

Butler Parachute Systems, Inc.
Tethered Tandem Bundle Delivery System
Gen 2AA TT-600, and Gen 1/2 & 3 TT-1000
Assembly and Packing Instructions

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Initial Release

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BUTLER

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Revision History

Title		Tethered Tandem Bundle Delivery System, TT-600 and TT-1000, Assembly and Packing Instructions	
Issue	Description	Date	Approving Authority
1.0	Initial Release	3/18/23	Roberto Montañez

List of Effective Changes

Page Number

Section Number

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

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.

The Butler Tethered Tandem Bundle Delivery System is an equipment pack-style parachute designed for fast, accurate, and reliable aerial delivery using the tethered tandem methodology. The Butler TT-600 or TT-1000 systems are capable of delivering payloads at all-up-weights of up to 600 and 1,000 pounds respectively.

The Gen 2A TT-600 and Gen 1/2 and 3 TT-1000 systems ensure reliability in a wide variety of operating scenarios by using the Tandem Bundle CYPRES AAD. The CYPRES is well protected from rough handling (inside the container) and exposure to hostile weather. The CYPRES control display is easily accessible on the outside of the container and offers the Jumpmaster an unobstructed view for pre-drop checks. The TT-600 is constructed using PIA-W-4088, Type 13 webbing and the TT-1000 is constructed using Type 22 webbing. All of the Tandem Bundle systems are equipped with ringed quick release fittings in case of an emergency where the user wants to jettison the parachute pack and barrel. The Gen 2A TT-600 and Gen 1/2 TT-1000 are equipped with a modified standard 3-ring release and the Gen 3 TT-1000 is equipped with a 4-ring release.

These instructions outline the procedure to assemble and pack the components and canopy into the container. A basic proficiency of parachute rigging is required to service and pack Butler Tethered Bundle Systems. 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 Tethered Tandem Bundle is an important piece of survival equipment. Proper installation, maintenance, and packing are necessary for the parachute to deliver the safety and operational 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.

Most of the information and procedures contained in this manual will be routine for the experienced parachute rigger. However, a few of the procedures are unique to the Tandem Bundle System and **must** be followed as written for the bundle system to operate correctly. Failure to do so could result in injury or death to the operator.

2. Parachute and CYPRES AAD Service Life and Maintenance Interval

The Gen 3 TT-600 and TT-1000 systems have an estimated service life of 25 years when properly serviced and maintained. This parachute must be inspected and repacked in accordance with the applicable service manuals and directives.

The Tandem Bundle System must be opened, unpacked, inspected and repacked once every two years. The parachute is considered unairworthy and must be taken out of service if no inspection cycle has been performed within the past two years. If the parachute equipment is subjected to any unusual or severe conditions such as dust, moisture, impact damage, humidity, oil, hydraulic fluid, JP-4, etc., it should be serviced on a more frequent basis.

All CYPRES AAD units delivered after August 2016 have a service life of fifteen-and-a-half years from the date of manufacture. These units have a maintenance interval of 5 years from the date of manufacture. CYPRES units delivered prior to August 2016 have a total service life of fourteen-and-a-half years and have a first maintenance interval of 4 years, and a second maintenance interval of 5 years. Both versions of the CYPRES must be maintained in accordance with the applicable service manuals and directives. The CYPRES AAD must be removed from the parachute and sent to Butler Parachute Systems for factory maintenance within a one year window of the fifth and tenth year anniversary of the manufacture date. The window extends from six months before, to six months after the designated date of the maintenance due date.



If the system is deployed at terminal velocity, do not place the canopy back in service. The canopy is considered a one-time-use item when deployed at terminal velocity.

3. Tools and Materials for Inspection and Repack

2	CYPRES-brand Temporary Closing Pins, marked "Safety" and "Container"
1	Pull-up Cord – 50", made from CYPRES closing loop material
1	Pull-up Cord – 50", made from PIA-C-5040, T2A, coreless cord
2	Locking Pull-up Cords, with washer
4	Packing Weights
1	Gun Cleaning Rod - 22" or longer
1	Packing Paddle
1	9mm or 3/8" Wrench
1	6-foot Cable Bodkin
1	8-inch Line Stow Bodkin or Packing Hook
1	Scissors and Tacking needle
1	Finger Trap Tool
1	Static Line Insertion Tool
As Needed	*Lite Super Tack Cord (50 lb) A-A-52080, Type 1, Size 3, Finish B
As Needed	80-pound Break Tape, PIA-T-5661, Type 1, 1/4"
As Needed	3-cord Cotton (15 lb), ticket 8/4, A-A-52094, Type V, Tex 350, Ply 5
4	Locking Stow Band, Retainer Stow Band, 1 1/4" x 3/8"
1	Bridle Break Loop, 10" of PIA-T-5038, T3, 1/2"
As Needed	Container closing loop material, CYPRES approved 408 pound, 1.7 mm Spectra cord
As Needed	Safety loop material, PIA-C-5040, T2A, Coreless
As Needed	CYPRES approved silicone gel
Optional	Slider Packing Aid

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



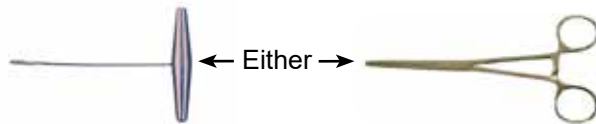
Locking Pull-up Cord, PN: S7667
NSN: 5180-016223424



8" Line Stow Bodkin, PN: 801156-3



Gun Cleaning Rod - 22" or longer



Finger Trap Tool

Hemostats



Static Line Stow Fid



Optional Slider Packing Aid, 4 foot poll
(e.g. broom handle) with padded end



Temporary Closing Pins marked "Safety" and "Container"



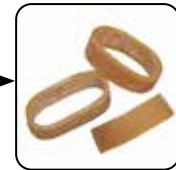
CYPRES Closing Loop Material
50m Roll
PN: AADCRILP



CYPRES Disc
PN: AADCRIWA1G
NSN: 1670-016828602



Locking Tube Stow band
PN: Microbulk-nat



← Either →

Retainer Stow Band
1 1/4" X 3/8", PN: S7111
NSN: 7510-015801615

4. Parts List

TT-600 Tethered Tandem Bundle System, Gen. 2A: P/N: 11076

TT-1000 Tethered Tandem Bundle System, Gen 1: P/N: 11035

TT-1000 Tethered Tandem Bundle System, Gen 2: P/N: 11092

TT-1000 Tethered Tandem Bundle System, Gen 3: P/N: 11147



Container
TT-1000 - Gen 3 PN: 11148



Container
TT-600 PN: 11077

Butler Parachute Systems - TT-600/1000 Assembly and Packing Instructions



CYPRES AAD
PN: AAD2C1M1535A



CYPRES Extension Cable
TT-600, 17" PN: AADCCEXT-17
TT-1000, 24" PN: AADCCEXT-24



Upper Attachment Ring
(left/right) TT-1000G3
PN: 801205



Upper Attachment Ring
(left/right) TT-600 &
TT-1000G1/2
PN: 801103



Bridle Keeper
PN: 701059



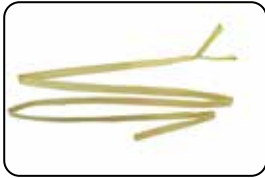
Release Handle
TT-600 PN: 701030
TT-1000 PN: 701120



Pilot Chute
TT-600 PN: 501002
TT-1000 PN: 501016



Deployment Bag
TT-600 PN: 101019
TT-1000 PN: 101052



Zip Strip
TT-600 & TT-1000 Gen 1/2
PN: 101042-7



Channel Bridle
TT-600 & TT-1000 Gen 1/2
PN: 101042-13



Canopy Assembly
TT-600 PN: 301034
TT-1000 PN: 301028



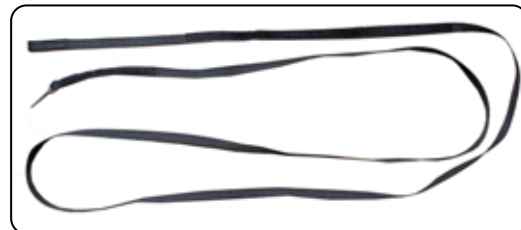
Deployment Bag Bridle
TT-1000 Gen 3
PN: 701135



Pilot Chute Bridle
TT-1000 Gen 3
PN: 701134



Side Attachment (Belly Band)
TT-600 PN: 101042-3
TT-1000 PN: 701121



Static Line
TT-600 PN: 101042-15
TT-1000G1/2 PN: 101015-15
TT-1000G3 PN: 701123

5. Methods

5.1 General

Unless stated otherwise, secure all hand tacks and ties with a surgeon's 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 or left inside the parachute

5.2 Container Closing Loop and Safety Loop

The Safety Closing Loop is **not** the primary closing loop and only acts as a safety to ensure the container remains closed until the system is activated by the operator pulling the release handle. The Safety Loop must not be as tight as the Container Closing Loop. If the Safety Loop creates a kink in the yellow release safety cable, then the loop is too short and must be adjusted accordingly. The Safety Loop must be 1/2" longer than the Container Closing Loop. Both of these loops must be installed with a CYPRES anchor disc.



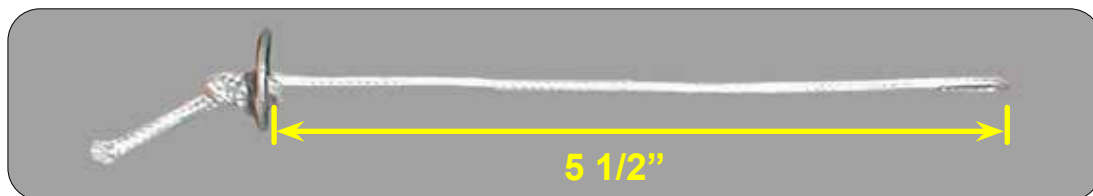
WARNING

The Safety Loop must be 1/2" longer than the Container Closing Loop to prevent a hard pull on the cutaway handle. If the Safety Closing Loop is too tight, it may increase the amount of pull required by the user to activate the system.

Adjustable soft closing loops made with CYPRES approved cord must be used on the container closing loop. No other closing loop material is approved for use. The loop must be installed with a CYPRES anchor disc*.

