Butler Parachute Systems, Inc

Butler Seat Type
Personnel Parachute Container
Assembly and Packing Instructions

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Revision C

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Title	Seat Pack Assembly and Packing Instructions

Issue	Description	Date	Approving Authority
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1.0	Initial Release	1/1/00	Manley Butler
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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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Contents

WARNING

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.

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 Seat Pack Emergency Parachute system is a seat pack-type parachute designed for use in aircraft and flight conditions that warrant the ability to bailout if the aircraft becomes disabled. The Butler Seat Pack Emergency Parachute is equipped with a Butler HX-series high speed canopy or a Butler Lopo-series canopy. The canopy is deployed manually with a ripcord or optional static line deployment. This manual, along with the manual titled *Butler Personnel Canopies, Assembly and Packing Instructions*, and the manual titled *General Information for Parachute Riggers* outline the procedures to assemble and pack a complete Butler Seat Pack Emergency Parachute system. 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 Butler Seat Pack Emergency Parachute 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.

WARNING

IMPROPER USE OR NEGLIGENT CARE OF THIS EQUIPMENT CAN CAUSE SERIOUS INJURY OR DEATH.

2. Service Life and Repack Interval

All personnel parachutes manufactured by Butler Parachute Systems, Inc. are manufactured and certified under the Technical Standard Order (C23) process of the Department of Transportation, Federal Aviation Administration (FAA). Our products have been sold all over the world, and thus may fall under many other sets of operating regulations. The following guidance is provided to determine the allowable service life and repack interval under the specific circumstances listed:

The following information is provided as guidance only.

- When used in civil aircraft **in the United States of America**, our products have a recommended service life of 20 years from the date it is placed in service or 25 years from the date of manufacture. However, this parachute must be inspected and repacked in accordance with the applicable Federal Aviation Regulations, every 180 days. If more than 180 days has passed since the last inspection and repack, then the parachute is considered unairworthy until such inspection is completed.

- When used in civil aircraft **outside the United States of America**, our products have a recommended service life of 20 years from the date it is placed in service or 25 years from the date of manufacture. The local regulations pertaining to parachute inspection and repacking (if any) may be applied, but in no case longer than two years between inspection and repack.

If the parachute equipment is subjected to any unusual or severe conditions such as dust, moisture, impact damage, etc., it should be serviced on a more frequent basis. Please review all information in the service manuals before extending your repack cycle.

3. Operating Limitations

Harness & Container Operating Limitations

Maximum Gross Weight: 350 pounds

Maximum Pack Opening Speed: 170 KEAS

Maximum Demonstrated Load: 6,500 Pounds

Refer to the manual titled Butler Personnel Canopies Assembly and Packing Instructions for instructions for additional limitations.

P/N	Model	Diameter	Weight	Maximum Permitted Gross Weight @ 150 KEAS*	Maximum Recommended Gross Weight @ 150 KEAS*	Demonstrated Overload KIAS †	TSO Authorization
2101-1	Lopo 350	23'	6.0	220 lb	175 lb	264 lb @ 180 KIAS	C23d
2101-2	Lopo 450	26'	7.0	285 lb	235 lb	345 lb @ 180 KIAS	C23d
2101-3	Lopo 550	29'	8.0	330 lb.	300 lb	420 lb @ 180 KIAS	C23d
3101	HX-300	20'	5.8	250 lb	160 lb	300 lb @ 180 KIAS	C23d
				Maximum Permitted Gross Weight @ 170 KEAS*	Maximum Recommended Gross Weight @ 170 KEAS*		
3102	HX-400	23'	6.4	333 lb	225 lb	400 lb @ 180 KIAS	C23d
3103	HX-500	26'	7.9	350 lb	280 lb	450 lb @ 205 KIAS	C23f
3106	HX-500/24	26'	8.5	416lb	280 lb	500 lb @ 180 KIAS	C23d
3104	HX-600	28'	9.1	500 lb	340 lb	600 lb @ 180 KIAS	C23d

* KNOTS EQUIVALENT AIRSPEED: THE CALIBRATED AIRSPEED CORRECTED FOR ADIABATIC COMPRESSIBLE FLOW FOR THE PARTICULAR ALTITUDE.

