



Operating Instructions

UP Makalu



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Welcome in the team!

Congratulations on the purchase of your new UP paraglider. With the UP Makalu you have chosen a paraglider that represents the maximum safety, performance and quality in our sport.

Please take a little time to fill in and send the reply card contained within this manual. This way we can keep you informed of all new products and developments at UP, as well as any technical information about the UP Makalu.

We would also be delighted to hear any feedback you have concerning the glider. It is only through this feedback that we can continue to develop world-class paragliders that appeal to the majority of pilots.

If you have any questions regarding your paraglider or ancillary equipment please ask your local dealer. If he is unable to help you then feel free to contact us here at UP directly.

Your UP Europe Team



Safety instructions

Paragliding is an extremely demanding sport requiring exceptional levels of attention, judgement, maturity, and self-discipline. Due to the inherent risks in flying this or any paraglider, no warranty of any kind can be made against accidents, injury, equipment failure, and/or death. This glider is not covered by product liability insurance. Do not fly it unless you are willing to assume personally all risks inherent in the sport of paragliding and all responsibility for any property damage, injury, or death which may result from use of this paraglider.

Please read this owner's manual comprehensively before your first flight with the UP Makalu, so that you are fully acquainted with your new glider. This manual gives you information on all important flying characteristics of the UP Makalu, but it does not replace attending a paragliding school. It is important to note the following points:

- at the time of delivery the UP Makalu conforms to German Hang Gliding Association (DHV) and/or AFNOR (SHV and ACPUL) requirements (see certification information later in this manual)
- any change outside the permissible range of adjustment invalidates any and all claims under the guarantee
- the use of this paraglider is exclusively at the risk of the user
- no responsibility can be taken by the manufacturer or distributor
- it is assumed that the pilot is in possession of the necessary qualifications and provisions of any relevant laws are observed



Development of paragliders at UP

UP Europe can look back on an extremely successful history in the development of hang gliders and paragliders.

The development of a new glider begins with a detailed and exacting market analysis, and on this basis a new product concept emerges. In close cooperation with our customers we define the exact characteristics that the new glider should exhibit.

With these characteristics in mind we first develop a three-dimensional computer model, with the latest CAD software, which is subjected to initial tests and simulations. The model data is then transmitted directly to the production house for construction of the first prototype.

This prototype is then subjected to a rigorous series of flight tests and modifications. If necessary further prototypes are built, although this is seldom the case, and testing continues until the team is happy that all the original criteria have been met or exceeded.

Finally, the last prototype is presented to the DHV and/or AFNOR for certification. Only when this is completed will the glider be released to join the rest of the UP range.



Technical description

The UP Makalu was developed by UP to satisfy the demand from low airtime pilots for a fast and secure intermediate paraglider with outstanding take-off attributes.

As with all UP products, the materials used have been carefully chosen for their outstanding quality and strength, to guarantee a long and trouble-free life.

Technical Data

	UP Makalu XS	UP Makalu S	UP Makalu M	UP Makalu L	UP Makalu XL
Area; real	23,7 m ²	26,0 m ²	28,5 m ²	31,0 m ²	33,5 m ²
Area; projected	20,1 m ²	22,0 m ²	24,1 m ²	26,2 m ²	28,4 m ²
Wing span; real	10,9 m	11,4 m	11,9 m	12,4 m	12,9 m
Wing span; projected	8,7 m	9,1 m	9,5 m	9,9 m	10,3 m
Aspect ratio; real	5,0	5,0	5,0	5,0	5,0
Aspect ratio; projected	3,8	3,8	3,8	3,8	3,8
No. of supported ribs	22	22	22	22	22
No. of cells (upper sail)	42	42	42	42	42
No. of cells (under sail)	42	42	42	42	42
Average line length	5,93 m	6,20 m	6,50 m	6,78 m	7,05 m
Total line length	315 m	331 m	346 m	360 m	375 m
Total number of lines	134	134	134	134	134
Line diameters [mm]	1,1 / 1,7 / 2,15 (2,3 XL)				
Certification DHV accelerated / not accel.	1-2 / 1-2	1-2 / 1-2	1-2 / 1-2	1-2 / 1-2	1-2 / 1-2
Take-off weight DHV	55-75	65-85	80-105	95-120	110-150



Further construction details, including line lengths, are included in the certification specification sheets which form part of this manual. Any technical changes will appear in the appendix.

Canopy material

The UP Makalu is constructed from polyamide cloth which is particularly stretch-resistant and durable, and is specially treated for maximum UV resistance.

After an extensive series of tests and years of practical experience we have found that the best material is a high tenacity polyamide “New Sky-Tex”, from Porcher Marine (France), with the designation 9092 E38A (upper and lower surface; cloth weight 45 g/mm²) and 9092 E29A (ribs and V-ribs; cloth weight 45 g/mm²). This material exhibits consistently excellent air permeability and has a remarkably good colour fastness with the latest PU coating.

Construction of the canopy

The canopy of the UP Makalu is composed of 42 cells and profile ribs. To keep the line quantity to a minimum, only every other cell on the UP Makalu is suspended.

At each suspended cell there are internal V-tapes which transfer the load onto the adjacent ribs. With this system it has been possible to increase the smoothness of the overall profile and reducing the total line length at the same time. With this system UP could increase the performance and safety of the UP Makalu once more

The completely new developed profile joins outstanding take-off attributes with a high passive safety. The construction of the canopy let the UP

Makalu fly in turbulent conditions and in thermals always solidly and safe.

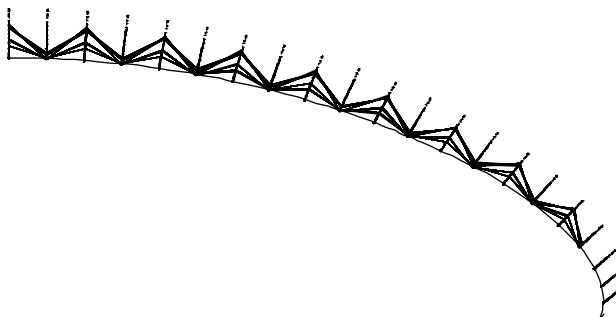


Illustration 1: Construction of the canopy wit ribs and V-tapes

Line material

In the UP Makalu we use 1.1, 1.7 and 2.15 mm Ø Cousin Freres Technora lines. These lines are composed of a specially woven Co-Aramid core and display an extremely high tensile strength. Furthermore, tests have shown that these lines are much less sensitive to bending loads and display a better stability at extension than other Co-Aramid lines.

