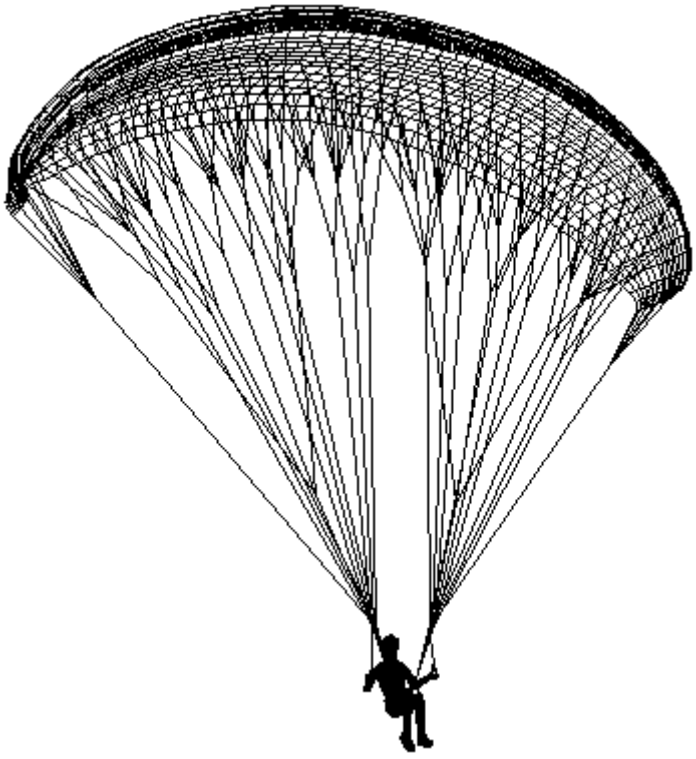
PILOTS MANUAL

SOL

Quasar



WELCOME TO THE FAMILY OF SOL PILOTS !

THE SOL QUASAR IS PRODUCED UNDER LICENSE OF NOVA INTERNATIONAL.

We congratulate you on buying your new
SOL QUASAR
and wish you many enjoyable flying hours !

If you have any questions, suggestions or criticisms regarding any SOL product please do not hesitate to contact us. We are happy to give help and advice.

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We are looking forward to hearing from you!

PLEASE READ THIS MANUAL CAREFULLY AND NOTE THE FOLLOWING DETAILS

THIS PARAGLIDER MEETS AT THE TIME OF DELIVERY THE REQUIREMENTS OF THE DHV GÜTESIEGEL (GERMAN HANG/PARAGLIDING ASSOCIATION'S CERTIFICATE OF AIRWORTHI-NESS) OR OF THE AFNOR (SHV AND ACPUL).

ANY ALTERATIONS TO THE PARAGLIDER WILL RENDER ITS CERTIFICATION INVALID !

THE USE OF THIS PARAGLIDER IS SOLELY AT THE USER'S OWN RISK !

MANUFACTURER AND DISTRIBUTOR DO NOT ACCEPT ANY LIABILITY.

PILOTS ARE RESPONSIBLE FOR THEIR OWN SAFETY AND THEIR PARAGLIDER'S AIRWORTHINESS.

THE AUTHOR ASSUMES, THAT THE PILOT IS IN POSSESSION OF A VALID PARAGLIDING LICENCE !

TECHNICAL DATA

Type		**123**	**126**	**129**	**131**
Zoomfactor		0.94	1	1.06	1.12
No. of cells		17 x 2	17 x 2	17 x 2	17 x 2
Projected wingspan	m	9.42	10.01	10.59	10.77
Projected surface area	m²	22.79	25.77	28.92	30.48
Aspect ratio		3.89	3.89	3.89	3.81
Overall wingspan	m	11.33	12.05	12.77	13.26
Overall surface area	m²	25.48	28.83	32.40	34.89
Aspect ratio		5.04	5.04	5.04	5.04
Line diameter	mm		1.1 / 2.15		
Line length	m	6.82	7.25	7.69	7.98
Overall line length	m	364.5	387.7	411	415
Maximal chord	m	2.82	3.00	3.18	3.3
Minimal chord	m	0.82	0.87	0.925	0.96
Weight	kg	6	6.5	7	7.5
Legal takeoff weight[1]	kg	66-85	75-100	90-120	100-150
Recomm. takeoff weight*	kg	66-85	80-100	95-120	100-150
DHV		2	2	2	2G**
AFNOR		Stdard.	Stdard.	Stdard.	-

* Pilot + approx. 17 kg of equipment
** Not valid with cross-streps effected

Line specifications are detailed in the line plans, they are measured under a 5 kg load.
The DHV measures lines from the quick link to the undersurface.

