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# **Butler Parachute Systems, Inc.**

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

**Updated 15 July 1994**

## Butler Parachute Systems, Inc.

This set of instructions is for the routine maintenance of all personnel parachute canopies manufactured by Butler Parachute Systems, Inc. and for the normal flaking, folding and line stowage of Butler canopies equipped with a BPS deployment diaper in the P/N 103 series. Most of what you will see is routine. However, we do utilize a slightly different method to flake and fold the skirt. We also require that a break tie be used to tie the lowest bight of the suspension lines to the pack tray and that a break tie be used to form a loop to keep the pilot chute bridle centered on the vent lines. None of our parachute canopies have been tested without these features and we feel that they each add a small increment of reliability to our parachutes (and to any other round parachute for that matter).

All personnel parachute canopies manufactured by Butler Parachute Systems, Inc. have been approved under TSO C23c, Category B or under TSO C23d with appropriate limitations. All canopies manufactured by Butler Parachute Systems, Inc. will have a warning stamped on the data panel similar to the one shown here. This data must be shown on the packing data card and on the outside of the pack for items approved under TSOC23d in any category.

# WARNING!!!

**MAXIMUM GROSS WEIGHT XXX lb.**

**MAXIMUM PACK OPENING SPEED XXX KIAS**

### NO WARRANTIES DISCLAIMER

It is expressly understood and agreed that, in connection with the use of this parachute system by the Buyer or any subsequent user, the Seller shall in no way be deemed or held liable upon or under any guarantees or warranties, express or implied, statutory, by operation of law or otherwise, beyond that expressed herein. This parachute system is sold with all faults and ***WITHOUT ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE***, express or implied.

The liability of the Seller is limited to the replacement of defective parts found upon examination by the manufacturer to be defective in material or workmanship within 90 days after its purchase, and which have not been caused by an accident, striking, improper use, alteration, tampering, excessive use, misuse or abuse. The period is limited to 90 days because after that period of time normal use of this parachute system without inspection by the Seller may affect it. The damages of the Buyer and/or user shall be deemed liquidated in the costs of replacement as above. ***THE SELLER AND/OR MANUFACTURER SHALL IN NO EVENT BE LIABLE FOR PERSONAL INJURIES***, or for any other damages, whether direct or consequential to any person, and have no other liability in connection with this device, and the Seller further **DISCLAIMS** and the Buyer and/or user hereby **WAIVES** any such liability.

# General Information for the Parachute Rigger

Butler Parachute Systems, Inc. spares no effort in making this the finest emergency parachute available; however, parachute riggers in the field must also do their part to educate the users so that they may benefit fully from the advantages that this system offers. In addition, the parachute rigger has a moral responsibility to the user of a parachute to aid that person in understanding his parachute and its use. It is suggested that you review the basic procedures contained in this manual with the customer and answer any questions he may have concerning the use, care and maintenance of this assembly. It is also suggested that you require the customer to actually pull the ripcord himself before each repack.

## Maintenance and Repairs

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

***Any components requiring major repairs or alterations that may affect airworthiness must be returned to the manufacturer or a designated representative.***

## Service Life Limitations and Repack Interval

When used in civil aircraft in the United States of America, under the rules and regulations of the Department of Transportation, Federal Aviation Administration this parachute has an *estimated service life of 20 years*. However, this parachute must be inspected and repacked every 120 days in accordance with the applicable Federal Aviation Regulations. If more than 120 days have passed since the last inspection and repack, then the parachute is considered unairworthy until such inspection is accomplished. When used outside of the United States and in non-US aircraft, we recommend an inspection and repacking interval of one year.

## 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.

Closing loops may be replaced with the outer sheath of MIL-C-5040 Type III suspension line cord. No other type of closing loop material is authorized!

