



# **PARA- CUSHION**

## **EMERGENCY PARACHUTES**

US Patent 3,908,937

**Owner's Manual**  
**For packing and maintenance of**

# **Para-Cushion**

## **Model 311 Wedge**

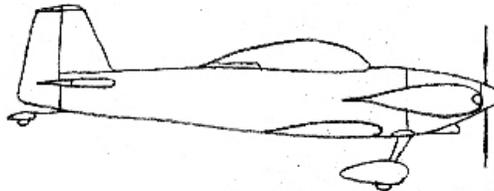
**Part number: 124180**

**with**

**Diaper equipped**

**26ft. Mid-Lite Canopy**

**Part number: 420550**



# **Strong Enterprises**

*"The parachute company with imagination"*

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# **! WARNING !**

*Parachuting is a hazardous activity that can result in serious injury or death. Failure to follow all warnings, instructions and required procedures may result in serious injury or death. Parachutes sometimes malfunction, even when they are properly designed, built, assembled, packed, maintained and used. The results of such malfunctions are sometimes serious injury or death. There are so many factors, both human and natural, beyond our control that we want you to clearly understand that by using or intending to use our parachutes, you are assuming a considerable risk of personal injury or death. If you are not willing to assume that risk, please return the parachute to the dealer where it was purchased for a full refund.*

# **DISCLAIMER**

*There are NO WARRANTIES which extend beyond the description of the parachutes in this manual and neither the seller nor any agent of the seller has made any affirmation of fact or promise with respect to the parachutes except those that appear therein.*

*The liability of the seller is limited to the duty to replace defective parts found upon examination by the manufacturer to be defective in material or workmanship within 7 days after purchase and found not to have been caused by any accident, improper use, alteration, tampering, abuse or lack of care on the part of the purchaser.*

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# 1. Introduction

Thank you for purchasing a new Para-Cushion Wedge Model 311 Emergency Parachute System from Strong Enterprises. It is the finest available anywhere and with a little care, should last you a very long time. Rest assured that your new Para-Cushion has been constructed to retain the durability, reliability, and comfort that Strong Enterprises has been building into its products for over 50 years. We welcome your comments so that we may continue to improve our products and help make flying safer and more comfortable.

## 1.1 Scope

This owner's manual constitutes the manufacturer's instructions for the operation, packing, and maintenance of the Para-Cushion Wedge Model 311 Parachute System.

## 1.2 FAA Approval

Originally certified in 1973 under TSO C-23b, standard category, the Para-Cushion parachute assemblies were upgraded in 1992 and are now FAA approved under TSO C-23c, (in accordance with AS 8015A, category B and FAR 21, Subpart O). A copy of the FAA Approval Letter is on the inside of the back cover of this manual.

## 1.3 Operational Limitations

When using the 26ft Mid-Lite Canopy (Strong Enterprises Part Number 420550), this Para-Cushion is limited to use by persons up to 254 lbs (115kg) fully equipped (person, clothes, and equipment including parachute) at up to 150 knots IAS.

## 1.4 Parachute Repack Interval

Your Para-Cushion 311 Wedge is designed for a 365-day repack cycle. Your countries laws may dictate a stricter schedule, check your local regulations. The Para-Cushion 311 Wedge must be packed by an FAA certificated parachute rigger, or foreign equivalent, with an appropriate rating or returned to Strong Enterprises for inspection and repack. If your Para-Cushion is exposed to moisture, excessive dirt or is damaged it should be inspected sooner than the maximum allowed.

***Note!***

***USA current repack regulations can be found in FAA FAR 91.307***

## 1.5 Model Description

The unique Para-Cushion system design (U.S. Patent #3,908,937), with externally mounted pilot chute, allows for a soft, flexible container with protected ripcord pins. The Para-Cushion, is an FAA approved, manually operated emergency parachute system.

The Para-Cushion Wedge Model 311 (P/N: 124108) measures 24" (61cm) tall by 16" (40.5cm) wide by 1" (2.5cm) at the shoulders and 3" (7.5cm) at the lower back, and weighs approximately 16 lbs. (7.3 kg).

This unique configuration allows for maximum comfort for the pilot by using the shape of the parachute system to put you in a slightly reclined position.

The parachute assembly is designed to be used in airplanes where headroom is at a minimum and the backrest is at a straight upright angle with the seat bottom, such as a Pitts S1, Pitts Model 12, Christen Eagle, RV-4, RV-6, Harmon Rocket, and many others.

The 26' (7.92m) Mid-Lite parachute is block constructed using low porosity (Lo-Po) fabric. This fabric allows less air flow than conventional parachute fabric and therefore provides a slower, more stable rate of descent.

## 1.6 System Function

The Para-Cushion is activated by pulling the ripcord handle. This withdraws the ripcord pins and releases the locking loops allowing the pilot chute to eject, catch air and extract the parachute canopy from the container. A "diaper" is sewn to the skirt at the bottom of the canopy. On deployment, the canopy and suspension lines are extracted from the container. The diaper is released as the last stows deploy, allowing the canopy to inflate.

Typically, it takes about 2 to 3 seconds from ripcord pull to fully inflated canopy, traveling a vertical distance of 150 to 300 feet. This does NOT mean that you should plan on jumping or pulling at 300 feet. Deployment time and distance depend on, among other factors, your airspeed.

## 1.7 Care of your 311 Wedge Parachute System

Observe these precautions to maximize the service life of your Para-Cushion Emergency Parachute System. Parachutes are simultaneously very rugged and quite delicate. They are life saving devices and should be treated with great care. Parachutes are made of nylon, a very strong and durable, but not invincible, material. Nylon is deteriorated by small amounts of acid and weakened by ultraviolet sunlight. These surface effects do not seriously influence thicker materials, such as webbing or pack material, but canopy cloth is very vulnerable. If your Para-Cushion is opened or used, it should be taken to a certificated parachute rigger, or returned to the manufacturer for airing, drying, inspection and repack. FAA FAR 65.129 requires that no parachute be packed, maintained, or altered in any manner that deviates from procedures approved by the manufacturer.

The parachute should be left unopened inside its protective container until ready for use. When you take your Para-Cushion to your rigger for servicing, they will be glad to allow you to pull the ripcord yourself, give you a functional demonstration, and answer all your questions. We urge you NOT to open your parachute in the field for demonstration purposes. Foreign objects can cause costly damage the canopy.

When your Para-Cushion is in the aircraft, care must be exercised to ensure that it is not damaged. Be sure that it does not come in contact with any sharp or loose metal surfaces, or any objects within the plane, which might cut or snag it. All metal edges, exposed nuts and bolts, etc. should be taped or covered to prevent wear on the parachute container. Be sure that your parachute does not come in contact with water, oils, acids, grease, dirt, agricultural or fire retardant chemicals.

For long term storage the best possible way to store your canopy is unopened inside the carry bag. It doesn't matter how long the canopy is kept that way. If you open your para-cushion there are more opportunities to damage the canopy or lines. If you decide that you must open it and remove the rubber bands we suggest putting both canopy and lines directly into the cloth bag (laundry bag, pillow case). The reason we don't recommend a plastic bag is that nylon "breathes". Or more specifically it will absorb and release moisture and stabilize to the ambient humidity levels. If it is trapped in a plastic bag there is more opportunity for mold/mildew to grow, while a cloth bag allows the breathing process to continue.

### **! WARNING !**

***Leaving your packed parachute system exposed to the sun will greatly decrease its service life.***

## 1.8 Service Life

FAA FAR 65.129 requires that “No certificated parachute rigger may pack a parachute that is not safe for emergency use”. The continued airworthiness of an assembly is at the discretion of the FAA licensed parachute rigger’s inspection during repack. While proper care can no doubt extend its usefulness, an older parachute should be examined more closely for signs of deterioration. Your parachute is a sensitive piece of life saving equipment and should be treated as such. However, it should not be expected to last forever, even with proper care.

## 1.9 Preflight Inspection

The parachute must be inspected by the wearer prior to each use. Check it visually for any unsafe condition. Be sure the harness is not twisted or misrouted. Be sure the fittings are not rusted. Be sure the ripcord handle is securely in its pocket (under the fabric pocket covering). Lift Velcro® on the back pad and check ripcord pins. Be sure they are properly seated in their loops. All pins should extend at least 1/2-inch beyond the fabric locking loop. Be sure the rigger’s seal and thread are still intact around the furthest pin. That is your assurance it has not been opened since it left the rigger’s packing table. Check the packing data card in the nearby pocket to be sure that the parachute is current and has been repacked in accordance with regulations.

## 1.10 Fitting the Parachute Harness

Strong Enterprises produces 3 basic harness designs: the standard fixed harness, the fully adjustable harness, and the aerobatic harness. Below, please find proper fitting for each of these models.

**Standard Fixed Harness** - This harness has 3 adjustment points, one on the chest, and one on each leg. If you are putting the parachute on for the first time, unsnap the hardware on the straps, loosen the three adjustment points, and slip your arms through the main lift web (the vertical straps in front), much like putting on a jacket. Next, reach between your legs, pick up each leg strap, untwist them if necessary, and snap them in place on each side of the lower portion of the main lift webs. Lean forward, pull the leg straps below your hips, and tighten them snugly, yet comfortably around your thighs. Finally, snap and adjust the chest strap. Fold and stow the webbing ends in the elastic keepers. Be sure the ripcord handle is securely stowed, yet accessible.

**Fully Adjustable Harness** - The fully adjustable harness allows you to custom fit your harness. To properly adjust this harness, first loosen all adjustment points all the way out. Then put on the parachute as explained above being sure to fit the leg straps snugly. Then stand at attention and take up the slack in the main lift web (vertical straps) by pulling on the harness ends located just above the leg pads. This should pull the straps down snug over your shoulders. Next adjust the horizontal back strap (located behind you at the leg junction) to come in contact with your back. This strap need not be tight for a comfortable fit. Finally, snap and adjust the chest strap, fold and stow the webbing ends in the elastic keepers. Be sure the ripcord handle is securely stowed, yet accessible.

**Aerobatic Harness** - The Aerobatic, or two-point harness moves the snaps normally located on the leg, to the middle of the chest, thereby preventing interference with your seat belt. To properly don this harness, loosen the two adjusters all the way out. Slip your arms through the main lift webs (the vertical straps in front), much like putting on a jacket. Then reach between your legs, pick up the right leg strap, untwist if necessary and thread the right strap through the loop located on the right main lift web at the leg junction. Take care not to twist the strap. Next, snap it in place at the chest on the opposite (Left) main lift web. Repeat the process for the left strap. The straps should be adjusted tight, but not so tight that it restricts your ability to stand upright. Resist the urge to

over tighten the straps once you are seated. Fold and stow the webbing ends in the elastic keepers. Be sure the ripcord handle is securely stowed, yet accessible.

