USER'S MANUAL
ROLLER

ROLLER

Remember when you had no limits

WELCOME

We wish to welcome you to our team and thank you for your confidence in our glider product line.

We would like to share the enthusiasm with which we created this wing and the importance and care we took in the design and manufacture of this new model in order to offer maximum pleasure on every flight with a Niviuk glider.

The ROLLER is the new speedflying wing from Niviuk. This is a completely new wing design that integrates our latest innovations which offers, compared to previous models, greater versatility and possibilities for speedflying pilots.

It is a wing with an extensive speed range which can be manoeuvred quickly and precisely at all times.
Its intuitive, direct handling also provides a high degree of safety and user-friendliness.

This is the user manual and we recommend you read it carefully.

The **NIVIUK** Team.

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USER'S MANUAL

NIVIUK GLIDERS ROLLER

This manual provides you with the necessary information on the main characteristics of your new paraglider.

Whilst it provides information on the wing, it cannot be viewed as an instructional handbook and does not offer the training required to fly this type of paraglider.

Training can only be obtained at a certified paragliding school and each country has its own system of licensing. Only the aeronautical authorities of respective countries can determine pilot competence.

The information in this manual is provided in order to warn you against adverse flying situations and potential dangers.

Equally, we would like to remind you that it is important to carefully read all the contents of your new ROLLER manual.

Misuse of this equipment could lead to severe injuries or death. The manufacturers and dealers cannot be held responsible for misuse of the paraglider. It is the responsibility of the pilot to ensure the equipment is used correctly.

SUMMARY

1. CHARACTERISTICS

1.1 WHO IS IT DESIGNED FOR?

The ROLLER is intended for speedflying aficionados and is ideal for those pilots able to fly actively. It can be used as a primary or secondary wing.

The versatility of this wing means the pilot is not limited to quick descents, but it can also be used to have fun turning in thermals, soaring, practicing carving or long flights in strong winds up to 70km/h.

It is important to note that speedflying should only be undertaken by trained pilots. It is essential in terms of safety that the pilot skill is commensurate with the 'benefits' of the wing and/or the objectives the pilot wants to achieve.

The control, safety and freedom provided by the ROLLER depend directly on the skill level of the pilot.

The pilotage requirements for this wing mean that it is only for experienced pilots. And depending on the size/weight, it is intended only for expert pilots.

'Not recommended for newly-qualified pilots'

We strongly recommend that beginners seek the advice of qualified instructors and coaches during their learning.

We encourage pilots from other disciplines to use the assistance of professionals as well as common sense when commencing speedflying.

The ROLLER is a wing designed for a large target group of pilots in order to enjoy the experience of speed.

1.2 CERTIFICATION

The ROLLER has been submitted for the European EN and LTF certification.

All sizes passed the certification tests.

The ROLLER complies with the following requirements:
EN 926-1:2015, chapter 4.5 / LTF NFL II-91/09 -2-251-16, chapter 3

The load and traction tests were conducted by the Air Turquoise testing centre in Switzerland.

Shock test to 800 kg.
Supported load test to 8 g 132 kg.

Please note!
Competition rules state that speedflying wings must have a load test certificate and a flight test to determine their certification level.

The 16 m^2 ROLLER was tested in accordance with EN 926-2: 2013, EN 926-1: 2015 & LTF 91/09, and was awarded the classification C.

Certification number: PG_1111.2016.
•Testing was performed without the use of trimmers. Testing was performed using the speed-bar.

- **Description of EN C class wing characteristics**:
Paragliders with moderate passive safety, potentially dynamic reactions to turbulence and pilot errors. The recovery to normal flight may require precise interventions by the pilot.

- **Description of the pilot skills required for an EN C wing:**
Designed for pilots familiar with recovery techniques, who fly actively and understand the implications of flying a glider with reduced passive safety.

We recommend paying special attention to the flight test report made by the certification test house. It provides all necessary technical information to know about the wing and how it reacted during each tested manoeuvre.

It is important to note that different sized wings will react differently during manoeuvres. Even within the same size, at maximum or minimum load, the behaviour and reactions of the wing may vary.

For further information on the flight test and the corresponding certification number, please see the final pages of this manual.

1.3 IN-FLIGHT BEHAVIOUR

Niviuk developed this wing by adopting very specific goals: the objective was to seek utmost performance - faster, steadier and better in turns. Better feel for the wing and easier piloting.

The ROLLER provides extreme stability in conjunction with precise handling and is fast and dynamic. It is exceptionally good at dampening turbulence thanks to its reduced size and profile.

The brakes respond immediately to pilot input and directional control through weight-shift is accurate and automatic. The unfavourable roll behaviour sometimes found in speedflying wings does not exist in the ROLLER; pitch is damped enough so that the wing does not suffer unexpected frontal collapses or loss of internal pressure, allowing the pilot to fully concentrate on reading the terrain.

The wing remains stable during takeoff and the entire flight. It flies at high speeds without stress. During the wing design, maximum attention was paid to its ability to descend mountains quickly by *swooping* or to use the conditions and elements by ridge soaring, thermalling, playing with the laminar wind or trying out new ways of flight.

Please note!
The term ‘speedflying’ implies that together with the experience and skill required to fly a glider of this type, the pilot should fly actively and be able to anticipate the wing’s reactions to input.
Attention must be paid to groundspeed in turns, induced pitching and generally in all manoeuvres which involve acceleration. These must be performed correctly, especially when undertaken near the terrain. The accuracy and speed of response, either through the brake or weight-shift, is an excellent characteristic of the ROLLER, but it requires considerable practise to fully master it.

1.4 ASSEMBLY, MATERIALS

The ROLLER has all the technological innovations used on other Niviuk gliders. It is built with the most careful selection of current materials, technology and accessories available, to improve pilot comfort whilst increasing safety and performance.

