
Butler Parachute Systems

Tethered Tandem Bundle Delivery System TT-600 Gen 1 & 2 Assembly Instructions

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INTRODUCTION

This manual contains all the required information for assembling the Butler Parachute Systems, Inc. TT-600 Gen 1 & 2 Tethered Tandem Bundle Delivery System and is broken down into two sections: TT-600 Components and TT-600 Assembly.

Most of the information and procedures contained in this manual are routine for the experienced parachute rigger. However, a few of the procedures are unique to the TT-600 and **MUST** be followed as written for the TT-600 system to operate correctly. Failure to do so could result in injury or death to the operator.

If at any time you are unsure of a procedure or have a question, stop what you are doing and give us a call...we will be glad to provide you with any assistance you may need.

SUMMARY OF SYSTEM CHANGES

After receiving feedback from TT-600 users in the field, Butler Parachute Systems, Inc incorporated that feedback into the Gen 1 system and produced Gen 2. While the outward appearance of the system is different, the overall operation of the system has not been affected.

The changes incorporated into Gen 2 are as follows:

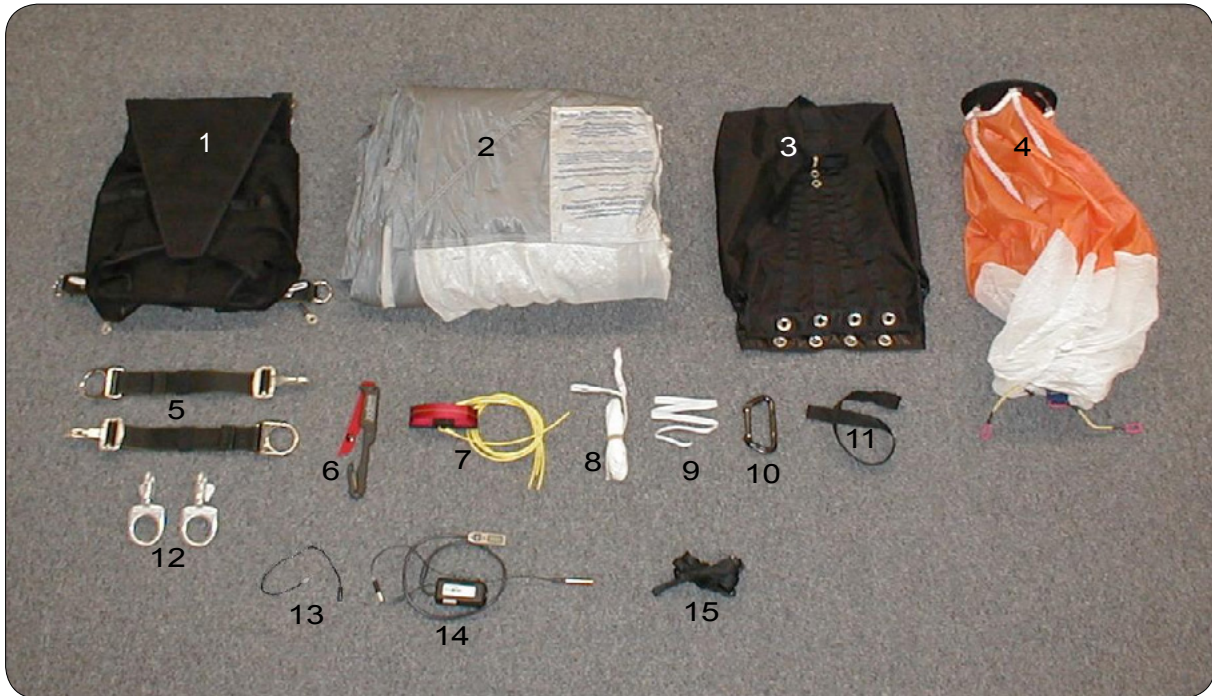
1. Main harness webbing changed from MIL-W-4088, T7 to MIL-W-4088 T13.
2. Lower Attachment Assembly (Belly bands) changed from MIL-W-4088 T7 to double MIL-W-4088 T8.
3. Static Line Carabiner Loop rotated 90 degrees for ease of carabiner removal.
4. Rings added to side of container for Quick Ejector stowage when not in use.
5. Carry handle added to bottom of container.
6. Three loops added for stow band attachments.
7. Link removed from tether, incorporating the tether directly into the main harness.
8. Two rows of MIL-W-4088, T4, 1", added to harness cover.

The Gen 2 system was further modified at the request of a customer to allow the use of a navigation board. This modification consisted of removing the hook knife, incorporating a second layer to the harness cover to create a Velcro pocket, and adding an additional piece of MIL-W-4088, T4, 1", to the center of the harness cover. Systems utilizing this modification are referred to as Gen 2A.

TT-600 COMPONENTS

The photograph below illustrates all of the components necessary for the assembly of the TT-600. With the exception of the CYPRES unit, all of the components are included in the TT-600 system as it is delivered from the factory.

Before beginning the assembly process, please ensure that you have all of the required components.