The line lengths as specified in the line plans include the end loops.

The paragliders' details are printed onto the wingtip.

Date and pilot of test flight will have to be written in space provided!

TECHNICAL DESCRIPTION

The SOL QUASAR sets new standards in its class of advanced performance paragliders.

The QUASAR is a slim, elliptical wing with a slightly rearward swept plan form. The glider's construction with 17 'double cells' and new aerofoil cutting techniques, ensure a smooth top surface, exact profile reproduction and stability.

Out of a range of outstanding computer calculated aerofoils, the finest in terms of performance and stability was selected as the basis of the QUASAR. This superior aerofoil offers a wide speed range with excellent stability in disrupted airflow.

The QUASAR presents a closed leading edge to the airflow, while internal Dacron re-enforcements maintain its precise form. The cell openings of the QUASAR are on the undersurface. Integrated, stretch resistant Dacron flares at the suspension points ensure an equal distribution of load throughout the canopy.

Large cross port vents allow effective airflow inside the aerofoil without affecting the profile of the canopy.

The geometry of the wing tips and stabilisers ensure stable straight flight and coordinated turns.

RIGGING SYSTEM

The lines of the SOL QUASAR are made of a strong and stretch resistant sheath-core construction: the sheath consists of coloured polyester with a core of white Dyneema or brown Technora.

The rigging system comprises individual lines looped and stitched at each end. Apart from the principal lines and the main control lines which have a diameter of 2.15 mm, all lines are 1.1 mm in diameter.

The suspension lines are distinguished between *'fork-lines'* (near the undersurface) and '*principal-lines'* (which lead to two to four fork lines) which lead to the '*quick link'* (a Mallion Rapide that connects lines and risers).The '*stabiliser lines'* connect the stabilisers to the quick link.

The *'control / brake lines'* are not suspension lines. They lead from the trailing edge of the canopy to the *'main control/brake line'* running through the *'D-ring'* at the back-risers to the *'control handle'*.
A -lines, *A* -risers and control lines are coloured different for better distinction.

The line connections are triangular mallion rapides fitted with heat shrink to prevent any slipping of the lines on the quick link.

The control lines are attached to suspension tabs, each of which is sewn to the trailing edge between two ribs.

The main control lines are attached to the control handles at their optimum trimming point, which is also marked on the line. This adjustment, on the one hand, allows sufficient brake to be applied during extreme flying situations and landing, while on the other hand it ensures that the canopy is not permanently braked. This trimming should not be altered.

SPEEDSYSTEM

The SOL QUASAR can be flown with a foot-operated speed system. Each size of canopy owns a certification for respective system !

The speed system affects the A, B and C-risers. In the normal flight all risers are 53.5 cm long overall.

When the speed bar is pushed down A, B and C-risers are shortened by up to 14.5 cm, 13.5 cm and 7.25 cm respectively. D-risers retain their original length. An incorrectly fitted speed system results in the loss of certification!

How is it fitted ?

Most harness on the market already have fixed pulleys for the speedsystem. If not, you have to fix some pulleys by sewing on loops at the right position. It is important to sure that they are sewn on in such a way that allows the pilot to maximise the power-vector of his/her legs without 'pushing up' in the harness.
Pull both ends of the cord through the speed bar and secure them with a knot inside the tube (see overview).These two cords run from the speed bar through the pulleys on the harness up to the clip.

The length of the cord leading to the speed bar should be such, that it is easy to put your feet into the speed bar in flight, while allowing use of the full speed range. Test your speedsystem for the correct length of rope on the ground first, with your harness and risers, before flying with it !

How does it work ?

The speed system utilises a pulley mechanism which results in shortening the risers as described above.

How to use it ?

