

V3M-SERIES / MICRON

o w n e r ' s m a n u a l

the uninsured

RELATIVE &
WORKSHOP, inc.







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Vector 3



O W N E R ' S M A N U A L

W A R N I N G

Sport parachuting is a hazardous activity that can result in injury or death.

Parachutes sometimes malfunction, even when they are properly designed, built, assembled, packed, maintained and used. The results of such malfunctions are sometimes serious injury or death.

The U.S. Parachute Association estimates that there about 35,000 skydivers in the USA, and these jumpers made approximately 2.2 million jumps in 2001. The association reported 35 skydiving fatalities that year, meaning the probability of dying on a skydive is approximately 1 in 64,000. Experts estimate that hundreds of people are also injured. Some of these deaths and injuries are the result of equipment malfunction.

If you use your Vector 3, or if you allow someone else to use it, you are acknowledging sport parachuting's risk and accepting the fact that the Vector 3 and its components may malfunction. If you are not willing to accept the risks of sport parachuting, or if you are not willing to accept the possibility that your Vector 3 or its components may malfunction and perhaps cause you to be injured or killed, then you may return your Vector 3 for a full refund before it is used. Details on how to do this are printed below.

This manual is applicable to the Vector 3 bearing the serial number:

DISCLAIMER – NO WARRANTY

Because of the unavoidable danger associated with the use of this harness and container assembly, the manufacturer (The Uninsured Relative Workshop, Inc) makes no warranty, either expressed or implied. This rig is sold with all faults and without any warranty of fitness for any purpose. The manufacturer also disclaims any liability in tort for damages, direct or consequential, including personal injuries, resulting from a malfunction or from a defect in design, material, workmanship or manufacturing whether caused by negligence on the part of the manufacturer or otherwise.

By using this rig, or allowing it to be used by others, the buyer waives any liability for personal injuries or other damages arising from such use.

If the buyer declines to waive liability on the part of the manufacturer, buyer may obtain a full refund on the purchase price by returning the parachute harness and container, before it is used, to the manufacturer within 30 days from the date of original purchase with a letter stating why it was returned.

Take note that neon and fluorescent colored fabrics and tapes fade rapidly. Color brilliance may be lost within a year of manufacture. The Uninsured Relative Workshop, Inc assumes no responsibility for this action.

Save this manual, your rigger may not have an applicable manual and will need it to service your Vector 3. This manual does not cover the correct assembly and packing procedures for the older Vector models.





Dear Skydiver,

Congratulations on your purchase of a Vector 3 harness and container system - without question one of the safest and most reliable container systems on the market today. I have spent my entire skydiving career personally striving to improve the safety in our sport through various innovations and design ideas which are now incorporated into Relative Workshop products. From the 3-Ring release system, the hand-deploy pilot chute, the Booth ball reserve pilot chute, the first ever riser covers. The list goes on, and will continue to go on, as we develop the next generation of Vectors. You will find that the majority of other container manufacturers have now incorporated these innovations into their own designs, following the lead of Relative Workshop.

Here at Relative Workshop, we are totally committed to you, our customer, through the quality and performance in the harness and container systems we design, build and deliver. We have stood behind our products 100% from the day it leaves our factory and reaches your doorstep, and have done so for over 30 years. You will find our service after the sale to be as comprehensive as our customers have come to expect from Relative Workshop. When you buy a Vector, you're buying more than a container system, you're buying innovation, quality, reliability, and most of all a product that has survived the test of time. Relative Workshop has built more sport, student and tandem harness/container systems than anyone else in the world. We've been here for over 3 decades, designing the equipment that meets the imagination of today's skydiver.

Thank you again for your purchase of a Vector - with proper care and maintenance it should provide you with many years of safe and enjoyable skydiving. Should you have any questions or concerns about your equipment, please do not hesitate to contact us.

Blue skies!

Bill Booth
President, Relative Workshop



CONVENTIONS USED IN THIS MANUAL

n o t e

An example of a Note.

=====
This convention is used to highlight additional information in the form of a note.



An example of a Warning

=====
This convention is used to highlight areas of safety and to warn the user of dangers.





SECTION 1

INTRODUCTION

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INTRODUCTION

CONGRATULATIONS!

By choosing the Relative Workshop Vector 3, you've shown that you'll settle for nothing less than the best.

THE HISTORY BEHIND RELATIVE WORKSHOP

Over the past three decades, Relative Workshop has delivered more than 40,000 quality harness and container systems to skydivers all over the world!

In 1972, Bill Booth started Relative Workshop in a Miami garage. During the late 1970's Bill made two major contributions to the world of skydiving. First, Bill invented and patented the hand deploy pilot chute system. This contribution changed the sport forever. Bill Booth's second and maybe greatest contribution and recognition during this period came with the invention and patent of the Booth 3-Ring release system. In 1983, Bill received the prestigious Parachute Industry Association (PIA) Achievement Award. The Federation Aeronautic International (FAI) awarded Bill Booth the 1984 Gold Medal for outstanding achievement in parachute safety design, the highest award available in this field.

Relative Workshop's first harness and container system was called the Wonderhog. This rig incorporated all of the best safety improvements of its era. Not long thereafter, the Wonderhog Sprint was introduced. In 1981, the Vector was introduced and soon became the most popular rig in the world. The Vector II followed and soon enjoyed even more popularity. Since 1977, teams and individuals have been winning gold medals wearing Relative Workshop systems! The U.S. Skydiving Team at the 1981 World Meet wore the very first Vectors.

In the late 1980s and early 1990s, new freefall disciplines such as Skysurfing and Freestyle made their way into the skydiving mainstream. Freeflying entered the mainstream shortly thereafter. These new disciplines brought with them new and increased demands on skydiving equipment. In these flight attitudes, the container is subjected to direct, high-speed airflow. The need for more security such as riser protection, pin protection and bridle protection became apparent. Hence, our engineers went to work.

VECTOR 3

In 1994, Relative Workshop unveiled the Vector 3 harness and container system. This new design incorporated concepts that originated through years of research and development.

In 1999, using the latest technology and the knowledge Relative Workshop gained in building the Vector 3, the Micron was introduced to suit the growing trend of smaller canopy use. The Micron is the most technically advanced harness and container system in the world. Relative Workshop achieved this by hiring a team of engineers from the arena of sport skydiving. These engineers, who happen to be world-class competitive skydivers, reviewed current system designs and applied sound engineering practices to them. The result: improved overall function of the Vector 3 riser



covers, greater pin protection, better overall comfort of the rig and the improvement to the operation of the Booth 3-ring release system.

Consistent innovators and perfectionists, Relative Workshop's engineers continue to make improvements to the production and design of products. This determination to make the most comfortable and safest skydiving systems in the world has resulted in yet another update to the classic Vector 3. In February of 2002, the Vector 3 M-Series was successfully launched. The M-Series utilizes Micron technology to improve function, safety and comfort but is suited to larger canopies.

We continue to introduce innovative construction techniques that make rigs safer, lighter, and more comfortable. Many of these innovations have been adopted by the entire skydiving industry.

At Relative Workshop, we have the facilities and expert staff to assemble, pack, and maintain your entire Vector 3 harness and container system.

Please read this manual thoroughly before assembling or using your Vector 3 even if you have owned or jumped a Vector 3 before. We recently made several important changes to the rig, and you should know about them before using it in the air.

If you have any questions, comments or suggestions after reading this manual, please feel free to contact us at:



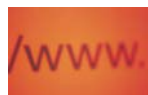
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Relative Workshop is open **Monday** through **Friday**, from **8 am** to **5 pm** EST.



FEATURES OF THE VECTOR 3

The following is a list of features that set the Vector 3 apart from other harness and container systems. Please feel free to contact us if you have any questions or need further elaboration regarding these attributes.

* **Pro-Fit Harness**

This is a state-of-the-art harness system that contours the jumper's body for a glove-like fit, while allowing maximum comfort and freedom of movement. The harness is constructed of Type 7 and Type 8 Mil-Spec webbing.

* **Yoke**

The contoured yoke brings the harness over the shoulders and curves inward over the chest, which provides the most efficient placement of the emergency handles eliminating the need for chest rings and the inherent problems associated with them. This design also prevents the harness from slipping off the shoulders, should you have narrow shoulders.

* **Chest Strap**

Our double Type 8 chest strap is designed to provide the maximum in upper harness protection while complimenting the contoured yoke and protecting the cable housings.

* **Back Pad**

This is the foundation of the Pro-Fit Harness. It allows maximum upper body mobility without compromising total body fit.

* **Housing Guides**

Our guides provide a clean channel for the housings to float upward during high load situations. These guides also make it very difficult to misroute the cutaway cables.

* **Cutaway Cable Housings**

Our flexible housings are the first step in preventing hard pulls during cutaways. The upward float allowance provided by these housings significantly reduces the likelihood of near impossible cutaways. Without upward float, premature loading of the riser loop is almost a certainty. This would lead to the yellow cutaway cable being pulled up and through the housing end by the loop.

* **External Riser Covers**

These tuck-tab riser covers utilize *the most successful* tab/pocket design on the market. Years of extensive research and development (and *thousands* of jumps) with Arizona Airspeed, Patrick De Gayardon, Eric Fradet, and our in-house test jumpers resulted in this superior design. It is the ultimate in riser protection.

* **Secondary Riser Cover**

Even in the highly unlikely event of an external cover opening during freefall, the secondary riser cover makes it virtually impossible for a riser or toggle to escape until the main pin is pulled. The Vector 3 is the only rig on the market to offer this level of riser/toggle security.

* **Main Pin Protection**

The main pin cover flap is integrated into the #1 closing flap and tucks upwards into itself for maximum protection against external forces. Similar "tuck-up" systems are now being implemented in rigs around the world. Both the main and reserve pin covers are designed to



conform better to the container. This ergonomic design helps eliminate protruding corners or edges that can catch on doorjamb, bulkheads or other such objects.

*** Reserve Pin Protection**

The reserve cover flap utilizes three tuck tabs to remain virtually immovable, without interfering with the reserve activation process.

*** Absolute Zero Bridle Exposure**

The Vector 3, configured for BOC or Pull-out deployment, totally eliminates bridle exposure and the need for Velcro-type fasteners on the bridle cord.

*** Pocketed Corners**

Both the main and reserve pack trays utilize pocketed corners at the bottom of the tray. This serves to ensure optimum bag positioning during deployment, helping to protect against bag tumble or spin as it leaves the container. The corner of the main tray also serves as a pocket for the main bridle, virtually eliminating bridle exposure during freefall.

*** Tru-Lok Toggles**

Our new Tru-Lok toggle eliminates the need for hook and loop fasteners. This design utilizes a stainless steel pin to secure each toggle in place on the main riser without inhibiting the jumper from releasing the toggles after deployment.

*** Quality**

Just as is true of all of our containers, the Vector 3 is constructed to exacting standards, using only the finest materials available. Even with nominal care, your Vector 3 will perform faithfully for years. You don't have to look very hard to find Vectors out there with thousands of jumps on them, and lots of life left in them.

*** Guarantee**

Relative Workshop is totally committed to you, our customer, through the quality and performance in the harness and container systems we design, build and deliver. We will back our products 100% from the day it leaves our factory. You will find our after sales service to be as comprehensive as our customers have come to expect from Relative Workshop. When you buy a Vector 3, you are buying with confidence in the company that has built more sport, student and tandem harness/



container systems than any other harness/container manufacturer in the world. We've been here for 30 years and we will continue to be here when you need us.

BEFORE JUMPING YOUR VECTOR 3

Please read this manual thoroughly before assembling or using your Vector 3, even if you've owned or jumped a Relative Workshop Vector before. We have recently made several important changes to the rig, and you should know about them before using your rig.

TRAINING REQUIRED

If you have not jumped a Relative Workshop Vector 3 before, or if you're transitioning from other types of equipment to a Relative Workshop Vector 3, make sure you receive instruction on its use from a certified instructor. This instruction should consist of a practice session in a suspended harness or on the ground where you practice both routine and emergency procedures.

It is the responsibility of the owner to ensure that their Vector 3 is properly assembled, properly maintained, correctly packed and used. It is also the owner's responsibility to seek out and obtain proper training before using any skydiving equipment such as the Relative Workshop Vector 3.

Ensure that the person who inspects and packs both the main and reserve parachutes is qualified to do so.

The owner of a Vector 3 should not loan it to another person without first determining that the person is fully capable of using it properly and safely.

Finally, nothing in this manual is meant to discourage the reader from using the Vector 3 in a reasonable and prudent way.

The information and specifications in this manual were in effect at the time of printing. The Relative Workshop, Inc., however, reserves the right to change the Vector 3 at any time without notice or warning and without incurring any obligation.

ABOUT MODIFICATIONS

It is common for jumpers to "improve" their rigs by altering them. A high percentage of these alterations cause malfunctions or make the rig harder to use correctly.

Typical alterations include conversions to a pull-out pilot chute, changing the dimensions of the harness, changing the length of the bridle cord, installing automatic activation devices (AAD), and so forth.

We strongly urge you to check with the Relative Workshop before you make any changes to your Vector 3. The Relative Workshop has spent years of testing and development to achieve the current design and functionality. Check with us before you allow any changes to be made; even seemingly insignificant alterations to your Vector 3 may have dangerous and unforeseen consequences.

note

This manual is not a course of instruction on how to make a parachute jump, nor does it contain the various regulations that govern sport



SECOND-HAND VECTORS

If you obtained your second-hand Vector 3 privately, make sure it is airworthy before using it. We recommend that you have the rig thoroughly inspected by your local rigger before you purchase it or use it. However, if you prefer, the Relative Workshop will inspect your second-hand Vector for a nominal service fee.

If you obtain replacement parts from a source other than a Relative Workshop dealer, make sure that they match the parts they are replacing. For example: When you replace a reserve ripcord with an incorrectly sized reserve ripcord (i.e. non-matching), you can cause your rig to open prematurely. Consult a rigger whenever you replace any component of your Vector 3.

COMPONENTS

THE VECTOR 3 COMES COMPLETE WITH THESE COMPONENTS:

- * Harness and container
- * Hand-deploy main pilot chute
- * Main deployment bag
- * Main closing loop
- * Vector 3 balloon reserve pilot chute
- * Reserve bridle and free bag
- * Reserve ripcord
- * Reserve closing loop
- * Main risers and steering toggles
- * 3-Ring release handle (cutaway handle)
- * The Vector 3 Owner's Manual (on CD or hardcopy)

Once you are sure you have these components, check that the containers are sized properly for your main and reserve canopies. Refer to the TSO label on the pocket of the reserve packing data card to determine the size of the containers. Refer to the Vector 3 compatibility chart to determine what canopies will fit in your Vector 3. This chart is located in the back of the manual.

REPLACEMENT PARTS FOR THE VECTOR 3

Replacement components for the Vector 3 are readily available from the Relative Workshop. Should you decide to use any components that were not supplied with the Vector 3 harness and container system, make sure that they are made to the correct dimensions, exacting standards, and are made of the same materials. For example, make sure the cutaway cables are the correct length.





NOTES





SECTION 2

RESERVE ASSEMBLY PROCEDURES

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RESERVE ASSEMBLY PROCEDURES

INTRODUCTION

This section provides information needed to assemble the reserve canopy and attach it to the reserve risers. Take note that all Vector 3 rigs come Cypres ready. Included are instructions on attaching a RSL. Remember though that a RSL is not standard.

ATTACH THE RESERVE CANOPY TO THE RESERVE RISERS

Attach the canopy to the risers following the canopy manufacturer's instructions. Double-check the orientation of the canopy and the continuity of the lines. Check that the links are tightened securely and correctly. Follow manufacturer's instructions on installation of Slider Bumpers and Slinks (Soft Links).

n o t e

To minimize the chance of having a malfunction, ensure that the toggles and the risers are compatible.

ATTACH THE RESERVE STEERING TOGGLES

It is important to follow the *reserve canopy owner's manual* directions before attaching the toggles to the steering lines. The reserve owner's manual contains important information relevant to that particular make and model of reserve canopy.

The reserve canopy steering toggles are supplied with the Vector 3. These steering toggles are compatible with the Vector 3 reserve risers.

It is important to attach the steering toggles at the mark that is located along the steering line. The mark was measured and put there by the reserve manufacturer. Proper alignment of the mark and the steering toggle will ensure the canopy remains in a true no-brake mode while the toggles are resting against the guide ring. This will, in turn, ensure that the canopy maintains the correct glide during flight or landing. If the toggles are mounted too far down the steering lines, the canopy may be less responsive and the jumper may not be able to apply full brakes. If the toggles are mounted too high up the canopy, the glide and landing characteristics of the canopy may be affected or it may even result in a canopy stall (which could result in injury or death).

The situations mentioned above are more likely to occur when a canopy is hastily switched from one set of risers to another. If the guide rings on both sets of risers are not located the same distance from the connector links, the steering toggles must be moved to another location on the steering line.

n o t e

The guide-ring location on the reserve riser: The standard distance from the end of the reserve riser to the top of the guide ring is 4 inches and allowing $\pm 1/4$ inch tolerance (9.7cm). Almost all rig manufacturers use this distance during harness and





Toggles mounted too far down the steering lines will cause the canopy to be less responsive and the jumper may not be able to apply full brakes. Toggles mounted too high up the steering line can affect the glide and landing of the canopy, or stall the canopy which could result in injury or death.

PROCEDURE

There are 2 methods for attaching steering toggles to steering lines. Method A is for reserve canopies with Dacron (polyester) lines and Method B is for reserve canopies with small-diameter Spectra (Microline).