This stability in the lines guarantees that there is no change in the glider's characteristics in it's first few hours of flying; the time during which the lines are first exposed to flight loads.

For the main brake line we use another line material with a Dyneema core. This material is extremely strong is not weakened when knotted, due to limited elasticity.



Line attachment points

The entire line system is formed from individual lines, which are sewn and looped at both ends. The single lines levels are connected over a special loop technology ("handshake") to prevent a weakening of the core and a loss of strength. The lines and stitching are subject to rigorous production controls, to ensure high and consistent manufacturing quality.

The lines of each wing consist of four groups and the brake lines:

A-Lines: A1-A3

B-Lines: B1-B3

C-Lines: C1-C3 / S1

D-Lines: D1-D2

Brake Lines: BRK1

The brake lines are collected at one main control line per side. This control line runs through a pulley attached to the D-Riser and is marked with a black dot at the point where it should loop around the D-ring. The brake is pre-set so that the glider is at 0 degree brake when the toggle is free. Please don't change the main brake lines without checking the new length carefully at a suitable training hill before flying!

The line bundles (A, B, C and D) are colour coded for easy identification and handling. All main lines of each level are looped together and attached to delta quick links, which are connected to the risers. The quick links have special line collectors to prevent lines slipping, and are secured using a strong thread-locking compound (Loctite®), to prevent unintentional opening. After maintenance work the delta quick links should be re-Loctited!



Risers

The lines are grouped into four risers and one control line on each side. The riser ends are colour coded for easy identification at take off as well as in flight for B Stall.

The UP Makalu has a divided A riser (see illustration) to facilitate easy 'big ears'.

During normal flight all risers are 550mm in length (480mm for the Small and Extra small). As the accelerator is activated so it shortens the effective length of, at first, just the A riser. After 30mm of travel the A and B risers are then shortened together by further application of the accelerator, and the C riser by half this amount.

The largest change in the angle of attack is reached when the speed system pulleys are pulled together. The A riser then has an effective length of 360 mm (310 mm), the B riser of 390 mm (340 mm) and the C riser of 470 mm (415 mm). Throughout the entire acceleration the length of the D-risers remains constant.

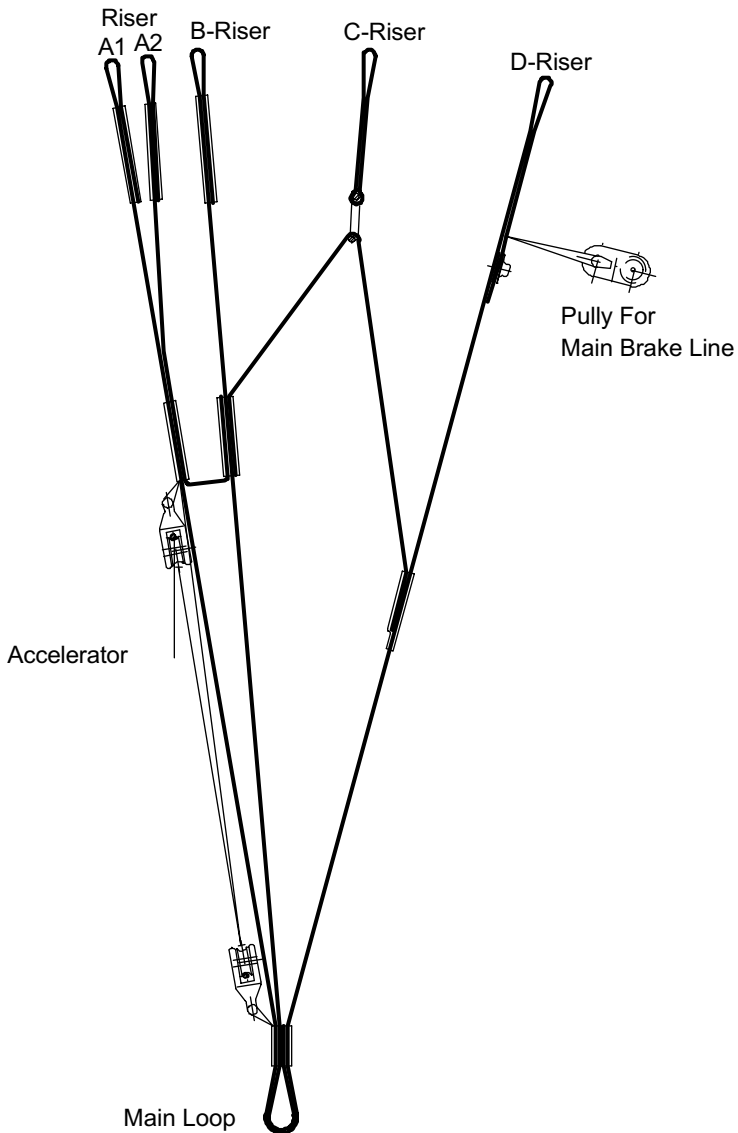


Illustration 2: UP Makalu Riser



UP Backpack

At UP our Research and Development reaches beyond just the paraglider to encompass all parts of the flying experience. Your UP Makalu comes with a high volume backpack designed especially for ease of use and comfort.

We have built in an anatomical carrying system which allows an optimum load distribution for maximum security and comfort. The S shaped shoulder straps allow full adjustment and the detachable chest strap prevents the shoulder straps from sliding off the shoulders.

The load control straps attached to the shoulder straps can be set either loose, to aid ventilation, or tight, for extra stability. They should rise from your collarbone at about a 45° angle.

A hip belt is also incorporated to assist overall comfort. If the hip belt is tightened then the shoulder straps can be released slightly to transfer the load away from the shoulders. The hip belt is fitted with stabilization straps, which can be tightened to help stability, or loosened for extra freedom of movement. The hip belt is removable for when packed size is critical, or the pack is being transported by air.

It is important, especially when there is a long carry involved, that the backpack is adjusted for maximum comfort. The following advice should be considered when packing.

