

MANUAL



for



HIGH PERFORMANCE RESEARCH

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(This manual revised November, 2006)

Dear Skydiver,

We congratulate you on your purchase of the BLADE canopy. The BLADE is distributed in the United States by HiPerUSA. The BLADE is a new design that incorporates many of the time-tested innovations we have used on the NITRO, but with refinements that are targeted to appeal to today's growing number of extremely skilled canopy pilots.

The BLADE is a high-speed elliptical canopy that demands considerable skill, experience, and concentration from the pilot. The Blade is designed to be flown aggressively by skydivers who want to make swoop landings and long surfs. The BLADE reacts immediately to riser and toggle input, so the canopy is extremely responsive. The glide angle is steeper than that of the NITRO, giving the canopy a higher sink rate and faster airspeed. However, on the landing approach, the slightest application of brakes transfers that high speed into lift with a resulting long surf prior to touchdown. The BLADE is intended to be flown with an approach turn or dive, and this steep dive and high set-up add a margin of safety to swoop landings, as it allows much more time for adjustment to keep the pilot out of the dangerous "corner". In the event that the pilot elects to make a straight-in approach, the BLADE can be landed very nicely without additional speed.

The BLADE is equipped with the proven Winglets, which are attached to upper surface and outside cells. They account for the BLADE's superb track-holding, especially in crosswind landings. The tendency for line twists is greatly reduced as well. The ventilation of the cells is shifted downward, making it virtually impossible to collapse the BLADE. The profile was made thinner and flatter, thus the wing has a much lower coefficient of drag and is very fast. The stabilizers are designed so that an efficient laminar flow is created, especially in braking, without creating a fluttering high-drag area around the wing tips. The use of continuous lines made of tiny Technora further reduces drag and adds to the stability of the wing. Just as on the NITRO, the unique leading edge improves the landing flare. The BLADE's performance truly rivals that of a cross-braced canopy without having any of the disadvantages of that design.

Safety Notice

Some references to security:

We generally recommend an experience level of 700 jumps on high speed parachutes, since the BLADE is designed to be flown at wing loadings of at least 1.8 pounds per square foot in order to fully achieve its potential.

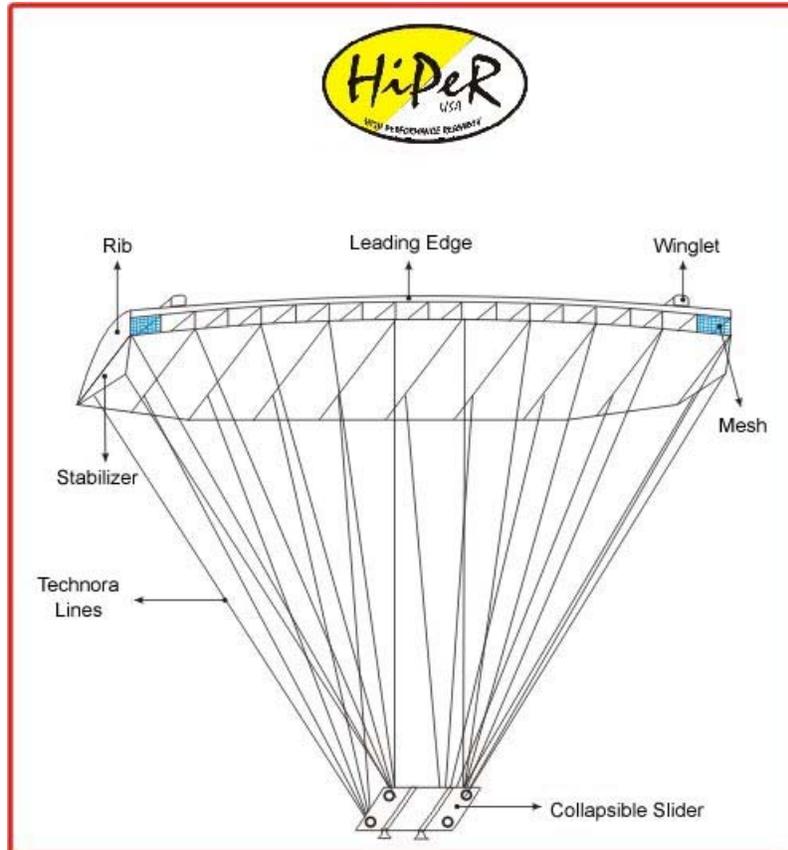
The BLADE was developed for very experienced pilots who are looking for more speed and performance potential than is available with the NITRO. Accordingly, we set the minimum / maximum wing loadings at a very high level. So before jumping the BLADE, you should have considerable experience on high speed canopies at high loading. The BLADE was conceived and initially designed by Klaus Schenck, who we remember saying, "If your canopy is faster than your eye, then you have a problem!"

