.

We recommend the DIVA is flown in the middle of the weight range.

If you fly the DIVA in the lower half of the weight range, the turning agility decreases and the glider will be more damped. In strong turbulence the wing tends to deform and to collapse slightly more than with a higher wing loading. If you mainly fly in weak conditions you should consider flying the DIVA towards the lower end of the weight range.

If you fly the DIVA in the upper half of the weight range, the agility and the stability in turbulence will increase. Also the speed will increase slightly. The self-damping will decrease in turns, as well as after collapses, so if you fly in bumpy conditions and you want a dynamic flight characteristic you should go for the top of the weight range.

### Active Piloting

Active piloting is a tool that will help any pilot fly with greater safety and enjoyment. It means flying in empathy with your paraglider, not only guiding the glider through the air but also being aware of feedback from the wing, especially in thermals and turbulence. If the air is smooth the feedback can be minimal but in turbulence feedback is continuous and needs to be constantly assessed by the pilot. Such reactions become instinctive in good pilots.

In order to get the best performance from the wing, the pilot should try to control it through small brake inputs and weight-shift, rather than constantly being present on the brakes. A small movement early is more efficient than a big brake movement later to control the wing. The more you let the glider fly at trim speed, the better performance you will get out of it. The objective of active piloting is to get the glider to fly smoothly through the air with a stable position above the head, and controlled angle of incidence. Flying actively increases your safety margin.

## Harness

The DIVA is tested with a 'GH' (without diagonal bracing) type harness. The GH category includes weight-shift harnesses as well as ABS style (semi stable) harnesses.

### Approved harness dimensions

This glider has been tested with a harness that complies with the EN standard harness dimensions. These are:

Seat board width: 42cm. The horizontal distance between the attachment points of the paraglider risers (measured from the centreline of the karabiners) must be:

- Up to 50kg = 38cm
- 50-80kg = 42cm
- 80kg or more = 46cm

## Take-off

The best inflation technique is to hold one A-riser in each hand.

### Forward Launch

Take an A-riser in each hand. The A-risers are marked with red cloth to make them easy to find. In nil or very light

wind, stand with all the A lines taut behind you, then take one or two steps back (do not walk all the way back to the canopy) and begin your launch run pulling gently and smoothly on the A-risers. As soon as the canopy starts to rise off the ground stop pulling so hard on the A-risers but pull all the risers evenly through the harness. Maintaining gentle pressure on the A-risers always helps in very calm conditions. Have your hands ready to slow up the canopy with the brakes if it starts to accelerate past you.

### **Reverse Launch**

In winds over 10km/h it is recommended to do a reverse launch and inflate the canopy whilst facing it using the A-risers, without the 'Baby A-risers,' to prevent the glider from inflating the wingtips first. Releasing pressure on the A-risers when the canopy is at about 45° will help to avoid overshooting. The stronger the wind and the greater the pressure on the A-risers, the more quickly the canopy will rise.

### **Turning**

The DIVA does not require a strong-handed approach to manoeuvring. For a fast turn smoothly apply the brake on the side to which the turn is intended. The speed with which the brake is applied is very important. If a brake is applied fairly quickly the canopy will do a faster banking turn, but care must be taken not to bank too severely. To attain a more efficient turn at minimum sink, apply some brake to the outside wing to slow the turn and prevent excessive banking. The DIVA flies very well like this, but care must be taken not to over-apply the brakes as a spin could result, even though the DIVA has a very low spin tendency. The DIVA will turn far more efficiently if the pilot weight-shifts into the turn in the harness. Remember that violent brake application is dangerous and should always be avoided.

### **Straight Flight**

The DIVA will fly smoothly in a straight line without any input from the pilot. The trim speed shown in the specs table in section 8 is achieved when the glider is flown at the maximum weight without the accelerator. The top speed is achieved at max. weight with full speedbar applied.

## Thermalling

To attain the best climb rate the DIVA should be thermalled using a mild turn, as described above, keeping the wing's banking to a minimum. In strong thermals a tighter banking turn can be used to stay closer to the thermal's core. Remember that weight-shifting in the harness will make the turn more efficient and reduce the amount of brake required.