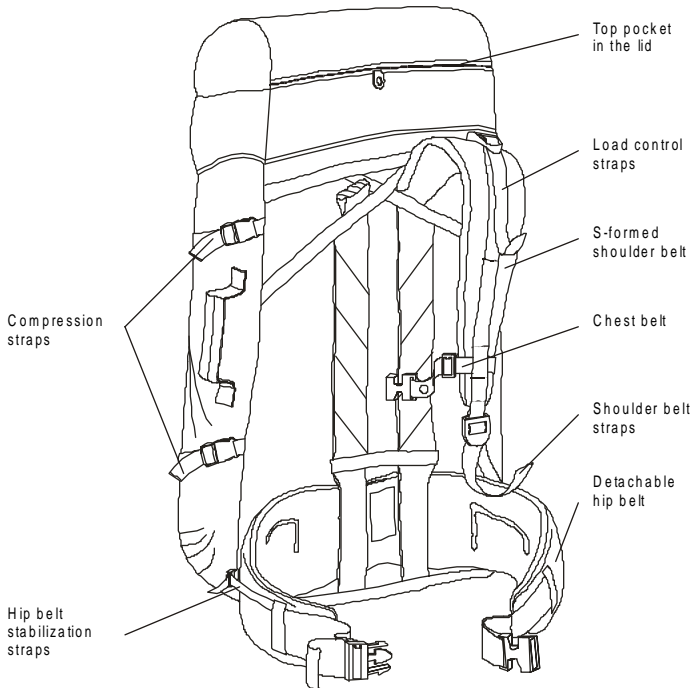


Illustration 3: UP Backpack

Adjustment of the backpack

When fully loaded, all compression straps should be tightened, to secure the load into the pack. All carrying straps should be set fully loose and the pack put on your back. The hip belt should be fastened and tightened so it rests approximately in the middle of the hip. Any slack should be taken out of the shoulder straps, although they don't want to be over tightened, and the chest strap should be done up. The load control straps at the shoulders and hip can now be tightened to achieve the desired stability.

Suggestion of packing

The load should be arranged in the pack as in the diagram below, with the heaviest weight closest to the shoulders. Try to avoid having heavy objects either too low in the pack, or too far behind the shoulders. Medium weight items should be packed high, and only lightweight items in the base and outside pockets.

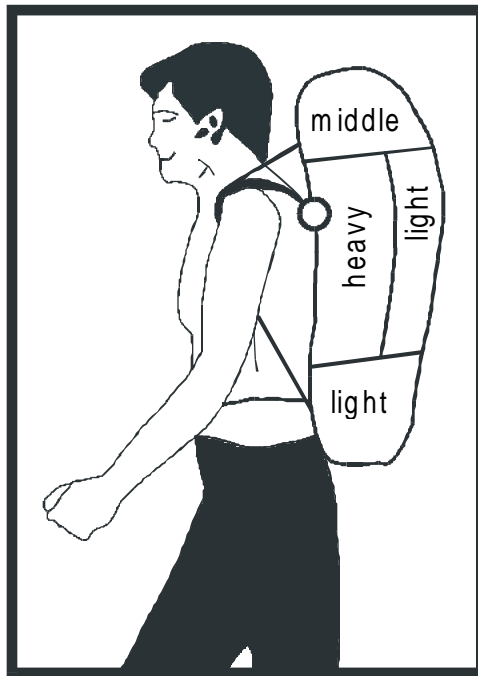


Illustration 4: Best distribution of the load for the UP Backpack



Before the first flight

Adjustments

The UP Makalu has undergone an extensive development programme and series of flight tests to ensure that the production model exhibits the optimum characteristics with regard to safety, handling and flight performance.

As with all products from UP Europe, the UP Makalu is manufactured to the highest quality and precision. The line lengths of each glider are individually checked and recoded before dispatch.

Under no circumstances should the lengths of the lines or risers of the UP Makalu be altered in any way.

Warning: Any change will invalidate certification!

The only change allowable is to the length of the lower brake line. This should only be done by an experienced person.

Position of the brakes

The UP Makalu is delivered from the factory with what we feel is the best brake position for most pilots. But tall or short pilots, or those with a harness with non-standard attachment points might feel it necessary to change the position of the brake loops.

If the brakes are to be shortened, it is extremely important that any adjustment does not affect the glider's trim speed. There must always be some free play in the brakes when they are fully released. This can be checked with the glider inflated above the pilot's head. There should be some noticeable bow in



the brake lines, and the brakes should be having no effect on the shape of the wing.

If the brake lines are to be lengthened, it is important to ensure that the pilot can still stall the canopy (i.e. during extreme manoeuvres or landing) without the need to take wraps.

If you do feel the need to change the brake line lengths, then only change them by a little (3-4cm) at a time, and preferably at an easy training slope. Check especially that both lines are the same length, as any asymmetry will lead to tiring and possible dangerous flight situations.

If you have any questions or concerns with reference to the brake line lengths then seek advice from either your UP dealer or directly from UP Europe.

To tie the brake line onto the brake handle use one of the following knots; the simple fisherman's knot or the Bowline as shown in illustration 5 and 6. These knots guarantee the least amount of line weakening.

Warning: Loose or incorrect brake knots can cause serious accidents through loss of the steering of the glider!

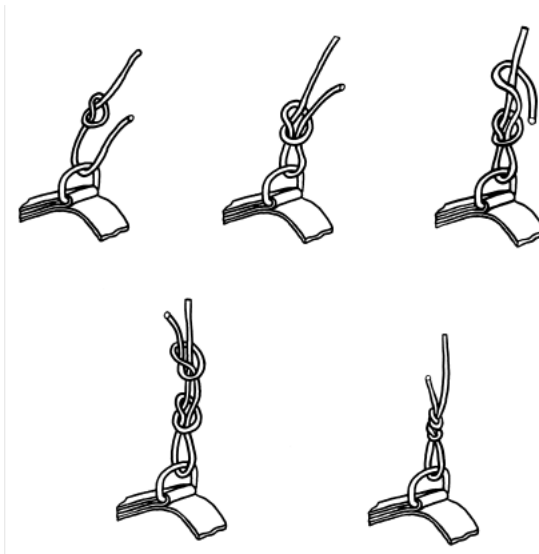


Illustration 5: Brake knot – the simple fisherman’s knot



Illustration 6: Bowline



Speed System

It is important that the speed system is connected correctly, and the length checked, to ensure smooth operation in flight.

