

SERIAL #

RAM AIR CANOPY

OWNERS MANUAL

Tandem Main & Reserve, BlackHawk Main & Reserve, NightHawk Main & Reserve

AngelFire Reserve, Mentor, Basix, FireBolt

PARACHUTE LABORATORIES INC.

d.b.a. JUMP SHACK

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GENERAL

INTRODUCTION

Congratulations on the purchase of your new main or reserve canopy from Jump Shack. As you put jumps on your new canopy and get to know it, you will come to realize that you have purchased the most reliable parachute that money can buy. We are sure that it is the most thoroughly engineered canopy available. All of our canopies have been designed using 3-dimensional CAD technology.

This manual introduces you to your new Racer Tandem Main or Reserve, AngelFire Reserve, BlackHawk Main or Reserve, NightHawk Main or Reserve, Basix, Mentor or FireBolt - an introduction you must have before taking to the air with it. So leave yourself plenty of time between getting the canopy and making the first jump on it. Use this manual to help familiarize yourself with your complete system.

WARNING

IT IS ASSUMED THAT INTENTIONALLY JUMPING FROM AN AIRPLANE IN FLIGHT OR FROM A FIXED OBJECT IS DANGEROUS TO LIFE AND LIMB. PARACHUTES DO NOT ALWAYS WORK AS DESIRED. WHEN YOU TAKE IT UPON YOURSELF TO PARTICIPATE IN PARACHUTE JUMPING, YOU ACCEPT THE FACT THAT NO MATTER HOW CAREFUL YOU ARE, OR HOW GOOD YOUR EQUIPMENT IS, YOU CAN BE SERIOUSLY OR FATALLY INJURED.

DISCLAIMER

It is expressly understood and agreed between the seller and the buyer and any subsequent user of this parachute, all or in part, the manufacturer and seller shall in no way be deemed or held liable or

accountable for any failure or damages resulting from failure of the product. Use of this product for any purpose shall constitute waiver to the manufacturer and seller for any damages to person or property directly or indirectly caused by said use. This parachute is sold with all faults and without fitness for any particular purpose, and the manufacturer neither implies nor expresses any warranties or guarantees of the parachute. Use of this parachute for any purpose constitutes agreement between the buyer or user and the seller according to the terms herein. If the buyer refuses the terms of this agreement, he must return the unused parachute to the manufacturer with 10 days of receipt of the parachute with a letter stating why the parachute was returned along with the accompanying invoice showing purchase price.

ABOUT THE MANUAL

We have tried to write this manual, for all Jump Shack canopies. However, it is only current for the serial number shown on the first page. The data contained herein was current at the time of this writing, but the sport advances rapidly. Some of this information may not be true now or especially as time goes on. We reserve the right to change the canopy and its procedures without notice. Prudence requires that you contact us for information on updates if you are using this manual as a guide to service a later generation Jump Shack canopy. Additionally, you may view the most recent version of the Owners Manual at our Internet site WWW.JUMPSHACK.COM

COPYRIGHTS

Jump Shack holds all copyrights to this manual. We grant permission to anyone to reproduce it all or in part for non-commercial purposes. No reproduction of this manual may be sold anywhere without a roy-

ality agreement with Jump Shack. Anyone copying this manual for distribution must do so without charge, excepting the cost of reproduction.

SERIAL NUMBER

The first two digits of the serial number denote the week of manufacture. The third digit denotes the year. The last two digits denote the sequence.

Caution: This manual is serial numbered corresponding to the canopy with which it was shipped.

Technical information in this manual refers only to the canopy of that same serial number.

Record the information from the data plate now, along with the colors of your canopy, in case your gear becomes lost or stolen. Keep the record some place other than your equipment bag.

If you have any question regarding your canopy, this manual, or the procedures described in the manual, contact:

Jump Shack
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TEL (386) 734-5867
FAX (386) 734-8464

TECHNICAL DATA

These Reserve Parachutes are approved under one of the following: Part number SST202 7-Cell Reserve (sizes 97 through 226), has been certificated in the Low Speed Category by the Federal Aviation Administration (FAA) under Technical Standard Order (TSO) C-23(b). It is limited to use in Aircraft under 150MPH. It is additionally limited to use with less than 254 pounds. The AngelFire 245, 280 and

300, and the NightHawk 245, 280 and 300 are certified for a maximum weight of 330 pounds at 180 KTS. This TSO refers to National Aircraft Standard (NAS) 804 published in September, 1949. The 9-Cell and 11-Cell Tandem Reserve are Certified under TSO-C23(c) this TSO refers to AS-8015a published September 30, 1982. To meet these requirements, the manufacturer must submit the design in drawings to the FAA Engineering District Office. The FAA then inspects and certifies the manufacturing facility and approves the quality control of the manufacturing process as described in the manufacturer's manual.

The FAA further assures that the manufacturer will trace and inspect each piece of fabric and hardware he uses during the manufacturing process of the equipment.