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

# General Inspection and Packing Procedures for Butler Parachute Systems Parachute Canopies

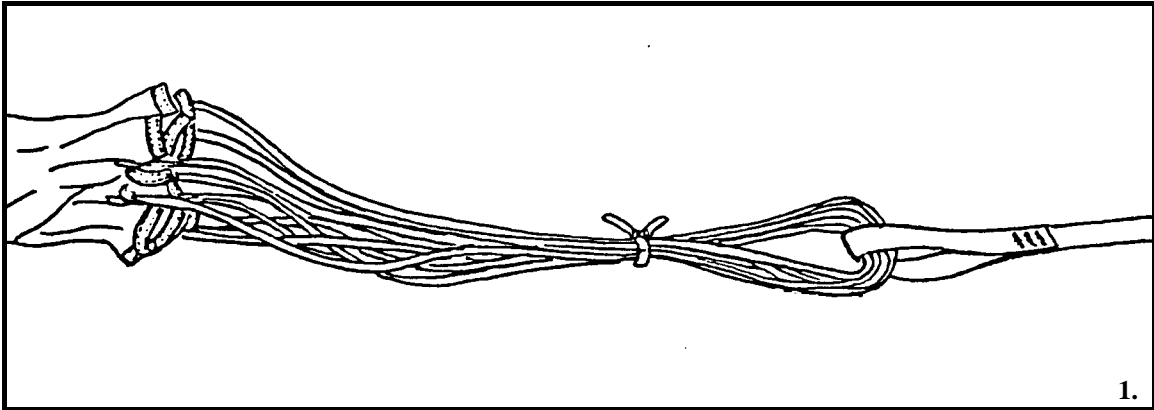
These instructions assume that the parachute has already been inspected and assembled in accordance with the appropriate instructions which are issued for each type assembly and option group (back, seat, chest, etc). Throughout these packing instructions the pack tray and the harness are oriented with the wearer face down, head toward the apex of the canopy. Inspect the following items prior to packing:

- Record serial number, date of manufacture and manufacturer of all components.
- Check layout and line rotation. Line #1 and its next adjacent line going counter-clockwise (#1 & 24 for example) are on top with the center mesh vent on top when laid out correctly. Perform a standard "4-line check" as a minimum.
- Pilot Chute - snags, spring, solid ferrules, cloth and mesh in good condition.
- Bridle - good condition; minimum of 3 bartacks on each end; correct length, 60 to 66". The bridle must be installed so that it slides freely on the vent lines.
- Apex - lateral band, straighten vent hem.
- Canopy - radial seams and cross seams, general condition.
- Perform a 40# strength test on MIL-C-44378, Type 1 and Type 3 Cloth and a 35# strength test for MIL-C-7020, Type 1 using the methods of PIA TS 108 in randomly selected location. Mark test location.
- Lower lateral band - skirt hem, line attachments.
- Suspension lines - snags, kinks, stitching.
- Connector links - general condition, finish, barrel nut, threads not exposed, tight.
- Risers - general condition.
- Cross connectors - if required, present and good condition, proper orientation.
- Harness - webbing, hardware, etc.
- Ripcord - cable condition, pins straight.

**NOTE:** When inspecting the connector links, ensure that all **Rapide Brand Links** actually have the name Rapide stamped on them and that they are the type with the smooth rounded ends on the barrel nut. When used with Rapide links the lines must be finger spliced with a loop at the end. Substitution of other types of connector links is a major alteration and may be done only with the Manufacturer's guidance. When used with MS22002-1 "L-bar" links, each line must be tied off with a clove hitch and half hitch, then sewn a minimum of 3" with type 308 zig-zag stitch.

