

# **SKY** SNATCH

## **USER MANUAL**

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**YOU MUST READ THIS MANUAL BEFORE DOING  
ANYTHING WITH YOUR SQUIRREL EQUIPMENT**

## **IMPORTANT: About this Manual**

This manual does not provide instructional information, and is not a substitute for professional training, instruction, or experience. Before using your equipment, it is critical that you receive training and instruction for its use by a certified / rated instructor who is familiar with the proper use of this system. This manual is only a general guide and does not contain any instructional information.

This manual may be updated, revised, or changed by Squirrel LLC without notice, at any time. Contact Squirrel LLC to be sure that you have the most up to date version of this manual. It is imperative that you read this manual in its entirety, and understand it fully. If you do not understand any part of this manual, or feel that any part is unclear in any way, please notify Squirrel LLC in writing and do not use any equipment that this manual refers to until you are certain that you fully understand the most up-to-date information pertaining to your equipment.

### **Your Squirrel Equipment comes with NO WARRANTY.**

Parachuting, skydiving, and wingsuit flying are extremely dangerous activities. This product is sold with all faults, as is, and with no guarantee or warranty of fitness for any purpose. Squirrel LLC, its members, owners, associates, and dealers, disclaim any and all liability in tort for damages of any kind, caused by negligence on the part of Squirrel LLC or otherwise. By using this system or allowing it to be used by others, the user waives any liability of the manufacturer for personal injuries or other damages resulting from its use.

### **⚠ WARNING ⚠**



ALL FORMS OF SKYDIVING, PARACHUTING, AND WINGSUIT FLYING ARE INHERENTLY HAZARDOUS ACTIVITIES AND REQUIRE THE DELIBERATE AND CONSCIOUS CONTROL OF YOUR PHYSICAL BODY THROUGH THE PROPER USE OF THIS PRODUCT IN RELATION TO EVER-CHANGING VARIABLES AND DANGERS. TRAINING, PROFICIENCY, SKILL, GOOD JUDGMENT, AND BEING CONTINUALLY ALERT TO CHANGING CONDITIONS, INCLUDING WEATHER, VISIBILITY, SURFACE CONDITIONS, ATMOSPHERIC CONDITIONS INCLUDING DENSITY ALTITUDE, AND OBSTACLES, ARE REQUIRED TO LOWER THE RISK OF SERIOUS INJURY OR DEATH. DO NOT USE THIS PRODUCT WITHOUT INSPECTING IT AND ALL OF ITS COMPONENTS BEFORE EACH AND EVERY USE.



**!!!Even when properly used, this product may malfunction or fail to operate as expected. You risk death or serious injury each time that you use this parachute system!!!**

**The SkySNATCH is a kill-line pilot chute system designed for experienced parachutists ONLY.**

# General Information & Characteristics

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## ABOUT THE SkySNATCH

The SkySNATCH is an evolution in pilot chute design. The three dimensional partial toroidal shape is the most technically advanced design being used in skydiving today. Simply put, the SkySNATCH is the most efficient, stable, and symmetrical pilot chute available.

The SkySNATCH is a kill-line pilot chute system for skydiving. It comes standard with an 8' bridle (from pin to PC attach-point, 11' in total), attachment mallions, and a carbon fiber handle. All sizes of the SkySNATCH are constructed from ZP.

## HISTORY

The Snatch project began after a conversation between Squirrel Co-designer, Will Kitto, and CRW expert, Jim Rasmussen. Although the toroidal design concept has been used extensively in parachutes for over 40 years (it is also known as an annular or pulled-down-apex (PDA) design), it has never before been put into production for skydive pilot chutes due to the complexity of the design. The Snatch has rapidly become the new standard in BASE jumping pilot chutes, where PC stability is critical. The new SkySNATCH is designed for skydivers who seek the highest quality PC available.

## THE DESIGN

The SkySNATCH's three dimensional partial toroidal shape is joined together with two mesh cones. The torus shape, like a donut cut in half, has a very high drag coefficient. "Traditional" skydiving pilot chutes are a very loose approximation of this same shape. Traditional PCs are two circles sewn together around the edges, typically one of ZP and one of mesh, with a piece of line or webbing connecting the center of each circle together at a specific distance. When pulled from the center of the mesh circle and dragged through a fluid, it inflates into a rough approximation of a pulled-down-apex shape, but with a large amount of distortion and error, with a wrinkled and asymmetric circumference. Imagine crumpling up a single piece of paper until it forms the 3D shape you want to design - it won't look good, nor be an accurate representation of a 3D surface. Yet that is the current basis of traditional PCs: an approximate and inefficient 2D design meant to perform a task that requires a 3D shape.

The SkySNATCH's design achieves a specific 3D shape when inflated by using multiple panels (gores), each with a mathematically calculated 3D shape. The design is similar to the way that round parachutes are designed from multiple gores to form a hemispherical shape when inflated.