† KNOTS INDICATED AIRSPEED: THE SPEED SHOWN ON AN AIRCRAFT'S PITOT-STATIC AIRSPEED INDICATOR.

4. 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.

5. 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.

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

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

5.1 Diaper Placement

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.

If you are packing a container that has the diaper placed somewhere other than described above, that particular container was probably designed for an unusual application. See "Appendix A. Alternate Canopy Stowing Method" on page 22 for further guidance regarding the placement of the diaper.

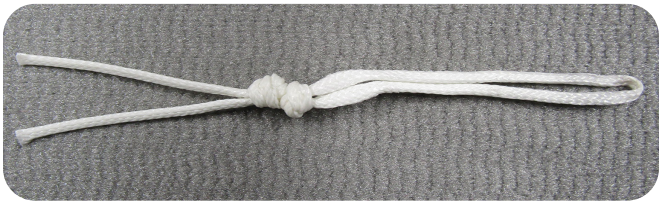
5.2 Closing Loop Length

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 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).

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



WARNING 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.

6. 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”, Paragear PN: S7111
•	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.

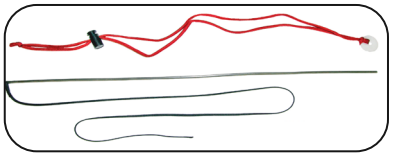
Required for initial assembly of an HX-series high speed canopy.

- 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.

- 8” bodkin with 23” pull-up cord attached
- Locking pull-up cords with washer



7. Packing Procedures

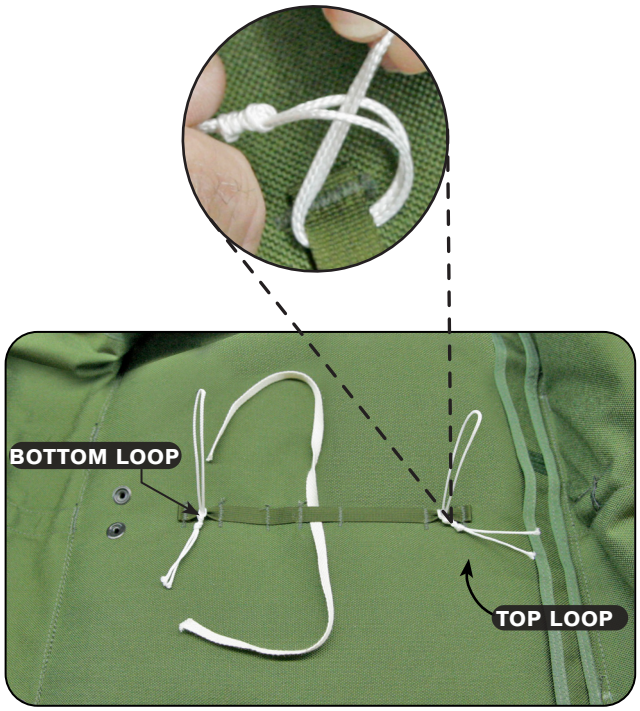
WARNING It is the rigger's responsibility to ensure that the ripcord pull force is at or below 22 pounds for each assembly and each repack every time you work on the parachute.

7.1

Thread a piece of break tape* through the center anchor loop in the pack tray.

Install the closing loops on the anchor loops in the pack tray as shown.

* 80 pound break tape (MIL-T-5661, Type 1, 1/4").



7.1 Preparing the pack tray.

7.2

Hold the suspension lines at the last line stow; lift the diaper and pull the canopy back and onto the pack tray.

Place the risers in the riser channels and mate the Velcro.

7.2 Stowing the risers.

7.3

Tack* the risers where they enter the pack tray at the tack loop.

Spread the canopy links so they are not stacked on top of each other.

Thread the cord down through the riser, underneath the tack loop, then back through the riser.

* One-turn-single of Lite Super Tack cord (MIL-T-43435).

7.3 Tacking the risers.

7.4

Lift the canopy slightly and rotate the container 90° while keeping the diaper on the pack tray.

7.4 Turning the container.

7.5

Form a stow-bight with the unstowed line and stow the bight to the pack tray with the 80 pound break tape.

7.5 Tying the pack tray stow.

A canopy installed into a Butler Back Pack, or Butler Seat Pack is S-folded into the pack tray from bottom-to-top, or top-to-bottom. A few custom designed seat packs have a narrow length from front-to-back. These narrow designs prohibit the diaper from being the first stow at the bottom of the pack.