Under TSO C-23(b), equipment can be tested to Standard Category (sometimes called High Speed) or Low Speed Category. A rig may be assembled with a Low Speed Category reserve canopy, but then the entire system becomes certificated in the Low Speed Category. (Later installation of a Standard Category canopy restores the system to the Standard Category). Regulations require the rigger to identify the system as Low Speed Category in the appropriate manner when he installs a reserve from that category. Standard Category requires no markings. Performance limitations of the installed canopy should be placarded, in the manner required by the TSO document, for the user's information.

The 9-Cell and 11-Cell reserves certified under TSO C23(c) must conform to AS-8015a. The Racer Tandem Reserve canopies have been tested to 625 LBS @ 175 KTS. Part numbers 12120 & 12121 9-cell reserves of 300 & 265 sq. ft. respectively, have been approved under TSO C-23d which requires conformance to AS-8015b. They are approved for use in dual (main & reserve) containers and are limited to use at 254 lbs. At 150 kts.

ASSEMBLY

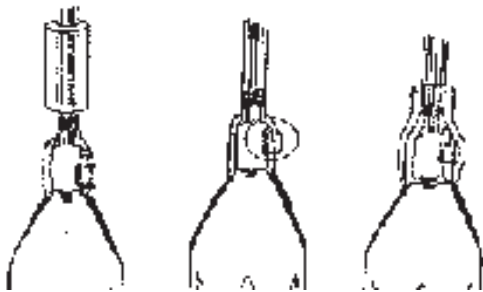
PARTS LIST

Canopy with Attached Lines
Connector Links
Rubber Stow Bands

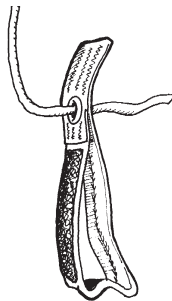
Note: Only U.S. Military Specification R-1832 (Keener Brand) rubber stow bands may be used on Parachute Labs. Products. They are available from Jump Shack.

RESERVE ASSEMBLY

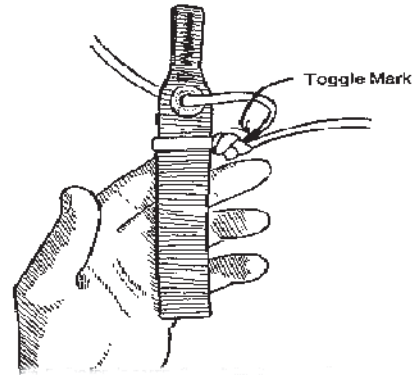
A. Connect the canopy to the reserve risers using appropriately sized Rapide links. For Rapide links, turn under the edge of the riser webbing to buffer it-self and install the links. Turn the barrel nuts until snug plus one-quarter turn.



Instructions For Spectra Line



B. Route the steering line through the guide ring on the riser. Then route it through the grommet on the toggle, starting from the side with Velcro. Wrap the



steering line around the outside of the toggle, over the grommet. The locator mark should be 1 1/4" (3cm) from the side as shown.

C. Slide the line off the toggle and tie a loose over-hand knot in the folded line.

D. Next slide the line back over the toggle and tighten the knot. The idea is to use the width of the toggle as a measuring guide for the size of the loop. The locator mark on the line should be just to the



outside of the knot, away from the toggle.

E. Pull the knot up to the grommet. Daisy chain the excess end of the steering line. Don't cut the excess

OPERATIONAL LIMITATIONS

CYCLIC INSPECTIONS

The Federal Aviation Administration requires that all parachute systems in use for emergency circumstances be inspected every 120 days. You, as the user of this equipment, should be familiar with and check these items.

PERSONNEL QUALIFICATIONS

Only a currently FAA licensed rigger may assemble, inspect, pack, and certify a reserve as airworthy. Riggers are required to have *this* manual available to them while servicing this canopy. Per the FAA regulations you must be familiar with any type of reserve parachute you wish to certify. The main canopy and its accessories may be assembled and packed by you or a licensed rigger.

The FAA states that minor repairs may be done by a Senior Rigger and major repairs must be done by a Master Rigger. They further define minor repairs as anything that does not affect the airworthiness of the equipment, and major repairs as anything that does affect the airworthiness. This regulation/policy is subjective and open to discussion. You as the owner and your rigger should discuss the required repair and make the best decision you can. If there is still some question call us.

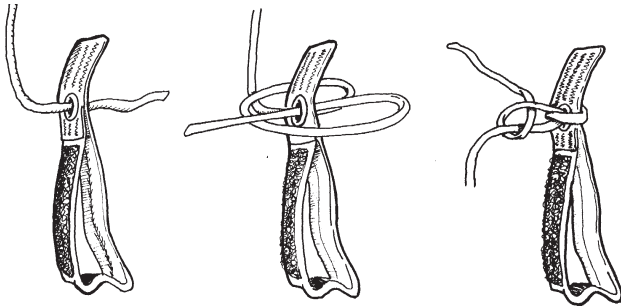
MAINTENANCE & REPAIR PROCEDURES

The best guide for the execution of general repairs to be performed on parachutes is “The Parachute Manual” by Poynter. When performing periodic inspection to your canopy the relative line lengths should be noted. A differential of more than one inch should be cause for rejection and subsequent correction before return to service. Any broken fibers or threads should be repaired or replaced. Stains must be identified and documented. They should be removed if possible without damaging the fabric. Generally only acidic entities are harmful to nylon therefore a pH test is an appropriate method of determining if a stain is harmful.

off, as you may wish to change the toggle setting slightly at some time.