The link between the foot stirrup and the risers consists of two ropes and two small carabiners. The accelerator stirrup itself is composed of a foot bar (an aluminium bar in a webbing sleeve) with loops sown on either end to attach the ropes. These ropes should be run up through the eyelets and pulleys on the harness to connect with the pulley system on the front of the risers (see Illustration 7). This illustration refers to the UP Action harness, but many harnesses are similar. If in any doubt, please ask the harness dealer/manufacturer.

The length of the ropes should be set so that, at full leg extension, the pulleys on the risers are just touching each other. Any shorter and the stirrup will be difficult to reach; longer and the whole speed range will be unavailable.

During take off it is advisable to fix the accelerator stirrup underneath the harness to avoid any danger of tripping over it. UP harnesses have two elastic loops to facilitate this.

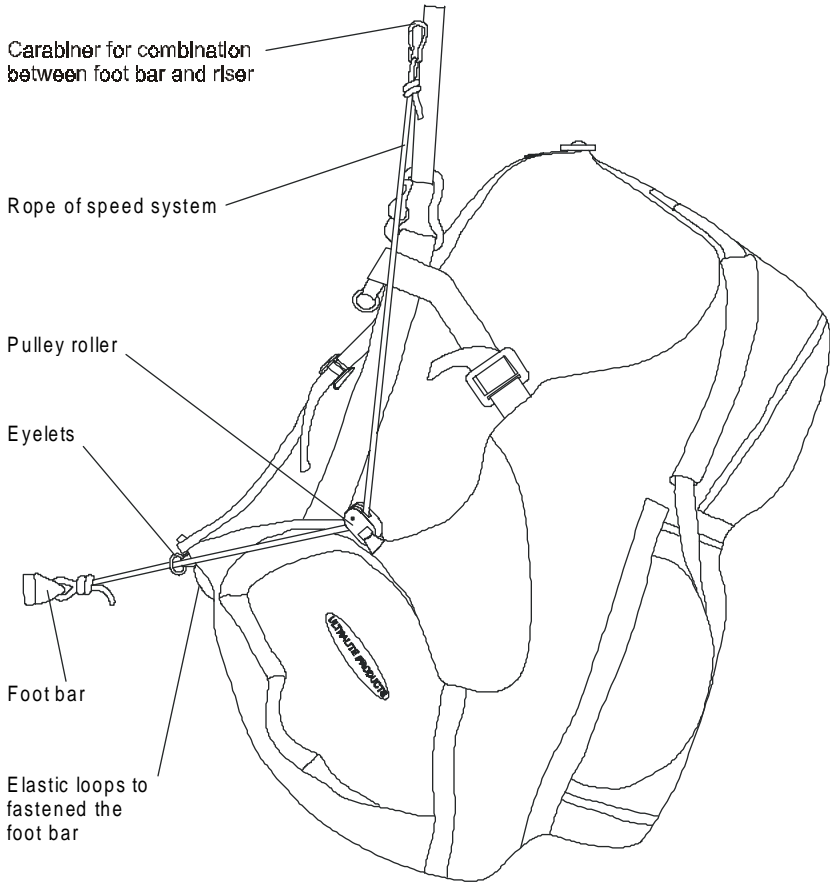


Illustration 7: Components of the foot accelerator and the rope course



Harness

Any harness with hang points near chest height is suitable for use with the UP Makalu. The lower the hang point of the harness, the better the pilot can steer by weight shift. A DHV or ACPUL certified harness is recommended.

The harness design should also guarantee that it's possible to accelerate the UP Makalu up to the maximum speed.

Note that the height of the hang point also affects the brake line length. If you have a question about your UP harness, contact your dealer or UP Europe.

Rescue System

It is strongly recommended that you have a rescue system (reserve parachute) fitted at all times. In some countries it is mandatory, so check if you plan to travel. Make sure that the rescue system you have is the correct size, and that you are fully conversant with its use.

For fitting the rescue system, follow the instructions of the harness manufacturer.

Use of the paraglider

The UP Makalu has been developed and tested solely for foot launched and winch launched paraglider flights. It is not allowed and potentially dangerous to use the glider for any other purpose.



Aerobatics

The UP Makalu has not been developed, constructed and tested for aerobatics use.

Warning: The glider has not been certified for aerobatics. Performing aerobatics with the UP Makalu or any other paraglider can be very dangerous. Doing aerobatics can induce flying configurations well beyond the tested flight envelop, and can lead to total loss of control. Aerobatics can also overload your glider and break it in flight.

Motorised Paragliding

The UP Makalu has not been developed, constructed, and tested for being used with any kind of engine.

If you want to fly your UP Makalu with a motor please get in touch with the manufacturer of the engine unit and UP to check on certification of this configuration.



Flying the UP Makalu

Pre-flight

Make sure whenever you get your UP Makalu back from somebody else to check the glider very carefully if you are not the only pilot flying it. Ask if there was anything that could have damaged any part of the glider, if the pilot has found any part that needs to be replaced or if they noticed any strange flight behaviour. Make sure you do the same when you lend your glider to somebody else. A thorough pre-flight inspection should be performed prior to each flight.

Before each launch you should carry out a full pre-take-off check (5 points check). It is a good idea to always carry out the checks in the same sequence to avoid the possibility of forgetting anything.

- 1) Unpack your glider in a semi-circular shape. This shape insures that the centre cells inflate before the tips. When unfolding your glider, observe the wind direction and arrange your glider so that it is pointed directly into the wind.
- 2) The lines must be arranged so that there are no tangles and the A lines are uppermost. Once the lines are free and untangled, check to make sure that they all go directly from the riser to the glider without going over the top of the wing. Launching with a line over is extremely dangerous! It is also important that the brake lines are free and not caught up.
- 3) You should check that you have put the harness on correctly, and ensure that both leg straps and the chest strap are closed and adjusted. Also



check the rescue system pins and deployment handle.

4+5) Directly before the launch you should, once again, check the wind direction and air space for other paragliders.

Take-Off

The take-off characteristics of the UP Makalu are extremely straight forward. Only a gentle forward pressure on the A risers is necessary and the glider will inflate evenly and climb above your head. The glider has no tendency to hang back behind you nor to overshoot over your head.

With the A risers and the brakes in your hands, have another look at your unfolded glider. At stronger wind the start can be facilitated, if the UP Makalu is raised solely with the internal both A-lines (front A-riser). Make sure that you are centrally positioned in the middle of the wing, and that the wing is facing into wind. The middle of the canopy is marked by the UP Makalu logo at the leading edge.