Seat Packs with a front-to-back length of less than 12” should be packed using the instructions outlined in “Appendix A. Alternate Canopy Stowing Method” on page 22.

7.6

Rotate the diaper so the three locking stows are on top and place the edge of the diaper slightly past the left edge of the container.

7.6 Setting the diaper.

Placing the diaper slightly past the left edge of the container will help fill-in the corner of the container and make for a better looking pack. The picture “7.11 Closing the bottom flap.” on page 15 illustrates how far the diaper should extend past the edge of the container.

7.7.1 Closing loop comes straight up.

7.7.1

If the bottom closing loop comes straight up from the bottom of the pack without interference from the diaper, proceed to step “7.9 S-folding the canopy.” on page 14.

7.7.2

If the volume of the diaper impedes the closing loop from coming straight up from the pack, route the closing loop behind the stowed suspension lines.

7.7.2 Diaper volume impedes closing loop.

7.8

Place a pair of hemostats (or similar tool) behind the line stows so the closing loop will come straight up from the bottom of the pack.

Grab the pull-up cord and bring the pull-up cord up and behind the line stows.

CAUTION

Route the closing loop behind the stows. Do not route the closing loop through any of the line stows.

7.8 Routing the closing loop behind the suspension lines.

7.9

S-fold the canopy into the container 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.

7.9 S-folding the canopy.

7.10

Make the last fold by turning the apex under the last fold and place it at the center of the pack tray.

☞ Place the apex under the ripcord housing to ensure there is enough bulk to fill out the area under the housing.

7.10 S-folding the canopy.

7.11

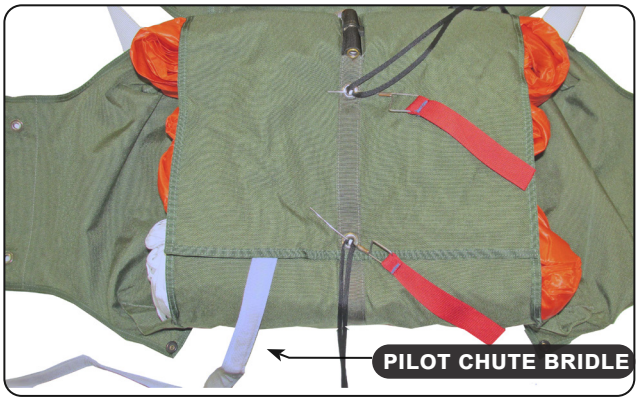
Close the bottom flap and secure the loops with temporary pins.

7.11 Closing the bottom flap.

7.12

Route the pilot chute bridle down and over the bottom flap. Close the top flap and secure the loops with temporary pins.

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



7.12 Closing the top flap.

7.13

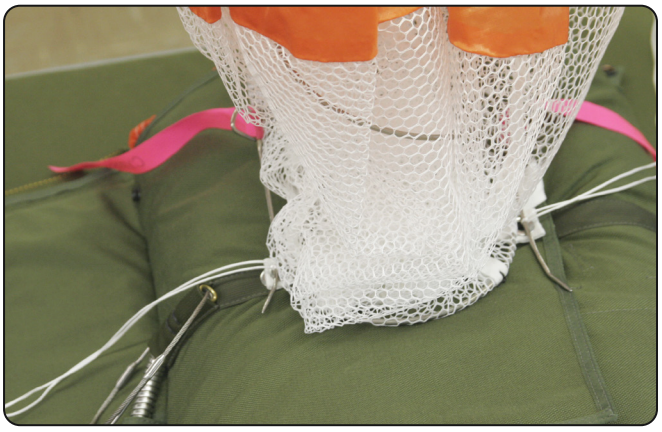
Stow the pilot chute bridle between the grommets on the top flap.

Spread the folds of the bridle in a circular fashion to minimize bulk, but keep it in the area under the center of the pilot chute spring.

7.13 Stowing the pilot chute bridle.

7.14

Place the pilot chute on top of the folded bridle and pull the closing loops through the bottom grommets on the pilot chute. Insert temporary pins.



7.14 Setting the pilot chute.

7.15

Compress the pilot chute and hold it down with your knee.

Pull all of the material out from between the spring.

