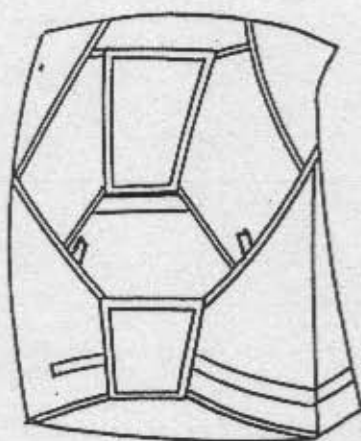


STUDENT ZEROX



OWNERS MANUAL



*Thomas sports Equipment
Pinfold lane Industrial Estate
Bridlington
North humberside
YO16 5XS
TEL: 0262 678299.
FAX: 0262 602063.*



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INTRODUCTION



T.S.E. PAGE 1

First of all we would like to thank you for choosing a Thomas Sports Equipment STUDENT ZEROX, you have shown your students and staff that you'll settle for nothing less than the best.

Please read this manual thoroughly before assembling or using your Student Zerox. Each of your instructors must also read this manual and should, if possible, jump the Student Zerox him / herself.

If after reading this manual you still have questions concerning the Student Zerox please contact us, we will be more than willing to help.

If you have any suggestions or see a need for some changes in the Student Zerox please let us know by calling or writing to:

Thomas Sports Equipment
Pinfold Lane Industrial Estate
Bridlington
North Humberside
YO16 5XS
TEL: 0262 678299.
FAX: 0262 602063.

FACTS about Thomas Sports Equipment

Thomas Sports has been manufacturing parachute equipment since 1963 and has provided services from students to British team members. Twenty years in our sport has provided TSE with a wealth of experience in developing and manufacturing parachute equipment with an enthusiasm and commitment in the complete sense. A service second to none. This in turn means you can be confident in the knowledge that with TSE you are using the best available, from the initial PLF through to SCR and beyond.

Staff qualifications are more than impressive: 4 FAA master riggers, 4 BPA ADV. rigger examiners, with a collective total of over 10,000 jumps, oversee all aspects of the production, maintenance and repairs operations at the loft. Every care is taken to ensure that each rig from TSE meets the highest possible standards. Approved to British Safety Standards B.S.I. 5750 part 2, I.S.O. 9002, E.N. 299002, T.S.E. Standard 1 Issue 2. Approved by the Australian Civil Aviation Authority C.A.A. under C.A.O. 103.18-Equipment Standards-Emergency-Parachutes.

CONCEPT.

The Student Zerox was designed to closely resemble the standard Zerox that is popular with experienced jumpers around the World. We believe a parachutist should be required to learn only one set of procedures and then be able to keep using them as he progresses through the sport.

Here's an example of how the student Zerox makes parachuting easier to learn: The deployment handle, reserve ripcord and breakaway handle on the Student Zerox are all in the same places as on the Standard Zerox. That means a student's first jump emergency procedures will remain the same throughout his jumping career. He'll easily transition from "Student" to "Advanced" gear.

Another example: Regardless of whether the Student Zerox is configured for ripcord or hand deployment, the activation handle is in the same place, and the jumper uses the same motion to pull the handle. This permits a novice to make his first jumps with a spring-launched pilot chute and easily transition to hand deploy.

The Student Zerox provides additional safety features, including an automatic activation device (AAD) and a reserve landyard (staticline).

DESCRIPTION

The Student Zerox is a piggyback harness and container system designed for the special demands of Student training. It is available in a wide variety of container sizes to fit practically any main or reserve canopies, both round and ram-air.

The Student Zerox is manufactured in accordance with B.S.I. 5750 part 2, I.S.O. 9002, E.N. 299002, T.S.E. STANDARD 1 Issue 2, Approved by the Australian civil aviation authority C.A.A. under C.A.O. 103.18-Equipment -Standards-Emergency-Parachutes.

MAIN CONTAINER



T.S.E. PAGE 2

The main canopy may be deployed by either hand-deploy pilot chute, spring launch pilot chute or static line. Converting from one deployment method to another takes a few minutes and requires no tools. The same deployment bag is used for all three methods.