RAM Air Intake system (RAM) – it is characterised by the arrangement of the air inlets, to ensure optimal internal pressure is maintained. Thanks to this design, we were able to reduce their size, while maintaining the same air flow at all angles to improve laminar flow.
Having greater internal pressure means better tolerance of turbulence, greater consistency of the profile shape across the speed range; excellent handling at low speed is achieved by allowing the pilot to extend the braking limit, there is a lower risk of collapse and consequently, greater control and stability.

Titanium Technology (TNT) – a revolutionary technique using titanium. Using Nitinol for the internal wing construction offers great advantages: on the one hand it reduces the overall wing weight, which reduces the inertia and improves the manoeuvrability and launch inflation.
On the other hand, the leading edge is more rigid and the wing surface remains perfectly taut, without creases or parasitic drag. This optimises glide in all phases of the flight.

Because the flexible rods always return to their original shape, the integrity of the profile is never affected.
Nitinol provides the highest level of protection against deformation, heat or breaks.

Structured Leading Edge (SLE) - the use of the SLE considerably reduces the amount of Mylar which was used in previous Niviuk wings and this also reduces the weight of the leading edge. Therefore it is easier to inflate this wing than a paraglider without this system.

3D Pattern Cut Optimisation (3DP) – the latest generation of wings require a new fabric panel pattern and cutting system. Creating separate panels for each of the sections at the front of the wing means the sail fabric is more taut and crease-free. During the cutting, the optimal orientation of the fabric section is selected, depending on its final location. If the fabric pattern is properly aligned with the axes of load, it suffers less deformation after repeated use, to the long-term benefit of the leading edge.

3D Leading Edge (3DL) - adding an extra seam to the longitudinal axis of the glider helps, on the one hand, give more consistency and volume to the profile (a more efficient 3D contour) and on the other, joins and shapes the leading edge panels. The fabric is guided by the panel position to ensure fewer creases and better load distribution. The result is a cleaner profile, which benefits the wing in terms of performance and durability.

The use of these technologies is a big technological leap forward in building wings and a big improvement in flight comfort.

From Olivier Nef's computer to fabric cutting, the operation does not allow for even a millimetre of error. The cutting of each wing component is performed by a rigorous, extremely meticulous automated computer laser-cutting robotic arm. This program also paints the guideline markers and numbers on each individual fabric piece, thus avoiding errors during this delicate process.

The jigsaw puzzle assembly is made easier using this method and optimises the operation while making the quality control more efficient.

All Niviuk gliders go through an extremely thorough and detailed final inspection.

The canopy is cut and assembled under strict quality control conditions facilitated by the automation of this process.

Every wing is individually checked with a final visual inspection.

The fabric used to manufacture the glider is light, resistant and durable. The fabric will not experience fading and is covered by our warranty.

The main lines are made from Technora with a polyester sheath, the gallery lines are made from sheathed Dyneema and the upper cascade is made using unsheathed Dyneema.

The line diameter has been calculated depending on the workload and aims to achieve the required best performance with the least drag. The sheath protects the line cores from UV rays and abrasions.

The lines are semi-automatically cut to length and all the sewing is completed under the supervision of our specialists.

Every line is checked and measured once the final assembly is concluded.

Each glider is packed following specific maintenance instructions as recommended by the fabric manufacturer.

Niviuk gliders are made of premium materials that meet the requirements of performance, durability and certification that the current market

demands.

Information about the various materials used to manufacture the wing can be viewed in the final pages of this manual.

1.5 ELEMENTS, COMPONENTS

The ROLLER is delivered with a series of accessories that, although not fundamental, are important in the use, transport and storage of the paraglider.

- A bag large enough to hold all equipment comfortably and with plenty of extra space.
- An inner bag to protect the wing from any possible damage during storage.
- An adjustable folding strap to make the wing as compact as possible.
- A small fabric repair kit with self-adhesive Ripstop nylon.

2. UNPACKING AND ASSEMBLY

2.1 CHOOSING THE RIGHT LOCATION

We recommend unpacking and assembling the wing on a training hill or a flat clear area without too much wind and free of obstacles. It will help you to carry out all the recommended steps required to check and inflate the ROLLER.

We recommend that a qualified instructor is present to supervise the entire procedure, as only they can address any doubts in a safe and professional way.

2.2 PROCEDURE

Take the paraglider out of the rucksack, open and unfold it on the ground with the lines positioned on the undersurface, oriented in the direction of inflation. Check the condition of the fabric and the lines for defects. Pay attention to the maillons connecting the lines to the risers to make sure they are fully closed and tightened. Identify, and if necessary untangle, the A, B and C-lines, the brake lines and corresponding risers. Make sure that there are no knots.

2.3 HARNESS ASSEMBLY

The ROLLER risers come with different colours:
- Right side in green
- Left side in red

This feature helps the pilot to better identify each side during the pre-flight phase and in flight.

Correctly connect the risers to the harness carabiners. The risers and lines cannot have any twists and must be in the right order. Check that the harness buckles are properly fastened and securely locked.

2.4 HARNESS TYPE

To have perfect control over the ROLLER, the correct harness choice is essential.

In addition to the control and comfort during the flight, the choice of a good ergonomic harness is essential to ensuring both the takeoff and landing are clean and precise.

The ROLLER can be flown with most types of harness, however, we recommend a lightweight harness with split leg loops.

At Niviuk we have designed a harness which is perfect for this purpose. The ROAMER is a reversible harness with ample capacity; it is easy to carry, with split leg loops, excellent balance and it is responsive to both

glider control input and provides feedback to the pilot. It is the perfect harness for the ROLLER.

The use of an airbag or foam protection harness is of course possible. Care should be taken with the chest strap setting. A wide chest strap setting permits more manoeuvrability but also requires more care when using weight-shift in turns. If the chest strap is set too tightly, the agility of the wing will be restricted.

2.5 CONNECTING THE SPEED-BAR

The ROLLER comes with a speed-bar system with 9 cm travel.

The system is engaged by pressing the speed-bar with the pilot's feet.

-not included as standard- the pilot must connect the speed-bar to the A-risers using Brummel hooks.