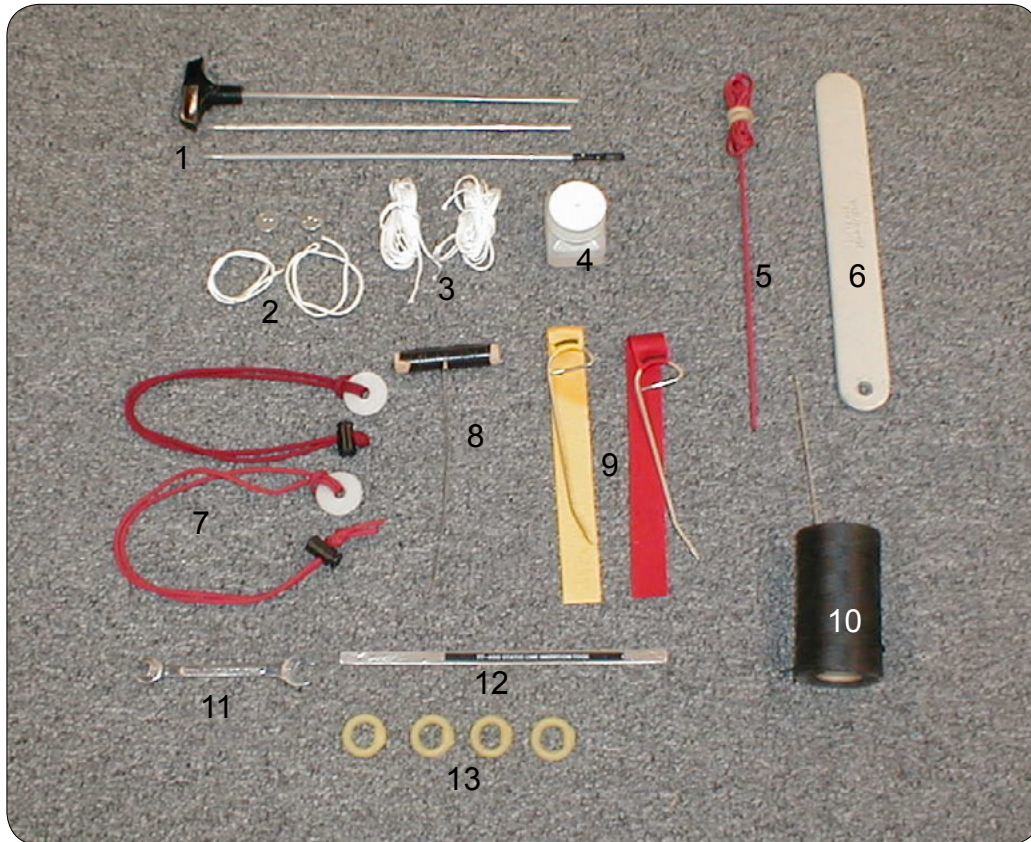


1. TT-600 Container
2. HX-600 Canopy
3. Deployment Bag
4. Pilot Chute
5. Belly bands (2)
6. Hook Knife (Removed from Gen 2A)
7. Release Handle
8. Zip Strip
9. 1/2" Type 3 Break Tie (15-inches long)
10. Carabiner
11. Canopy Channel Bridle
12. Welded Rings (RW-10/Butterfly Snaps) Set of left and right
13. 17-inch CYPRES Cable Extension
14. CYPRES
15. Static Line

TT-600 ASSEMBLY

REQUIRED TOOLS

Before you begin assembling the TT-600, make sure you have all of the tools required to complete the assembly. The following illustration shows all of the tools you will need: NOTE: The Rigging Kit, part number 701032, has all of the required tools.



1. Incremental Bridle (Zip-Strip) Tool
2. CYPRES Closing Loop, Safety Loop and Discs (2) *
3. CYPRES Pull-up Cords (2) *
4. CYPRES Silicone *
5. Line stow Fid (2)
6. Packing Paddle
7. Locking Pull-up cords (2)
8. Fingertrapping Fid
9. CYPRES Temporary Pins (2) *
10. Supertack (or equivalent) with Tacking Needle
11. 3/8" or Adjustable Wrench
12. TT-600 Static Line Insertion tool
13. Stow bands (4)

NOTE: Items with an * are contained in the CYPRES Packer's Kit.

ADDITIONAL MATERIALS: Ticket 6 Cotton Cord or (DOUBLE) Ticket 3 Cotton Cord, Red seal cord and 80# Cotton tape.

Before starting the TT-600 assembly, use the following illustrations to familiarize yourself with the various components of the TT-600 container:



1. Closing Loop Base
2. Grommet for SAFETY Closing Loop
3. Grommet for CYPRES Closing Loop
4. Risers
5. CYPRES Pocket
6. CYPRES Cable Channels
7. CYPRES Elastic Cutter Pocket

INNER TOP FLAP

1. Static Line Guide
2. Static Line Stow Flutes
3. Safety Cable Channels
4. Safety Cable Closing Loop Grommet
5. CYPRES Closing Loop Grommet



HARNES COVER MODS

The harness covers used on the different systems are as follows:

TT-600 GEN 1

1. Carabiner Pouch
2. Hook Knife Pocket
3. CYPRES Control Unit Cover
4. Carabiner Stow Loop



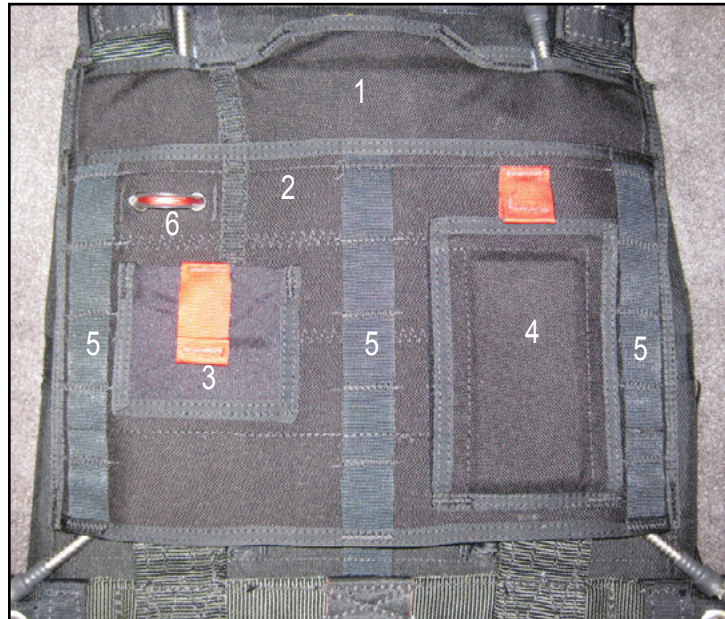
TT-600 GEN 2

1. Carabiner Pouch
2. CYPRES Control Unit Cover
3. Molle Loops
4. Carabiner Stow Loop
5. Knife Pocket



TT-600 GEN 2A

1. Inner Nav Board Pocket
2. Outer Nav Board Pocket
3. Carabiner Pouch
4. CYPRES Control Unit Cover
5. Molle Loops
6. Carabiner Stow Loop



CYPRES PREPARATION

The cable on standard CYPRES cutter units is too short to use on the TT-600. Therefore, a 17-inch cable extension is included with the TT-600 system as it comes from the factory. To prepare the CYPRES for installation into the TT-600 Container:

1. Unplug the CYPRES cutter unit from the processing unit.
2. Plug the release unit into the 17-inch cable extension.
3. STOP. Do not plug the extended cutter cable back into the processor unit at this point.

CYPRES INSTALLATION

NOTE: All CYPRES installations must be done by licensed riggers using the CYPRES Rigger's Guide and any IAW written instructions issued by the rig manufacturer. If you do not have a CYPRES Riggers Guide, you can download a copy from: <http://www.CYPRES.cc>

Prior to installing the CYPRES into the TT-600 Container, take a moment and familiarize yourself with the openings the CYPRES Control Unit needs to pass through to wind up in the control unit pocket located on the type of harness cover on your container.

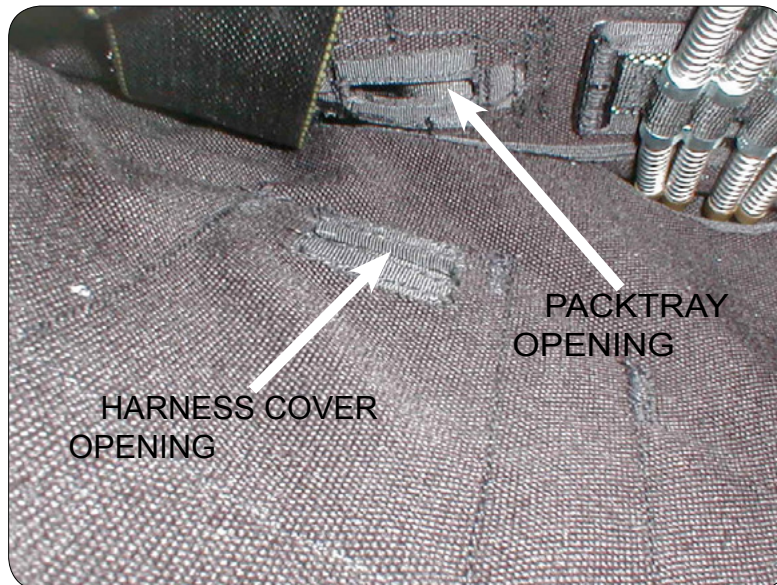
On the inside of the container, just below the CYPRES pocket, an opening through the packtray is covered with a piece of 1-1/2" Type 3 webbing. The Control Unit must first pass UNDER the Type 3 and through the opening.



GEN 1 & 2 CONTAINER CYPRES INSTALLATION



The CYPRES Control Unit pocket on the harness cover of the container also has an opening that is covered with Type 3 webbing. This is the second opening that the control unit must pass through.



