

# *Butler Parachute Systems, Inc.*

## **High Speed Deployment Bag Assembly and Packing Instructions**

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<b>Title</b>	Back Pack Assembly and Packing Instructions
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1.0	Initial Release	1/1/00	Manley Butler
2.0	Revision A	3/25/19	Roberto Montañez
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### List of Effective Changes

The portion of the text affected by the changes to the preceding released document are indicated by a black vertical bar in the left outer margins of the page.

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Since we have no control over the actual conditions of usage we make no guarantee, expressed or implied, that a parachute system will successfully save a particular individual regardless of correct manufacture, assembly, packing and usage in any and all conditions under which it might be used.

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## **Warranty for Emergency Parachute Systems**

Butler Personnel Parachute Systems, Inc. (hereafter referred to as BPS) manufactures the finest emergency parachute systems in the world. Accordingly, subject to the Terms & Conditions set forth below, we warrant that our emergency parachute systems are free from defects in materials, workmanship and design for a period of five years from the date of manufacture.

### **Terms & Conditions of Warranty**

This warranty excludes any condition that (in the sole opinion of BPS) has resulted from misuse, abuse, modification, improper maintenance, neglect, exposure to ultraviolet light, damage from aircraft parts and/or any other condition that is outside the realm of normal usage. Usage of this product in a manner that violates state or federal law is a misuse of the product and voids all warranties, express or implied. BPS shall not be liable in any manner whatsoever for damages related to the use of this product in an illegal manner.

This warranty excludes any condition related to color fastness, fading and/or the matching of any particular lot of materials with any color.

All BPS products have been thoroughly tested and found to be in conformance with all applicable FAA requirements for TSO C-23 certification in effect on the date of authorization. However, since we have no control over the actual conditions of usage, this warranty specifically excludes any guarantee, express or implied, that a parachute system will successfully save a particular individual in all conditions under which it might be used.

This warranty covers the product only when it is used in accordance with the manufacturer's instructions and within the stated and/or placarded operating limits regarding maximum pack opening airspeed and maximum gross weight for the lowest rated component of each assembly. Failure to follow these guidelines for the use of the product voids any and all warranties.

This warranty does include any changes that may be required under BPS Service Bulletins or FAA Airworthiness Directives, if issued. It does not include changes or updates that are recommended but not required.

The warranties and agreements herein set forth are exclusive and are expressly in lieu of all other warranties and agreements, express, implied, or statutory. There are no implied warranties of merchantability, workmanship or fitness for a particular purpose.

The customer's sole and exclusive remedy for any breach of this warranty is limited to repair or replacement of any BPS product deemed to be defective. BPS shall have no other liability for any incidental, consequential or punitive damages.

## 1. Introduction

The following symbols are used throughout this manual:



**WARNINGS** indicate a procedure or situation that may result in serious injury or death if instructions are not followed correctly.



**CAUTIONS** indicate any situation or technique that will result in potential damage to the product, or render the product unsafe if instructions are not followed correctly.



**NOTES** are used to emphasize important points, tips, and reminders.



Butler Parachute Systems, Inc. reserves the right to revise this publication without obligation to provide notification of such changes. Butler Parachute Systems, Inc. does its best to provide current and accurate information in this manual. However, Butler Parachute Systems, Inc. reserves the right to change any specifications and product configurations at its discretion without prior notice and without obligation to include such changes in this manual.

The Butler High Speed Deployment Bag is a bag-type deployment device designed to control the canopy when it deploys with a more evenly staged and predictable sequence than a conventional canopy diaper deployment system. This deployment bag offers more performance in a high speed environment than the diaper deployment system.

All deployment bags manufactured by Butler Parachute Systems are designed and made for a particular container. The deployment bag is made to match the shape of the container. There are two different methods used to place the deployment bag into the container. Which method you use depends on the shape of the container. The methods are:

- *Standard Placement* - This is the most common design and is used when the container shape has a uniform thickness, or is thick at the bottom, and tapers to very thin at the top of the container.
- *Inverted Placement* - This method is used when the container is thick at the top, and tapers to very thin at the bottom of the container.