* See "Appendix D. Closing Loop Disc Installation" on page 73 for instructions on attaching the loops to the discs.

5.2.1 TT-600 Closing Loop and Safety Loop Length

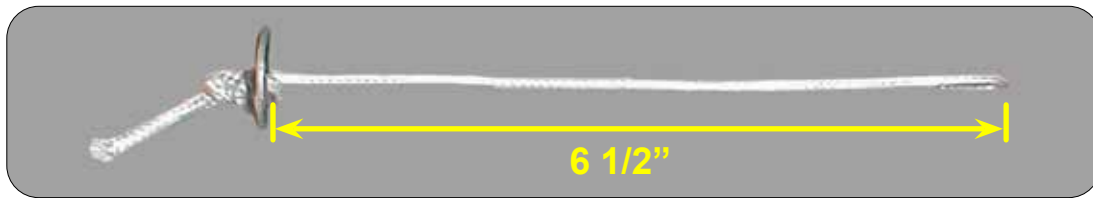


TT-600 Container Closing Loop: Following the steps in the Cypres Rigger's Manual, make one closing loop 5 1/2" (14 cm) long (+- 1/4"). The closing loop length may need to be adjusted later.



TT-600 Safety Loop: Using PIA-C-5040, T2A, coreless cord and a CYPRES disc, create a safety closing loop 1/2" (1.3 cm) longer than the closing loop.

5.2.2 TT-1000 Closing Loop and Safety Loop Length



TT-1000 Container Closing Loop: Following the steps in the Cypres Rigger's Manual, make one closing loop 6 1/2" (16.5 cm) long (+- 1/4"). The closing loop length may need to be adjusted later.



TT-1000 Safety Loop: Using PIA-C-5040, T2A, coreless cord and a CYPRES disc, create a safety closing loop 1/2" (1.3 cm) longer than the closing loop.

5.3 Release Cable Maintenance

Clean and lubricate the release cable with silicone spray at every repack cycle. Spray the silicone on a paper towel and firmly wipe the cable twice. A thin, invisible film will remain. Avoid applying too much silicone. Too much silicone will attract grit and dirt.

If the release cable is subjected to any unusual or severe conditions such as dust, moisture, impact damage, humidity, oil, hydraulic fluid, JP-4, etc., it should be serviced on a more frequent basis.

5.4 Locking Stow Band Type and Maintenance Cycle

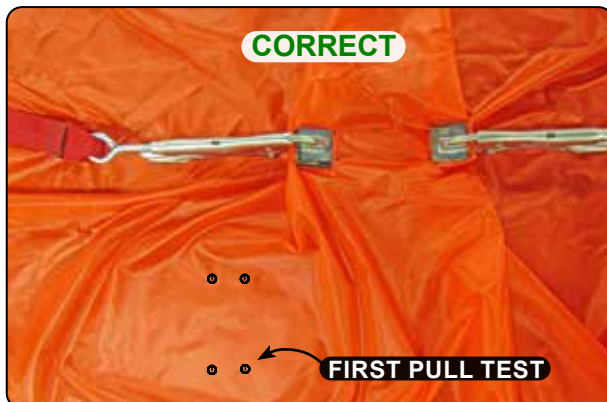
Two types of stow bands are approved for use on the Tandem Bundle system. Use only 1 1/4" X 3/8" retainer bands for low bulk lines or Tube Stow brand stow bands for microline.

The four locking stow bands on the deployment bag must be replaced at every repack cycle. Write an entry in the logbook noting that the locking stows were replaced.

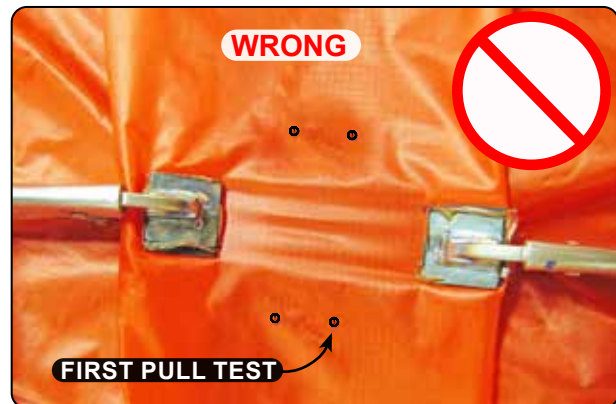
5.5 Parachute Canopy Fabric Pull Test Procedure

A canopy cloth pull test will be accomplished every other inspection and repack. The purpose of this test method is to provide a non-destructive method for verifying the strength of parachute fabric. Follow the pull test procedures outlined in Appendix C (PIA Technical Standard TS-108). Write an entry in the logbook noting when canopy pull tests are made.

This manual supersedes the PIA pull test procedures when there is a conflict with the number and method of pull tests on the cloth. Do two (2) pull tests at every other inspection and repack. Do one test in one direction of the yarns, and the other test at 90° from the first test without overlapping the first pull test. Pull test different colors of cloth than the last pull test. Pull test random gores that have not been pull tested before. Do both pull tests along the bias with the clamps aligned even with the squares on the cloth.



Pull test along the bias with the clamps aligned even with the squares on the cloth.



Do not overlap the first pull test when doing the second pull test.



Caution should be exercised as this test can damage the fabric if the clamps are not tight.

5.6 Shipping Parachutes

Parachutes should be shipped in a sturdy, double-walled box with all exposed seams on the container sealed with two inch clear packing tape.

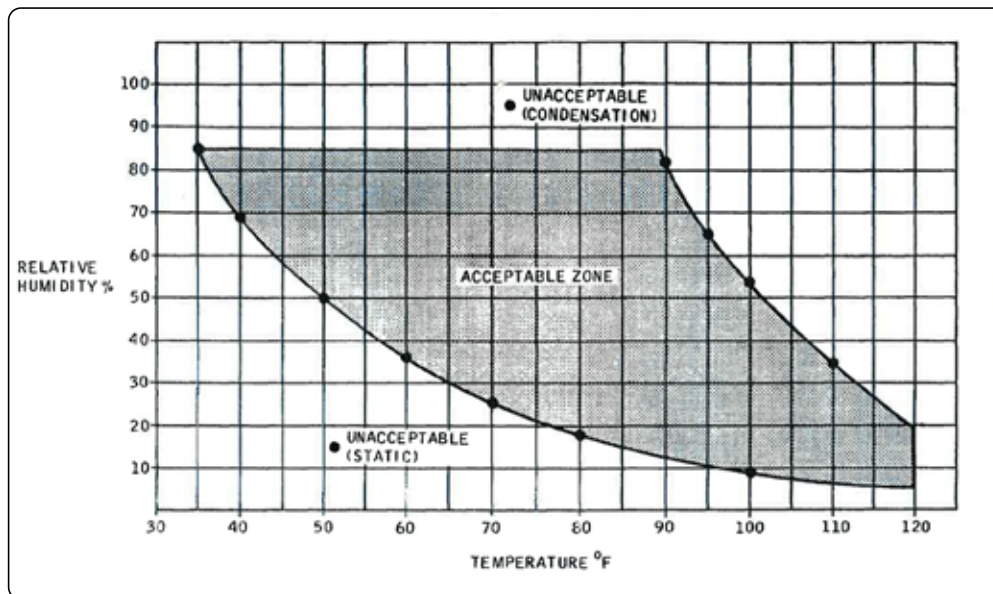
5.7 Storing Parachutes

Store the Tandem Bundle in a well ventilated area that is free of dust and other contaminants such as oil and chemical-based products. Do not store the parachutes directly on the floor, around heating/cooling apparatus, or in direct sunlight. The acceptable temperature and humidity limits for storing parachutes are illustrated in the chart below.

Parachutes should be clean and dry before placing in storage. Parachutes being stored for more than three (3) repack cycles should be stored with the pilot chute deployed and un-compressed. Open the container and stow the pilot chute under the side flaps.