Instructions for Dacron or Polyester line.

A. Route the steering line through the guide ring on the riser.



the riser.

Then route it through the grommet in the toggle, starting from the Velcro side.

B. Then route the steering line around the toggle on the right side and then back through the grommet.

C. Now route the steering line around the toggle on the left side and then back through the grommet.

D. Adjust the line so that the toggle mark is on the line exiting the grommet going to the canopy, at the base of the grommet, on the Velcro side of the toggle. Pull out all the slack while maintaining the toggle mark position.

E. Tie an overhand knot in the steering line and cinch it down against the toggle.

TANDEM CANOPY ASSEMBLY

All canopies should have a rubber stow band attached to the line attachment point of one of the inboard “C” lines. The center of the slider should be stowed in this retainer during packing. The purpose of this retainer is to prevent the slider from coming down the lines prematurely. It is a good idea to do this to any canopy.

Other canopies may require that the stow band be located on the “B” line. This may be determined by pulling the center of the slider up into the center of the air channel with the slider grommets firmly against the slider stops. Observe where the point 3 to 4 inches from the center point of the slider falls, and locate the stow band on the nearest line attachment point.

SPECIFICATIONS

Canopy & P/N	Cells	Sq. Ft.	Chord	Span	Aspect	Average. Peak Force	Pack Volume
AngelFire 97 P/N 11001	7	97	6.5'	15.5'	2.32	3465	286 Cu. In.
AngelFire 114 P/N 11002	7	114	6.9'	16.0'	2.32	3465	312 Cu. In.
AngelFire 125 P/N 11003	7	125	7.8	17.5'	2.32	3465	312 Cu. In.
AngelFire 150 P/N 11004	7	150	8.3	18.0'	2.32	3465	390 Cu. In.
AngelFire 180 P/N 11005	7	180	9.25'	19.5'	2.32	3465	416 Cu. In.
AngelFire 200 P/N 11006	7	200	9.75'	20.6'	2.32	3465	468 Cu. In.
AngelFire 228 P/N 11007	7	228	10.4'	22.0'	2.32	3465	520 Cu. In.
AngelFire 245 P/N 11008	7	245	10.8'	22.75'	2.32	3800	546 Cu. In.
AngelFire 280 P/N 11009	7	280	11.5'	24.3'	2.32	3800	598 Cu. In.
AngelFire 300 P/N 110010	7	300	11.9'	25.2'	2.32	3800	702 Cu. In.
NightHawk 245 P/N 11008NH	7	245	10.8'	22.75'	2.32	3800	546 Cu. In.
NightHawk 280 P/N 11009NH	7	280	11.5'	24.3'	2.32	3800	598 Cu. In.
NightHawk 300 P/N 110010NH	7	300	11.9'	25.2'	2.32	3800	702 Cu. In.
BlackHawk 265 P/N 12121	9	265	10.1'	26.8'	2.65	3692	580 Cu. In.
BlackHawk 300 P/N 12120	9	300	10.75'	28.5'	2.65	3600	702 Cu. In.

Line Differential Specifications

	A to B	A to C	A to D
AngelFire 97 P/N 11001	2.2"	7.3"	14.5"
AngelFire 114 P/N 11002	2.3"	7.9"	15.6"
AngelFire 125 P/N 11003	2.5"	8.3"	16.4"
AngelFire 150 P/N 11004	1.6"	7.2"	15.8
AngelFire 180 P/N 11005	2.2"	8.2"	17.7"
AngelFire 200 P/N 11006	2.4"	8.8"	18.5"
AngelFire 228 P/N 11007	2.6"	9.6"	20.1"
AngelFire 245 P/N 11008	2.5	9.5"	20.4"
AngelFire 280 P/N 11009	2.7"	10.2"	21.9"
AngelFire 300 P/N 110010	2.8"	6.8"	18.9"
BlackHawk 265 P/N 12121	2.75"	9.15"	18.9"
BlackHawk 300 P/N 12120	2.75"	9.3"	19.3"

INSPECTION INSTRUCTIONS

Your Parachute Labs reserve must be inspected thoroughly at the time of its initial assembly and at every Inspect & Repack Cycle. The preferred method of inspecting your ram air parachute is to hang the parachute up by the tail so that you can see the entire top and bottom skin. This will make the line continuity check easier too. Clamps attached to a spreader bar that is at least the width of the canopy make this job a cinch.

An FAA certificated rigger must inspect your new Parachute Labs reserve and determine its compatibility with your rig. The inspection should be done in a clean, well lit area that will allow the canopy to be completely spread out.