This manual is required to pack a Butler Back Pack that is equipped with a deployment bag. You will also need the manuals titled:

- *Butler Personnel Canopies, Assembly and Packing Instructions*
- *Butler Back Type, Personnel Parachute Container, Assembly and Packing Instructions*
- *General Information for Parachute Riggers*

You may need additional manuals to service the parachute system if it has options requiring maintenance and service that are not covered in these manuals. Contact Butler Parachute Systems if you are not sure you have the manuals you need. **DO NOT ATTEMPT TO PACK THE PARACHUTE WITHOUT A COMPLETE SET OF INSTRUCTIONS.**

The High Speed Deployment Bag is an important piece of survival equipment. Proper installation, maintenance and packing are necessary for the parachute to deliver the safety performance it is designed to provide. It is important that you become familiar with these instructions to properly install the components, fold the canopy and pack the canopy in the container. Improper installation of the components and improper packing may result in failure of the parachute system during use.

## 2. Rigger Responsibilities

We spare no effort in making our equipment the finest emergency parachutes available. However, parachute riggers in the field must also do their part to educate the user so he or she may fully benefit from the level of safety protection our systems offer. Parachute riggers should help the user understand his or her parachute and how to use it. We recommend that you become familiar with the User Guide and answer any questions the user may have. We also recommend that you allow the user to don the parachute and pull the ripcord before each repack.

All routine maintenance and minor repairs that do not affect airworthiness may be performed by an FAA licensed Senior Parachute Rigger (or foreign equivalent) with the proper facilities and equipment.



Major repairs or alterations that may affect airworthiness must be returned to butler parachutes or a designated representative.



It is the rigger's responsibility to ensure that the ripcord pull force is at or below 22 pounds for each assembly and each repack every time you work on the parachute.



Improper use or negligent care of this equipment can cause serious injury or death.

## 3. General Methods

Unless stated otherwise, secure all hand tacks and ties with a surgeons knot and locking knot.

All directional references are as the equipment is worn by the user.

Always count your tools before and after you work on a parachute to ensure nothing is missing and left inside the parachute.

Butler Parachute Systems recommends that the four locking rubber bands on the deployment bag be replaced at every repack cycle.

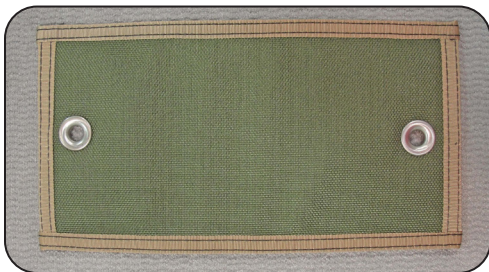
### 3.1 Closing Loop Length

All BPS packs use adjustable soft closing loops. In general, the closing loops should be short enough to fully compress the pilot chute and keep it firmly in place. This not only ensures that the spring will get a good solid launch, but it will also keep the spring from shifting off center. For an initial assembly of a parachute, the force to pull the loops up, and insert the pins, can be quite high and still result in a pull force within limits (22 lb.) after several days. This is because the pack tray area where the loops are attached changes shape under the tension from the loops, allowing the loop tension (and thus the pull force) to drop off. This effect only occurs after the initial assembly and packing or an extreme increase in the loop tension. You may have to adjust the length of the closing loops to achieve a neat/uniform pack and a pull force that is at or below 22 pounds.

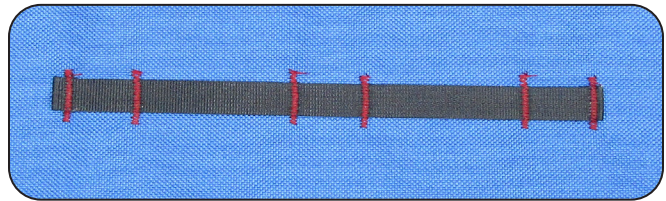
The only material approved for the closing loops is 225 lb. braided Dacron cord\* unless a CYPRES Automatic Activation Device (AAD) is installed.

\* If the system you are packing has a CYPRES AAD installed, you must use closing loops made with CYPRES approved material (408 pound, 1.7 mm Spectra cord).

Use the appropriate method to make closing loops for the type of closing loop anchor that is fitted to the system you are packing.



Base plate anchor.



Type 4 tape anchor.

#### 3.1.1 Closing Loop for Type 4 Tape Anchor

Form a loop using a double overhand knot with a 1 1/2" to 2" tail.



### 3.1.2 Closing Loop for Base Plate Anchor

If you are packing a system with a CYPRES AAD installed you must use closing loops made with CYPRES approved material (408 pound, 1.7 mm Spectra cord). Make the closing loop as outlined in the Airtec publication titled CYPRES Rigger's Guide for Installation.

If you are packing a system that is not equipped with a CYPRES AAD, use 225 lb. braided Dacron cord and make the loop as outlined below.

