

OZONE

Roadster 4

Pilot Manual - EN



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THANK YOU

Thank you for choosing to fly Ozone. As a team of free flying enthusiasts, competitors and adventurers, Ozone's mission is to build agile paragliders of the highest quality with cutting edge designs, performance and maximum security.

Confidence and belief in your paraglider is a far greater asset than any small gains in performance - ask any of the Ozone pilots on your local hills, or those who have taken our gliders on ground-breaking adventures or stood on podiums around the world. All our research and development is concentrated on creating the best handling/performance characteristics possible with optimum security. Our development team is based in the south of France. This area - which includes the sites of Gourdon, Monaco and Col de Bleyne - guarantees us more than 300 flyable days per year, this is a great asset in the development of the Ozone range.

As pilots we fully understand just how big an investment a new paraglider is. We know that quality and value for money are essential considerations when choosing a new wing, so to keep costs low and quality high we manufacture all of our products in our own production facility. During production our wings undergo numerous rigorous quality control checks that are fully traceable, this way we can guarantee that all of our paragliders meet the same high standards.

This manual will help you get the most out of your glider, it is essential that you read it before flying your new wing for the first time. Its details the procedure for preparing the wing before flight, basic flying techniques and also includes tips and advice on how best to care and maintain your wing to ensure a long life and high resale value. For the latest updates, including all technical data please refer to the online version. This can be found on the product's page at www.flyozone.com

If you need any further information about any of our products please check flyozone.com or contact your local dealer, school or any of us here at Ozone.

Safe Flying!
Team Ozone

WARNING

- Paragliding/Paramotoring is a potentially dangerous sport that can cause serious injury including bodily harm, paralysis and death. Flying an Ozone paraglider is undertaken with the full knowledge of the involved risks.
- As the owner of an Ozone paraglider you take exclusive responsibility for all risks associated with its use. Inappropriate use and or abuse of your equipment will increase these risks.
- Any liability claims resulting from use of this product towards the manufacturer, distributor or dealers are excluded.
- Be prepared to practice as much as you can - especially ground handling, as this is a critical aspect of paragliding. Poor control while on the ground is one of the most common causes of accidents.
- Be ready to continue your learning by attending advanced courses to follow the evolution of our sport, as techniques and materials keep improving.
- Use only wings suitable for your level and always fly with a reserve parachute. Respect the recommended weight ranges, never fly above the maximum permitted load. Flying a wing outside its certified configuration is dangerous and increases the risk of structural failure, it may also jeopardise any insurance (e.g. liability, life etc) you have.
- Make sure you complete a thorough daily and preflight inspection of all of your equipment. Never attempt flying with unsuitable or damaged equipment.
- Always wear a helmet, gloves and boots.
- All pilots should have the appropriate level of license for their respective country and third party insurance.
- Make sure that you are physically and mentally healthy before flying.
- Choose the correct wing, harness and conditions for your level of experience.
- Pay special attention to the terrain you will be flying and the weather conditions before you launch. If you are unsure do not fly, and always add a large safety margin to all your decisions.
- **NEVER fly your glider in rain, snow, strong wind, clouds or turbulent weather conditions.**
- If you use good, safe judgment you will enjoy many years of paragliding/paramotoring.

YOUR ROADSTER 4

The Roadster 4 is a dedicated paramotoring wing with a fully reflexed profile that is safe, fun and agile. It excels in all types of powered flight: circuits, low level precision flying and XC adventures. Thanks to its ease of use and high levels of safety it is suitable for a wide range of pilots from the newly qualified to the more experienced. Beginners under training and the newly qualified will appreciate the impeccable launching characteristics and rock solid stability whilst experienced XC pilots will appreciate its overall efficiency, performance and agile handling. The Roadster 4 is a truly versatile wing; designed for pilots who want to progress and develop their skills with the added security of EN B certification.

Based on the successful Roadster 3, the latest generation features a significant number of enhancements which improves safety, precision, control, performance and launch characteristics without compromising the fun. With the same proven planform and aspect ratio as its predecessor, adjustments have been made to the OZRP cell opening position and profile thickness to aid the inflation behaviour so it rises above the head faster. The Roadster 4 now features double 3D shaping and mini ribs, pulled directly from our competition winning series to significantly improve the airflow in these aerodynamically critical areas. Higher levels of efficiency improves performance which equates to slower take off speeds and higher fuel efficiency.

The Roadster 4 implements winglets for increased safety by improving roll and spiral stability. Improved roll stability makes the wing easier to fly at full speed, the wing feels like it is on rails and the tip steering system allows for precise response control whilst accelerated. Improved spiral stability reduces the likelihood of neutrality, the tendency is for it to always pull out of spiral dives even when flown heavily loaded and with high hang pointed harnesses. The new arc offers better roll response in the turn for more direct, precise handling whilst also calming the behaviour during side collapses for improved safety.

The updated risers are sublimation printed to easily identify your trim settings and feature long range roller cam trimmers for smooth operation; a foot operated speed system; tip steering system and fully adjustable brake attachment points to suite different power units and pilot preferences.

The Roadster series continues to improve and impress, advances in performance, ease of use and safety make for a truly versatile wing that excels in powered flight whilst offering more than enough sink rate performance and handling for un-powered free flying. The brake response and overall levels of agility makes the Roadster 4 fun, a real pleasure to fly suited for carving low level lines and thermalling high up to the clouds, wherever the adventure takes you.

The risers feature coloured long range Rollercam trimmers; stronger brake handle magnets; TST steering system; fully adjustable brake pulley height settings and coloured risers for easy identification. See pg 30.

Trimmers

The Roadster 4 comes equipped with a new trimmer system featuring Roller Cam buckles and printed webbing. This system allows for easy adjustment of the trimmer position and prevents the trimmer buckle from slipping. The coloured webbing includes a black and white line with an arrow to indicate the recommended trimmer position for takeoff. Additional marked lines on the webbing assist with symmetrical trim adjustments. The Roadster 4 has been flight tested to EN 926-2 standard (flight test) with the trimmer fully pulled to its slowest position.

The wing inflates well in the slow (standard) setting but the trimmers can be released, up to the white arrow for faster inflation behaviour during the take-off, this is especially useful in light winds and/or at high altitudes. The white arrow position is a good setting for 'normal' powered flight, it allows you to cruise around with a relatively high trim speed whilst retaining efficiency. The lines on the trimmers indicate a reference for symmetry.

The standard (slow) trim setting is ideal for climbing under power, whilst thermalling, free flying and when flying in turbulent conditions, brake pressure is at its lightest and the handling at its best.

To increase cruise speed you can use the accelerator system, release the trimmers, or do both. Using the speed system has exactly the same effect as releasing the trimmers. Unlike some other PPG wings, it is safe and possible to fly with the trimmers in the standard (slow) position whilst using the full range of the foot operated speed system.