## 1.11 Plan Ahead

Be prepared in the event of an emergency situation. Know and rehearse your emergency procedures before they are needed. With the parachute on, sit in your cockpit and fasten your lap and shoulder belts. Be certain these are over your parachute harness. Wear gloves, helmet and goggles, even headphones if you normally use them. Mentally organize your bailout procedure. Inspect your cockpit for projections or sharp edges that may damage the parachute, or injure you. Consider canopy ejection, oxygen disconnect, or other requirements that you may be faced with. All these things take time, and an emergency leaves you little time for errors. Generally, you are better off staying with the aircraft if it is controllable. However, your margin of safety is reduced as time passes evaluating your situation. With time many situations can get worse. Make your decision quickly because all these actions consume altitude.

## 1.12 How to Get Out of the Aircraft

There are only two steps to remember when you must leave your aircraft. 1) Get clear of the aircraft, 2) then pull your ripcord, in that order. If the parachute begins to open while you're still aboard, the wind may inflate it, dragging you out or into the tail. Also, it may entangle with the aircraft. There are no other rules - the aircraft may be tumbling, spinning, or inverted. Simply get yourself out any way you can. Clear the aircraft and pull your ripcord immediately. There is enough oxygen to breath and you'll be descending into denser air.

## 1.13 How to Open Your Parachute

The ripcord handle is located near the chest strap on the wearer's left front of the harness. The key is to:

**LOOK** at the ripcord handle, rather than fumble or tug on a harness fitting. Beneath the fabric cover, the ripcord handle is held in place by a pocket. Look at it first because it may have been dislodged by your exit.

**REACH** over and grab it with both hands (typically with your right hand and left thumb), and **PULL!** This is no time to be gentle!

If the ripcord doesn't come free on the first pull, check to make sure it is the handle in your hand, not some other piece of hardware. Back the handle up to the housing to create slack in the cable, then punch it out again. The entire cable assembly should come completely out of the housing.

To reduce the pull force, push the handle in the direction that the protective ripcord housing points - rather than straight out from your chest. The ripcord housing on the Para-Cushion Wedge model 311 comes over your shoulder, so push the handle down toward your feet. By having both hands together on the handle, you also reduce the chance of the canopy or lines entangling with an extended limb. Keep your feet together for the same reason. Body position is secondary to pulling.

***Remember to LOOK-REACH-PULL.***

## 1.14 How to Steer

Having a steerable parachute reduces your rate of descent, increases your stability, and helps you avoid obstacles such as buildings, trees, water, and power lines. The parachute drifts with the wind and has a forward speed of about 6 MPH, which can be directed with or against the wind using the built-in steering vents in the rear.

The canopy may be turned by pulling down on the webbing toggles, located on the rear of the risers, just above your head. An 8-12 inch pull will produce a slow rotation. Excessive pulling will not improve the performance.

## 1.15 Landing and Recovery

Ideally, you want to reduce your landing speed by facing into the wind (or quartering slightly). Avoid all but very slight turns below 200 feet.

Push your feet and knees tightly together and point your toes slightly so you don't land on your heels. The tension caused by keeping your ankles and knees pressed tightly together increases their individual support, reducing your chance of injury. Keep your elbows in and try to look at the horizon, not down at the ground. This will give you a better idea of your altitude (much like looking out the side, rather than over the nose during a landing flare).

If the wind keeps your canopy inflated after touchdown, you may be dragged. Pull in the lines closest to the ground to spill some air, and then run around the canopy to collapse it.

In most cases you can maneuver the canopy as necessary to avoid as many obstacles as possible. In the event of a tree or power line landing, keep your feet together so you don't straddle a limb or wire. Be prepared to slide through and hit the ground afterwards. You should be able to avoid power lines, but if not, throw away the ripcord -- it is an electrical conductor. If suspended from a power line, do not attempt to climb down and do not accept assistance from anyone until the power has been shut off.

To prepare for a water landing, the chest strap may be unfastened (except with the Aerobatic harness) as long as you cross your arms in front of the harness to prevent falling out. Depth perception over water is difficult, so do not attempt to leave your harness above the water. Take a deep breath just before you splash down. Once under water, unfasten your harness straps and swim as far as possible upstream, allowing the canopy to blow away from you. Entanglements with wet nylon cloth and lines can weigh you down.

## 1.16 Reporting of Recommendations

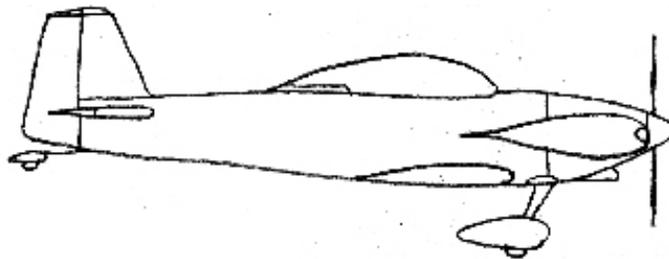
In our effort to continuously improve our products, processes, and services, we invite you to send us your comments and suggestions. As a user of this equipment, you are uniquely suited to provide us with valuable feedback regarding design and/or performance. Feel free to tell us what you like and what you don't like. Send us an email or mail a letter to:

Strong Enterprises  
6448 Pinecastle Blvd. Ste. 104  
Orlando, FL 32809  
sales@strongparachutes.com

## 2. 311 Wedge Product Description

The model 311 Wedge is an FAA approved, manually operated emergency parachute system, fitted with a 26' canopy. The system was designed specifically for aircrafts where the head room is at minimum and the back rest is at straight, upright angle with the seat bottom, such as Pitts SI, Pitts Model 12, Christen Eagle, RV-4, RV-6, Harmon Rocket, FI Rocket and many others.

The harness is fully adjustable in the main lift webs (vertical straps) as well as in the pilot's lumbar area to ensure proper fit and support. The back cushion utilizes Confor Foam padding for additional comfort and support.



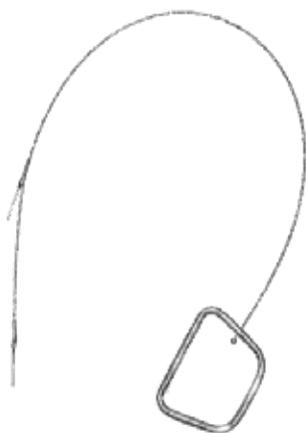
## 2.1 Parts List



Harness and Container  
Assembly  
124180



26-foot Mid-Lite  
420550



Ripcord Assembly  
611366



Locking Loop  
861043 (white / with Mid-Lite)



Cap for Pilot Chute  
799030



Pilot Chute, Lil Grabber  
790120



Carrying Bag  
816006



Owner's Manual  
510079

### 3. Required Packing Tools

**A - Shot Bags, at least 4**

**B - Line Separator 1 ea**

**C - Pilot Chute Locking Rod 1 ea**

**D - Pilot Chute Locking Strap 1 ea**

**E - T-handles 3 ea**

**F - Pull-Up Cords 3 ea**

**G - Tension Plate 1 ea**

**H - Tension Hook 1 ea**

**I - Fid 1 ea**



## 4. Prepare Parachute for Packing

1. Gather the appropriate tools.
2. Always count your tools to ensure you don't leave any in the packed parachute.
3. Lay the harness, container and canopy down on the table with the harness facing down.
4. Attach canopy apex to tension hook and attach container to tension plate. By tightening both ends, canopy will be stretched out allowing easier inspection and packing.

## 5. Pre-Packing Inspection

Always perform the following inspection prior to packing:

- Inspect the entire assembly for any damage.
- Inspect pilot chute and bridle.
- Check that the Larks-head knot on the pilot chute is secure.
- Inspect Apex area.
- Check over entire canopy for damage.
- Inspect lines for damage.
- Check line sequence and control lines.
- Perform a complete suspension line continuity check.
- Check the barrels on #6 rapide link for cracks.
- Check that links are tight.
- Inspect Harness and Container assembly.
- Check that the elastic stow bands are in good condition.
- Check tackings for tightness and condition.
- Inspect Hardware for functionality and condition.
- Inspect Harness for nicks, abrasions, and sun damage.
- Check that ripcord is snug in pocket.
- Check closing loop length. Loop should be 10" with a tolerance of (-) 1/4"

## 6. Packing the 311 Emergency Parachute System

### 6.1 Pleat and Long Fold

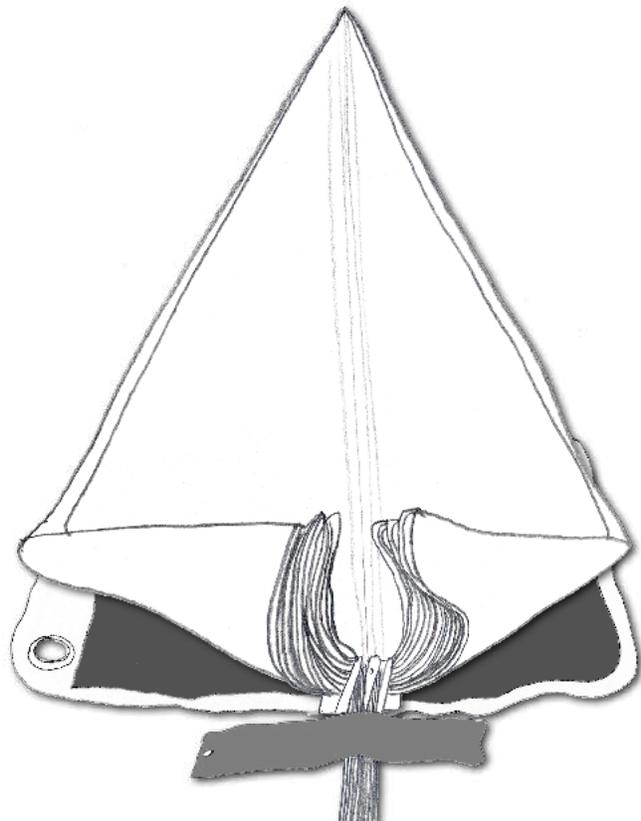
#### 6.1.1

Lay the harness container and canopy down on the table with the wearer facing down. Inspect entire assembly for completeness and any damage. Check line sequence and 4 line release system. Flake canopy and pleat in the normal manner with an equal number of gores to each side.