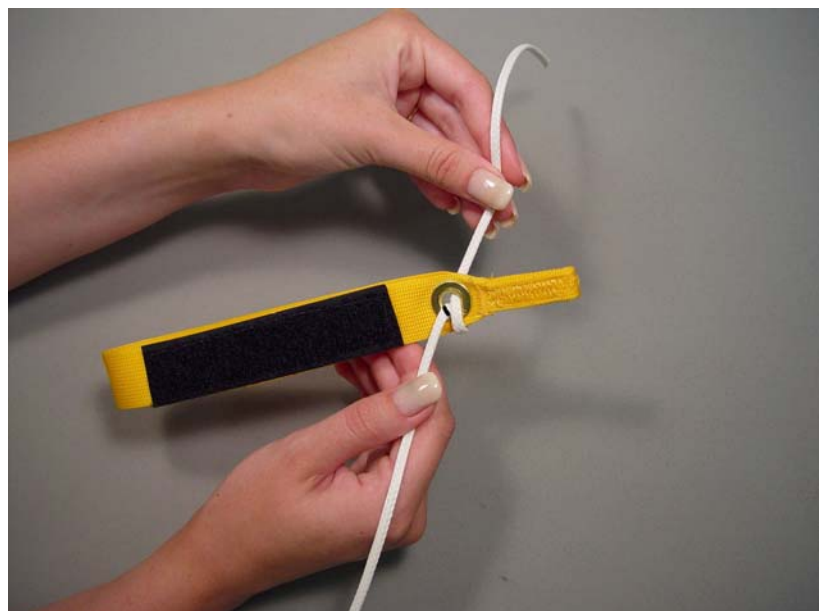
METHOD A—DACRON STEERING LINES

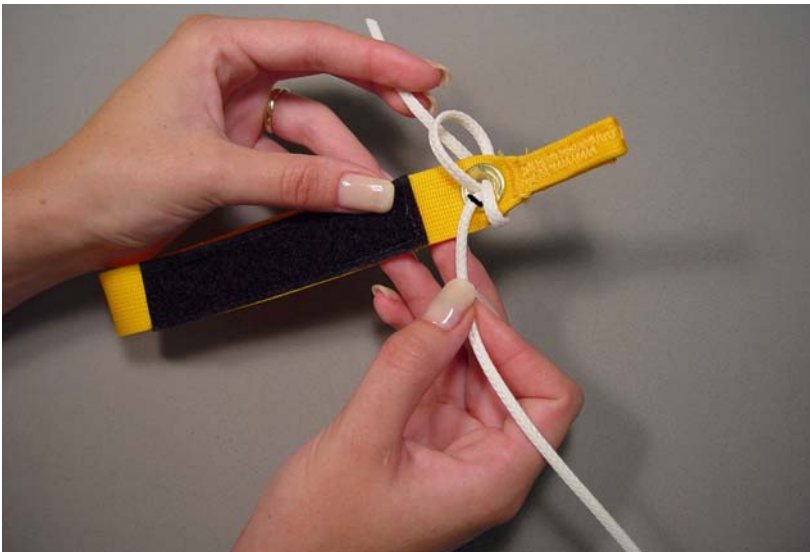
Once the canopy has been correctly attached to the risers and while it is still laid on its side, begin to attach the reserve steering toggles using the following steps:

1. Ensure the steering lines are correctly routed (i.e. they should not wrap around any suspension lines). This is accomplished by starting at the tail of the canopy. Trace the upper steering lines down to the lower steering line. Check that the right hand steering line passes through the right hand rear slider grommet and the left hand steering line passes through the left hand rear slider grommet.
2. Locate the mark on the steering line that indicates the correct toggle location. Verify correct location of this mark by referring to the reserve canopy owner's manual.
3. Thread the steering line through the guide ring that is located on the riser.

4. Starting from the hook and loop fastener (loop side), thread the end of the steering line through the Vector 3 steering toggle grommet. Adjust the steering line so that the mark (on the steering line) is close to the grommet but has not passed through it.

5. Loop the running end of the steering line around the toggle and thread it through the grommet again. Now pull it snug. Check that the mark remains in the correct place.

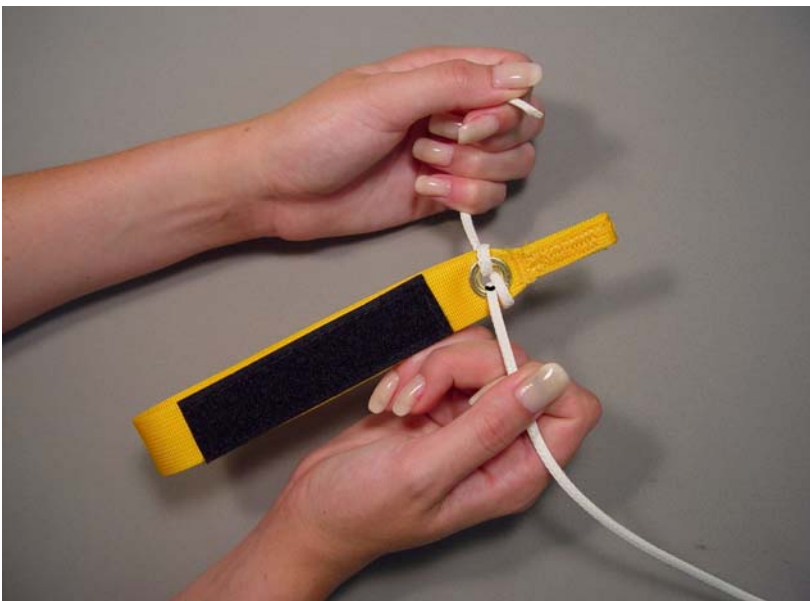




6. Continue by looping the running end of the steering line around the other side of the toggle and, once again, pass it through the grommet.

note

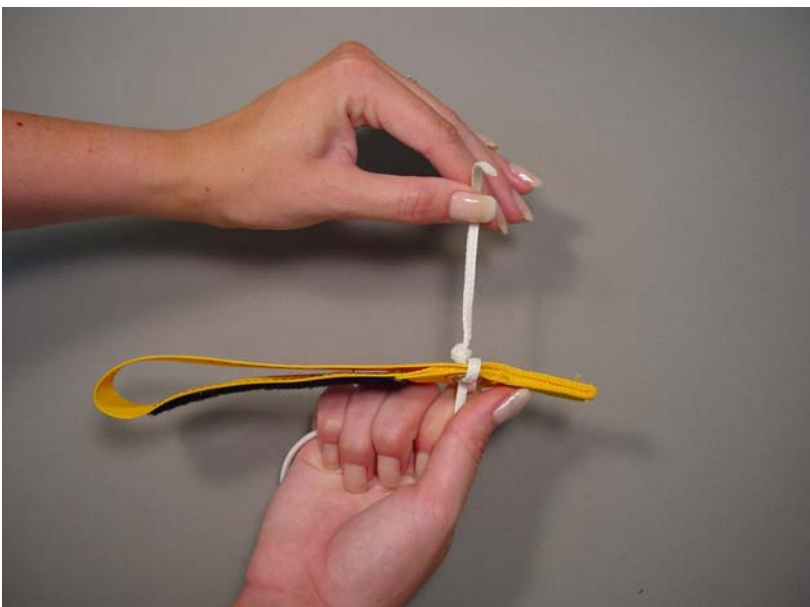
The hook and loop fastener side of the toggle faces the canopy.



7. Now grasp the steering line on both sides of the toggle and pull it tight, ensuring the hook and loop fastener side of the toggle faces the canopy. The steering line does a figure 8 through the grommet and exits on the other side of the toggle. Once again, check the mark on the steering line, ensuring it is still in the correct place.



If the knot is not snug, the toggle may slip off the line.



8. Tie an overhand knot in the free end of the steering line and tighten it right down to the toggle. Ensure it is snug for now.

9. Check the canopy with the deployment brakes set and with both not set to be sure that it is correctly configured. The reserve canopy owner's manual contains the correct brake settings and steering line lengths. Keep in mind that there are NO standardized dimensions. Therefore, unless the lines are the correct length, the canopy may not open or fly correctly.



10. Verify that the brake setting measurements are correct. Tighten the overhand knot at the toggle once more. It is generally not a good idea to cut off the excess steering line, as you may want to adjust the steering toggles after the canopy has been jumped.

11. Repeat the procedure for the other toggle.

12. Inspect the installation. Ensure proper routing of the steering lines.

METHOD B—SPECTRA STEERING LINES

1. Ensure the steering lines are correctly routed (i.e. they should not wrap around any suspension lines). This is accomplished by starting at the tail of the canopy. Trace the upper steering lines down to the lower steering line. Check that the right hand steering line passes through the right hand rear slider grommet and the left hand steering line passes through the left hand rear slider grommet.

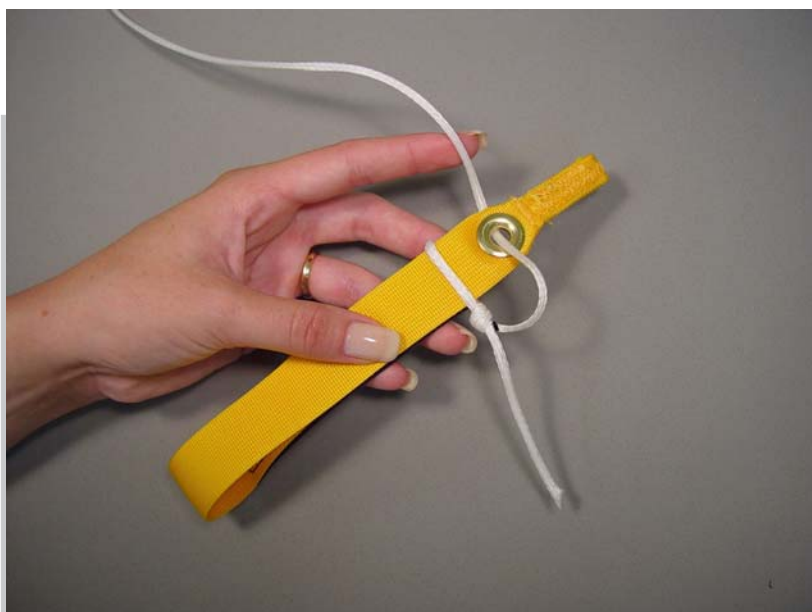
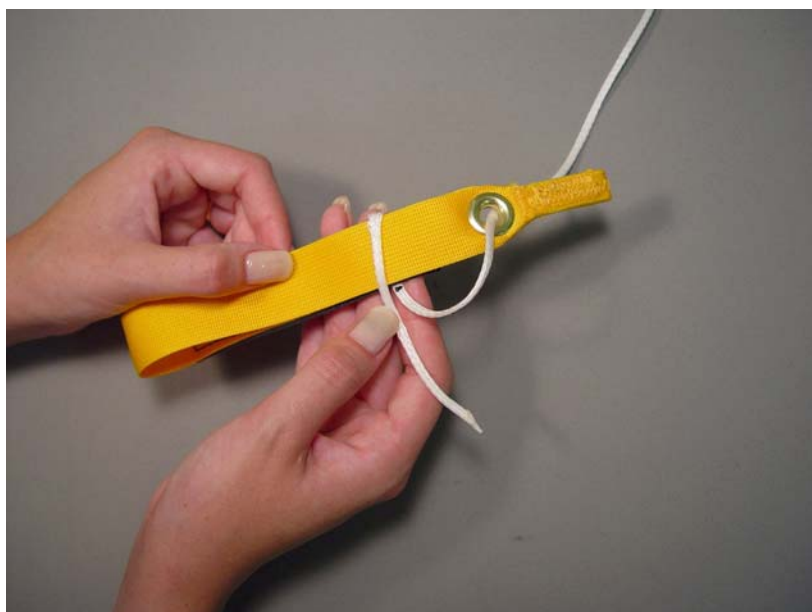
2. Locate the mark on the steering line that indicates the correct toggle location. Verify correct location of this mark by referring to the reserve canopy owner's manual.

3. Thread the steering line through the guide ring that is located on the riser.

4. Starting from the hook and loop fastener (loop side), thread the end of the steering line through the Vector 3 steering toggle grommet. Wrap the steering line around the outside of the toggle and then over the grommet. The mark on the steering line that indicates the correct toggle position should be 1 ¼ inches (3cm) from the side of the toggle.

5. Slide the line off the looped end of the toggle and tie a loose overhand knot in the folded line.

6. Now slide the line back over the toggle. Adjust the knot until the mark is just outside of the knot away from the toggle. The loop should fit closely around the toggle. Tighten the knot.



note

The mark on the steering line that indicates the correct toggle position should be 1 ¼ inches (3cm) from the side of the toggle.



7. Pull on the steering line to draw the knot back up to the grommet. Daisy chain, finger trap or tack the excess end of the steering line to the toggle. Don't cut the extra line off; you may wish to adjust the toggle position later.
8. Repeat the procedure for the other toggle.
9. Inspect the installation. Ensure proper routing of the steering lines.

INSTALLING AUTOMATIC ACTIVATION DEVICES (AAD)

All Vector 3 rigs are manufactured Cypress ready. Consult the Cypress owners manual for instructions on installing the Cypress into your Vector 3 harness and container system. A manual is provided with each Cypress device. The Cypress installation was devised and tested by Airtec (makers of Cypress). It has subsequently been retested and approved by Relative Workshop.



Cypress AAD prior to installation.

Because AAD's are reliable only if they are properly installed and maintained, anyone who purchases a Vector 3 with an AAD must have the unit tested by the manufacturer or an accredited testing facility at specified time intervals as outlined by the AAD manufacturer.

note

Route the control cable under the white polyester tape in the same way indicated in this picture.



Cypress AAD after installation.

An AAD is a backup emergency device that, like many complex mechanical or electronic devices, is subject to failure or malfunction. It is not a substitute for proper

note

Nothing in this manual is meant to contradict any instructions or advice from the manufacturers of AADs.





SECTION 3

RESERVE PACKING INSTRUCTIONS

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* Parts List	22
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* Commonly Used Tools	23
* Setting the Brakes	23
* Flaking and Folding	24
* Placing the Canopy in the Bag	25
* Placing the Bag into the Container	26
* Closing the Reserve Container	27
* Installing RSL	32



RESERVE PACKING INSTRUCTIONS

INTRODUCTION

After the reserve parachute has been attached per Section 2 "Reserve Assembly Procedures", you may proceed with packing the reserve. This section provides instruction for packing the reserve parachute into the Vector 3 harness and container. Make sure to read through this section entirely before you begin packing the reserve canopy. Because there are so many different ram-air reserve canopies on the market today, this manual does not contain specific instructions on canopy inspection, assembly or flaking. For these steps, the rigger must follow the instructions provided by the canopy manufacturer.

Regarding reserve canopy packing, follow the regulations and guidelines set forth by the sport parachuting governing body of the country in which you will be skydiving. For example, in the United States, a Federal Aviation Administration, or FAA Senior or Master rigger certificate is required to pack any reserve parachute that will be carried for use in the US.

n o t e

Refer to appendix for reserve packing tips. To order a reserve packing video, contact Relative Workshop.

PARTS LIST

- * Vector 3 harness and container system (including the Vector 3 reserve risers and reserve steering toggles)
- * Ram-Air reserve canopy
- * Vector 3 free bag
- * Vector 3 spring-loaded pilot chute with bridle
- * Two bridle lengths are acceptable (depending on canopy size): Small: 15.5 ft \pm 0.25 ft. (4.7m \pm 0.1m) OR Medium: 18.5 ft \pm 0.25 ft (5.6m \pm 0.1m).
- * Safety stow loop for free bag: Small: 6 inches \pm 0.25 inches (15.2 cm \pm 0.6 cm) for rigs up to a V350 OR Medium: 7.5 inches \pm 0.25 inches (19.1cm \pm 0.6cm) for anything above V350.
- * Closing loop for reserve container
- * Reserve ripcord: 28 inches (71.1 cm) in length for all Vector sizes EXCEPT those with shoulder extensions, which require 30 inches (76.2cm) in length. Check with the manufacturer of your container for the correct length.

INSPECTION

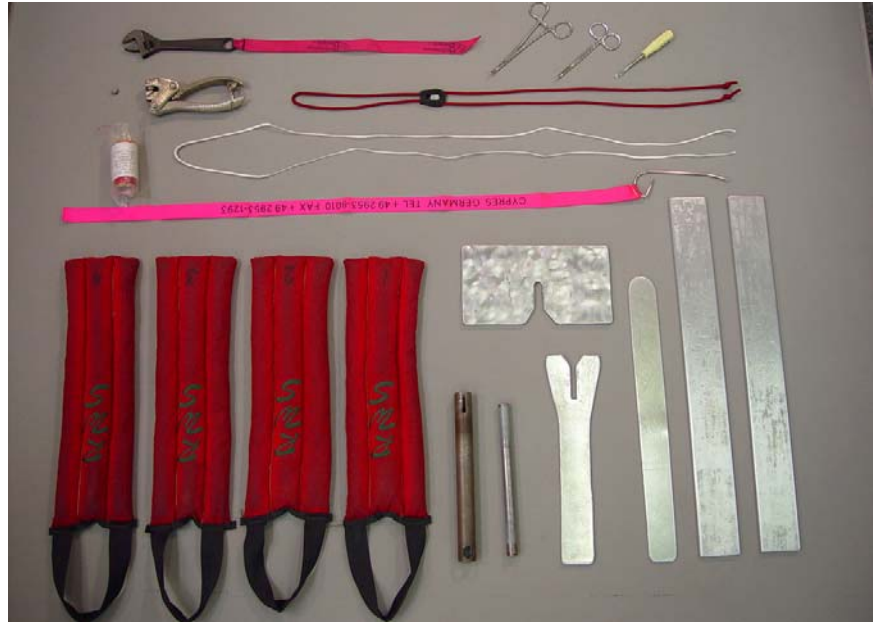
Thoroughly inspect every part of the canopy and harness and container system including, but not limited to:

- * the ripcord
- * pilot chute and bridle
- * deployment bag
- * canopy
- * lines
- * links
- * risers
- * harness and container
- * closing loop