Care must be taken not to apply so much brake as to stall. This is easy to avoid as the brake pressure increases greatly as you approach the stall point. Only fly near the stall point if you have enough height to recover (at least 100m above the ground).

## Big Ears

The 'baby A-riser' allows the DIVA to be 'big eared' simply and easily. This allows the pilot to descend quickly without substantially reducing the forward speed of the canopy (as is the case with B-lining). To engage big ears the pilot will need to lean forward in the harness and grasp the big ears risers (one in each hand) at the maillons, keeping hold of both brake handles if possible. Pull the risers out and down at least 30 cm so as to collapse the tips of the glider. It is very important that the other A-lines are not affected when you do this as it could cause the leading edge to collapse. Steering is possible by weight-shifting with big ears in. If the big ears do not come out quickly on their own, a pump on the brakes will speed things up.

Before using the big ears facility in earnest it is essential to practise beforehand with plenty of ground clearance in case a leading edge collapse occurs. Always keep hold of both brakes in order to retain control. Putting your hands through the brake handles so they remain on your wrists is a good method of doing this.

## Spiral Dive

A normal turn can be converted into a strong spiral dive by continuing to apply one brake. The bank angle and speed of the turn will increase as the downward spiral is continued. Be careful to enter the spiral gradually as too quick a

brake application can cause a spin or an over-the-nose spiral.

The over-the-nose spiral is a special type of spiral dive where the glider points almost directly at the ground. It will enter this if you make a sudden brake application during the spiral entry so that the glider yaws around. The nose of the glider ends up pointing at the ground, after which it picks up speed very quickly. This technique is very similar to SAT entry technique, and like the SAT it is an aerobatic manoeuvre, which is outside the normal safe flight envelope. Please do not practise these manoeuvres as they can be dangerous. Care should be taken when exiting from any spiral dive. To pull out of a steep spiral dive, release the applied brake gradually or apply opposite brake gradually. A sharp release of the brake can cause the glider to surge and dive as the wing converts speed to lift. Always be ready to damp out any potential dive with the brakes. Also be ready to encounter turbulence when you exit from a spiral because you may fly through your own wake turbulence, which can cause a collapse.

**CAUTION: SPIRAL DIVES CAN CAUSE LOSS OF ORIENTATION (black out) AND SOME TIME IS NEEDED TO EXIT THIS MANOEUVRE. THIS MANOEUVRE MUST BE EXITED IN TIME AND WITH SUFFICIENT HEIGHT!**

## Speed System

The DIVA is sold with accelerator risers and a speed stirrup as standard but can be flown without the speed stirrup attached. Launching and general flying is normally done without using the accelerator. The accelerator bar should be used when higher speed is important. Glide angle is not as good in this format, so it is not necessarily the best way to race in thermic conditions and the canopy is slightly more susceptible to deflations. Using the stirrup can require some effort and the pilot's balance in the harness can be affected. It may be necessary to make some adjustments to the harness. We recommend you only fly in conditions where you can move forwards into wind with the risers level, so that you have the extra airspeed in reserve should you need it.

To fly at maximum speed the stirrup should be applied gradually until the upper pulley on the A riser butts against the second pulley. The accelerator system is designed to give maximum speed when the pulleys of the accelerator touch each other. Please do not go beyond this point by using excessive force to attempt to make the glider go

faster as this may result in the glider collapsing.

IMPORTANT:

1. Practise using the speed system in normal flying.
2. Be careful flying fast in rough or turbulent conditions as deflations are more likely to occur at speed. The speed increase is achieved by reducing the angle of attack, so the canopy has slightly more collapse tendency.
3. Remember that glide deteriorates at higher speeds. Best glides are achieved when the risers are level and the brakes are off.

Check the component parts regularly for wear and tear, and ensure that the system always works smoothly.

## Landing

Landing the DIVA is very straightforward. Flare in the normal way from an altitude of around 2m when landing in light winds. It may sometimes help to take wraps on the brakes to make the flare more effective.

Strong-wind landings require a different technique. If you use the brakes to flare in a strong wind the glider tends to convert this to height, which can be a problem. The best method is to take hold of the rear-risers at the maillons just before landing, and collapse the canopy using these when you have landed. The glider will collapse very quickly using this method. The glider can also be steered using the rear-risers but be careful not to cause a premature stall.