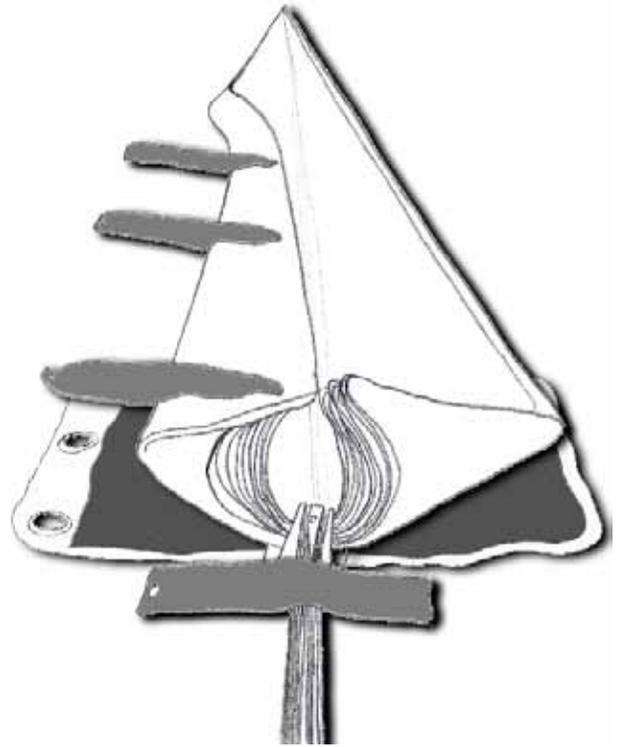
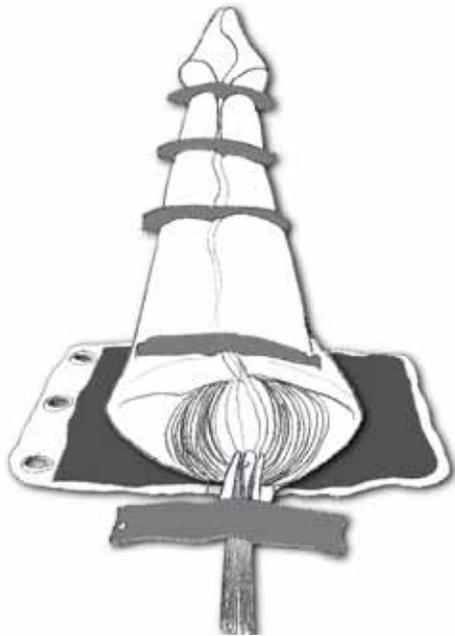
#### 6.1.2

Fold the skirt up 90° on each side parallel to the radial seams.



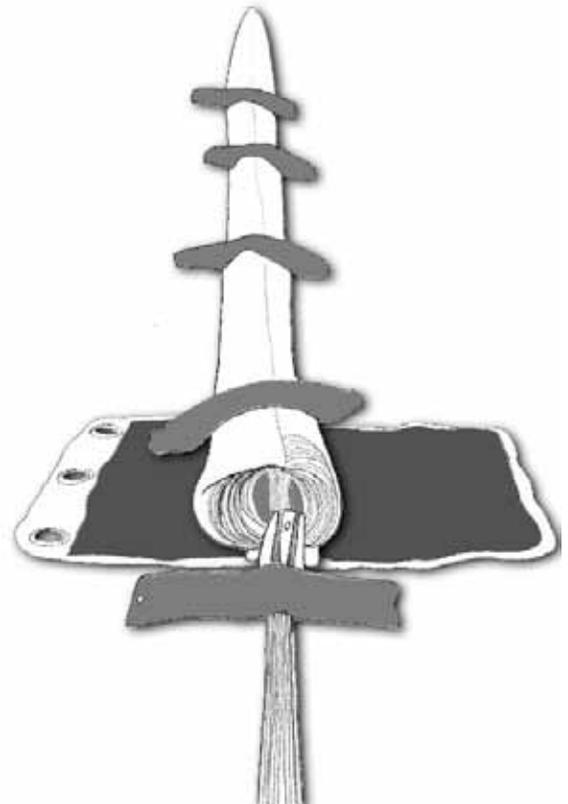
**6.1.3**

Fold the canopy into thirds by bringing the sides up to the middle. First right side and then left.



**6.1.4**

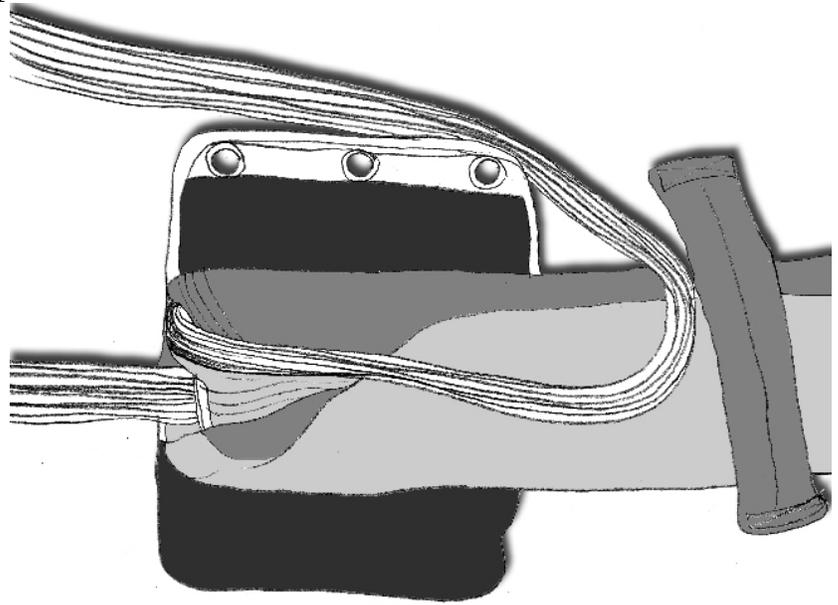
Long fold the canopy into fifths, long and tight, bringing the right side just past center then folding the left side over center.



## 6.2 Securing the Diaper

### 6.2.1

Spread diaper out flat. Bring lines on the LEFT-HAND GROUP ONLY loosely up over skirt.

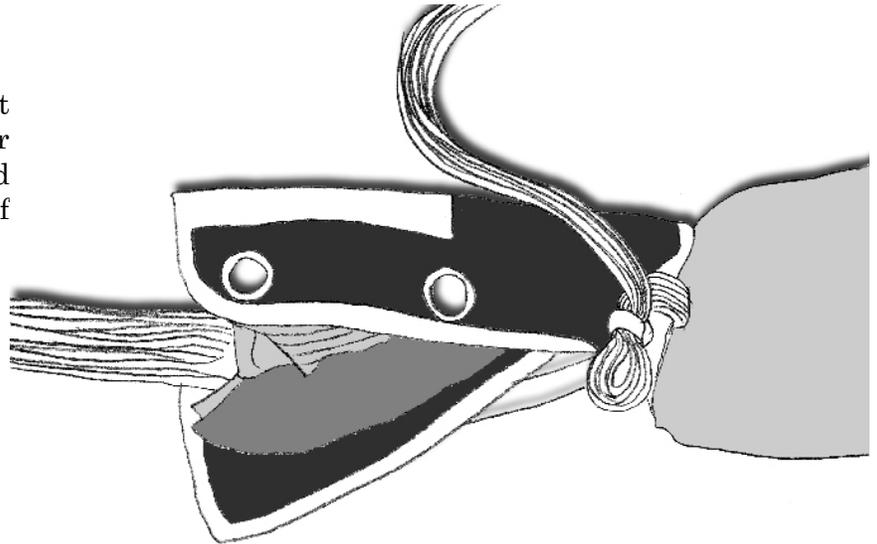


### ***! WARNING !***

***DO NOT tuck the lines inside the folded canopy. Tucking the lines in the canopy can cause serious burns to the canopy and lines.***

### 6.2.2

Wrap the diaper around the skirt and left line group. Bring rubber band through upper grommet and lock in place with 1 1/2 inch bight of line from left line group.



### **! WARNING !**

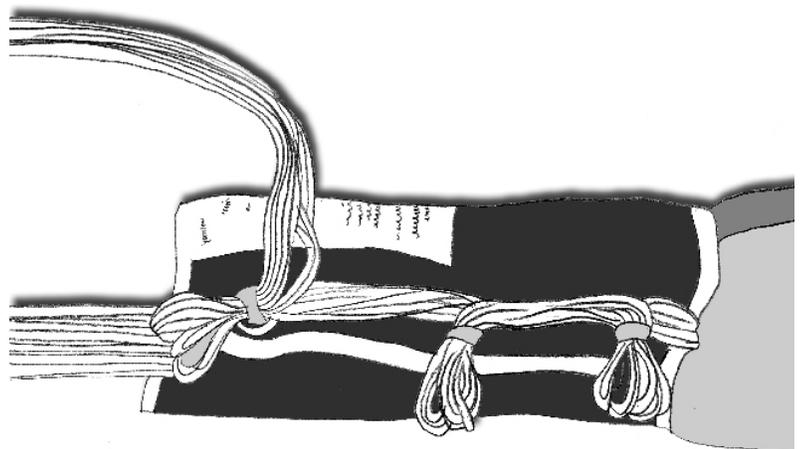
***Put only the left line group of lines inside the diaper. Otherwise the purpose of the diaper will be defeated, allowing it to release before all lines are unstowed.***

### 6.2.3

Continue to secure the diaper by bringing remaining rubber bands through their respective grommets and locking in place with 1 1/2 inch bights of line from left line group.

***Note:***

***If using shorter (1 1/4 inch) rubber bands, a single wrap is sufficient. If using large rubber bands, double wrap each stow.***



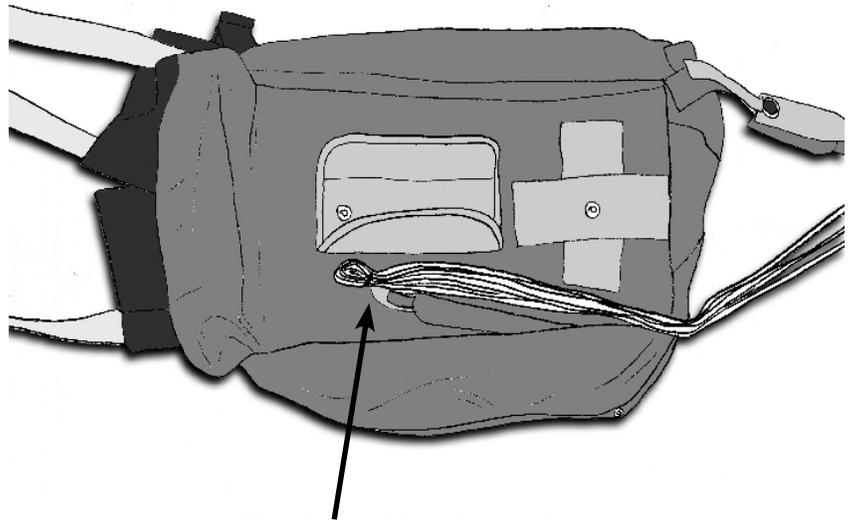
## 6.3 Riser Placement & First Line Stows

### 6.3.1

Open the riser cover flaps on the container.