Regular inspections of your equipment are essential. Not only should you have your canopy periodically inspected by a qualified rigger, but you should also inspect the canopy frequently during normal use. If any component looks questionable, get a qualified opinion before making another jump. One of the best ways to keep your gear in good condition is by controlling it. Never allow your canopy to be exposed unnecessarily to the sun and harmful UV rays. Don't store your gear in a vehicle. Do not allow your equipment to come in contact with harmful contaminants. In the event of extreme soil or contamination, rinse the canopy in pure water only, using no detergents or solvents. Soft connector links are highly recommended, as they prevent damage to the slider and suspension lines.

We're sure that you will enjoy jumping your new BLADE and you can feel secure in knowing that you have purchased a product built to provide many years of reliability, dependability, and enjoyment.

Blue skies and safe swoops,

The HIGH PERFORMANCE RESEARCH Team



**Suspension
Lines
Without
Cascades**

As already mentioned in the introduction and can be seen in the chart, the suspension lines are continuous without cascades. That is, each line is individually fastened to the attachment points on the canopy. This method allows for a much-improved wing and better glide, as cascaded lines cause the airfoil to become distorted during turns and braking. The outboard lines terminate at the bottom of the stabilizers, which eliminates flutter and increases efficiency of the wing.

**Dimensional
Stability of
Technora
Lines**

Another important factor concerning the suspension lines is the material used, Technora, which has a very low stretch factor. Our Technora line exhibits a maximum stretch of 3.5% at full load and does not shrink over time like Spectra (microline) does. Dacron lines stretch as much as 10% and the shrinkage of Spectra line can approach an inch per hundred jumps! Technora is an Aramid-based fiber with a molecular structure that has a very high flex-fatigue (bending) factor.

**Lineset
Summary**

These combinations of improvements guarantee a better-flying canopy and a lineset that will last many hundreds of jumps while maintaining perfect line trim throughout its lifespan. **An important note** about the lineset: We recommend pulling the slider down below the lines (on the risers) for each canopy flight. If left in contact with the lines, the constant vibration of the slider grommets may cause premature wear of the outboard suspension lines. We suggest you perform this step prior to releasing the deployment brakes, but after collapsing the slider. It is also advisable to position the rear slider grommets below the toggles and the front grommets below the dive loops.

**Improved
Leading
Edge**

The nose of the BLADE is fitted with a freely attached leading edge. As a continuous piece of fabric across the entire span of the upper surface, the leading edge is fastened individually to each rib by small tapes. This type of leading edge has shown to provide better stability during the flare.

**Better
Control
Using
Mesh**

The openings of the end cells are covered with mesh. It is well known that canopies flying in steep turns have pronounced distortion at the end cells. The mesh covering keeps these cells pressurized and virtually eliminates this distortion.