With the trimmers fully released it is possible to use the brakes for directional control. However when flying faster by accelerating further with the speed system directional control should be maintained with the TST. Using the brakes at speeds faster than the trimmer-released position can lead to a collapse.

Speed System

The risers feature a foot operated speed system with ball bearing pulleys for easy, comfortable high speed cruising. Using the speed system has exactly the same effect as releasing the trimmers - either can be used in any combination to accelerate the wing. Be careful, fully accelerated with the trimmers released is very fast and due to the lower angle of attack the wing is more prone to collapse. Flying at full speed should only be done in calm conditions and with sufficient altitude. Use the TST for directional control, applying the brakes whilst fully accelerated may lead to a collapse.

Brake Lines

The brake line lengths have been set carefully during testing. We feel it is better to have slightly long brake lines and to fly with a wrap (one turn of line around the hand). However, if you do choose to adjust their length please keep in mind the following:

- Ensure both main brake lines are of equal length.
- If a brake handle has been removed, check that its line is routed through the pulley when it is replaced.
- When the brakes are fully released in flight, the brake lines should be slack. There must be a substantial bow in them to guarantee no deformation of the trailing edge when accelerated.
- There must be a minimum of 10cm of free play before the brakes begin to deform the trailing edge. This prevents the trailing edge from being deformed when using the speed system.

Adjustable brake line pulley height

The height of the brake line pulleys can be adjusted according to pilot preference and to suite the power unit's hang point height. The height can be set as desired, setting it near the upper part (as set by the factory) is suited for low hang point motors whilst lower settings are for units with higher hang points.

If you lower the brake line pulley, you must lengthen the brake lines accordingly.

Adjust the position of the brake handle retaining magnet as necessary.

IMPORTANT

Using the accelerator or releasing the trimmers decreases the angle of attack and makes the wing more prone to collapse, therefore accelerating the wing near to the ground or in turbulent conditions should be avoided.

IMPORTANT

If you adjust the brake handle height, you MUST re-lengthen the brake lines accordingly.

Tip Steering System

The Tip Steering System (TST) uses ergonomic handles for control of the wing during high speed accelerated flight. Located on the B risers, the handles are easily accessible and linked to the very tips of the wing, giving high levels of precision and comfort for high speed cruising or accurate low level carving. The TST allows for precise handling without the need to use the brakes, it is not necessary to use large control movements to effect a turn so be progressive and gentle at first until you are familiar with the handling characteristics. The attachment height of the TST handles can also be adjusted according to your comfort, flying style and motor unit.

With the trimmers fully released it is possible to use the brakes for directional control. However when flying faster - by accelerating further with the speed system - directional control should be maintained with the TST. Using the brakes at speeds faster than the trimmer-released position can lead to a collapse. Application of brake when the wing is at a low angle of attack has a negative effect on the reflex profile causing loss of precision, adverse roll, and reduced collapse resistance. In accelerated flight the tip steering system can be used for both directional control - to keep a straight heading and for effecting nice smooth turns. It becomes more precise the faster you fly.

When using the TST, it is advised to keep the brake handles through the wrists. This is in case of an engine failure or loss of control. It is therefore necessary to ensure that the brake lines are adjusted in such a way that they are not activated when using the tip steering - make sure the brake and TST lines are set correctly.

IMPORTANT
In the unlikely event of a brake line snapping in flight, or a handle becoming detached, the glider can be flown by gently pulling the rear risers or the TST system for directional control.

LIMITATIONS

Pilot Suitability

The Roadster 4 has been designed as a solo beginner/intermediate level wing. Due to its forgiving nature it is also suitable for all levels of training. It is not intended for tandem flights nor aerobatic manoeuvres.

Certification

This wing has passed the criteria required by the DGAC and has been load tested to the EN 926.1 standard. In addition to our own extensive testing, sizes 24, 26 and 28 have also been independently flight tested to the EN 926.2 standard with the trimmers set to the slow position. Releasing the trimmers, using the accelerator or flying outside of the EN certified weight range invalidates any EN flight certification. Using a harness that does not conform to the dimensions required of the EN standard or flying with a power unit will lead to a change in the flight characteristics. As delivered, the wing does not conform to the EN 926.2 standard due to the inclusion of the trimmer risers.

Choosing Your Wing Size

The most suitable size wing for you depends on how you intend to use it. If you will be flying solely with a motor, aim for the middle of the PPG weight range (all up weight with wing, motor, fuel etc). However if you intend to also free fly with the wing, consider your all up free flying weight and aim to be near the top of the PG weight range.

Never fly above the recommended maximum PPG weight.

Wing Loading and Flight Characteristics

Wing loading has a significant effect on the flight characteristics and behaviour of the wing. Heavily loaded, the Roadster 4 is more responsive to pilot inputs and reacts more dynamically in turns with a greater loss of height. Recovery from collapses tend to be more impulsive and with higher pitch angles. High loading also makes the wing more likely to remain neutral in a spiral dive, especially when combined with a high hang point or trike power unit. Flying at the maximum recommended load is only suitable for more experienced pilots who have the necessary skills to control a more dynamic wing. High G rapid descent manoeuvres should be avoided when flying above the maximum recommended EN weight or when flying with a trike or high hang point harness. We advise you to aim for near the top of the recommended EN weight range for free flying and to never fly above Ozone's recommended PPG weight range whilst under power.

IMPORTANT

This wing has passed the criteria required by the DGAC and has been load tested to the EN 926.1 standard. In addition to our own extensive testing, sizes 24, 26 and 28 have also been independently flight tested to the EN 926.2 standard with the trimmers set to the slow position and without the use of the speed bar. Releasing the trimmers, using the speed bar or flying outside of the EN certified weight range invalidates any 3rd party EN flight certification.

Load test and wing loading information for PPG wings

To verify the structural strength of a paraglider or paramotor wing, the larger sizes of each model are subjected to the EN 926.1 load test. This test is comprised of two parts; a static shock test, and a sustained load test. First, using at least a 1000 kg weak link (higher for tandems) the wing must survive a brutal static shock test without any visible signs of damage to the lines or sail. The same wing then performs a sustained load test, inflated and pulled along a runway by a large truck until a three second average value of 8G is achieved without breaking. 8G is the minimum accepted load factor for EN certification, calculated by 8x the maximum permitted EN weight.

In addition to EN 926.1 our paramotor wings are also recognised by the DGAC, an entity responsible for Microlight (ULM) and lightweight powered aircraft (Paramotor) certification in France. Using the EN load test results, the DGAC accepts 5.25G as the maximum acceptable load factor.

We consider the DGAC load factor limit of 5.25G to not be sufficient, in our testing we have recorded loads of exceeding 5.25G during fully engaged, nose-down spiral dives throughout the weight range. For this reason we use the established EN 926.1 8G limit to set the maximum permitted load.