## THE MATH

A torus is made by rotating an ellipse around a center axis. For this design, we used an ellipse with a ratio of 7:10 (height : width) with an axis offset from the ellipse by 20% of its width. Mesh cones meet with the outside and inside edges of the partial torus at an exact tangent to its curve, ensuring a smooth transition from mesh to ZP, which maintains a smooth and error-free perimeter of the pilot chute. The difference between a SkySNATCH and a traditional PC design is immediately apparent when handled or inflated by any experienced jumper.

## HOW IT WORKS BETTER

The inherent imperfection of the standard double circle pilot chute design means that there is a significant amount of randomness in its inflated shape. There is a constant tug-of-war between air pressure forcing it into a 3D shape, and the fabric trying to remain a 2D shape. Across its surfaces there are sections of high and low stress, where there is too much material in one section and not enough in another, causing "stretch and sag". This can contribute to the pulsing and surging we see in traditional pilot chutes in freefall. A toroidal design minimizes the randomness and helps to ensure that the inflation is more consistent and predictable. Once inflated, the pilot chute is not searching for alternative shapes: it inflates to its intended shape and stays there. There is no pulsing, and instead only a clean inflated shape.

## **WHAT THIS MEANS TO YOU, THE JUMPER**

Per square millimeter, the SkySNATCH pulls with more stability than a traditional PC. Wind tunnel and field testing have shown superior stability in all applications, from CRW to Wingsuit use.

## **WHAT SIZE SHOULD I CHOOSE?**

The SkySNATCH is not necessarily more or less powerful than other PCs of similar size. The main difference is stability. For example, if you find that your 30" PC is functioning well for wingsuit use currently, then a 30" SkySNATCH will work similarly depending on the design factors specific to your current PC. If you are using an older O-3fcm (F-111) PC for skydiving currently and are happy with the extraction force it is providing, then you may need to choose a smaller size of SkySNATCH.

## **SkySNATCH BRIDLE LENGTH**

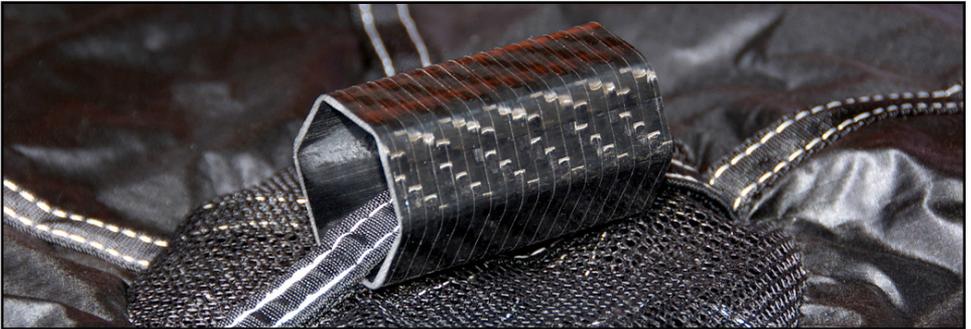
The SkySNATCH bridle length is 8' from pin to PC (11' in total, but we don't measure the start of our pony tail at our foreheads). The optimum bridle length for skydiving and BASE jumping has been debated many times. The SkySNATCH bridle length is chosen based on the burble size of an average wingsuit pilot flying at a responsible and acceptable speed and angle of attack for deployment. Extending the length beyond 8', in our opinion, only provides a crutch for pilots in irresponsibly slow or inefficient deployment configurations, and also increases the risk of bridle/PC entanglement. More bridle does not increase the inherent safety of the system and in fact decreases it (in our opinion, based on extensive field testing in the BASE environment).

## **WEIGHT & BALANCE, AND MATERIALS**

We believe pilot chute weight to be a critical safety factor. For over a decade now, the BASE community has known that hacky-sack-handles are bad, and contribute to PC/bridle entanglements because of their weight. Yet there are still countless PCs in use today which feature heavy and bulky PVC handles and overbuilt/clumsy construction. Evidence suggests that lighter is better, and for that reason we have created the lightest design that we could without sacrificing durability. A lighter PC is less likely to entangle with the bridle: it tumbles less, and is carried downstream at rates more similar to the bridle. A heavier PC can be carried downstream at a slower rate than the bridle, which can cause the heavy PC to then tumble and mix with the bridle in the jumper's burble.

## **HEXAGONAL CARBON HANDLE**

The hexagonal carbon-fiber handle design is very light. It provides a distinct easy-to-feel shape, with minimum weight. The carbon hex is standard on all SkySNATCHES. We do not offer other handle options.



## **QUALITY AND PRECISION**

Each SkySNATCH is guaranteed to be symmetric in construction. PC symmetry is critical - while there are many factors that can cause a pilot chute to exhibit unstable behavior, ensuring that your PC is built symmetrically is important to ensuring stable parachute extractions.

# Installation

## D-BAG

Feed the end of the bridle through the grommet\* on your d-bag until the block is flush against the grommet and the two loops of webbing are sticking through to the inside. Secure these two loops with the steel malleon that is provided. \*NOTE: The SkySNATCH is designed to work in conjunction with #4 or #5 size grommets ONLY.



Install the malleon to the inside of the D-bag as shown, around the bridle and through both loops.