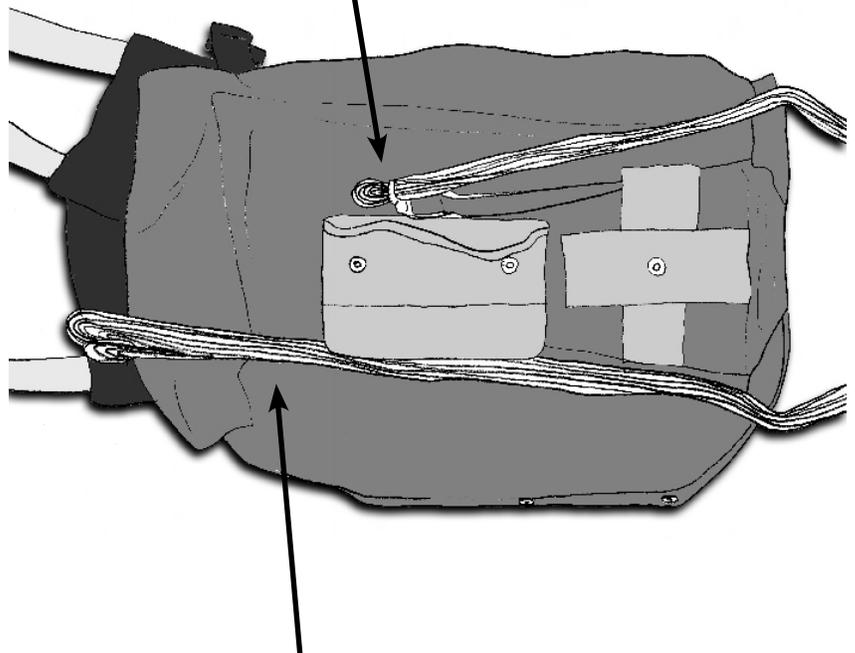
Route both risers down the channel and close the protective flaps. Be careful not to snag and damage the braided suspension lines. Lay the risers along the bottom of the container angling them slightly towards the center.

The first stow on both sides should be made using the rubber bands just above the links. Use a 1 1/2 inch bight of line for these first stows.



First Right Line Group Stow

First Left Line Group Stow



Excess Right Line

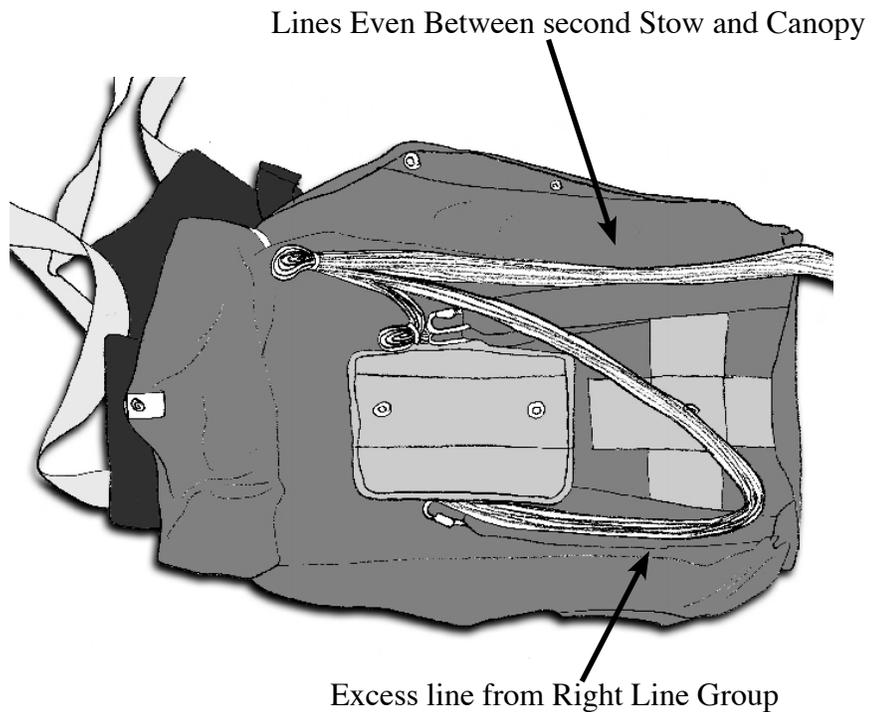
### 6.3.2

There will be approximately 16 inches of excess line from the right line group due to the diaper stows. Bring this excess into the container so that the lines from the canopy to the container are even.

## 6.4 Excess or Half line stow

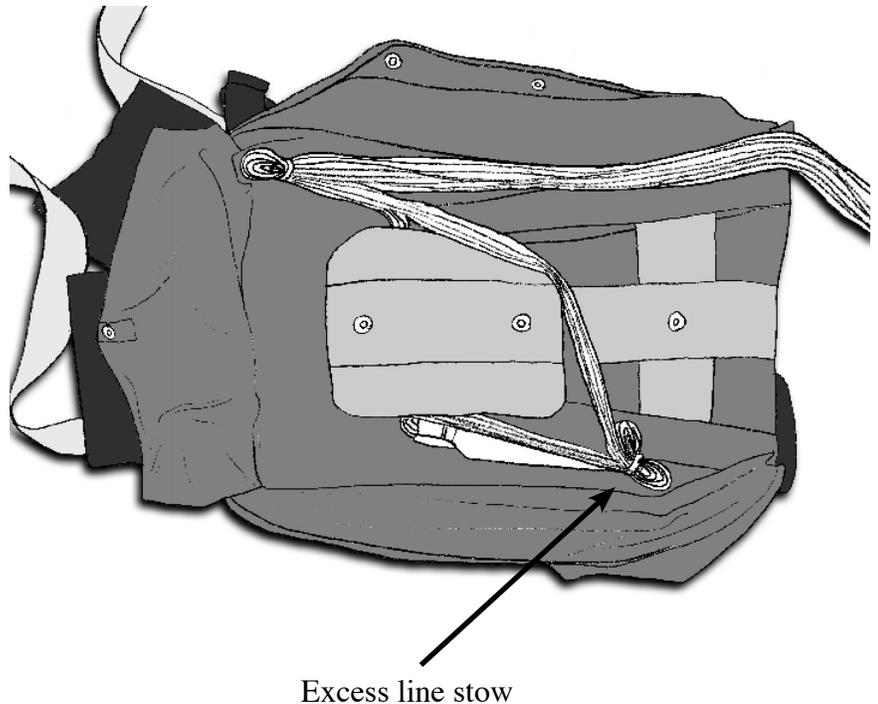
### 6.4.1

Grasp both line groups so that lines are even from canopy. Make a 1 1/2 inch bight of line using the outer most left side rubber band closest to the bottom of the container. Leave the excess line from the right line group between this stow and the first stow.



### 6.4.2

Stow the excess line from the right line group on the right side of the container in the inner most rubber band closest to the top of the container. Make sure to route the lines from the left to the right of the container under any flaps. Do not route the lines over the flaps.



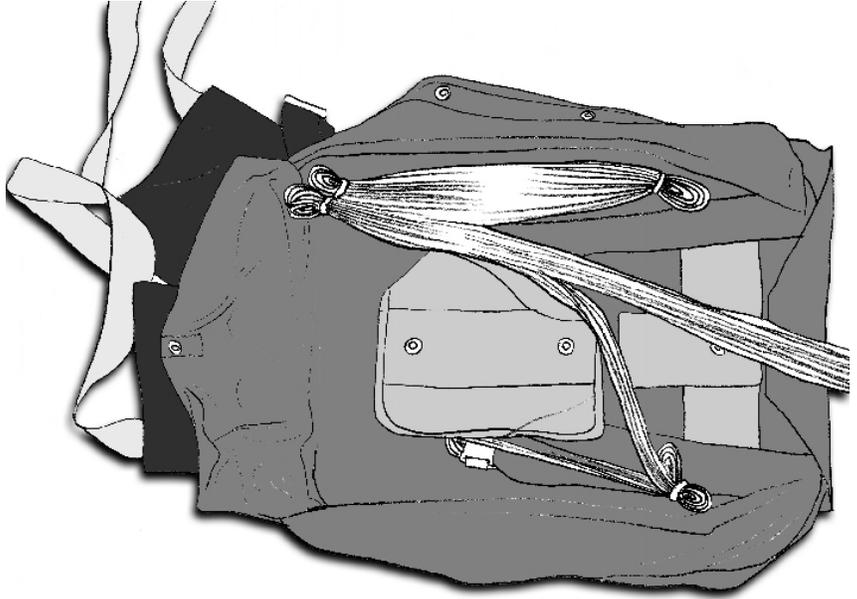
#### *Note!*

*When the 3-stow diaper is used, this bight may be doubled back on itself before being placed in the rubber band. With the 2-stow diaper, this will not be necessary.*

## 6.5 Remaining Line Stows

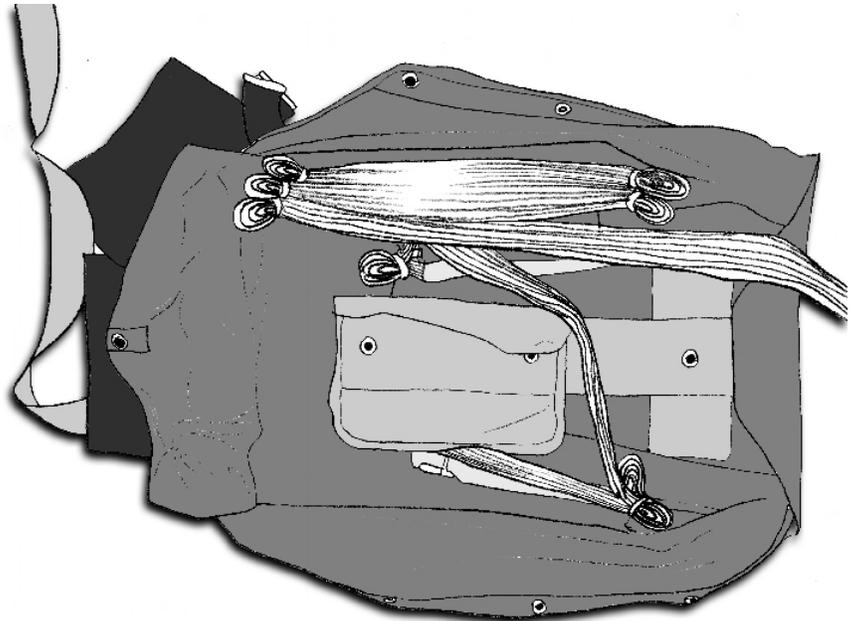
### 6.5.1

The next stow will be in the outer most left side rubber band closest to the top of the container. All line stows should be made using 1 1/2 inch bights of suspension line.



