



# M7

## MANTRA

*Pilots Manual*



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## THANK YOU

**T**hank 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 which 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.

It is essential that you read this manual before flying your wing for the first time. The manual will help you get the most out of your new wing, it details information about the design, tips and advice on how best to use it and how to care for your wing to ensure it has a long life and retains a high resale value. For the latest updates, including all technical datas please refer to the online version found on the product's page on at [www.flyozone.com](http://www.flyozone.com).

If you need any further information about any of our products please check [flyozone.com](http://flyozone.com) or contact your local dealer, school or any of us here at Ozone.

Safe Flying!  
Team Ozone

## WARNING

- Paragliding 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 that paragliding involves such 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 certified paragliders, harnesses with protector and reserve parachutes that are free from modification, and use them only within their certified weight ranges. Please remember that flying a glider outside its certified configuration may jeopardise any insurance (e.g. liability, life etc) you have. It is your responsibility as the pilot to verify your insurance cover.
- Make sure you complete a thorough daily and pre-flight 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, turbulent weather conditions or clouds.
- If you use good, safe judgment you will enjoy many years of paragliding.

Remember, PLEASURE is the reason for our sport

Everyone at Ozone continues to be driven by our passion for flying, our love of adventure and our quest to see Ozone's paraglider development create better, safer and more versatile paragliders.

The design team consists of David Dagault, Luc Armant, Fred Pieri, Russell Ogden, Honorin Hamard and Sam Jobard. Dav started flying when he was 12 years old and has accumulated a wealth of experience in competition flying, XC and paraglider design. Luc, a dedicated XC and competition addict has a background in naval architecture. Fred, our resident geek is a mathematician, mechanical engineer and vol Biv specialist. Russ is a competition pilot and test pilot with 1000s of hours testing experience. World and European champion Honorin is a naturally talented pilot who has been flying since he was 13 years old. Sam designs and develops our range of harnesses, he has a great deal of experience both flying paragliders and designing harnesses. Between them, they bring a wealth of knowledge, ideas and experience and work closely together in the design, development and testing process.

Mike Cavanagh is the boss and multiple winner of the UK XC league, when not out flying he generally keeps control of the mayhem. He is helped by Jean Christophe Skiera (JC) who manages our distribution network and the product range. Promotion and marketing are co-ordinated by BASE jumping legend Matt Gerdes.

Back in the office Karine Marconi, Chloe Vila and Isabelle Martinez run the show. These wonderful ladies look after the ordering system, the dealers, the design team and the general day to day running of the company - without them it would be chaos.

Our own manufacturing facility in Vietnam is headed up by Dr Dave Pilkington who works relentlessly manufacturing gliders and producing prototypes as well as researching materials and manufacturing processes for our future products. He is backed up by a superb team managed by Khanh and Phong with over 1000 production staff.



## YOUR MANTRA M7

The Mantra M7 is a completely new design incorporating the latest Zeno and Enzo 3 technology in a tight, compact, 3-line package. The profile, planform, and arc are all evolved from the Zeno, and the aspect ratio is a more moderate 6.5. The M7 offer a level of agility, comfort and safety closer to the Delta series, with near-Zeno glide performance. Most importantly, it is an incredibly fun wing to fly!

This new design replaces the M6, and bridges the gap in our range between the Delta 3 and Zeno. It is a significant step up from the M6 in terms of performance, especially in accelerated flight, but with better collapse recovery characteristics, reduced pilot workload, and more cohesion in turbulent air. It is the ideal wing for experienced pilots stepping up to the D class who want the performance and pleasure of a modern 2-liner, but with more comfort, security, and confidence.

The Zeno-inspired profile, with A-line attachments set relatively far back from the leading edge, creates a strong & collapse-resistant nose. You can push hard through turbulence and gain lift in each gust. The internal structure is optimised for weight and cohesion. The wing absorbs turbulence without chord or spanwise deformation, meaning that the handling can be exploited at all times, even in the strongest, roughest thermals. The cohesion of the sail, coupled with this solidity, is confidence inspiring. It reduces the demands on the pilot allowing you to use the full XC potential of the day.

A new riser control system allows full control in accelerated flight. Acting on both the B and C risers, this innovative system offers direct, efficient angle of attack control without deforming the profile. The intuitive feel and feedback from the risers allows the pilot to maintain the solidity of the wing while accelerated in turbulent air.