The majority of harnesses have a speed system pre-installed. To install the speed-bar, pass the speed system cords through the harness and connect them to the speed system cords on the A-risers.
The length of the speed-bar travel must be adjusted depending on the height of the individual pilot.
We recommend testing the complete system when hanging in a frame first - most schools have such equipment.

The speed system uses an action/reaction system. Released, the speed-bar is set to neutral. When the bar is pushed using the feet, the wing accelerates. The speed can be regulated by varying the pressure on the bar. Once the pressure on the bar is released, the speed system returns to the neutral setting.
The speed system is efficient, sensitive and precise. The pilot can use the system whenever they want during the flight.

The use of the speed system results in changes to the speed and reactions of the wing.

In the neutral position the wing will fly slower but with better glide; at maximum acceleration (full speed-bar) the wing will have greater speed but reduced glide.

Neutral position A, B, C-risers aligned
Fully engaged speed-bar (maximum speed) A-B= 3 cm, A-C=9 cm

2.6 ADJUSTING THE BRAKES

The length of the main brake lines is adjusted at the factory according to the length established during the certification procedure (see technical data). However, it can be changed to adapt to the pilot's own flying style. In any case, we recommend flying for a while using the default line length factory settings before making any adjustment. It will enable you to become more familiar with the ROLLER and its unique flying characteristics. If you then decide to change the length of the brake lines, untie the knot, slide the line through the brake link to the desired length, and strongly re-tie the knot.
Only qualified personnel should carry out this adjustment. You must ensure that the modification does not slow the glider down without pilot input. Both brake lines should be symmetrical and of the same length. We recommend using a clove hitch or bowline knot.

When changing the brake length, it is necessary to check that they do not engage when the accelerator is used. When accelerated using the speed-bar, the glider rotates over the 'C' risers and the trailing edge rises. The brake lines should be checked for proper adjustment, while taking this extra length into consideration.

2.7 ADJUSTING THE TRIMMERS

The trimmers are installed in the factory and the pilot only needs to check their proper operation and adjustment.

The ROLLER has three risers. The trimmers are situated on the C-riser and have a maximum travel of 10 cm.
The use of the trimmers results in changes to the speed and reactions of the wing.

The pilot is responsible for the trimmer setting.

The trimmer setting and symmetry must be constantly checked during

flight and before every takeoff.

The trimmer system is set by the pilot, i.e. it does not return to its point of origin, but remains in place until the pilot decides to release/change the position.

Engaging and releasing the trimmers is effective and quick as well as sensitive and accurate.

When the trimmer is in the neutral position, the wing will fly at a lower speed with greater glide; when the trimmer is released, the wing will fly with higher speed and worse glide.

Trimmers in neutral position A, B, C-risers aligned
Trimmers released A-B= 3.3 cm, A-C= 10 cm

2.8 INSPECTION AND WING INFLATION ON THE GROUND

After your gear is thoroughly checked and the weather conditions deemed favourable for flying, inflate your ROLLER as many times as necessary to familiarise yourself with its behaviour. The smooth inflation is easily done. An over-energetic handling is not necessary to bring the wing overhead as it will gently climb with minimum tension on the harness when moving forward. The sequence can be made easier by using the A-risers.

Do not pull, but rather accompany them naturally, following the rising arcing movement of the wing. Once the wing has climbed overhead, simply apply the correct amount of brake pressure to keep the ROLLER stationary.

3. THE FIRST FLIGHT

3.1 CHOOSE THE RIGHT LOCATION

For the first flight we recommend going to your usual flying area and that a qualified instructor is present and supervising the entire procedure.

When arriving at the take-off, the pilot should assess the following conditions: wind speed and direction, possible areas of rotor, take-off is clear of obstacles, etc.

A defined flight plan should be formulated and this should include taking note of the topography, obstructions and risk areas to avoid. The take-off zone should be sufficiently large and free of obstacles.

Before takeoff, inspect the wing, harness, helmet and any other equipment.

Given that the ROLLER can fly in a wide range of conditions, it is essential to assess the conditions and terrain before every flight. The conditions must also be suitable for the pilot's skill level and experience. Just because the wing is fast, pilots should not make the mistake of underestimating the conditions and taking off in unsuitable and unsafe circumstances.

3.2 PREPARATION

Repeat the procedures detailed in chapter 2 UNPACKING AND ASSEMBLY to prepare your equipment.

3.3 FLIGHT PLAN

Planning a flight before taking off to avoid possible problems later is always a good idea.

3.4 PRE-FLIGHT CHECK LIST

Once ready, but before taking off, conduct another equipment inspection. Conduct a thorough visual check of your gear with the wing fully open, the lines untangled and properly laid out on the ground to ensure that all is in working order. Be certain the weather conditions are suited to your flying skill level.

3.5 WING INFLATION, CONTROL AND TAKE-OFF

The ROLLER takeoff phases are the same as with conventional paragliders.

With a standard breeze and once everything is checked, it is important to adjust the position of the trimmers to neutral. Please note that because the takeoff speed is greater than with a larger surface glider, a speed wing requires more space for the takeoff run.

The wing will inflate cleanly after a proportionate pull. If it is necessary to control the wing during the acceleration phase, we recommend

first ensuring the sail is equally pressurised and then the pilot should reposition themselves under the centre of the wing. It is important to remember to launch with sufficient speed and to remember that any brake input will slow down the glider.

With more experience, and being accustomed to launching in stronger winds, the pilot will learn to master different takeoff styles.

Whenever the wind speed permits it, we recommend a reverse inflation. This technique enables the pilot to have a better view of the wing to make sure all is in order before turning around and running down the slope.

3.6 LANDING

In this final stage of the flight we must assess the conditions in the landing field and act accordingly. The trimmers must be released and in the neutral position, make the approach with speed, rounding out smoothly when the speed decreases and braking to the maximum.

A constant-aspect approach is recommended if the chosen fields and conditions permit, but the pilot must be flexible and adapt the approach depending on the terrain, wind speed, obstacles, etc.