VISUAL INSPECTION

It's best to inspect your reserve in a careful, systematic way. We recommend starting at the top of the canopy and working down to the risers as described below:

1) TOP SURFACE: Hang the canopy or spread the canopy out on its bottom surface and inspect the top surface starting at the front of the left end cell. Check half of the cell from nose to tail. Then check the other half cell going tail to nose. Repeat this pattern until all the cells top surfaces are inspected. Look for rips, stains, or failed seams.

2) BOTTOM SURFACE: Again use the procedure of inspecting half cells as on the top surface. Check for rips, stains and failed seams. Look very closely at the line attachments. Even slight damage is cause for rejection in these areas. Line attachments must be completely free of any damage or defects.

3) INSPECT EACH RIB: From leading edge to the trailing edge by looking inside each cell. Pay extra attention to the line attachment points.

4) Check that all lines in each line group are the same length and that the trim differential between each line group is correct for this reserve. This can be done while the canopy is in the hanging position or with the canopy neatly laid out on its side. Check the condition of the stabilizers and slider stops on the stabilizer.

5) SUSPENSION LINES: Check the full length of each line for damage and wear. Look for fraying at all cascades and where each line attaches to the connector link. Check that all lines are sewn and that the stitching is good. Check the continuity and routing of each line.

6) SLIDER: Be sure the fabric isn't torn, that the grommets are undamaged and have no sharp edges, and that they are securely attached to the slider. Be sure every suspension line and both steering lines pass through the proper grommet on the slider.

7) RISERS & LINKS: Be sure the barrels of the connector links have not moved by checking the match marks. Visually check the match mark and link condition. If the match mark is still intact and the link is not bent or damaged, the link is OK for continued service.

If the upper and lower parts of the mark become misaligned, then the barrel has shifted. Should this happen, the link must be immediately disassembled, cleaned and inspected. If no damage has occurred, the riser/link/line/slider bumper assembly may be reattached .

Ensure that the slider bumpers located on the connector links are the correct ones, are positioned correctly, and are properly tacked to the links.

The toggles must be installed correctly and must match the guide ring and Velcro on the risers. Parachute Labs canopies come with brake settings and

toggle tie-on marks set for PIA standard riser/brake dimensions. This standard calls for 4 inches (10.2 cm) from the top of the riser to the top of the brake-setting ring. If there is a differential of more than 1 inch (2.5 cm), from this standard the canopy must be modified. This modification may only be done by a master rigger and must be reported to

Parachute Labs, Inc. In addition, any changes must be marked on the canopy's data panel.

8) THE REST OF THE ASSEMBLY: Follow the instructions in the harness/container manufacturer's owners manual to inspect the rest of your parachute system.

Setting Brakes on the FireBolt

The outer steering line from the wingtip has a brake eye; the inner steering line does not. Prevent these from getting twisted for easier inspection and packing.

Pull the outside steering line down below the guide ring. Insert the nose of the toggle through the brake eye of the outside steering line.

Pull up on both steering lines to eliminate slack and to check that brakes have been set properly. Excess steering line can be stowed in the Velcro keeper, or by looping it through the top of the riser and around the nose of the toggle (with metal links only). If soft links are used, it is not advisable to loop the excess through the top of the risers, as the line can get caught on the tab of the soft links.

Jump Shack Risers have a loop located on the front of the rear riser, made of $\frac{3}{4}$ " Type 3, for the purpose of providing a place to stow excess steering line. The nose of the toggle is then inserted into the elastic keeper on the riser.



Excess line stows neatly, and releases with “normal” pull force.



Jump Shack

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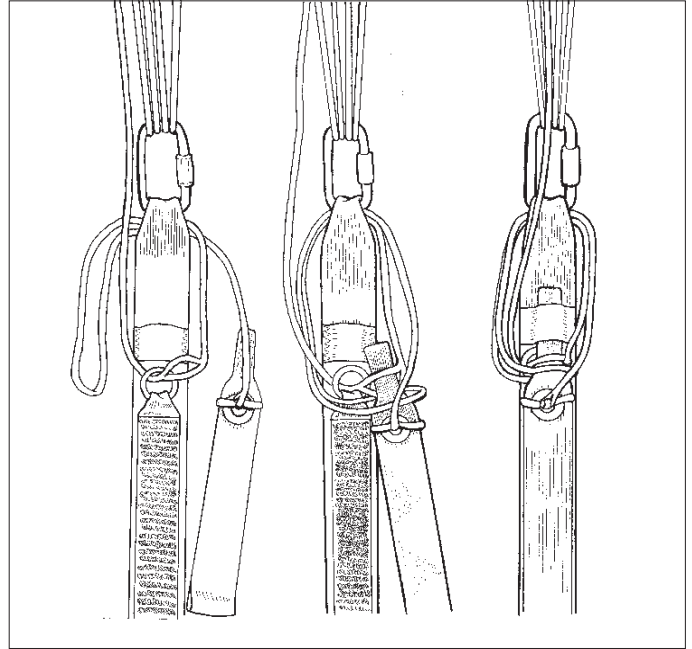
RESERVE PACKING INSTRUCTIONS

CRITICAL POINT

Compatibility—Make sure the canopy you're packing is the right size for the rig it's connected to. Even if it was in there before, someone else's mistake will become yours when you sign the packing data card.