The M7 is certified EN D and aimed at EN D level pilots, even if the certification grade is mainly due to the use of collapse lines. The level of comfort and security is closer to the class below. Collapse lines were used because we were totally unwilling to weaken the structure of the wing just to achieve a lower EN grade. True Performance in real conditions remains our first priority. Extensive collapse testing has shown excellent recovery behaviour - better than the M6, with less tendency to cravat.

The M7 is for advanced pilots who are progressing to the highest levels of XC flying. It is ideal for competent pilots stepping up from a lower grade, or those wishing for easier, more benign behaviour than a 2-liner without sacrificing performance. It's recommended for experienced pilots who fly at least 100 hrs per year, with recent SIV training.

## **Rucksack**

As standard, your wing is supplied with a specially designed bag that is light and comfortable. It features a padded hip belt, ergonomic adjustable shoulder straps and extra pockets to store keys, accessories and all those extra bits. Its large volume allows you to store all of your equipment whilst distributing the weight for comfortable hiking. We have a large range of bags and you can choose from any of them at the time of order.

## **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 the handle 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 5-10cm 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.

## **Risers**

The Mantra M7 has been designed with 3 risers per side. The A risers are covered with coloured webbing for easy identification and split into two - the smaller riser, holding only the outermost A line, is for an easier application of big ears.

The risers feature attachments for a foot operated accelerator system, they do not feature trimmers or any other adjustable devices.

The M7 features a new riser control system for full control whilst accelerated. Acting on both the B and C risers, this new innovative system offers direct, efficient angle of attack control - without deforming the profile. The intuitive feel and feedback from the risers allows the pilot to increase the solidity of the wing whilst accelerated in turbulent air.

**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 (C-risers) for directional control.**

### **Total Weight in flight**

Each Ozone glider has been designed and certified for a defined weight range. We strongly recommend that you respect these weight ranges. If you are between sizes the following information may help you make a decision as to which size to buy:

- For the most precise and dynamic handling or if you generally fly in mountains and/or in strong conditions, you should choose to fly in the top part of the weight range.
- If you want a better sink rate, or if you generally fly in flat lands and/or in weak conditions, you may choose to fly nearer the middle part of the weight range. Remember, you can always add ballast for when conditions are stronger.
- It is not recommended to fly at the very bottom of the weight range.

### **Towing**

The Mantra M7 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. When towing you must be certain that the paraglider is completely over your head before you start. In each case the maximum tow force needs to correspond to the body weight of the pilot.

### **Limitations**

The Mantra M7 has been designed as a high performance solo XC/competition wing and is for experienced pilots only. It is not suitable for beginner or intermediate pilots, aerobatics, training or tandem flights. To be flown safely, the M7 requires a high level of piloting skills. Pilots are expected to have an in-depth knowledge of SIV, preferably with recent, direct experience of a high aspect ratio wing. We also expect the pilot to have the necessary active flying skills and quick reaction times to keep a high aspect ratio wing open in turbulent air.

The M7 was certified with the use of collapse lines, therefore during SIV collapses must not be performed without them. Collapse lines are available to order separately and must be mounted correctly, for information please contact your local Ozone dealer. Ensure that you fully understand the correct and safe use of this equipment before attempting SIV.



## PREPARATION

### Accelerator System

To set up the accelerator system, first route the lines supplied with the speed system through the harness. Make sure this is done correctly and that the lines pass through all of the pulleys (check your harness manual for instructions). Attach the speed system lines to the accelerator system on the risers with the Brummel hooks.

A basic set-up can be performed on the ground: ask a friend to pull the risers tight into their in-flight position whilst you sit in the harness on the ground. Now adjust the lengths of the lines so that the main bar sits just beneath your seat. You should be able to hook your heel in to the lower loop of the accelerator.

There must be enough slack in the speed system to ensure the A risers are not inadvertently pulled during normal trim speed flight, but not so long that it is impossible to use the full speed range of the glider. Fully extending the lower loop of the speed bar will accelerate the wing to approximately half its accelerated speed range. For full speed, hook your heels on to the upper bar and smoothly extend your legs, maximum speed is when the pulleys on the risers overlap. Once set up, test the full range of the accelerator in calm flying conditions and ensure that both risers are pulled evenly during operation. Fine-tuning can be completed when you are back on the ground.