3.6 TT Bundle stowed for long-term storage.



3.6 Storage and Temperature and Humidity acceptable range.

6. Reference

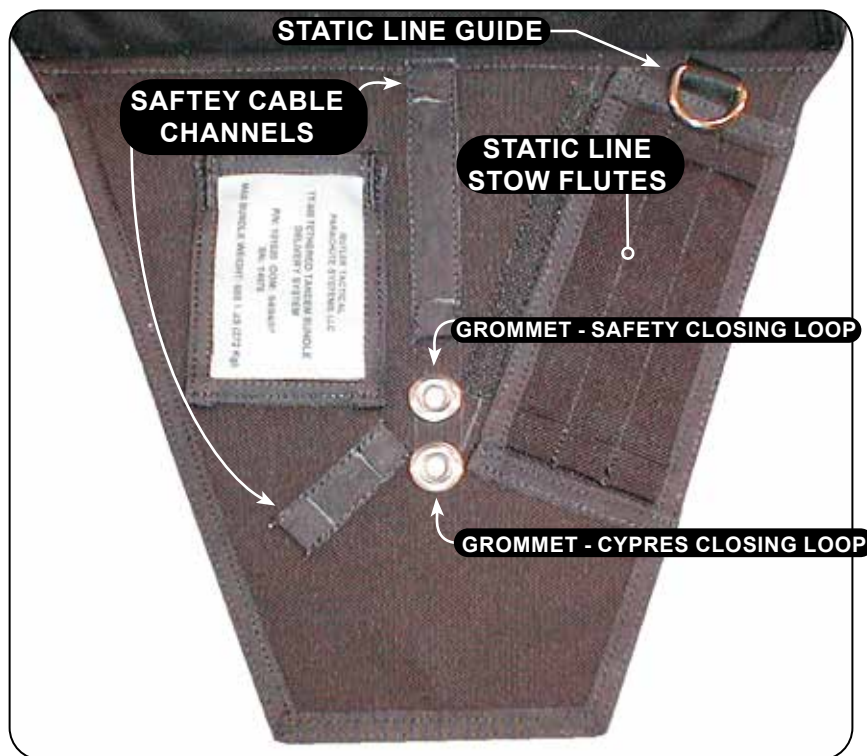
6.1 Pack Tray



6.2 TT-600 & TT-1000 Gen 1/2 Harness Cover



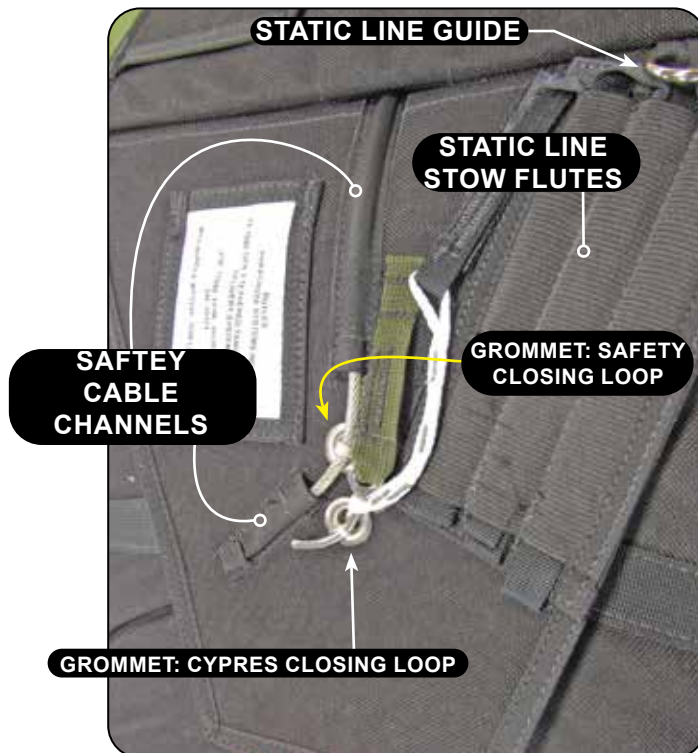
6.3 TT-600 & TT-1000 Gen 1/2 Inner Top Flap



6.4 TT-1000 Gen 3 Harness Cover

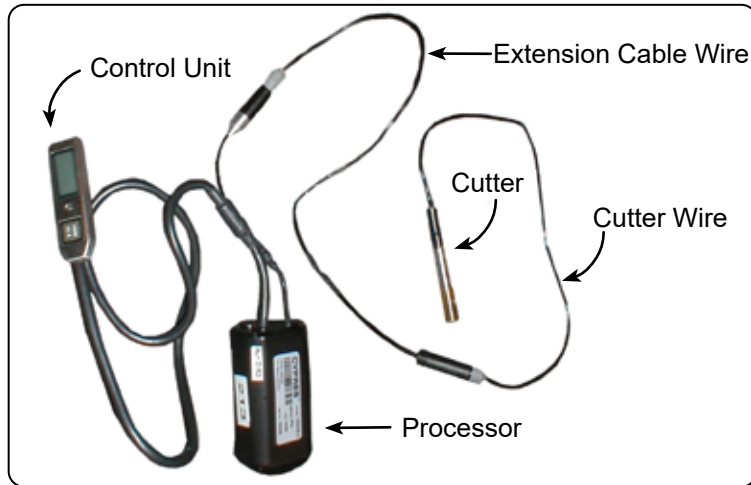


6.5 TT-1000 Gen 3 Inner Top Flap



7. Container Preparation

7.1 CYPRES Preparation



Handle the CYPRES with care. Never pull, twist, or kink the cutter wires or the control unit cable. A bend in any of the cables cannot be less than 0.94" (24mm) (the diameter of a U.S. quarter).

Visually inspect the CYPRES for damage or wear.

Perform a function check and verify that the maintenance cycle of the CYPRES will not expire before the next scheduled service of the parachute. Refer to "Appendix C. CYPRES Function and Maintenance Verification" on page 72 for instructions on performing a function check and verifying maintenance.

Write the CYPRES serial number and date-of-manufacture in the parachute packing data book.

7.2 Installing the CYPRES

Unplug the cutter wire from the processor.

7.2.1

Insert the processor into the pouch located on the inside of the pack tray.

Place the processor in the pouch so the cutter wire and control unit cable are located on the bottom, flat against the pack tray.



7.2.1 Inserting the CYPRES processor.



The cutter wire and the control unit cable must be located on the bottom, flat against the pack tray.

7.2.2

Pass the control unit through the corner opening of the pouch.



7.2.2 Routing the control unit.

7.2.3

Feed the control unit under the Type 3 webbing on the pack tray and through the pack tray opening.



7.2.3 Routing the control unit.

7.2.4

Reach underneath the harness cover and pass the control unit through the opening and into the pocket.



7.2.4 Seating the control unit.

7.2.5

Route the cutter wire plug underneath the control unit cable at the processor.



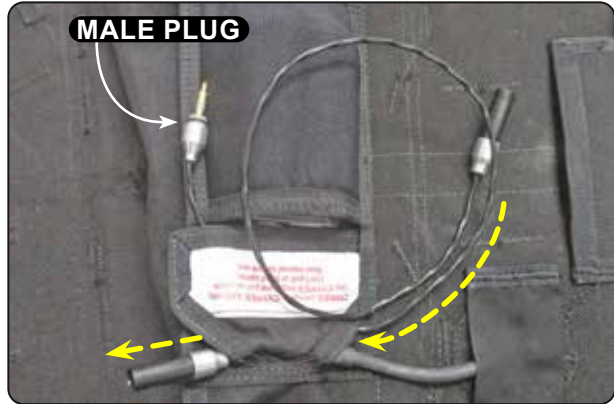
The cutter wire and the control unit cable must be routed underneath the control unit cable.



7.2.5 Routing the cutter wire.

7.2.6

Pass the extension cable wire through the corner opening of the pouch with the male plug to the inside of the pouch.



7.2.6 Routing the extension cable wire.

7.2.7

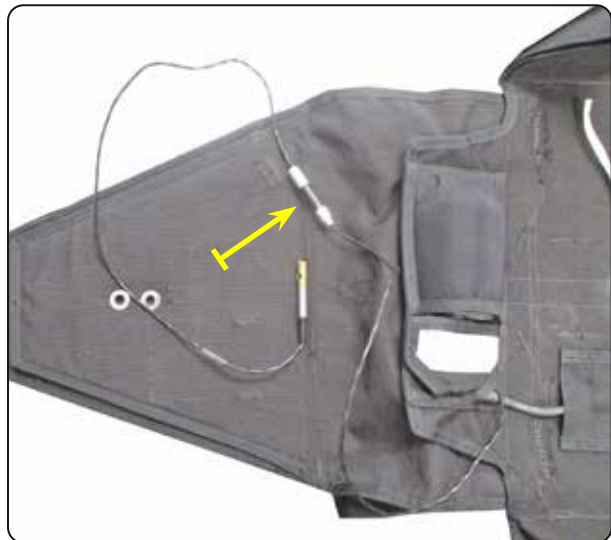
Plug the extension cable wire into the processor.



7.2.7 Attaching the extension cable to the processor.

7.2.8

Plug the extension cable wire into the cutter wire.



7.2.8 Attaching the extension cable to the processor.

7.2.9

Pass the cutter underneath the Type 3 tape that covers the opening on the pack tray. Route the cutter through the cable channels.

Insert the cutter into the elastic keeper.



7.2.9 Installing the cutter cable wire.

7.2.10

Coil the excess cable and wire at the processor and close the pouch cover.



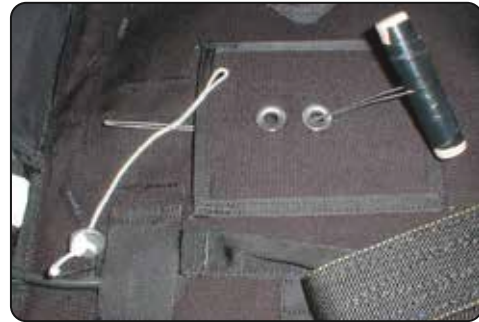
7.2.10 Stowing the excess cable/wire.

7.3 Installing the Closing Loop and Safety Loop

7.3.1

Insert a fingertrap tool through the bottom grommet on the closing loop base.

Thread the CYPRES closing loop through the tool and pull the loop through the grommet until the CYPRES disc is seated against the grommet.



7.3.1 Installing the CYPRES closing loop.

7.3.2

Install the safety loop on the top grommet using the same method as 8a.3.1.



7.3.2 Installing the safety loop.

7.3.3

Coat the closing loops with CYPRES approved silicone.



7.3.3 Treating the CYPRES closing loop.

7.4 Preparing the Deployment Bag

Install (four each) new locking stow bands* on the deployment bag.

* See section "5.4 Locking Stow Band Type and Maintenance Cycle" on page 13 for approved stow bands.



7.4 Installing the locking stow bands.

8. Canopy Assembly



Prior to starting any packing procedure, a full inspection must be performed.

If you find damage or wear on the parachute system, you must stop. Do not proceed with packing the parachute. Damage or wear that will affect the airworthiness of the parachute must be repaired or replaced before you pack the parachute.

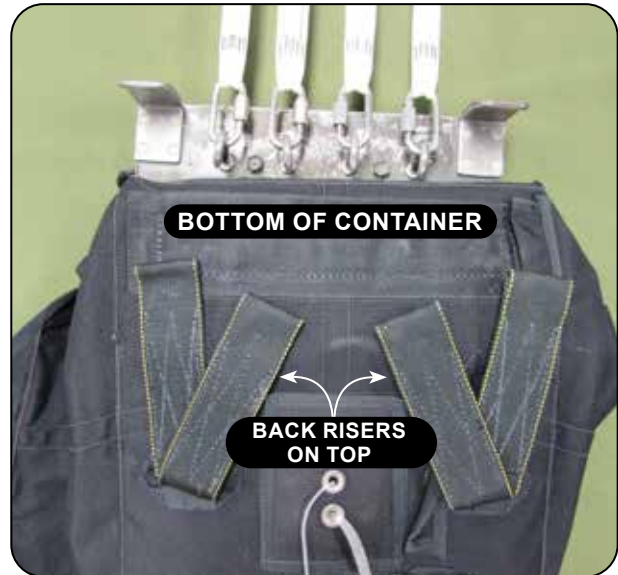
It is the rigger's responsibility to determine the airworthiness of the parachute system. Contact butler parachutes if you have questions regarding the airworthiness of the parachute system.