COMMONLY USED TOOLS

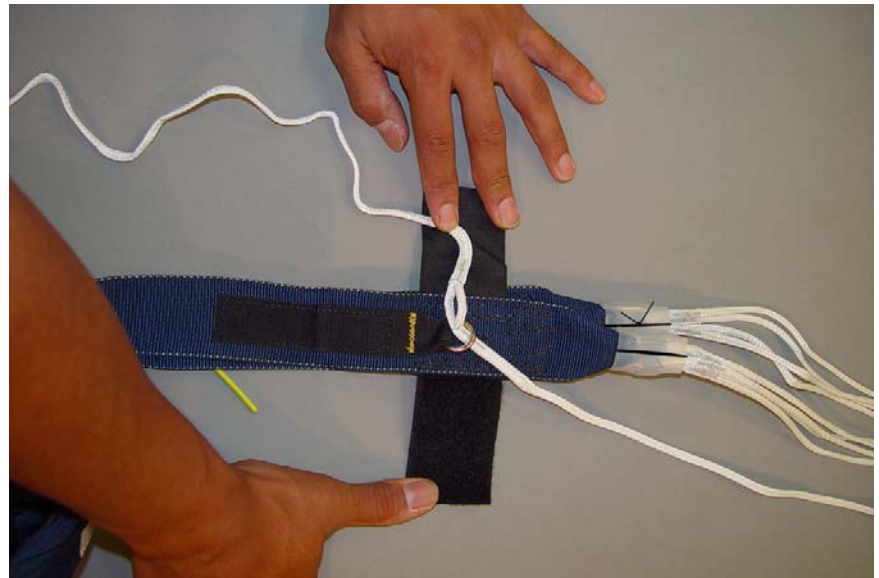
- * Temporary pins with flag
- * Pull-up cords
- * Packing paddles
- * 2 (6 inches x 1 inches) pile (15.2 cm x 2.5 cm) hook and loop fastener strips with flags (not shown)
- * Cranking tool
- * Weight bags
- * Seal press
- * Hemostats
- * Thread
- * Adjustable wrench



SETTING THE BRAKES

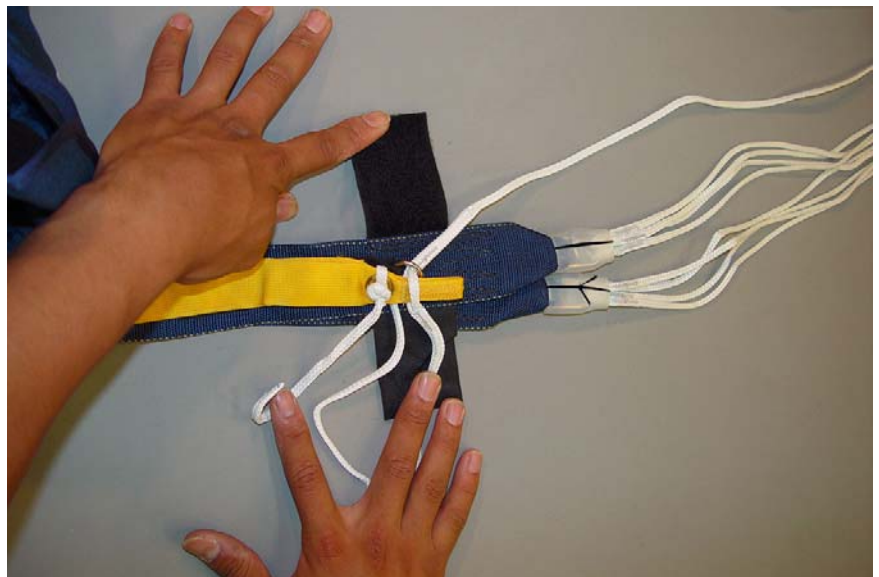
1. Open the hook and loop fastener cover on the riser. Use the toggle to pull the right-hand steering line down until the brake loop just passes through the guide ring.

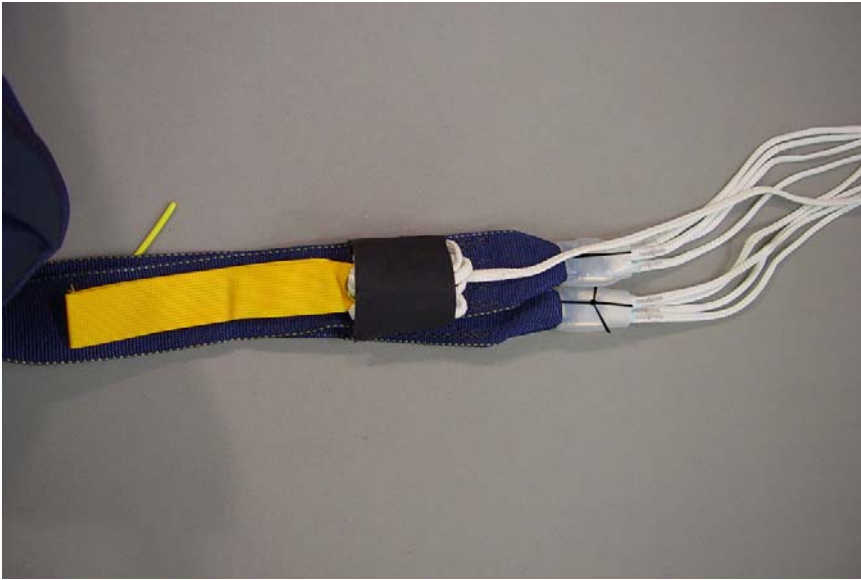
2. Insert the tapered end of the toggle all the way into the loop. Pull on the steering line above the guide ring to seat the toggle against the ring.



3. Mate the hook and loop fastener on the toggle with that on the riser. Check to be sure the tapered end of the toggle is completely seated in the loop (it shouldn't be inserted past the end of the taper, or it may be difficult to extract in the air).

4. Fold the excess line between the toggle and the loop into 3 inches (7.6 cm) folds and lay it neatly next to the toggle.





5. Carefully close the hook and loop fastener cover to encase the stowed toggle and folded line. Be sure none of the steering line is caught between the layers of hook and loop fastener.

6. Repeat the process for the other toggle.



FLAKING AND FOLDING

Follow the canopy manufacturer's instructions for the following:

- * A. Flaking the canopy.
- * B. Folding the nose and canopy.
- * C. Splitting the tail.
- * D. Stowing the slider.
- * E. Dressing the canopy.

n o t e

Refer to the packing tips in the Appendix section.



PLACING THE CANOPY IN THE BAG.

1. Carefully slide the bag over the canopy, pushing each "ear" into the top corners of the bag, filling the corners evenly and leaving a tapered shape.

2. Lock the bag closed with two bights of suspension line. A shock cord "safety stow" is used, not rubber bands.



If a Molar strap is used, make sure that it is removed before placing the canopy in the bag!



3. Stow the remainder of the suspension lines into the pouch on the underside of the bag using S-folds that extend from one side of the pouch to the other. Be sure none of the lines are trapped between the hook and loop fastener at the mouth of the pouch. Another acceptable method of stowing the lines which some riggers prefer: Stow all the lines on top of the pouch first, either S-folding or Figure-8 folding, and insert the entire line group into the pouch. Remove the two hook and loop fastener strips from the bag.





PLACING THE BAG IN THE CONTAINER

1. Place the bagged canopy on the main container and position the reserve risers in the reserve pack tray. Fan the links rather than stacking them on each other, placing the rear links to the outside. Be sure to place the reserve risers far enough in the pack tray so they will lie flat over the shoulders.

2. Pass the other pull-up cord through the reserve closing loop.

If a T-bar was passed through the bag, thread the ends of the pull-up cord through the hole in the end of the T-bar. Remove the T-bar from the bagged canopy, pulling the closing loop and pull-up cord through it.



3. Place the bagged canopy in the pack tray, taking extra care to fill the lower corners. Then use the pull-up cord to pull the closing loop up through the bagged canopy. Secure it with a temporary locking pin.



CLOSING THE RESERVE CONTAINER

The reserve flaps are numbered 1-6 for reference. Close them in proper sequence.



1. Close the inside bottom kicker flap (Flap #1) and secure it with the temporary pin.



2. Pack the first third of the bridle in the container by making long S-folds in the bridle from the top of the bag to the bottom right-hand corner of the reserve container as shown. Carefully tuck the bottom of the S-folded section under the inside bottom kicker flap (Flap #1).



3. Repeat this process on the left side with the second third of the bridle, making the S-folds from the top of the bag to the lower left-hand corner of the container and tucking the bottom sections under the inside bottom kicker flap (Flap #1).





4. Close the inside top kicker flap (Flap #2) and secure it with the temporary pin. The bridle should come out between Flap #1 and Flap #2. Check the amount of free bridle extending from the closed flaps to the base of the pilot chute; there must be at least 5 feet (1.5m). If there is less than 5 feet (1.5m), reopen the flaps and restow the S-folded bridle to make the length of free bridle at least 5 feet (1.5m), maximum 6 feet (1.8m) long.



5. S-fold the length of free bridle on top of #1 and #2 kicker flaps from right to left up to the base of the pilot chute.



6. Thread the pull-up cord up through the pilot chute from bottom to top.

7. Make sure the pilot chute is centered over the loop, then compress it straight down and lock it with the temporary pin.



8. Pull all the pilot chute fabric out, away from the spring. After pulling the fabric away from the spring, check to make sure the pilot chute base is centered under the crown.



Fully compress the spring to see how much loop can be pulled through the top of the pilot chute. If you can pull more than $\frac{1}{2}$ to $\frac{3}{4}$ inches (1.3 cm – 1.9 cm) through, the loop is too long. Now would be the best time to open the container and shorten the loop.

9. Lay the fabric flat all around the pilot chute and fold it under in wide folds to the center. Fold the top and bottom first, then the sides. Do not allow the folds of fabric from the pilot chute to get under the open flaps. Folding the fabric, rather than stuffing it between the coils, increases pilot chute launch performance and reduces the bulk of the packed container.



10. Thread the pull-up cord through the reserve bottom flap (Flap #3). Close and secure with the temporary pin.





11. Thread the pull-up cord through the right side flap (Flap #4), then the left side flap (Flap #5) in that order. Close and secure with the temporary pin each time. Ensure the pilot chute folds stay flat and neat.

n o t e

If the force necessary to close the last two flaps seems excessive, the loop may be too short. Use a scale to determine how much force is needed to extract the pin; 8lb (3.6 kg) to 12lb (5.4kg) is correct. A short loop can also bend the reserve loop anchor



If a cranking tool is used, care should be taken that the 22lb (9.9 kg) pull force is not exceeded. This is stipulated by the FAA FAR's in the



12. Thread the pull-up cord through the top center flap (Flap #6).

13. Replace the temporary pin with the reserve pin.



14. Remove the pull up cord.

15. Insert the ripcord handle into its pouch on the main lift web.

note

Walking on the reserve with stocking feet or clean shoes to help expel air from the container will make the rig look flatter and more aesthetically pleasing.



16. Dress the container, seal, sign and log the reserve. Close the reserve pin protector flap.

17. Count your tools.



Walking on the reserve without closing the reserve pin protector flap can dislodge the pin.



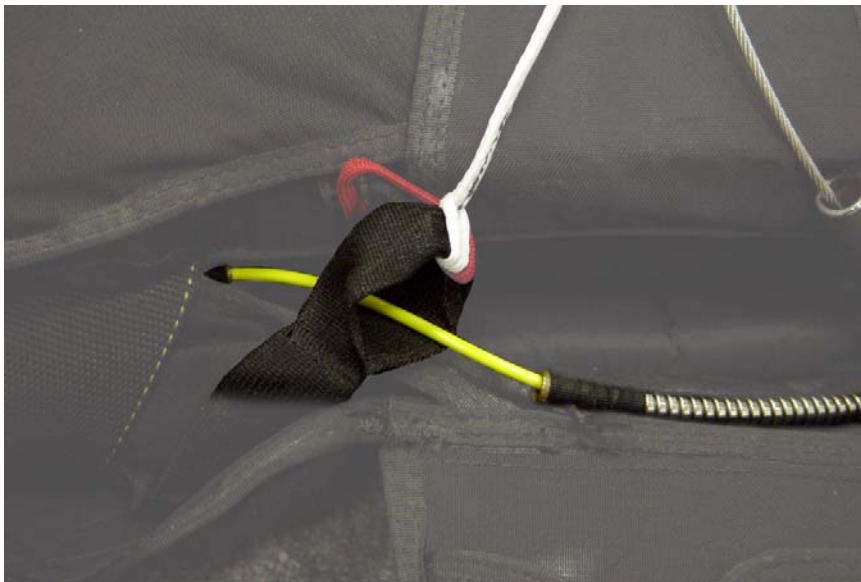
Skyhook RSL - Supplemental Packing Instructions



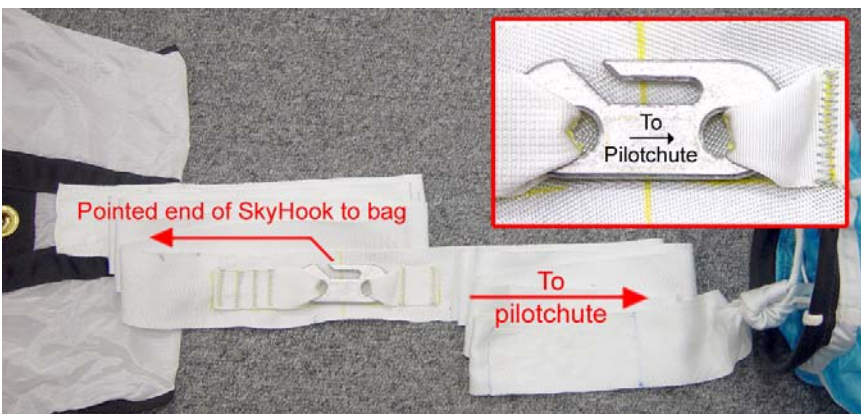
WARNING - Before Packing:



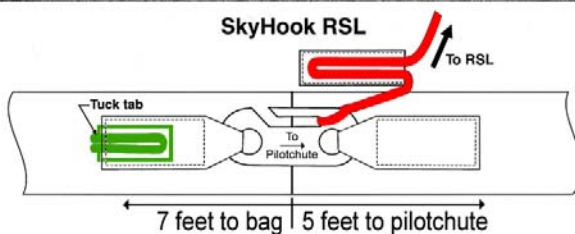
Note: There is no RSL guide Ring on flap #6 on Skyhook equipped rigs. Make sure the RSL guide ring has been removed on converted rigs. It was never really necessary, and someone might pass the Skyhook lanyard through it some day, causing a reserve total.



Make sure the left hand (exposed) yellow breakaway cable passes through the Collins' Lanyard loop at the end of the RSL. The Skyhook should not be used without a Collins' lanyard.



Make sure that the Skyhook is sewn to the reserve freebag bridle correctly, with the pointed end of the hook facing toward the bag. If the Skyhook were sewn on the bridle facing the wrong way, a reserve pilot chute in tow would result if the reserve were pulled in response to a main total. (This pilot chute in tow could be cleared by pulling the yellow tab to release the RSL.) Remember, this malfunction can only occur if the Skyhook is SEWN to the bridle upside-down. It cannot be caused by a packing error.





PACKING

1. Place the bagged reserve canopy in the container as usual.

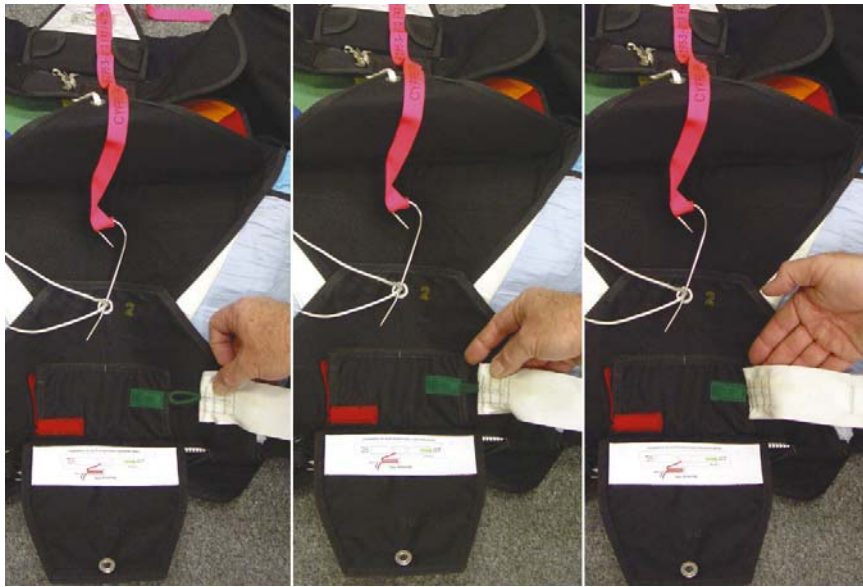


2. S-fold the 8-foot section of freebag bridle (up to the Green flex-tab) under pilot chute kicker flap #1, in the normal manner. Close flap #2, and secure with the reserve closing loop and temporary pin. Make sure the remaining bridle exits the closed kicker flaps to the wearer's LEFT (Right in photos) of the #2 (upper) flap, with the flex-tab side up.



3. Attach the RED Skyhook lanyard to flap #2 by folding the stiffened section of the lanyard in half, and inserting it in the RED pocket on the flap. You may have to open the pocket a little with a pencil before inserting the flex-tab.





4. Fold the bridle over the edge of flap #2, and insert the GREEN flex-tab on the freebag bridle into the GREEN pocket on the #2 flap.



5. Lift the Lexan cover slightly, rotate the Skyhook enough to slip the loop on the end of the red Skyhook lanyard over the Skyhook, and rotate back into position. The Skyhook should be held firmly in place between the two pockets with less than ¼" of play. (Note: It should take a force of 5-7 lbs. to pull the red or green flex-tab out of its pouch, at a 180 degree angle to the mouth of the pouch.)



Hand tack the Red Skyhook Lanyard to the white free bag bridle with a single piece of red rigger seal thread and lock with a surgeon's knot

n o t e

(NOTE) The Skyhook has a Lexan cover piece designed to:

1. Hinder anything but the Skyhook Lanyard from entering the Hook-slot.
 2. Lower the chance that the hook area might be damaged by use or misuse
- Make sure this cover is in good condition. Make sure the hook area is smooth and free of burrs.



6. Close the Skyhook cover flap (2a) over the Skyhook assemblage, pass the reserve closing loop through its grommet, and secure with the temporary pin.



(WARNING) Make sure that the Skyhook lanyard goes directly from the RSL lanyard to the Skyhook hardware, without going under or through anything. (Except flap #2A)



7. S-fold the remaining 5' of freebag bridle on top of flap 1, compress the pilot chute over the folded bridle, and continue packing according to existing Vector 3 Owner's manual starting at page 28, #6.



Completed packjob.



INSTALLING A RESERVE LANYARD (RESERVE STATIC LINE OR RSL)

1. Inspect the RSL: Check the stainless steel snap shackle is operating smoothly and that the spring will retain the locking pin. Check that the hook and loop fastener is clean and sufficiently tacky to hold the reserve lanyard in place. The pin should be curved from the eye to half way down its length. The rest of the pin should be straight.