Inflate the glider with a steady run and remember to position your arms so that they are a continuation of the A risers. As the glider comes above your head, you should glance up to see that the entire canopy is inflated and flying. The UP Makalu has a low surge tendency, so there is usually no necessity to brake to stop the glider from over-flying you.

Directional control should only be attempted when the glider is above your head. Excessive braking will cause the wing to drop back.

After checking that the wing is properly inflated, you should apply slight brake pressure and accelerate



rapidly down the hill. After a few steps you will reach flying speed and become airborne.

Speed control

Using the brakes

The UP Makalu has a wide useable speed range, coupled with excellent stability at all speeds. The speed can be set with the brakes to optimise performance in any situation.

Maximum glide speed is achieved with the brakes released completely, whereas minimum sink speed is with approximately 15 to 20 cm of brake applied. Further braking will not improve the sink rate, but the brake pressure increases noticeably as the glider reaches minimum speed.

Warning: Flying close to the stall point is very dangerous and should be avoided. At speeds below minimum sink the danger of entering an unintentional stall or spin is increased dramatically.

Using the Speed System

The UP Makalu is supplied with a speed system, which is activated by a foot stirrup. Full application increases the speed by approximately 10-12 km/h. In certain circumstances the use of the speed system is extremely effective, and it should be an integral part of your flying.

The speed system should be used when you are trying to get away from sinking air, trying to achieve best glide in a headwind, or trying to cover the ground as quickly as possible. But it is important to remember that the glider will be more susceptible to collapses at



high speed, so the speed system should not be used in extreme turbulence. If, with the speed system applied, a collapse occurs then it should be released immediately. Some warning of an imminent collapse is afforded by the tension felt in the speed system; should the tension suddenly reduce then the stirrup should be released and the glider returned to normal trim speed.

Warning: All extreme flight situations, such as collapses, happen more dramatically at increased speed. Therefore the speed system should not be operated low to the ground or in noticeable turbulence.

Turning

The UP Makalu has been developed to meet the demands of low airtime and inexperienced pilots. The brakes have been designed so that the first 15-20 cm of travel will cause only gentle turning, whereas larger movements will give the glider an agile and nimble feel.

By using weight shift and slight braking, the UP Makalu will make flat turns with minimum loss of altitude. Increasing the amount of brake pressure decreases the turn radius. It is important to continually feel the changing pressures in both sides of your canopy when turning.

When brake pressure is increased dramatically on one side, the UP Makalu begins a fast and steep turn which can be made into a steep spiral (refer to chapter heading "steep spiral").

Landing

The UP Makalu is easy to land. While pointing into the wind, the pilot should fly the wing fast until he is



approximately 1m above the ground, at which point he should apply both brakes completely. When landing in stronger wind, less brake is required. Landing from steep turns should be avoided, due to the risk of an uncontrolled pendulum reaction.

Winch towing

The UP Makalu can be winch towed easily. There are no special techniques that need to be employed, but consideration should be given to the following points:

- Especially when you are towing at a unknown field, make sure that you are fully conversant with any local conditions and peculiarities. Ask the local pilots if you are at all unsure.
- During the launch, ensure that the glider is completely inflated and over your head before giving the 'start towing' signal. If the glider is not central over your head do not continue with the tow. If tow tension is applied when the glider is not correctly positioned then a 'lock out' could occur.
- Try to avoid large brake inputs until you are reasonably high. Emphasise weight shift if any course correction is necessary close to the ground.
- Do not try to climb steeply during the first part of the tow. Good airspeed is essential.
- Do not use a towline tension greater than 90 daN at any time during the tow.
- All persons involved with the winching operation should be suitably qualified and experienced. All equipment used should, where necessary, be



certified, and a tow permit should be valid for the field being used.



Flight safety

The development of high performance paragliders from square parachutes has led to vast improvements in speed, sink rate and handling. But, at the same time, it has also led to a requirement on behalf of the pilot for accurate, sensitive control and an acute anticipation of possible flying conditions. Any glider, whether beginner or competition, can collapse in turbulent conditions, and you must be able to react accordingly.

Today, you have a wide choice between different gliders in the UP range. The main differences between the gliders is in the stability which each offers. Beginner wings react to turbulence less dramatically and allow inaccurate flying when compared to top performance gliders, which have more sensitive, but less forgiving handling. Making the correct decision when choosing a new glider is most important; you should critically examine your flying and your level of knowledge.

It is a good idea to practice ground handling to get used to your new paraglider. If you can find a suitable area, like a playing field, and a little wind it's quite easy to practice inflating the glider and feeling the reaction to brake input.

Before take-off and whilst flying it is very important to try to anticipate any likely turbulence and fly accordingly. Look well ahead, and as well as looking for areas of likely lift, try and predict, and avoid, areas of sink and rough air. If you do find yourself in turbulence then look for the cause, and adjust your flight plan to avoid other similar places.



Thermals and Turbulence

In turbulent air, the UP Makalu should be flown with a little brake to increase the angle of attack and provide greater stability. While flying in strong or broken thermals, it is important that you concentrate on keeping the wing centrally above your head. Do this by letting the glider fly fast while entering a thermal, and by braking the surge of the canopy while exiting the thermal.

The UP Makalu possesses high stability due to its construction and design. However, an active flying style in turbulence will help increase safety by preventing unnecessary collapses and deformation of the glider.

Rapid loss of altitude

All rapid descent manoeuvres should be practiced initially in smooth conditions with plenty of height, before you need to use them 'for real'. It is important to distinguish between the three techniques, and to know the merits of each.

Warning: All other manoeuvres, such as full stalls and spins, should be avoided as fast descent techniques, as incorrect recovery (as with any paraglider) can have dangerous consequences!

Steep Spiral Dive

A maximum sink rate of over 15 m/s can be achieved in a steep spiral dive, but it is advisable to build up gradually to these values when you first practice spiralling.



Getting the UP Makalu into a spiral dive is very simple and has already been described in the chapter regarding turning. When entering the spiral it is essential to induce the turn gradually; if you apply the brake too quickly then there is the danger of entering a spin. If this happens, release the brake immediately and let the glider recover before trying again. Keep a steady tension on the inside brake and observe the increased angle of bank and sink rate. A little brake on the outer wing will help stabilise the glider at a high sink rate.