After landing, the B-risers can also be used to collapse the canopy, although it is more difficult to control the collapsed canopy on the ground using this method.

## 6. Recovery Techniques

### Stalls

Stalls are dangerous and should not be practised in the course of normal flying. Stalls are caused through flying too slowly. Airspeed is lost as brake pressure increases and as the canopy approaches the stall point it will start to descend vertically and finally begin to collapse. Should this occur it is important that the pilot releases the brakes at the correct moment. The brakes should never be released when the wing has fallen behind the pilot; the brakes should be released fairly slowly, to prevent the forward dive of the canopy from being too strong. A pre-release of the brake and the reconstruction of the full span is recommended to avoid the tips getting cravatted during the recovery. All pilots who fly the DIVA are advised never to attempt this manoeuvre unless under SIV instruction. This manual is not intended to give instruction in this or any other area.

#### **Deep Stall (or Parachutal Stall)**

The DIVA has been designed so that it will not easily remain in a deep stall. However, if it is incorrectly rigged or its flying characteristics have been adversely affected by some other cause, it is possible that it could enter this situation. In the interests of safety all pilots should be aware of this problem, and know how to recover from it. The most common way to enter deep stall is from a flying too slowly, from a B-line stall or even from big ears. When in deep stall the pilot will notice the following:

1. Very low airspeed.
2. Almost-vertical descent (like a round canopy), typically around 5m/s.
3. The paraglider appears quite well inflated but does not have full internal pressure. It looks and feels a bit limp.

Recovery from deep stall is quite simple: The normal method is to simply initiate a mild turn. As the canopy starts to turn it will automatically change to normal flight, but it is very important not to turn too fast as this could induce a spin.

The second method is to pull gently on the A-risers. This helps the airflow to re-attach to the leading edge, but be careful not to pull down too hard as this will induce a front collapse.

If the deep stall is particularly stubborn and the previous methods do not work then a full stall will solve the problem. To do this apply both brakes again fairly quickly, as if to do a strong stall, then immediately release both brakes and damp out the forward surge in the normal way. The canopy will swing behind you then automatically reinflate and surge forward in front of you before returning to normal flight. It is the surge forward that exits the canopy from deep stall.

## Spins

Spins are dangerous and should not be practised in the course of normal flying. Spins occur when the pilot tries to turn too fast. In a spin the pilot, lines and canopy basically stay vertical and rotate around a vertical axis. The DIVA will resist spinning, but if a spin is inadvertently induced the pilot should release the brake pressure but always be ready to damp out any dive as the glider exits the spin. If the pilot does not damp the dive on exiting the spin the glider may have an asymmetric deflation.

## Symmetric Front Collapse

It is possible that turbulence can cause the front of the wing to symmetrically collapse, though active piloting can largely prevent this from occurring accidentally. A pilot can reproduce the effect by taking hold of both the A-risers and pulling down sharply on them. The DIVA will automatically recover on its own from this situation in around 3 seconds. During this recovery period it is advisable not to apply the brakes as this could stall the wing.

## Asymmetric Front Collapse

The DIVA is very resistant to deflations; however if the canopy collapses on one side due to turbulence, the pilot should first of all control the direction of flight by countering on the opposite brake. Most normal collapses will immediately reinflate on their own and you will hardly have time to react before the wing reinflates automatically. The act of controlling the direction

will tend to reinflate the wing. However, with more persistent collapses it may be necessary to pump the brake on the collapsed wing using a long, strong, smooth and firm action. Normally one or two pumps of around 80 cm will be sufficient. Each pump should be applied in about one second and smoothly released. In severe cases it can be more effective to pump both brakes together to get the canopy to reinflate. Be careful not to stall the wing completely if this technique is used.

## Releasing a trapped tip (cravat)

On the DIVA it should be difficult to trap the tip so that it will not come out quickly. However, following a very severe deflation any canopy could become tied up in its own lines. If this occurs then first of all use the standard method of recovery from a tip deflation as described in Asymmetric Front Collapse above. If the canopy still does not recover then pull the rear risers to help the canopy to reinflate. Pulling the stabilo line is also a good way to remove cravats, but remember to control your flight direction as your number-one priority. If you are very low then it is much more important to steer the canopy into a safe landing place or even throw your reserve.