Despite this safety margin, due to the natural ageing process of the materials and the chances of accidental damage, we recommend when flying at high wing loadings (above the middle of the recommended PPG weight range) to not perform deeply engaged nose down, high-G spirals and other aggressive aerobatic manoeuvres. Doing so poses a real risk of line failure with potentially fatal consequences.

Trike Flying

The Roadster 4 may be used with a light solo trike so long as the maximum recommended weight range is respected. It is strongly recommended to not perform deeply engaged, high sink rate spirals when flying with a trike.

Towing

The Roadster 4 may be tow-launched. It is the pilot's responsibility to use suitable harness attachments and release mechanisms and to ensure that they are correctly trained on the equipment and system employed. All tow pilots should be qualified to tow, use a qualified tow operator with proper, certified equipment, and make sure all towing regulations are observed.

IMPORTANT

Do not perform high G spiral dives when flying above the maximum EN weight range or when flying with a trike or a high hang point harness

IMPORTANT

Wing loading has a direct effect on the flying characteristics. The closer to the top of the recommended weight range the more dynamic and responsive the wing will be. Fly progressively.

IMPORTANT

It is strongly recommended to not perform deeply engaged, high sink rate spirals when flying with a trike.

Flying in the Rain

Modern wings are susceptible to rain and moisture, flying with a wet wing can result in the loss of normal flight. Due to the efficient, wrinkle-free design of the sail, water tends to bead on the leading edge causing flow separation. Flow separation will make the wing more prone to entering inadvertent parachutal stalls, so flying in the rain, or with a wet wing (e.g early morning dew) should be avoided at all costs. If you are accidentally caught-out in a rain shower, it is best to land immediately. If your wing becomes wet in the air it is advised to maintain accelerated flight using the speed bar and/or releasing the trimmers, even during the final approach. DO NOT use big ears as a descent technique, big ears increases drag, and with a wet wing this will further increase the chances of a parachutal stall occurring. Instead, lose height with gentle 360's and maintain your air speed at all times. If your wing enters parachutal stall when wet, immediately release the trimmers and accelerate the wing to regain airspeed.

Modifications

Your Ozone Roadster 4 was designed and trimmed to give the optimum balance of performance, handling and safety. Any modification voids the certification and will also make the wing more difficult and dangerous to fly. For these reasons, we strongly recommend that you do not modify your glider in any way.

IMPORTANT
**Do not fly when your
wing is wet.**

PREPARATION

Harness and Motor

It will be in your harness that you will enjoy flying. Therefore, we recommend you spend the time on the ground to adjust your harness' different settings. Hang from a solid beam and double check that you are comfortable and that you can reach the brake handles and that you can achieve the full range of speed bar travel before flying. Do not fly with your chest strap set too tight.

The Roadster 4 is suitable for all types of power units, however we recommend using units with low hang points or Goose neck systems. Using power units with high hang points is possible, but it will have a detrimental effect on the behaviour of the wing especially during spiral dives with an increased risk of neutrality. Using a harness that does not conform to the dimensions required of the EN standard or flying with a power unit will lead to a change in the flight characteristics.

There are many different motor units available and it is vitally important that you choose one that is suitable for your needs, weight and skill level. Due to the high performance profile of the Roadster 4, a unit with a less powerful motor and low movable hang points may be advisable.

Wing

To familiarise yourself with the glider it is a good idea to perform practice inflations and ground handling both with and without the motor. As with all new equipment, only fly in conditions that you would normally fly in and on a familiar site. Fly the wing in a progressive manner and be aware that wing loading has a direct effect on the wing's flying characteristics.

Preflight Checks

Lay out the wing downwind of your motor on its top surface in a pronounced arc, with the centre of the wing higher than the tips. As you unfold the wing check the upper and lower panels for any rips or tears, pay particular attention to the seams and line attachment points as these are load bearing. Never fly with a damaged wing.

Lay out the lines one side at a time and check for any obvious signs of damage. Hold the risers clear of the ground at shoulder height and starting with the brake lines, pull all lines clear. Repeat the process with the D, C, B and then the A lines, laying the checked lines on top of the previous set. Make sure no lines are tangled, knotted or snagged then mirror the process on the other side.

IMPORTANT

The wing has been certified with defined harness dimensions. The 28 was certified with the hang point width between 46cm to 48cm, and the 26 & 24 between 46cm to 44cm.

IMPORTANT

Always lay out your glider downwind of the motor, never leave the motor downwind of the wing or connected to the motor if unattended.

IMPORTANT

Never fly with a damaged sail or lines.



Take-off checklist:

1. Check reserve parachute - pin in and handle secure
2. Helmet on and fastened
3. All harness buckles closed - check leg-loops again
4. Carabiners and maillons tight
5. Holding the A's, your brake handles and throttle
6. Leading edge open
7. Aligned directly into wind
8. Engine warm and able to deliver full power
9. Trim set correctly
10. Prop clear of lines
11. Airspace and visibility clear

BASIC FLIGHT TECHNIQUES

Launching

Your Roadster 4 will launch with either the forward or reverse technique. The wing should be laid out in a pronounced arc, with the centre of the wing higher than the tips.

Forward Launch - Nil to Light winds

When the wind is favourable, whilst gently holding the A risers move forward positively, your lines should become tight within one or two steps and the Roadster 4 will immediately start to inflate. You should maintain a constant pressure on the risers until the wing is overhead. Do not pull down or push the risers forward excessively, or the leading edge will deform and possibly collapse making taking-off more difficult and potentially dangerous.

Move smoothly throughout the entire launch, there is no need to rush or snatch at it. You should have plenty of time to look up and check your canopy before committing yourself. Once you are happy that the Roadster 4 is inflated correctly, accelerate smoothly off the launch.

Reverse Launch - Light to Strong Winds

Lay out your wing as you would for the forward launch. However, this time turn to face it, passing one entire set of risers over your head as you turn. Now you can inflate the glider with your body weight and the A-risers. Once the wing is overhead, release the risers, brake gently if necessary, turn and launch.

In stronger winds, be prepared to take a few steps towards the glider as it inflates. This will take some of the energy out of the glider and it will be less likely to overfly you. This reverse-launch technique can be used in surprisingly light winds too.

Practice ground handling as much as possible! Not only is it great fun, but it will give you a much better feel for your wing's flight characteristics. It will also improve your overall enjoyment of flying by giving you the feeling of control and making your launches easier and less stressful.

The Climb Out

Once in the air you should continue flying into wind whilst gaining height. Do not attempt to climb too steeply or too quickly by using the brakes or slow trim. The wing already has a high angle of attitude, coupled with a higher AoA (if you use the brakes) plus the engine's full thrust acting on the pilot, this could contribute to make the glider more prone to stall. Furthermore, in the event of an engine failure the

IMPORTANT

The trimmers can be set to the take off position mark for better inflation behaviour during take-off. This is especially important in light winds and/or at high altitudes.