7.15 Compressing the pilot chute.

7.16

Place your knee on the cap and pull the center line out from the middle of the pilot chute.

7.16 Clearing the center line.

7.17

S-fold the center line and place it back inside the spring at the center of the pilot chute.

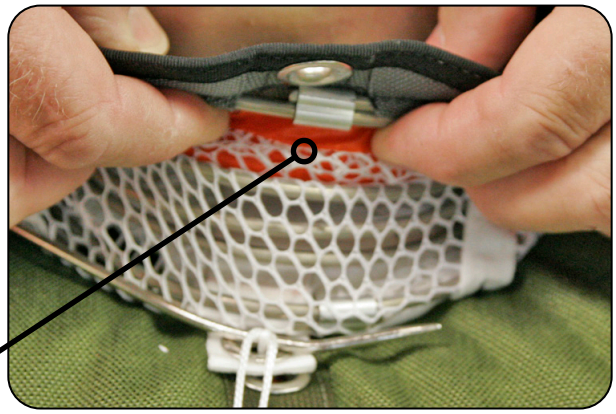
7.17 Folding and stowing the center line.

7.18

Fold the material under at the grommets and stow it between the top two coils of the spring and behind the swage.

CAUTION

All of the material must be stowed at the top of the spring where the grommets are located and behind swage. Damage to the material may occur if it is not stowed properly.



7.18 Stowing the pilot chute fabric.

7.19

Pull the closing loops through the top grommets on the pilot chute and insert temporary pins.

7.19 Pinning the pilot chute.

7.20

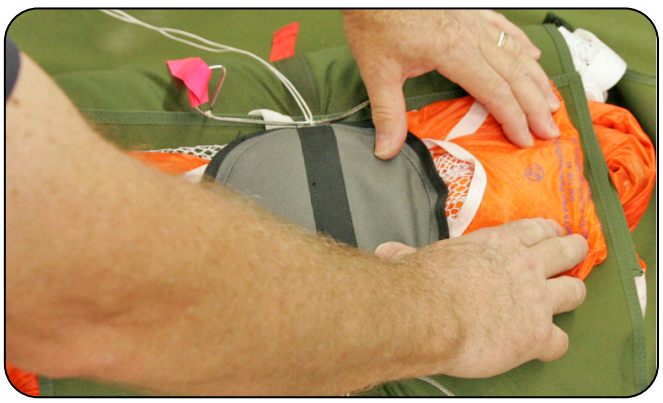
Gently pull on the remaining exposed material to ensure that it is cleared from the spring.

7.20 Clearing the material.

7.21

Fold the material on the left side first.

Fold the material so it lays flat on top of the closing flap.



7.21 Folding the material.

7.22

Close the left container flap and insert temporary pins.

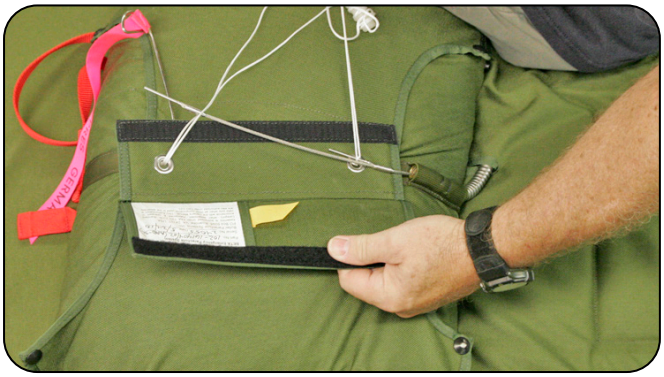
Dress and shape the top and bottom flaps as you close the side flaps.

7.22 Closing the left container flap.

7.23

Fold the pilot chute material on the right side as outlined in step “7.21 Folding the material.” on page 19.

Close the right container flap with the ripcord pins.



7.23 Closing the right container flap.

WARNING 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.

7.24

Slowly remove the pull-up cords after routing them underneath the ripcord pin.

Seal the front pin.

Count you tools.

CAUTION

Do not remove the pull-up cord while it is against the closing loop. Doing so may burn the closing loop. before you remove the pull-up cord, thread it underneath the ripcord pin.

