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# Butler Parachute Systems, Inc.

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## **General Packing Instructions for Butler Seat Type Emergency Parachute Systems Utilizing Canopies Equipped with P/N 103- Deployment Diapers**

For use with Butler Parachute Systems manuals titled:

*General Canopy Folding  
and  
Packing Instructions  
for  
Personnel Parachute Canopies  
Manufactured by  
Butler Parachute Systems, Inc.*

OR

*General Canopy Folding  
And  
Packing Instructions  
For  
H-X Series  
Personnel Parachute Canopies*

## INTRODUCTION

This manual contains information required to pack the canopy into the BPS Back Style emergency parachute system and is intended to be used in conjunction with one of a series of BPS manuals generally titled "General Canopy Folding and Packing Instructions for **XXXX** Personnel Parachute Canopies". Once the canopy portion of the instructions have been complied with, then you must transition to this manual (or its equivalent for other products). If you do not have access to the appropriate manuals, **DO NOT ATTEMPT TO PACK THE PARACHUTE!** Contact the owner or BPS for a replacement copy.

## PART NUMBERING SYSTEM

BPS currently produces over 200 different parachute configurations and uses the following part numbering system, consisting of two or more sections as follows:

### PPP-WW/wwLLTT/tt(XXXX)-CCCC

**PPP** – is the basic part number: 101 for back/chair style (the BPS chairpack is actually an extended version of the backpack and therefore uses the same basic part number), and 102 for seatpack.

**WW/ww** – is the design width of the pack in inches. The lower case segment is only used if the width of the pack is different from top to bottom; the top width is given first. For seatpacks, the width of the pack at the front edge (as worn) is shown at the first position.

**LL** – is the design length of the pack in inches. For seatpacks, this number is the front-to-rear dimension as seen when worn.

**TT/tt** – is the design thickness of the pack in inches. The lower case segment is only used if the pack thickness differs from top to bottom; the top thickness is given first. For seatpacks, the front thickness is given first.

**XXXX** – an open format designator reserved for various types of optional equipment; multiple optional items will appear separated by slashes within the parentheses. This section is not used unless there has been a structural or functional modification to the parachute.

**CCCC** – a canopy designator for complete systems to indicate which canopy is installed in the system.

Examples:

**P/N 101-122002-HX300** is a Back Style parachute that is 12 inches wide, 20 inches long, 2 inches thick, and contains an HX-300 canopy.

**P/N 101-14190.5/02-HX400** is a Back Style parachute that is 14 inches wide, 19 inches long, .5" thick at the top tapering to 2" at the bottom, and contains an HX400 canopy.

**P/N 102-151303(WB/SL)-HX500** is a Seat Style parachute that is 15 inches wide, 13 inches long, and 3 inches thick. It is a Warbird model equipped with the optional Static Line and contains an HX500 canopy.

**Note:** Placement of the diaper and distribution of the bulk when packing is dictated by the design dimensions of the particular container. For example, a container that is thicker at the top would have the diaper placed in the thicker portion at the top and the remainder of the bulk distributed to fill the container in proportion to the thickness at each point. Please keep this in mind if the particular parachute you are packing does not match the illustrations in this manual. Also remember that you as the rigger have broad discretion in how minute details of a particular pack job are accomplished.

**Note:** Some containers that are very narrow (relative to the diaper length) are not covered by these instructions since the diaper would need to have the diaper placed lengthwise down the side of the container. If you need the alternate instructions, please check our web site.

## 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 (15 for chest packs and 22 lb. for all others) 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.

The original (and strongly preferred) material for the closing loops is a 225 lb. braided polyester cord; however, you may also use the outer sheath or MIL-C-5040, T3 ("550 line") . No other types of closing loop material are authorized! Please contact Butler Parachute Systems for replacement cord.

**Note: It is the rigger's responsibility to ensure that ripcord pull force meets the requirements**

## TOOLS REQUIRED

Three pull-up cords  
Three temporary pins with safety flags  
Packing paddle  
Tacking needle with waxed 6-cord or equivalent  
Seal thread/lead seals

## GENERAL PACKING PROCEDURES

1. COUNT YOUR TOOLS!
2. Pull test – If possible, have the customer pull the ripcord themselves.
3. Airing and drying – as required.
4. Check layout and line rotation; straighten canopy from the top down.
5. INSPECTION – Record Serial number and other data from all components.
  - a. Pilot chute – snags, bent spring, solid ferrule, proper type.
  - b. Bridle – tackings and knots, proper routing of incremental bridle, T3 break tape.
  - c. Apex – vent and cap, lateral band, straighten vent hem.
  - d. Canopy – radial seams and gore seams, general condition, fabric pull test.
  - e. Lower lateral band – skirt hem, line attachments.
  - f. Suspension lines – snags, kinks, sheathing.
  - g. Connector links – plating, approved type (no speed links).
  - h. Risers – Stitching, condition of webbing.
  - i. Harness – canopy releases, webbing, hardware, ripcord and cables, housings, and pocket
6. Repair and re-inspect as necessary.
7. Pleat, fold, stow, stack, close, dress pack...Neatness Counts!
8. Seal, sign, record data.
9. Count your tools!