Sharp turns near the ground should be avoided, anticipation is the best way for a good approach. The stability and manoeuvrability of the ROLLER really assist the pilot in this final stage of flight.

During the first few flights with this wing, we recommend choosing a large landing field where sharp turns and manoeuvres close to the ground will not be necessary.

3.7 FOLDING INSTRUCTIONS

The ROLLER has a complex leading edge, manufactured using a variety of different materials and it must be packed carefully. A correct folding method is very important to extend the useful life of your paraglider.

It should be concertina-packed, with the leading edge reinforcements flat and the flexible rods stacked one on top of the other. This method will keep the profile in its original shape and protect the integrity of the wing over time. Make sure the reinforcements are not bent or folded. It should not be folded too tightly to avoid damage to the cloth and/or lines.

The Niviuk Nkare Bag is designed for ultra-fast packing and can easily be carried as a backpack. It allows you to unpack the wing quickly and easily. Just place the wing inside the Nkare Bag and secure it with the compression straps.
Perfect for short walks or to transport the wing in the car without the risk of damage.
It has two adjustable straps and a small inner pocket to avoid the risers getting tangled with the lines.

4. IN FLIGHT

Please carefully review the glider certification results including the relevant information pertaining to the manoeuvres involved during the tests.

Note that glider behaviour can vary depending on size, or wing loading for the same size.

Becoming familiar with the test results can help you better understand the glider to control various situations when flying.

4.1 FLYING IN TURBULENCE

The ROLLER has an excellent profile and is very robust and solid in these situations. It is very stable in all conditions and has excellent passive

flight reactions, which makes it very safe in turbulent conditions.

In normal conditions we should not expect any incidents with the ROLLER, even in thermic conditions the wing profile and high internal pressure absorbs turbulence well. In severe turbulence the wing may lose pressure, but will recover immediately. Collapses rarely occur, but cannot be completely discounted. In turbulent conditions, the best way to prevent collapses is to fly actively. In these conditions, it is best if the trimmers are in the neutral position.

The ROLLER is able to stay in the air when the wind is strong and standard paragliders cannot fly, however, if conditions are very turbulent, this is not mitigated by being able to fly faster.

All paragliders must be piloted for the prevailing conditions and the pilot is the ultimate safety factor.

We recommend active flying in turbulent conditions, always taking measures to maintain control of the wing, preventing it from collapsing and restoring the speed required by the wing after each correction.

Do not correct the glider (braking) for too long in case this provokes a stall. If you have to take corrective action, make the input then re-establish the correct flying speed.

4.2 POSSIBLE CONFIGURATIONS

To become familiar with the manoeuvres described below, we recommend practising within the environment of a competent training outfit. The pilot must adapt their use of the brakes depending on the wing-loading and avoiding over-steering.

It is important to note that the type of reaction to a manoeuvre can vary from one size of wing to another and even within the same size the behaviour and reactions may be different depending on the wing-loading.

In the test report, you will find all the necessary information on how to handle your new wing during each of the tested manoeuvres. Having this information is crucial to know how to react during these manoeuvres in real flight, so you can deal with these situations as safely as possible.

Asymmetric collapse

In spite of the ROLLER's profile stability, strong turbulent air may cause the wing to collapse asymmetrically, especially if the pilot is unable to fly actively and prevent the collapse. In this case the glider conveys a loss of pressure through the brake lines and the harness. To prevent the collapse from happening, pull the brake handle corresponding to the affected side of the wing. It will increase the incidence of the wing (angle of attack). If the collapse does happen, the ROLLER will not react violently, the turning tendency is gradual and easily controlled. Weight-shift toward the open, flying side (the opposite side of the collapse) to keep the wing flying straight, while applying light brake pressure to that side if necessary. Normally, the collapsed side of the wing should then recover and reopen by itself. If it does not, then pull the brake handle on the collapsed side decisively and quickly all the way (100%) down. You may have to repeat this pumping action to provoke the re-opening of the deflated glider side. Do not over-brake or slow down the flying side of the wing (control the turn). Once the collapsed side is open make sure you return to the default flying speed.

Frontal collapse

Due to the ROLLER's design, in normal flying conditions frontal collapses are unlikely to take place. The wing's profile has great buffering abilities when dealing with extreme incidence changes. A frontal collapse may occur in strong turbulent conditions, entering or exiting powerful thermals or when lacking experience using the trimmer without adapting to the prevailing conditions. Frontal collapses usually re-inflate without the glider turning, but a symmetrically applied quick braking action with a quick deep pump of both brakes will accelerate the re-inflation if necessary. Release the brake lines immediately to return to default glider air speed.

Negative spin
A negative spin does not conform to the ROLLER's normal flight behaviour. Certain circumstances however, may provoke a negative spin (such as trying to turn when flying at very low air speed whilst applying a lot of brake). It is not easy to give any specific recommendation about this situation other than quickly restoring the wing's default air speed and angle of attack by progressively reducing the tension on the brake lines. The normal wing reaction will be to have a lateral surge on the re-accelerated side with a rotation not greater than 360º before returning to default air speed and a straight flight path trajectory.

Parachutal stall
The possibility of entering or remaining in a parachutal stall has been eliminated from the ROLLER.
A parachutal stall is virtually impossible with this wing. If it did enter into a parachutal stall, the wing loses forward motion, becomes unstable and there is a lack of pressure on the brake lines, although the canopy appears to be fully inflated. To regain normal air speed, release brake line tension symmetrically and manually push on the A-lines or weight-shift your body to any side WITHOUT PULLING ON THE BRAKE LINES.

Deep Stall
The possibility of the ROLLER stalling during normal flight is very unlikely. It could only happen if you are flying at a very low air speed, whilst over-steering or performing dangerous manoeuvres in turbulent air.

To provoke a deep stall, the wing has to be slowed down to its minimum air speed by symmetrically pulling the brake lines all the way (100%) down until the stall point is reached and held there. The glider will first pitch rearward and then reposition itself overhead, rocking slightly, depending on how the manoeuvre was done. When entering a stall, remain clear-headed and ease off the brake lines until reaching the half-way point of the total the brake travel. The wing will then surge violently forward and could reach a point below the pilot. It is most important to maintain brake pressure until the glider has returned to its default overhead flying position.