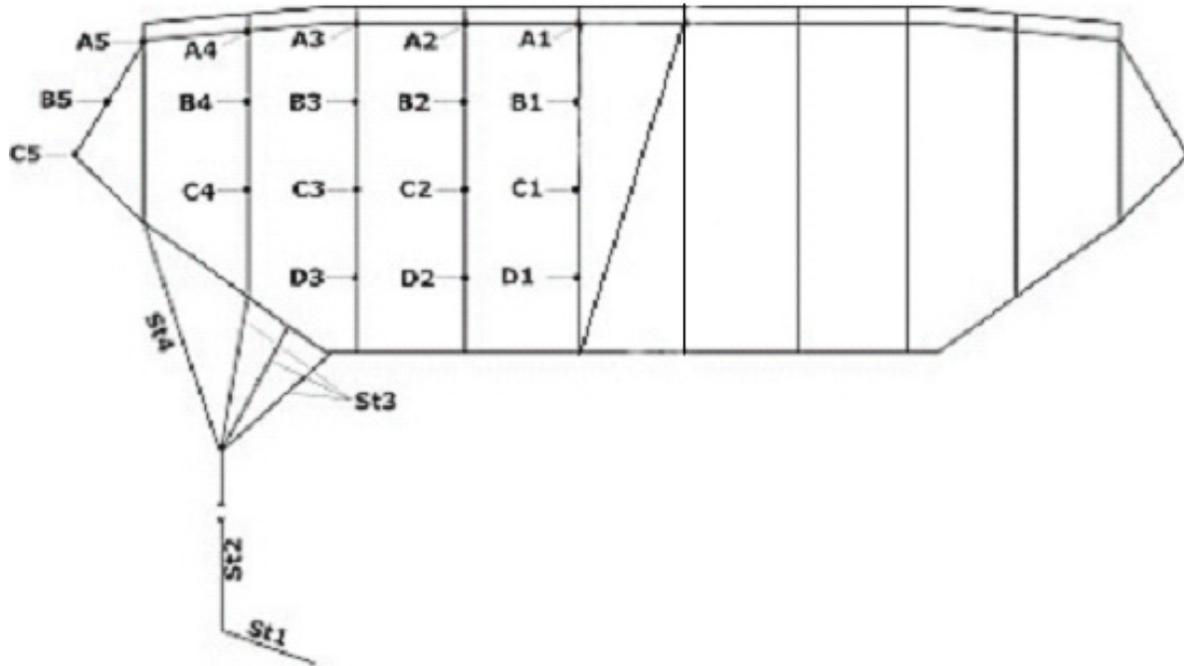
**The Benefits
Of Winglets**

Further construction improvement which affects the stability of the canopy is the use of winglets on the BLADE. Inspired by their use on aircraft and paragliders, we transferred this technology to our canopies. The winglets provide extra lift to the airfoil by reducing disturbances over the upper surface of the wing; this allows the canopy to fly to a slower stall speed, thereby giving a more powerful flair. They provide for better recovery from steep carving turns, and improve directional control during crosswind landings. They also help to prevent the diving effect of line twists that is often associated with elliptical canopies.