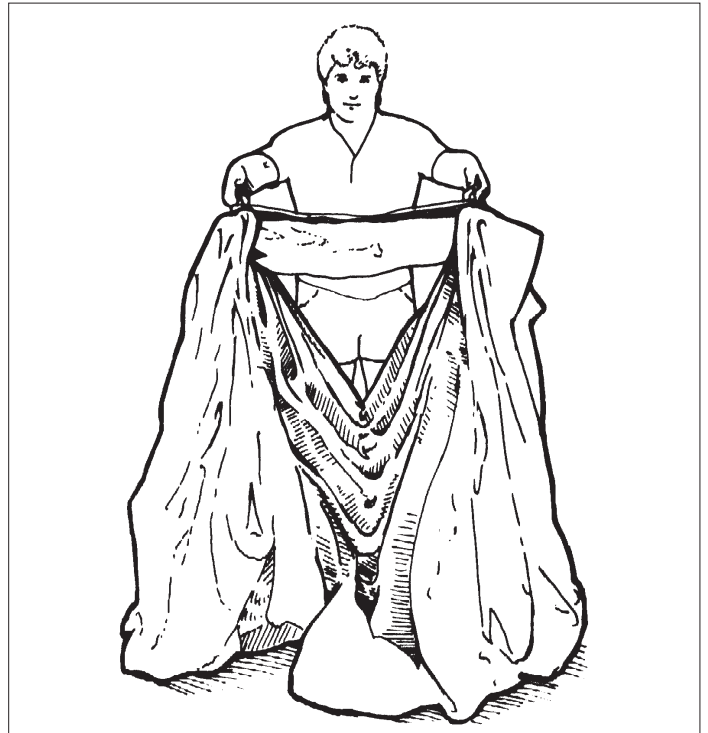
SETTING BRAKES :

- A.** Pull the steering line through the guide ring mounted on the riser down to the eyelet provided in the steering line.
- B.** Fold the excess in half and insert through slot in top of riser.
- C.** Place the loop made by the excess over and in line with the brake eyelet.
- D.** Insert the toggle through the loop in "C." and then through the brake eyelet.
- E.** Insert the toggle into it's elastic keeper and seat it to the mating velcro on the riser.



FOLDING CANOPY:

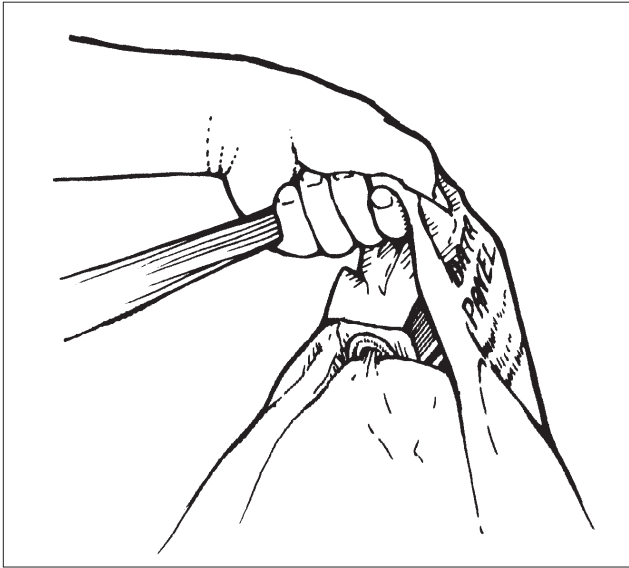
- A.** Separate the four line groups below the slider and walk the slider up toward the canopy while lifting the canopy off the floor. Seat the slider grommets against the slider stops.
- B.** Hold all the lines in one hand while standing, and organize the nose. It should now face the container. With "HANDS ON" trace and clear the perimeter of the canopy pulling all stabilizers toward the outside of the bundle.



RESERVE PACKING INSTRUCTIONS

NOTE: This process is similar to the flaking of a round canopy and must be done with care as panels not cleared could cause a malfunction.