NOTE: Test pilots have tested the DIVA well beyond the normal flight envelope, but such tests are carried out in a very precise manner by trained test pilots with a back-up parachute, and over water. Stalls and spins on any paragliders are dangerous manoeuvres and are not recommended.

## 7. Storage and Servicing

### Storage & Care

If you have to pack your canopy away wet, do not leave it for more than a few hours in that condition. As soon as possible dry it out, but do not use direct heat sources as it is inflammable!

Always store the canopy in a dry, warm place. Ideally this should be in the temperature range of 5 to 13 degrees centigrade.

Never let your canopy freeze, particularly if it is damp.

The high-quality nylon your paraglider is made from, is treated against the effects of ultraviolet radiation. However, UV exposure will still weaken the fabric and prolonged exposure to harsh sunlight can severely compromise the safety of your canopy. Therefore once you have finished flying, put your wing away. Do not leave it out in strong sunshine unnecessarily.

Do not treat your canopy with chemical cleaners or solvents. If you must wash the fabric, use warm water and a little soap. If your canopy gets wet in sea water, wash it with warm water and carefully dry it.

Small tears in the top or bottom surface (not normally the ribs) of a canopy can be repaired with a patch of self-adhesive ripstop nylon. Tears no longer than 100mm can be repaired in this way providing they are not in a high-stress area. If you have any doubt about the airworthiness of your canopy please contact your dealer or BGD directly.

## Servicing / Inspection

It is important to have your glider regularly serviced. It should have a thorough check / inspection every 24 months or every 150 flight hours, whichever occurs first. This check must be made by the manufacturer, importer, distributor or other authorised persons. The checking must be proven by a stamp on the certification sticker on the glider as well in the service book. BGD will offer an inspection service every winter. This is a comprehensive service which checks line lengths and strength, fabric porosity and tear strength and a variety of other tests and we strongly advise all pilots to take advantage of this.

Please print out the service pages from this manual, fill in the number of flights and hours flown in the Service Record, and send it with your glider when it goes for inspection or servicing. The manufacturer will only accept responsibility for paraglider lines and repairs which we have produced and fitted or repaired ourselves.

## Environmental protection and recycling

Our sport takes place in the natural environment, and we should do everything to preserve our environment. A glider is basically made of nylon, synthetic fibres and metal. At the end of your paraglider's life span, please remove all metal parts and put the different materials in an appropriate waste/recycling plant.

## 8. Technical data

### Materials

The DIVA is made from the following quality materials:

Top surface:	Dominico D30
Bottom surface:	Porcher Skytex 27g/m <sup>2</sup> soft white
Supported ribs (profil):	Porcher Skytex 38g/m <sup>2</sup> hard finish white
Unsupported ribs (profil):	Porcher Skytex 27g/m <sup>2</sup> hard finish white
Diagonal ribs:	Porcher Skytex 38g/m <sup>2</sup> hard finish white
CS Straps (connectors):	Porcher Skytex 38g/m <sup>2</sup> hard finish white
Nise reinforcing:	2.5mm plastic wire centre, 2.0mm tips
Risers:	Liros 13 mm black kevlar/nylon webbing
Maillons:	Maillon Rapide 3.5mm maillons
Pulleys:	Ronstan bearing 20mm black
Top lines:	Edelrid 8000U
Middle lines:	Edelrid 8000U
Lower lines:	Edelrid