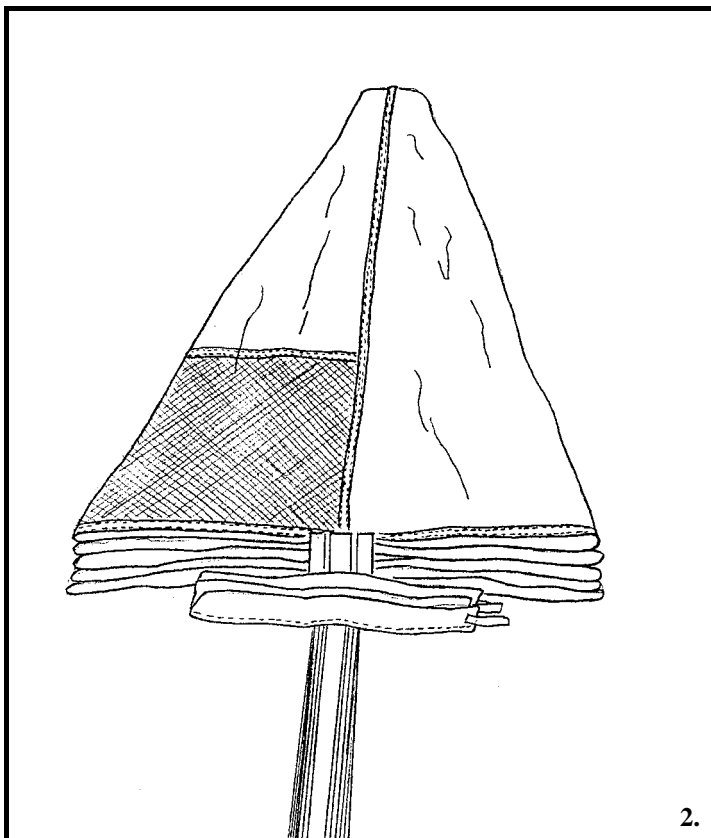
## Tools Required for General Inspection & Packing

- 2 or 3 ea. pull-up cords 36" long; made from MIL-C-5040, Type 3, sheathing only
- 2 or 3 ea. temporary pins with safety flag
- 4 to 6 packing weights; minimum weight 1 lb.
- 1 ea. line separator
- 1 ea. packing paddle
- 1 ea. tacking needle with waxed 6-cord or equivalent
- 2 ea. fabric clamps per Parachute Industry Association Technical Standard 108 (PIA TS 108)
- 1 ea. spring scale per PIA TS 108
- 80# Break Tape per MIL-T-5661, Type 1, 1/4"

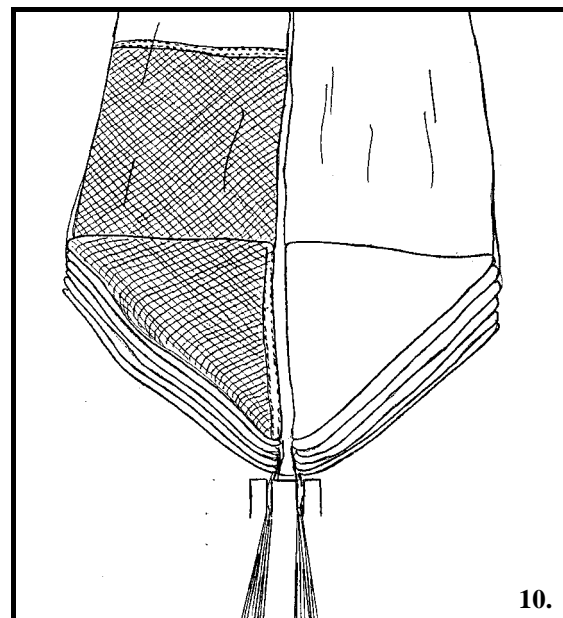
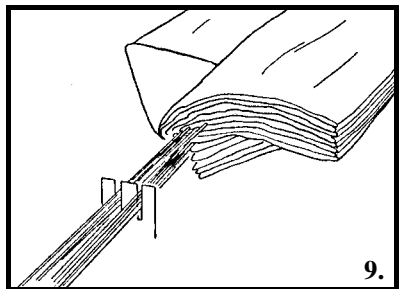
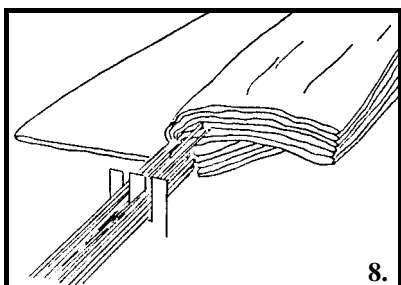
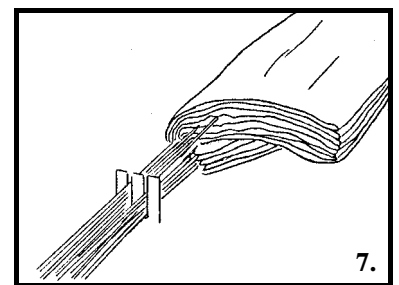
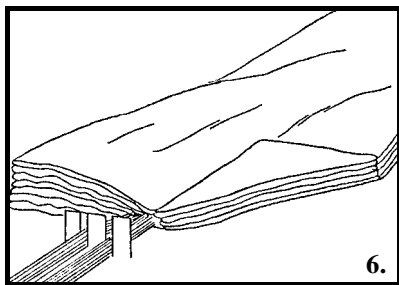
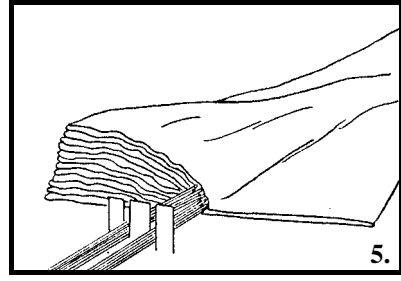
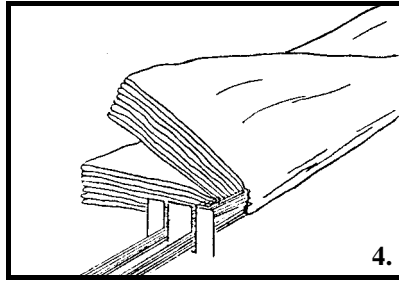
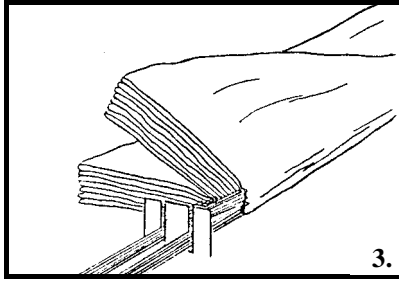