**Durable
Canopy
Fabric**

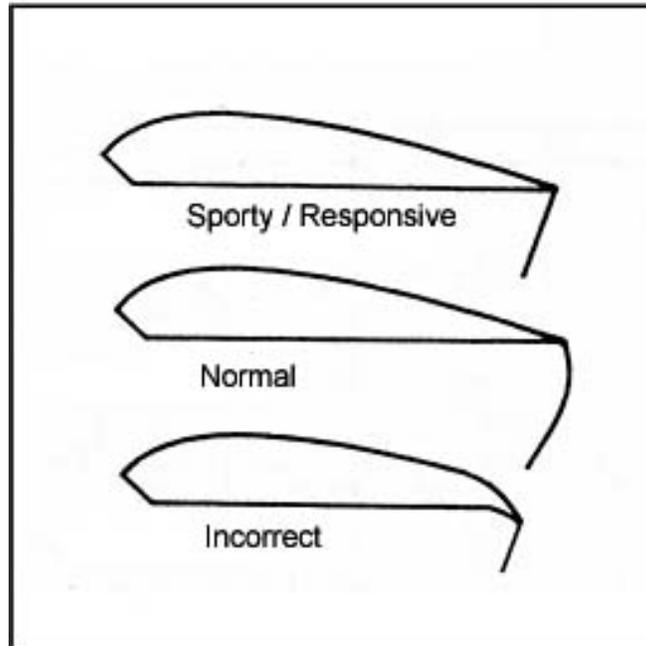
We use the fabric: LCN 065C41 F106 K27 from Gelvenor Textiles. This is a very tear-resistant and long lasting fabric which achieves its zero porosity through a silicon-based treatment, rather than the former method of a polymer yarn technique. This new fabric was introduced in late 2006, and the result is that our new canopies are built with a cloth that has a much higher strength (min. 47 lbs/inch tensile) and will last indefinitely without any degradation in performance. The material weight is 1.3 oz/sq. yd. Our canopies are built using only the strongest materials and reinforcements, and thus may pack slightly bigger than some canopies; this is compensated by the tremendous load carrying capacity and product durability you will experience with the BLADE.

System of Lines: BLADE 58, 68, 78, 88, 98, 108, 120



If you need to replace individual lines, please specify the line(s) needed according to the above drawing.

Control Line Adjustment



All BLADE canopies are designed to fly correctly for most jumpers with normal brake line length. With this setting it is easy to collapse the slider or pull the front riser, without causing the canopy to buck. The slack in the brake lines at the factory-recommended setting is 10-15 cm. If you find that this toggle setting needs to be adjusted please contact HiPerUSA or your local rigger.

Installation Instructions for HiPerLink Soft Connector Links



1) Check the continuity of your line group. Begin installation by inserting the link through all the lines and then through the riser.



2) Pass the link through the lines and through the riser again, so that the link forms a doubled loop.



3) Insert the small loop at the top of the link through the loop just above the stopper knot.



4) Using a fid, ballpoint pen, or similar object, carefully open the top loop a little wider to enable it to pass over the stopper knot. Make sure that you don't damage any of the fibers as you perform this step.

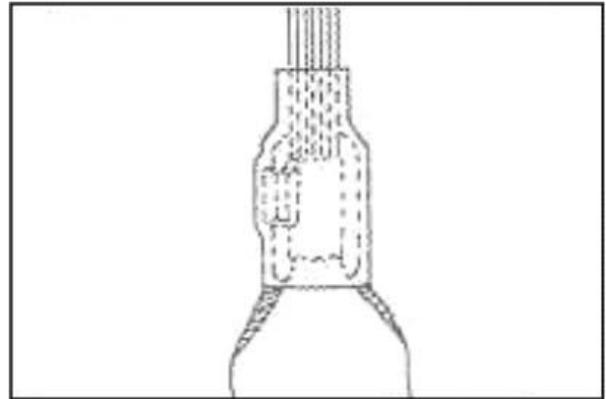


5) Now pass the widened loop over the stopper knot, then "milk" the finger-trapped portion of the link to return the top loop to its original smaller size.