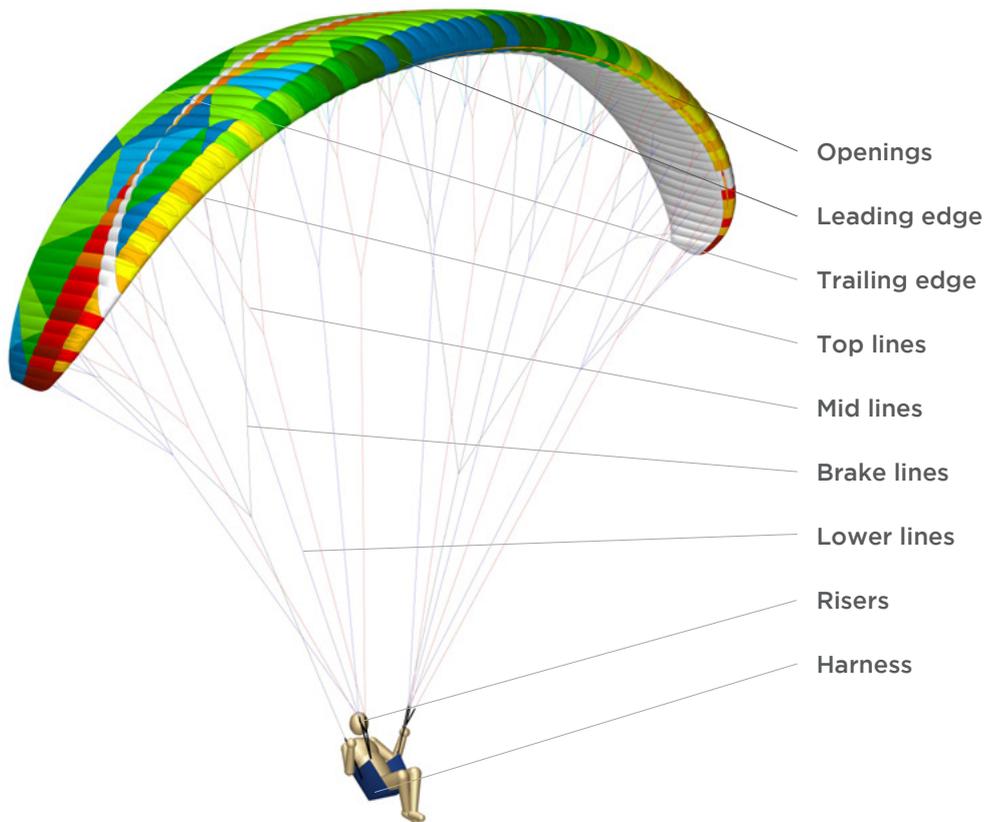
Spare parts can be obtained directly from BGD or through our network of registered BGD repair shops.

For a full list check [www.flybgd.com](http://www.flybgd.com)

## Specifications

	XS	S	M	L
Linear scaling factor	1	1.04	1.08	1.12
Projected area (m <sup>2</sup> )	17.4	18.8	20.3	21.9
Flat area (m <sup>2</sup> )	21	22.7	24.5	26.3
Glider weight (kg)	5	5.4	5.8	6.2
Total line length (m)	205	212	222	231
Height (m)	7.1	7.4	7.6	7.9
Number of main lines A/B	3/3	3/3	3/3	3/3
Cells	74	74	74	74
Flat aspect ratio	7.5	7.5	7.5	7.5
Projected aspect ratio	5.4	5.4	5.4	5.4
Root chord (m)	2	2.1	2.3	2.5
Flat span (m)	12.6	13	14.1	15.8
Projected span (m)	9.7	10.1	10.9	12.2
In-flight weight range (kg)	70 - 90	80 - 100	90 - 112	100 - 125
Trim speed (km/h)	40	40	40	40
Top speed (km/h)	75	75	74	74
Min sink (m/s)	1	1	1	1
Best glide	12	12	12	12
Certification	CCC	CCC	CCC	CCC