### Harness

It is important to set up your harness correctly before flying the wing. Make sure to spend time adjusting your harness's different settings until you are completely comfortable. We recommend a chest strap setting between 44cm and 48cm (measured between the centre of the hang points).

The wing has been certified with a standard seated harness, S size is certified with a chest strap set to around 42cm, the MS/ML between 44-46cm, and the L between 46-48cm. Do not fly with a chest strap setting too tight (below 42cm) or too wide (above 48cm) as this will affect the behaviour and feedback of the wing. Using a pod harness in a laid back supine position does not invalidate the certification but it may have an influence on the behaviour of the wing. Pod harnesses increase the risk of twists occurring during a large asymmetric collapse.

### **IMPORTANT**

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

## **Wing**

To prepare the wing, lay it out on the top surface and perform a thorough daily check. You should inspect the top and bottom surfaces for any rips and tears or any other obvious signs of damage. Lay out the lines one side at a time, hold up the risers and starting with the brake lines, pull all lines clear. Repeat with the stabilo, D (uppers), C, B and A lines, laying the checked lines on top of the previous set, and making sure no lines are tangled, knotted or snagged. Mirror the process on the other side and then inspect the lines for any visual damage. Then inspect the risers for any signs of obvious damage. The general rule is if it looks OK then it is OK, however if you have any doubts please get advice from an experienced pilot or your local dealer or instructor.

To familiarise yourself with the glider it is a good idea to perform practice inflations and small flights on a training hill. This will enable you to set up your equipment correctly.

### **Take-off checklist:**

1. Check reserve parachute - pin is in and handle secure
2. Helmet on and fastened
3. All harness buckles closed - check leg-loops again
4. Risers connected to the harness correctly with carabiners and maillons tight
5. Accelerator system connected
6. Holding the A risers and your brake handles correctly
7. Leading edge open
8. Aligned in the middle of the wing and directly into wind
9. Airspace and visibility clear

### **Launching**

Your Mantra M7 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 Mantra M7 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 Mantra M7 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.

### **Speed to Fly**

Flying at trim speed (hands-up), the Mantra M7 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 using the accelerator system. Using up to half bar does not degrade the glide angle or stability significantly and will improve your flying performance. You will reach the next thermal faster and higher. At full speed the Mantra M7 is stable, however we recommend that you do not fly at full speed close to the ground or in turbulent air.

**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.**

By applying approximately 20cm of brakes the Mantra M7 will achieve its Minimum-Sink rate; this is the speed for best climb and is the speed to use for thermalling and ridge soaring.

### **Turning**

To familiarize yourself with the Mantra M7 your first turns should be gradual and progressive. To make efficient and coordinated turns, first check the airspace is clear and then lean in the direction you want to go. The first input for directional change should be weight-shift, followed by a 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 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 quickly apply the brakes until you feel normal pressure again. Once you have normal pressure, raise the hands 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. The brake inputs 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 likelihood 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, but be ready to anticipate the following pitch forward. The goal is to maintain the wing directly overhead with a constant level of internal pressure.

No pilot and no glider are immune to collapses however correct active flying will reduce the chances significantly. When the conditions are turbulent, be more active and anticipate the movements of your wing, always be aware of your altitude and do not over-react.

We strongly advise you to keep hold of your brakes at all times and to not fly in turbulent conditions.

#### **IMPORTANT**

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

#### **IMPORTANT**

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

## Landing

The Mantra M7 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!

## ADVANCED FLIGHT 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**

Whilst it is possible to make traditional Big Ears with the outer A lines, it is more effective to use the 'C3' technique. Folding in the wingtips 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 during the top landing approach.

To pull Big Ears, keep hold of your brake handles and take the outermost C-line on each side (CR3), then pull out and down until the wingtips peel backwards. Keep hold of the CR3 lines to maintain the ears, directional control while using the C3 ears should be with weight shift. To reopen the ears, release both CR3 lines at the same time, the tips will automatically return to normal.

Once the C3 ears are engaged you can further increase the sink rate by pushing on the accelerator bar.

Whilst it is possible to enter a spiral dive whilst holding in C3 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 C3 ears engaged.**

### **B-Line Stall**

It is not recommended to perform B line stalls with the Mantra M7.