To resume normal flight conditions, progressively and symmetrically release the brake line tension to regain air speed. When the wing reaches the overhead position, the brakes must be fully released. The wing will then surge forward to regain full air speed. Do not brake excessively at this moment as the wing needs to accelerate to pull away from the stall configuration. If you have to control a possible frontal collapse, briefly pull both brake handles down to bring the wing back up and release them immediately while the glider is still in transition to reposition itself overhead.

Cravat
A cravat may happen after an asymmetric collapse, when the end of the wing is trapped between the lines. Depending on the nature of the tangle, this situation could rapidly cause the wing to spin. The corrective manoeuvres to use are the same as those applied in case of an asymmetric collapse: control the turn/spin by applying tension on the opposite brake and weight-shift opposite to the turn. Then locate the stabilo line (attached to the wing tip) trapped between the other lines. This line has a different colour and is located on the outside position of the B-riser. Pull on this line until it is taught, as it should help undo the cravat. If ineffective, fly down to the nearest possible landing spot, controlling the direction with both weight-shift and the use of the brake opposite to the tangled side. Be cautious when attempting to undo a tangle while flying near terrain or other paragliders; it may not be possible to continue on the intended flight path.

Over-controlling
Most flying problems are caused by wrong pilot input, which then escalates into a cascade of unwanted and unpredicted incidents. We should note that the wrong inputs can lead to loss of control of the glider. The ROLLER was designed to recover by itself in most cases. Do not try to over-correct it!

Generally speaking, the reactions of the wing, which are caused by too much input, are due to the length of time the pilot continues to over–control the wing. You have to allow the glider to re-establish normal flying

speed and attitude after any type of incident.

4.3 ACCELERATED FLIGHT

The ROLLER profile was designed for stable flight throughout its entire speed range.

When accelerating the wing, the profile becomes more sensitive to turbulence and closer to a possible frontal collapse. If a loss in internal wing pressure is felt, tension on the speed-bar should be reduced to a minimum and a slight pull on the brake lines is recommended to increase the wing's angle of attack. Remember to re-establish the air speed after correcting the angle of attack.

It is NOT recommended to accelerate near obstacles or in very turbulent conditions. If necessary, constantly adjust the movements and pressure on the speed-bar whilst doing the same to the brake lines. This balance is considered to be 'active piloting'.

4.4 FLYING WITHOUT BRAKE LINES

If, for any reason at all, the ROLLER's brake lines become disabled in flight, piloting the wing with the C-risers and weight shifting will become necessary. The C-lines steer easily because they are not under much tension, however you will need to be careful and not handle them too heavily in case this causes a stall or negative spin. The wing must be flown at full speed during the landing approach, and the C-risers will have to be pulled symmetrically all the way down shortly before contact with the ground. This braking method is not as effective as using the brake lines, and hence the wing will land with a higher groundspeed.

4.5 LINE KNOT(S) IN FLIGHT

The best way to avoid knots and tangles is to thoroughly inspect the lines as part of a systematic pre-flight check. If a knot is spotted during the take off phase, immediately abort the launch sequence and stop.

If inadvertently taking off with a knotted line, the glider drift will need to be compensated by weight-shifting to the opposite side of the wing and applying a slight brake pull to that side. Gently pull the brake line to see if the knot can be undone or try to locate the problem line. Try pulling it to see if the knot can be undone. Beware of trying to clear a knotted line or untangle a line in flight when close to the terrain. If the knot is too tight and cannot be undone, carefully and safely fly to the nearest landing zone. Be careful: do not pull too hard on the brake handles because there will be an increased risk of stalling the wing or entering a negative spin. Before attempting to clear a knot, make sure there are no other pilots flying in the vicinity.

5. LOSING ALTITUDE

Knowledge of different descent techniques could become vital in certain situations. The most suitable descent method will depend on the particular situation.

To become familiar with the manoeuvres described below, we recommend practising within the environment of a competent training outfit.

5.1 EARS

Big ears is a moderate descent technique, able to increase the sink rate and reduces the ground speed. The angle of attack and effective wing-loading will also increase due to the smaller surface area of the wing.

To re-establish forward speed and the correct angle of attack, the pilot must accelerate once the ears are pulled.
Big ears can be applied until landing but should be released at the moment of braking.

To activate the ‘Big ears’ manoeuvre, take the outer ‘3 A 2’ line on each A-riser and simultaneously, smoothly pull them outward and downward. The wingtips will fold in. Let go of the risers to re-inflate them automatically. If they do not re-inflate, gently pull on one of the brake lines and then on the opposite one. We recommend inflating the wing tips asymmetrically, without major change to the angle of attack, especially when flying near the ground or flying in turbulence.

5.2 B-LINE STALL

When carrying out this manoeuvre, the wing stops flying, loses all horizontal speed and the pilot is no longer in control of the paraglider. The airflow over the profile is interrupted and the wing enters a situation similar to parachuting.

To enter this manoeuvre, the ‘B’ risers are grabbed below the maillons and symmetrically pulled down together (approx. 20-30 cm) and then held to this position. The initial phase is quite physical (high pull resistance) requiring a strong tug until the wing’s profile/chord deforms in an accordion-like shape. The initial pulling force will then be significantly lessened. Holding the ‘B’ lines in the pulled down position will be necessary to maintain the configuration. The wing will then deform, its horizontal speed will drop to 0 km/h, vertical descending speed increase to –6 to –8 m/s depending on the weather conditions and how the manoeuvre was performed.

To exit the manoeuvre, simultaneously release both risers. The wing will then slightly surge forward and automatically return to normal flight. It is better to let go of the lines quickly rather than slowly. This is an easy escape manoeuvre to do, but remember that the wing will stop flying, will lose all forward horizontal speed, and its reactions will change significantly when compared to normal flight configuration.