8.1

Connect the links to a tension board with the back line groups on the inside and the front line groups on the outside.

Place the harness/container on the table behind the tension board with the pack tray facing up, and bottom of the container at the links.

Fold the risers over so the back risers are on top.



8.1 Layout.

8.2

Thoroughly inspect the entire parachute system for damage or wear.

Place the canopy on the table with the back panel* of the canopy facing up.

* Panel #22 for HX-600 and panel #28 for HX-1000.

Position the slider halfway between the canopy and the container between the two line groups.

Perform a line continuity check:

- a. Spread the two main line groups apart so the front and back gores are in the middle of the line groups.
- b. Starting with panel #1 on the left side, pick up each line from the table on the left side and ensure that it runs free and clear from the canopy to the link.
- c. Repeat the same procedure for the right side.



8.2 a. Spreading the main line groups.



8.2 b. Line continuity check.

8.3

Repeat steps b and c of 8.2 on the slider to ensure the suspension lines run free and clear through their respective slider grommet in the same order that the suspension line is installed on the connector link.



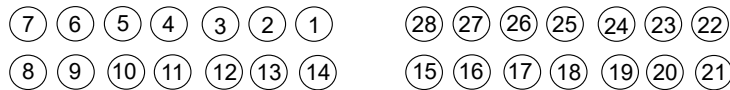
Be sure the suspension lines run free and clear through their respective slider grommet in the same order that the suspension line is installed on the connector link.



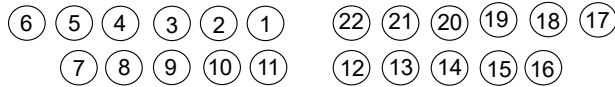
8.3 Slider continuity.

Line Continuity

HX-1000



HX-600



8.4

Ensure that the barrel nuts on the links are facing inboard and the longer segment of the link is downward toward the pack.

Connect the canopy Rapide links* to the risers and tighten them hand-tight plus 1/4 turn.

Do a continuity check to verify continuity.

* Genuine french maillon rapide links are the only connector links approved for installation on Butler products.



8.4 Attaching the canopy to the container.

8.5

Tack the riser below the link with one turn of Lite Super Tack cord.

Figure-eight a piece of tack cord through each group of the suspension line loops at the link and tie the lines together.



Do not tie any lines together from different riser groups.

Do not pierce any lines when tacking the suspension lines.

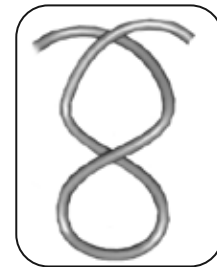
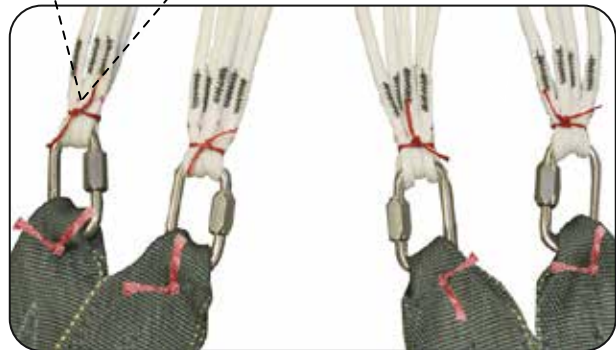


Figure-eight knot



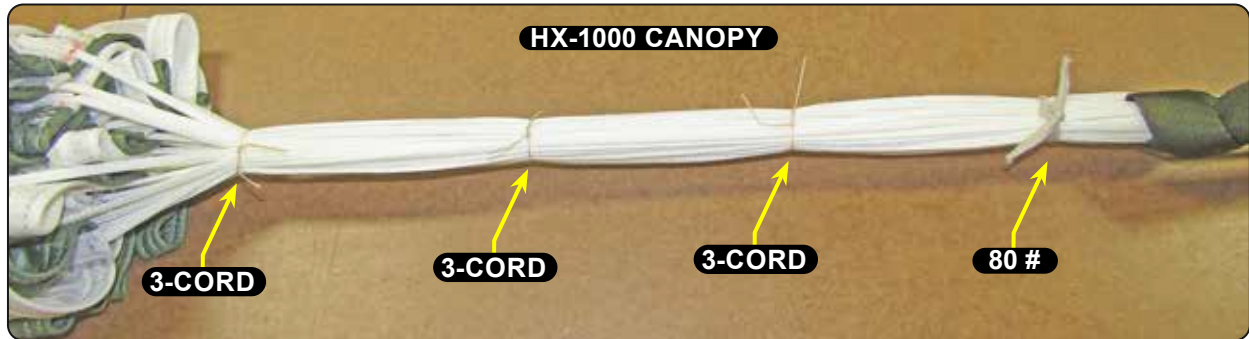
8.5 Riser and line tacks.

9. Preparing the Canopy Apex

If you are assembling an HX-1000 canopy, follow the procedure outlined in 9.1 to secure the apex lines.

If you are assembling an HX-600 canopy, follow the procedure outlined in 9.2 to secure the apex lines.

9.1 HX-1000 - Preparing the Canopy Apex



9.1 Tying the apex lines on an HX-1000.

9.1

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

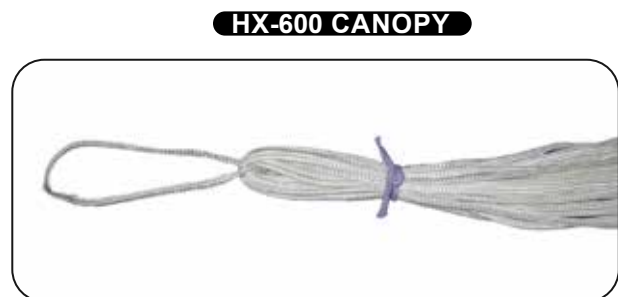
Tie the apex lines in three places 4" to 6" apart with 3-cord cotton.

9.2 HX-600 - Preparing the Canopy Apex

9.2.1

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.



Apex tie on an HX-600.

9.2.2

Tie the 4 center tie-tabs together with one turn-doubled, 8/4 cotton thread.



9.2.2 Tying the center tie-tabs.

9.2.3

Tie the 4 top tie-tabs together with one turn of 80-pound break tape.



9.2.3 Tying the top tie-tabs.

10. Deployment Bag Assembly

10.1 TT-600 and TT-1000 Gen 1/2 Deployment Bag Assembly

10.1.1

Lark's-head one loop of the replacement zip strip onto the vent lines as shown.



10.1.1 Installing the zip strip.

10.1.2

Lark's Head the end of the bridle to the remaining zip strip loop as shown.



10.1.2 Installing the zip strip.

10.1.3

Using a 15" length of 1/2" Type-3 webbing, create the zip strip break-tie by passing one end through the canopy vent lines, and the other through the loop on the end of the canopy channel bridle.



10.1.3 Installing the break tape.

10.1.4

Bring the ends of the Type-3 together and form a loop approximately 1" diameter. Tie the ends together with a square knot.

Tie an overhand safety knot on each end and trim to 1/2".



10.1.4 Installing the break tape.



10.1.5 Stowing the zip strip.

10.1.5

Insert the cable bodkin into the pilot chute end of the channel bridles.

Thread the bodkin through the channel.

10.1.6

Thread a piece of super tack cord through the end of the zip strip and form a loop.



10.1.6 Stowing the zip strip.



10.1.7 Stowing the zip strip.

10.1.7

Lock the super tack loop to the cable bodkin.



10.1.8 Stowing the zip strip.

10.1.8

Pull the zip strip through channel.



Ensure that there are no twists in the zip strip before you thread the strip. The zip strip should run flat through the channel.

10.2 TT-1000 Gen 3 Deployment Bag Assembly

10.2.1

Attach the end of the deployment bag bridle with the 5" loop to the apex lines of the canopy with a lark's head knot.

Do not tighten the knot. Tack the knot so the bridle can float freely on the apex lines.

Tack the lark's head knot with one turn of Lite Super Tack cord.



10.2.1 Attaching the deployment bag bridle.

10.2.2

Thread the end of the pilot chute bridle with the 3 1/2" loop through the deployment bag.



10.2.2 Routing the pilot chute bridle.

10.2.3

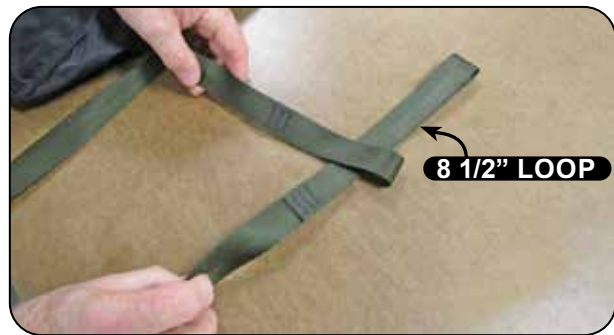
Thread the pilot chute bridle through the loop in the deployment bag bridle and back through the top of the deployment bag



10.2.3 Installing the deployment bag bridle.

10.2.4

Thread the other end of the pilot chute bridle (end with the 8 1/2" loop) through the other end of the pilot chute bridle with the short loop.



Thread the bridle through itself to form a lark's head knot at the top of the deployment bag.



10.2.4 Installing the pilot chute bridle.

10.2.5

Do not tighten the knot. Tack the knot so the bridle can float freely on the attachment point.

Tack the lark's head knot with one turn of super tack cord.



10.2.5 Tacking the lark's head knot.

11. Assembling the Pilot Chute

11.1

Thread the pilot chute bridle through both of the loops at the bottom of the pilot chute.

Pass the pilot chute through the loop on the bridle and form a lark's head knot at the pilot chute loops. Cinch the knot tight.



9.2.6 Attaching the pilot chute.

11.2

S-fold the deployment bag bridle and stow it in the bridle keeper.

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



11.2 Stowing the deployment bag bridle.

Start here if you are performing maintenance service and not assembling the parachute system.

12. Canopy Folding

Place the parachute face-down on the table and apply tension. Thoroughly inspect the entire parachute system for damage or wear.