To recover from a spiral, simply release the inside brake. Do this gradually to prevent an uncontrolled steep climb. Be prepared for the glider to climb a little and to damp out the subsequent dive. Be warned that you can pull considerable G forces in a spiral; high loading for both you and the glider.

Warning: Never pull Big Ears in a spiral dive, as it's relatively easy to overload of paraglider, pilot and equipment.

B-Line Stalls

To induce a B-line stall, start from normal, un-accelerated flight. Reach up and take hold of both B risers, still with your hands in the brake loops, and pull down simultaneously by between 15 and 20cm. The first few centimetres of travel is quite hard, but as the glider settles into the stall so the effort becomes less. The glider will drop back a little as it stalls, and then centralise over your head. With 20cm or so of pull a sink rate of up to 6 m/s can be achieved. With less pull so you will get a decrease in sink rate. Pulling down more than 20cm is not recommended, as the paraglider will get into a more unstable flight position.



To recover from a B-line stall, let up both B risers simultaneously and quickly. The glider will drive forwards slightly as it regains forward speed, so be ready to damp this out. If you release the B risers slowly there is a danger that the glider might enter a deep stall. The glider will recover with no pilot input almost always from a deep stall, but refer to the 'Deep Stall' section for correct recovery.

Big Ears

To pull the ears in, reach up and get hold of the outermost A risers, and pull them down, simultaneously, by about 40 cm until the tips collapse. Keep these two risers in your hands, to prevent the wing re-inflating, and use weight shift for steering. The sink rate will increase with big ears to about 2 to 3 m/s, but the forward speed will not increase. To re-inflate the tips, release the A risers and, if necessary, pump the brakes gently.

Do not fly either big wingovers or steep spirals with the ears in, to avoid the possibility of overloading the wing. If the UP Makalu is flown at the lower end of the take off weight range, it is possible that it could enter a deep stall if the ears are in and you apply a lot of brake. If this should happen then recovery will normally be automatic on release of the brake. Refer to the 'Deep Stall' section for correct recovery.



Extreme flight manoeuvres

Behaviour in extreme flying conditions

Although the UP Makalu is an extremely stable design, it is possible that it could enter an extreme flying attitude, due to either rough turbulence or pilot error, or more likely a combination of the two. The very best preparation for this is to attend a safety training course.

Extreme flight manoeuvres should only be executed in smooth conditions, at sufficient height and with professional instruction. It is recommended that they only be practiced over water, and, of course, with a reserve parachute attached.

The manoeuvres described on the following pages can be caused either intentionally, through flying in turbulence or through pilot error. All these manoeuvres are potentially dangerous; if you plan to do them intentionally then ensure you know exactly what you are doing. Do not fly in conditions where they might happen unintentionally.

Warning: Incorrect recovery from any of these manoeuvres can lead to unrecoverable problems.



Collapses

Although the UP Makalu is very stable, it, like any other paraglider, can suffer wing tip closures in turbulent conditions. Normally, closures will re-inflate very quickly, without pilot input.

Asymmetric collapses

The UP Makalu belongs to the new generation of paragliders that, as well as having very good performance, also exhibit a high degree of stability. Should the glider suffer a wing tip closure, it will only turn slowly, giving plenty of time for corrective action.

In the event of an asymmetric collapse, it is best to stop the turn by opposite weight shift and steering. If you let the glider turn then it is possible that, although the collapse will clear quickly, the other wing might suffer a small closure. Any closure will normally reopen independently, but it is a good idea to help it with a good long pump (not short hectic pumps) with the brake on the affected side, whilst maintaining course with the other brake.

Should the UP Makalu suffer an extensive closure then be careful not to apply the opposite brake too much or too quickly. This can lead to the canopy entering a stall before it fully reopens.

Symmetric collapses

Should the UP Makalu suffer a symmetric collapse, due to a negative angle of attack causes either by turbulence or pulling down on the A risers, then it will re-inflate both quickly and independently. Application of both brakes together will speed up re-inflation.



Kinds of stalls

The airflow around the wing for the paraglider is mostly laminar in normal flight. If the laminar flow is lost over the top surface, by whatever means, then a stall will occur. This stall will be one of three variations.

Warning: Spinning and full stall are dangerous and unpredictable flight manoeuvres. They should not be entered intentionally. It is important to be able to recognise the onset of a stall, and be able to react correctly to prevent it.

Parachutal or Deep stall

The UP Makalu has no tendency to remain in deep stall. It will automatically recover if you try to enter a deep stall, either with the brakes, back risers or through slow release of a B-line stall. If, due to some strange chance the glider does settle into a deep stall then recovery should be made by pushing both A risers.

Flight manoeuvres close to the stall should be avoided unless you have plenty of height. Do not attempt to recover from a suspected deep stall by unilateral braking, because of the danger of entering a negative spin.

Full stall

Full stalls should only be done during landing. Just prior to touching the ground, apply both brakes completely and simultaneously. The glider will fall behind you and lose all its internal pressure.

During testing the glider is full stalled intentionally. The brakes are applied fully; the glider slows to minimum



speed, and then appears to fall back, behind the pilot. Do not, under any circumstances, release the brakes at this moment; there is a good chance that if you did the glider would dive forward so far that you would end up falling into the sail.

After the initial phase, the glider will once again be above your head, but the tips will be thrashing wildly. You will have to hold against this until it is safe to recover.

Before recovery the glider will need to be central over your head. Best technique at this point is to release both brakes, slowly and symmetrically, until the glider is completely open. If at any time the canopy dives in front of you, then release both brakes immediately. If the canopy opens symmetrically then it will dive slightly, but shouldn't tuck. But be ready, both to damp the dive and counter any asymmetric closures.

An asymmetric recovery from full stall is only attempted by test pilots during certification flights. This manoeuvre should not be attempted at any time. There is a high chance of getting an unrecoverable cravat during this manoeuvre.

Spin

The negative spin occurs when one side of the wing is stalled. This can happen when, if flying very slowly, one brake is applied fully, quickly. When it starts to spin, the glider will turn extremely quickly around the vertical axis, with the stalled side flying backwards. To recover from a spin, simply release the brake on the stalled side. The glider will immediately speed up and, most likely, suffer an asymmetric closure. Recover as above.