5.3 SPIRAL DIVE

This is a more effective way for rapidly lose altitude. Beware that the wing will experience and be subjected to a tremendous amount of descending and rotating speed (g force), which can cause a loss of orientation and consciousness (blackout). This manoeuvre must therefore be done gradually to increase one’s capacity to resist the g force exerted on the body. With practice, a pilot will fully appreciate and understand it. Only practice this at high altitude and with enough ground clearance.

To enter the manoeuvre, the pilot will need to synchronise weight-shift with a gradual brake pull toward the inside of the intended turn. The intensity of the rotation can be controlled by applying a slight brake line pull on the upper and opposite half side of the wing.

A paraglider flying at its maximum rotating speed can reach –20 m/s, equivalent 70 km/h vertical descending speed, and a stabilised spiral dive will reach from 15 m/s onwards.

These are the reasons why any pilot should become familiar with the manoeuvre and know how to properly exit it.

To exit this manoeuvre, the inner brake (down side of the turn) must be progressively relaxed while momentarily applying tension to the outer brake opposite to the turn. The pilot must also weight shift and lean towards the opposite side of the turn at the same time. This exit needs to be carried out gradually and smoothly to feel the g force and adapt to the speed changes taking place.

When exiting the spiral, the glider will briefly experience an asymmetrical acceleration and dive, depending on how the manoeuvre was carried out.

Practice these manoeuvres at sufficient altitude and with moderation.

6. SPECIAL METHODS

6.1 ACROBATIC FLIGHT

Although the ROLLER was tested by expert acrobatic pilots in extreme situations, it was not designed for it. We do not recommend using this glider for acrobatic flying!

We consider acrobatic flight to be any form of piloting different than standard flights. Learning acrobatic manoeuvres should be conducted under the supervision of qualified instructors within a school environment and over water with all safety/rescue elements in place. Centrifugal forces as high as 4 to 5 G can be exerted on the body and wing during extreme manoeuvres.

The ROLLER is a wing with an extensive speed range which can be manoeuvred quickly and precisely at all times. Extremely dynamic and responsive, pure performance for those pilots capable of flying actively. Brake efficiency means the wing provides a great deal of useful feedback. This wing provides feedback so the pilot can easily control every moment of the flight.

The ROLLER is equipped with an efficient speed system and trimmers. The combination of the two systems allows an infinite number of angles of attack (and therefore speed) and more importantly, this means the pilot can enjoy more than just top-to-bottom flights, either by thermalling or soaring, having fun practicing barrel rolls, *swoops* or playing with height and speed.

7. CARE AND MAINTENANCE

7.1 MAINTENANCE

Niviuk are firmly committed to making technology accessible to all pilots. Therefore our wings are equipped with the latest technological advances gained from the experience of our R&D team.

Careful maintenance of your equipment will ensure continued top performance. Apart from the general checks, we recommend actively maintaining your equipment.
A pre-flight check is obligatory before each flight.
If there is any damage to the equipment, you should inspect it and act accordingly.

All incidents involving the leading edge should be reviewed. A hard impact can damage the sail cloth.

Thanks to TNT and the RAM system, the wing has more safety and performance, but this means being more careful with the material. If any Nitinol rod is damaged, they are easily replaceable.

The fabric and the lines do not need to be washed. If they become dirty, clean them with a soft damp cloth, using only water. Do not use detergents or other chemicals.

If your wing is wet from contact with water, place it in a dry area, air it and keep it away from direct sunlight.

Direct sunlight may damage the wing's materials and cause premature aging. After landing, do not leave the wing exposed to the sun. Pack it properly and stow it away in its backpack.

If flying in a sandy environment, and sand has accumulated inside the wing, remove it before packing it away. The apertures at the wingtips facilitate easy removal of objects from the trailing edge.

If your wing is wet from contact with salt water, immerse it in fresh water and dry it away from direct sunlight.

7.2 STORAGE

It is important for the wing to be correctly folded when stored. Keep it in the in a cool, dry place away from solvents, fuels and oils.

Do not leave the gear inside a car boot, as cars left in the sun can become very hot. A rucksack can reach temperatures up to 60ºC.

Weight should not be laid on top of the equipment.

It is very important to pack the wing correctly before storage.

It is essential that the wing is properly folded and packed. In case of long-term storage it is advisable, if possible, that the wing is not compressed and it should be stored loosely without direct contact with the ground. Humidity and heating can have an adverse effect on the equipment.

7.3 CHECKS AND CONTROLS

The ROLLER must be periodically inspected after 100 flying hours or every 12 months, whichever comes first (EN/LTF norm).

We strongly recommend that any repairs should be done in a specialist repair shop by qualified personnel. A thorough pre-flight check must be performed before every flight.

7.4 REPAIRS

If the wing is damaged, you can temporarily repair it by using the Ripstop tape included in the repair kit, as long as no stitching is required to mend the fabric. Any repair should be done in a specialist repair shop by qualified personnel. Do not attempt home repairs.

Damaged lines must be repaired or exchanged immediately. Please refer to the line plan at the end of this manual.

Any repair should be done in a specialist repair shop by qualified personnel. Niviuk cannot be held responsible for any damage caused by incorrect repairs.

8. SAFETY AND RESPONSIBILITY

Please remember that speedflying is considered a risk sport, where safety depends on the person who is practicing it.

Wrong use of this equipment may cause severe, life-changing injuries or even death. Manufacturers and dealers cannot be held responsible for your decisions, actions or accidents that may result from participating in this sport.

You must not use this equipment if you have not been properly trained to use it. Do not take advice or accept any informal training from anyone who is not properly qualified as a flight instructor.

The pilot alone is responsible for their decisions and it is their responsibility to assess whether the weather conditions, wind, site, landing zone and the pilot's skill level are suitable and sufficient for any potential risks.

9. GUARANTEE

The equipment and components are covered by a two year warranty against any manufacturing defect.

The warranty does not cover misuse of the equipment.