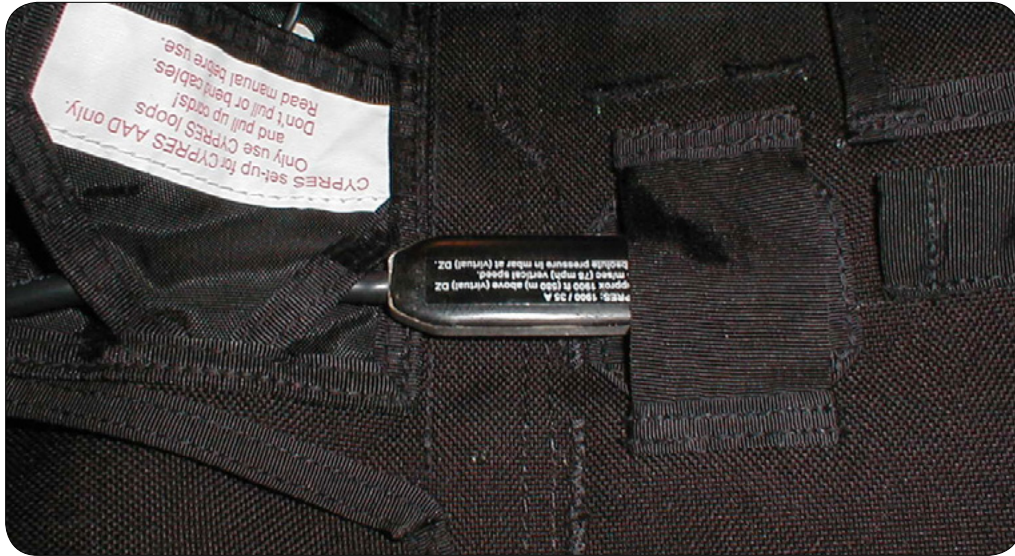
Looking between the harness cover and the underside of the packtray, you can see both openings that the CYPRES Control unit must pass through.



1. Place the CYPRES Processing Unit into the CYPRES pouch as shown. Remember that, in accordance with the CYPRES Manual, the cables MUST be on the bottom.



2. Pass the control unit through the corner opening of the cable protector flap.



3. Feed the Control Unit under the Type 3 webbing on the packtray and through the packtray opening.



4. Reaching up with one hand between the packtray and the harness cover, pass the control unit through the harness cover opening and into the harness cover pocket.

GEN 2A CONTAINER CYPRES INSTALLATION



The CYPRES Control Unit pocket on the harness cover of the container has an opening that is covered with Type 3 webbing. This is the second opening that the control unit must pass through.



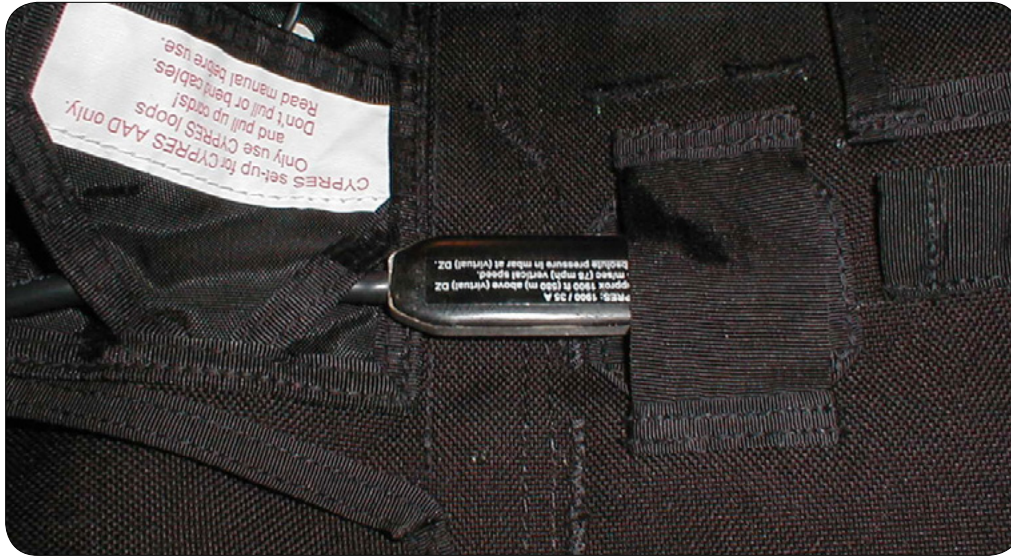
Looking between the harness cover and the underside of the packtray, you can see both openings that the CYPRES Control unit must pass through.



1. Place the CYPRES Processing Unit into the CYPRES pouch as shown. Remember that, in accordance with the CYPRES Manual, the cutter cable MUST be on the bottom.



2. Pass the control unit through the corner opening of the cable protector flap.



3. Feed the Control Unit under the Type 3 webbing on the packtray and through the packtray opening.



4. Pull the Control Unit between the harness cover and the back of the container.



5. Pass the Control Unit face down into the lower opening on the harness cover.



6. Slide the Control Unit fully into the pocket as shown.



7. Using one turn single Supertack, tack the Control Unit cable to the harness cover to keep the Control Unit in position. Carefully pull excess cable back up into the container.

CYPRES CUTTER INSTALLATION (BOTH GEN 1 & GEN 2)



1. Install the CYPRES Cutter by first passing it under the Type 3 webbing that covers the opening in the packtray.



2. Next, insert it into the opening of the packtray channel as shown and carefully feed it through the channel.



3. The bottom flap has two channels. After passing the Cutter through the packtray channel, insert it into the first bottom flap channel and carefully feed it through.