2. Start by routing the RSL along its hook and loop fastener path along side the right-hand riser. Insert the pin-end of the RSL through the guide ring on the #6 top reserve flap. Mate the patch of yellow pile hook and loop fastener on the top reserve flap.

n o t e

RSLs should only be installed by a qualified rigger.

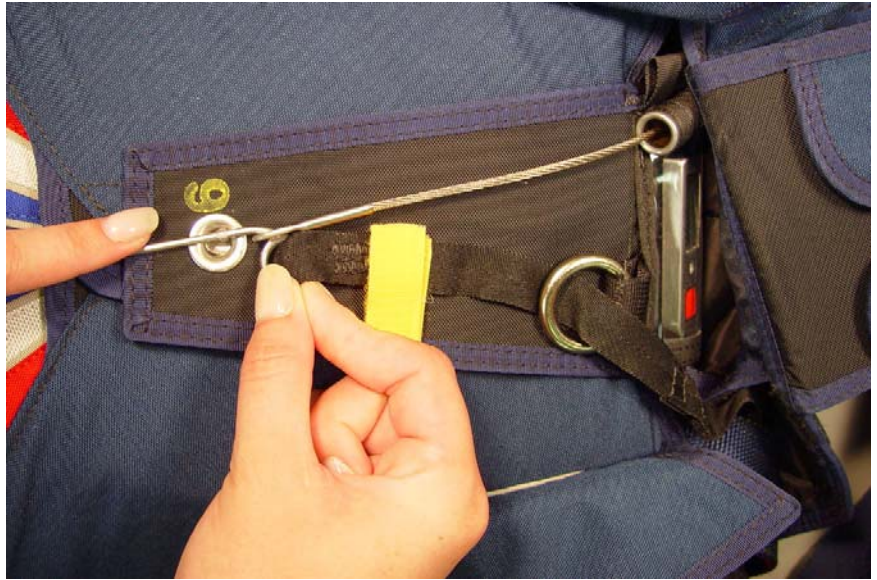


3. After threading the reserve ripcord through the housing and placing the ripcord handle into its pocket, insert the RSL pin through the loop at the end of the reserve ripcord cable.

4. Place the rig on a clean surface facing up and walk on it with stocking feet or clean shoes to help expel air from the container and to make it flatter.



5. Replace the temporary pin with the reserve pin.



6. Insert the stiffened part of the RSL (located close to the snap shackle) into the holding pocket located under the reserve risers.

7. Attach the main parachute risers to the harness.



8. Hook the reserve lanyard shackle to the ring on the right-hand riser.

9. Dress the container, seal, sign and log the reserve.

10. Count your tools.





NOTES





SECTION 4

ASSEMBLING AND PACKING THE MAIN PARACHUTE

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MAIN CANOPY ASSEMBLY AND PACKING PROCEDURES

INTRODUCTION

The Vector 3 is compatible with almost every ram-air canopy in use today. The Vector 3 is available with a variety of main container sizes. Consult with the Relative Workshop or your dealer to ensure compatibility between the pack volume of your main canopy and your Vector 3. Failure to follow manufacturers recommendations regarding proper canopy sizing (i.e., using oversized or undersized canopy volumes) may create a situation such as a pilot-chute-in-tow or a premature opening of the main container.

This manual does NOT provide specific packing instructions for the various main canopies on the market. It is the responsibility of the owner to obtain canopy packing information from the canopy owner's manual. This manual will, however, walk you through the steps necessary to pack your canopy from the point it is inside the main deployment bag until the container is closed and pilot chute is packed.

ATTACHING THE MAIN CANOPY TO THE MAIN RISERS

Carefully inspect the main canopy for wear or manufacturing defects.



Attach the main canopy to the main risers (included with the Vector 3) following the canopy manufacturer's instructions. Double-check the orientation of the canopy and the continuity of the lines. Check that the links are tightened securely and correctly. Leaving the risers attached to the harness while attaching the canopy will help minimize confusion.

USING SOFT LINKS

Follow manufacturers instructions on installation of the soft links.



n o t e

The slider bumpers must be properly installed to ensure they do not interfere with the slider functioning properly and the canopy's deployment. Follow the canopy manufacturer's instructions for the correct installation procedures.

USING RAPIDE LINKS

If the canopy uses Rapide links, make sure the barrel nuts completely cover the threads. After hand tightening, turn the barrel $\frac{1}{4}$ turn with the proper sized wrench.

ATTACHING THE MAIN STEERING TOGGLES

It is important to note that Spectra lines (sometimes referred to as "Microlines") and Vectran lines require a different method of toggle attachment than that of Dacron lines. Incorrect toggle attachment to a canopy that has Spectra lines will result in the lines slipping out of the knot and toggle detachment. This situation may require a cut-away and reserve deployment, if not something more serious. If there is any question about the type of line the main canopy utilizes, refer to the canopy owner's manual, consult a rigger, or contact your canopy manufacturer directly.

The Vector 3 is supplied with steering toggles for the main canopy that are compatible with the Vector 3 risers. It is important that the toggles and risers be compatible to decrease the risk of associated malfunctions.

The toggle attachment point should be located along the steering lines so that at full flight, the toggles are resting against the guide ring. This is important in obtaining proper canopy flight. If the toggles are mounted too high on the steering lines, the canopy will fly "in brakes" and will not glide or land correctly. Likewise, if the toggles are mounted too low on the steering lines, the canopy will become less responsive and the canopy pilot may not be able to apply full brakes or stall the canopy. This could result in flaring difficulty while landing.

These situations are likely to occur when a main canopy is hastily switched from one set of risers to another. If the guide rings on both sets of risers are not located the same distance from the connector links, the steering toggles must be moved to another location on the steering line.

It is also important to securely attach the toggles to the steering lines. Although using the rear risers may adequately control some canopies, a "lost" toggle can be hazardous in some circumstances, and may require a cut-away and reserve deployment.

PROCEDURE

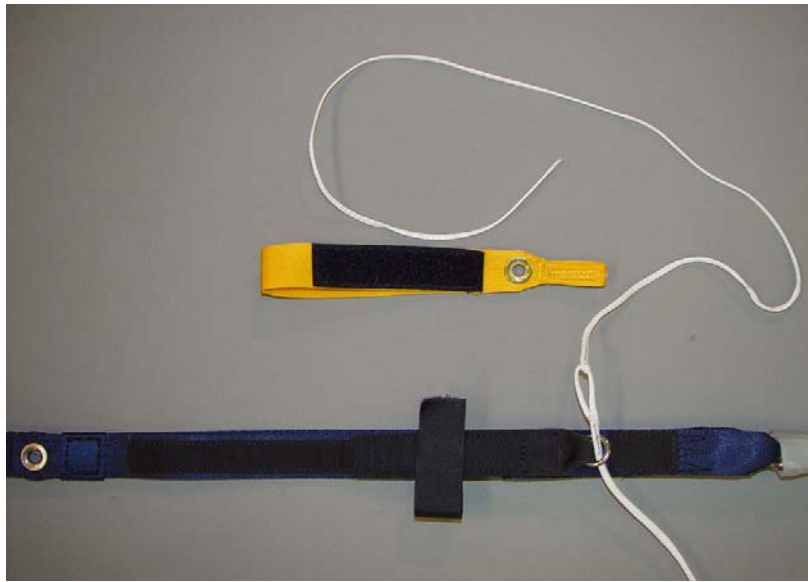
There are two methods for attaching steering toggles to steering lines. Method A is for main canopies with Dacron (polyester) lines and Method B is for main canopies with small-diameter Spectra (Microline) and Vectran lines.

METHOD A—DACRON LINES

After the main canopy has been properly attached to the risers and while it is still on its side, attach the toggles by performing the following steps:

1. Ensure the steering lines are correctly routed (i.e. they should not wrap around any suspension lines). This is accomplished by starting at the tail of the canopy. Trace the upper steering lines down to the lower steering line. Check that the right hand steering line passes through the right hand rear slider grommet and the left hand steering line passes through the left hand rear slider grommet.



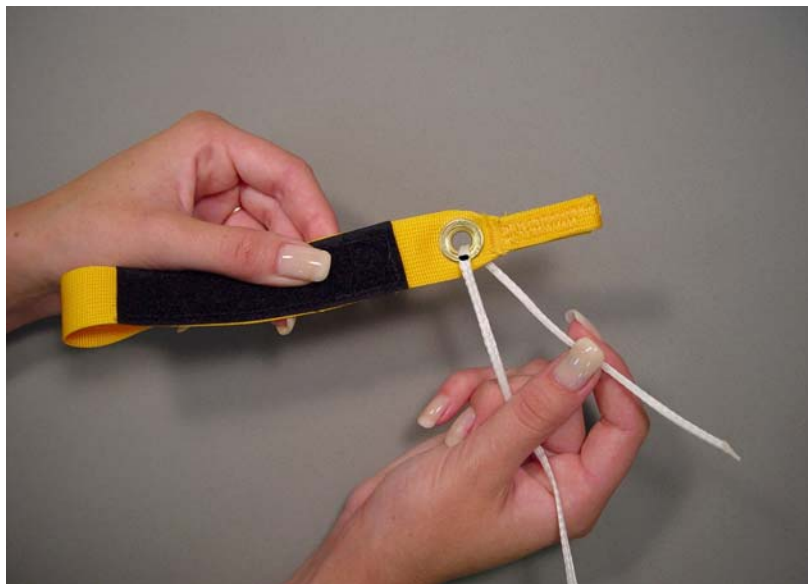


2. Locate the mark on the steering line that indicates the correct toggle location.

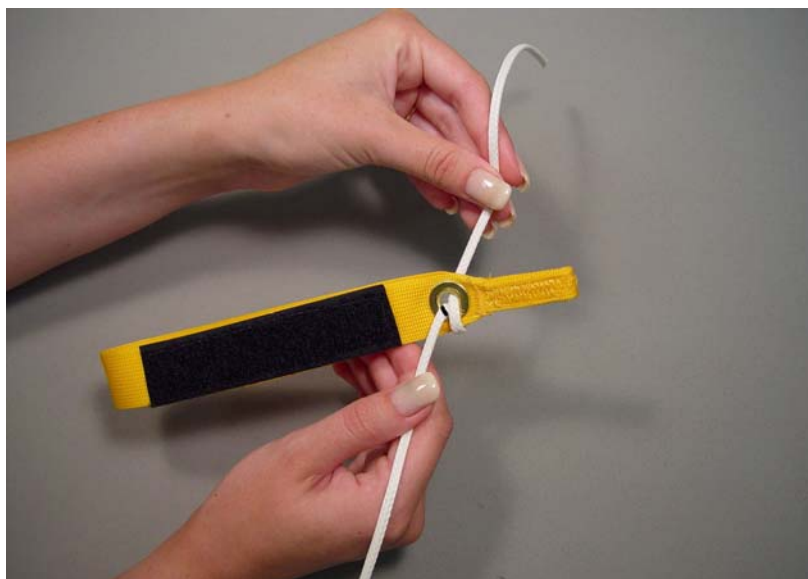
3. Thread the steering toggle through the guide ring located on the riser.

n o t e

Verify that this mark is in the correct location by referring to the main canopy owner's manual.



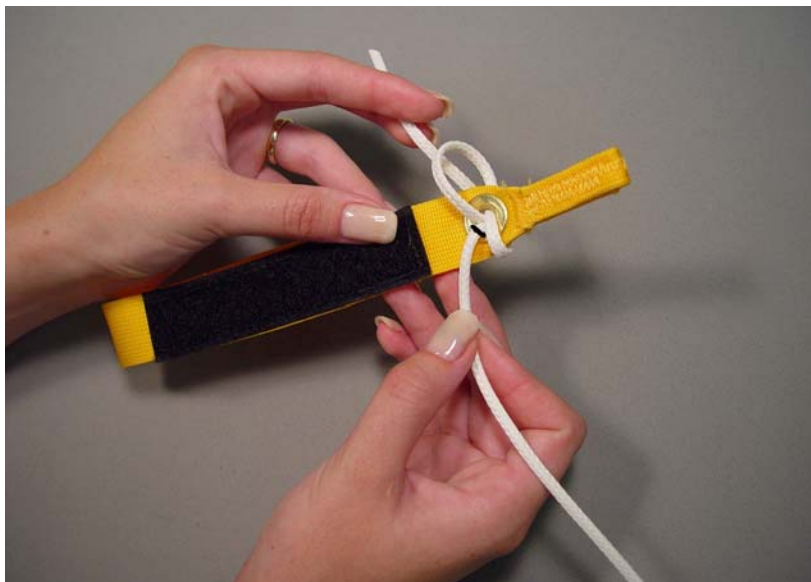
4. Thread the end of the steering line through the Vector 3 steering toggle grommet. Adjust it so the mark on the steering line is close to the grommet but has not passed through it.



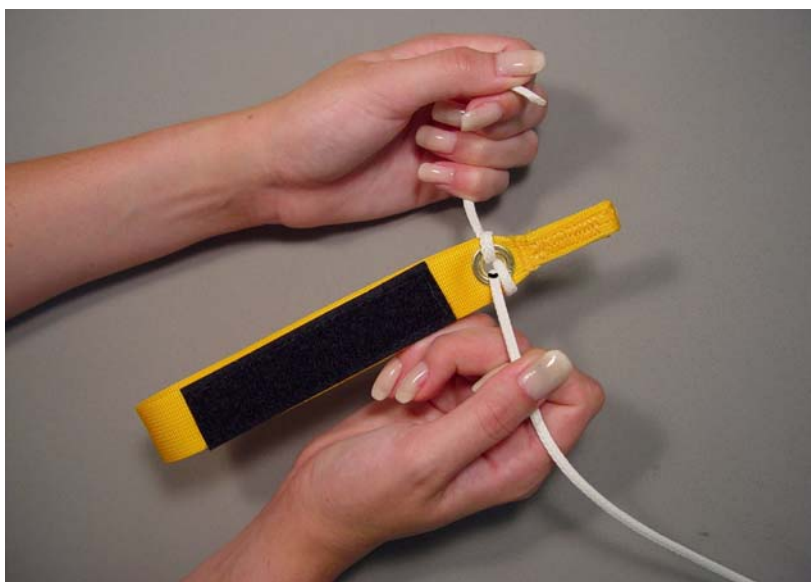
5. Loop the running end of the steering line around the toggle and thread it through the grommet again. Now pull it snug. Check that the mark remains in the correct place.



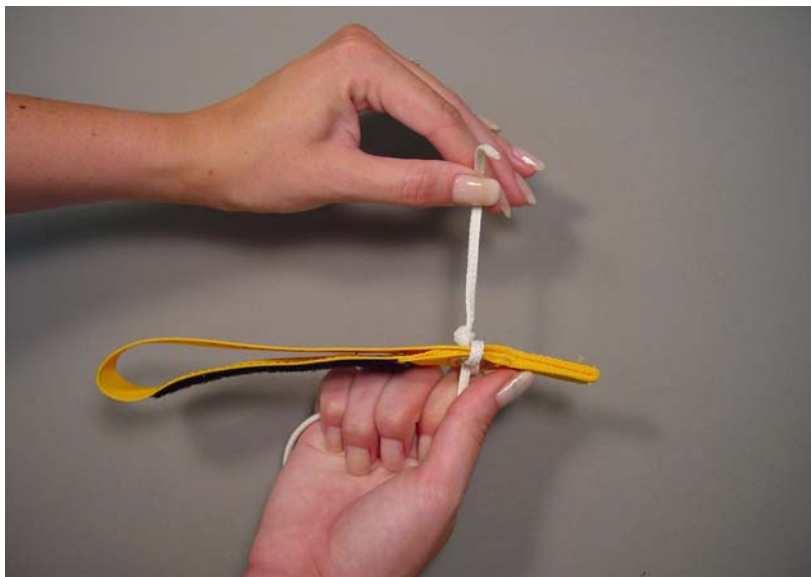
6. Loop the running end around the other side of the toggle and pass it through the grommet once again.



7. Grasp the line on both sides of the toggle and pull it tight. The steering line does a figure 8 through the grommet and exits on the other side of the toggle. Again, check the mark on the steering line, ensuring it is still in the correct place.



8. Tie an overhand knot in the free end of the steering line and tighten it right down to the toggle. Ensure it is snug for now. Beware: If the knot is not snug, the toggle may slip off the line!



9. Check the canopy with the deployment brakes set and with the brakes not set to be sure that it is correctly configured. The main canopy owner's manual contains the correct brake settings and steering line lengths. Keep in mind that there are NO standardized dimensions. Therefore, unless the lines are the correct length, the canopy may not open or fly correctly.

10. Once the measurements have been verified, tighten the overhand knot at the toggle. Daisy chain, finger trap or tack the excess end of the steering line to the toggle. Don't cut the extra line off; you may wish to adjust the toggle position later.

11. Repeat procedure for the other toggle.

12. Inspect the installation. Ensure proper routing of the steering lines.

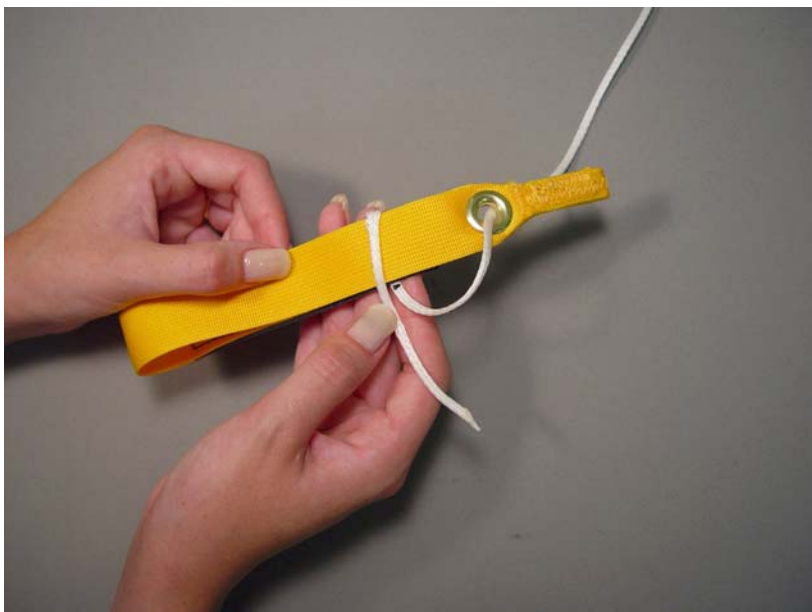
METHOD B—SPECTRA (MICROLINES) LINES

After the main canopy has been properly attached to the risers and while it is still lying on its side, attach the toggles to it by following these steps:

1. Starting at the tail of the canopy, trace the upper steering lines down to the lower steering line. The idea is to be sure the steering lines are routed correctly; they should not wrap around any suspension lines. The right-hand steering line must pass through the right-hand rear slider grommet, and the left-hand line must pass through the left-hand rear slider grommet.