IMPORTANT

Never take off with a glider that is not fully inflated or if you are not in control of the pitch/roll of your wing.

resulting backward pendulum motion of the pilot and the forward dive of the wing may bring you back to the ground very hard. Do not initiate turns until you have sufficient height and airspeed. Avoid low turns downwind with insufficient airspeed.

The Roadster 4 is well damped in roll but under certain circumstances it is possible for the pilot to induce oscillations. This is caused by a combination of the engine/propeller torque and pilot weight shift and/or brake inputs. To stop oscillations it is best to reduce the power slightly and ensure that you remain static with weight shift and brake inputs. Once settled you can once again apply full power. Under full power the torque effect will attempt to gently turn the wing, using weight shift or adjusting the trims asymmetrically is the best method to correct this.

Normal Flight

Once at a safe height you can release the trimmers for a faster cruise speed. If your motor has enough power, the Roadster 4 will achieve very good straight line speeds whilst maintaining level flight with trims fully released and full speed bar applied. Be cautious when releasing the trimmers, only do so in calm conditions.

Flying at trim speed (hands-up, trimmers pulled to the slow position), the Roadster 4 will achieve its 'best glide' speed for still air. You should fly at this speed when gliding downwind or when the air is not excessively sinking. For better penetration in headwinds and improved glide performance in sinking air, crosswinds or headwinds, you should fly faster than trim speed by using the accelerator system or trimmers. Using up to half bar does not degrade the glide angle or stability significantly and will improve your flying performance. At full speed the Roadster 4 is stable; however we recommend that you do not fly at full speed close to the ground or in turbulent air.

By pulling the trimmers to the slow position and applying a small amount of brake, the Roadster 4 will achieve its best minimum-sink rate; this is the speed to use for thermalling and ridge soaring whilst free flying. For maximum efficiency whilst flying downwind, release the speed bar and return the trimmers to the slow position.

IMPORTANT
Never apply the brakes whilst flying at full speed - it makes the wing more prone to collapse.

Turning

To familiarize yourself with the Roadster 4 your first turns should be gradual and progressive. To make efficient and coordinated turns with the Roadster 4 first look in the direction you want to go, then lean into it. Your first input for directional change should be weight-shift, followed by the smooth application of the brake until the desired bank angle is achieved. To regulate the speed and radius of the turn, coordinate your weight shift and use the outer brake.

Active Flying

To minimize the likelihood of suffering collapses in turbulent conditions, it is essential to use active flying. These are skills that are best learnt by playing with the glider on the ground. Flying with a small amount of brake applied (approx. 20cm) will allow you to feel the feedback from the wing. In turbulent conditions the internal pressure of the wing is constantly changing and only by using a small amount of brake will you feel these changes. The aim of active flying is to maintain a constant pressure through the brakes, If you feel a reduction or loss of pressure apply the brakes until you feel normal pressure again. Once you have normal pressure, raise the hands quickly back to the original position. Avoid flying with continuous amounts of deep brake in rough air as you could inadvertently stall the wing. Always consider your airspeed.

These movements can be symmetric or asymmetric; you may have to apply both brakes or just one. These subtle adjustments will keep the glider flying smoothly and directly above you and dramatically reduce the chances of a collapse. If the glider pitches in front of you, use the brakes to slow it down. Equally, if the glider drops behind you, release the brakes to allow it to speed up. The goal is to always keep the wing directly overhead.

No pilot and no glider are immune to collapses however active flying will virtually eliminate any tendency to collapse. When the conditions are turbulent, be more active and anticipate the movements of your wing.

IMPORTANT

Never initiate a turn at minimum speed (i.e. with full brakes on) as you could risk entering a spin.

IMPORTANT

In turbulent air return the glider to trim speed - release the speed bar and return the trims to the slow position.

IMPORTANT

Always keep hold of your brakes. Do not fly in turbulent conditions.

Landing

The Roadster 4 shows no unusual landing characteristics but as a reminder, here are some tips:

- Always set up for your landing early, give yourself plenty of options and a safe margin for error.
- Once below 30 metres avoid turning tightly as the glider will have to dive to accelerate back to normal flight. If you are at low altitude, or if you hit sink, this could mean you hit the ground harder than necessary.
- Lean forward out of your harness before the actual landing (especially if it's turbulent), with your weight leaning forward against the chest strap, and make sure your legs are ready for the landing and a possible PLF (parachute landing fall).
- Allow the glider to fly at hands up (trim) speed for your final descent until you are around 1 metre above the ground (in windy or turbulent conditions you must fly the glider actively all the way). Apply the brakes slowly and progressively to slow the glider down until groundspeed has been reduced to a minimum and you are able to step onto the ground.
- In light winds/zero wind you need a strong, long and progressive flare to bleed off all your excess ground speed. In strong winds your forward speed is already low so you are flaring only to soften the landing. A strong flare may result in the glider climbing upwards and backwards quickly, leaving you in a vulnerable position.
- If the glider does begin to climb, ease off the brakes (10-20cm) - do not put your hands up all the way - then flare again, but more gently this time. Keep the brakes at mid speed, stand up, be ready to run and make sure you brake fully as you arrive on the ground.
- Choose the appropriate approach style in function of the landing area and the conditions.
- In strong winds you need to turn towards the glider the second your feet touch the ground. Once facing the wing pull smoothly and symmetrically down on the brakes to stall the wing. If the glider pulls you, run toward it.
- If the wind is very strong, and you feel you might be dragged, or lifted again, stall the glider with the C risers. This stalls the wing in a very quick and controllable way and will drag you less than if you use the brakes.
- Always land heading into wind!

RAPID DESCENT TECHNIQUES

Ozone would like to remind you that the following manoeuvres should be learnt under the supervision of a qualified instructor and always used with caution. Never forget that properly analysing the conditions before launch will help avoid the need to use these techniques.

Big Ears

Folding in the wing tips increases the sink rate without radically changing the airspeed. This is useful for staying out of cloud or descending quickly through the lift band of the hill, for example when top landing.

To pull big ears, keep hold of your brake handles and take the outermost A-line on each side, then pull out and down (preferably one at a time) until the wing tips fold under. The Outer A line is attached to the Baby A riser, making identification and use of the big ear system easier. The size of the big ears can be adjusted by pulling more line, or reaching higher up the line. For directional control while using the Big Ears, you should use weight shift. To reopen the ears, release both A lines at the same time. To help reinflation, brake gently one side at a time until tips regain pressure. Avoid deep symmetric applications of the brake as this could accidentally induce parachutal or full stalls.