#### 3.1.2.1

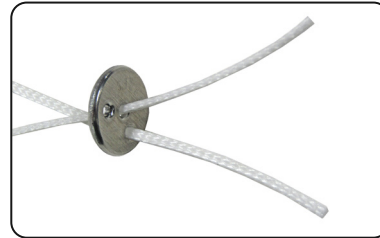
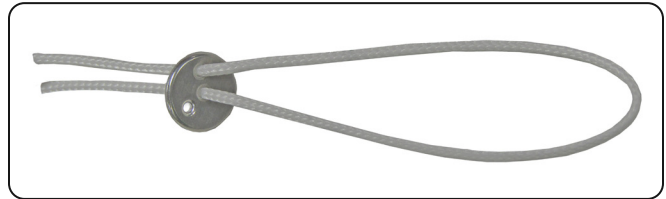
You must use a CYPRES disc if the system you are packing is fitted with a base plate anchor.



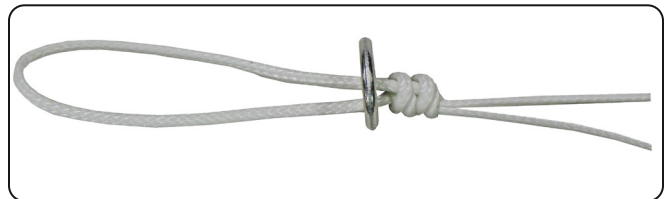
cypres disc, PN: aadcriwa1g

#### 3.1.2.2

Thread one end of the dacron cord through the center hole in the disc and the other end of the cord through one of the side holes.



Form a loop using a double overhand knot with a 1 1/2" to 2" tail.





## 4. Tools and Materials

We consider the following tools to be the minimum tools necessary to pack a complete emergency parachute system. While all the tools listed may not be necessary to perform the steps outlined in this manual, they are necessary to perform the packing service of a complete emergency parachute system from start to finish.

•	Temporary pins* with safety flag
•	Pull-up cords*, 50", made from CYPRES closing loop material
•	Packing weights, 4 minimum
•	Line separator (Optional)
•	Packing paddle
•	9mm or 3/8" wrench
•	Scissors & tacking needle
•	Lite Super Tack** cord (50 lb.) A-A-52080, Type 1, Size 3, Finish B
•	80-pound break tape (MIL-T-5661, Type 1, 1/4")
•	Closing loop material* (225 pound braided Dacron cord)
•	Stow Band, Rubber Band***, 1 1/4" X 3/8", <a href="#">Paragear PN: S7111</a>
•	Lead seal and thread

\* If the system you are packing has a CYPRES AAD installed, you must use closing loops made with CYPRES approved material (408 pound, 1.7 mm Spectra cord), CYPRES pull-up cords, and CYPRES closing pins.

\*\* Super Tack size 2 (80 lb.) is approved for use as an alternative.

\*\*\* Tube Stows for micro line, PN: Microbulk-nat, are approved for use as an alternative.

Required for initial assembly of an HX-series high speed canopy.

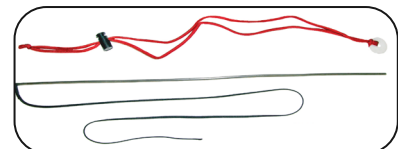
- Cable bodkin, PN: 801157 (or gun cleaning rod)
- Mil-T-5038, T3, 1/2" x 10"
- 3-cord cotton (15 lb.), ticket 8/4, A-A-52094B, Type V, Tex 270



Cable Bodkin

Additional tools required for packing a system with a deployment bag.

- 18" bodkin with 40" pull-up cord attached
- Locking pull-up cords with washer



## 5. Deployment Bag Assembly

The deployment bag assembly is the same for both the HX-series canopies, and the Lopo-series canopies. Assemble the canopy as outlined in the manual titled *Butler Personnel Canopies, Assembly and Packing Instructions* and stop at the end of Chapter 6. Proceed as follows.

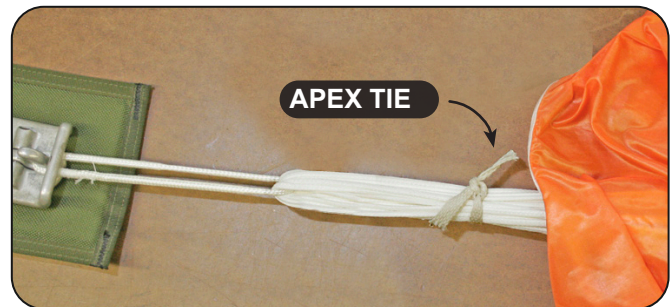
### 5.1

Straighten the canopy apex.