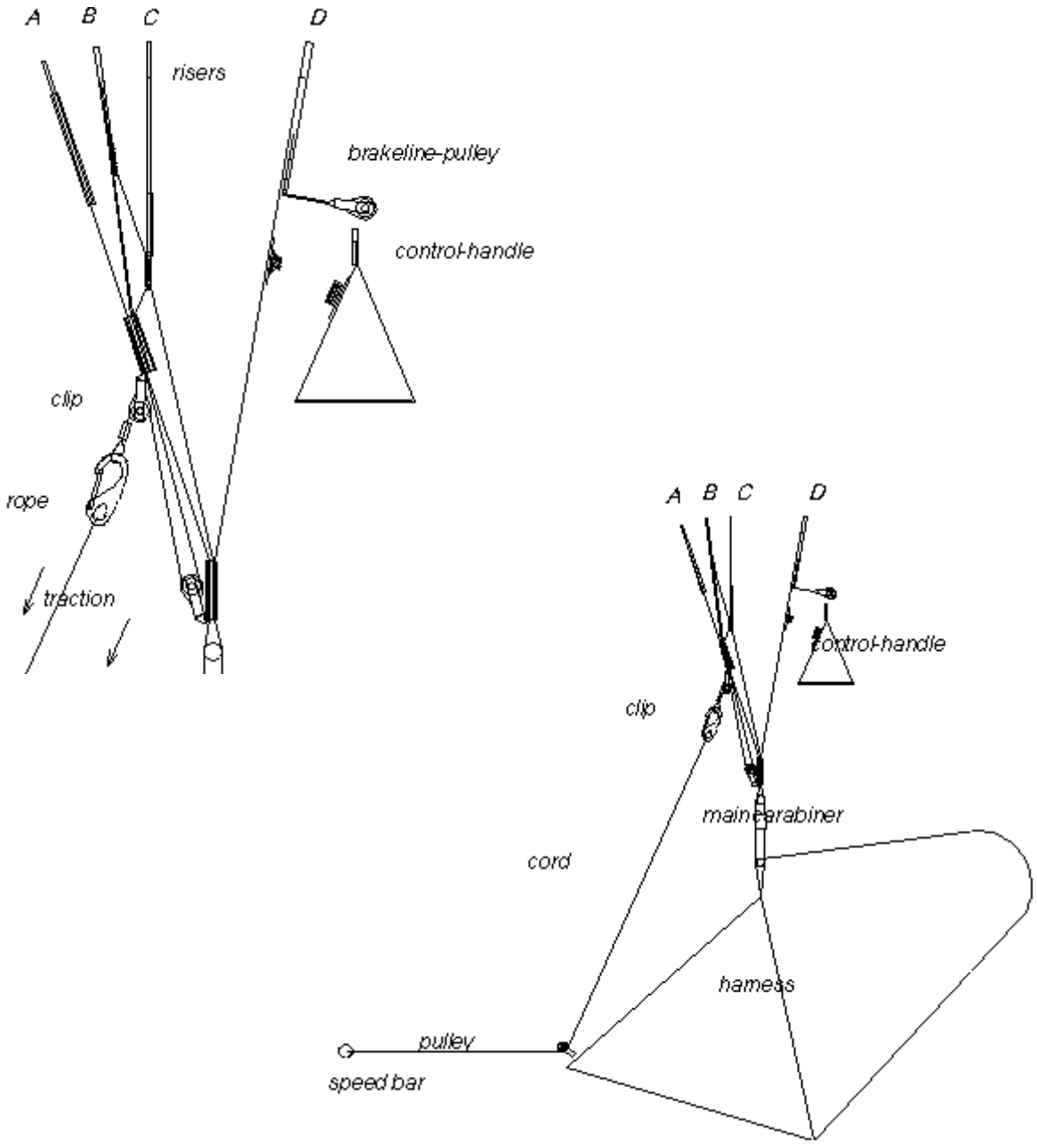
Before launch first attach the risers to the main carabiner and then hook the clip to the loop on the end of the rope, which leads through the pulley on the middle of the riser (see figure 1). Ensure that the speed system is untangled and runs freely for operation.

Be careful !