7.24 Removing the pull-up cords.

7.25

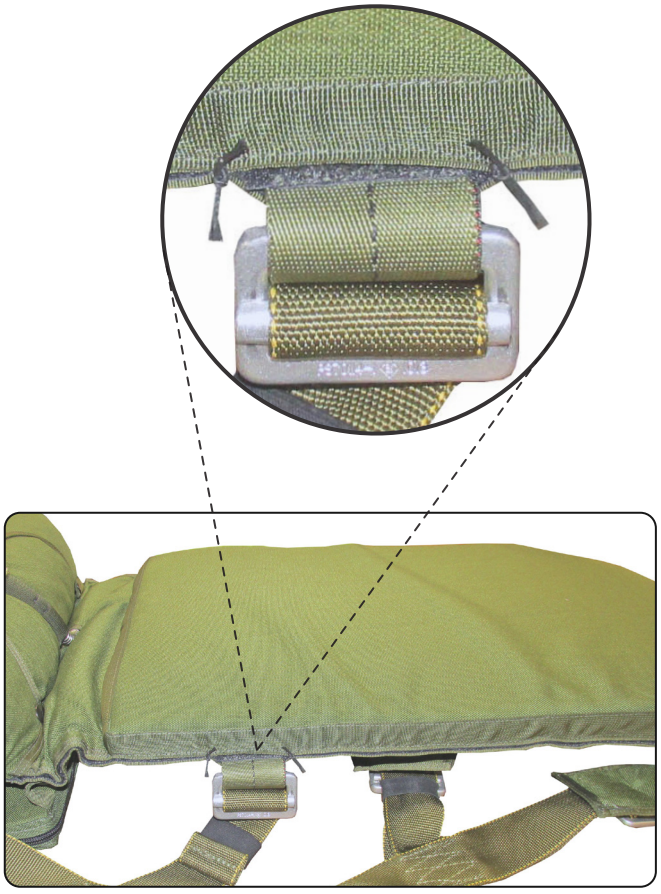
Close the corner snaps and dress the container.

7.25 Dressing the container.

7.26

Warbird Seat Pack models with the extra 1” thick back pad must be tacked* above and below the horizontal back strap.

Tack the extra back pad to the thin back pad to close the riser cover. Run the tack cord behind the binding tap of the thin pack pad.



7.26 Tacking the back pad.

* One-turn-single single, of Lite Super Tack cord (PIA-T-43435, Type 1, Size 3), or equivalent.

Appendix A. Alternate Canopy Stowing Method

A canopy installed into a Butler Back Pack, or Butler Seat Pack is S-folded into the pack tray from bottom-to-top, or top-to-bottom. A few custom designed seat packs have a narrow length from front-to-back. These narrow designs prohibit the diaper from being the first stow at the bottom of the pack.

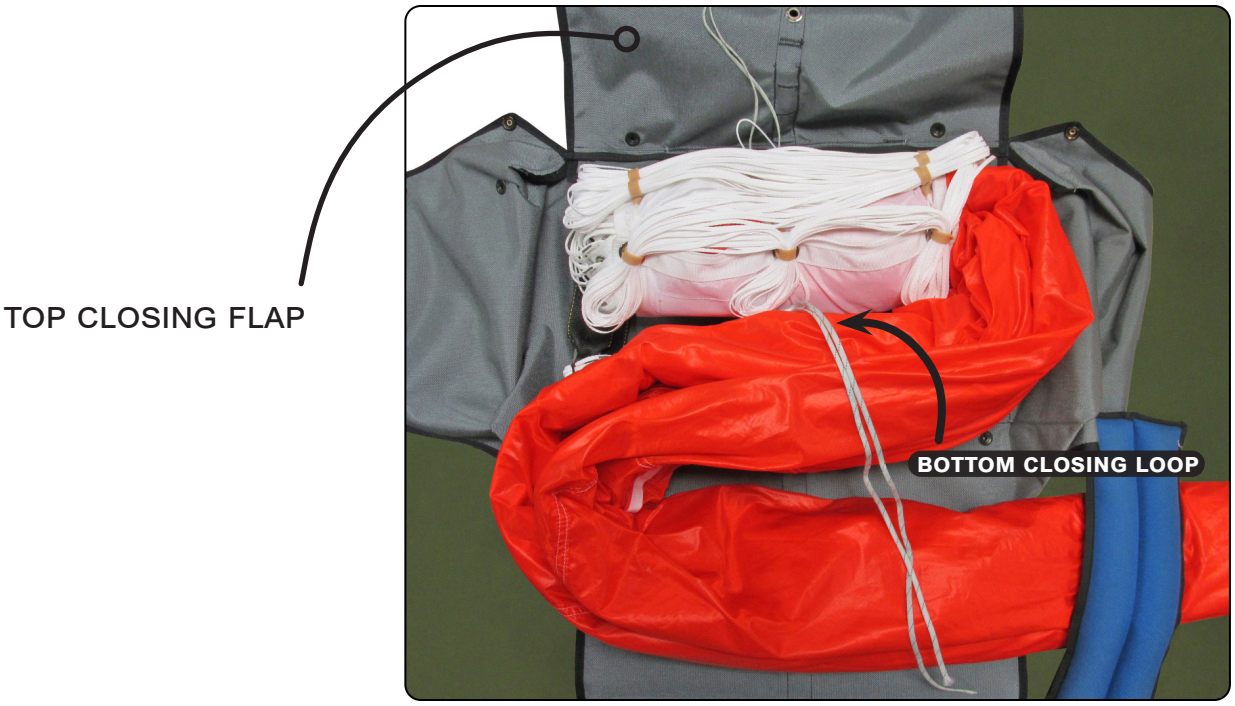
Seat Packs with a front-to-back length of less than 12” should be packed using the following S-fold pattern.