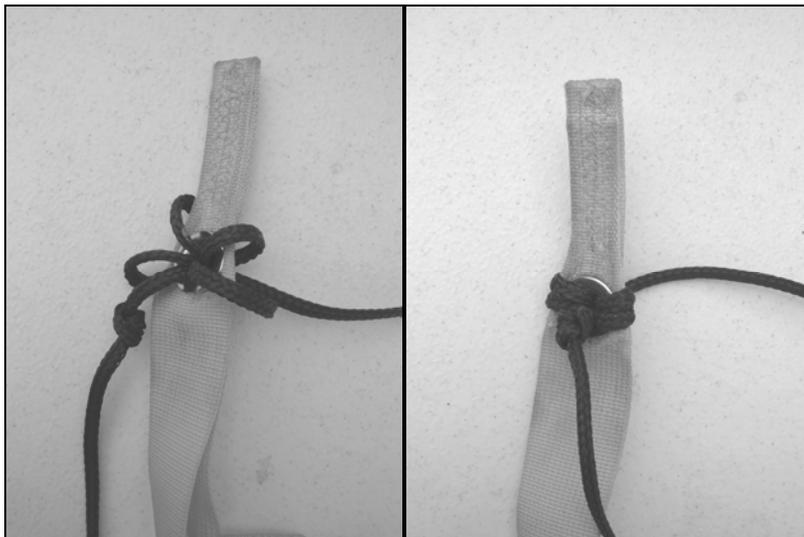
6) Rotate the link so that the knotted portion is hidden inside the riser. Finally, pull the riser and suspension lines away from each other to tighten the connector link. It is important that the locking section of the link remain inside the riser, so for the first several pack jobs check for this. After a few jumps the link will take a "set" and have no tendency to rotate.

Should you choose to use stainless steel connector links, assemble the links as shown in the illustration and use silicone hose or other suitable bumper material. If jumped without this protection, the lines and slider can be damaged. **The best solution is to use soft connector links!** When soft links are utilized, slider bumpers are not required.



Install the slider with each of the four groups of lines routed through the appropriate slider grommet. When installed correctly, the pull tabs are on the rear of the slider and the slider's reinforcement tape faces up towards the canopy, not down towards the jumper.

Your NITRO comes from the factory with a mark for toggle settings. We do not sew a loop for the simple reason that jumpers have individual preferences for toggle placement. There are many ways to attach the lower control lines to the toggles, but we have found the method shown in the pictures below to be simple, effective, and easy to adjust as necessary. **Note:** Control lines must always be routed through the rear slider grommets and the brake rings on the rear risers!

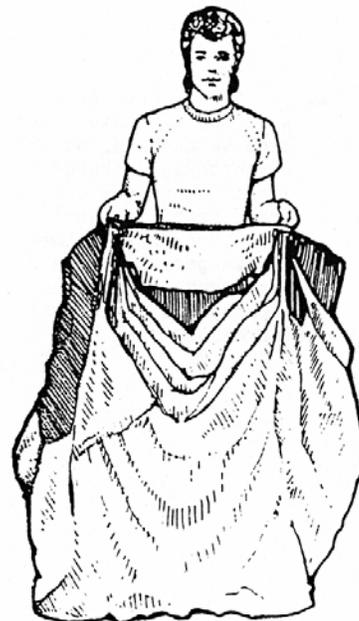


Pro-Packing Procedure

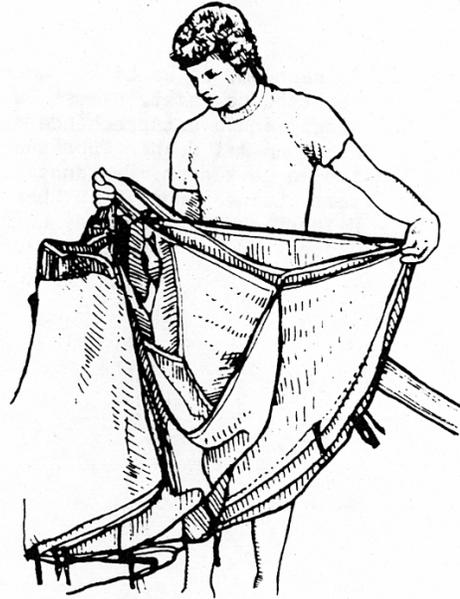
1) Lay down your gear face-up on the floor. The suspension lines should be straightened, and the canopy's nose should point towards the floor. Take care that the steering toggles lay on top of the risers. Take both steering lines and rear and front groups of suspension lines. Let them run separately through your fingers while approaching your canopy. In doing so, push the slider up to the top.