### 6.5.2

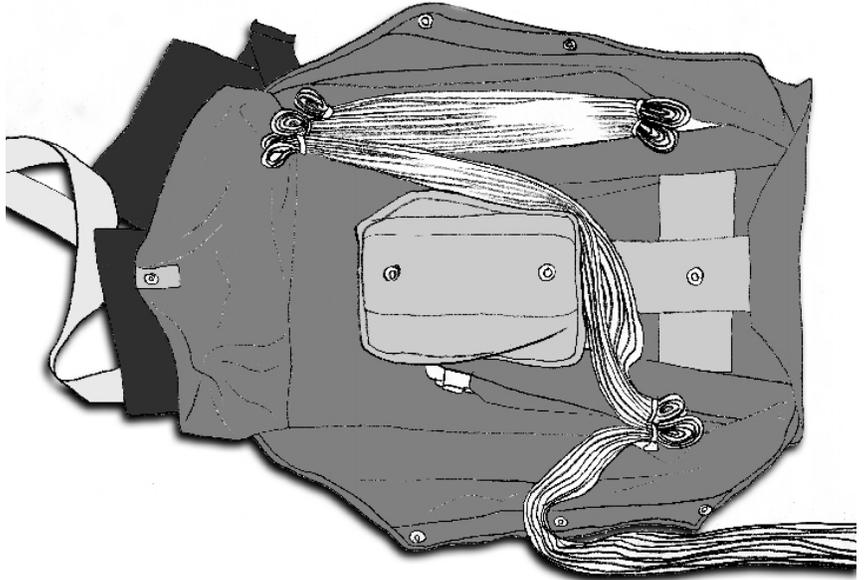
Continue stowing lines working from the outside to the inside of the container until a total of five stows are on the left side of the container.



### 6.5.3

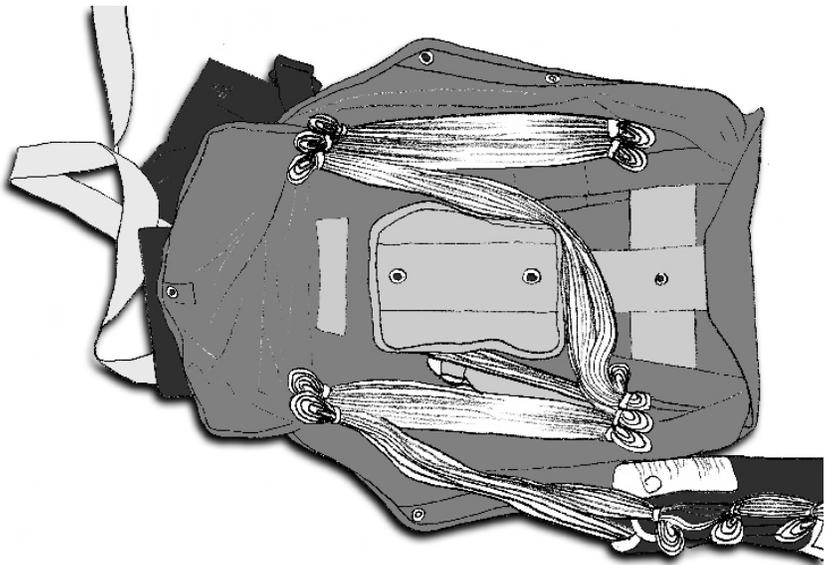
Bring lines to the right side of the container by routing them to the rubber band located next to the excess line stow. This should be the second rubber band on the right side closest to the top of the container.

Make sure that the lines run under the protection flaps and none are routed over the flaps.



### 6.5.4

Stow lines on the right side of the container in the same manner as the left working from the inside to the outside of the container. The last stow should be in the lower right corner of the pack, about 8"-16" from the diaper.

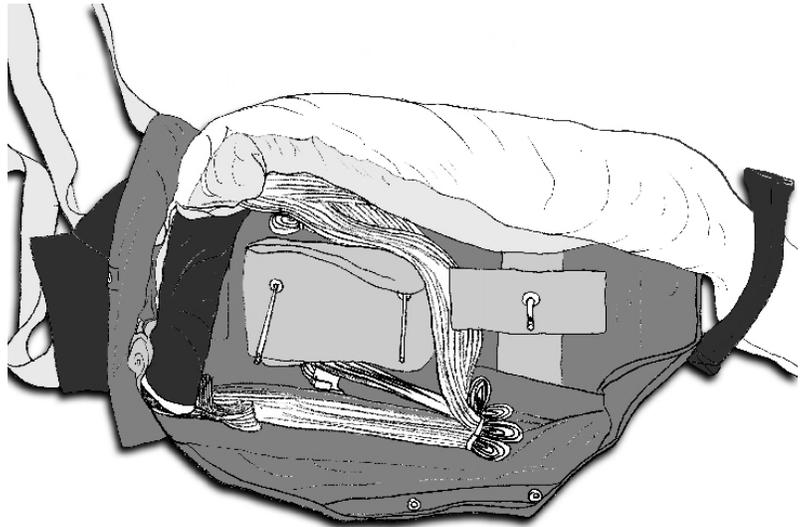


## 6.6 Skirt Placement

### 6.6.1

Insert the T-handles up through the grommets in the bottom of the pack tray.

Place the skirt of the canopy across the bottom of the container from right to left.



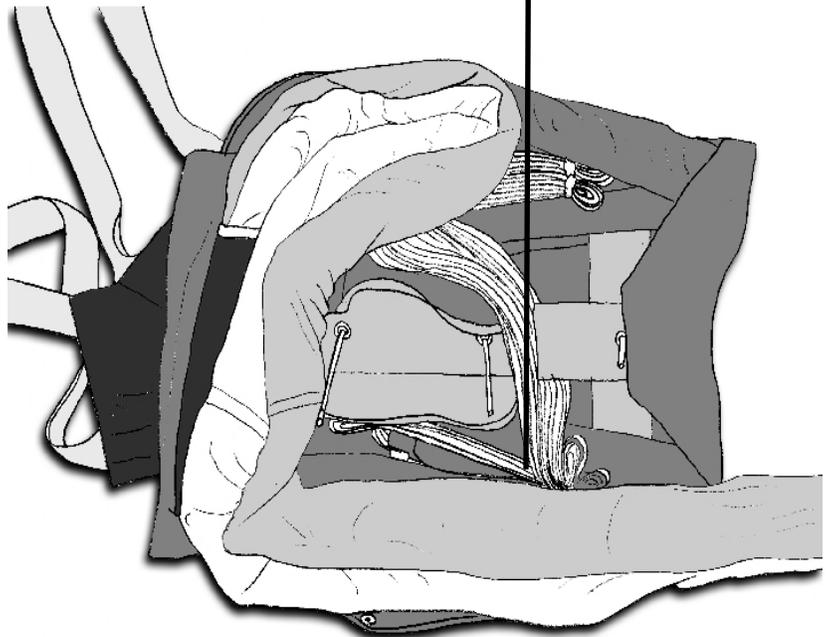
Even with Protector Flap

## 6.7 Packing the Canopy

### 6.7.1

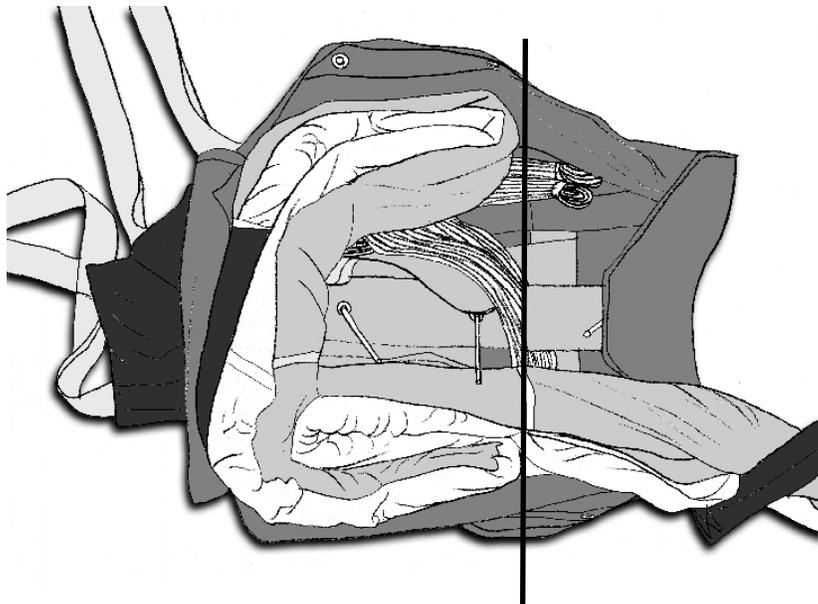
The canopy is stowed “on edge” and not “flat”.

Bring the canopy up the left side until even with the top of the protector flap. The canopy is then routed back to the skirt and across the bottom of the container from left to right. This fold is between the skirt and the bottom most grommet.