When using the speedsystem, the angle of attack is lowered, thus airspeed is increasing, and the canopy is destabilising. Therefore do not use the speedsystem in turbulent conditions, close to the ground or near other airspace users !

DO NOT USE THE SPEEDSYSTEM IN ANY EXTREME MANOEUVRES! IF THE CANOPY DOES COLLAPSE, RELEASE THE SPEED BAR IMMEDIATELY AND CORRECT ANY TUCKS AS NORMAL !

USING THE SPEEDSYSTEM MAY CHANGE THE GÜTESIEGEL-CLASSIFICATION : HAVE A LOOK AT THE CERTIFICATE !



Harness

Any harness with a hang point at about chest height may be used with a SOL QUASAR.

Please note, that the hang point position changes the brake position.

Flight

Preflight check:

A thorough preflight check is essential for any aircraft, the SOL QUASAR is no exception.

Having unpacked and laid out the paraglider in a horseshoe the following checks must be made:

The paraglider should be arranged in such a way that the A-lines in the centre section of the canopy will tension before the ones at the wing tips. This ensures an easy and balanced launch.

All lines and risers should be untangled and arranged in a way that they do not catch on anything. Special attention should be paid to the A-lines, which should run free from the A-risers (pink sleeve) to the canopy.

It is equally important to untangle the control lines so that they are clear and cannot get caught during launch.

The control lines should run freely through the pulleys to the trailing edge of the canopy. Make sure the risers are not twisted.
It is important that no lines are looped around the canopy.
A so called 'line-over' may have disastrous consequences during takeoff.

Before every launch check lines, risers and canopy for damage! Do not launch in case of even the smallest damage!

Launch :

The SOL QUASAR is easy to launch.

When the pilot is ready to takeoff he / she holds the A-risers and the control handles.

To facilitate distinction between A - lines and control-lines the A-lines including the sleeves on the A - risers are coloured different, so are the brake-lines and the brake-handles.

Check your canopy before launch and via a last glance before starting to launch.

A good hard run ensures your SOL QUASAR will inflate and come up equally and quickly, a 'surging forward' is unusual.

Hold your arms stretched back and down as an extension of the A-lines.

After the initial effort of inflation - the canopy is already above the pilot - the paraglider should be braked gently and possibly corrected for drift in order to keep it above the pilot's head.

The pilot looks up and checks that the canopy is fully inflated.

The final decision to launch is taken only then!

The SOL QUASAR is easy to reverse launch.

As this launch technique can be difficult and can result in the pilot taking off with twisted risers, it is recommended to practice the reverse launch on a training hill first.

Turns :

The SOL QUASAR is very responsive, it has exceptionally easy handling and reacts instantly. Weight shift input results in wide and flat turns with minimal height loss.

A combined technique: weight shift and pulling on the appropriate control line is the most efficient turning method for any situation, whereby the radius of the turn is determined by the amount of brake pulled.

In case it is necessary to turn the SOL QUASAR in a confined area at slow speed, it is recommended to steer the decelerated canopy by loosening the brake at the outside of the turn while applying a little more brake on the inside of the turn.

For the SOL QUASAR minimum sink is attained with no brake pressure applied.

Pulling one brake too hard or too fast can result in the canopy entering a negative spin.

Spiral dive :

To enter a spiral dive with a SOL QUASAR the pilot must slowly apply more and more brake on one side, to initiate an increasingly steeper turn which eventually results in a spiral dive.

During a spiral dive the angle of bank can be controlled with the brakes - increasing or reducing the amount of inside brake.

Induce and recover slowly from a spiral dive!
Due to the rapid loss of height encountered during a spiral dive (more than 20 m/sec) sufficient altitude is essential for this manoeuvre!

Thermaling and soaring :

In turbulent conditions the canopy should be flown with some brake applied. This improves stability by increasing the angle of attack and the pressure inside the canopy.

The canopy should not rock back or surge forward but should remain above the pilot. Thus, the pilot should increase speed by letting the controls up when entering a thermal (according to its strength) and should brake the canopy on exiting.

When soaring a minimum height of 50 m above ground level is recommended for safety reasons. It is important to comply with the rules of the air, especially when many pilots share airspace close to a hill where last minute avoidance manoeuvres are often not possible.