## BPS SEAT TYPE PACKING INSTRUCTIONS

1. Prior to placing the canopy in the container, insert the ripcord into the ripcord housing and tuck the ripcord out of the way. Then release the tension on the canopy at the apex and fold the risers back over the back pad toward the container. Carefully route the risers inside the riser covers on the back pad and mate the velcro to close the covers. You may adjust the main lift web and risers at the shoulder adapter as much as desired as long as the connector links and the top 6" of the riser remain inside the pack tray. All slack in the risers must be in the pack tray or inside the riser covers; do not leave any slack above the shoulder as this could become entangled with the aircraft during a bailout. Using one turn single of "Supertack" or equivalent, hand tack the risers to the pack tray just inside the edge of the container. (See Fig 1.)



2. After tacking the risers into position and closing the riser covers, insert a 12" piece of 80 Lb cotton break tape under the Type IV webbing located in the center of the pack tray. This will be used to secure the first bight of suspension lines to ensure proper staging of the canopy during deployment. Next, insert your pull-up cords into the container closing loops.



3. Place the canopy diaper across the front edge of the pack tray and position the risers as shown. Using the approximately 20" of suspension lines that were left unstowed, form a bight in the lines and secure to the pack tray with the 12" piece of 80 Lb cotton break tape using a Surgeon's and locking knot. Trim the 80 Lb 1" from the ends.

**WARNING: When forming the suspension line bight, ensure that the lines running to the first diaper stow are on the top and not under the lines from the risers.**



4. Position the diaper so that the end is just past the edge of the pack tray.



5. Bring the bottom container flap up and over the diaper, route the bottom pull-up cord through the appropriate grommet, and pin in place with a temporary pin.



6. After pinning the bottom flap in place, fold the upper portion of the flap back towards you.



7. With the upper portion of the bottom flap folded back towards you, begin "S" folding the canopy into the pack tray with the folds slightly past the edges. The number of folds between the closing loops will vary depending on the dimensions of the container you are packing and may be positioned at the riggers discretion. Pay particular attention to the area at the top center under the ripcord housing – this area must be sufficiently full to keep the ripcord housing aligned with the pack tray stiffener.



8. Having determined the correct number of folds to place between the pull-up cords, fold the upper portion of the bottom flap over the folds, insert your pull-up cord through the appropriate grommet, and pin in place.





9. "S" fold the remainder of the canopy into the pack tray. Folding the apex back towards the center will place the pilot chute bridle in the correct position and leave a cleaner edge when closing the container. Again, pay attention to the amount of canopy that is placed under the ripcord housing.

Adjust the distribution of the canopy bulk to reflect the dimension of the container; for example, a wedge shaped container that is thin and narrow at the back edge would require less canopy bulk at that point.



10. Fold the top flap over the bottom flap, route your pull-up cords through the grommets, and pin in place. Ensure that the pilot chute bridle is properly routed out from under the top flap (arrow).

NOTE: The pilot chute bridle may be positioned on either side of the grommets.



11. With the top and bottom flaps closed, begin stowing the pilot chute by "S" folding the pilot chute bridle between the grommets on the top flap. As you fold, spread the bridle out to eliminate bulk, but keep it in the area under the center of the pilot chute spring.



12. After "S" folding the pilot chute bridle, place the base of the pilot chute on top of the bridle. Holding the pilot chute in place, pass the bottom pull-up cord through the first grommet on the bottom pilot chute guide strap.



13. Holding the pilot chute in place, remove the temporary pin, pull the closing loop through the grommet on the guide strap, and pin in place.



14. Repeat on the other side.





15. Pinning the pilot chute guide strap in place.



16. Carefully compress the pilot chute and pull all the material (mesh and cloth) clear of the spring.

Note: If you lose control of the pilot chute spring it will hurt – be careful.



17. Hold the compressed pilot chute in place (your knee works well). Carefully fold the pilot chute material covering the top of the container and carefully stuff it under the cap, allowing clearance for the pull-up cord and closing loops. Take care to ensure that the closing loop does not pinch the pilot chute material.