2. Locate the mark on the steering line that indicates the correct toggle location. Verify that this mark is in the correct location by referring to the main canopy owner's manual.

3. Thread the end of the steering line through the guide ring located on the riser.



4. Thread the end of the steering line through the Vector 3 steering toggle grommet. Wrap the steering line around the outside of the toggle and then over the grommet. The mark on the steering line that indicates correct toggle position should be 1 ¼ inches (3cm) from the side of the toggle.

5. Slide the line off the looped end of the toggle and tie a loose overhand knot in the folded line.

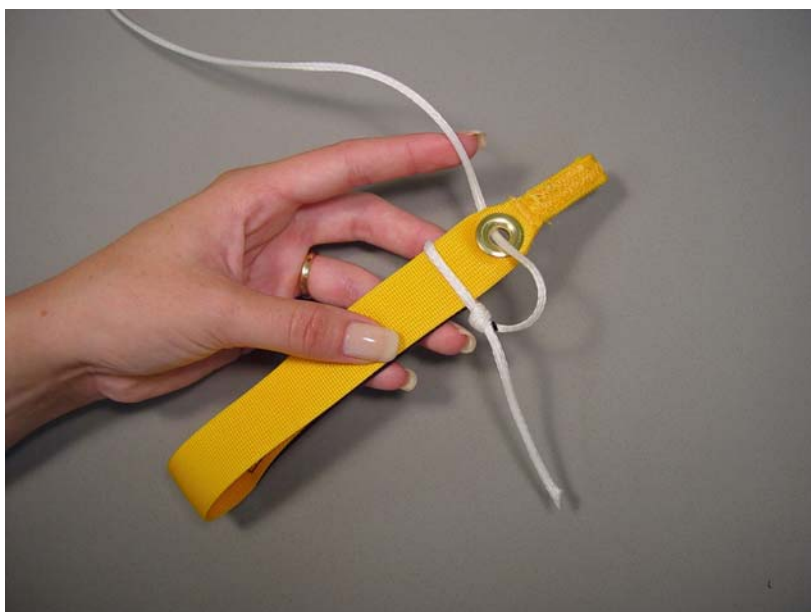


6. Now slide the line back over the toggle. Adjust the knot until the mark is just outside of the knot away from the toggle. The loop should fit closely around the toggle. Tighten the knot.

7. Pull on the steering line to draw the knot back up to the grommet. Daisy chain, finger trap or tack the excess end of the steering line to the toggle. Don't cut the extra off; you may wish to adjust the toggle position later.

8. Repeat the procedure for the other toggle.

9. Inspect the installation. Check to be sure the steering lines are routed correctly.



ATTACHING THE COLLAPSIBLE PILOT CHUTE

1. Locate the main canopy's pilot chute bridle attachment point.

2. Open the new collapsible pilot chute and bridle.

3. Run the end of the bridle opposite the pilot chute through the grommet in the top of the main deployment bag. The bridle should be inserted from the outside to the inside of the bag.





4. Pull the bridle through the main deployment bag grommet until the grommet is snug against the stop block (of the bridle) on the outside of the bag.



5. Pull the two fabric loops on the bridle back so they rest against the grommet on the inside of the bag.

6. Attach the pilot chute and bag to the pilot chute bridle attachment point on the main canopy. Pass the pilot chute and bag through the looped end of the bridle.

OPERATION OF THE COLLAPSIBLE PILOT CHUTE



1. To cock your pilot chute, step on your main bag and pull the handle on the top of the pilot chute with one hand, and with the other hand, stretch the bridle until it is tight.



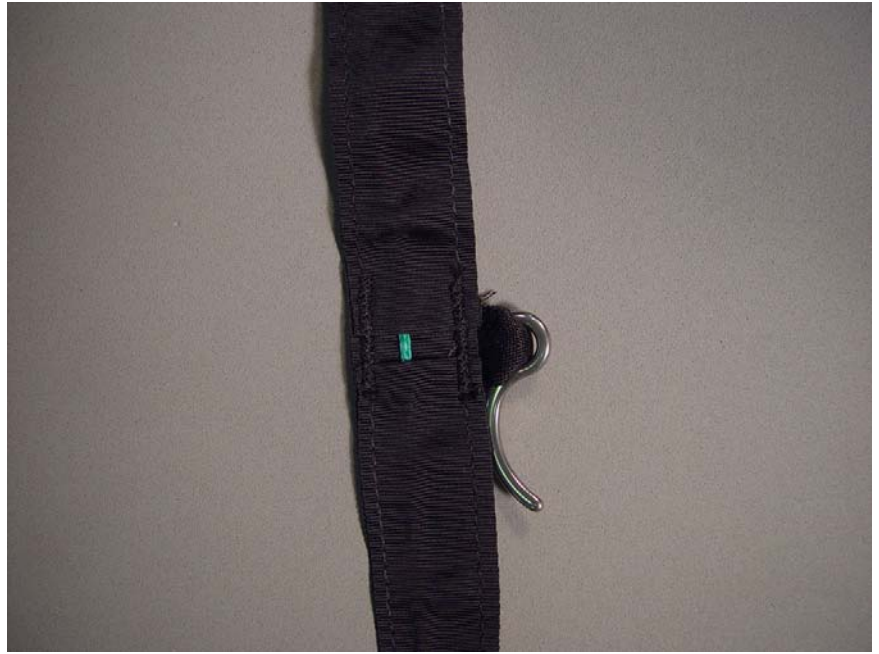
Your pilot chute must be cocked to function correctly.



2. Always remember to cock your pilot chute before you begin packing and always recheck it after you place the bag into the container. This assures that the bridle has not become partially uncocked while packing. You must see the green marking on the kill line to be sure it is cocked.



Cocking the pilot chute allows the pilot chute to inflate when thrown into the air-stream. An uncocked pilot chute will remain collapsed and subsequently create a pilot chute in tow situation.



SETTING UP THE PULL-OUT DEPLOYMENT SYSTEM

When a Vector 3 is to be set up with the pull-out main deployment system, the bridle/pin and handle setup must first be attached to the pilot chute. To do this, perform the following:

1. First, thread the end of the bridle with no hook and loop fastener on it through the loop located on the handle/pin setup.

2. Next, thread the end of the bridle through the crossed tape and centerline at the base of the pilot chute.





3. Finally, thread the end of the bridle back through the opposite end of the bridle.

MAIN CANOPY PACKING INSTRUCTIONS

Instructions for packing specific main canopies are published by the canopy manufacturer and are beyond the scope of this manual.

ABOUT THE DEPLOYMENT BRAKES

Every ram-air canopy on the market today is equipped with "deployment brakes" to make it open more gently and reliably. The brakes work by keeping the tail of the canopy pulled down several inches during deployment. This prevents the canopy from surging forward as it inflates and begins flying.

Malfunctions and poor deployments may result if the brakes are not set during packing, if the brakes are incorrectly set, or if one or both brakes release before complete canopy inflation and stabilization. Incompatible toggle and riser combinations may also create similar problems.

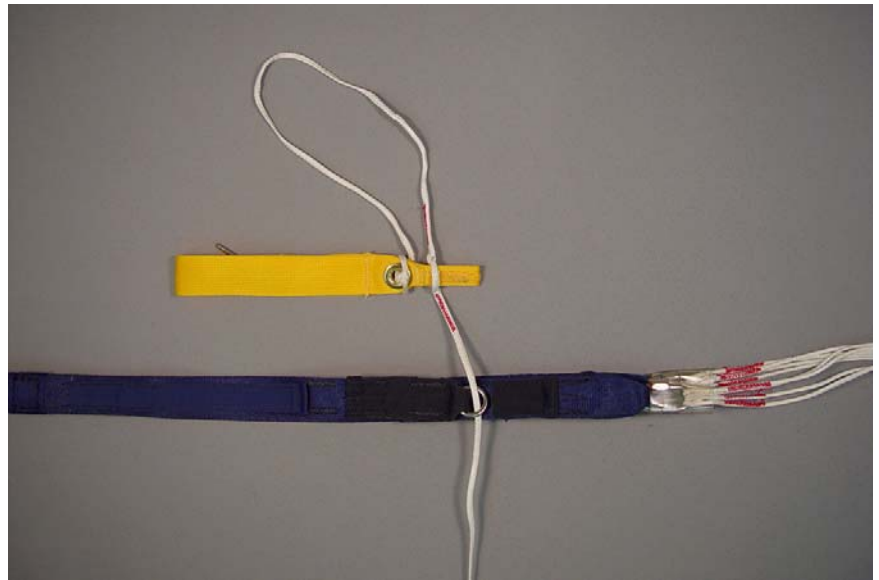
Not all harness and container systems have risers that are configured like those shipped with the Vector 3. Different riser designs require different procedures and a rigger should be consulted for the correct one.



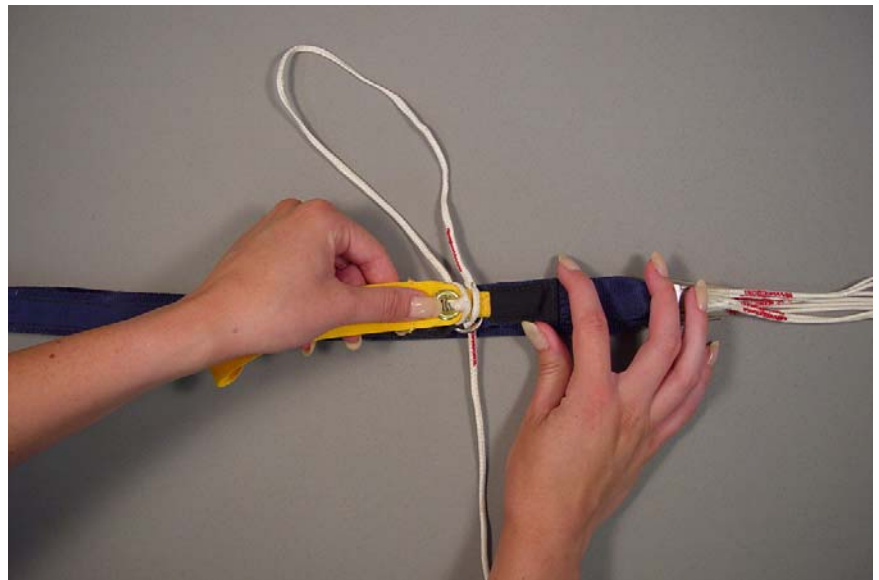
PROCEDURES FOR SETTING DEPLOYMENT BRAKES

TRU-LOK DEPLOYMENT BRAKE SYSTEM.

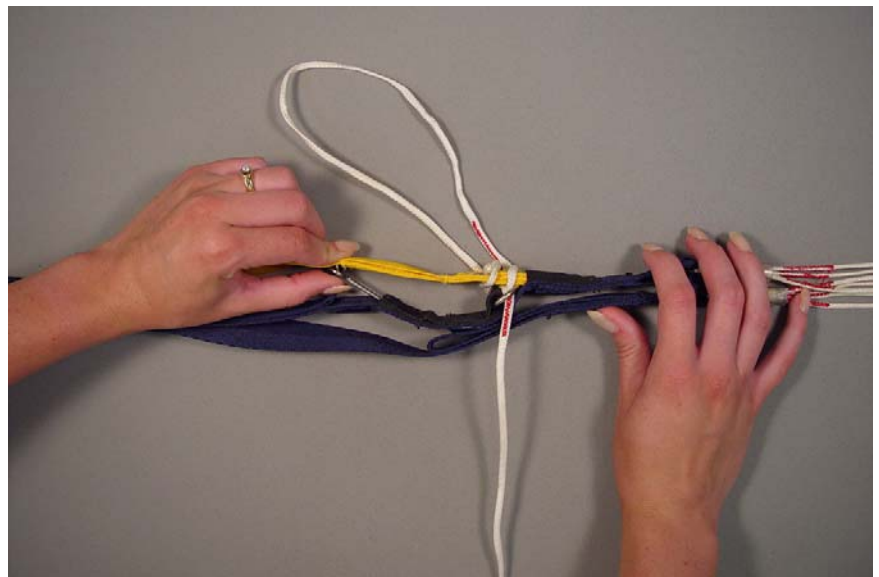
1. Insert the tip of the toggle through the cat's eye below the guide ring as you would in a standard brake setup.

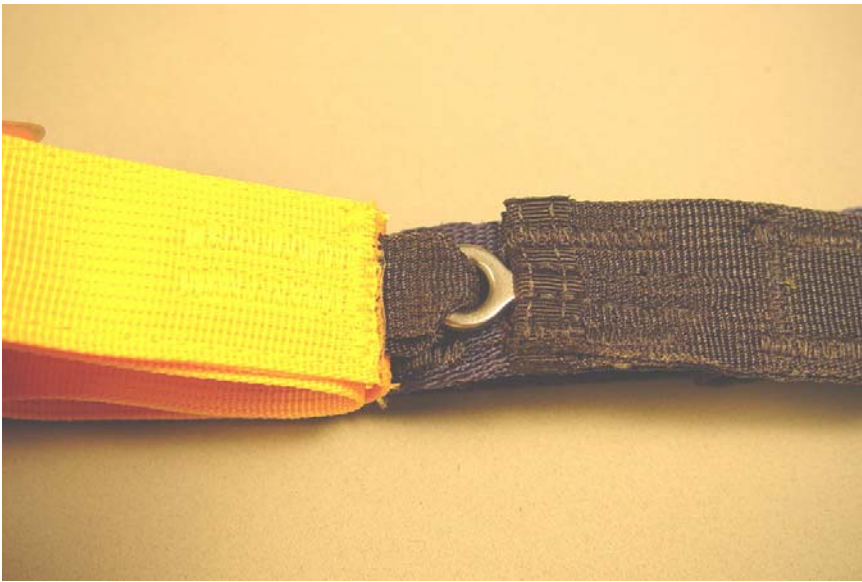


2. Insert the tip of the toggle firmly into the type 3 toggle keeper on the riser.



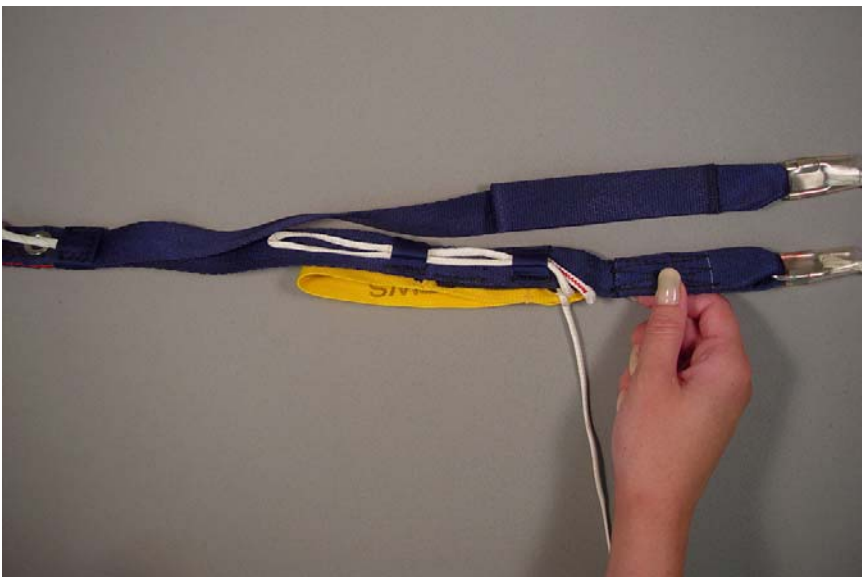
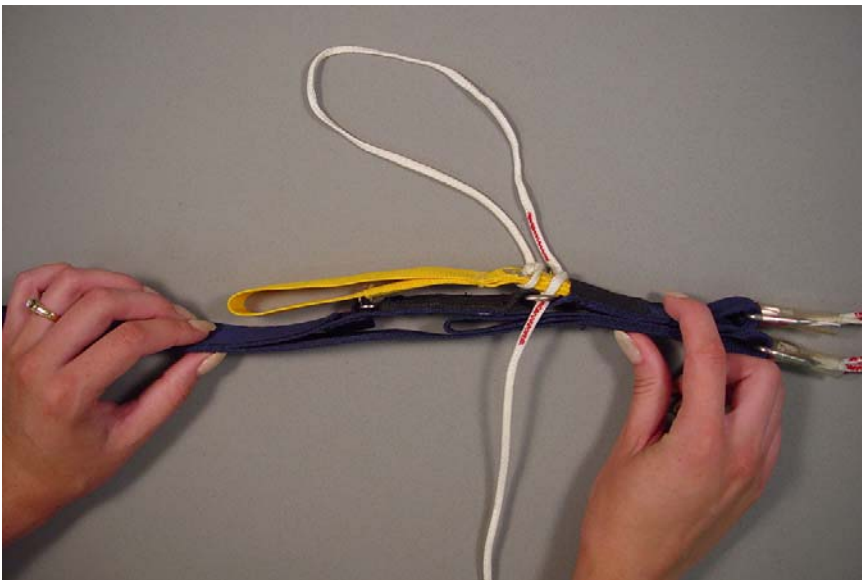
3. Insert the pin into the pin keeper. Ensure it is inserted all the way.





n o t e

Ensure that the Tru-Lok pin is inserted all the way into the keeper.