C. Place the center tab of the tail under your thumb as shown



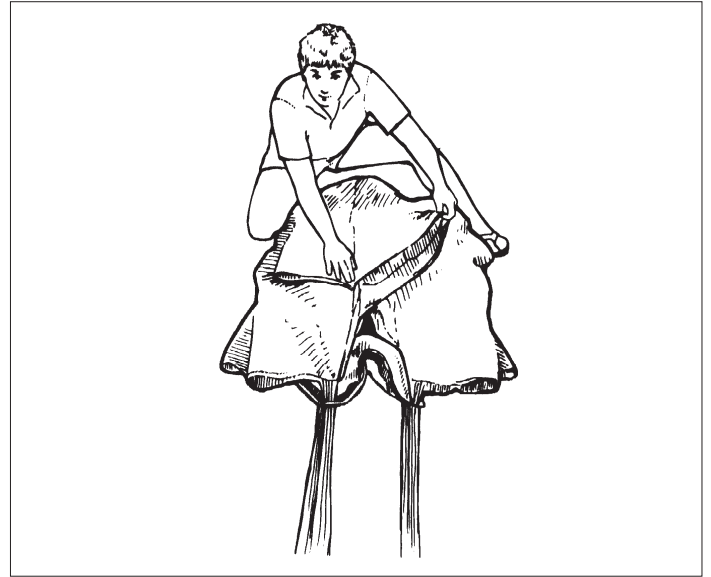
opy and lay it on the floor. The bundle will spreadout widely, but neatly.



D. Sweep your forearm under the nose of the can-

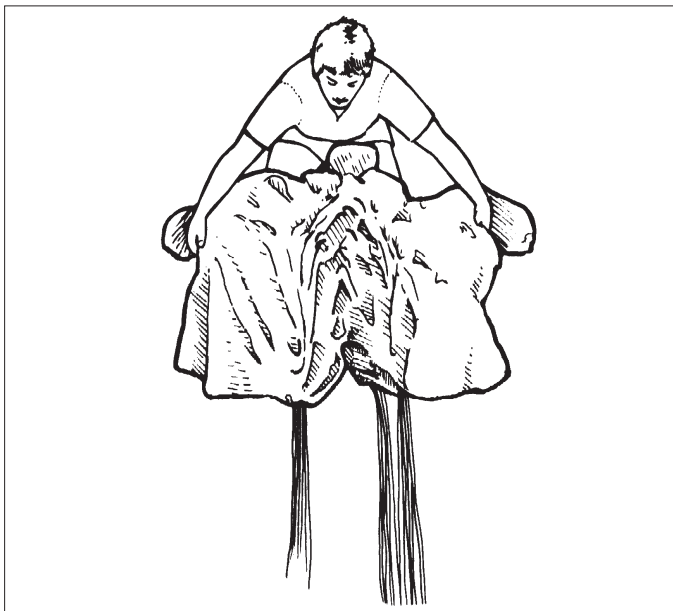


E. Kneel at the top of the canopy facing the container. Draw the canopy toward you while at the same time narrowing the bundle to the width of the bag. Constantly work the fabric away from the links.



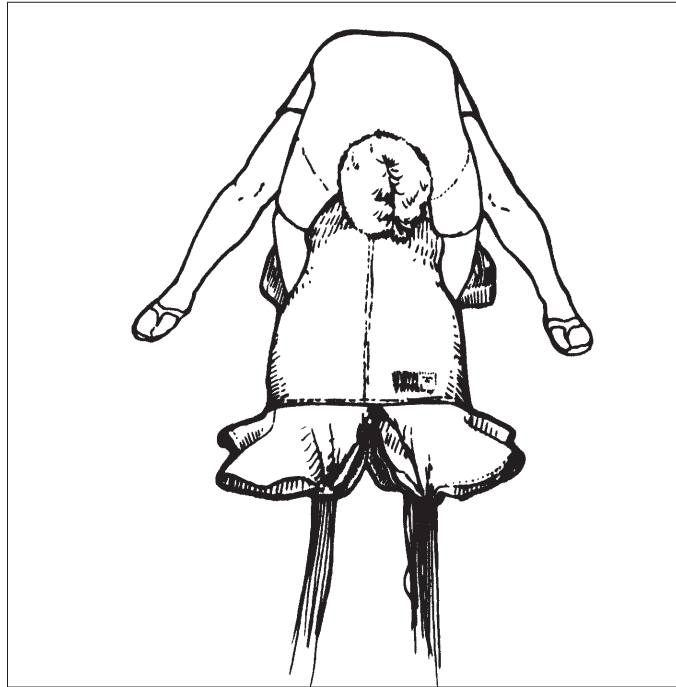
F. Pull the center tab of the tail to the top exposing the air channel.

G. Fold one-half of the tail over the bundle to inspect the stabilizer folds. Dress the tail, stacking all chord seams neatly over the center line (air channel) and neatly lay all stabilizer and tail fabric to the outside. Repeat with other half of tail back to the center. Stow the slider in its rubber band.



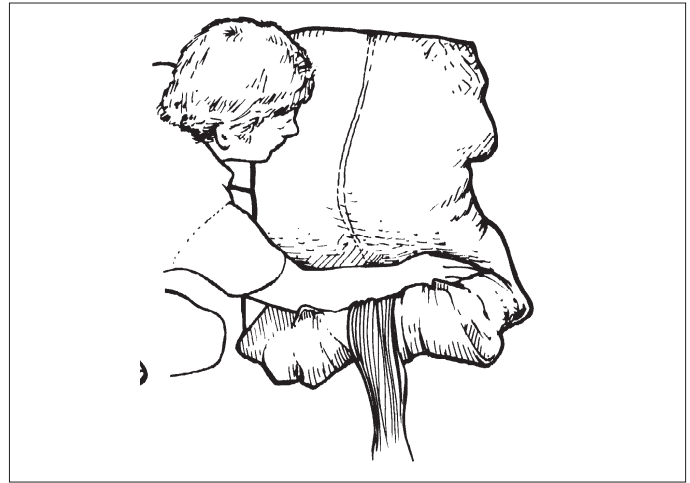
H. Return the center tail tab to the bottom center of the bundle. Where the stabilizers attach to the main body of the canopy. “Cocoon” the canopy to the width of the bag.