The Student Zerox main container can be built to accept ram-air canopies with the built equivalent to the Glide Path Manta and the National Hercules.

The main canopy attaches to the harness with the 3 ring release system. Pulling a soft handle located on the right main lift web jettisons the risers.

RESERVE

The reserve parachute container is held closed by a single pin. The reserve ripcord handle is made of metal and fits into a pocket on the left hand main lift web. The reserve ripcord cable end is a small loop through which the locking pin is inserted to close the container.

A landyard extends from the base of the right hand riser through a guide ring to the single reserve pin. When the jumper jettisons a partially malfunctioned main canopy and drops several feet, the landyard acts as a static line to extract the reserve pin. The landyard will therefore pull the reserve if the jumper does not. It also resolves in the fastest possible reserve deployment.

The reserve system will except the popular automatic activation device the FXC 12000. The Student Zerox must be equiped with a properly calibrated and maintained AAD.

The reserve ripcord, landyard and AAD provide three different ways to deploy the reserve parachute.

The Student Zerox reserve container can be manufactured to except round or ram-air reserves with a packed volume equivalent to that of a 26' Lopo.

HARNESS

The harness of the Student Zerox features non-slip adjustments on the main lift web so that it fits most jumpers. It is constructed of Type 7 and Type 8 Mil-Spec webbing.

TRAINING REQUIRED BEFORE JUMPING THE STUDENT ZEROX

The T.S.E. Student Zerox may be jumped only by persons who have received thorough instruction on its use from a qualified instructor. It is the responsibility of the owner and those whom he allows to use the system to ensure it is properly assembled, maintained, packed, worn and used, also that the user has the training and skill to use it properly. This Manual is NOT a course of instruction on how to make a parachute jump. Nor does it contain the various regulations that govern sport parachuting and related activities. This information is best obtained from government bodies. The person who inspects and packs both the main and reserve parachutes must be qualified to do so. Finally, nothing in this Manual is meant to discourage the reader from using the T.S.E. Student Zerox in a reasonable and prudent way.

The information and specifications in this Manual where in effect at the time of printing. Thomas Sports Equipment Limited, however, reserve the right to change specifications or design at any time without prior notice and without incurring any obligation.

ABOUT MODIFICATIONS



T.S.E. PAGE 3

It is common for jumpers to "improve" their rigs by altering them. A high percentage of these alterations cause malfunctions or make it difficult to use the rig correctly. Typical alterations include conversion to "pull out" pilot chute, changing the configuration of the harness and changing the length of the bridles.

Check with Thomas Sports Equipment before you make any changing to your Student Zerox. It was designed and built the way it is as a result of years of testing and development. There are reasons for having things the way they are, reasons that might not be apparent at first. Check with the manufacturer before you make any changes; even "insignificant" alterations may have very negative or unforeseen effects.

COMPONENTS SUPPLIED

The Student Zerox comes complete with the following components:

*Harness and Container
Spring-launched Student Zerox Main Pilot Chute
Main Deployment Bag
Main Pilot Chute Bridle
Main Locking Loop
Bag Attachment Loop
Apex Assist
1 Student Zerox Main Ripcord
Spring-Launched Student Zerox Reserve Pilot Chute
Reserve Ripcord
Reserve Locking Loop
Reserve Landyard
Reserve Pilot Chute Bridle
Main Risers and Steering Toggles
3 Ring Release Handle
Main Static Line
The Student Zerox Owners Manual
1 Student Hand-Out*

Once you are sure you have received these components, refer to the technical label on the left hand reserve riser. Check to be sure the container are sized properly for your main and reserve canopies. If you use components that were not originally supplied with the harness and container, be sure they have the correct dimensions and that they are made of the same materials. For instance, be sure the brake away cables are of the proper length.

Replacement components for the Student Zerox are readily available from Thomas Sports Equipment.



INTRODUCTION

The Student Zerox is compatible with practically any main parachute that will fit into the container. This Manual does not provide specific instructions for folding all of the various main canopies on the market. That information must be obtained from the owners Manual for each canopy that is supplied by the canopy manufacturer.