4. Route the excess steering line through the retaining loops on the rear of the riser, opposite the toggles.

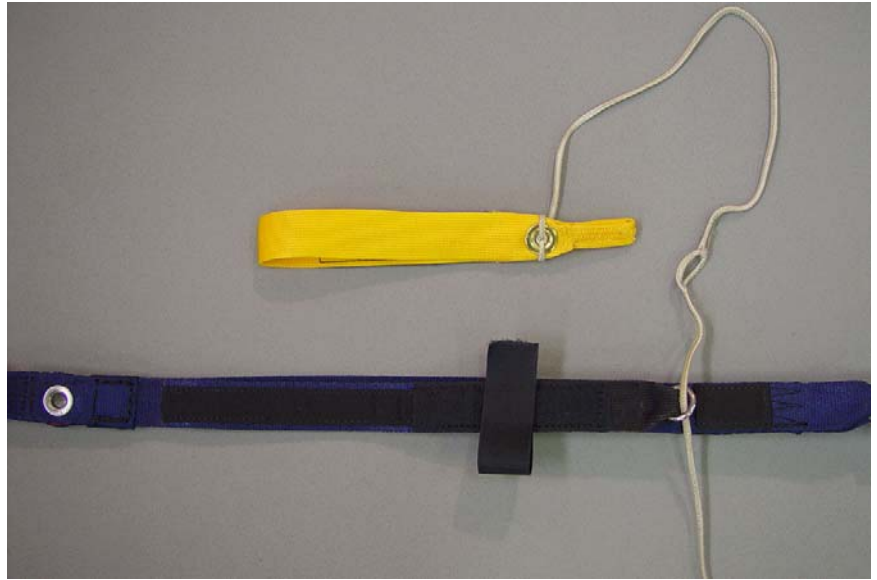
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With dacron control lines, use only the bottom retaining loop.

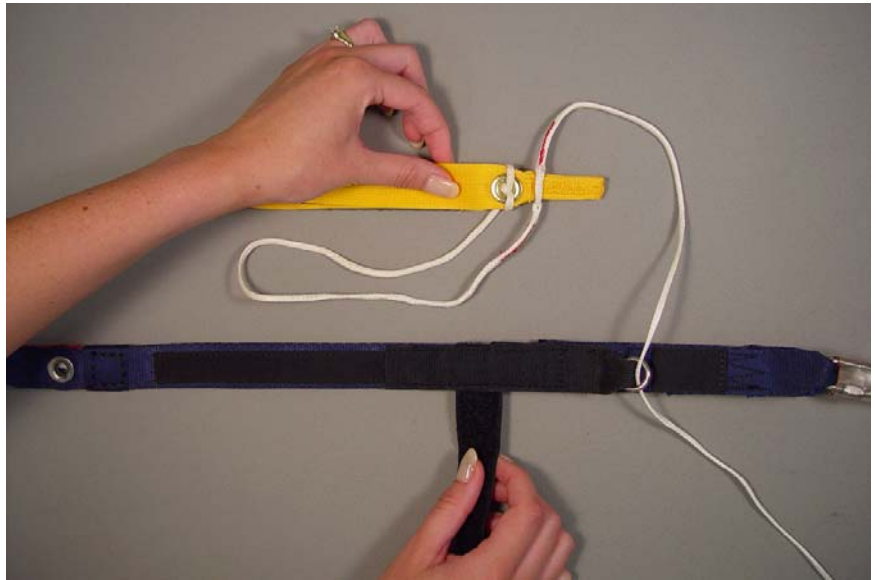


STANDARD DEPLOYMENT BRAKE SYSTEM.

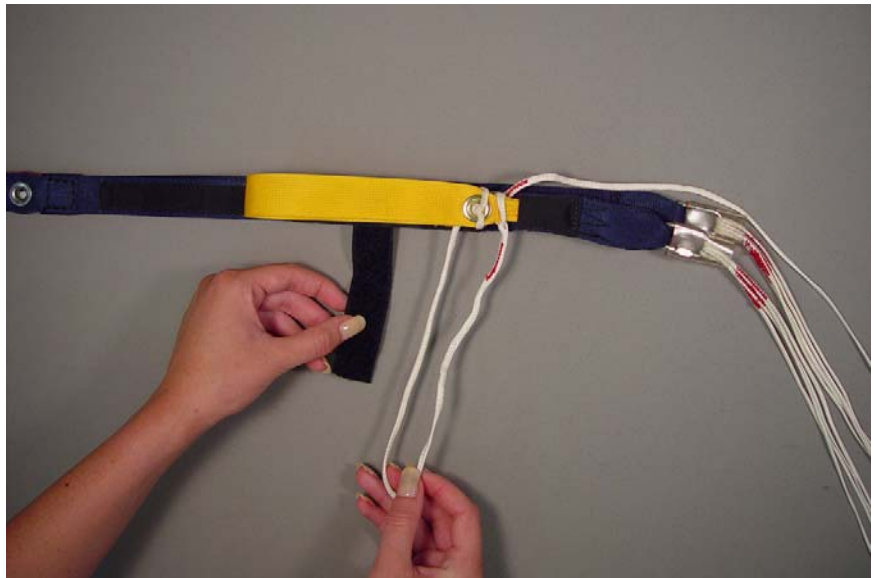
1. After the canopy is inspected, use the toggle to pull the right-hand steering line down until the brake loop just passes through the guide ring.



2. Insert the tapered end of the toggle all the way into the loop.



3. Pull on the steering line above the guide ring to seat the toggle against the ring. Mate the toggle hook and loop fastener with that on the riser. Check to be sure the tapered end of the toggle is completely seated in the loop (*It shouldn't be inserted past the end of the taper, or it may be difficult to extract in the air*).





4. Fold the bight of line between the toggle and loop with 3 inches (7cm) folds and stow it in the hook and loop fastener tab next to the toggle. Repeat the procedure for the left-hand toggle.



STOWAGE OF EXCESS STEERING LINES ON TRULOK TOGGLED RISERS

Warning:
Always stow excess steering line. Failure to do so may result in a knotted steering system and uncontrollable canopy. The TruLok toggle system allows the most secure steering line stowage available. Nevertheless, always look at your toggles before releasing, to make sure a clean release is possible.



1. Place the toggle tip through the cat eye on the steering line in the normal fashion.
2. Insert the tip of the toggle into the keeper located above the riser ring.



3. Pass the excess steering line through the two small loops of material located on the reverse side of the riser with the toggle assembly.



4. Take the loop that has been created by slipping the excess steering line and bring it around the riser so that you can place it over the straight pin of the trulok.



5. Insert the straight pin into the channel that has been created in the material holding the ring to the riser.



note

For those canopies with longer excess steering lines you can position the excess so that there is an even amount on both the top and bottom loops.



PACKING THE MAIN CONTAINER

The Vector 3 manual does not include instructions on how to pack the main canopy. Instructions for packing the main canopy can be found in the canopy owner's manual. Relative Workshop's instructions for packing the main container start with stowing the lines (After the main canopy has been inserted into the main deployment bag according to canopy manufacturer's instructions).



1. The bag is held shut by four rubber bands located across the mouth of the bag; each of these rubber bands pass through a grommet located along the edge of the locking flap. To close the bag, pass one of the center two rubber stow bands through its corresponding grommet and insert a 1 inch to 2 inches (3-5 cm) bight of lines through the stow band. Repeat process with the other center stow band, followed by the opposite corner band. Repeat for other corner band.



2. Stow the remainder of the lines across the bottom of the bag in the rubber bands located on opposite ends working from locking stows toward the opposite end of bag, alternating stows from left to right side of bag. Keep the line bights one to two inches long. Leave no more than 15 inches (37 cm) of lines unstowed between the bag and the connector links.

3. Use your knees or feet to "walk" on the bag, squeezing air out and distributing the bulk until the packed canopy is uniformly distributed within the bag.



4. Pick the bag up by its sides and set it into the container on its line stows.

5. Gently roll the bag out of the way. Follow the risers over the shoulders of the harness and container system and down along the sides of the main container. Separating the risers and laying them side-by-side (versus "stacking" the risers) against the outside wall of the reserve container will create a flatter, cleaner looking pack job. Lay the connector links into the container neatly against the sides making sure that no lines will wrap around them during canopy deployment.

RISER FLAPS

6. Close riser covers by performing the following:

a) Place main risers on top of (not under) tuck-tab pocket (A).

b) Continue routing the main risers down along side the reserve container and close internal riser cover (B) over the main risers.

c) Close external riser cover (C) over the risers & insert tuck-tab into pocket (A).

d) Close main container by the numbers.

note

Once you have 50 jumps on the container you may put the risers under tuck-tab pocket A and external riser cover C.

7. Lay the bag down in the container with the line stows against the bottom flap. Lift up on the top main flap as you push the top corners of the bag into the top of the main container so that the connector links are kept in place between the bag and the sides of the container. Make sure that none of the flaps are under the bag. Pull the bridle to its full length.





3. Use your knees or feet to “walk” on the bag, squeezing air out and distributing the bulk until the packed canopy is uniformly distributed within the bag.

8. Kneel on the center of the bag and pull up the main container side flaps until the bag fills the container and is flush with the container.



CLOSING THE MAIN CONTAINER

1. Insert a pull-up cord through the closing loop located on the bottom flap of the main container (Hint: this is a good time to check the condition of the closing loop to ensure no fraying and to ensure your pilot chute is cocked, if applicable).

2. Route the bridle to the right of the container. Correct bridle routing is CRITICAL if the Vector 3 is to function properly. The position of the pin (whether it is from right to left or vice versa) is much less critical, as it will release from all possible angles.



3. Thread the pull-up cord through the grommet of the top container flap (flap #1). Pull the pull-up cord towards the bottom of the container (avoid overstressing the grommet). Placing your knee on the closing loop will help hold it in place.



4. Place the bridle over the #1 top flap from right to left and mate the small piece of yellow loop fastener on the bridle to the yellow hook fastener on the #1 top flap.



5. Thread the pull-up cord through the #2 right side flap and then through the #3 left side flap. (The flaps MUST be closed in this order).



6. Insert the closing pin (located on the bridle) through the closing loop from right to left.



Failure to remove the pull-up cord will result in a pilot chute-in-tow malfunction. The container will not open in freefall.





7. Slowly remove the pull-up cord to prevent excess friction from damaging the closing loop. It is best to pass the pull-up cord under the closing pin while extracting it. Doing so places the primary friction point between the pull-up cord and the closing pin, thereby reducing wear on the closing loop.

n o t e

Note that the grommets do not line up - see picture.



It may be necessary to adjust the length of the closing loop to make the flaps align properly. The curved pin should be held firmly in place, but a force of no more than 12 pounds should extract it and open the container. The standard length for the closing loop is 1 5/8 inch, (4.1 cm) ± 1/8 inch (± 3 mm).

8. Double check the yellow hook and loop fastener patches to be sure they are mated properly. If there is not enough slack in the bridle to allow proper mating of the hook and loop fastener, create a small amount by gently pulling the bridle out of the main container.

9. Tuck the excess bridle under the bottom edge of the #2 right side flap.

Ensure the bridle extends from the locking pin to the pilot chute without passing through the harness. Mate the loop fastener on the bridle to the hook fastener on the bottom flap; you'll have to tuck the bridle under the #2 right side flap to do this. Close the main pin cover flap and be sure it completely covers the pin and bridle.



FOLDING THE PILOT CHUTE FOR BOC POUCH (BOTTOM OF CONTAINER / BOC)

1. Lay the pilot chute out (mesh side up), so the edge of the circle is at the mouth of the Spandex pouch. S-fold the bridle on the half of the pilot chute over the pouch.



2. Fold the pilot chute in half over the bridle.



3. Fold the pilot chute into thirds as shown.





4. Fold the pilot chute in half so that the handle is even with the skirt.



5. Before inserting the pilot chute into the pouch, pat the bottom of the rig to flatten out the pouch area. Doing so will allow more room to insert the pilot chute and will minimize a difficult extraction.

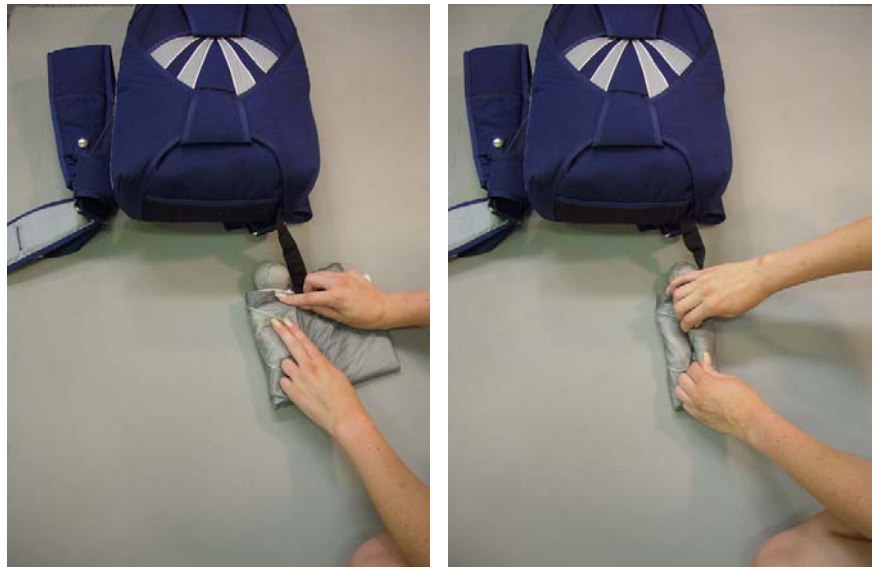


6. Flip the pilot chute over.



7. Fold one quarter of the pilot chute toward the center. Repeat this for the opposite side.

8. Fold once more in half lengthwise so the pilot chute resembles a hotdog bun.



9. Insert the pilot chute into the pouch until only the handle is exposed. Once again, pat the pouch to flatten it, reducing the amount of force necessary to extract the pilot chute.



n o t e

If you have any excess bridle after inserting the pilot chute, tuck it away in the BOC pouch, between the pilot chute and the container.





PACKING THE PULL OUT DEPLOYMENT SYSTEM

1. When closing the main, place the bag in the pack tray as usual, with the lines at the bottom of the container. S-fold the bridle over the bag as shown.



2. At the bottom right outside corner of the container is a flap. Secure the soft deployment handle to the hook and loop fastener under this flap, and the hook and loop fastener tab opposite the pin just above it.



3. S-fold the stretched-out pilot chute on top of the bag so that it fits over the main bag, and is centered as shown at right.



5. Close the top flap #1, again keeping the pin to the right and outside the flaps to the bottom, as shown.



6. Close side flaps #2 and #3 and secure with the main closing pin.



n o t e

Make sure there are no twists in the bridle and make sure the bridle is not looped around the tab that has the grommet set in it

7. Slowly remove the pull-up cord under the closing pin while extracting it. Doing so will reduce the wear and tear on the loop. Close the main pin cover flap and make sure it completely covers the pin and bridle cord. Tuck any excess bridle under the right side flap.





NOTES





SECTION 5

THE BOOTH 3-RING RELEASE SYSTEM

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THE BOOTH 3-RING RELEASE SYSTEM

INTRODUCTION

The 3-Ring release system was invented by Relative Workshop founder Bill Booth in 1976. It was the first practical release system that allowed skydivers to jettison their main canopies by pulling a single handle. The Booth 3-Ring was not only easier to operate than previous canopy release systems, but it was also more reliable and far less expensive. The Booth 3 Ring release system is now the industry standard.

GETTING TO KNOW THE BOOTH 3-RING

Knowing how the Booth 3-Ring release works will help you assemble and inspect it properly.

Begin by peeling the release handle (more commonly referred to as a cutaway handle or breakaway handle) from the hook and loop fastener on the harness. Peeling upward and then down, rather than pulling straight down, makes it easier to separate the handle from the webbing.

Take a look behind the risers near the harness and observe the movement of the yellow cable as you pull the cutaway handle. When the cable clears the white loop, the release is disengaged.

Slowly pull one of the risers off the harness. As you pull, you'll notice that the white loop gets pulled through the grommet by the action of the smallest ring.

While opening shock may exceed 1,000 lbs the yellow cable never sees a force in excess of about 10lbs. This is due to the mechanics of the Booth 3-Ring release system.

Because of the tremendous mechanical advantage of the system, it is important to understand the properties of the nylon components of the system.

When nylon stays in the same position for a long time, it begins to conform to that position. This is sometimes referred to as a "set". If the 3-Ring release system stays assembled for too long, the nylon can become so stiff that the low drag from a malfunction (such as a streamer) won't pull the riser off the ring.

The 3-Ring release system must be disassembled, flexed and inspected every 3 months. Procedures for this are listed in the care and maintenance chapter of the manual.

n o t e

A small stick or object in the white loop could prevent a riser from releasing. That is the reason why it's important to keep foreign matter, such as bits of grass and other debris out of the Booth 3-Ring assembly.



ASSEMBLY

Before assembling the Booth 3-Ring release system, make sure the risers aren't twisted or reversed. Lay the Vector 3 face down, as you would to pack it.

1. Thread each reserve cutaway cable into its housing and fasten the handle to the harness. The handle should be positioned as close to the ends of the housings as possible so that little or no cable is exposed.

2. With the rings of the riser facing toward the floor, pass the ring on the end of the riser (middle ring) through the large harness ring from above. Fold it back toward the canopy and risers.



3. Thread the smallest ring through the middle ring in the same way, but make sure it doesn't pass through the large ring.



A) Rigs without RSL: each yellow cable should extend about 6 inches (15.2 cm) past the housing ending.

B) Rigs with RSL: the right (RSL) side yellow cable should extend 7½ inches (19.1 cm) past the housing ending. The left (non RSL) side should extend 5½ inches (14 cm) past the housing ending.





4. Bring the white loop over and through the small ring only, and then through the riser grommet so it protrudes out the back of the riser.



5. Continue threading the white loop through the cable housing grommet on the end of the cable housing. The flat side of the cable housing grommet should be against the riser.



6. Thread the yellow cable through the white loop, making sure the loop isn't twisted. Be careful not to bend or kink the cable as you insert it through the white loop. Insert the remaining free end of the cable into the channel which is on the back of the riser.