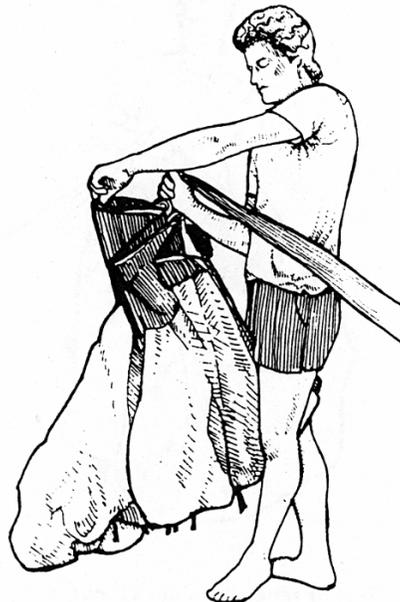
2) After sorting out the suspension lines, separate the right and left line groups as far as the slider allows. Then shake the canopy thoroughly several times to let the canopy smooth and sort itself out. The canopy's nose must point to your body. If it does not, the canopy is either connected improperly or there are some twisted lines.



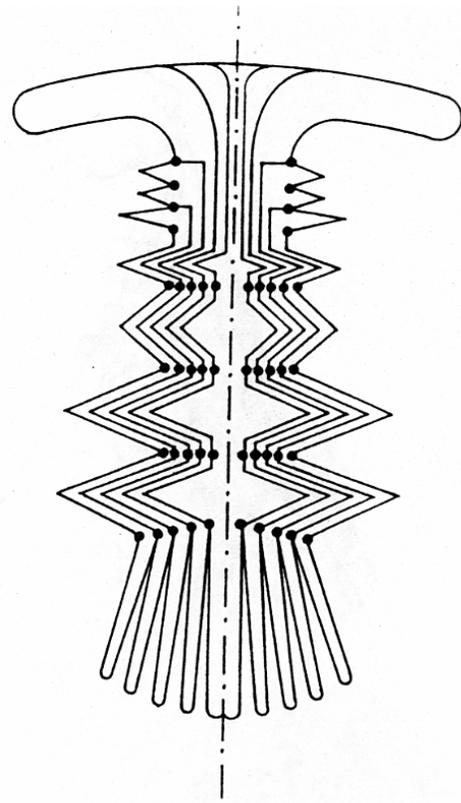
3) Now take both line groups into a hand and sort the cells by pulling each one out and laying it on your thigh. Make sure you do not miss any of the nine cells.



4) Place all folded cells between your knees and hold them tightly. Arrange the stabilizers and the slider. Now push the fabric between each line group to the outside, leaving the lines toward the center.



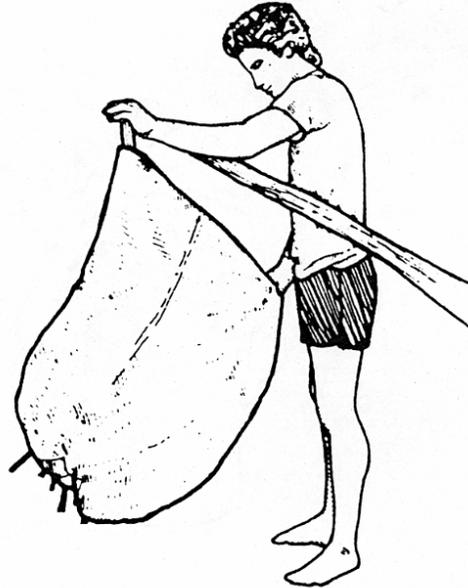
5) If you arranged everything correctly, this (schematically represented) should be your view of the flaked canopy.