**Fig. 1.** Lay out canopy and apply tension. Straighten apex and vent. Equalize the vent lines and make sure that the bridle loop is centered on the vent lines. Recheck the vent hem alignment and then tie a 15" section of 80# cotton break tie cord around the apex lines 4" to 6" below the top. Make one turn (single) and tie off with a surgeon's knot and locking knot. Cut the tail to 1".

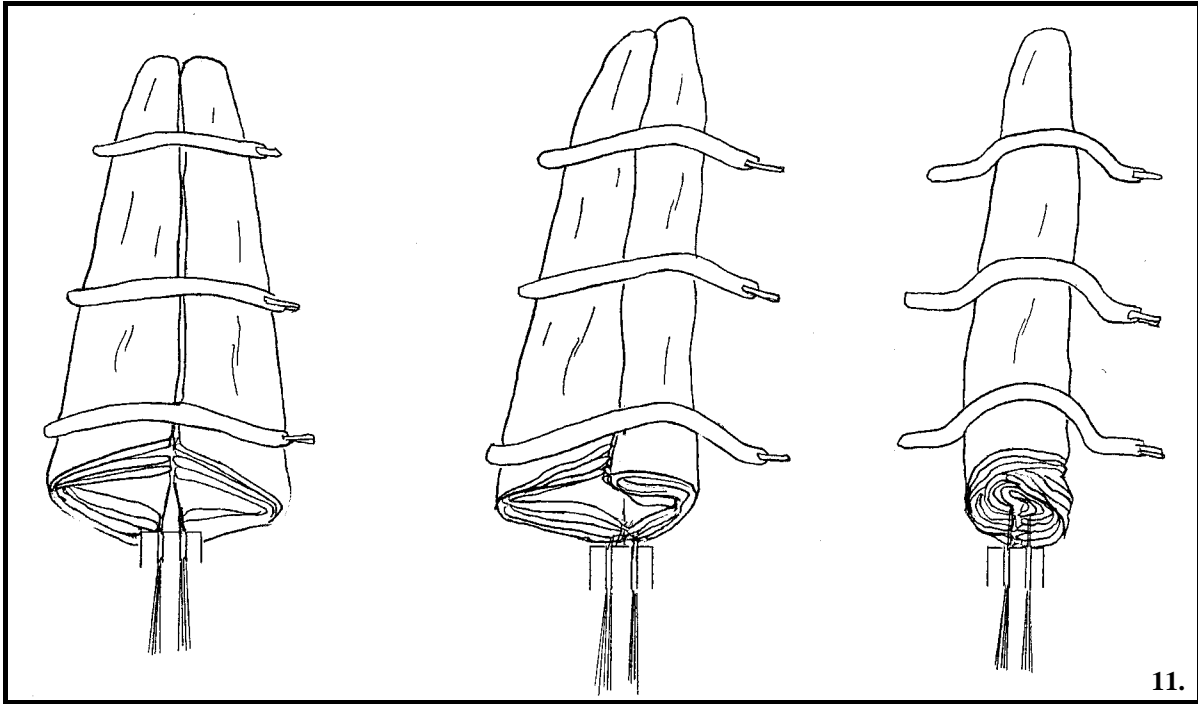
**Note:** This break tie serves to keep the pilot chute bridle centered on the apex lines and **MUST** be installed. The parachute has not been tested without the break tie installed.