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

Follow the General Packing Instructions to Step “7.5 Tying the pack tray stow.” on page 13

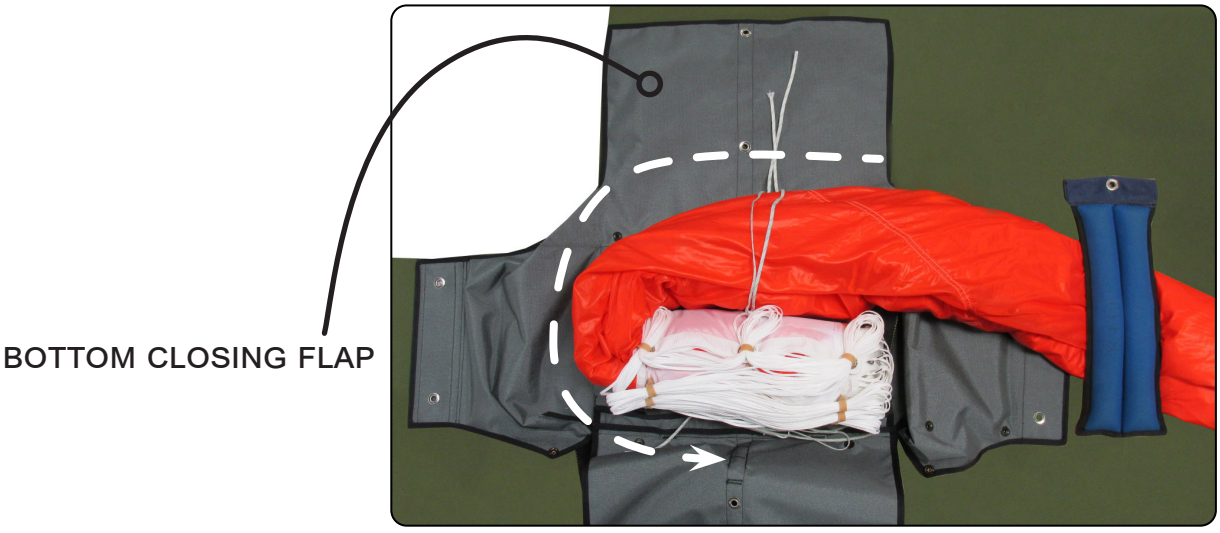
Step 4.

Place the diaper on the pack tray between the two closing loops.



Step 5.

Make one fold below the bottom closing loop.



Step 6.

Rotate the container left and under the canopy 180^{o} so the bottom closing flap is on top.

Step 7.

Make a second fold between the diaper and the first fold. This fold will be shorter than the first fold.

Step 8.

Fold the canopy around the diaper and S-fold the remaining canopy above the top closing loop.

Return to the General Packing Instructions and continue with Step “7.11 Closing the bottom flap.” on page 15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RIGGER