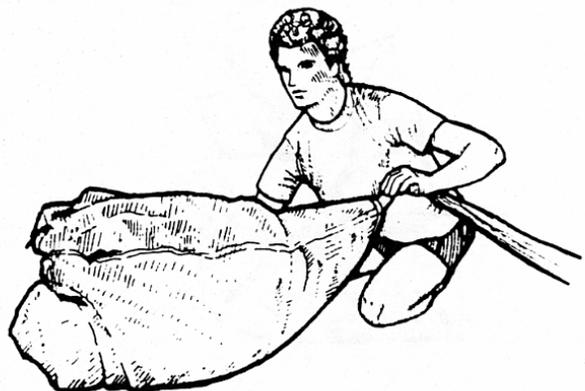
6) Reach down and take the center of the tail (at the warning label). Bring it up to the slider and with your other hand take hold of it.



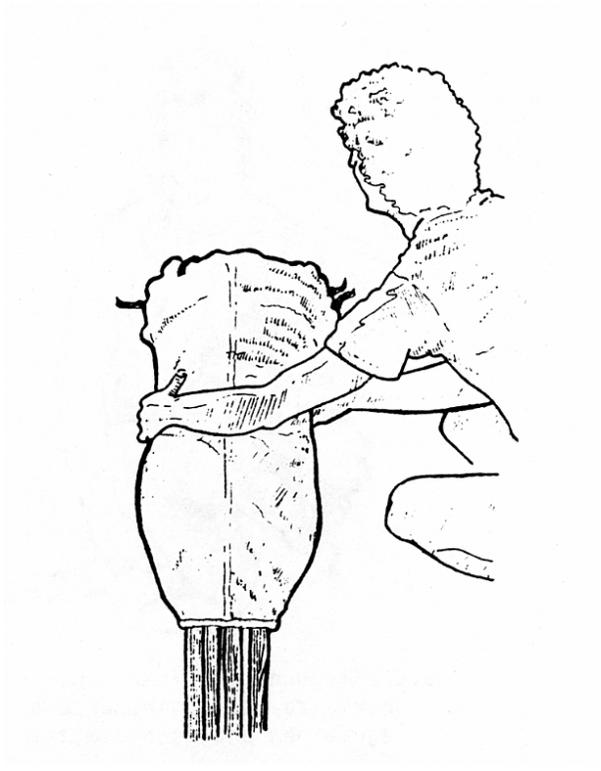
7) Now put the right and left side of the tail around the bundle and roll both sides somewhat together. **Caution:** No control lines should be allowed to pass around the canopy. This could lead to a line-over malfunction!



8) Swing the canopy forward, and gently lay it down onto the floor. Take care that the lines remain tight and straight.



9) Push the lateral canopy parts together and under the bundle. Beginning at the slider, kneel on the canopy and form a “cocoon” the width of the deployment bag.



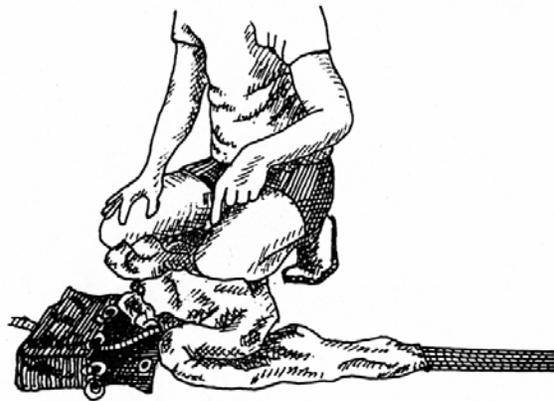
10) Kneel beside the canopy and make the first S-fold.



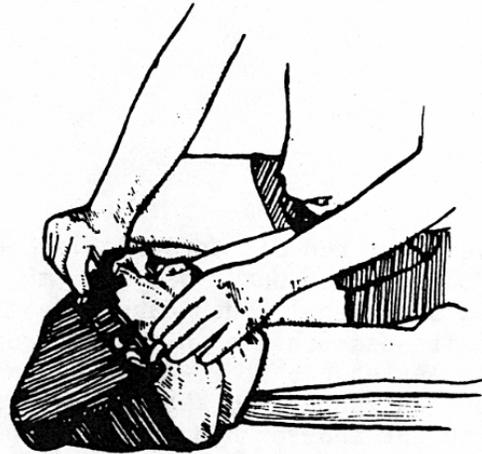
11) Now make another S-fold on top of the first. The result is a compact canopy bundle.