DISCLAIMER:
Paragliding is an activity requiring concentration, specific knowledge and sound judgment. Beware! Learn your skills under the supervision and guidance of a certified school. Take out personal insurance and become

a licensed pilot. Be realistic when evaluating your knowledge in respect to weather assessment before deciding whether or not to fly. Niviuk's liability coverage is for its product line only. Niviuk cannot be held responsible for your actions. Fly at your own risk!

10. TECHNICAL DATA

10.1 TECHNICAL DATA

ROLLER			**14**	**16**	**18**	**20**
CELLS	NUMBER		35	35	35	35
	CLOSED		8	8	8	8
	BOX		27	27	27	27
FLAT	AREA	m^2	14	16	18	20
	SPAN	m	7,76	8,3	8,8	9,27
	ASPECT RATIO		4,3	4,3	4,3	4,3
PROJECTED	AREA	m^2	12,5	14,28	16,1	17,85
	SPAN	m	6,71	7,17	7,61	8,02
	ASPECT RATIO		3,6	3,6	3,6	3,6
FLATTENING		%	12%	12%	12%	12%
CORD	MAXIMUM	m	2,17	2,32	2,46	2,59
	MINIMUM	m	0,72	0,77	0,81	0,86
	AVERAGE	m	1,80	1,93	2,05	2,16
LINES	TOTAL METERS	m	180,4	193,5	205,8	217,5
	HEIGHT	m	4,88	5,23	5,54	5,84
	NUMBER		164	164	164	164
	MAIN		2/3/2	2/3/2	2/3/2	2/3/2
RISERS	NUMBER	3	A/B/C	A/B/C	A/B/C	A/B/C
	TRIMS		YES	YES	YES	YES
	ACCELERATOR	m/m	90	90	90	90
INTERMEDIATE WEIGHT	MINIMUM	kg	60	70	80	90
IN FLIGHT	MAXIMUM	kg	90	100	110	120
GLIDER WEIGHT		kg	3	3,3	3,6	3,9
CERTIFICATION		EN	926-1	926-1	926-1	926-1

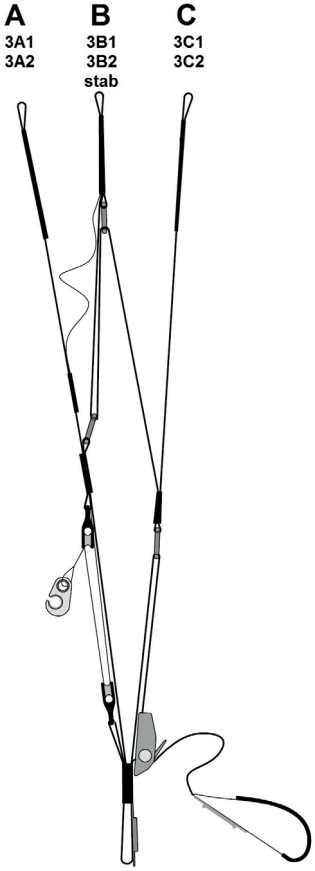
10.2 MATERIALS DESCRIPTION

CANOPY	FABRIC CODE	SUPPLIER
UPPER SURFACE	9017 E25	PORCHER IND (FRANCE)
BOTTOM SURFACE	N20 DMF	DOMINICO TEX CO. (KOREA)
RIBS	9017-E29	PORCHER IND (FRANCE)
DIAGONALS	9017-E29	PORCHER IND (FRANCE)
LOOPS	LKI - 10	KOLON IND. (KOREA)
REINFORCEMENT LOOPS	W-420	D-P (GERMANY)
TRAILING EDGE REINFORCEMENT	MYLAR	D-P (GERMANY)
RIB REINFORCEMENT	LTN-0.8 STICK	SPORTWARE CO. (CHINA)
THREAD	SERAFIL 60	AMAN (GERMANY)