If you suspect that a spin is imminent then immediately release the inside brake. The glider will accelerate smoothly and resume normal flight with little altitude loss.

Wingover

Wingovers are performed by flying alternating turns; each time letting the pendulum effect increase the angle of bank.

Warning: The UP Makalu is a very agile glider, and it is quite easy to get to an excessively high angle of bank in just a few turns. Practice wingovers gently at first, as there is a chance of quite large closures at high bank angles.

A wingover of more than 60 degrees bank angle is classed as illegal aerobatics!

Emergency Steering

If, for some reason, the UP Makalu cannot be controlled with the brakes, then it can be steered and landed with the rear risers. Be aware that, when rear riser steering, the glider is a great deal more responsive to pilot input, and the stall break is very sudden.



Maintenance and cleaning

Taking care of your paraglider

The wear and tear that your paraglider suffers depends on a number of factors; how frequently it's flown, whereabouts in the world you fly it, how much UV it gets and how well you look after it. Bear in mind the following maintenance points:

UP use a top grade polyamide cloth to build our paragliders, which has a special protective coating against UV radiation and air permeability. The cloth will suffer, though, if it's exposed to large amounts of UV (i.e. bright sunlight). Don't leave your glider lying in the sun for any longer than is absolutely necessary. Also, if it gets wet, then dry it as soon as possible; but not in direct sunlight!

When choosing an area to lay out the glider before launching, try and find somewhere that is relatively free of stones and sharp rocks. Pay particular attention to the top surface, where it lies on the ground. Pack the glider in a slightly different way, now and again, so that it's not always the same bit of material that gets the maximum exposure.

The lines used on the UP Makalu are high grade Technora Aramid lines. Keep the following points in mind:

- The lines should be checked regularly for damage.
- The lines should not be knotted unnecessarily.
- The main brake line at the handle should not have too many knots. Each knot weakens the line.



-
- After any line over-stressing (tree lands, water lands and other extreme situations) all lines must be checked for condition and length and should be replaced where necessary.
 - If any change in flying characteristics is noticed then the lines should be checked and replaced, if necessary.

Cleaning

If you feel it necessary to clean your UP Makalu at any time then use lots of lukewarm water and a soft sponge. More stubborn stains can be cleaned with a weak soap solution, and rinsed thoroughly. Never use chemical cleaning agents on the material, as these destroy the coating and affect the strength of the cloth.

The best place to store your paraglider is in a dry, dark and well-ventilated room. Do not store it where is could become contaminated by chemicals of any sort (petrol, perhaps).



Examination, repairs and further references

Examination and Repairs

Paragliding is a wonderful sport; flying as free as a bird in the air, enjoying the peace and tranquillity. But the air is an alien environment that commands respect and a responsible attitude from the pilot. At UP we don't just put our knowledge and experience into the development of paragliders, but also into their maintenance, service and repairs to ensure you can fly safely.

Our service team are all professional pilots with a wealth of experience examining and repairing paragliders. You can be sure that they will look after your equipment in a conscientious manner and the quality of work done will be second to none.

Two Yearly Check for all UP gliders

You should get your paraglider examined and serviced every two years, or 300 hours, whichever is the least. This service should be carried out by the manufacturer or an Authorised Service Centre. We will happily service the glider more often, if you feel that it is necessary.

At UP Europe we have the special equipment and a wealth of experience necessary to carry out the 2 Year Check. We will check the canopy both inside and outside, as well as using a special "hang" device for checking the lines for damage. We will also test the cloth with an air-permeability gauge; an extremely important test, as low air-permeability can result in dangerous changes in the flying characteristics of the



wing (deep stall, changed angle of attack etc.). If we feel it necessary we will remove and destructively test the inner A, B, C and D main lines, and all the lines will be measured for both length and symmetry. A record is kept of all these tests and any trends noted.

As well as measuring and checking the complete glider, the examiner will make a final judgement, from personal experience, as to the airworthiness of the glider. If he feels it necessary, the glider will be flown by a UP test pilot to check on it's flight behaviour. This way, we can guarantee that the glider is still within certification limits, and safe to fly for another two years.

Always get your glider checked by a UP Europe
Authorised Service Centre.

Our experience for your safety!

It is also recommended that only an Authorised Service Centre carry out repairs to your glider. Contact UP Europe for your closest Centre

Packing and checking of the rescue system

Only by regularly having your rescue parachute repacked can you guarantee it's flawless operation! As with the glider, the rescue parachute should be examined every 2 years by either the manufacturer or an Authorised Service Centre. We offer a certified service for re-packing, checking and installing the parachute into your harness. We will also carry out any repairs necessary; all fully guaranteed.

Sending the UP glider and other UP products

The best way to send your paraglider, rescue parachute, harness etc. to our service team is in a box



via post or UPS. Enclose a note of what requires doing (2 Year Check, repair, repack etc.) and also your daytime contact details. We will return your equipment either by post or UPS. Please indicate preferred method of payment (either bank cheque or C O D).

Should you require any further information about the services we offer, please contact us at the address and phone number below. We are also able to give you information about your nearest Authorised Service Centre, as well as other manufacturers who are authorised to check and repair UP gliders and equipment.

UP Europe GmbH
-Abteilung Service-
Altjoch 19A
82431 Kochel am See
Germany

Email: service@up-europe.com
Service Phone: +49 (0) 88 51-92 92 40
Fax: +49 (0) 88 51-92 92 60

Further references

Be careful if you plan to stick any large logos onto your glider, especially those made from heavy, self adhesive cloth. Such logos can invalidate the certification, and also change the flying characteristics of the wing. If you are in any doubt, don't stick anything on the wing without seeking expert advice.

UP cannot take any responsibility if the glider is changed in any way.



If the glider is often flown near the sea, or in salty air, then it can age prematurely. In this case make sure that you get it serviced more often.



UP Homepage

The UP Homepage gives you information about the latest news and products from UP. You will find any technical information and accessories for your UP Pulse, as well as many useful things that are necessary for flying.

Beside paragliders, harnesses and flying equipment you will also find the new “Skywear” collection with the latest flying garments and the “News” section, which will keep you updated with all activities around UP.

www.up-europe.com



Some final words

With paragliding a fundamental new air sport has emerged; one that makes independent flight possible for almost everybody. The technical simplicity, the mobility of the wing and the ease of learning the basic flight techniques have made paragliding appear simple and straightforward.