Tie the vent lines with a piece of 80-pound break tape 4" to 6" from the top of the apex lines.



Make this tie as tight as possible.

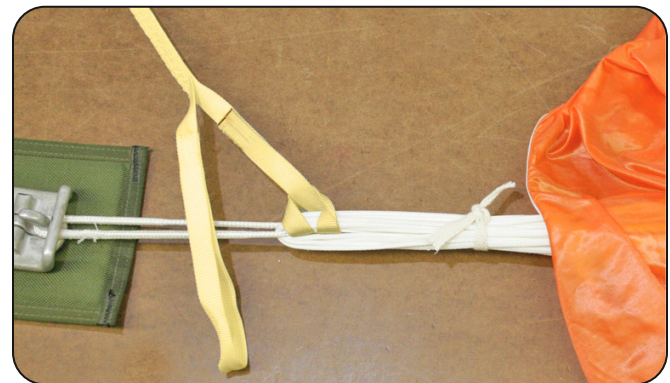


5.1 Apex tie.

### 5.2

The zip-strip bridle splits at one end with two looped ends.

Attach the zip-strip bridle to the apex with a Lark's Head knot.

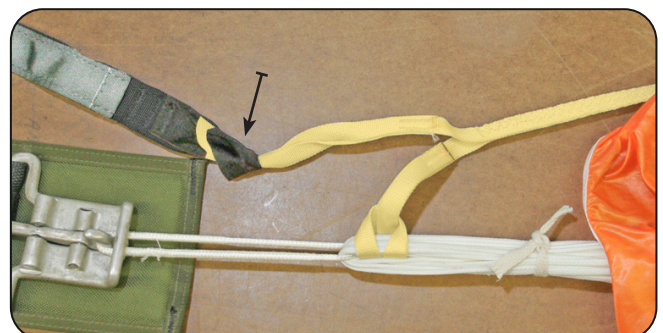


5.2 Attaching the zip-strip bridle to the apex.

### 5.3

Attach the channel bridle to the zip-strip bridle with a Lark's Head knot.

Do not tighten the knot as you must pass the break loop through the knot.



5.3 Attaching the deployment bag bridle.

5.4

Thread the T3, 1/2" break loop material through the Lark's Head knot on the channel bridle, then through the apex lines and the zip strip Lark's Head knot.

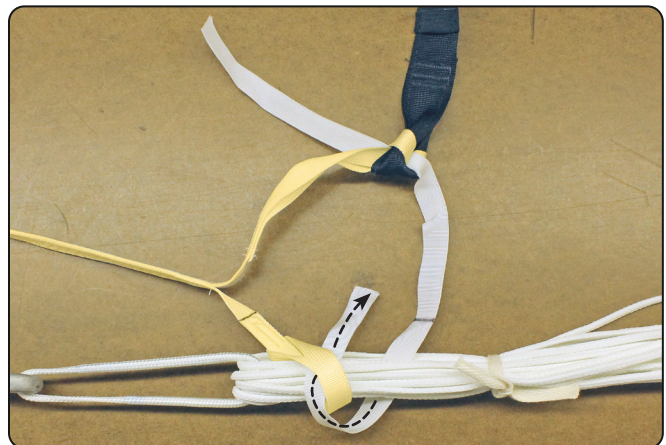


5.5

Form a 2"\* loop with the tape and tie with a square knot.

Tie an overhand knot on each free end of the tape.

Tighten the Lark's Head knot on the bridle.

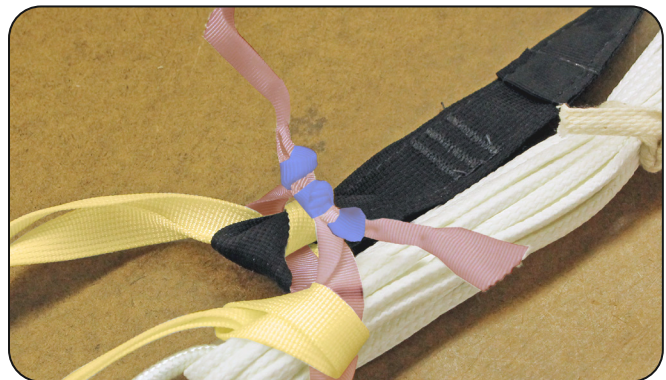


5.4 Threading the break loop.

\*Measured distance when extended.



Ensure that when tensioned from the channel bridle, the tension is placed on the 2" loop and not the yoke in the zip strip.