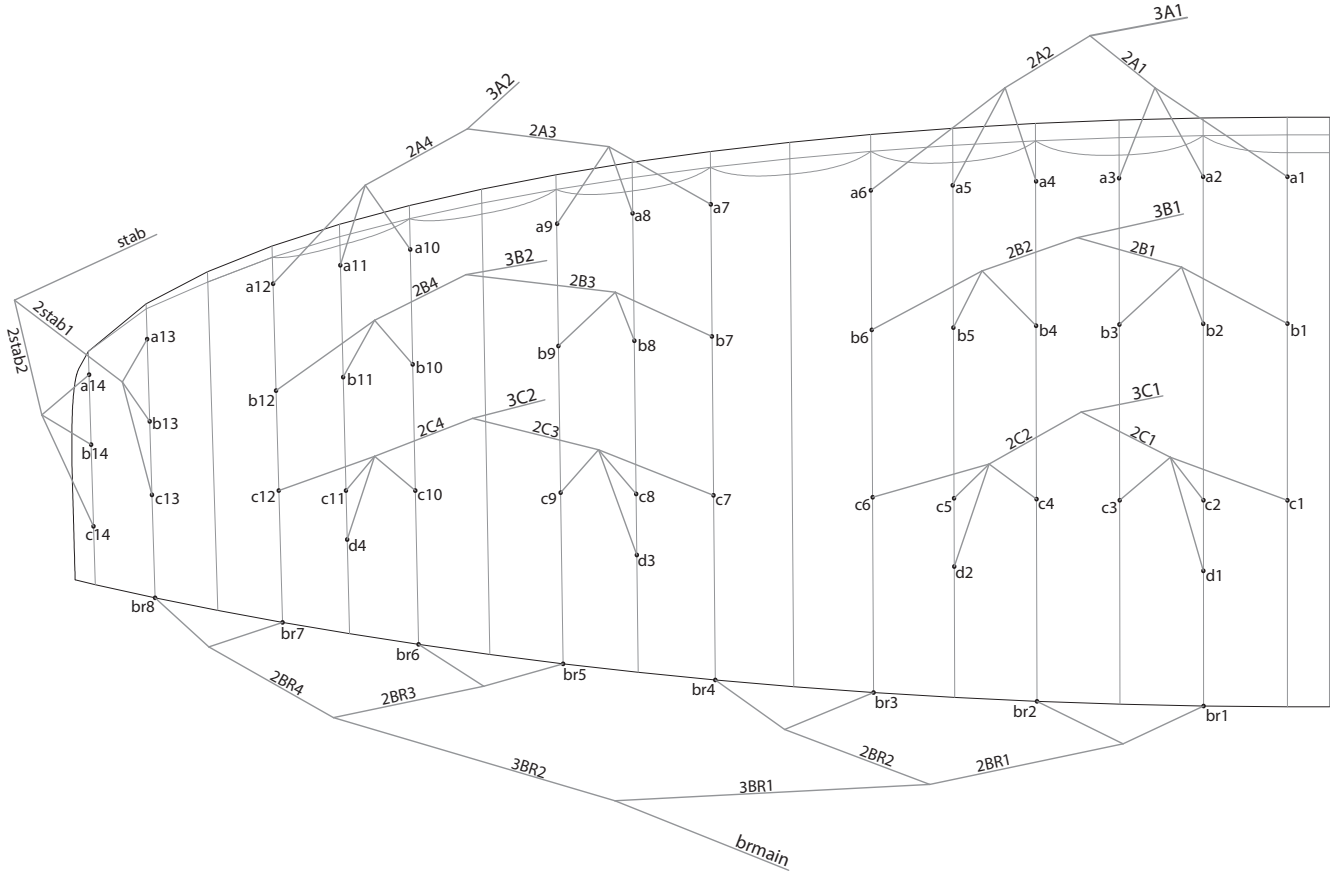
SUSPENSION LINES	FABRIC CODE	SUPPLIER
UPPER CASCADES	DC - 60	LIROS GMHB (GERMANY)
MIDDLE CASCADES	DC - 60	LIROS GMHB (GERMANY)
MIDDLE CASCADES	PPSL - 120	LIROS GMHB (GERMANY)
MIDDLE CASCADES	TNL - 140	TEIJIM LIMITED (JAPAN)
MAIN	PPSL - 120	LIROS GMHB (GERMANY)
MAIN	TNL - 280	TEIJIM LIMITED (JAPAN)
MAIN	TNL - 400	TEIJIM LIMITED (JAPAN)
MAIN BREAK	TNL - 400	TEIJIM LIMITED (JAPAN)
THREAD	SERAFIL 60	AMAN (GERMANY)

RISERS	FABRIC CODE	SUPPLIER
MATERIAL	G-R 22	TECNI SANGLES (FRANCE)
COLOUR INDICATOR	PAD	TECNI SANGLES (FRANCE)
THREAD	V138	COATS (UK)
MAILLONS	MRI4	ANSUNG PRECISION (KOREA)
PULLEYS	PY - 1304-2	ANSUNG PRECISION (KOREA)

10.3 RISERS LAYOUT



10.4 LINE PLAN



10.5 LENGTHS ROLLER 14

LINES HEIGHT m/m

	A	B	C	D	br
1	4425	4351	4460	4421	5128
2	4360	4287	4370	4391	4772
3	4340	4269	4338	4383	4661
4	4337	4269	4334	4314	4695
5	4337	4273	4345		4639
6	4376	4316	4406		4589
7	4374	4322	4414		4601
8	4332	4287	4357		4703
9	4321	4282	4343		
10	4281	4255	4316		
11	4254	4236	4306		
12	4253	4242	4330		
13	4118	4094	4149		
14	4091	4082	4161		

RISERS LENGTH m/m

	A	B	C	
	480	480	480	STANDARD
	480	507	580	TRIMMER OPENED
	390	445	580	ACCELERATED

10.6 LENGTHS ROLLER 16

LINES HEIGHT m/m

	A	B	C	D	br
1	4761	4684	4801	4762	5517
2	4694	4617	4706	4735	5138
3	4674	4599	4673	4729	5020
4	4673	4601	4671	4657	5058
5	4675	4607	4684		5001
6	4718	4654	4751		4949
7	4718	4663	4759		4963
8	4674	4625	4699		5074
9	4663	4620	4684		
10	4621	4592	4656		
11	4593	4572	4646		
12	4592	4580	4672		
13	4447	4420	4479		
14	4417	4407	4491		

RISERS LENGTH m/m

	A	B	C	
	480	480	480	STANDARD
	480	507	580	TRIMMER OPENED
	390	445	580	ACCELERATED

10.7 LENGTHS ROLLER 18

LINES HEIGHT m/m

	A	B	C	D	br
1	5079	4996	5121	5083	5884
2	5008	4926	5022	5058	5483
3	4989	4909	4988	5056	5359
4	4989	4912	4987	4981	5401
5	4992	4919	5001		5342
6	5039	4971	5074		5288
7	5040	4983	5085		5304
8	4994	4943	5022		5423
9	4982	4938	5006		
10	4939	4909	4977		
11	4910	4889	4967		
12	4909	4897	4995		
13	4756	4727	4789		
14	4723	4713	4801		

RISERS LENGTH m/m

	A	B	C	
	480	480	480	STANDARD
	480	507	580	TRIMMER OPENED
	390	445	580	ACCELERATED

10.8 LENGTHS ROLLER 20

LINES HEIGHT m/m

	A	B	C	D	br
1	5378	5294	5435	5397	6229
2	5305	5221	5331	5373	5808
3	5285	5204	5297	5374	5679
4	5286	5207	5296	5296	5725
5	5291	5216	5313		5665
6	5341	5271	5390		5610
7	5346	5285	5403		5628
8	5298	5244	5335		5753
9	5286	5239	5319		
10	5242	5209	5290		
11	5211	5188	5279		
12	5211	5197	5309		
13	5048	5018	5088		
14	5014	5003	5101		

RISERS LENGTH m/m

	A	B	C	
	480	480	480	STANDARD
	480	507	580	TRIMMER OPENED
	390	445	580	ACCELERATED

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