**6.7.2**

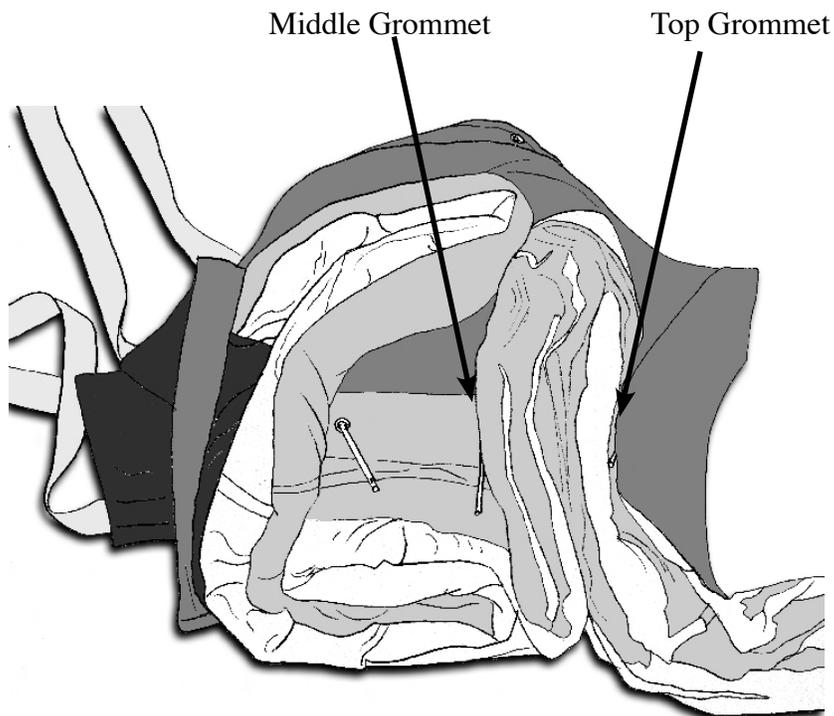
Next, fold the canopy 90° up the right side of the container until even with the top of the protector flap. Then fold the canopy back down the right side to the skirt and back up the right side of the container. Each fold should be to the inside of previous fold.



Even with Protector Flap

**6.7.3**

Make a short 90° fold to outer edge of the right side of container. This will help to smooth out the end of previous fold. Then bring the canopy across the container from right to left and back. Make sure this fold is completely in between the top and middle grommets.

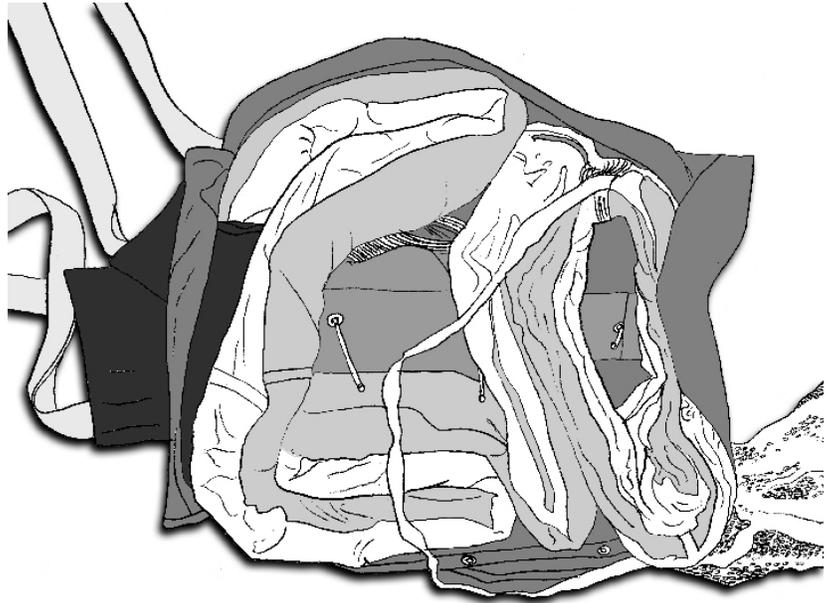


**6.7.4**

The remaining canopy is stowed across the top of container above top grommet. The apex should end on the left side of the container.

Route pilot chute bridle down the center of the container so that it is positioned between the bottom two grommets.

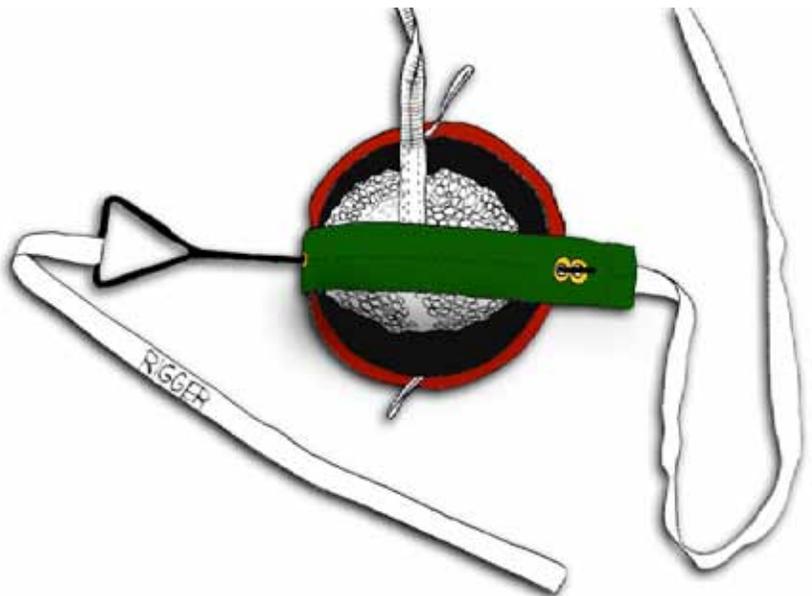
Bring the protector flaps up so that they are between the grommets and any canopy fabric. This keeps the canopy away from the closing loops and helps keep the canopy in place while closing.

**6.8 Compressing the Pilot Chute****6.8.1**

Stand the pilot chute upright on the locking rod. While compressing pilot chute, neatly and symmetrically tuck the pilot chute's cloth and mesh in between the coils of the spring. Continue until the pilot chute is fully compressed and lock with locking strap.

***Note!***

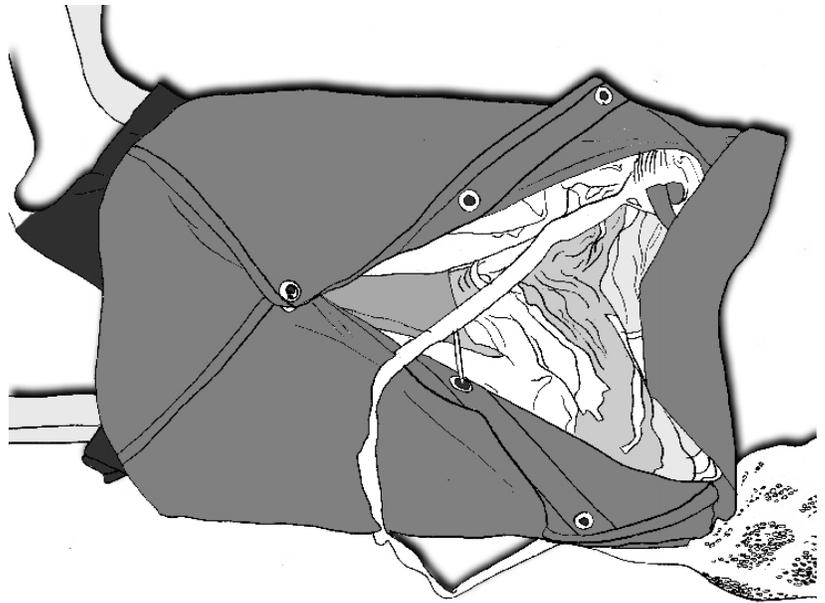
***Locking rod and strap should be at 90° angle to closing loops.***



## 6.9 Closing the Container

### 6.9.1

Bring the grommet from the bottom flap over the T-handle to close bottom flap. Next bring each of the grommets from the right side flap over each of the three T-handles followed by the grommets on the left side flap.

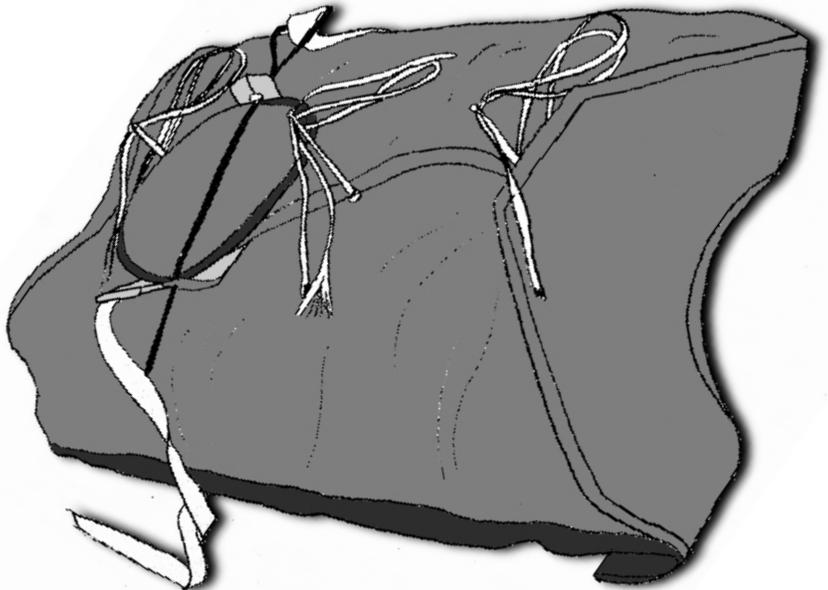


### 6.9.2

Pass a pull-up cord through the closing loop attached to the top flap and then pass the ends of the pull-up cord through the T-handle.

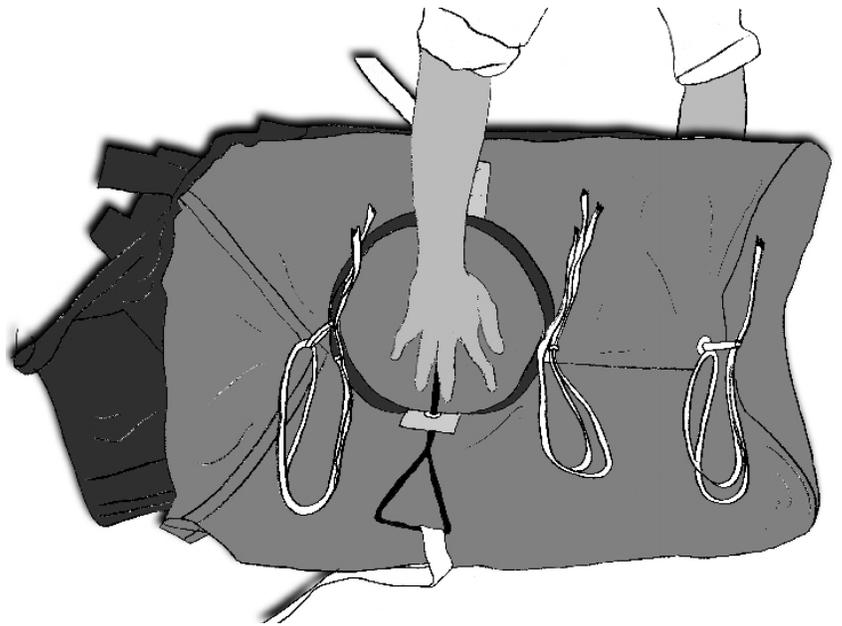
Next pass a pull-up cord through each of the closing loops in pilot chute cap and center the pilot chute between the two lower grommets. Pass the ends of pull-up cords through slots in T-handles.