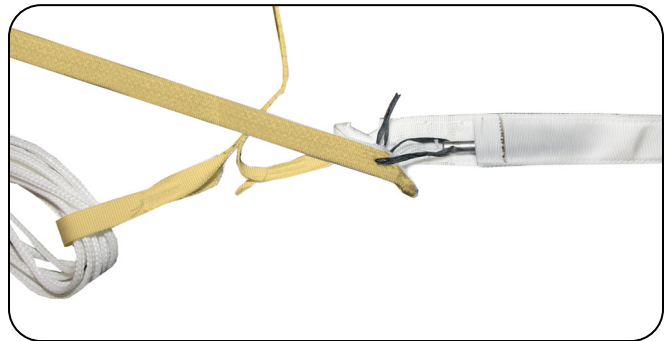
5.5 Tying the break loop.

5.6

Insert a 6' bodkin through the channel on the channel bridle from the top.

Thread a piece of tack cord through the hole in the bodkin and through the tip of the zip-strip bridle.

Pull the zip-strip bridle through the channel.



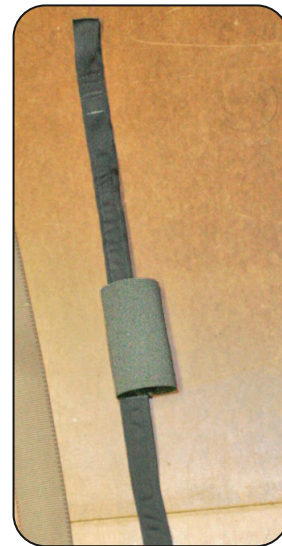
5.6 Threading the zip-strip bridle.



Be sure the zip-strip bridle is flat and has no twists in it before you begin to thread it through the channel.

5.7

Thread the channel bridle keeper onto the channel bridle.



5.7 Installing the channel bridle keeper.

5.8

Thread the end of the pilot chute bridle with the 3" loop through the deployment bag.



5.8 Pilot chute bridle through the deployment bag.

5.9

Thread the pilot chute bridle through the loop in the channel bridle and back through the top of the deployment bag.

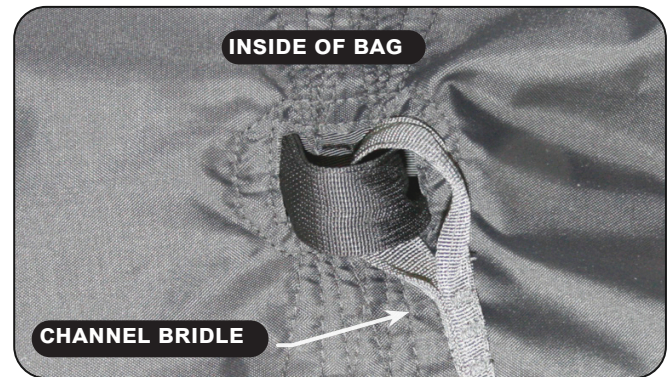


5.9 Connecting the bridles.

5.10

Thread the free end of the pilot chute bridle (the end with the 7" loop) through the 3" loop to form a Lark's Head knot around the apex of the deployment bag.

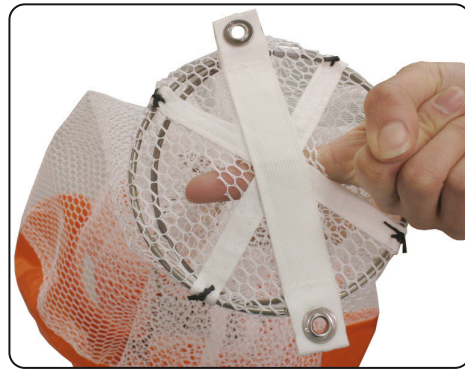
Tack the Lark's Head knot with one-turn-single of Super Tack cord.



5.10 Connecting the bridles.

5.11

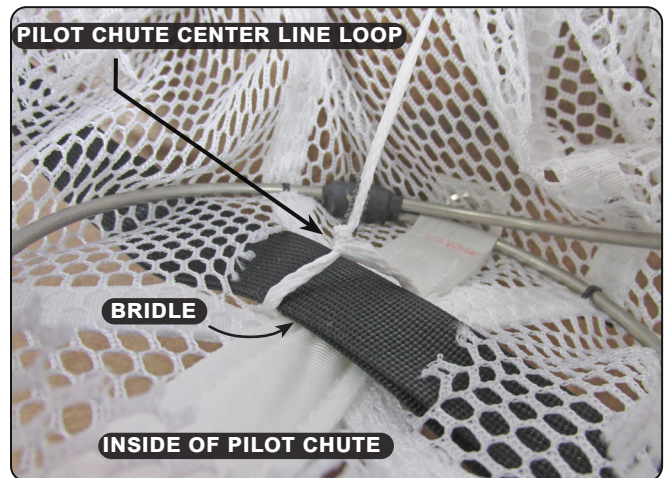
Cut two 1" slits in the mesh at the base of the pilot chute. Cut one slit on each side of the grommet tab.