The SOL QUASAR is a safe, stable paraglider. A pilot employing an active and anticipatory flying style can extend this safety margin even further, preventing the canopy tucking in turbulent conditions.

Flying with speed system :

When flying into head wind or through sink it is advisable to increase speed. The angle of attack is lowered with the increase in speed and the canopy may tuck easier than in normal flight. Tucks and stalls are more dynamic the faster the canopy is flown.

Landing :

The SOL QUASAR is easy to land. The final leg of the landing approach must be into wind. During this final glide the paraglider should be decelerated slowly and at approximately 1 metre above the ground the pilot should ‘flare’ the canopy.
Strong wind landings require hardly any brake, if any at all!
The final glide during the landing approach should be straight and not marked by steep or alternating turns as these can result in a dangerous pendulum effect near the ground.

Winching :

The SOL QUASAR has no special winching characteristics, although a relatively low angle of attack should be maintained during launch.

Motored Flight / Aerobatics :

The SOL QUASAR is neither designed to be used for motorised flight nor for aerobatics.

EXTREME FLYING MANOEUVRES

EXTREME FLYING MANOEUVRES SHOULD ONLY BE CARRIED OUT DURING SAFETY TRAINING COURSE (INSTABILITY TRAINING) UNDER PROPER INSTRUCTION !

Tuck :

A negative angle of attack will cause the SOL QUASAR, like any other canopy, to tuck.

If one wing tucks, straight flight is maintained by 'correcting for direction', braking gently on the inflated side.

In case of a big tuck this braking should be very gentle to avoid the canopy stalling.

If the pilot does not correct for direction the canopy self-recovers after a maximum 180 degree turn. In case the canopy does not recover by itself, the appropriate amount of brake must be applied to correct for direction and exit the turn.

The pilot's 'correction for direction' must be followed by a 'pumping out of the deflation', a slow, long pumping action on the brake of the deflated side of the wing helps the canopy to re-inflate.

Fullstall :

To induce a full stall, apply full brake on both sides and hold the brakes in that position.

The SOL QUASAR generally flies backwards during a full stall and forms a front rosette.

The canopy must be stabilised before letting out the full stall. If the canopy is not stabilised and the full stall is let out too early the canopy may surge forward a long way.
To recover from a full stall both brakes must be let up symmetrically at a moderate speed (1 second).
The SOL QUASAR surges forward a little bit after recovering from a full stall whereby a tuck may occur.

An ‘asymmetric’ recovery (one control released faster than the other) from a full stall is used by test pilots to simulate a paraglider falling out of a thermal and must not be practised by inexperienced pilots.

An asymmetric recovery from a full stall may result in a big, dynamic, tuck.

The danger of overcorrecting and overreacting exists during all extreme flight manoeuvres: Thus, any corrective action must be gentle and steady!

Spin :

A spin is induced when the pilot in full speed (DHV test) or in very slow flight (AFNOR) pulls one control line all the way down very hard and very quickly.

During a spin the canopy turns relatively fast around the centre section of the canopy while the inner wing flies backwards.

To recover from a spin the pulled down control line should be eased off so

that the canopy may accelerate and return to its normal straight and stable flying position without losing too much height.

In case the spin is allowed to develop for some time, the SOL QUASAR surges forward on one side and a big and impulsive asymmetric tuck can occur. If so brake gently to stop canopy surging, correcting tuck:
see 'tucks'.

Wingover :

To induce a wingover the pilot flies consecutive alternating turns to steepen the angle of bank. The SOL QUASAR only tucks when a high angle of bank is attained.

Attention: A turn with more than a 60 degree angle of bank is illegal aerobatics!

Front stall

If the pilot pulls both A-risers a front-stall is induced: the entire leading edge tucks and the canopy generally forms a frontal horseshoe. To recover from a front-stall apply steady brake on both sides.

Line over :

If for any reason lines are tangled or looped around the canopy during flight the following action should be taken:

Maintain straight flight by gently correcting for direction!

Check the situation carefully and once the line(s) looped around the canopy, is/are identified pull it/them gently to untangle.
In this situation pumping of the controls has little effect.

Deep stall :

The SOL QUASAR generally does not remain in deep stall, and is self recovering.