As long as you fly with the necessary respect for the demands and dangers, then these ideals of paragliding will be fulfilled. You should decide for yourself whether conditions are suitable before you proceed with the flight. You should always be aware that any kind of air sport is potentially dangerous if you overstep the natural and physical laws, whether from ignorance or unreasonableness.

“Probably there are only a few sports where success requires, besides physical fitness, understanding the processes in nature to such a high degree - a fact which distinguishes paragliding as sport especially.”* The charm of flying lies in “understanding the processes in nature”, because you have to try again and again to fathom the logic and fly with regard to the decisions you make.

If you want to realise the dream of flying, the dream of free movement in the air, fly not to impress others; fly for the sheer joy of it.

We at UP wish you delightful, beautiful and accident free flying with your UP Makalu

SEE YOU UP IN THE SKY - Your UP Europe Team

* from Helmut Reichmann from the book "Streckensegelflug"



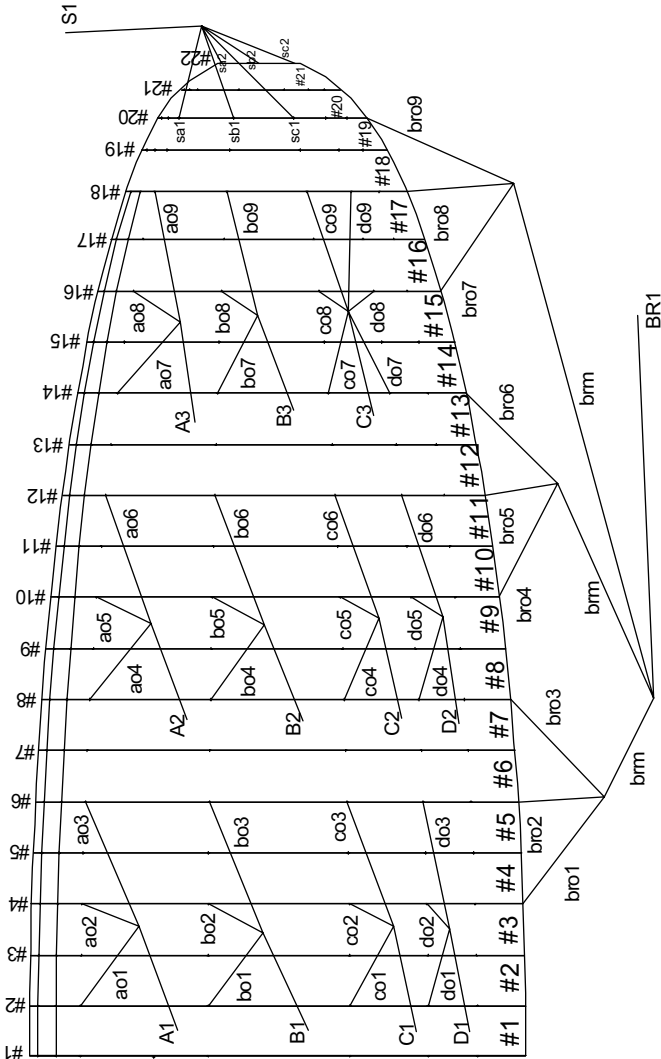
Attachments

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Line Layout Plan

UP Makalu XS-XL Leinenplan / Line Layout Plan



Reply card

Detach card along the perforation and send it
to UP Europe!

Surname: _____

First name: _____

Address: _____

Phone: _____

Fax: _____

Email: _____

UP Makalu serial number: _____

bought at: _____

My current flying qualification: _____

hours: _____

Paragliding learnt at: _____

Ultralite Products Europe GmbH
Altjoch 19 A
D-82431 Kochel am See



Standard Einweisungskontrollblatt für neu gekaufte Schirme

Käufer Name/Vorname:

Adresse:

Befähigungsnachweis Nr.:

neuer Gleitschirm, Typ:

Bisherige Anzahl Flüge:

Seriennummer des Schirms

Folgende Übungen sollten am Übungsstand unter Aufsicht absolviert werden:

Auslegen und Sortieren der Leinen

☐

Durchführen mehrerer Starts

☐

Aufziehtechnik vorwärts und rückwärts

☐

Laufen mit gebremstem Schirm

☐

Aufziehen mit schlecht ausgelegtem Schirm

☐

Slalom laufen

☐

Bodenwellenlaufen (sofern möglich)

☐

Das Beherrschen der oben angeführten Manöver ist die Grundlage, um die Reaktionen des neuen Gleitschirmes kennenzulernen. Zugleich werden wichtige Reflexe eingeübt, um den Schirm in turbulenter Luft angemessen handhaben zu können. Ungewollte Klapper und andere extreme Flugzustände können dadurch reduziert bzw. wesentlich besser beherrscht werden.

Folgende Manöver sollten während Höhenflügen unter Aufsicht mit Funk mit dem neuen Gleitschirm absolviert werden:

Übungen:

Einweisungen:

Schnelle Kurvenwechsel

☐

Einweisung in das Beschleunigungssystem

☐

Enge Vollkreise in beide Richtungen

☐

Seitliches Einklappen mit Kurs halten

☐

Steilspirale

☐

Eventuellen Sackflug richtig ausleiten

☐

B-Leinen Stall

☐

Ohren anlegen

☐

Diese Übungen dürfen nur mit einem Rettungsgerät erfolgen. In Thermik und Turbulenzen können alle diese Flugzustände plötzlich auftreten und es dient der eigenen Sicherheit, diese mit jedem Schirm neu zu erfliegen.

Diese Übungen ersetzen nicht ein Sicherheitstraining, dessen Besuch wir jedem Piloten im Interesse seiner eigenen Sicherheit empfehlen. Deine Flugschule kann Dir dies sicher bestätigen.

Wir bestätigen, daß oben genannter Gleitschirm von uns testgefliegen wurde, und die angeführten Manöver vom Käufer beherrscht werden:

Unterschrift Fluglehrer:

Unterschrift Käufer:

Ort/Datum:

Dieses Formular verbleibt während 2 Jahren bei Ihrer Flugschule

UP-EUROPE • Altjoch 19A • D-82431 KOCHEL AM SEE
PHONE +49 8851 92920 • FAX +49 8851 929260 • email: info@up-europe.com
WWW.UP-EUROPE.COM