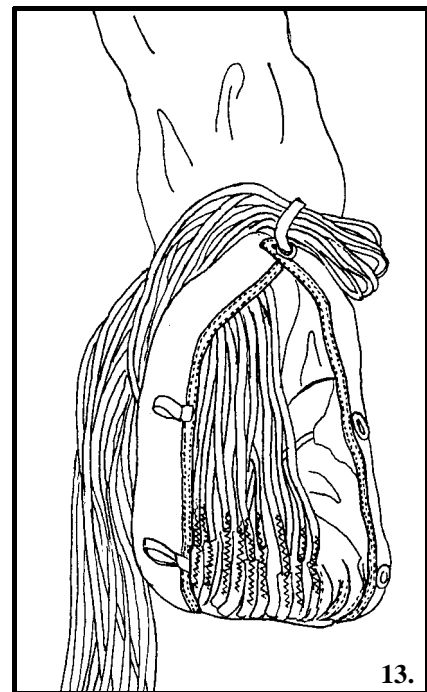
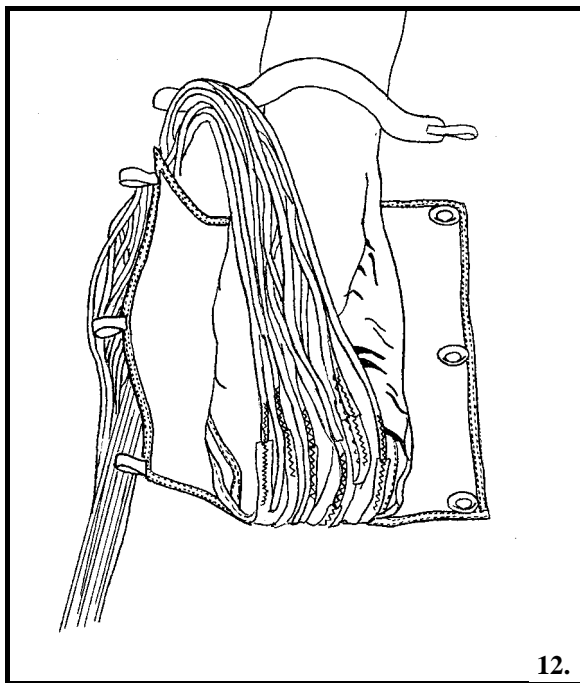
**Fig. 2.** Lay out the parachute assembly on the packing table as though the wearer were fastened in the harness face down with head toward the canopy. Release all fasteners, snaps, hardware, Velcro, and tackings on the pack so that the assembly will lay flat on the packing table. Stretch out the canopy on the packing table with gores 1 and 24 on top. Gore 24 will be one of the vent panels. Be absolutely sure of the proper orientation of the steering vents. Apply adequate tension between the apex and the connector links to hold the canopy and suspension lines taut for packing. Check the suspension lines for proper layout and rotation (4-line check minimum).