NOTE: Care must be taken during the cocooning process so as not to disturb the air channel and lines of the canopy.

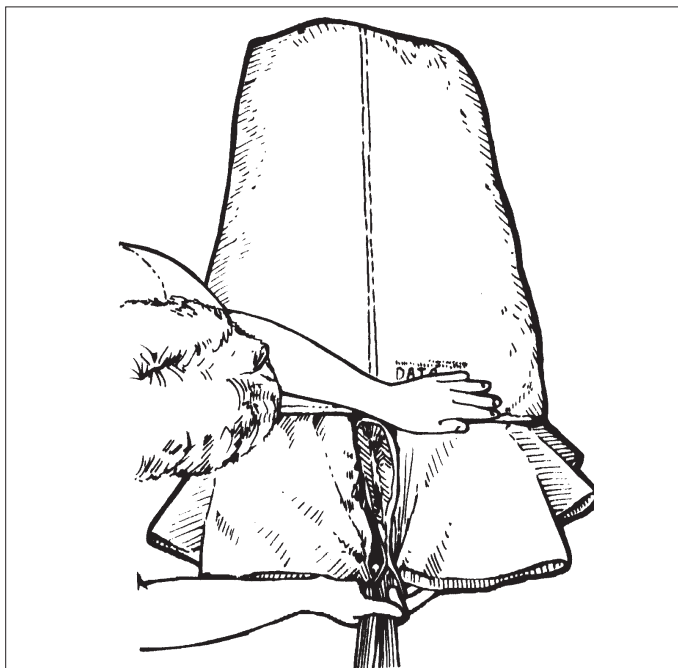


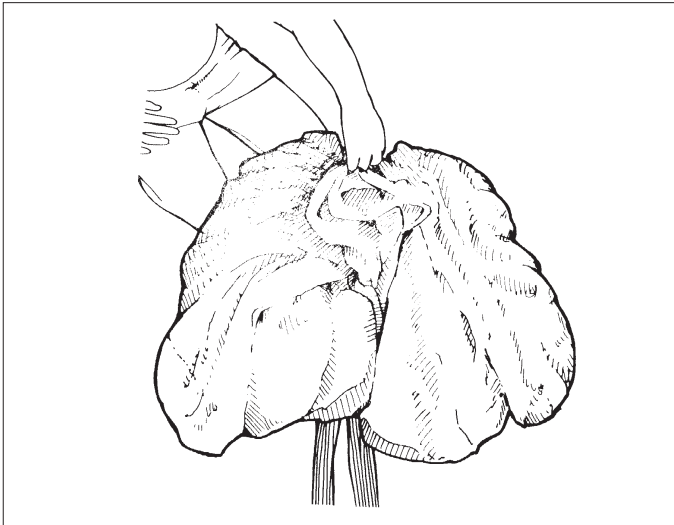
I. Fold the exposed stabilizers back under the tail. Lay your hand 6"-8" from the bottom of the bundle and fold the canopy back over itself.

J. Fold each section of the nose outward from the center so it takes air quickly during deployment.

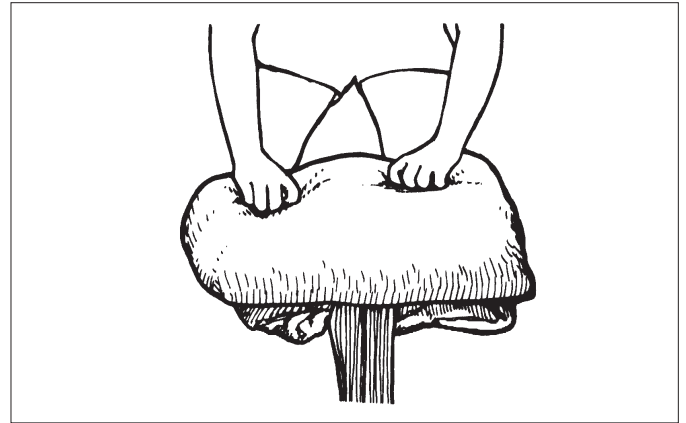


K. Fold the canopy back over so you now have an 8" S-fold at the bottom. The length and number of S-folds may vary according to the distance between the vertical partition that separates the main and reserve containers, and the grommet in the bottom flap of the reserve container.