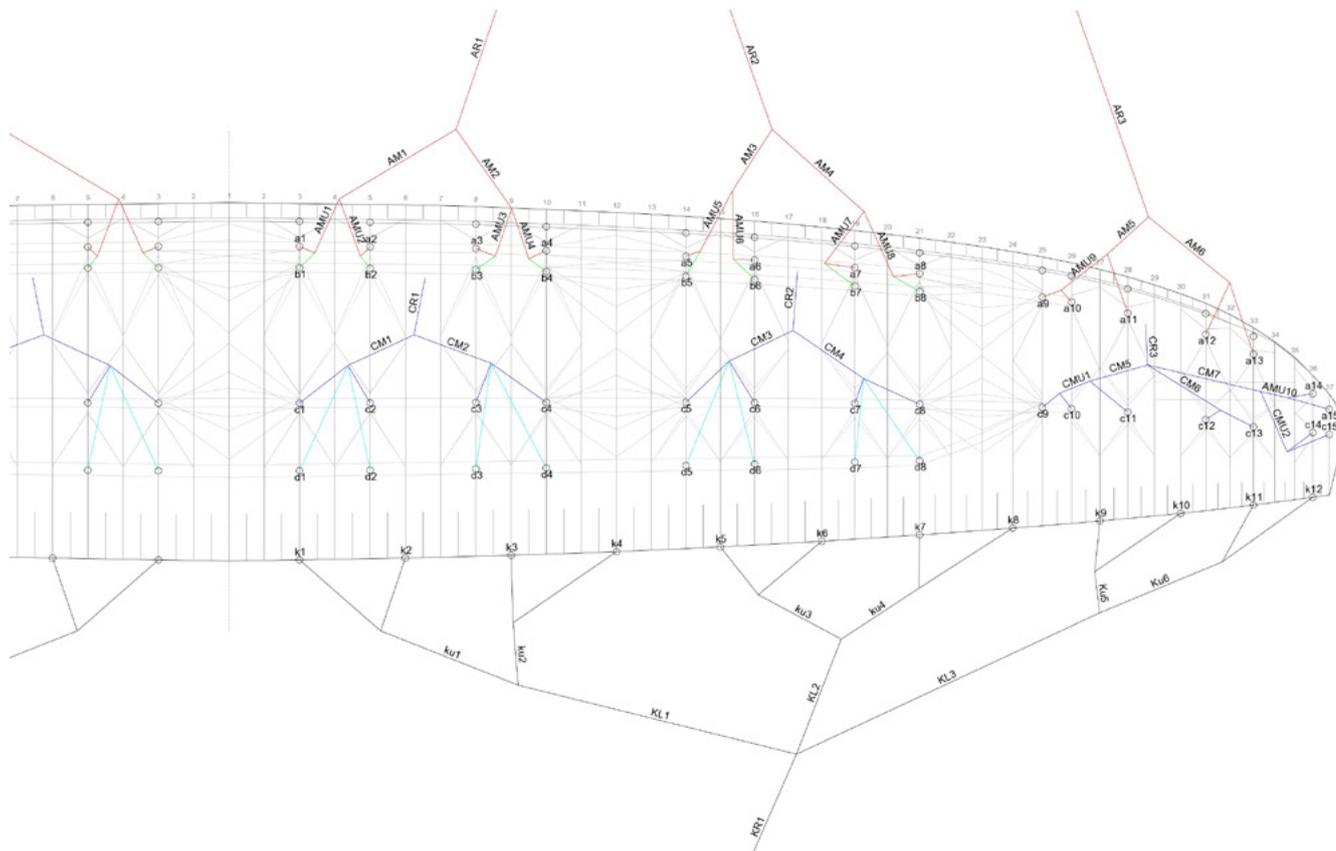
### Overview of glider parts



### Risers



## Line Plan



## 9. Service Booklet

### Test Flight Record

Model

Size

Serial Number

Colour

Date of test flight

Company signature and stamp

## Service Record

**Service No 1:**

Date :

Stamp - Signature :

No flights :

Type of service :

**Service No 2:**

Date :

Stamp - Signature :

No flights :

Type of service :

**Service No 3:**

Date :

Stamp - Signature :

No flights

Type of service :

## Owner Record

Pilot No 1

First name

Family name

Street

City

Post code

Country

Telephone

Email:

## Owner Record

Pilot No 2

First name

Family name

Street

City

Post code

Country

Telephone

Email:

## 10. Closing Words

With careful treatment your wing should last for many years. You should take care of it, and always respect the potential dangers of aviation. Your safety depends on you.

We recognise that there are still unknowns, for example the effective lifespan of the current generation of paragliders and how much cloth aging is possible before it starts to affect the airworthiness of the paraglider.

There are natural forces that can threaten your safety, regardless of the quality of construction or the condition of your glider. Your security is ultimately your responsibility. We strongly recommend that you fly carefully, adapt your flying to the weather conditions and always keep your safety in mind.

We recommend that you fly with a standard harness with back protection and a reserve parachute, and always use an approved helmet.

Fly safely, enjoy your new paraglider, and see you in the sky!

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