WARNING

If you find damage or wear on the parachute system, you must stop. Do not proceed with packing the parachute. Damage or wear that will effect the airworthiness of the parachute must be repaired or replaced before you pack the parachute.

It is the rigger's responsibility to determine the airworthiness of the parachute system. Contact Butler Parachutes if you have questions regarding the airworthiness of the parachute system.

12.1

Position the slider approximately halfway between the canopy skirt and the risers. Check the continuity of the suspension lines and slider installation.

Loosen the Rapide links* and retighten them hand-tight, plus one quarter turn with a wrench.

* GENUINE FRENCH MAILLON RAPIDE LINKS ARE THE ONLY CONNECTOR LINKS APPROVED FOR INSTALLATION ON BUTLER PRODUCTS.



Be sure the suspension lines run free and clear through their respective slider grommet in the same order that the suspension line is installed on the connector link.

12.2

Flake the canopy with an equal number of gores on each side with:

gore #22 on top for the HX-600

gore #28 on top for the HX-1000

Even the apex and dress the skirt.



12.2 Flaking the canopy.

12.3

Ensure that the slider is clear of the suspension lines and centered between the two line groups.

Pull the slider up the suspension lines and place it in the canopy wind channel under the top gore of the canopy



12.4

Dress the skirt of the slider.

Wrap a small packing weight around the suspension lines to maintain neatness.

Pull each section of the skirt out from between the suspension lines. While you are dressing the skirt, ensure that each slider grommet is seated against the stop ring.

Stack the slider skirt in two groups with an equal number of skirt sections on each side of the suspension lines.



12.3 Stowing the slider.



12.4 Dressing the slider skirt.



12.5

Stack the slider skirt in two groups with an equal number of skirt sections on each side of the suspension lines.



12.5 Dressing the slider skirt.

12.6

Fold the canopy into thirds.

Fold the skirt of the canopy on top of itself so the width of the skirt is the same width as the deployment bag.

Fold the right side of the canopy first, then fold the left side of the canopy over the right side.



12.6 Folding the canopy.

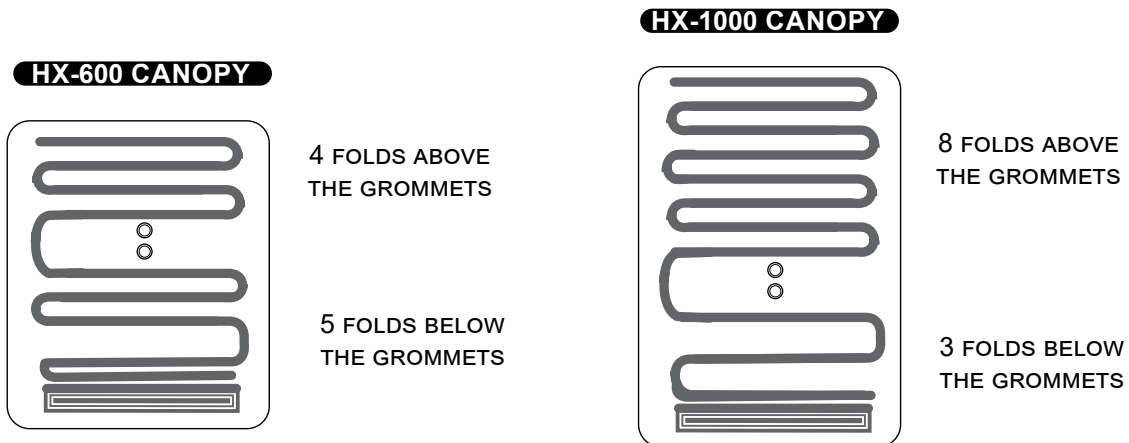
13. Stowing the Canopy in the Deployment Bag



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 on both sides of 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.

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

The following illustrations are a guide to the number of folds to put above and below the grommets. Fold placement is at the discretion of the rigger packing the system.



13.1

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

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

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



13.1 Folding the canopy into the deployment bag.



13.2

Thread a locking pull-up cord through the top grommet from underneath and install a washer on the pull-up cord with a lark's head knot.

Cinch pull-up cords tight and secure with a cord lock or slip knot.

Thread a locking pull-up cord in the same manner through the bottom grommet.



13.2 Installing the locking pull-up cords.



13.2

Continue S-folding the canopy into the bag until approximately 20" to 25" of canopy remains outside the deployment bag.

S-fold the remaining 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.



13.2 Folding the canopy into the deployment bag.

13.3

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

Fold the side flaps of the bag over the canopy.

Close the flap with the line flutes over the side flaps, then close the other flap.

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.



13.3 Closing the mouth of the bag.



13.4 Stowing the locking stows.

13.4

Make the first stow in the top-left flute.



13.4 Stowing the suspension lines.

13.5

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

Leave 6" to 10" of suspension lines unstowed.



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



WARNING

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.



13.5 Stowing the suspension lines.

13.6

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



13.6 Closing the line stow cover.

14. Closing the Container

14.1

Pick the bag up and rotate the bag so the line stows are on the bottom and place the bag into the container.



14.1 Placing the bag on the pack tray.

14.2

Lift the bag and thread:

The CYPRES pull-up cord through the container closing loop.

The T2A coreless pull-up cord through the safety loop.

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



14.2 Threading the closing loops.

14.3

Pull the closing loops through the bag and secure with temporary pins.



Mark the temporary pin flags "CONTAINER" and "SAFETY" to avoid confusion when closing the container.



14.3 Pinning the closing loops.

Steps 14.4 to 14.11 are for the TT-1000 Gen 1/2 only. If you are packing a TT-600 2A or a TT-1000 Gen 3, skip to step 14.12

14.4

Place the controller drogue flat on the table with the mesh facing up.



14.4 Stowing the drogue.

14.5

Fold the drogue in half, top-to-bottom.



14.5 Stowing the drogue.

14.6

Fold the drogue in half, right to left.



14.6 Stowing the drogue.

14.7

Fold in half again, top-to-bottom.



14.7 Stowing the drogue.

14.8

Fold top-to-bottom once more.



14.8 Stowing the drogue.

14.9

S-fold the drogue into thirds as shown.



14.9 Stowing the drogue.

14.10

Fold the controller drogue bridle on top of the deployment bag.



14.10 Stowing the drogue.

14.11

With the edge of the folded drogue even with the bottom of the deployment bag, place the drogue on top of the folded bridle.



14.11 Stowing the drogue.

14.12

Thread the CYPRES loop through the CYPRES cutter and the bottom flap grommet.

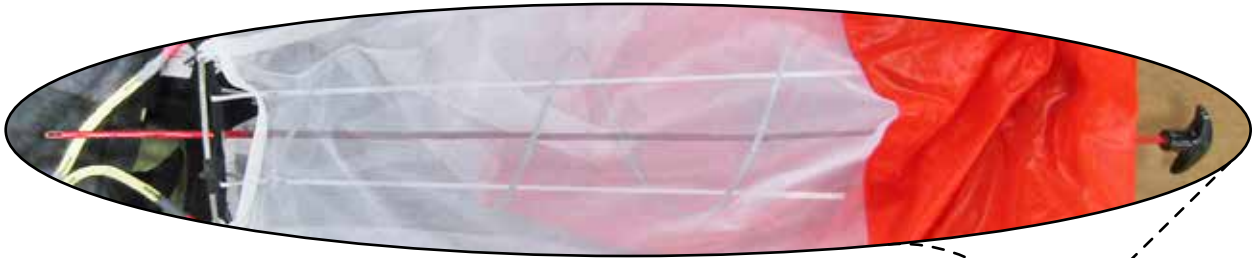
Close the bottom flap and secure it with the temporary pins.



14.12 Closing the bottom flap.



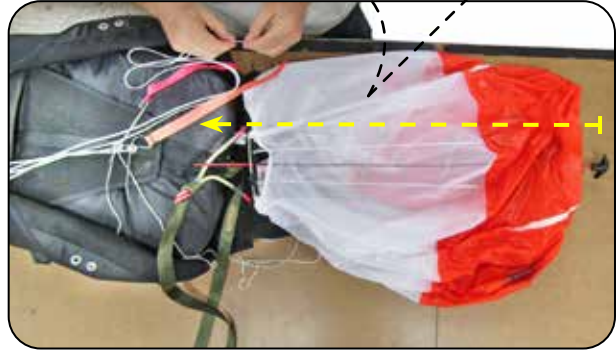
Check the closing loop length after you have closed the bottom flap. Adjust the loops accordingly if they are too short or too long.



14.13

Place the base of the pilot chute at the top of the container and remove any twists in the pilot chute bridal.

Insert a gun cleaning rod through the safety grommet* at the top of the pilot chute. Route the rod through the center of the pilot chute and through the grommet at the bottom of the pilot chute.



Make sure the rod goes straight down the center of the pilot chute and not around the spring or center lines.

Thread the pull-up cord from the safety closing loop through the eye of the rod and pull the pull-up cord through the pilot chute.

Repeat the same procedure for the container pull-up cord.

* The container grommet is centered on the pilot chute cap. The safety grommet is offset and next to the container grommet.



14.13 Threading the pull-up cords through the pilot chute.

14.14

Place the pilot chute on top of the deployment bag and compress the spring. Do not stow the bridle under the pilot chute.



Do not twist the pilot chute as you compress it. Hold the cap and push the spring straight down.

Pull the safety loop through the pilot chute and secure it with the temporary pin.

Pull all of the material out and clear of the pilot chute spring.



14.14 Compressing the pilot chute.

14.15

This step is for the TT-1000 Gen 3 only.

Pull both of the center lines out at the top of the pilot chute.

S-fold the center lines and place them back inside the spring at the center of the pilot chute.



14.15 Clearing the center lines.

14.16

Pull the container closing loop through the pilot chute and secure it with the container temporary pin.



14.16 Pinning the container closing loop.

14.17

Neatly fold the pilot chute material at the top and bottom of the container and place it under the top pilot chute cap.

Neatly fold the material at the sides of the container and fold it under itself at the sides of the pilot chute cap.



14.17 Folding the pilot chute material.

14.18

Close the left side flap.



14.18 Closing the right side flap.

14.19

Close the right side flap.