**IMPORTANT**  
**It is recommended to use the CR3 lines to perform big ears.**

**DO NOT perform spiral dives with C3 ears engaged.**

**IMPORTANT**  
**Do not perform B line stalls**



## **Spiral Dives**

The spiral dive is the most effective form of rapid descent. 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 and progressively pull down on the inside brake. The Mantra M7 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, smoothly weight shift in the opposite direction of the spiral and smoothly release the inside brake whilst applying the outside brake. As the Mantra M7 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.

It is possible for the Mantra M7 to remain neutral in a spiral dive under certain circumstances: unsuitable chest strap setting (too tight), 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 a spiral dive. To do so, use opposite weight shift and smoothly apply enough outside brake until you feel the wing start to decelerate, the glider will then start to resume normal flight. Recovering from a spiral with hard or quick opposite inputs will result in an aggressive climb and surge and is not recommended. Always be prepared to manage the energy, bleed off the speed if necessary. Never perform spiral dives close to the ground.

## **Active Riser Control**

The Mantra M7 features a new innovative control system that acts on both the B and C risers. Whilst gliding it is possible to pilot the wing with the risers, this gives an improved feel and control over the wing enabling you to fly actively without using the brakes. Using brakes whilst accelerated causes drag, this is not only inefficient but it also reduces the inherent stability of the profile - using the brakes whilst accelerated weakens the profile and can actually lead to a collapse. Using the risers increases the angle

**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.**

of attack more evenly across the chord and does not weaken the profile as much as using the brakes. The direct feel allows you to stop collapses before they happen and maintain higher speeds and higher levels of efficiency through turbulence.

To fly with the risers, keep hold of your brake handles (remove any wraps) and take hold of the C riser handles. If you see or feel the leading edge lose pressure, at the same time as releasing some or all of the accelerator you can also apply pressure to the C's, this will also impart pressure on the B risers to help keep the nose open. Be careful to use only small inputs with the C risers, you risk stalling part or all of the wing if you are over enthusiastic. The amount of pressure and size of the input is dependent on the amount of turbulence/loss of pressure, but always be gentle at first. Learn the feel of the wing - how much speed bar to release and the force required on the C's to keep the nose open without inducing unnecessarily large pitch movements.

The Mantra M7 is inherently stable at full speed, C riser control is very effective up to about  $\frac{3}{4}$  speed, however during the last few cms of speed bar travel C riser control on its own becomes less effective and can lead to a collapse. When flying faster than  $\frac{3}{4}$  speed, we recommend to control the pitch of the wing actively using a combination of the speed bar and C riser input. If you feel the nose of the wing start to collapse or pitch forward whilst accelerated the first action should be to release the speed bar impulsively and then make any necessary C riser input, always release the speed bar first before making any C inputs. Using the combined active speed bar/C riser control technique you will be able to maximise your speed and efficiency whilst minimising the likelihood of collapses.

Be prepared for plenty of practice as this new method may take some time for it to become totally intuitive, efficient and comfortable. This control method is suitable for gliding in good 'normal' air, it does not replace proper active flying with the brakes in strong turbulent conditions. If you are unsure about the air return the glider to trim speed, release the C risers and fly the glider actively with the brakes.

**IMPORTANT**  
**Never apply the brakes whilst using the speed system - it makes the wing more prone to collapse.**

### 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 Mantra M7 collapses in accelerated flight, immediately release the accelerator and manage the collapse using the methods described above.

## 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 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 quickly and is the most efficient and effective method. You can also try pulling on the stabilo line (ARL4 - outside line on the A riser) to free small stubborn wing tip cravats. Whichever method you use, be careful with any brake inputs as you may stall the opposite wing.

If it is a very large cravat and the above options have not worked then a full stall is the next option. Only attempt this if you have enough altitude and you know what you are doing. Remember if the rotation is accelerating and you are unable to control it, throw your reserve parachute immediately 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.

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

## **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.

## CARE AND MAINTENANCE

### **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 or any hard surface as this is guaranteed to cause damage to the sailcloth. Lift it up and carry it clear of the ground.
- 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 or high levels of heat. Leaving the wing sitting in the sun or allowing it to get hot (e.g in the back of a car) will significantly increase the chances of premature ageing.
- 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.
- Change your main brake lines if they are damaged.
- When groundhandling be careful 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 the risers. If you notice any signs of abrasion, especially to the lines, make sure to replace them. It is important to modify your groundhandling technique to stop any future damage.
- Your wing has an opening on the wing tips called the 'Butt hole'. The Butt hole makes it easy to empty any sand, leaves, rocks, mobile phones etc that may have accumulated in the wing.