18. With the pilot chute material folded, pass your pull-up cord through the grommet in the pilot chute crown.



19. Being careful not to trap any material in the pilot chute spring, remove the temporary pin, pull the closing loop through the grommet in the pilot chute crown and re-insert the temporary pin.



20. Repeat the procedure on the other side of the pilot chute crown.



21. With the pilot chute securely in place, carefully fold the remaining pilot chute



22. ...And tuck it around the sides of the pilot chute crown. Position this bulk so that it prevents the pilot chute spring from wobbling or rocking. You must also ensure that the pilot chute cloth is not trapped under the side flaps when the container is closed.



23. Repeat on the other side.



24. Begin closing the container by routing your pull-up cords through the grommets on the left side flap.



25. Using one hand to hold the top flap material in place (to prevent wrinkles) begin pulling the side flap into position.



26. Once the side flap is in position, remove your temporary pin, pull the closing loop through the grommet, and pin in place.





27. Again using one hand to hold the bottom flap material in place, pull the side flap into position and pin in place. Take care to push any wrinkles (in the top & bottom flap) to the outside.



28. Close the right side flap in the same manner as the left. Hold the top flap material in place while pulling the side flap into position...



29. ...And pin the side flap in place.



30. Pull the upper portion of the side flap into position while holding the top flap material in place.



31. Complete closing the container by pinning the side flap in place.



32. Begin dressing the container by smoothing out any wrinkles with a packing paddle. Again, push the wrinkles towards the outside.





33. After removing any wrinkle, and keeping the corners as neat and full as possible, carefully close and snap the corners of the containers as shown. Use your finger to reach inside and poke the corner tuck out if needed.

Route the ripcord through the housing and replace your temporary pins with the ripcord pins. Remove your pull-up cords being careful not to burn the closing loops. It is recommended that you place the pin between the pull-up cord and the closing loop before SLOWLY removing the pull-up cord. Seal the bottom pin, sign the packing data card, and COUNT YOUR TOOLS!



34. Ensure that there are no twists in the leg straps, then snap the "V" rings in place. If the leg straps were not in place for some reason, carefully slide them through the slots as shown here, then snap in place.

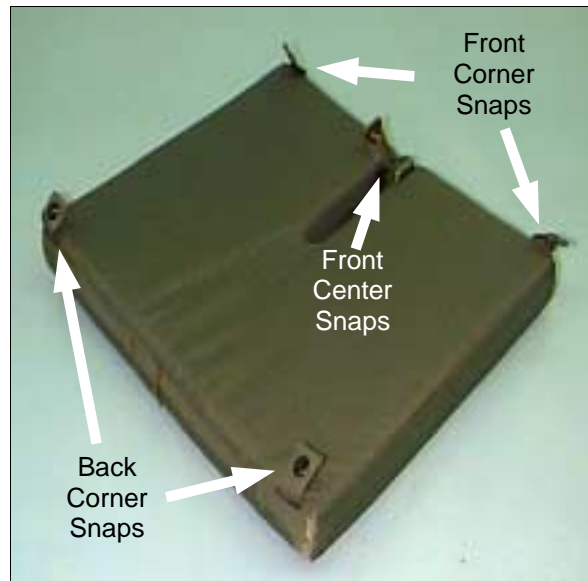


35. If the parachute you are working on is a BPS Warbird Seatpack model (extra 1" thick back pad), then the riser covers must be tacked above and below the horizontal back strap. These tacks prevent the riser covers from pulling open due to the extra back pad thickness. Using one turn single Super Tack or equivalent, tack through the binding tape of the riser covers and the back pad.



36. If the seat pack you are working on has an additional snap on seat cushion, familiarize yourself with the snaps to assure proper positioning on the container.

Note: The cushion in the illustration is bottom side up for clarity.



37. Prior to positioning the cushion on the container, locate the two snaps under the center slot in the seat pad area. These will be fastened last.



38. Containers that use the additional snap on cushion will have an extra snap on the front of the container. The outboard snap is used to hold the cushion in place. (Shown here prior to packing; you may unsnap the front corner snap if needed.)



39. Set the cushion on top of the container and snap the two back corner snaps to the snaps located on the backpad.



40. Unsnap the front corner container snap, snap the cushion to the outboard snap, and re-snap the container snap.



41. After passing the leg straps through the slot in the seat cushion, snap the front center cushion snaps. This may be a bit difficult, but once you get it snapped it will stay put.



# RIGGERS NOTES

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