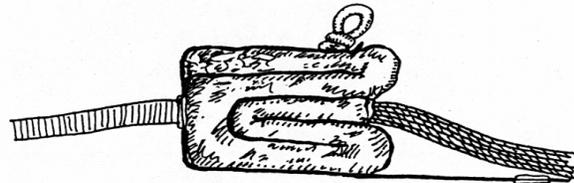
12) You can hold the S-folded canopy with your knees. Arrange the bag and push the closing flap under the bundle.



13) Push the canopy into the bag. Make sure that you keep the canopy in a bundle as you go. Push any remaining parts of the canopy neatly into the bag.



14) If packed correctly, the canopy should lie in the deployment bag as in this illustration.



As you stow the suspension lines on the deployment bag, use very small bands and / or make a double-turn of each stow. Because the Technora line is very small, it is important to ensure that the lines release from the bag in proper sequence to prevent hard openings or other deployment problems.

These packing instructions are for general information only. If your container manufacturer specifies a different method, follow those packing directions.

Recommended Wing Loading

The following table represents what we feel to be the **maximum** wing loadings for the BLADE main canopy. The listed maximum weights are exit weights, which is usually body weight plus about 20 lbs. for clothing and equipment. Keep in mind, these maximums should by no means be considered the recommended loadings. Rather, these weight limits should be viewed as the “do not exceed” limits for a given canopy model and experience level. As canopies fly with greatly increased forward speed and rate of descent at heavier wing loadings, your own personal preferences may put you at a lighter loading than the maximums indicated in this chart. Remember, even though the BLADE is designed for high speeds and aggressive flying, jumping as small a canopy as possible at extremely heavy loadings isn’t for everybody. When choosing a canopy it’s all about what suits you!

# Jumps	Blade 58	Blade 68	Blade 78	Blade 88	Blade 98	Blade 108	Blade 120
Below 400	N/R*	N/R*	N/R*	N/R*	N/R*	N/R*	N/R*
400 - 499	N/R*	N/R*	125 lbs	141 lbs	157 lbs	173 lbs	192 lbs
500 - 599	N/R*	122 lbs	140 lbs	158 lbs	176 lbs	194 lbs	216 lbs
600 - 699	116 lbs	136 lbs	156 lbs	176 lbs	194 lbs	216 lbs	240 lbs
700 +	128 lbs	150 lbs	172 lbs	194 lbs	216 lbs	238 lbs	264 lbs

* N/R means that the listed canopy size for a given experience level is NOT RECOMMENDED

Technical Specifications

Size	ASP. Ratio	Min. Exit Weight	Max. Exit Weight	Pack Volume	Min. Cord	Max. Cord	Wing Span
58	2.56	93lbs/ 42kg	128lbs/ 58kg	182 cu in	99 cm	141 cm	369 cm
68	2.56	109lbs/ 50kg	150lbs/ 68kg	198 cu in	104 cm	151 cm	401 cm
78	2.56	125lbs/ 57 kg	172lbs/ 78kg	214 cu in	110 cm	161 cm	426 cm
88	2.56	141lbs/ 64kg	194lbs/ 88kg	242 cu in	120 cm	171 cm	455 cm
98	2.56	157lbs/ 71kg	216lbs/ 98kg	256 cu in	125 cm	181 cm	476 cm
108	2.56	173lbs/ 79kg	238lbs/ 108kg	273 cu in	132 cm	191 cm	501 cm
120	2.56	192lbs/ 87 kg	264lbs/ 120kg	310 cu in	147 cm	201 cm	530 cm



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