14.19 Closing the left side flap.

14.20

Push the tuck flaps at the top of the container down and between the pack tray and the deployment bag.



14.20 Dressing the container.

14.21

S-fold the pilot chute bridal on the top/back area of the deployment bag.



14.21 Stowing the pilot chute bridal.

14.22

Close the top flap and dress the container.



14.22 Closing the top flap.

15. Connecting the Static Line - TT-600 & TT-1000 Gen 1/2

15.1

Remove the container temporary pin and seat the static line pin in the container closing loop.



15.1 Seating the static line pin.

15.2

Mate the Velcro on the static line to the Velcro next to the static line flutes.



15.2 Stowing the static line.

15.3

Stow two folds of the static line into each flute. Stack the second fold on top of the first fold.



15.3 Stowing the static line.

15.4

Stow the static line in the last flute until the Velcro on the static line is approximately 1" from top of the flute.



15.4 Stowing the static line.

15.5

Pass the static line through the static line guide ring and through the opening between the inner and outer top flaps.



15.5 Stowing the static line.



CAUTION

Failure to pass the static line through the D-ring will result in damage to the container and possible failure of the system.

15.6

Mate the static line Velcro to the top flap and harness cover Velcro.



15.6 Stowing the static line.

15.7

Close the cover flap and tuck it into the pocket at the bottom of the pack.



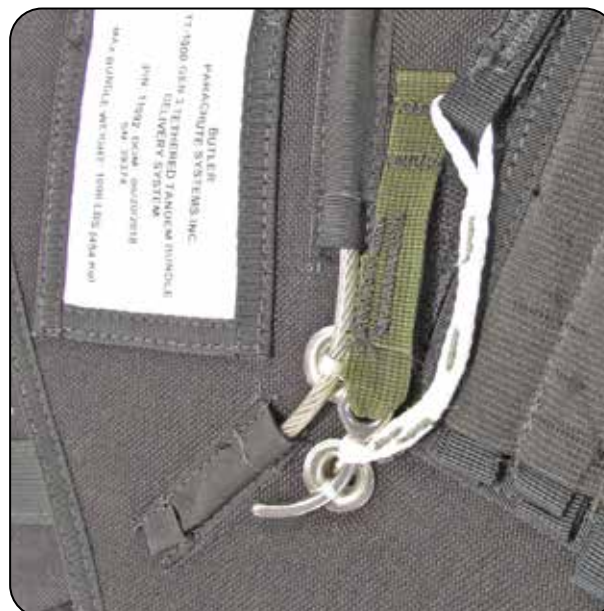
15.7 Closing the cover flap.

16. Connecting the Static Line - TT-1000 Gen 3

16.1

Place the curved closing pin through the small loop at the end of the static line lanyard.

Remove the container temporary pin and seat the pin in the container closing loop.

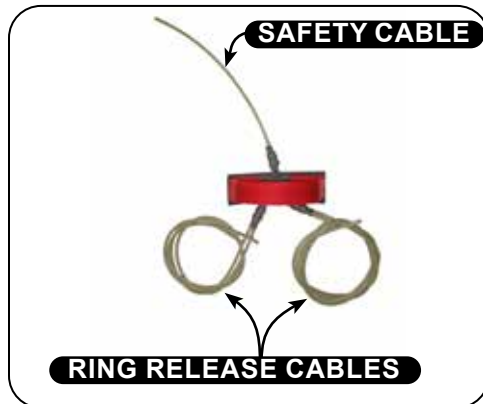


16.1 Stowing the static line.

16.2

Follow the steps 15.2 through 15.7 in the previous section.

17. Installing the Release Rings



17.1

Pass the four ring release cables on the handle through the opening at the bottom of the handle protector and into the four cable housings.

Install the cables in order so there is no twists in the cables.



13.1 Installing the release handle.

17.2

Insert the safety cable into the cable guide on the top flap.



17.2 Installing the safety cable.

17.3

Route the cable through the cable guide and through the safety closing loop.

Stow the end of the cable in the bottom cable guide.



17.3 Installing the safety cable.

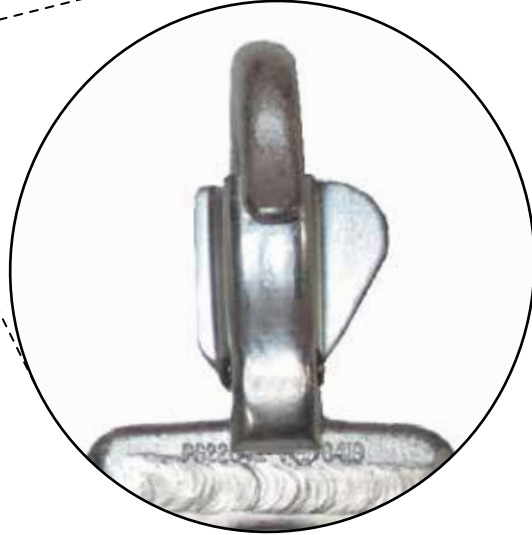
18. Installing the Release Rings

18.1 Installing the Upper Attachment Rings



The upper attachment assembly is a 4-ring release on the TT-1000. The assembly is a 3-ring release on the TT-600.

The upper attachment rings have one of the butterfly tabs removed. Install the snaps so the remaining butterfly tab faces outboard when it is installed.



Install the rings so the snap opening faces toward the container pack.



The TT-600 Gen 2A and the TT-1000 Gen 1/2 have a 3-ring release.

The TT-1000 Gen 3 has a 4-ring release.

18.1.1

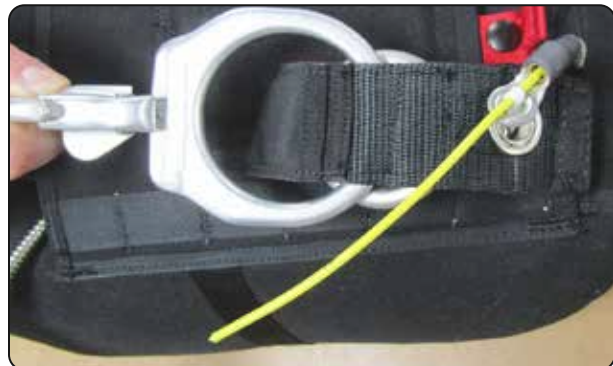
Install the upper attachment rings as you would a conventional 3-ring release.



TT-1000 SHOWN



TT-600 SHOWN



18.1.1 Installing the upper attachment rings.

18.1.2

Stow the end of the cable in the pocket at the end of the riser.



Do not kink the cable when stowing it in the pocket.



18.1.2 Stowing the cable end.

18.2 Installing the Side Attachments



18.2.1

Set the rings and bring the loop from the back of the riser through:

- a. the smallest ring
- b. then through the grommet tab on the front of the riser
- c. then through the grommet on the cable housing

Install the cable through the loop and stow the excess cable in the pocket on the side of the container.



18.2.1 Installing the side attachments.

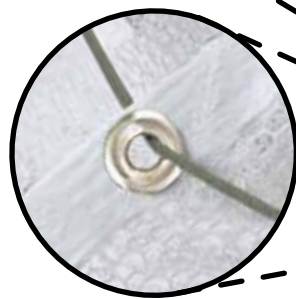
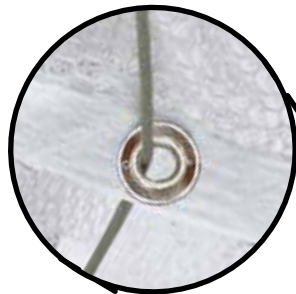
Appendix A. Installing the Slider

Install the slider so the grommet (smooth side) is facing down (toward the links) and the grommet washer is facing up toward the canopy.

Install the slider in the same sequential order as the suspension lines. Install the suspension lines on the canopy links as you install the slider. When you are finished with the installation, the slider should be centered between the two line groups.

Inspect the suspension lines and slider for continuity. Ensure that the suspension lines run free and clear through their respective slider grommets in the same order that the suspension line is installed on the connector link.

Washer (rimmed) faces up toward the canopy.



Grommet (smooth) faces down toward the links.

Slider runs free and clear of the suspension lines and is centered between the two line groups.

Appendix B. PIA Technical Standard TS108.1

This document is provided for reference only and comes from an outside source. Butler Parachute Systems, Inc. will not maintain or update this document. It is the responsibility of the technician using this procedure to ensure the currency of the information provided. This document is available at <http://www.pia.com/PIAPUBS.htm>.

This manual supersedes the PIA pull test procedures when there is a conflict with the number and method of pull tests on the cloth. Do two (2) pull tests at every other inspection and repack. Do one test in one direction of the yarns, and the other test at 90° from the first test without overlapping the first pull test. Pull test different colors of cloth than the last pull test. Pull test random gores that have not been pull tested before. Do both pull tests along the bias with the clamps aligned even with the squares on the cloth.



PIA-TS-108.1
15 January 2010

Superseding
PIA-TS-108
12 December 1992

PIA Technical Standard

Parachute Canopy Fabric Pull Test Non-Destructive Method

Disclaimer: Parachute canopy manufacturers may have pull test requirements that differ in methods, procedures, and loads applied. Test procedures specified by the canopy manufacturer takes precedence over the test procedures described in this document. The person performing the pull tests must determine if the canopy manufacturer has a specific method of pull testing their canopy fabric.

Background: The purpose of this test method is to provide a simple, standardized, non-destructive method of verifying the strength of parachute canopy fabric. **This test method may be used when no other procedure is specified by the manufacturer.** Although this test is intended to be non-destructive, caution should be exercised as this test could damage the fabric, if the fabric is not positioned correctly or is not secured tightly. It may also affect the fabric permeability.