You may use Big ears for the final landing approach but they should be released before making the final flare. Ozone advise to not use this technique in turbulent or windy conditions due to the reduced ability to fly actively and the risk of an inadvertent stall whilst descending through the wind gradient.

Once the big ears are engaged you can further increase the sink rate by pushing on the accelerator bar, however NEVER try to pull the Big Ears in if the accelerator is already pushed. The lower angle of attack and the act of deflating the tips can lead to a major deflation. Always make the Big Ears first and then apply the speed bar.

Whilst it is possible to enter a spiral dive whilst holding in Big Ears, the high forces applied to the lower lines could exceed the breaking strain of the lines leading to equipment failure!

Ozone strongly recommend to NOT perform Spiral Dives with Big Ears engaged.

NEVER induce Big Ears in accelerated flight, this can lead to a major deflation. Always pull the Big Ears first and then apply the speed bar.

DO NOT perform spiral dives with Big Ears engaged.

B-Line Stall

The B-line stall is for fast descents in emergency situations only, it is faster and safer to lose altitude with a spiral dive than a B-stall. To initiate the B-stall, keep the brakes in your hand and take hold of both the B risers, or place your fingers between the lines above the maillons. As you pull the B-lines down the airflow over the wing is broken and the glider loses its forward speed but remains open with a reduced cord. You can descend at around 6 m/s. To exit the B-stall the B-risers should be released symmetrically and in one smooth, progressive motion. The glider will resume normal forward flight without further input. Check you have forward flight again before using the brakes. If you pull too much B-line the glider may horseshoe and move around a lot. If this occurs, slowly release the B lines until the wing stabilises or simply exit the B line stall by immediately release the B risers. Do not attempt to maintain a B line stall that is not stable.

Spiral Dives

If you turn your glider in a series of tightening 360's it will enter a spiral dive. This will result in rapid height loss. To initiate a spiral, look and lean in to the direction you want to go, then smoothly pull down on the inside brake. The Roadster 4 will first turn almost 360 degrees before it drops into the spiral. Once in the spiral you should re-centre your weight shift and apply a little outside brake to keep the outer wing tip pressured and inflated.

Safe descent rates of more than 8m/s (1600 ft/min approx.) are possible in a spiral dive, but at these rates the associated high speeds and G-forces can be disorientating. Always pay particular attention to your altitude. To exit the spiral dive, ensure your weight shift is in a centred position and then smoothly release the inside brake. As the Roadster 4 decelerates allow it to continue to turn until enough energy is lost for it to return to level flight without an excessive climb and surge.

The Roadster 4 shows little tendency to remain neutral in a spiral dive; however some parameters could interfere with its behaviour. These might include: wrong chest strap settings, total weight in flight outside of the certified weight range, or being in a very deep spiral at a very high sink rate >14m/s. You should always be prepared to pilot the wing out of such a spiral dive. To do so, smoothly use opposite weight shift and apply enough outside brake to stop the wing from spiralling, the glider will then start to resume normal flight. Never attempt to recover from a spiral with hard or quick opposite inputs as this will result in an aggressive climb and surge.

IMPORTANT

Always be prepared to pilot the wing out of a spiral dive. Use opposite weight shift and apply enough outside brake to stop the wing from spiralling.

INCIDENTS IN FLIGHT

Deflations

Due to the flexible form of a paraglider, turbulence may cause a portion of the wing suddenly to collapse. This can be anything from a small 30% (asymmetric) collapse to a complete (symmetric) collapse.

If you have a collapse, the first thing to do is to control your direction. You should fly away from the ground or obstacles and other pilots. Asymmetric collapses should be controlled by weight shifting away from the collapse and applying enough brake to control your direction. This action alone will be enough for a full recovery of the wing most of the time.

Once a glider is deflated it is effectively a smaller wing, so the wing loading and stall speed are higher. This means the glider will spin or stall with less brake input than normal. In your efforts to stop the glider turning towards the collapsed side of the wing you must be very careful not to stall the side of the wing that is still flying. If you are unable to stop the glider turning without exceeding the stall point then allow the glider to turn whilst you reinflate the collapse.

If you have a deflation which does not spontaneously reinflate, make a long smooth progressive pump on the deflated side. This pumping action should take about 1-2 seconds per pump. Pumping too short and fast will not reinflate the wing and pumping too slow might take the glider close to, or beyond, the stall point.

Symmetrical collapses reinflate without pilot input, however 15 to 20cm of brake applied symmetrically will speed the process. After a symmetric collapse always consider your airspeed. Make sure the glider is not in parachutal stall before making any further inputs.

If your Roadster 4 collapses in accelerated flight, immediately release the accelerator and manage the collapse using the same methods described above.

WARNING
Uncoordinated wingovers can lead to large asymmetric collapses and cravats, therefore they should never be executed near the ground.

Cravats

If the tip of your wing gets stuck in the lines, this is called a 'cravat'. This can make your glider go into a spiral, which is difficult to control. The first solution to get out of this situation is to stabilise the glider into normal flight, i.e get control of your direction and then pull down the stabilo line (BR4 - outside line on the B riser) until the wing tip clears. You must be careful with any brake inputs or you may stall the opposite wing. You can also use strong deep pumps of the brake on the cravated side, when doing so it is important to lean away from the cravat otherwise you risk spinning or deepening the spiral. The aim is to empty the air out of the wing tip, but without spinning. Correctly done, this action will clear the cravat.

If it is a very large cravat and the above options have not worked then a full stall is another option. This should not be attempted unless you have been taught how to do it and can only be done with a large amount of altitude. Remember if the rotation is accelerating and you are unable to control it, you should throw your reserve parachute whilst you still have enough altitude.

Deep Stall / Parachutal Stall

It is possible for gliders to enter a state of parachutal stall. This can be caused by several situations including; a very slow release from a B-line stall; flying the glider when wet; or after a front/symmetric deflation. The glider often looks as though it has recovered properly but carries on descending vertically without full forward motion. This situation is called 'deep stall' or 'parachutal stall'.

It is unlikely to happen on any Ozone glider, but should it do so your first reaction should be to fully raise both hands. This normally allows the glider to return to normal flight but If nothing happens after a few seconds, reach up and push the A-risers forwards or apply the speed bar to encourage the wing to regain normal flight. Ensure the glider has returned to normal flight (check your airspeed) before you use the brakes again.

Do not fly in rain, doing so significantly increases the likelihood of parachutal stalls occurring. To reduce the chance of stalling in rain avoid using deep brake movements or Big Ears. Find a safe area to land and using the speed bar, maintain a good airspeed at all times.

IMPORTANT

A bad preparation on launch, aerobatic flying, flying a wing of too high a level or in conditions too strong for your ability, are the main causes of cravats.

IMPORTANT

Only a few cms of input from your brakes can maintain your wing in the stall. Always release your wraps if you have taken them!