## ATTACHING BRIDLE TO CANOPY

Attach the end of the bridle to the canopy attachment point using the steel malleon provided. Make sure the steel malleon feeds through both the webbing and the spectra loop at the end of the bridle, and through ALL attachment loop webbing on the parachute.

Steel malleons must be set to **finger-tight, plus a quarter turn** (using a wrench). It is critical that you do not under-tighten, or over-tighten, your malleons. All attachment points should be inspected before every jump.



Bridle to canopy attachment.

## Technical Info and Use

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### MESH BIAS

The hexagonal mesh used for the SkySNATCH elongates consistently in multiple directions.

### SIX LOAD TAPES

The SkySNATCH is constructed with six load tapes to ensure a uniform perimeter, consistent symmetry, and high longevity.

### SPECTRA KILL LINE WEAR AND MAINTENANCE

Spectra line can shrink over time, or when heated. Frequently inspect your kill line (or have your rigger check for you) to ensure that it is not out of trim. To extend in case of shrinkage, un-pick the finger trap section at the PC end, extend it, and re-trap / stitch. Alternatively, replace the whole kill line by doing the above and also picking out the stitching at the canopy attachment end. Either feed a temporary line in behind the spectra as you pull it out, or use a long wire to feed in the new line.

The spectra kill line slides through the bridle webbing on every jump, which creates friction which in turn creates heat. The kill line will slowly shorten over time and may need to be lengthened or replaced. Two symptoms to check for when examining kill line length are:

1. Can you fully cock the pilot chute? You should be able to extend the kill line to the same length as the pieces of centerline webbing inside the pilot chute. If you cannot, the pilot chute will not function properly
2. Does the kill line attachment point get swallowed by the bridle when it is collapsed? This may not affect the functionality of the pilot chute when it is inflated, but it may start to damage the bridle.

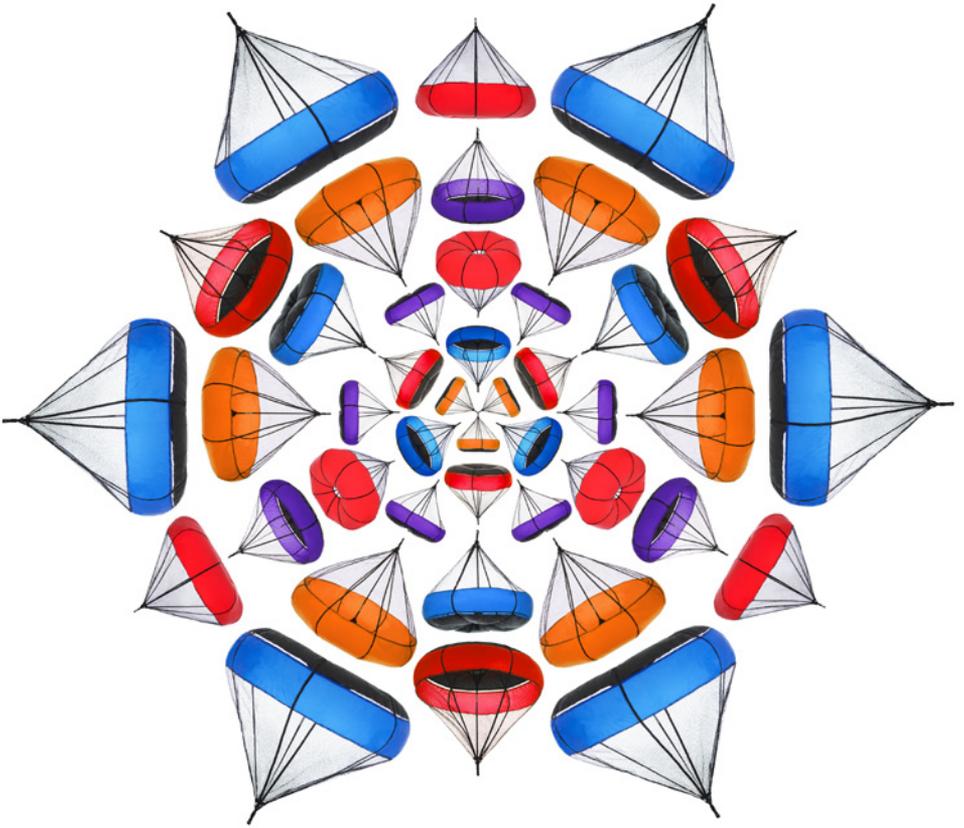
Over time the spectra line may start to cause friction wear to the bridle webbing. It is a good idea to inspect the bridle for this type of damage and replace when necessary.

### COCK YOUR PILOT CHUTE BEFORE USE

If you are smart enough to have read the manual thus far, then we trust you know this already. We recommend not forgetting to cock your PC, ever. It will not work unless you cock it.



Verify that the black mark is visible through the window, to indicate proper kill line extension.



## Contact Us

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If you have *any* questions about any product that we make, please do not hesitate to contact us.

**www.squirrel.ws**

**fly@squirrel.ws**

**855-FLY-SQRL**

THANK YOU FOR FLYING SQUIRREL!