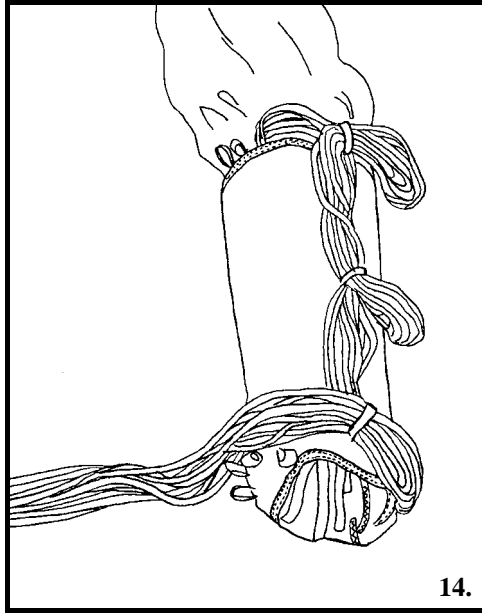
**Fig. 3. thru 10.** Flake the canopy in the usual manner with an equal number of gores on each side. Fold the skirt sections 90 degrees INDIVIDUALLY and place them parallel to the radial seam.



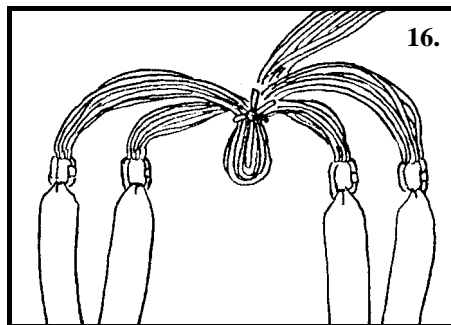
**Fig. 11.** Long fold the canopy in fifths. The first folds should be to the center without overlap, and the second folds should overlap completely.



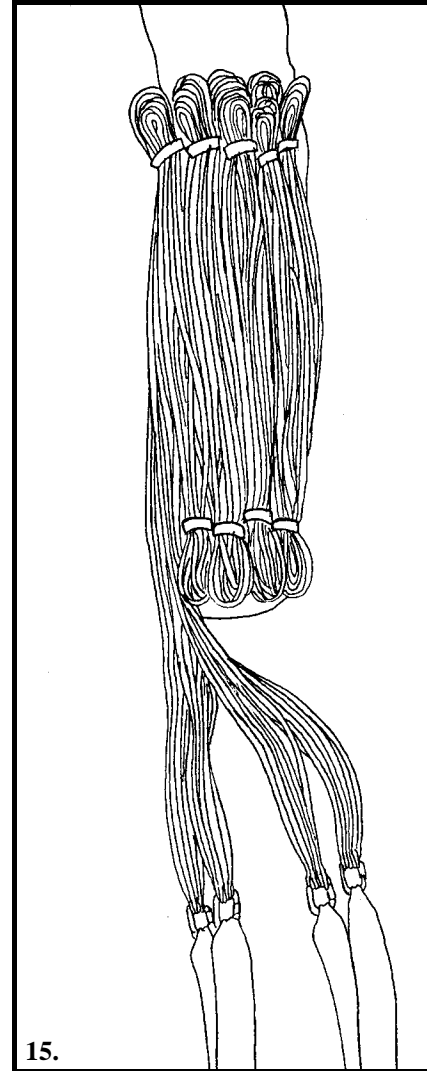
**Fig. 12. & 13.** Release the tension, then fold all the lines up over the skirt past the top edge of the diaper. Wrap the diaper around the skirt and the lines. Make the first locking stow ( at the top grommet) using all of the lines. Note that the lines must come up the center of the diaper and out at the top edge as shown. This will cause the lines to open the diaper when the last locking stow is released during deployment. Note the direction of the bights to allow clearance for stowing the lines.



**Fig. 14.** Make the next two locking stows in the same manner, working from top to bottom and using all the lines.



**Fig. 16.** Pass an 18" piece of 80# break tape through the tie down point on the pack, insert a bight from the remaining 20" of unstowed lines, and secure as shown.



**Fig. 15.** Continue stowing the lines on the diaper, working away from the locking stows. Leave approximately 20" of the lines unstowed. The figure shows what the canopy, suspension lines, and upper risers should look like at this point in the packing procedure.

**Note:** From this point, you must proceed with packing in accordance with the instructions for the particular container system you are servicing.