IMPORTANT

Never fly in the rain or with a wet glider.

CARE AND MAINTENANCE

Packing

To prolong the life of your wing and to keep the plastic reinforcements in the best possible condition it is very important to pack the wing carefully.

Ozone recommends to use the concertina packing method exactly as shown so that all of the cells rest alongside each other and the plastic reinforcements are not unnecessarily bent. You can however use the traditional half and half method. Using an Ozone Concerto pack will help preserve the life of the wing and aid with the speed and ease of packing.

Step 1. Lay mushroomed wing on the ground. It is best to start from the mushroomed position as this reduces the dragging of the leading edge across the ground.



Step 2. Group LE reinforcements with the A tabs aligned, make sure the plastic reinforcements lay side by side.



Step 3. Lay wing on its side and Strap LE...Note the glider is NOT folded in half; it is folded with a complete concertina from tip to tip. It is really important to not stress the middle cell or bend the plastic too tightly.



Step 4. Group together the middle/trailing edge of the wing by sorting the folds near the B, C and D tabs.

If using a Concerto pack go to Step 8.



Step 5. Once the LE and rear of the wing have been sorted, turn the whole wing on its side.



Step 6. Fold the wing with 3 or 4 folds whilst being careful not to crush the LE.



Step 7. Now place the folded wing into the stuff sack.



Step 8. If using the Concerto pack, carefully zip it up without trapping any material.



Step 9. Turn the Concerto on its side and make the first fold just after the LE reinforcements. Do not fold the plastic reinforcements, use 3 or 4 folds around the LE.



IMPORTANT: Do NOT lay the wing flat on the ground before packing the glider, this will cause abrasion damage to the top surface as you pull the glider towards the middle. ALWAYS pack from a mushroom or lift the wing off the ground when gathering the wing and grouping the leading edge.



IMPORTANT: Do not fold the glider in the centre, you will bend the plastics, instead pack the wing with a full concertina method from tip to tip before packing into the stuff sac.



Caring Tips

Careless ground handling damages many paragliders. Here are some things to avoid in order to prolong the life of your aircraft:

- DO NOT drag your wing along the ground to another take-off position - this damages the sailcloth. Lift it up and carry it.
- DO NOT try to open your wing in strong winds without untangling the lines first - this puts unnecessary strain on the lines.
- DO NOT walk on the wing or lines.
- DO NOT repeatedly inflate the glider and then allow it to crash back down. Try to keep this movement as smooth as possible by moving towards the glider as it comes down.
- DO NOT slam your glider down on the ground leading edge first! This impact puts great strain on the wing and stitching and can even explode cells.
- FLYING in salty air, in areas with abrasive surfaces (sand, rocks etc.) and ground handling in strong winds will accelerate the aging process.
- DO NOT fly in the rain or expose the wing to moisture.
- DO NOT expose the wing to unnecessary UV. Pack away once you have finished flying. Do not leave it sitting in the sun.
- DO NOT expose the wing to excessive heat. Allow the wing to cool before storage.
- If you fly with a wrap, you should regularly undo the twisting that appears on the main brake lines. By twisting the line become shorter and you can end up with a constant tension on the trailing edge (which can lead to problem on launch, stalling, glider not flying symmetrically, ...)
- Change your main brake lines if they are damaged.
- Be Careful when ground handling to not saw the brake lines against the risers or main lines. The abrasion caused by a sawing motion can damage the main lines and lead to premature ageing of the risers. If you notice any signs of abrasion, especially to the lines, make sure you get the wing professionally serviced and importantly modify your ground handling technique to stop any further damage.
- Your Ozone wing has an opening closed using Velcro on the trailing edge of the tip called the 'Butt hole'. This has been designed to easily empty all the things which have been accumulating in your wing (sand, leaves, rocks, mobile phones etc).



Storage and Transport

Always store all your flying equipment in a dry, cool room protected from any source of excessive heat. Your wing should be dry and cool before being packed away. Moisture, heat and humidity are the worst elements for damaging the fibres and coating of the cloth. Storing a damp glider in your car under the sun would be terrible for example.

If you land in salt water, you must first rinse it thoroughly with clean fresh water. Dry the wing completely, preferably out of the sun, in the wind. Never use a hair dryer, etc.

Take care that no insects get packed away with the wing. They may eat the cloth and make holes in a bid to escape. They can also leave acidic deposits if they die and decompose.

Transport the wing in the supplied bags and keep away from oils, paints, chemicals, detergents etc.

Cleaning

Any kind of wiping/scratching can damage the coating of the cloth. We recommend to not clean the wing, but if you do have to, use a soft cloth dampened with a small amount of water and use gentle movements little by little across the surface. Remember moisture and abrasion damages the coating of the cloth.

Repairs

Always let a registered dealer, professional repair centre or the manufacturer carry out any major or complex repairs, especially those near seam margins.

If you damage the sail:

If the rip is small and in the middle of a panel you can fix it yourself. You'll find all the materials in the repair kit you need. The fabric can be simply mended with the sticky rip stop/spinnaker tape. When cutting out the patches allow ample overlap of the tear and make sure both sides are different sizes. Make sure to round off each corner of the patches.

You can find more information about repairing your wing on the Ozone website, including step by step instructions with pictures.

IMPORTANT

Never pack away or store your glider wet.

IMPORTANT

Never use detergent or chemical cleaners.

If you damage a line:

Any line that is visually damaged MUST be replaced. Use a reputable paragliding service centre to make the replacement lines, alternatively you can order factory made lines from your local Ozone dealer.

It is important that replacement lines are made from the correct materials and diameters. You should check lengths against their counterpart on the other side of the wing to make ensure symmetry. Once the line has been replaced, inflate and check the glider before flying.

Maintenance Checks

In addition to the normal daily and pre flight checks, it is recommended to service the wing regularly, especially after a heavy period of use, after an incident or after a long period of storage. You alone are responsible for your flying kit and your safety depends on it. Changes in inflation/ground handling/flying behaviour indicates the gliders aging, if you notice any changes you should have the wing checked before flying again.

To ensure proper airworthiness your wing needs to be technically serviced by an experienced professional for the first time after 24 months, or after 100 hours. However, if the wing is used frequently then we recommend an annual service. The service centre should perform a thorough inspection of your wing and inform you of the condition of the sail, risers and lines and whether any parts need to be checked or changed before the next normal service period.

The sail and the lines do not age in the same way or at the same rate; it is possible that you may have to change part or all of the lines during the wing's life. For this reason it is important to do regular inspections so that you know the exact condition of all of the components of your glider.

We recommend these inspections to be carried out by a qualified professional and to include the following:

Porosity - A porosity meter measures the time taken by a certain volume of air to go through a certain surface of cloth. Measurements are made in several places along the top surface of the leading edge.