This method is designed to replace the old "Riggers' Thumb Test", first devised in response to the "canopy acid-mesh" discovery in the mid-1980's. It is now the accepted method for all parachutes requiring canopy fabric strength tests. Reasons for testing may include: Manufacturer's Service Bulletins (SBs), Airworthiness Directives (AD's), aging material, chemical contamination, UV exposure or discoloration of a suspicious origin, such as grass

2 ea. Locking Fabric Clamps

Figure 1

Para-Gear Equipment Co.
3839 W. Oakton St.
Skokie, IL 60076-3438

800-323-0437 (P/N S7989)
www.para-gear.com

Aerostar International, Inc.
1814 N.
Sioux Falls, SD 57117-5057

605-331-3500 (P/N 51406M)
www.aerostar.com

Ink, Marking (for parachutes and other textile items)
A-A-59291 (21Jul/98) Supersedes MIL-I-6903C (5Mar/68)

American Writing Ink Co.
33 Endicott St.
Norwood, MA 02062

781-762-0026

Strata Blue P/N 7510-00-286-5362 Available in 1 pint container
Orange-Yellow P/N 7510-00-634-6583 Available in 1 pint container

Hitt Marking Devices, Inc.
3231 W. MacArthur Blvd.
Santa Ana, CA 92704

714-979-1405
800-969-6699 (toll free)
www.hittmarking.com

Sharpie Pen- black

1 ea. Calibrated Spring Scale, 50 lb. (23 kg.) minimum capacity

This scale should be calibrated at least once a year to an accuracy of +/- 3 lbs. It should be identified with a serial number and written verification of calibration must be kept on file. An adhesive label (or similar) should be affixed to the scale showing the date calibrated and the date next calibration is due. If the scale is damaged in any manner, such as dropping, it must be pulled from service and tagged as unserviceable until its recalibration.

Test Procedures: The following procedures do not take precedence over a manufacturer's test procedures for their products. Before testing make sure you have the manufacturer's most current test procedures.

A minimum of 2 areas should be tested on a canopy, but not less than 2 pull tests on each separate color (1 in the warp direction and 1 in the fill direction). When testing look for areas of contamination and/or discoloration. If possible remain approximately 6 inches (150mm) from any seam.

Proceed as follows:**NOTE: Steps 1 and 2 apply to cases involving acid-mesh pull testing.**

1. Locate the mesh vents in the canopy and determine the fabric areas which are in contact with the mesh when the canopy is packed. These areas are shown as the diagonally shaded lines in typical tri-vent canopies (see FIGURE 2).

2. Perform one 40 lb. (18 kg.) pull test on each panel of material that comes in contact with the mesh when the canopy is packed. Alternate tests from the warp to fill direction on the panels. This could be as few as four tests or as many as twelve tests on some bias constructed canopies.

CAUTION: Never attach fabric clamps or perform pull tests on the mesh covered areas of any canopy. Extensive damage will result.**NOTE: Steps 3 through 6 apply to all pull tests (not just acid-mesh).**

3. The area to be tested must be visibly marked for future reference. Refer to FIGURE 3 for examples of how to mark the parachute to be tested.

4. After the marking ink has dried, attach the locking fabric clamps to the ripstop fabric as shown in FIGURE 4. The distance between the clamps should be 3 inches (76.2mm) plus or minus $\frac{1}{4}$ inch (6.35mm) and the clamps must be aligned so that the ripstop pattern is parallel (not on bias) to the edge of the jaws. Lock the clamps **VERY SECURELY**. This will prevent slippage and possible damage to the fabric.

NOTE: If the area to be tested is too small to allow 3 inches (76.2mm) plus or minus $\frac{1}{4}$ inch (6.35mm) between the jaws of the fabric clamps (such as the apex area of a round canopy), the distance between the jaws may be reduced to 2 inches (50.8mm) plus or minus $\frac{1}{4}$ inch (6.35mm).

5. Secure one clamp to the packing table or other object which will allow a sufficient load to be applied without movement of the fabric clamp. Attach the spring scale hook to the other fabric clamp and apply the load very smoothly and steadily. Hold the load for 3 seconds.

6. Record test results on the tested areas in contrasting ink as shown in FIGURE 5. Information should include the following:

- The amount of loading pulled to in pounds or kilograms
- The date tested
- The word PASS or FAIL
- The name and certificate number of the individual performing the test.

After completing the tests record the information in your rigger logbook and on the packing data card.

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PIA-TS-108.1



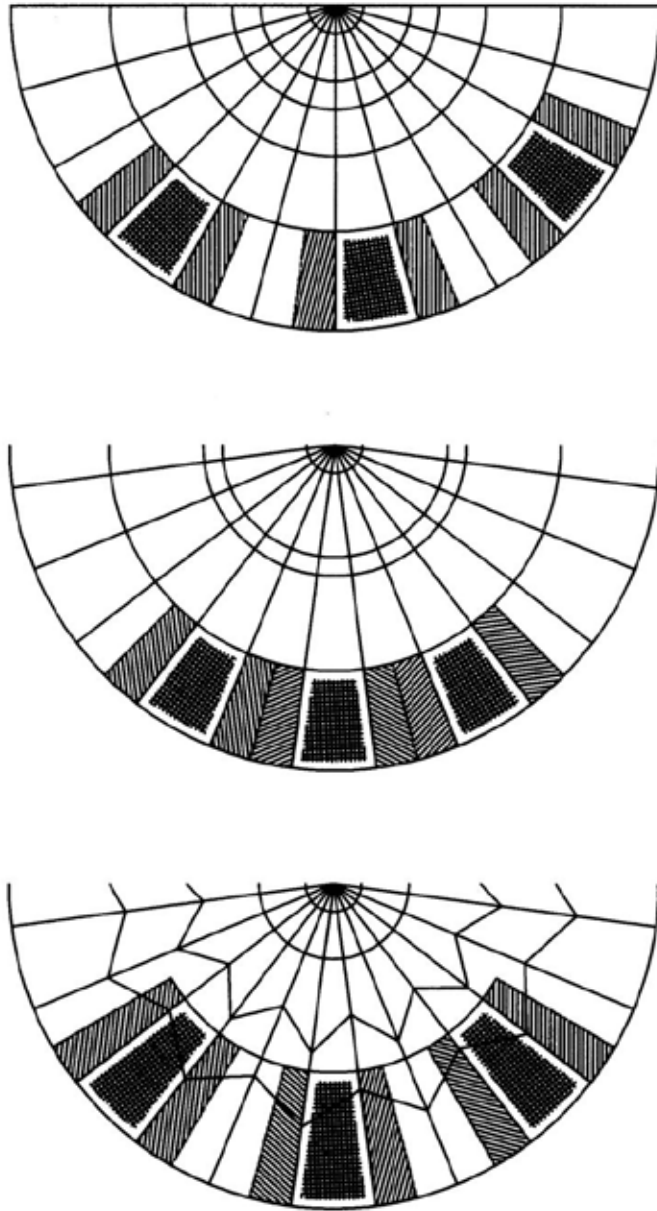
Fabric clamp (rubber padded/square jaw)

FIGURE 1

NOTE: Use only approved fabric clamps. Improvised or homemade clamps may increase the chances of damaging the area to be tested.

PIA-TS-108.1

Below are diagrams of typical tri-vent modifications.



NOTE: Diagonally shaded areas show examples of fabric that comes in contact with mesh or may contact mesh.

FIGURE 2

<p><u>40</u> LB.KG PULL TEST</p> <p>DATE: _____</p> <p>TESTED BY _____</p>
--

NOTE: This method uses either the corners of the box (above) or the dots (below) as guides for the fabric clamps.

- _____ LB/KG PULL TEST: ●
- DATE: _____
- RIGGER'S NAME AND CERTIFICATE NUMBER _____
- ●

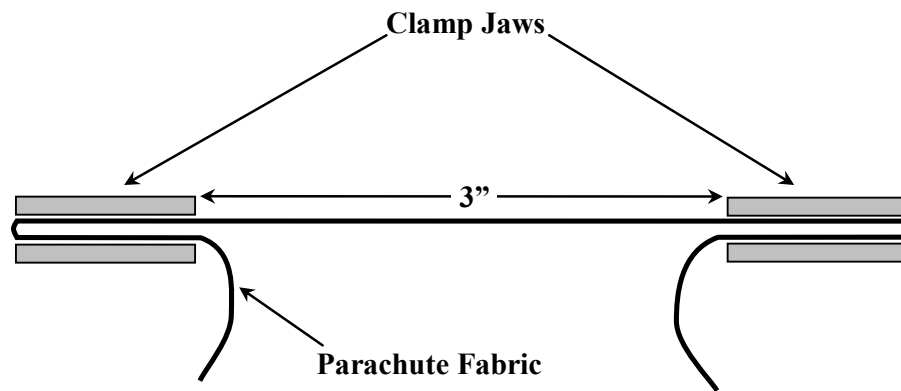
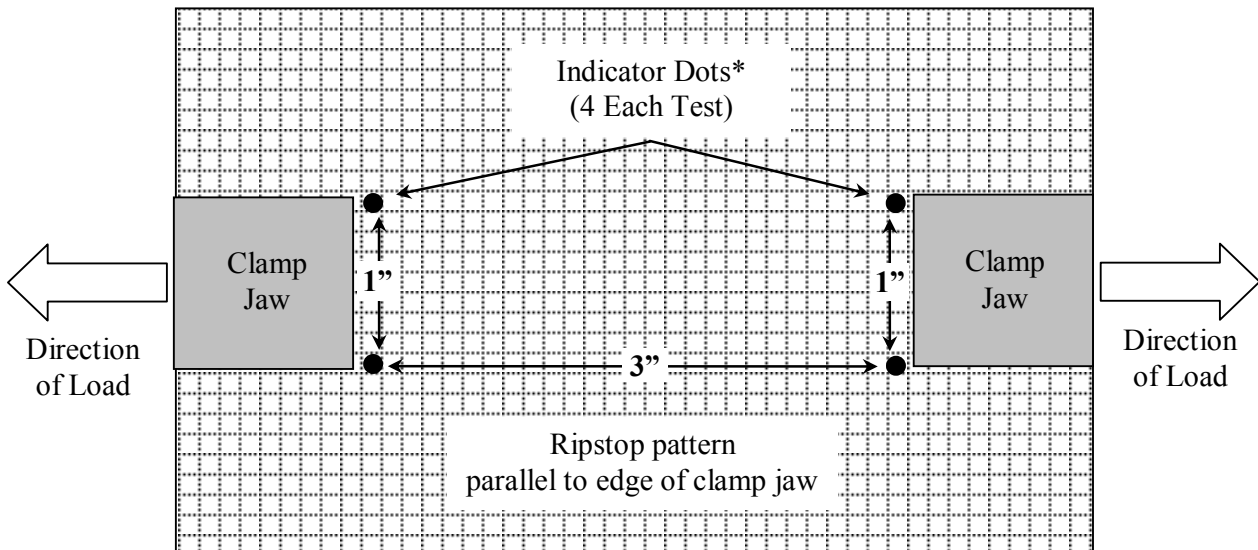


Examples of canopy markings

FIGURE 3

NOTE: Use only a rubber stamp and approved ink or a black Sharpie™ pen to mark the areas to be tested. Do not use a ballpoint pen, pencils or similar items to mark the test area. This could result in damaging the fabric being tested.