4. Insert the Cutter into the second bottom flap channel and feed it through.

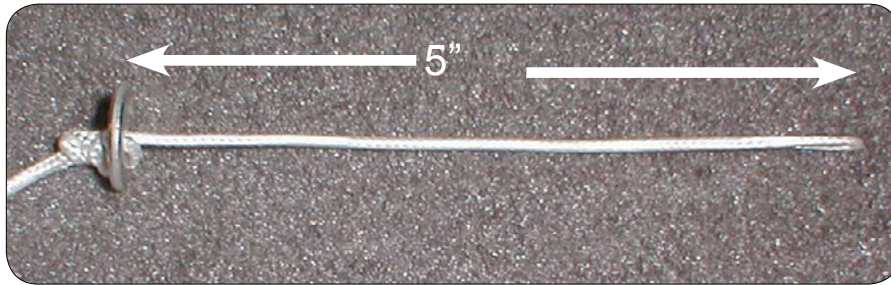


5. As the Cutter emerges from the second bottom flap channel, insert it into the elastic keeper as shown.

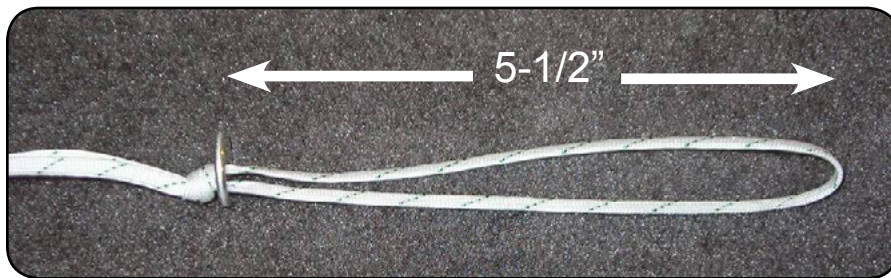


6. Plug the 17-inch Extension Cable into the Processing Unit cable. Neatly coil the excess control unit cable in the CYPRES pouch, and the excess Release Unit cable under the T3 as shown.

CLOSING LOOP INSTALLATION



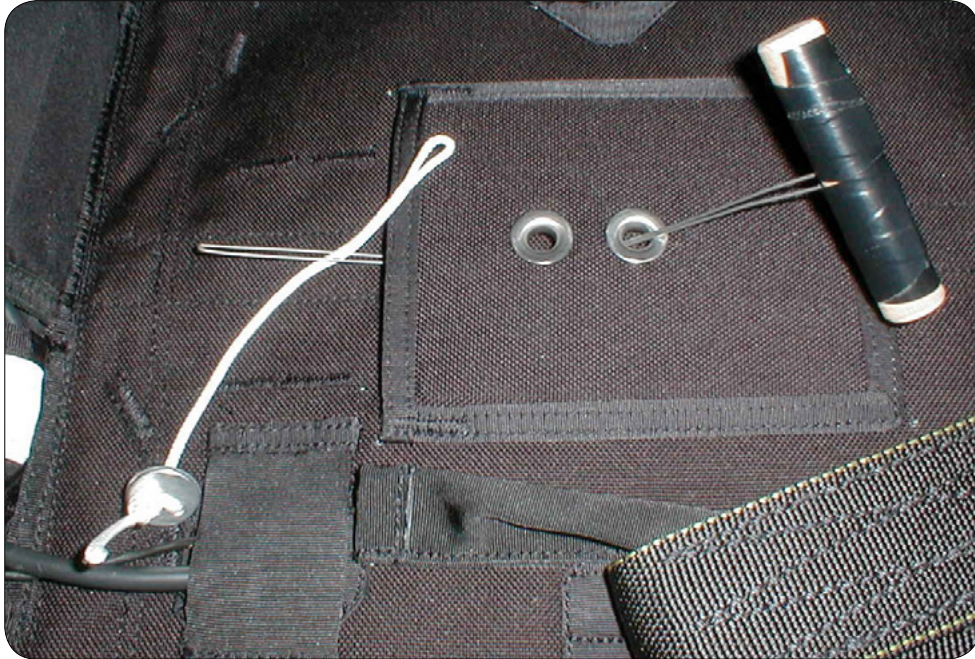
1. Following the steps in CYPRES Rigger's Manual, create one CYPRES closing loop 5" (13 cm) long (+- 1/4"). NOTE: The closing loop length may need to be adjusted later. This will become the CYPRES Closing Loop.



2. Using 22" length of Type 2a cord and a CYPRES disc, create a closing loop 5-1/2" long (13.3 cm) (+- 1/4"). This will be used as the Safety Closing Loop. The length of this loop may have to be adjusted later during packing.

WARNING: The Safety Closing Loop is NOT the primary closing loop of the TT-600 system and only acts as a safety to ensure the container remains closed until the system is activated by the operator pulling the release handle. Therefore, the loop does not need to be as tight as the CYPRES closing loop. As noted in the TT-600 Packing Manual, if the loop creates ANY type of kink in the Safety Cable, then the loop is too short and must be adjusted accordingly.