It is recommended that you regularly CHECK your wing, especially after a heavy period of use, after an incident or after a long period of storage.

### **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.**



## 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. We recommend 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. It is also good practice to use the supplied foam Folding Pillow, this reduces the angle of the leading edge fold and helps preserve the plastic reinforcements. The folding pillow can be compressed with the strap and carried in your harness. Also, using the Ozone Saucisse pack will help preserve the life of the wing and aid with the speed and ease of packing.

**Step 1.** Lay the mushroomed wing on the ground or on the Saucisse pack if you are using one. It is best to start from the mushroomed position as this reduces the dragging of the leading edge across the ground.



**Step 2.** Group leading edge (LE) plastic reinforcements with the A tabs roughly aligned. Make sure the plastic reinforcements lay side by side. Note the glider is NOT folded in half; it is folded as a complete concertina from wing tip to wing tip.



**Step 3.** Group together the middle and the trailing edge (TE) of the wing by sorting the concertina folds near the B and C tabs.



**Step 4.** Once the LE and TE of the wing have been sorted, turn the whole wing on its side.

If using a Saucisse pack go to Step 7.



**Step 5.** Strap the Folding Pillow below the LE - at the point of the first fold. The pillow reduces the angle of the fold and helps preserve the plastics. Next fold the TE over the LE being careful to not fold with tight angles.



**Step 6.** Now place the folded wing into the stuff sack.



**Step 7.** If using a Saucisse, with the wing laid on its side carefully close the zip (or clips) without trapping any material.



**Step 8.** Turn the Saucisse on its side, lay the foam Folding Pillow in place and make the fold of the LE around it. Use 3 folds.



**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.



### **Storage and Transport**

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

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 across the surface.

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 or other sources of direct heat.

### **Wing 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 however 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. Lines can be ordered from your local Ozone dealer or directly from our website [www.flyozone.com](http://www.flyozone.com). Alternatively, use a reputable paragliding service centre to make the replacement lines.

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***

Your wing, like a car, should be technically checked to ensure proper airworthiness. Your wing should be serviced by a qualified professional for the first time after 24 months, or after 100 hours. However, if you are a frequent flyer (more than 100 hrs per year), then we recommend you have the wing serviced annually. The checker should inform you about the condition of your glider and if some parts will need to be checked or changed before the next normal service check period.

The dimensions of the lines tend to move during the first part of their life, it is therefore recommended to have a performance trim check within the first 50hrs of use. To ensure the correct trim, the lines should be measured and adjusted to the published values as necessary. Loops in the C lines, along with loops attaching the B risers are in place to make the trimming process easier.

During the life of the wing the sail cloth 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 that inspections are carried out by a qualified professional.

You alone are responsible for your flying kit and your safety depends on it. Take care of your equipment and have it regularly inspected. Changes in inflation/groundhandling/flying behaviour indicates the gliders aging, if you notice any changes you should have the wing checked before flying again. These are the basic elements of the check up:

**IMPORTANT**

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



**Porosity** is measured with a porosity meter, the time taken by a certain volume of air to go through a certain surface of the cloth. The time in seconds is the result. A measurement is done in a several places on the top surface along the span of the glider behind 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 and a lower C (and lower D if applicable) line should be tested for strength. Each line is tested to breaking point and the value recorded. The minimum value is 14G for all main riser lines calculated from the maximum certified flying weight of the glider. The added minimum strength for the middle lines and upper lines should be the same value. If the breaking strength is close to the minimum value calculated, the professional should give a period after which the strength test should be performed again.

**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, ...) 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.

### **Modifications**

Your Ozone Mantra M7 was designed and trimmed to give the optimum balance of performance, handling and safety. Any modification means the glider loses its certification and will also probably be more difficult to fly. For these reasons, we strongly recommend that you do not modify your glider in any way.



## OZONE QUALITY GUARANTEE

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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](mailto: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.