The tearing resistance of the cloth - A non-destructive test following the TS-108 standard which specifies minimum tear strength for sky diving canopies should be made using a Bettsometer. (B.M.A.A. Approved Patent No. GB 2270768 Clive Betts Sails)

Strength of the lines - An upper, middle and lower A line, along with a lower B line should be tested for strength.

Lengths of the lines - The overall length (riser lines + mid lines + upper lines) has to be checked under 5Kgs of tension. The difference between the measured length and the original length should not exceed +/- 10mm.

Compliance of the test sample's suspension lines, brake lines and risers were checked by the testing laboratory after the test flights were completed.

Risers - Visual inspection for signs of wear or abrasion. Differences to manual lengths should not exceed +/-5mm.

Canopy check - A full visual check should be carried out: All the components of the wing (stitching, ribs, diagonals, lines, tabs etc) should be checked for signs of deterioration.

Finally, a flight test to confirm that the wing behaves normally should be carried out by a professional.

IMPORTANT
Take care of your glider and make sure you have it checked and serviced according to the schedule.

OZONE QUALITY GUARANTEE

At Ozone we take the quality of our products very seriously, all our gliders are made to the highest standards in our own manufacturing facility. Every glider manufactured goes through a stringent series of quality control procedures and all the components used to build your glider are traceable. We always welcome customer feedback and are committed to customer service. Ozone guarantees all of its products against manufacturer's defects or faults. Ozone will repair or replace any defective product free of charge. Ozone and its distributors provide the highest quality service and repair, any damage to products due to wear and tear will be repaired at a reasonable charge.

If you are unable to contact your dealer then you can contact us directly at info@flyozone.com.

Summary

Safety is paramount in our sport. To be safe, we must be trained, practised and alert to the dangers around us. To achieve this we must fly as regularly as we can, ground handle as much as possible and take a continuous interest in the weather. If you are lacking in any of these areas you will be exposing yourself to more danger than is necessary.

Every year many pilots get hurt launching; don't be one of them. Launching is the time that you are most exposed to danger so practice it lots. Some launch sites are small and difficult and conditions aren't always perfect. If you're good at ground handling you'll be able to confidently and safely launch whilst others struggle, practice as much as you can. You'll be less likely to get hurt and more likely to have a great day's flying.

Respect the environment and look after your flying sites.

If you need to dispose the wing, do so in an environmentally responsible manner. Do not dispose of it with the normal household waste.

Finally, RESPECT the weather, it has more power than you can ever imagine. Understand what conditions are right for your level of flying and stay within that window.

Happy flying & enjoy your Roadster 4.

Team Ozone

TECHNICAL SPECIFICATIONS

| | 20 | 22 | 24 | 26 | 28 | 30 |
|-------------------------------|--------|--------|--------|--------|--------|---------|
| No. of Cells | 48 | 48 | 48 | 48 | 48 | 48 |
| Projected Area (m2) | 16.8 | 18.5 | 20.2 | 21.8 | 23.5 | 25.2 |
| Flat Area (m2) | 20 | 22 | 24 | 26 | 28 | 30 |
| Projected Span (m) | 7.72 | 8.1 | 8.46 | 8.8 | 9.13 | 9.46 |
| Flat Span (m) | 10.1 | 10.59 | 11.07 | 11.52 | 11.95 | 12.37 |
| Projected Aspect Ratio | 3.55 | 3.55 | 3.55 | 3.55 | 3.55 | 3.55 |
| Flat Aspect Ratio | 5.1 | 5.1 | 5.1 | 5.1 | 5.1 | 5.1 |
| Root Chord (m) | 2.54 | 2.67 | 2.79 | 2.9 | 3 | 3.12 |
| Glider Weight (Kg) | 4.68 | 5.1 | 5.33 | 5.71 | 5.95 | 6.36 |
| Max Control Travel (cm) | 64 | 66 | 69 | 71 | 78 | 80 |
| Free Flight Weight Range (Kg) | 50-70 | 55-80 | 65-85 | 80-100 | 95-120 | 110-140 |
| PPG Weight Range (Kg) | 55-100 | 55-110 | 65-120 | 80-140 | 95-160 | 110-179 |
| EN Load test @ 8G (Kg) | 179 | 179 | 179 | 179 | 179 | 179 |
| Certification DGAC | Yes | Yes | Yes | Yes | Yes | Yes |
| Certification EN* | | | B | B | B | |

* As delivered, the wing does not conform to the EN 926.2 standard due to the inclusion of the trimmer risers.