IF THE SAFETY CLOSING LOOP IS TOO TIGHT, IT MAY INCREASE THE AMOUNT OF PULL REQUIRED BY THE OPERATOR TO ACTIVATE THE SYSTEM (SAFETY LOOP MUST BE 1/2" LONGER THEN THE CLOSING LOOP) .



3. Insert your fingertrapping fid through the center grommet of the closing loop base, then place the CYPRES Closing Loop through the fid as shown.



4. Pull the CYPRES Closing Loop through the base plate grommet until the CYPRES disc is in position at the base of the grommet.



5. Insert your fingertrapping fid into the remaining base plate grommet and pull the T2A Safety Closing Loop into place as shown.

CANOPY INSTALLATION



1. Stretch out the canopy and ensure that the back center gore (with mesh) is on top. Once you are certain of proper orientation, apply a slight amount of tension between the apex and connector links. Next, grab the skirt of the slider and pull it 3 to 4 feet towards the connector links.



2. Perform a “4-Line Check” to ensure that there are no twists in the suspension lines, and that the connector links are oriented correctly.



3. Fold the bottom flap of the container under, position the container adjacent to the connector links as shown and flip the risers down so that they are facing the connector links. Position the top two risers toward the center of the packtray. These are the “Rear” risers and will be attached to the two center connector links.



4. Taking care not to place a twist in the suspension lines, carefully attach the connector links to the corresponding risers.

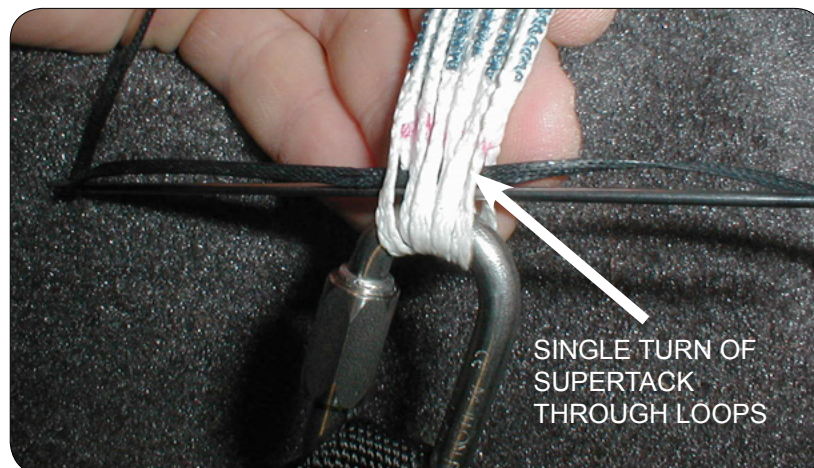


5. After attaching the connector links to the risers, rotate each link through the riser as shown so that the long end of the link is in the butterfly portion of the riser.



6. To help stabilize the connector links on the riser and prevent the possibility of side-loading the links, tack the risers at the base of the connector links with one turn single of Supertack. Tie with a Surgeon's and Locking knot, and trim the ends to 1/2".

7. To prevent the loop ends of the suspension lines from slipping over the barrel of the connector links, a Supertack tie is placed around each group of suspension lines. The following steps illustrate how to make the suspension line ties.



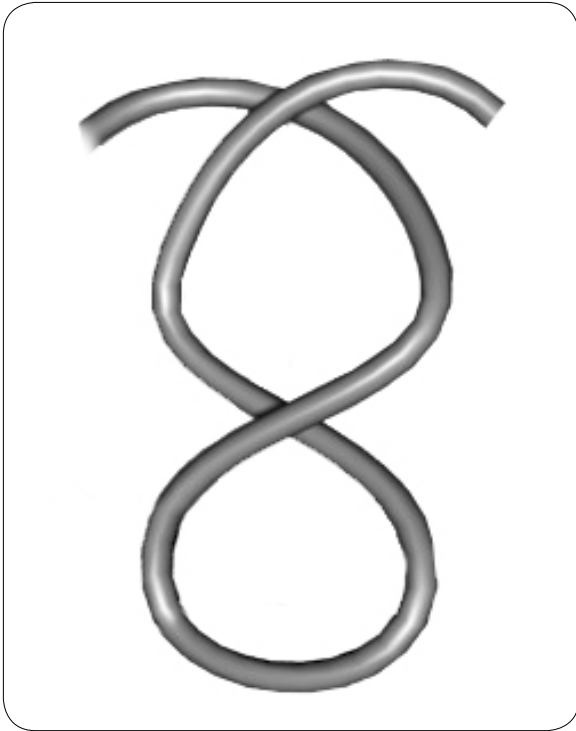
7a. Using a tacking needle or finger-trapping fid, first pass a single turn of Supertack through the loops of the suspension line as shown.



7b. Next, pass the Supertack UNDER the suspension lines.



7c. Pass the Supertack through the loops again. You should now have a loop of Supertack UNDER the suspension lines with the free ends of the Supertack through the suspension line loops.