In case the recovery from a B-Stall was not impulsive enough and the canopy remains in a deep stall, it is sufficient to gently pull down both A risers to reduce the angle of attack.

Emergency steering :

In case it is impossible to control the SOL QUASAR with the control lines the outer C-lines, D-risers or the stabiliser lines may be used to steer and land the canopy.

RAPID DESCENTS

Spiral dive :

Spiral dives as explained previously have a rapid descent rate, however, the very high G-forces make it difficult to sustain a spiral dive for long.

In case of strong winds the pilot may drift off course.

Big ears :

The outer cells of the wing tips may be deflated by pulling down one to two of the outer A-lines simultaneously by approximately 50 cm.

Keep hold of the control handles together with the A-lines.

The canopy remains completely controllable through one sided braking or weight shift. It maintains straight flight but with an increased sink rate (up to approx. 5 m/sec).

On releasing the A-risers the canopy reinflates by itself.

B - stall :

To induce a B - stall pull both B - risers simultaneously by 50 - 60 cm.
The airflow over the top surface is detached and the canopy enters a parachutal-stall without moving forward.

Further pulling of the B-risers reduces the surface area and increases the sink rate (to approx. 10 m/sec).

On releasing the B - risers the airflow over the top surface becomes reattached and the canopy surges forward to return to normal flight.

In the uncommon case, that the canopy builds a frontal rosette, gently apply brake on both sides.

ALL RAPID DESCENT TECHNIQUES SHOULD BE PRACTISED IN SMOOTH AIR AND WITH SUFFICIENT HEIGHT SO THAT THEY CAN BE EMPLOYED WHEN NECESSARY IN EXTREME FLYING CONDITIONS !
FULL STALLS AND SPINS ARE TO BE AVOIDED AS WRONG RECOVERY PROCEDURES, IRRESPECTIVE OF THE TYPE OF PARAGLIDER, MAY HAVE DANGEROUS CONSEQUENCES !

LOOKING AFTER YOUR PARAGLIDER

Looking after your canopy correctly will prolong the life of your SOL QUASAR.

Storage :

Store the paraglider in a dry space away from chemicals and UV light.

Cleaning :

Clean the paraglider only with water and a soft sponge. Do not use any chemicals or spirits for cleaning, as these can permanently damage the cloth.

Repair :

Repairs should only be carried out by the manufacturer, distributor or authorised workshops.

Deterioration : a few tips !

The SOL QUASAR is mainly made of NYLON, cloth which, like any synthetic material, can deteriorate through excessive exposure to UV. Hence, it is recommended to reduce UV exposure by keeping the paraglider packed away when not in use.

The lines of the SOL QUASAR are made of an inner core of Polyethylen or Technora and an outer sheath of Polyester. An overstretching of lines independent of the strain imposed durnig flight should be avoided as overstretching is irreversible. Ensure that the lines are not folded tightly.

Keep the canopy and lines clean as dirt may penetrate into the fibre and shorten the lines or damage the cloth.

Be careful, not to allow snow, sand or stones to enter inside the canopy´s cells : the weight can brake, or even stall the glider, as well as sharp edges can destroy the cloth !

Prevent lines from catching on anything as they may be overstretched.
Do not step onto the lines.

Uncontrolled strong wind takeoffs or landings can result in the leading edge of the canopy hitting the ground at high speed which may cause rips in the profile and damage the material.

The brake line can chafe if badly tangled.

Check line length after tree- or water landings. Clean the paraglider with fresh water after contact with salt water.
A line plan is enclosed in this operators manual or may be requested from the manufacturer or distributor.

Do not always fold the canopy symmetrically to the centre cell as this can cause constant stress on the centre cell (centre cell always to the outside).

An annual inspection of the SOL QUASAR should be carried out by the manufacturer or distributor.

The DHV requires a two yearly maintenance check.

IN CONCLUSION

The SOL QUASAR is at the forefront of modern paraglider design.

You will enjoy many safe years of flying with your SOL QUASAR if you look after it correctly and adopt a mature and responsible approach to the demands and dangers flying can pose.

It must be clearly understood that all airsports are potentially dangerous and that your safety is ultimately dependent upon you.