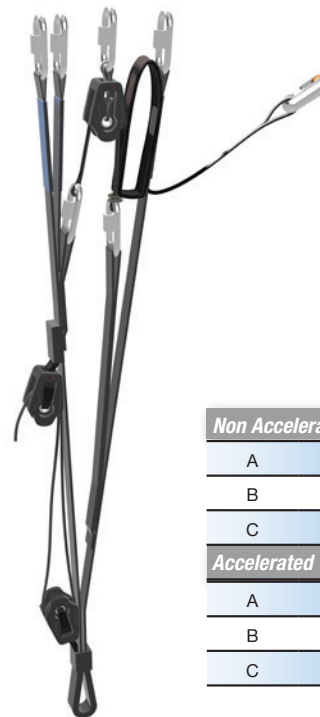
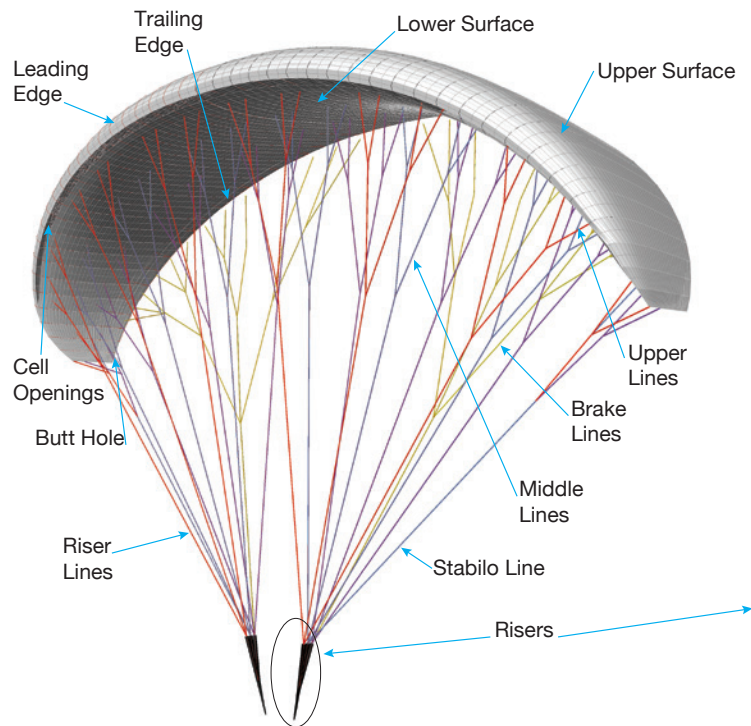
If you need to dispose the wing, do so in an environmentally responsible manner. Do not dispose of it with the normal household waste.