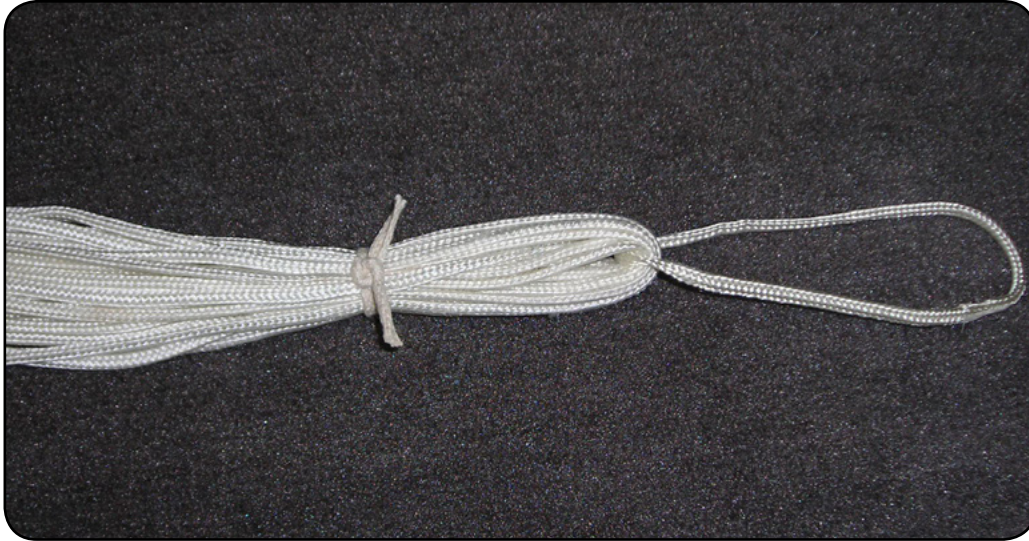
7d. Bring the free ends of the Supertack ABOVE the suspension lines while tying a Surgeon's and Locking knot. Pull the Supertack snug so as to minimize the suspension line loops movement on the link.



7e. The following photo is a side view illustrating the completed suspension line loop tie.



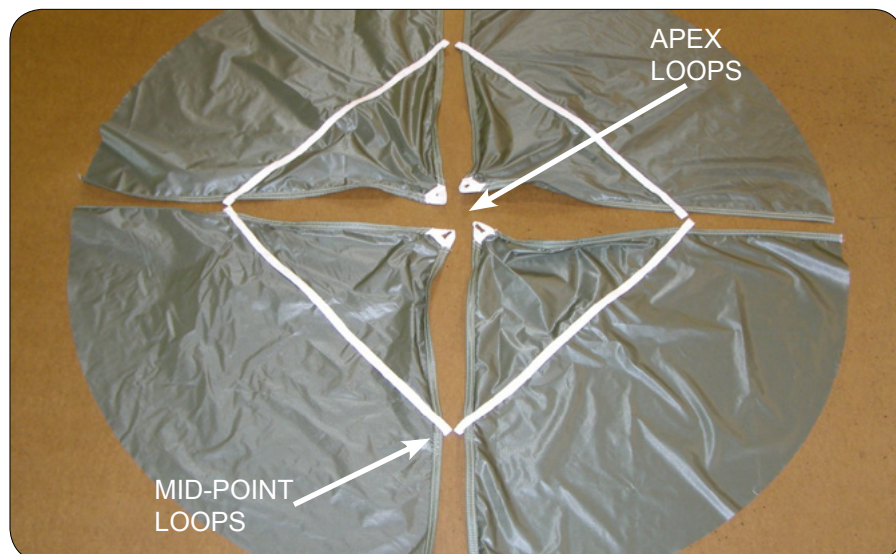
8. After completing the tackings and ties on all of the connector links, re-attach the connector links to your tension device. Perform a continuity line check to ensure lines are properly on the connector links and risers.



9. If not already tied, ensure upper lateral band is even and then make the Vent Line Centering Tie, 4 inches from the end, using one turn single 80# cotton as shown. Tie with a Surgeon's and Locking Knot, and trim the ends to 1 inch.

"4- LEAF" VENT CAP

Moving to the Apex of the canopy, familiarize yourself with the configuration of the "4-Leaf" style vent cap. Rather than use a solid vent cap, the HX-600 canopy in the TT-600 system utilizes a vent cap constructed out of 4 individual pieces. Prior to use, the 4 pieces are tied together at the mid-point with 1 Turn Single Ticket 6 Cotton Cord or 1 turn double Ticket 3 Cotton Cord, and tie at the apex loops with one turn single 80# cotton break tape. If, during deployment, the vent cap experiences a "High-Stress" situation, some or all of the ties will break, thereby reducing the chances of damage to the canopy. The photo illustrates the "4-Leaf" vent cap prior to being sewn on the canopy.





10. Begin rigging the vent cap by first making sure that the vents lines are clear, with no part of the vent cap panels running through them. Position the canopy so one vent cap panel is flat on the table with the vent lines passing directly overhead. For clarification in the following steps, the panels will be referred to as 1, 2, 3, and 4, with panel 1 being the panel flat on the table.



11. Pass a length of Ticket 6 cotton cord through the mid-point loops of panel 1 and 2 and tie them together using a Surgeon's and Locking Knot. Trim ends to 1/2" (1 cm).