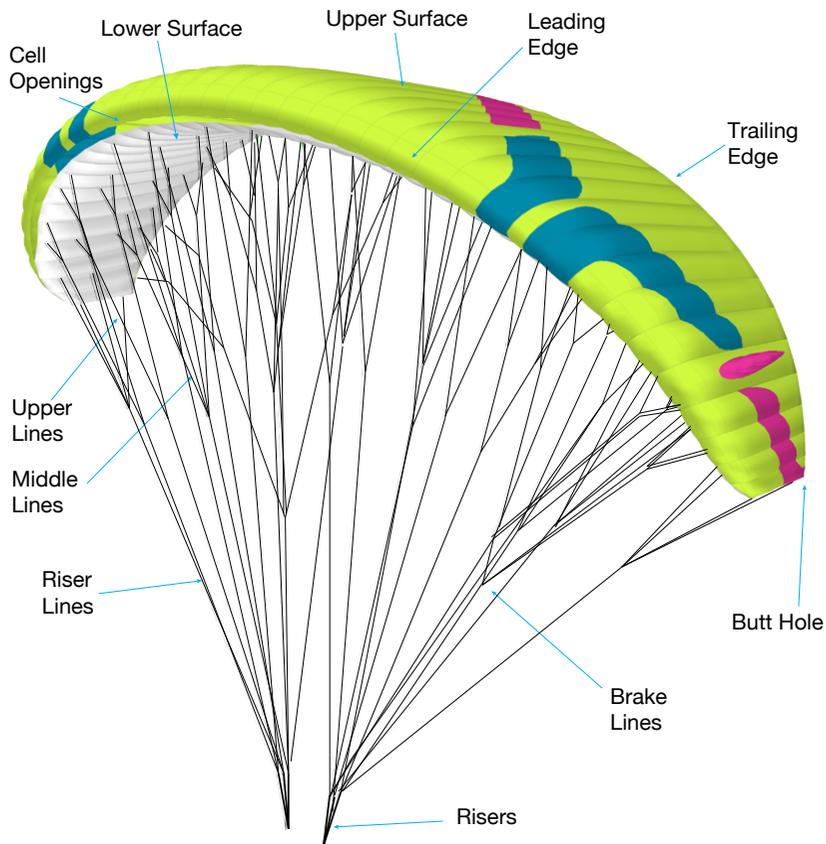
Riser Lengths

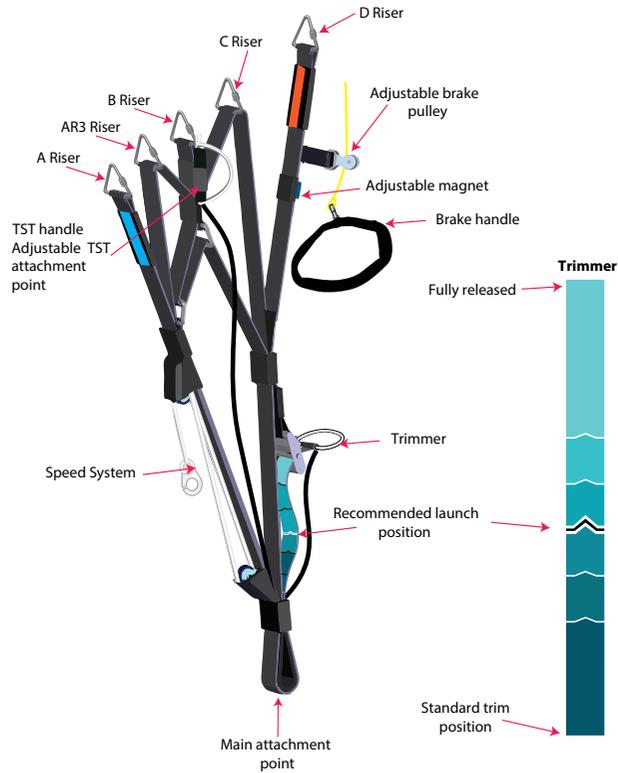
| Neutral | | Trimmed | |
|----------------|-------|-----------------------|-------|
| A | 500mm | A | 500mm |
| A ³ | 500mm | A ³ | 490mm |
| B | 500mm | B | 475mm |
| C | 500mm | C | 450mm |
| D | 500mm | D | 425mm |
| Untrimmed | | Neutral - Accelerated | |
| A | 500mm | A | 340mm |
| A ³ | 517mm | A ³ | 367mm |
| B | 533mm | B | 393mm |
| C | 567mm | C | 447mm |
| D | 600mm | D | 500mm |

Trimmer range - 17.5cm

Accelerator range - 16cm

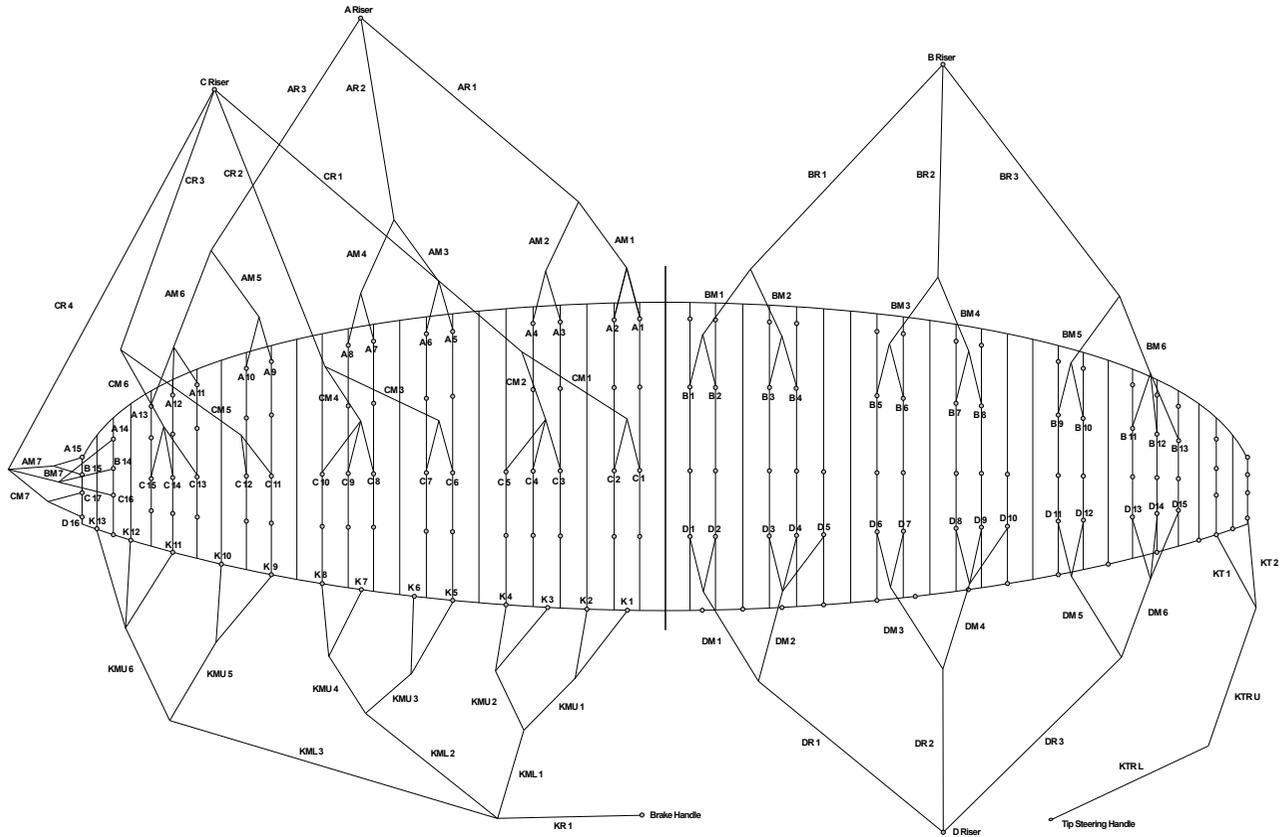
TECHNICAL DRAWINGS





LINE DIAGRAM

Individual and linked line lengths can be found online.



MATERIALS

All Ozone gliders are made from the highest quality materials available.

Cloth

Upper Surface

Dominico DOKDO 30D

Lower Surface

Dominico DOKDO 30D

Internal Ribs

Porcher 9017 E29

Leading Edge Reinforcement

Plastic

Main Line Set

Riser Lines

Edelrid 6843

Middle Lines

Liros DSL

Upper Lines

Liros DSL

Brake Lines

Main brake Lines

Liros - 10-200-040

Middle brake lines

Liros DSL

Upper brake lines

Liros DSL

Risers and hardware

Maillons

Maillon Rapide - Pegaut

Riser webbing

20mm zero stretch polyester webbing

Pulleys

Ronstan

INSPIRED BY NATURE, *DRIVEN* BY THE ELEMENTS

FLYOZONE.COM

OZONE

Ozone Power Ltd
16 Barnes Green
Livingston
Scotland
UNITED KINGDOM