5.11 Cutting the pilot chute mesh.

5.12

Thread the free end of the bridle around the bottom grommet strap on the pilot chute, and through the pilot chute center line loop.

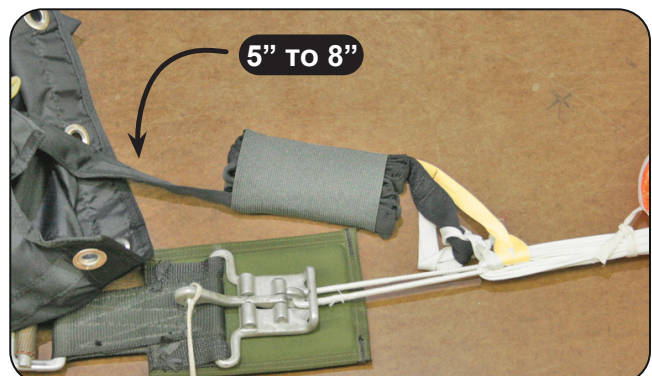


5.12 Threading the bridle.

5.13

S-fold the channel bridle and stow it in the channel bridle keeper.

Leave approximately 5" to 8" of the channel bridle outside of the keeper.



5.13 Stowing the bridle.

## 6. Standard Placement

It is important to distribute the bulk of the canopy evenly in the deployment bag. As you are S-folding the canopy into the deployment bag, fill the area between the grommets with enough canopy to fill out the corners of the bag and provide enough volume in each section for a smooth and even pack.

### 6.1 Standard Placement - Stowing the Canopy in the Deployment Bag

#### 6.1.1

Fold the canopy in thirds.

Stow the canopy into the deployment bag with the suspension line flutes facing up.

S-fold the canopy into the deployment bag with the apex in the upper corner of the deployment bag.

Fill the deployment bag with canopy folds to the first grommet.



6.1.1 Stowing the canopy.



Make your folds a little wider than the deployment bag to ensure that the bag fills evenly with no empty spaces at the edges.

#### 6.1.2

Thread a locking pull-up cord through the top and bottom grommet and install a washer on the pull-up cord with the washer on the bottom of the bag. Secure the washer with a Lark's Head knot.

Cinch the slip cord lock snug against the bag.



6.1.2 Installing the locking pull-up cord.

### 6.1.3

Fill the deployment bag with canopy folds between the first and second grommets. Install a locking pull-up cord through the grommets (2-pin container shown).

If you are packing a 3-pin container, continue to fill the deployment bag with canopy folds between the second and third grommets. Install a locking pull-up cord through the grommets.




6.1.3 Folding the canopy into the deployment bag.

### 6.1.4

Slide the remaining canopy into the deployment bag below the second\* grommet. S-fold the canopy on top of itself as you slide the canopy into the bag.

Fill the mouth of the deployment bag with the skirt of the canopy.

 Fill in the corners of the deployment bag with the skirt of the canopy.



6.1.4 Folding the canopy into the deployment bag.

\*below the third grommet if you are packing a 3-pin container.



## 6.2 Standard Placement - Stowing the Suspension Lines

### 6.2.1

The suspension lines come out of the bag between the inside locking stows.

Pull the inside locking stow bands through the grommets and form two locking stows, left side first.

Close the outside locking stows in the same manner.



Make the suspension line stow loops between 1 1/2" and 2" long.



6.2.1 Closing the locking stows.

### 6.2.2

Make the first stow in the top-left flute.



Do not expose more than 3/4" of suspension line past the stow flutes.



6.2.2 Stowing the suspension lines.

### 6.2.3

Continue stowing the suspension lines back and forth toward the mouth of the canopy.


Leave approximately 20" to 25" of suspension lines unstowed.



Do not put any twists in the lines as you are stowing the lines. Twists in the lines may result in failure of the parachute system and cause injury or death to the user.



6.2.3 Stowing the suspension lines.

 If necessary, use a half-stow to achieve the desired length of unstowed suspension line.



 Half stow.