We strongly urge you to fly safely. This includes your choice of flying conditions as well as safety margins during flying manoeuvres.

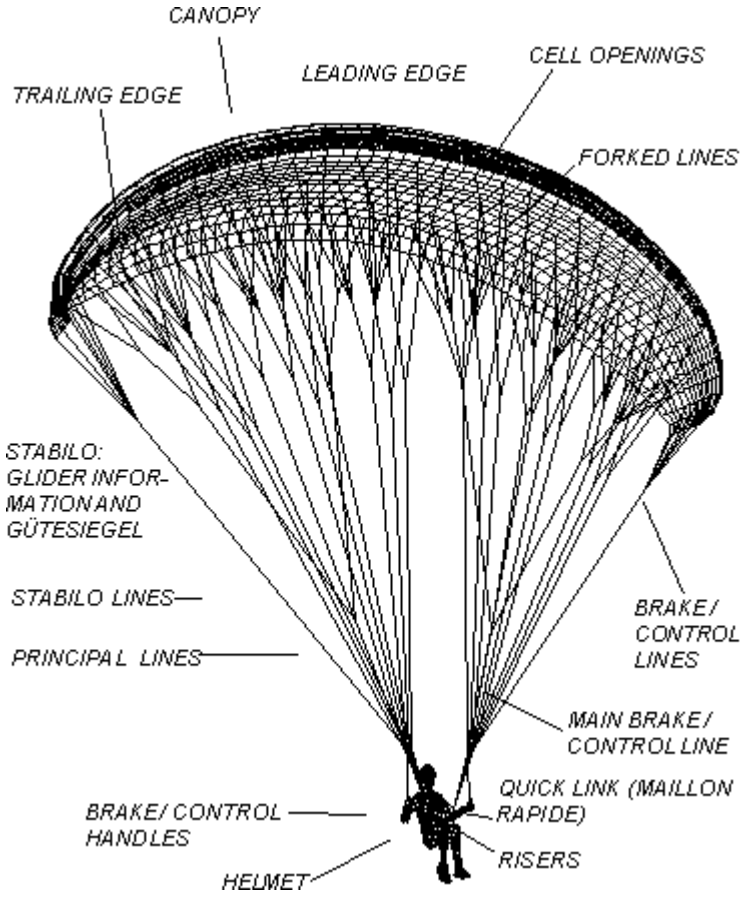
We recommend you only fly with a Gütesiegel approved harness, reserve chute, and helmet.

FLYING YOUR CANOPY IS AT YOUR OWN RISK !

SEE YOU IN THE SKY !

SOL PARAGLIDERS TEAM

OVERALL


CANOPY
LEADING EDGE
CELL OPENINGS
TRAILING EDGE
FORKED LINES
STABILO:
GLIDER INFOR-
MATION AND
GÜTESIEGEL
STABILO LINES
PRINCIPAL LINES
BRAKE/
CONTROL
LINES
MAIN BRAKE/
CONTROL LINE
QUICK LINK (MAILLON
RAPIDE)
BRAKE/ CONTROL
HANDLES
RISERS
HELMET

FLIGHT LOG

MODEL:_____ SERIAL No. _____

SIZE:_____

PURCHASED FROM:_____ DATE:_____

TEST FLOWN BY:_____ DATE:_____

DATE	SITE	DURATION	FLIGHT DETAILS

INSPECTION CHECK LIST

MODEL:_____DATE OF INSPECTION:_____

OWNER:_____

ADDRESS / FONE:_____

	CONDITION
LEADING EDGE CELL OPENINGS	_____
DACRON RE-ENFORCEMENT	_____
TOP SURFACE PANERS	_____
BOTTOM SURFACE PANERS	_____
TRAILING EDGE	_____
BRAKE LINE ATTACHMENT POINTS	_____
A LINES UPPERS	_____
B LINES UPPERS	_____
C LINES UPPERS	_____
D LINES UPPERS	_____
A LINES MAINS	_____
B LINES MAINS	_____
C LINES MAINS	_____
D LINES MAINS	_____
BRAKE LINES	_____
INTERNAL CELL WALLS AND VENTINGS	_____
RISERS	_____
MAILLON RAPIDES	_____
BRAKE TOGGLES	_____

COMMENTS:_____

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