12. Tie panels 2 and 3 together in the same manner.



13. Continue by tying panels 3 and 4.



14. Finish the mid-point ties by tying panels 1 and 4 together.



15. Mid-point ties completed, ready for apex tie.



16. Pass one end of a twelve-inch length of 80# Cotton break tape through the apex loop of panel #1.



17. Pass the ends of the 80# through the apex loops of panels 2 and 4.



18. Pass the left end of the 80# through the apex loop of panel #3.

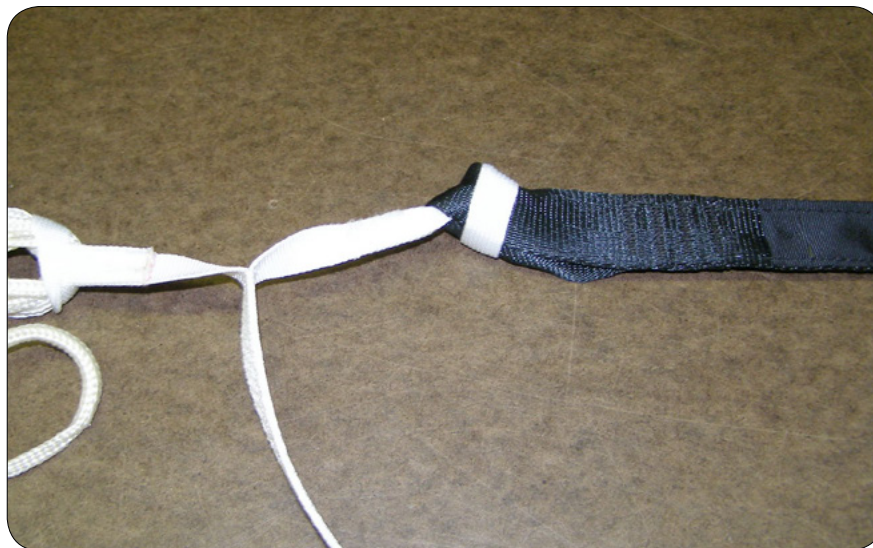


19. Pulling the 80# snug, tie with a Surgeon's and Locking Knot. Trim ends to 1/2" (1 cm).

DEPLOYMENT BAG / PILOT CHUTE INSTALLATION



1. Take a look at the canopy channel bridle and notice that one end has a large loop, while the other end has a small loop. The end with the large loop is the end that attaches to the zipstrip, and the end with the small loop attaches to the pilot chute bridle.



2. Lark's Head the zipstrip onto the vent lines and channel bridle as shown.



3. Using the 15-inch length of 1/2" Type 3 webbing, create the zipstrip breaktie by passing one end through the canopy ventlines, and the other through the loop on the end of the canopy channel bridled.



4. Bring the ends of the Type 3 together and form a loop approximately 1 inch (2.5 cm) in diameter. Tie the ends together with a Square Knot. Next, tie an overhand safety knot on each end and trim to 1/2 inch (1 cm).



5. Insert Incremental Bridle (Zip-Strip) Tool into the pilot chute end of the canopy channel bridle.



6. Push the Incremental Bridle (Zip-Strip) Tool through the canopy channel bridle until the end is exposed near the zipstrip break tie.



7. Using a tacking needle and a length of Supertack, place a loop through the end of the zipstrip.



8. Attach the Supertack to the Incremental Bridle (Zip-Strip) Tool.



9. Pulling the tool back through the canopy channel bridle, carefully insert the end of the zipstrip into the channel.



10. Taking care not to place any twists in the zipstrip, pull the zipstrip fully into the channel. NOTE: Keeping slight tension on the Channel Bridle will make it easier to pull the Zip-Strip through the Channel Bridle.



11. Tack the zipstrip to the channel bridle as shown using 1 turn single, red seal thread.



12. Snip one side of the Supertack loop, then pull the remainder out of the end of the zipstrip.



13. With the deployment bag inside out, attach the canopy channel bridle to the pilot chute bridle with a #5 Rapide link.

NOTE: The canopy channel bridle should be tacked at the base of the Rapide link with one turn single Supertack.



14. "S" fold the canopy channel bridle and secure the folds using Ticket 3 Cotton Cord as shown. NOTE: As an alternate, the folded channel bridle may also be held in place using rubber bands.



15. Attach the pilot chute to the deployment bag by first passing the deployment bag pilot chute bridle through both of the Kevlar loops located at the base of the pilot chute as shown.



16. Pass the crown of the pilot chute through the looped end of the pilot chute bridle.



17. Carefully work the pilot chute through the bridle loop as shown.



18. After passing the pilot chute through the bridle loop, pull the bridle snug against the Kevlar pilot chute loops.



19. Tack the large loop of the pilot chute bridle in two places with one turn double Ticket 6 Cotton Cord or one turn double Supertack as shown.



20. With the deployment bag and pilot chute now attached to the canopy, the system is now ready to pack.

Refer to the TT-600 GEN 1&2 TETHERED TANDEM BUNDLE DELIVERY SYSTEM PACKING MANUAL for packing instructions.

RIGGER'S NOTES

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