Make short "S" folds with the pilot chute bridle and tuck into container between the left and right side flaps directly under the pilot chute.



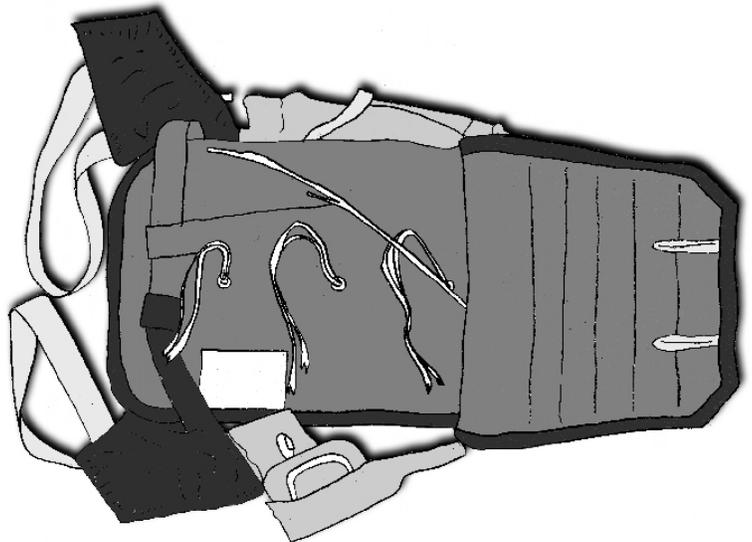
**6.9.3**

Holding pilot chute in position with one hand and with the other hand under pack, turn the pack over.



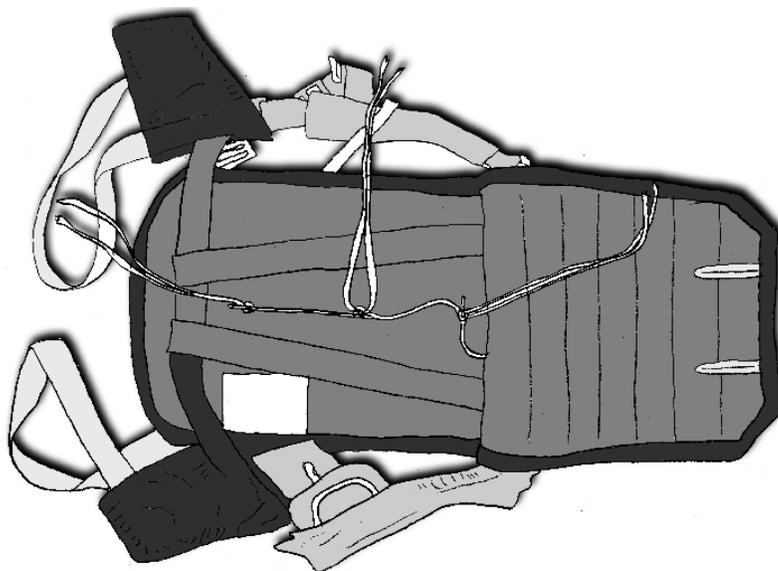
**6.9.4**

Draw pull-up cords through grommets by removing T-handles from the pack.



**6.9.5**

Working from the top, pull the locking loop through the container and insert ripcord pin. Once all three pins are in place, remove pull-up cords slowly to avoid burns.

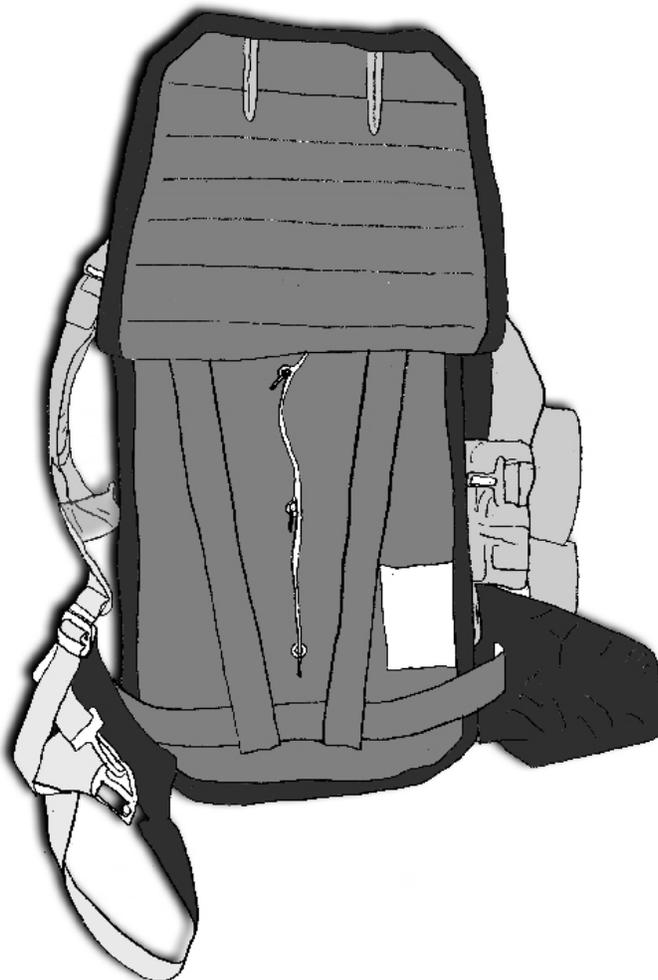


**6.9.6**

Dress the pack neatly and seal the bottom pin. Complete the data card and your rigger's logbook. Close the back pad by mating the Velcro®.

Turn rig over and remove pilot chute locking rod and strap. Use a fid to tuck the excess pilot chute fabric under the rim of the cap. The pilot chute should be centered on the back, and sunk down below the sides of the pack.

Be sure the ripcord handle is secure in its pocket.



***! WARNING !***  
***Count your tools to assure you have not left any in the packed parachute.***

## 7. Repair Guidelines

The following repair specification is set forth to aid riggers in the maintenance of Strong Enterprises' parachutes. Repairs must be made only by appropriately rated FAA certificated parachute riggers.

### CANOPY

#### TYPE OF REPAIR

#### LIMITATIONS

Re-stitching:

No limit as to length or number

Patch, single side:

Size limit: 50% of panel area

Limit of 3 per panel, 15 per canopy

Panel replacement:

Limit 9 per canopy

Radial Seams:

Size limit: 12", no more than 4 per canopy

Lateral bands:

Damage: size limit 2"

Upper

Limit: 1 per canopy

Lower

Limit: 4 per canopy

"V" tabs:

No limit

Suspension Lines:

No limit

### PILOT CHUTE

Use re-stitching or single side patch. Anything more, replace.

### PILOT CHUTE CAP

Replace when Spandura® fabric becomes worn.

### LOCKING

Replace one time per year. Length for Para-Cushion Model 311 Wedge locking loop is 10 inches, tolerance +0, -1/4 inch. Replace if out of tolerance or worn.

### BRIDLE

Damaged bridles should be replaced.

### CONTAINER

Standard military single side patches or replacement of the damaged area is authorized.

### HARNES

Any portion of the harness which is structurally damaged should be replaced in a manner to duplicate original equipment.

### RIPCORDS

Damaged ripcords should be replaced.

### DATA CARD

Data cards should not be discarded or replaced. When filled, they should be attached to a new card so a complete log of packing, repairs, and alterations is recorded. This is the history of the parachute.

#### *Note!*

*Darning and ripstop tape are not authorized for certified canopies as they may weaken the fabric. Single side patches are recommended for even small damaged areas.*

## 8. Changing the Pilot Chute Loop and Cap

### 8.1

The Para-Cushion Model 311 Wedge has a pilot chute cap with a Spandura® Rim. This Spandura® Rim is hand-tacked to the top of the pilot chute at 90° angles to the loop openings. By snipping this hand tacking, you can easily remove the cap and lift it off.

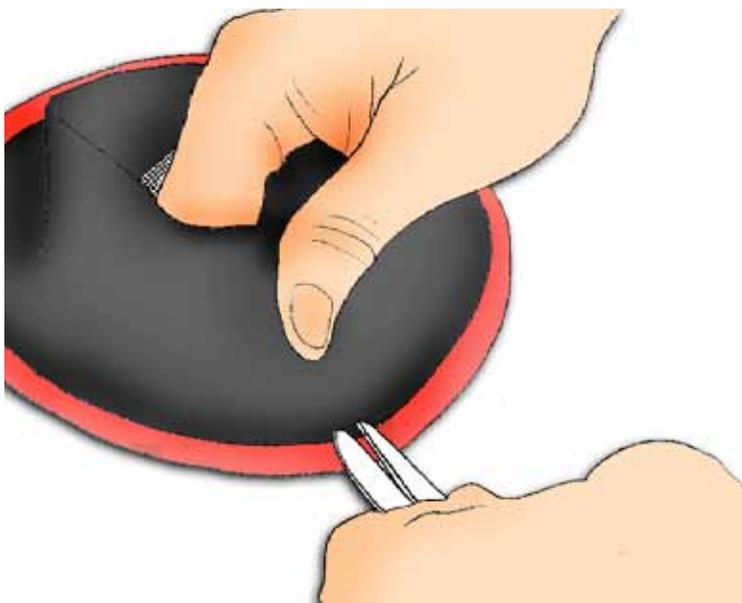


### 8.2

Once the cap is removed, remove the loop by snipping the hand tacking. Install a new locking loop by hand tacking the Type 4 tape to the pilot chute top, (do not hand tack the canopy of the pilot chute) followed by a good surgeon's knot. Position new loop so that the Type 4 is between loop and pilot chute.