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 Mantra M7.  
Team Ozone

## TECHNICAL SPECIFICATIONS

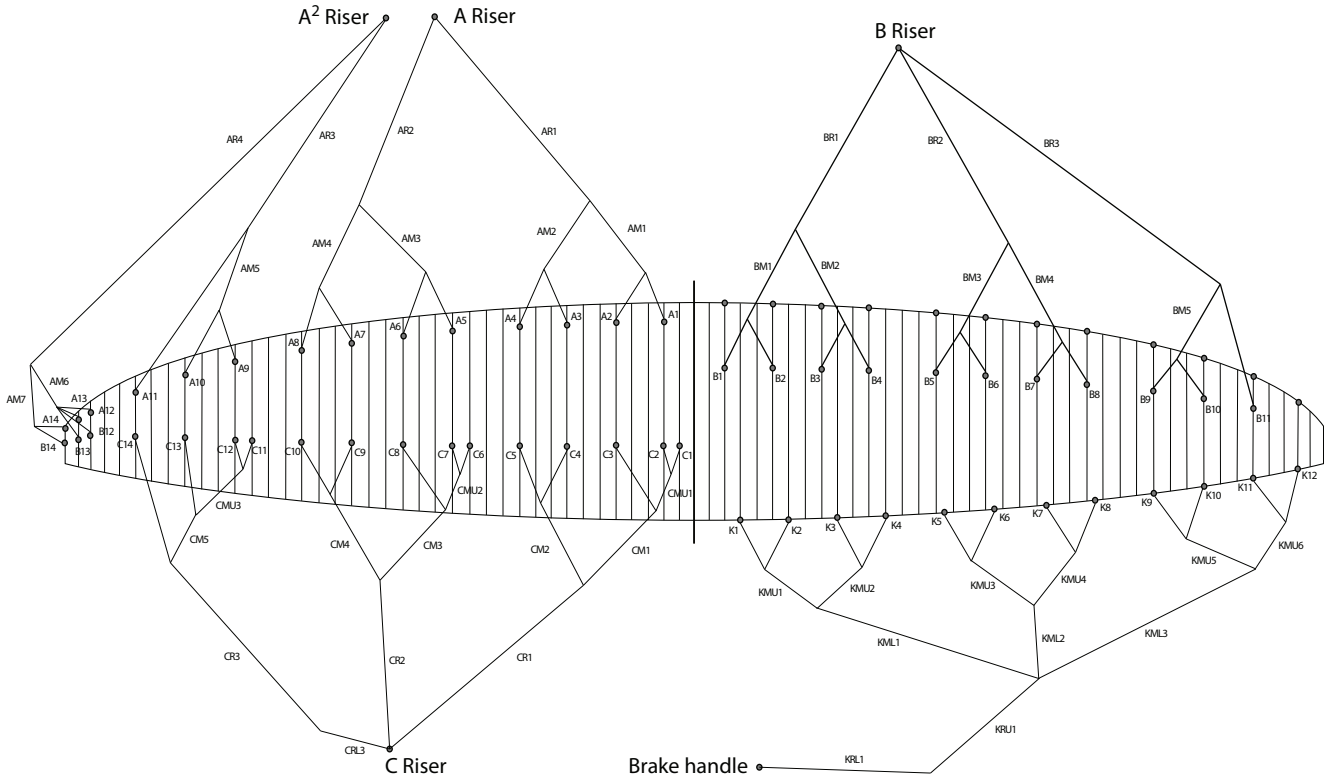
	<b>XS</b>	<b>S</b>	<b>MS</b>	<b>ML</b>	<b>L</b>	<b>XL</b>
No. of Cells	78	78	78	78	78	78
Projected Area (m <sup>2</sup> )	16.2	17.6	19	20.4	21.6	23.3
Flat Area (m <sup>2</sup> )	19.3	20.9	22.6	24.2	25.7	27.6
Projected Span (m)	8.8	9.1	9.5	9.8	10.1	10.5
Flat Span (m)	11.2	11.6	12.1	12.5	12.9	13.3
Projected Aspect Ratio	4.7	4.7	4.7	4.7	4.7	4.7
Flat Aspect Ratio	6.5	6.5	6.5	6.5	6.5	6.5
Root Chord (m)	2.17	2.27	2.35	2.44	2.51	2.6
Glider Weight (kg)	4.59	4.86	5.2	5.45	5.62	5.99
Approximate Control Travel (cm)	50	50	55	60	65	76
Certified Weight Range (kg)	60 - 75	70-85	80-95	90-105	100-115	110 - 130
Certification EN/LTF	D	D	D	D	D	D



<b>Non Accelerated</b>	
A	550mm
B	550mm
C	550mm
<b>Accelerated</b> <small>Pulleys axis - axis</small>	
A	395mm
B	473mm
C	550mm

# LINE DIAGRAM

Individual and linked line lengths can be found online.



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

## **Cloth**

### **Upper Surface**

Dominico 30D MF

### **Lower Surface**

Porcher 7000 E71

### **Internal Ribs**

Dominico 30D FM / Porcher 7000 E91

### **Leading Edge Reinforcement**

2.5/1.8/1.4mm Plastic

## **Main Line Set**

### **Riser Lines**

Edelrid 8000U - 90/130/190/230

### **Middle Lines**

Edelrid 8000U - 50/70/90/130

Edelrid 9200U - 30

### **Upper Lines**

Edelrid 8000U - 70/90

Edelrid 9200U - 30

## **Brake Lines**

### **Main brake Lines**

Liros - 10-200-040/8000U -190

### **Middle brake lines**

Edelrid 9200U - 30

### **Upper brake lines**

Edelrid 9200U - 30

## **Risers and hardware**

### **Shackles**

Maillon Rapides

### **Riser webbing**

12mm zero stretch polyester webbing

### **Pulleys**

Ronstan ball bearing



1258 Route de Grasse  
Le Bar sur Loup  
06620  
France

*Inspired by Nature, Driven by the Elements*

[www.flyozone.com](http://www.flyozone.com)