#### 6.2.4

Close the line stow cover and tie the corners to the bag with one-turn-single of 8/4 cotton (3-cord) thread.



6.2.4 Closing the line stow cover.

### 6.3. Standard Placement - Closing the Container

#### 6.3.1

Pick the bag up and place it in the container with the line stows facing up.



6.3.1 Placing the bag.

### 6.3.2

Flip the bag over to expose the pack tray.



6.3.2 Flipping the bag.

### 6.3.3

Fan the risers so the links are not stacked on top of each other and the top riser is to the inside.

Form a 1 1/2" to 2" stow-bight with the unstowed line and tie it to the pack tray with 80-pound break tape.

Ensure that the stow-bight is tied tightly.



6.3.3 Pack tray line stow.



**WARNING**

The break tape must be tied around the entire line group at the stow bight. Do not tie any one line group individually.

#### 6.3.4

Thread pull-up cords through the closing loops and flip the bag back onto the pack tray with the line stows facing up.



6.3.4 Flipping the bag.

#### 6.3.5

Remove the washer from the locking pull-up cords and thread the pull-up cords on the pack tray through the locking cords.



6.3.5 Threading the pull-up cords.

#### 6.3.6

Pull the pull-up cords through the deployment bag and install temporary closing pins.



6.3.6 Securing the pull-up cords.

### 6.3.7

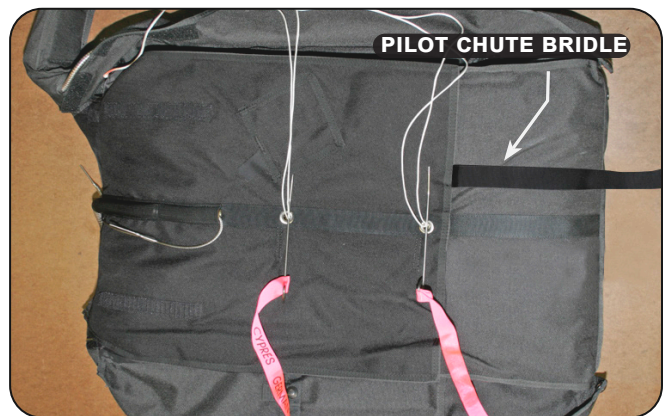
Close the bottom flap.



6.3.7 Closing the bottom flap.

### 6.3.8

Route the pilot chute bridle out and to the right side of the grommets and close the bottom flap.



6.3.8 Closing the top flap.

Continue to close the container as outlined in the manual titled *Butler Back Type, Personnel Parachute Container, Assembly and Packing Instructions*, Section Number 7.9.

## 7. Inverted Placement

It is important to distribute the bulk of the canopy evenly in the deployment bag. As you are S-folding the canopy into the deployment bag, fill the area between the grommets with enough canopy to fill out the corners of the bag and provide enough volume in each section for a smooth and even pack.

## 7.1 Inverted Placement - Stowing the Canopy in the Deployment Bag


### 7.1.1

Fold the canopy in thirds.

Stow the canopy into the deployment bag with the suspension line flutes facing down.

S-fold the canopy into the deployment bag with the apex in the upper corner of the deployment bag.

Fill the deployment bag with canopy folds to the first grommet.

 Make your folds a little wider than the deployment bag to ensure that the bag fills evenly with no empty spaces at the edges.



7.1.1 Stowing the canopy.

### 7.1.2

Thread a locking pull-up cord through the top and bottom grommet and install a washer on the pull-up cord with the washer on the top of the bag. Secure the washer with a Lark's Head knot.

Cinch the slip cord lock snug against the bag.



7.1.2 Installing the locking pull-up cord.

### 7.1.3

Fill the deployment bag with canopy folds between the first and second grommets. Install a locking pull-up cord through the grommets (3-pin container shown).

If you are packing a 2-pin container, proceed to the next step.

If you are packing a 3-pin container, continue to fill the deployment bag with canopy folds between the second and third grommets. Install a locking pull-up cord through the grommets.




7.1.3 Folding the canopy into the deployment bag.

### 7.1.4

Slide the remaining canopy into the deployment bag below the third\* grommet. S-fold the canopy on top of itself as you slide the canopy into the bag.

Fill the mouth of the deployment bag with the skirt of the canopy.

 Fill in the corners of the deployment bag with the skirt of the canopy.

\*below the second grommet if you are packing a 2-pin container.



7.1.4 Folding the canopy into the deployment bag.




## 7.2 Inverted Placement - Stowing the Suspension Lines

### 7.2.1

The suspension lines come out of the bag between the inside locking stows.