#### *Note!*

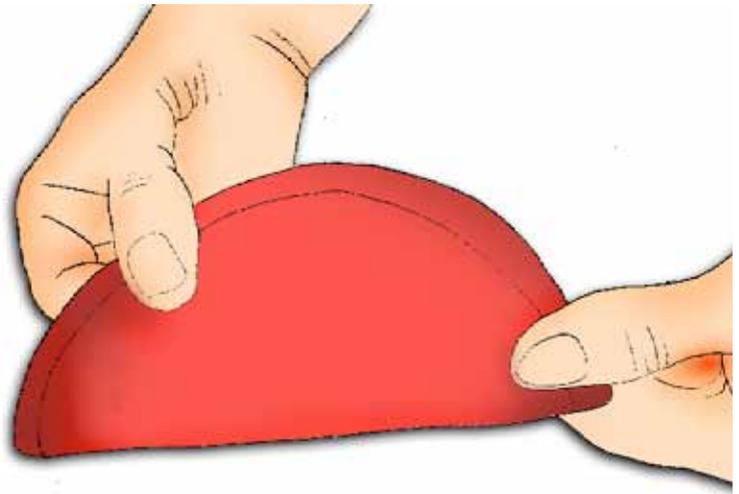
*Pilot chute loop must be placed as close to dead center as possible. Being off even a couple of degrees may cause the pilot chute to sit improperly on the packed container.*



### 8.3

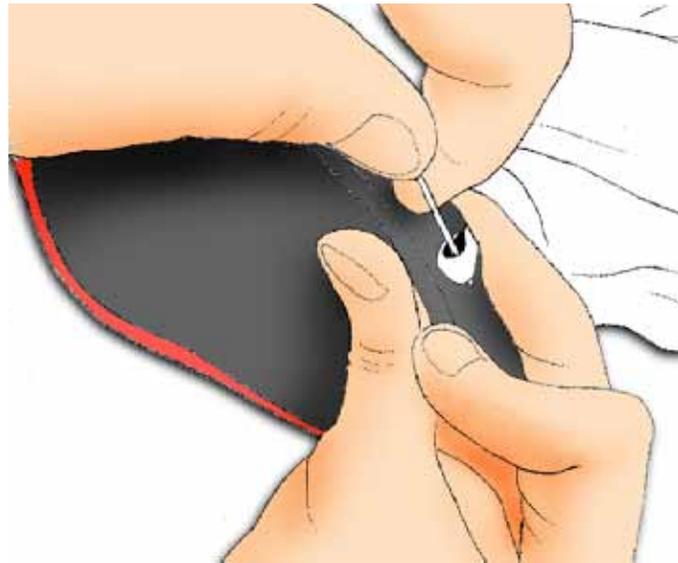
If you are replacing the cap, you must make two small holes where the loops will come through the Spandura® Do this near the seam in the binding tape.

**Rigger Tip:** Once you have cut the first hole in the Spandura® for your loop to come through, fold the cap perfectly in half at that hole, making a crease. Unfold the cap, and you can see just where 180° is and where your other hole should go.



### **8.4**

Once the holes are cut, install the new cap over the loop by aligning the loop ends with the holes in the Spandura® cap and pulling the loop through the holes with your hand tack needle.



Hand tack the new cap in place at 90° angle to the loop.

### **Note!**

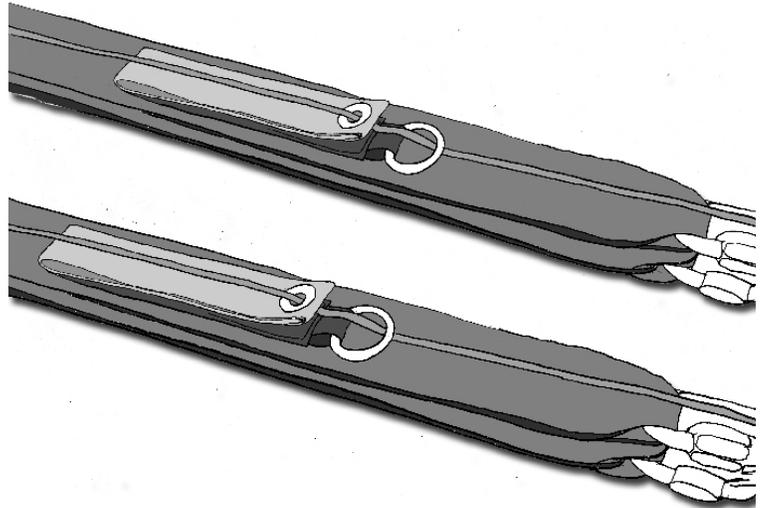
***Be careful not to catch the pilot chute canopy cloth below the stitch line at the top of the pilot chute. Doing so may result in stress being put on the cloth resulting in a hole in the canopy.***

## 9. Installing the Toggles

### 9.1

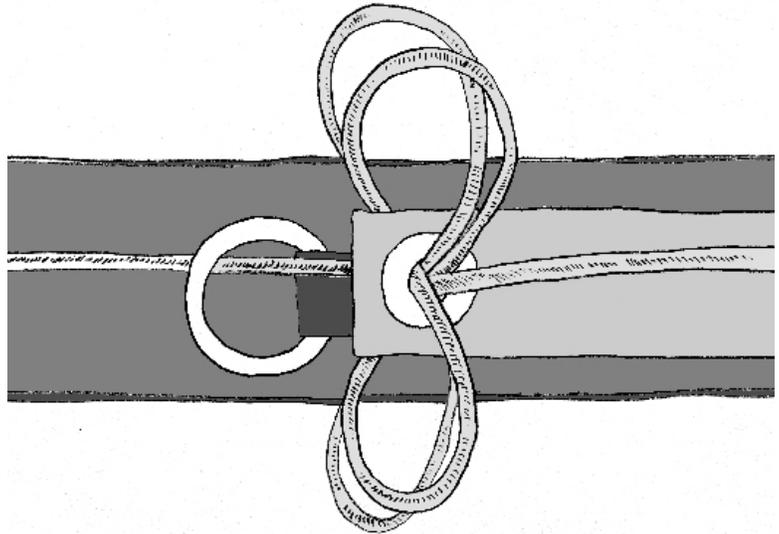
Thread the steering line through the guide ring then through the grommet in the toggle, starting from the underside of the toggle (the side with Velcro®).

Lay the toggle on the riser where it will be when set, and measure where the steering line should be tied. There should be one or two inches of slack in the steering line after the rest of the lines are pulled tight.



### 9.2

“Figure-8” the line through the grommet and secure with an overhand knot. If the steering line is thin, as in the Mid-Lite, or Lite, a second “figure-8” may be necessary to fill up the grommet hole.

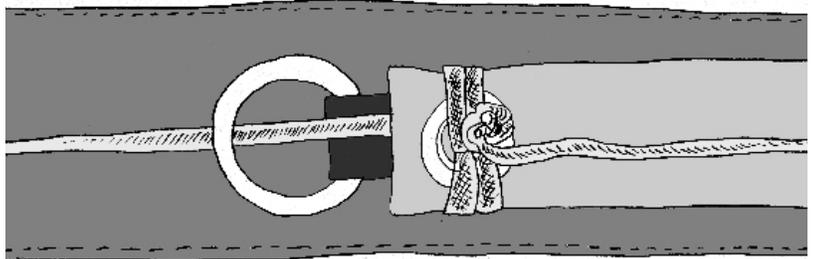


### 9.3

Mate the Velcro® to secure the toggle to the riser.

### 9.4

For original Para-Cushions (old style) that utilize a metal ring instead of cloth toggles, route the steering lines through the guide ring on each riser. Zig-zag stitch a 1 1/2 inch loop (trim the excess line) then slip loop through and over a 1 inch ring or through the steering loop.



Safety tie each steering ring to the riser immediately below the guide ring using seal thread (cotton 24/4), one turn, single ply.

Mr. Edward Strong  
 President, Strong Enterprises  
 A Division of S.E. Inc.  
 11236 Satellite Boulevard  
 Orlando, FL 32837



U.S. Department  
 of Transportation  
**Federal Aviation  
 Administration**

Dear Mr. Strong:

This is in response to your March 9, 1992, and subsequent submittals requesting Federal Aviation Administration authorization to identify Para-Cushion Series, Part No. 1045-( ) emergency parachutes assemblies, in accordance with the requirements of Federal Aviation Regulation (FAR) Part 21, Subpart O, Technical Standard Order (TSO) C23c, and SAE Aeronautical Standard AS-8015A, Category B.

We find your March 9, 1992, Statement of Conformance submitted with your request and your Quality Control Manual dated December 6, 1988, acceptable.

The following data as submitted by your letter will be retained on file for this authorization:

- a. Strong Enterprises Test Summary dated March 9, 1992.
- b. Strong Enterprises Drawings for the Para-Cushion Series P/N 1045-( ) submitted with your March 9, 1992, request.
- c. Strong Enterprises Owner's Manual which includes limitations and instructions and was submitted on May 7, 1992.

Effective this date, you are authorized to identify the Para-Cushion Series, Part No. 1045-( ) parachute assemblies with the appropriate TSO markings required by the applicable TSO and FAR 21.607(d).

This authorization is not transferable to another person or location and is effective until surrendered, withdrawn, or otherwise terminated by the Administrator.

Your responsibilities as a holder of a TSO authorization are outlined in FAR 21.3 and FAR 21, Subpart O.

The Airframe Engineer for this authorization is Cindy Lorenzen, telephone number (404) 991-2910. The Technical Support Specialist is Lorraine Dash, telephone, (404) 991-6137.

Sincerely,

John Tigue  
 Manager, Atlanta Aircraft  
 Certification Office

## AVAILABLE OPTIONS TO CUSTOMIZE YOUR Para-Cushion Model 311 Wedge



### **Custom Monogram** PN:099105

We can monogram your name, N number, Company Name, Nose Art or anything you can imagine. Space provided 6" X 2.5"



### **G-Pad Cushion** PN: 812113

An auxiliary pad that attaches to the back pad of any Para-Cushion. G-pad is formed to snugly fit around the pilot's sides providing extra support during high G maneuvers.



### **Aerobatic Harness** PN:260050

Moves the adjustment points from your thigh to your chest. Use for high G maneuvers.



### **Sheepskin Back Pad** PN:812137

Sheepskin pads keep you cool in the summer and warm in the winter.



### **Lumbar Support Pad** PN:812135

A rounded Tempor® foam pad that attaches in existing channel. Adjustable to just the right position in the small of your back.



### **Capewell Riser Releases** PN:099114

Allows you to release the canopy once you have landed in case of high winds, water or tree landing.



### **Quick Ejector Snaps** PN:099113 (3 each) or PN: 099112 (2 each)

Military Style hardware replaces B-12 snaps. Allows you to lift the gate and eject the hardware instead of reaching under and lifting.



### **Aero Pad** PN:812112

A zip-on seat pad held in place by the pilot's weight to restrain the Para-Cushion and prevent shifting during high G maneuvers.

*Call or email for more information and pricing.*