PRE-JUMP INSPECTION

BEFORE JUMPING THE VECTOR 3, CHECK THE BOOTH 3-RING RELEASE SYSTEM FOR THE FOLLOWING:

- * Each ring passes through only one other ring.
- * The white loop passes through only the small ring.
- * The white loop passes through the grommet on the end of the cable housing without twisting.
- * Nothing passes through the white loop except the yellow cutaway cable.
- * The Booth 3-Ring release handle is securely fastened to the harness, and no cable is visible between the handle and the cable housings. If your release handle has a tendency to hide itself, or flip under your main lift web, undo the velcro and twist the handle in a clockwise rotation (when wearing rig) so the handle will stick out and slightly forward for a better grip.



We recommend that only Relative Workshop 3-Ring risers be used with the Vector 3 harness/container. If a Vector 3 is fitted with 3-Ring risers that were not built by Relative Workshop, it is important that they be checked for proper configuration. The side view above shows a correctly built Booth 3-Ring riser attached to the harness ring and put under moderate tension.

NOTE THE FOLLOWING:

- * The rings overlap each other and maintain metal-to-metal contact.
- * The rings are aligned in parallel planes.
- * The smallest ring is not pulled snug against the grommet; the white loop is long enough to give it some play.
- * The white locking loop goes straight down through the center of the riser grommet on its way to the cable housing end fitting; it does not extend past the edge of the grommet hole and then turn back upwards towards the hole.

If your riser configuration does not match this illustration, the 3-Ring release might not function correctly, contact a rigger or Relative Workshop if you are unsure of the 3-Ring riser configuration.

n o t e

Refer to the Relative Workshop web site for the correct configuration.

WWW.RELATIVESHOP.COM



TRIMMING CUTAWAY CABLES TO MATCH HOUSING LENGTH

There are many different length cutaway cable housings on many different rigs. To accommodate these differences, cutaway handles are manufactured with over length cables. So that both risers leave at the same time during a cutaway, these cables must be cut to match the housings of the particular rig on which the handle is to be installed.

- * Feed the cutaway cables all the way through both housings, and secure the handle in place. Do not hook up the risers, and make sure the long housing is not stretched out.
- * Measure the cable sticking out of each housing from the end of the housing. Cut each cable at the same length, 6 1/2" (16.5 cm) within +/- 1" (2.5 cm).

Each cable end must be finished by exposing it to a (lighter) flame for a few seconds, and then forming the softened plastic coating to a blunt point using your fingers. The finished point should completely cover the inner steel cable so that no sharp edges are exposed. **Be careful not to overheat the nylon as you could burn your fingers!** It is always a good idea to consult a rigger if you have any doubt about how to safely accomplish this procedure.

SAFETY TIP:

If you are jumping a high performance ram air canopy, you should consider installing RWS cutaway cable housings on your risers. Doing so will allow you to cutaway more easily if you experience line twists which are severe enough to twist down into your risers.

note

Instructions only apply to cutaway cables that have been ordered as replacement parts. New rigs come with correctly



If an RSL is being used, trim the cable on the side which the RSL is attached at 7 1/2 inches (± 1/2 inch) or 19.1 cm (± 1.2 cm) and cut the other cable at 5 1/2 inches (± 1/2 inch) or 14 cm (± 1.2 cm). This is done to assure that the riser to which the RSL is attached will always leave last. Make sure there is 2 inches (± 1/4 inches) or 5 cm (± 6 mm) differential between the lengths of the cables.





SECTION 6

MAINTENANCE AND CARE

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MAINTENANCE & CARE

INTRODUCTION

The secret to extending the life of your new harness and container system is performing periodic inspections and maintenance. The inspections and maintenance that will be discussed go beyond a normal gear-check before boarding a plane. Under most circumstances, the Vector 3 requires very little maintenance unless it is subjected to abnormal or harsh conditions. Remember, you entrust your life to the skydiving equipment you have chosen. It is your responsibility to ensure that equipment remains in optimum working order.

INSPECTING YOUR VECTOR 3

The best approach to rig maintenance is to spend a few minutes performing a periodic, detailed inspection of the rig. The inspection should be performed at least once per month. Obviously, the more you use your equipment, the more frequently you should inspect it. If any wear or damage is found, have it fixed immediately. In addition to inspecting the rig yourself, ask your rigger to inspect the entire assembly every time the reserve is repacked. If you have ANY questions regarding the condition of your harness and container system, do not hesitate to ask a rigger or the manufacturer to take a look at it.

GEAR INSPECTIONS SHOULD COVER ALL PARTS OF YOUR HARNESS AND CONTAINER SYSTEM, WHILE PAYING PARTICULARLY CLOSE ATTENTION TO THESE AREAS:

✿ **Cutaway System**

Refer to the 3-Ring section in this chapter for detailed information on inspecting the canopy releases.

✿ **Reserve System**

This includes the reserve ripcord, closing loop, pins, handle, housing, container and associated sewing. You should NOT attempt any repairs or modifications to ANY of these items unless you are a rigger. You can, however, identify smaller problems before they become more severe. Some items to look for would include kinks in the reserve ripcord cable, frayed or worn closing loop, frayed stitching on the container, etc.

✿ **Harness**

The harness should be inspected periodically for broken stitching or frayed webbing.

✿ **Main Container**

Inspect the plastic stiffeners in the container flaps and have replaced any that are broken. Replace any grommets that are deformed, nicked, damaged, or that are pulling out of their setting.

✿ **Main Pilot Chute**

Check the centerline (the length of nylon line inside the pilot chute that extends from the handle to the base) of the main pilot chute. It must be firmly sewn at each end; there must be no broken stitches or torn fabric. Inspect the seam that joins the pilot chute mesh to the pilot chute fabric. If the mesh is torn or badly frayed, replace the pilot chute.



☼ **Closing Loop**

The main container is held shut with a closing loop made of nylon suspension line sheathing. This loop is subject to wear. If it wears out and breaks, the main canopy may release prematurely and a malfunction may result. Replace the closing loop upon the first sign of wear. A closing loop is a lot less expensive than some of the possible consequences of a premature opening.

☼ **Hook and Loop Fastener**

Hook and loop fastener have many applications within skydiving. Even though it can eventually wear out, there exist few materials that can compete against it with regard to its flexibility, adaptability, and wide variety of applications. The "hook" portion of hook and loop fastener often attracts dirt, bits of grass, hair and other debris. You can clean the hook portion using a fine-toothed comb. The "loop" section generally remains clean but the nylon fibers sometimes tend to get pulled out of place. When you find that your hook and loop fastener is losing its adhesive qualities, replace it. Again, replacing a worn hook and loop fastener is a lot less expensive than a reserve repack or purchasing a main canopy due to a dislodged cutaway handle.

CARING FOR YOUR VECTOR 3

Your Vector 3 is manufactured primarily from nylon. Nylon is very durable, but is still susceptible to damage from several sources:

☼ **Sunlight**

The ultraviolet rays in sunlight quickly and permanently weaken nylon. Keep your Vector 3 out of direct sunlight as much as possible. Structural weakening of nylon may not be immediately noticeable. Prevention is the key.

☼ **Acids**

Acids damage nylon. Keep your Vector 3 away from hangar floors, dirty car trunks and similar areas where acids may be found. If such contamination does occur, immediately and thoroughly wash the rig with plenty of warm soapy water. Until a rig can be washed, baking soda will quickly neutralize most acids. If acid damage occurs or is suspected, a rigger should thoroughly inspect your Vector 3. Pay attention to where you place or store your rig.

☼ **Oils and Grease**

Most petroleum compounds do not weaken nylon; they simply stain it. A rigger using the proper petroleum solvent should promptly remove such stains.

☼ **Water**

Water will not structurally damage your Vector 3, but prolonged agitation in fresh water weakens webbing or may cause some fabric and tape colors to bleed. Salt water may damage nylon and cause hardware to corrode if not promptly and thoroughly washed off with plenty of fresh water. Your rig will maintain its new appearance longer if it is kept dry.

☼ **Soil**

Soil may damage your Vector 3. Brush off the soil after it has dried and gently wash with warm soapy water. Be sure that the soil is not in the cable housings, Booth 3-Ring release or reserve ripcord pins or loops. Consult a rigger if your rig is heavily soiled or extremely dirty.

☼ **Sand**

Fine sand will weaken and cut webbing and fabrics of all types. Prolonged exposure to sand will shorten the life of the entire parachute assembly. One way to minimize the damage done by sand is to use a packing mat while packing.



Abrasion

Nylon quickly frays if dragged over concrete or other rough surfaces. Do not drag your rig on the concrete while packing.

PERIODIC MAINTENANCE FOR THE BOOTH 3-RING RELEASE SYSTEM

The Booth 3-Ring release system has been in use for many years with excellent results. Although the system is as durable as the rest of the rig, it requires periodic maintenance and inspection to ensure proper operation.

The procedures below should be done at least every 3 months. This is especially important if the rig has not been used for an extended period, such as during the winter. Immediate inspection is required if it has been subjected to some abuse such as a drag across the runway, a water landing or exposure to a lot of dust or sand.

It's important to maintain the system even more frequently in humid, muddy or freezing conditions. If the Vector becomes immersed in mud or muddy water, clean the 3-Ring release system with a mild solution of soap and water. Any rusted components must be replaced.

PROCEDURE FOR PERIODIC MAINTENANCE OF THE BOOTH 3-RING RELEASE SYSTEM

1. Every 3 months operate the 3-Ring release system on the ground. Extract the cable completely from the housings and disconnect the risers.
2. While the system is disassembled, closely inspect it for wear. Check the white locking loops (the ones that pass over the smallest ring and through the grommet) to be sure they are not frayed.
3. Check the hook and loop fastener on the cutaway handle and main lift web to be sure it is clean and adequately holds the handle.
4. Check the cable ends for a smooth finish. The ends are finished at the factory to have a smooth, tapered surface. This prevents the cable from hanging up in the loop. Check the cable ends and consult a rigger or the manufacturer if a burr or "hook" is present.
5. Check the stitching, including that which holds the large rings to the harness.
6. Check the 3-Ring release housings for solid hand tacking and proper stretch. The housing ends lay at the chest strap area, pull downward on these housing ends and check that they don't move downwards more than ½ inch. Pull the housings from the free end and expect 1-2 inches of movement.
7. Take each riser and vigorously twist and flex the webbing near where it passes through each ring. The idea is to remove any set or deformation in the webbing. Do the same thing to the white loop.
8. Check the housings for dents or other obstructions. Use the cable to do this.
9. Clean and lubricate the release cable with a light oil such as "3 in 1" brand or silicon. Put a few drops on a paper towel and firmly wipe the cable a few times. A thin, invisible film should remain—



too much will attract grit and dirt, or the oil could become tacky in cold weather. Too much oil will require more force to extract the cable during a breakaway.

10. Inspect the fittings at the end of each housing. If one of these fittings were to come off the housing, a riser might release prematurely.

11. If any wear is found, consult the Relative Workshop or a rigger before using the Vector 3.

12. Reassemble the system. Double check it. Make sure the risers aren't reversed.

The Relative Workshop appreciates and welcomes any comments from users that relate to the safety, operation or maintenance of the 3-Ring release.

REPLACEMENT PARTS

The Relative Workshop supplies replacement parts for its rig at a reasonable cost. When ordering parts for your rig, include the serial number, type and date of manufacture of your Vector so the proper items can be quickly supplied. This information is written on the lable tucked under the left hand ring cover.





NOTES





SECTION 7

HOW TO USE THE VECTOR 3

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HOW TO USE THE VECTOR 3

This chapter provides specific procedures for using the Vector 3. It is not a training syllabus.

It is the responsibility of the owner to possess the specific knowledge required to make a safe skydive, including how to use their equipment properly. This kind of knowledge can only be gained by personal professional instruction.

SUGGESTED EQUIPMENT

It is essential that someone jumping a Vector 3 for the first time practice normal and emergency procedures on the ground. Practicing normal and emergency procedures should be performed using training aids that simulate the equipment to be used in the air.

If required, Relative Workshop can provide a Vector 3 training harness. It is equipped with simulated cutaway handles, reserve handles and main deployment handles that are located in the same positions as the Vector 3. If you decide to build your own practice harness make sure the main, reserve and cutaway handles are located in the same positions as the Vector 3 rig.

PRE-JUMP EQUIPMENT CHECK

The equipment check should follow a logical order. For example: top to bottom, front to back.

STARTING AT THE FRONT:

- ◆ Make sure the 3-Ring system is assembled correctly and free of any dirt or other foreign matter.
- ◆ Check the position of the cutaway handle and reserve ripcord handle. Do not remove them from their pockets unless you suspect a problem, as this puts unnecessary wear and tear on the hook and loop fastener. Ensure that the chest strap is not threaded through the reserve ripcord handle.
- ◆ If you step into your harness, check the leg straps to make sure that they are threaded correctly. Should you prefer to leave them unthreaded prior to putting on your gear, make sure they are not wrapped around the main lift web but rather hang straight down.
- ◆ Open the reserve container pin protector flap by grasping the sides of the flap, and pulling straight up. Do not grasp the bottom edge of the flap. This will cause the end of the flap to curl up, becoming permanently deformed and more easily snagged. Check the pin; it should be straight and seated well into the closing loop.

n o t e

When asking another jumper for a pin check, make sure they also follow proper procedures.



- ◆ Slide the reserve ripcord cable back and forth in its housing to be sure it moves freely.
- ◆ Lift the main container pin-protector flap and check the curved closing pin. It must be at least halfway through the closing loop. Make sure that the yellow hook and loop fastener patches on the bridle cord and container flap are mated.
- ◆ Make sure the bridle is routed correctly from the closing pin, under the right-hand flap along the main lift web and into the pilot chute pouch.



Routing the bridle around the leg strap will cause a pilot-chute-in-tow malfunction.

- ◆ Check the 3-Ring release cutaway handle. The hook and loop should be mated correctly. No more than ½ inch (1.2cm) of yellow cable should be visible between the cutaway handle and the cable housings.
- ◆ If you have an AAD installed, make sure that you switch it on according to the instructions provided by the manufacturer.

DONNING AND ADJUSTING THE VECTOR 3

The Vector 3 is designed so that it fits snugly, yet comfortably, when the harness is properly adjusted.

Pick up the Vector 3 using the main lift web close to where the 3-Rings are located. Put on your Vector 3 in the same way you would put on a coat.

Check the leg straps for twists before threading them. Make sure you route the webbing correctly before tightening them until they are snug. Slide the excess strap through the black elastic keepers provided and then stow the excess strap in the pockets on the leg pads. This will ensure that the leg straps don't flap around in the air while you are in freefall.

Threading the chest strap. The chest strap enters the adjuster from behind (closest to the jumper's chest), around the sliding bar, and back through between the bar and the end of the adjuster. Adjust it so the main lift webs are parallel when the chest strap is tight. Stow the end through the black elastic keeper. An unstowed running end will cause major slippage.



Improper threading of the chest strap may result in death. Death has occurred from a skydiver falling out of the harness due to an improperly fastened chest strap.



SUMMARY

To summarize the adjustment procedures:

- ◆ Always check your gear thoroughly before putting it on your back.
- ◆ Put the packed rig on over your jumpsuit.
- ◆ Thread the leg straps through the adapter or connect the straps, checking that they are not twisted, and position the comfort pads.
- ◆ Tighten the leg straps until snug.
- ◆ Stand up straight and secure the chest strap; it should not be cinched too tightly.

JUMPING THE VECTOR 3

DEPLOYING THE MAIN PARACHUTE

Before a jumper uses a hand deploy system, they should first practice the procedures on the ground under an appropriately rated instructor's supervision.

DEPLOYING THE RESERVE PARACHUTE

Before a jumper uses a Vector 3, they should first practice the reserve procedures on the ground under an appropriately rated instructor's supervision.

A skydiver may be faced with a number of emergencies including those in the aircraft, during climb out or exit, in freefall, during deployment, under canopy and landing. A currently rated instructor or parachute center must provide training for any and all emergencies before jumping a Vector 3.

note

You must be properly trained on all aspects of skydiving, including ground training, in-air training and landings.

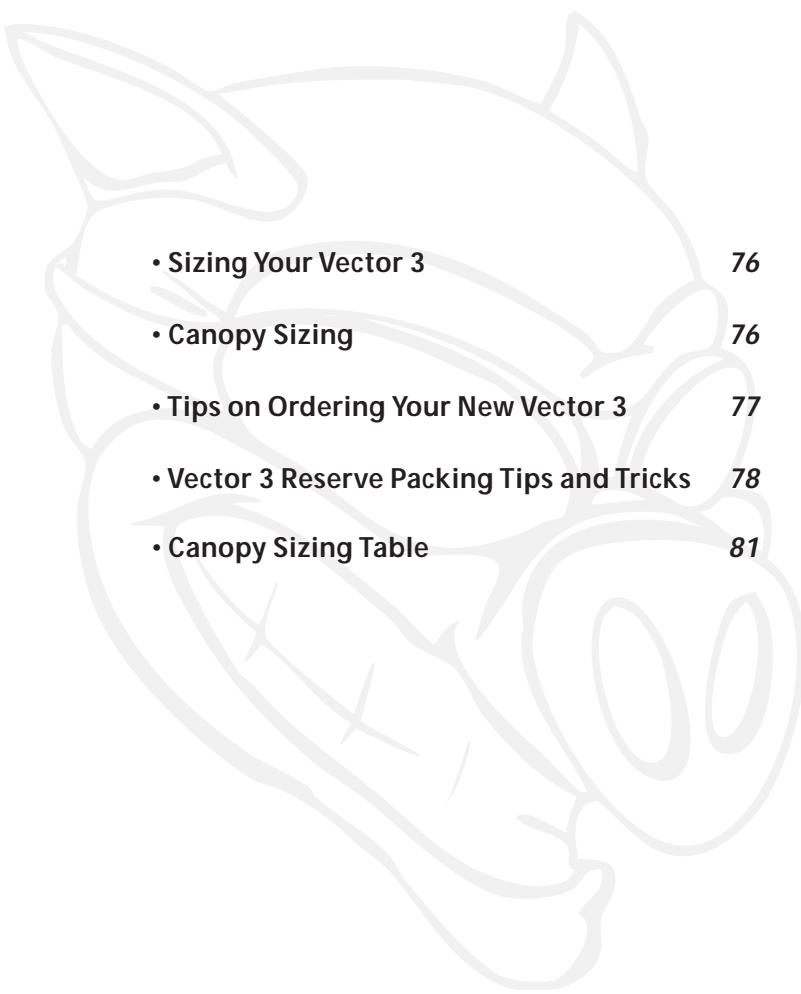


AAD's are backup devices only.