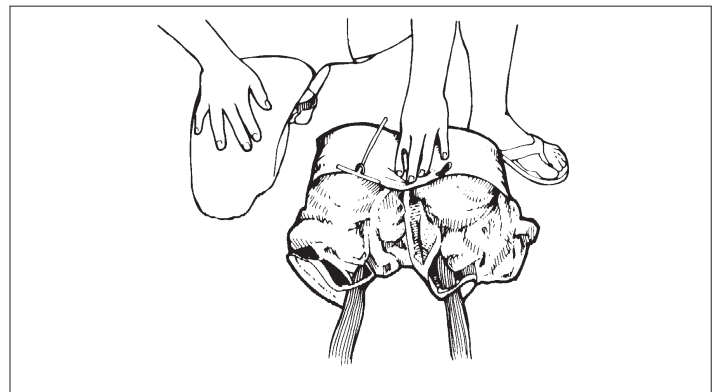


L. Tuck the remainder of the canopy under the bundle until it is the height of the bag.



PLACING CANOPY INTO BAG:

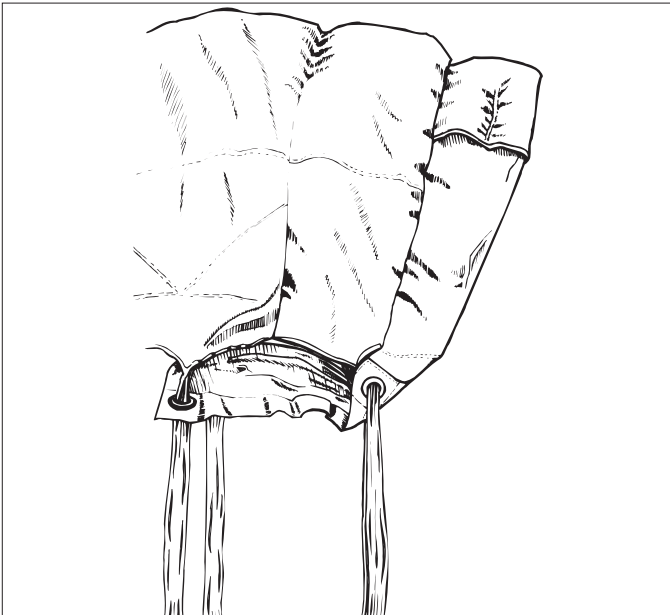
A. Face away from the container and kneel on the packed canopy to keep it under control. Shape the bundle to resemble the bag, prepare the bag and install the canopy into it. The canopy must be folded to mimic the length, width and thickness of the container.



Tandem Specific Instructions

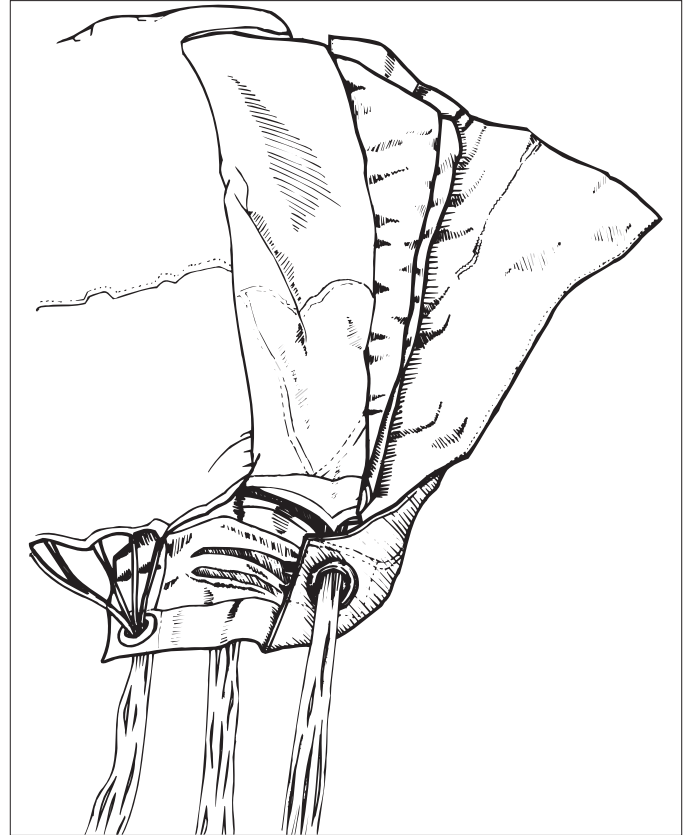
FLAG SLIDER INSTRUCTIONS

Pull the slider up to the stops in the same manor you would for a non-flagged slider. Continue to pull the flag portion up towards the top of the canopy until the flag is straight and the grommets are against their stops. The pockets of the flag should be pointing out or exposed. Fold the canopy using the procedure you are most comfortable with, PRO or Side packing. Roll or fold the nose and make the A to B Fold if you are side packing.



NOTE: The purpose of the flag is to cover the nose during deployment and for the pockets on the flag

to inflate and hold the flag in place covering the nose and slowing inflation.



PERMANENT HISTORY RECORD

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