Pull the inside locking stow bands through the grommets and form two locking stows, left side first.

Close the outside locking stows in the same manner.

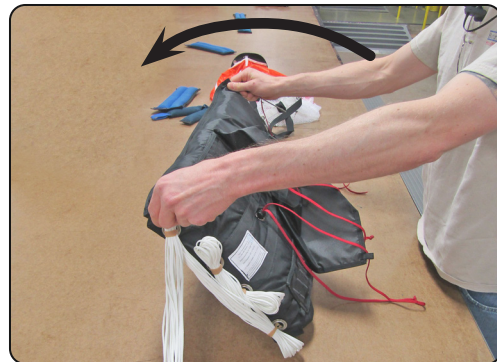
 Make the suspension line stow loops between 1 1/2" and 2" long.



7.2.1 Closing the locking stows.

### 7.2.2

Rotate the bag away from you so the line stow flutes are on top.



7.2.2 Rotating the bag.

### 7.2.3

Make the first stow in the top-left flute.



Do not expose more than 3/4" of suspension line past the stow flutes.



7.2.3 Stowing the suspension lines.

### 7.2.4

Continue stowing the suspension lines back and forth toward the mouth of the canopy.

Leave approximately 20" to 25" of suspension lines unstowed.



Do not put any twists in the lines as you are stowing the lines. Twists in the lines may result in failure of the parachute system and cause injury or death to the user.



7.2.4 Stowing the suspension lines.



If necessary, use a half-stow to achieve the desired length of unstowed suspension line.



Half stow.

### 7.2.5

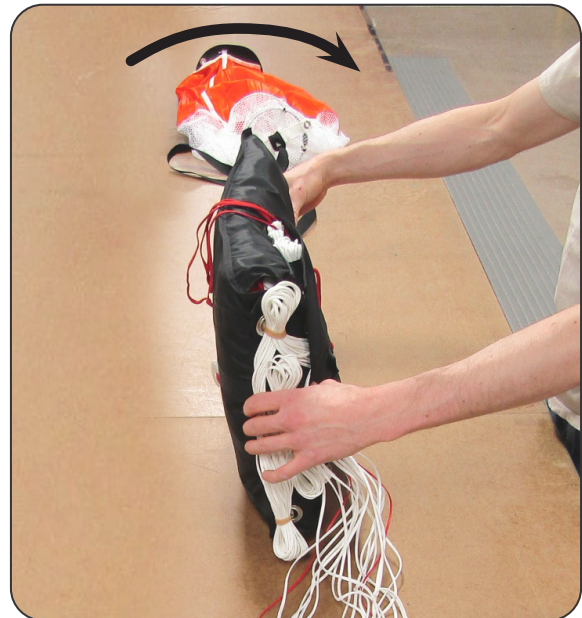
Close the line stow cover and tie the corners to the bag with one-turn-single of 8/4 cotton (3-cord) thread.



7.2.5 Closing the line stow cover.

### 7.2.6

Rotate the bag back towards you so the line stow flutes are on the bottom.



7.2.6 Rotating the bag.

### 7.3 Inverted Placement - Closing the Container

#### 7.3.1

Pick the bag up and rotate the bag so the line stows are on top and place the bag at the bottom of the container.



7.3.1 Flipping the bag.

### 7.3.2

Fan the risers so the links are not stacked on top of each other and the top riser is to the inside.

Form a 1 1/2" to 2" stow-bight with the unstowed line and tie it to the pack tray with 80-pound break tape.

Ensure that the stow-bight is tied tightly.

Thread pull-up cords through the closing loops.



The break tape must be tied around the entire line group at the stow bight. Do not tie any one line group individually.



7.3.2 Pack tray line stow.

### 7.3.3

Place the bag straight into the container with the line stows facing up. The four locking stows will be at the top of the container.



7.3.3 Placing the bag into the container.

7.3.4

Remove the washer from the locking pull-up cords and thread the pull-up cords on the pack tray through the locking cords.



7.3.4 Threading the pull-up cords.

7.3.5

Pull the pull-up cords through the deployment bag and install temporary closing pins.



7.3.5 Securing the pull-up cords.

7.3.6

Close the bottom flap.



7.3.6 Closing the bottom flap.

7.3.7

Route the pilot chute bridle out and to the right side of the grommets and close the top flap.



7.3.7 Closing the top flap.

Continue to close the container as outlined in the manual titled *Butler Back Type, Personnel Parachute Container, Assembly and Packing Instructions*, Section Number 7.9.