APPENDIX



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APPENDIX A: SIZING YOUR VECTOR 3

This chart was designed to give you an idea which main and reserve canopies are compatible with one another in the Vector 3 harness/container system. If you already have a preference for a certain main and reserve canopy, then check the known pack volume in the canopy sizing table and determine if they will fit in the same container. If not, then another main or reserve must be selected.

WIDTH A:

The width of the backpad at the top of the container. Measured from the outside edge of the binding tape to the outside edge of the binding tape.

WIDTH B:

The width of the backpad at the bottom of the container. Measured from the outside edge of the binding tape to the opposite outside edge of the binding tape.

LENGTH:

The length of the backpad from the outside edge of the binding tape at the bottom of the container to the outside edge of the binding tape at the top of the container (the yoke). For Microns, the length measure is calculated by adding the reserve container length to the main container length.

THICKNESS:

Measured from the bottom inside corner of the main container up the bottom wall to the upper end of the bound box.

note

If the Vector 3 harness is too small or too large for the jumper's body size, the safety of the jumper can be affected during the parachute jump. If there is any doubt as to the sizing, contact Relative Workshop immediately.

APPENDIX B: CANOPY SIZING CHART

The pack volume represented by these sample groups should be considered maximum recommended pack volumes to ensure proper fit, function and ease of packing. Down sizing main and/or reserve canopy one size category is acceptable. It is not recommended to use larger reserve canopies than represented in the sample group. This will compromise the functionality of the system. It is possible to temporarily use a main canopy one size larger than the recommended sample group. However this is not recommended for cosmetic and packing reasons.

The sizing chart should serve as a reference only when determining which Vector 3 container will best fit your canopies. Many factors influence a canopy's pack volume in the Vector 3 including humidity, temperature, color of fabric, experience of the packer as well as the date when the canopy was manufactured.

Most canopy recommendations are determined by actually packing the canopy into the specified container by Relative Workshop. Canopy types included in this chart are intended to represent a group of common canopies suitable for each container size. Any canopy type with similar pack volume as the sample grouped will naturally be suitable for the same container. Brands appearing in this chart are in no particular way more suitable for our Vector containers than brands that are not listed.

Please contact Relative Workshop at rws@relativeworkshop.com to inquire about a canopy that may not be listed here or if you have any other questions about sizing your rig. Relative Workshop encourages customer feedback; so if you feel that a canopy not presently listed in the sizing chart should be included, let us know. We will be happy to add it to our chart should we find the fit is acceptable.

note

All dimensions given are approximate.



APPENDIX C: TIPS ON ORDERING YOUR NEW VECTOR 3

- ★ Provide as much information about your canopies as you know. For example, date of manufacture (or state that it is a new canopy), the type of suspension line, etc. This will assist the Relative Workshop in identifying the container that is most ideal for you.
- ★ Whenever possible, size the container to fit the mid-range of the stated pack volume.
- ★ Consider that a canopy with a pack volume at the low-end of the scale will pack easier and will be more comfortable than a canopy that is at the high-end of the scale.
- ★ If you jump in regions that have low humidity, such as Colorado or Arizona, you may need to go up one container size for the canopies to fit properly.
- ★ If you are a dealer ordering a Vector 3, please let us know the state or country of origin of your customer. This will help us decide if the container fit is compatible.

note

This information is subject to change at any time without incurring any obligation whatsoever.

Example: A V5 has a main pack volume range between 425-550 cubic inches. When choosing canopies, keep in mind that a main canopy with a stated volume of 548 cubic inches may not fit. The reason is canopies that are the same model, produced by the same company, but are made of different colored fabrics or manufactured at different times can have pack volumes that vary quite a bit.

We have found that the pack volumes given by the canopy manufacturers can range from 5-20% less or more than the actual pack volumes that have been determined by the Parachute Industry Association.

For this reason the Relative Workshop reserves the right to change the container size when we know your choice will not fit. We will make every effort to inform you of the discrepancy.



APPENDIX D: VECTOR 3 AND MICRON RESERVE PACKING TIPS AND TRICKS

ORDER OF IMPORTANCE:

- 1 Functionally safe and airworthy
- 2 Comfortable
- 3 Good looking

WHETHER YOU PRO-PACK OVER THE SHOULDER OR ON THE FLOOR:

- ★ Lay the canopy out on its side and pull all of the cell's high points even before starting the pack job.
- ★ This reduces the amount of work required to flake the canopy and produce a neat, orderly pack job with good bulk distribution.

MAKE ALL OF YOUR FOLDS AS NEAT AND WRINKLE FREE AS POSSIBLE.

- ★ Less wrinkles = less bulk = easier and neater pack job

USE PACKING WEIGHTS AND TENSION TECHNIQUES TO KEEP THE CANOPY UNDER CONTROL AT ALL TIMES.

- ★ Develop handling methods which allow you to work on one section of the canopy at a time without disturbing the rest.

APPLY TENSION ALONG YOUR FOLD LINES WHEN FLAKING THE CANOPY.

- ★ This causes the canopy material to fold at the line of tension, allowing better control.

KEEP ALL SUSPENSION LINES IN THE MIDDLE, WITH THE CANOPY MATERIAL EVENLY SPREAD TO THE SIDES.

- ★ The center cell's center seam should run down the middle of the pack job to ensure the center cell bulk is evenly distributed.

WIDTH REDUCTION FOLDS SHOULD PRODUCE A FOLDED CANOPY THAT IS APPROXIMATELY 2 INCHES WIDER THAN THE FREEBAG.

USE THE CENTER OF THE TAIL TO COCOON THE PACK JOB.

- ★ The tail should help isolate the steering lines from the leading edge of the canopy when packed as shown in the Relative Workshop Vector 3 packing video.

PULL THE TAIL DOWN CAREFULLY.

- ★ Do not pull slack into the "D" suspension lines.
- ★ Do not distort the top portion of the flaked canopy.
- ★ Cocoon the pack job carefully to avoid moving any suspension lines or steering lines from the middle.

MAKE ALL "S" FOLDS WITH PACKING PADDLES.

- ★ This establishes precise fold lines.
- ★ This also maintains line tension within the packed canopy.



n o t e

Use a friction lock and pull up cord to keep the freebag grommets together - this will keep bulk on the outside of the bag.

SPREAD THE SLIDER GROMMETS APART AND STAGGER THEM.

- ✦ Be sure the grommets are lying flat relative to the reserve pack tray.
- ✦ This distributes the bulk over a wider area, minimizing lumps in the pack job.
- ✦ Spread them apart 4 inches if the rig is Cypres-equipped.
 - This allows the pack job to mold around the Cypres unit and reduce it's protrusion into the main container
 - It also prevents the unit from contacting the hard grommets if the rig is dropped

LEAVE 2-3 INCHES OF FOLDED CANOPY PROTRUDING OUT OF THE MOUTH OF THE BAG.

- ✦ This helps fill the corners of the reserve container.
- ✦ This also helps prevent excessive bulk distribution in the center of the pack tray.

n o t e

Do not rely on the container to shape the pack job or hide any poor fabric distribution.

THE BAGGED CANOPY SHOULD REFLECT THE DESIRED SHAPE OF THE RIG FOR BEST RESULTS.

- ✦ Putting the canopy in the bag is best described as: "Pulling the bag onto the pack job, not putting the pack job into the bag"
- ✦ It should be square at the bottom, wedge shaped in profile, and thin at the top.
- ✦ When pressing down on the pack job, it should be firm at the mouth of the bag and get progressively softer as you get closer to the bridle attachment point.
- ✦ Leave very little, if any canopy in the ears/top corners of the freebag.

MAKE NEAT AND ORDERLY LINE STOWS.

- ✦ Use protective strips on the bag hook and loop fastener to protect the lines from snags.
- ✦ Make the line stows the same width as the line stow pocket.
- ✦ Distribute the lines evenly from the bottom of the pocket to the top to minimize bulk.
- ✦ Leave 12 inches of line unstowed between the bag and riser ends.

USE A 3/4 INCH OPENING IN THE RESERVE CLOSING LOOP.

- ✦ This allows a temporary pin to remain in place while the loop is pulled through the reserve flap grommets.
- ✦ It gives you a chance to determine if you can close the flap prior to unpinning the container, at which time you are committed to closing the flap or losing the pack job.
- ✦ The 3/4 inch opening will be contained within the stacked grommets, minimizing any risk of canopy material from becoming lodged in the loop

WHEN USING A CYPRES CLOSING LOOP, USE TWO CYPRES PULL-UP CORDS.

- ✦ Two cords will hold the eye of the loop open wider to ease pin insertion.
- ✦ The second cord is inserted after the closing loop is through the loop cutter, as two will not fit.
- ✦ Another option is to finger trap one cord into another to produce a fatter pull-up cord.

n o t e

Make a Cypres "indent" in the pack job prior to placing the bag into the container.

PRE-STRETCH CYPRES CLOSING LOOPS.

- ✦ Pre-stretched loops will behave more consistently than unstretched loops.
- ✦ Consistent loop behavior combined with consistent packing techniques will allow you to establish known loop lengths for different canopy/container combinations.



WHEN PREPARING THE CONTAINER TO RECEIVE THE CANOPY, TURN THE UPPER RESERVE WRAP AROUND CORNERS INSIDE OUT.

- ★ This allows the reserve bag and canopy to drop straight down into the container.
- ★ It also makes it easier to fill the bottom corners of the container.
- ★ Leave the upper corners turned inside out until it is time to close flaps #4 and #5.

PLACE THE RESERVE RISERS TO THE FAR SIDE EDGES OF THE PACK TRAY.

- ★ This places the bulk of the toggle assembly to the outer edges, allowing the backpad to lay comfortably flat against the jumper's back.
- ★ Fanning the risers slightly with the rear risers to the outside will help with bulk distribution, and minimize lumps in the backpad.

SECURELY POSITION THE RESERVE BAG BEFORE INSERTING THE TOP CORNERS.

- ★ Pull up on the closing loop and press the reserve bag against the reserve pack tray.
- ★ This will properly position the reserve bag in the reserve pack tray.
- ★ Place your knee on the center of the reserve bag, over the closing loop to hold it in position while you work the corners of the reserve container around the bag.
- ★ Your knee will prevent the reserve bag from moving out of position.
- ★ Leave your knee in position until the #1 kicker flap is nearly closed.

CHECK RESERVE RISER PLACEMENT BEFORE CLOSING FLAP #2

- ★ Ensure that the risers are at the edge of the pack tray with the rear riser fanned to the outside.
- ★ Adjust the risers so that they lay flat against the yoke or shoulder padding.

HOLD A PACKING PADDLE ACROSS THE TOP OF THE RESERVE BAG AND BRIDLE TO HOLD THEM IN POSITION WHILE CLOSING FLAP #2.

- ★ This prevents the top of the bag from rolling up and creating a lump at the top of the pack job.
- ★ Too much bulk or lumpiness at the top of the pack job contribute to an uncomfortable fit and a security reduction of the outer riser covers.

KEEP ALL FOLDED RESERVE PILOT CHUTE MATERIAL WITHIN 1.5 INCHES OF THE TAPED PILOT CHUTE TOP.

- ★ "S" folds in the pilot chute material will produce better launches than rolling the material.
- ★ Keeping the material close to the pilot chute top will help fill the void between the stacked pilot chute spring and the container flaps.

CLOSE BOTH SIDE FLAPS, #4 AND #5, AT THE SAME TIME.

- ★ This prevents the bulk of the pack job from pushing to the side that isn't closed, which then makes it more difficult to close that side.
- ★ By closing both side flaps at the same time, the pack job is evenly compressed from both sides.

NEVER PULL THE CLOSING LOOP THROUGH THE GROMMETS TO LINE THEM UP!

- Work both side flap grommets into place with the pull up cord BEFORE pulling the closing loop through.
- This prevents the loop from getting pinched in between the grommets and subsequently damaged.

ALWAYS COUNT YOUR TOOLS WHEN FINISHED!



Container Size	Width A	Width B	Length	Thickness	Main Canopy	Reserve Canopy
V303 MICRON	10"	10"	15.5"	4.5"	Velocity 75, Stiletto 97	PD106R
V304 MICRON	10"	10"	16"	4.5"	Stiletto 107, Safire 109, Diablo 110, Velocity 96, Icarus Extreme 94	PD106R, Micro Raven 109
V306 MICRON	10"	10"	16"	5"	Diablo 120, Stiletto 120, Icarus Omega 119, Icarus Extreme 109, Velocity 103	PD113R, Micro Raven 120, Tempo 120, Techno 115
V308 MICRON	10"	11"	16"	5.5"	Batwing 134, Falcon 150, Monarch 135, PD150, Sabre 135, Silhouette 135, Spectre 135, Stiletto 135	Micro Raven 135, Mini Cricket 130, PD 126R
V310 MICRON	10"	11"	17.5"	5.5"	Batwing 153, Falcon 175, Monarch 155, PD170, Sabre 150, Silhouette 150, Spectre 150, Stiletto 150	Cricket 145, Micro Raven 135 & 150, PD143R, Swift 145
V314 MICRON	10"	10"	18"	4"	Stiletto 107, Safire 109, Diablo 110, Velocity 96, Icarus Extreme 94	Micro Raven 109
V316 MICRON	10"	10"	18"	4.5"	Diablo 120, Stiletto 120, Icarus Omega 119, Icarus Extreme 109, Velocity 103	PD113R, Micro Raven 120, Tempo 120, Techno 115
V319 MICRON	10"	10"	18"	5"	Diablo 120, Stiletto 120, Icarus Omega 119, Icarus Extreme 109, Velocity 111	PD126R, Micro Raven 120, Tempo 120
V326M	10"	12"	17.75"	4"	Batwing 116, Falcon 135, Icarus Extreme 104, Monarch 120, PD135, Sabre 120, Spectre 120, Stiletto 120	Micro Raven 109 & 120, PD113R
V328M	10"	12"	17.75"	5"	Batwing 134, Falcon 150, Monarch 135, PD150, Sabre 135, Silhouette 135, Spectre 135, Stiletto 135	Micro Raven 135, Mini Cricket 130, PD126R,
V335M	10"	12"	19.5"	3.5"	Batwing 98, Falcon 120, Sabre 97 & 107, Spectre 107, Stiletto 97 & 107	Micro Raven 109 & 120, PD113R
V336M	10"	12"	20"	3.5"	Batwing 116, Falcon 135, Icarus Extreme 104, Monarch 120, PD135, Sabre 120, Spectre 120, Stiletto 120	Micro Raven 120, PD113R
V339M	10"	12"	19.5"	4"	Batwing 116, Falcon 135, Icarus Extreme 104, Monarch 120, PD135, Sabre 120, Spectre 120, Stiletto 120	Micro Raven 135, Mini Cricket 130, PD126R
V340M	10"	12"	20"	4"	Batwing 134, Falcon 150, Monarch 135, PD150, Sabre 135, Silhouette 135, Spectre 135, Stiletto 135	Micro Raven 135, Mini Cricket 130, PD126R
V343M	10"	12"	19.5"	4.5"	Batwing 134, Falcon 150, Monarch 135, PD150, Sabre 135, Silhouette 135, Spectre 135, Stiletto 135	Cricket 145, Micro Raven 135 & 150, PD143R, Swift 145, Tempo 150
V344M	10"	12"	20"	4.5"	Batwing 153, Falcon 175, Monarch 155, PD170, Sabre 150, Silhouette 150, Spectre 150, Stiletto 150	Cricket 145, Micro Raven 135 & 150, PD143R, Swift 145
V347M	10"	12"	19.5"	5"	Batwing 153, Falcon 175, Monarch 155, PD170, Sabre 150, Silhouette 150, Spectre 150, Stiletto 150	PD160R, Raven1, Swift 175, Tempo 170
V348M	10"	12"	20"	5"	Batwing 171, Falcon 195, Monarch 175, PD190, PD210, Sabre 170, Silhouette 170, Spectre 170, Stiletto 170	PD160R, Raven 1, Swift 175, Tempo 170



Container Size	Width A	Width B	Length	Thickness	Main Canopy	Reserve Canopy
V350M	10"	12"	20"	5.5"	Falcon 215, Monarch 195, PD210, PD218, Sabre 190, Silhouette 190, Spectre 190	Firelite 175, PD176R, Raven 1, Swift 175, Tempo 170
V351M	12"	14"	21"	3.75"	Falcon 215, Monarch 195, PD210, Sabre 190, Silhouette 190, Spectre 190	PD160R, Raven 1, Swift 175, Tempo 170
V352M	12"	14"	20"	4.25"	Falcon 215, Monarch 195, PD210, Sabre 190, Silhouette 190, Spectre 190	Firelite 175, PD176R, Raven 1, Swift 175, Tempo 170
V353M	12"	14"	20"	5"	Falcon 235, Monarch 215, PD230, Sabre 210, Silhouette 210, Spectre 210	Maverick 200, PD193R, Raven 2
V354M	12"	14"	21"	4.25"	Falcon 235, Monarch 215, PD230, Sabre 210, Silhouette 210, Spectre 210	Firelite 172, PD 176R, Raven 1, Swift 175, Tempo 170
V355M	12"	14"	21"	5"	PD230 Dacron, Raider, Sabre 230, Silhouette 230, Spectre 230	Maverick 200, PD193R, Raven 2
V357M	12"	14"	20.5"	5.5"	PD230, Sabre 210, Silhouette 210, Spectre 210, Falcon 235, Monarch 215	PD218, Swift 225, Raven 3, Tempo 250
V358M	12"	14"	21"	5.5"	PD260, Sabre 230, Silhouette 230, Spectre 230, Falcon 265, Triathalon 220	PD218, Swift 225, Raven 3, Tempo 250
V375M	14"	16"	22"	5"	Falcon 300, PD280, PD300	Fury 220, PD253R, Raven 3, Swift225
V378M	14"	16"	23"	5"	Falcon 300, PD 300, PD 340	Fury 220, PD 253R, Raven 3, Swift225
V386	15"	17"	23"	8"	Tandem 421 / 500	Tandem Reserve 360/421



the uninsured

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