PIA-1S-108.1



How to attach clamps

FIGURE 4

PIA-TS-108.1

40 LB PULL TEST: PASSED
DATE: 14 JUN 2009
MASTER RIGGER: JOE RIGGER 1234567

Example of completed test

FIGURE 5

Appendix C. CYPRES Function and Maintenance Verification

This document is provided for reference only and comes from an outside source. Butler Parachute Systems, Inc. will not maintain or update this document. It is the responsibility of the technician using this procedure to ensure the currency of the information provided. This information is available in the *Military CYPRES 2 User's Guide* and *The Military CYPRES Quick Guide For Operators*.

4.2 Switching CYPRES 2 on

CYPRES 2 is switched on by briefly clicking the push button four times. Start the switch-on cycle by clicking the button once. After approx. one second, the red LED light will flash. You must acknowledge the red light immediately by clicking the button again. This sequence - a click as soon as the red light appears - will be repeated two more times. After a total of four clicks, CYPRES 2 will enter self-test mode.

If you do not act promptly after seeing the LED light, or if you push the button too soon, CYPRES 2 will ignore the switch-on attempt.

This four-click switch-on cycle has been designed to prevent the unit from being switched on accidentally.

Once the switch-on procedure has been completed, the unit will run through its self-test. Initially, the display will show the number 10, and then a countdown ending with 0. Between displaying 1 and displaying 0, CYPRES 2 shows the current ambient air pressure. When 0 with a down arrow appears, the unit is functional for the next 14 hours. After 14 hours have passed, the unit will switch itself off automatically. The unit can be switched off manually at any time using the push button. If the self-test is unsuccessful, an error code is shown on the display for approximately 2 seconds. The meaning of these error codes is explained in Section 5.

The manual switch-off sequence is identical to the switch-on procedure (click, light, click, light, click, light, click). This procedure is designed to prevent the unit from being switched off accidentally.

Switch on

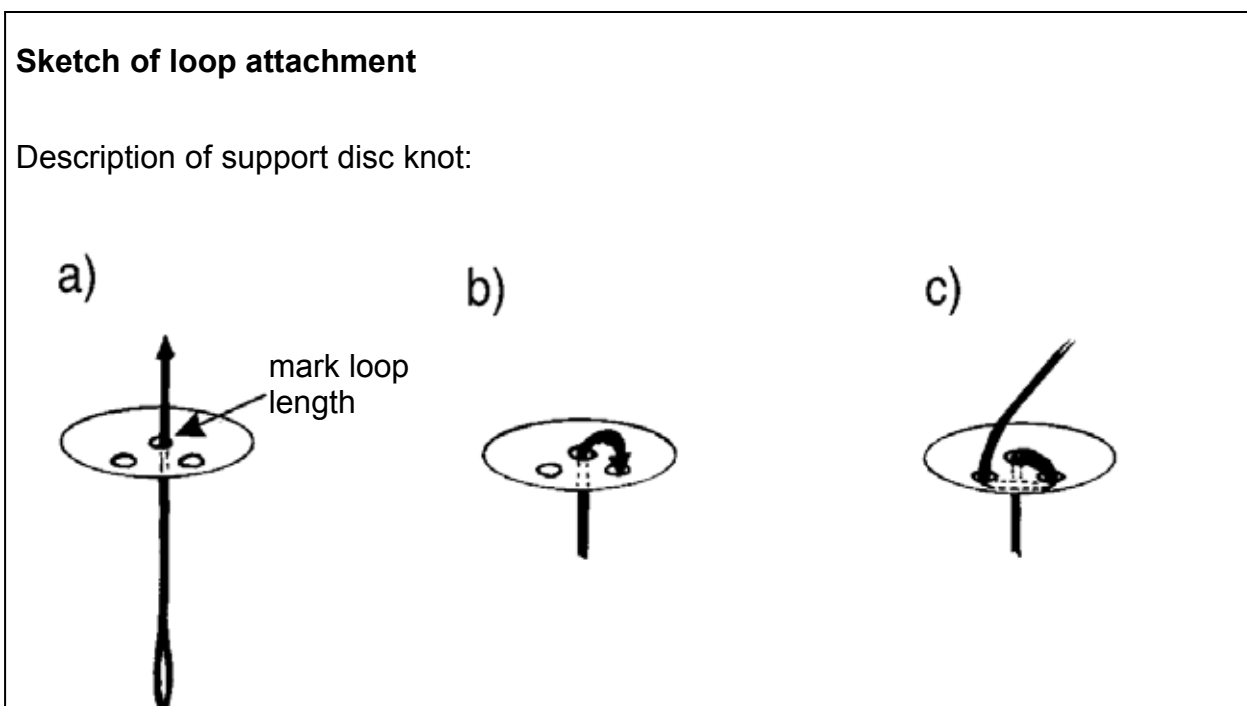


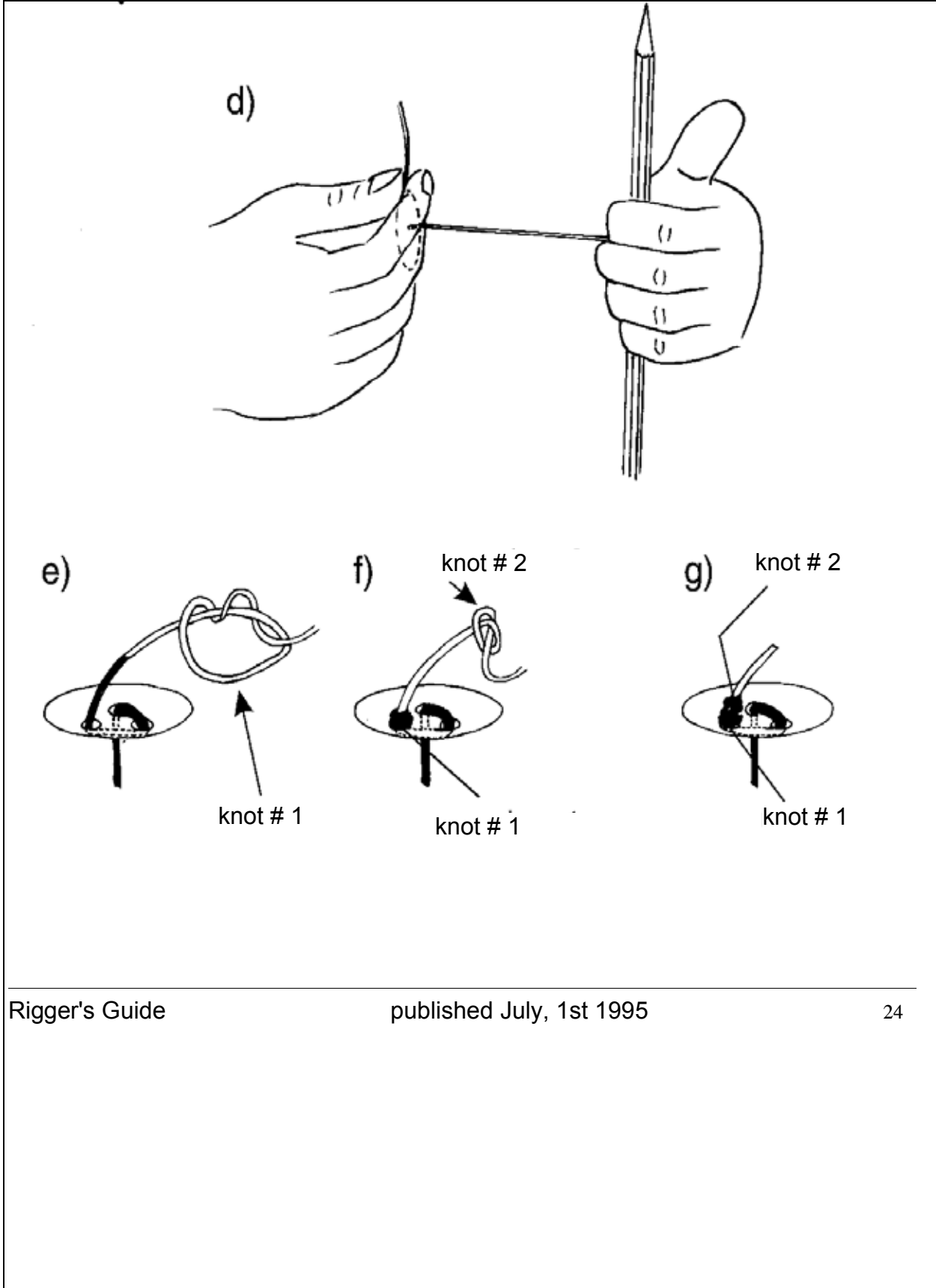
Appendix D. Closing Loop Disc Installation

This document is provided for reference only and comes from an outside source. Butler Parachute Systems, Inc. will not maintain or update this document. It is the responsibility of the technician using this procedure to ensure the currency of the information provided. This information is available in the Airtec publication titled *CYPRES Rigger's Guide for Installation*.

- a) pass the loop cord through the central hole and mark the desired length with a pen
- b) route the cord back through one of the outside holes
- c) and upwards again through the third hole
- d) hold to the disc between the index and the second finger and trap the spare cord with the thumb. Pass a pen through the loop and sharply pull the whole loop cord twice to prestretch the material. Re-align the pen mark with the disc and knot the cord as shown in sketch e).
- e) make one further knot as shown in sketch f) to prevent slippage

Caution: Do not use other knots than suggested!





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