ASSEMBLING THE MAIN PARACHUTE

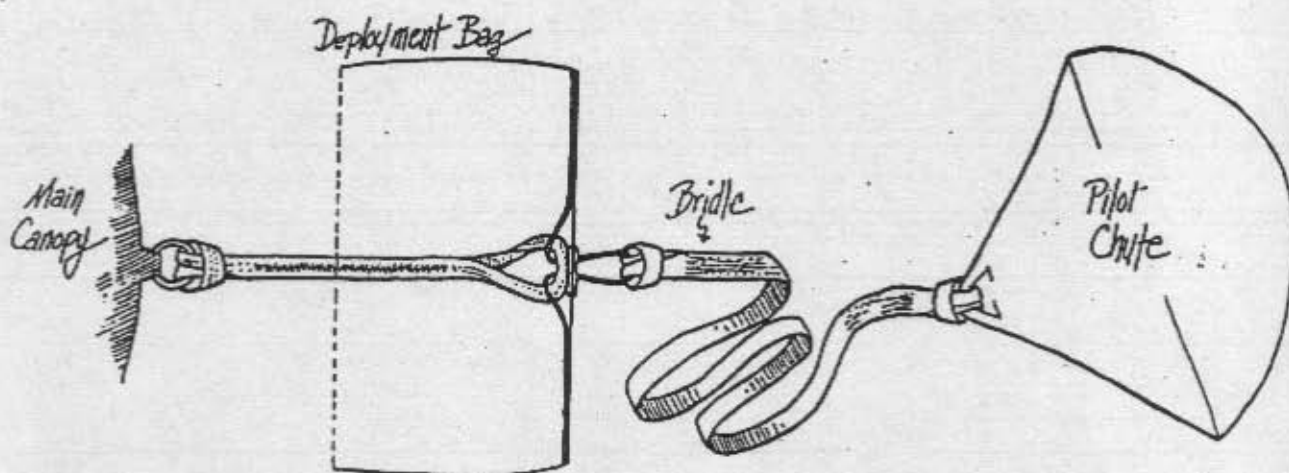
Carefully inspect the main parachute for wear or manufacturing defects. Attach the main parachute to the main risers, included with the Student Zerox. (Other 3 ring risers are incompatible because of the reserve landyard). Leaving the risers on the harness while attaching the canopy will help prevent confusion. If the canopy uses #5 rapid links, make sure the barrel nuts completely cover the threads. You may consider installing slider buffers to protect the slider grommets on ram-air canopies. In addition to protecting the grommets, slider buffers also keep the barrel nuts on the links from working loose. Buffers may be made from practically any 3/4" diameter flexible tubing. It is important to check that the ram-air main canopy steering lines cannot jam between the slider buffers and the slider grommets. If they jam, the parachute will be rendered unsteerable. Attach the steering toggles to the control lines of the main canopy. Secure the control lines as shown in later diagrams. When the canopy is first installed on the risers it should be carefully checked to ensure the steering lines and brake loops are of proper length. Inspect the canopy installation to make sure the risers are not reversed or twisted. Inspect the 3 ring assembly according to the instructions in this Manual.

INSTALLING THE BAG & BRIDLE

If a static line is to be used refer to static line installation and packing procedures, which you will find in the latter pages of this Manual.

A. For freefall deployment of a ram air canopy:

Attach the bridle attachment loop to the bridle ring on top of the canopy with a larkhead knot. Attach the bridle attachment loop to the bag: Push the type 17 bag loop out of the grommet at top of the bag, put the bridle attachment loop over the bag loop, then push the bag loop through the grommet. Then attach the proper end of the bridle to the bag loop with a larkhead knot.



MAIN CANOPY PACKING INSTRUCTIONS



T.S.E. PAGE 5

Anyone who has never packed a main canopy in the Student Zerox should first do so under the supervision of a rigger or an instructor who is familiar with the system. Not only does such supervision enhance safety, it provides an excellent opportunity to learn ways to make the procedure easier.

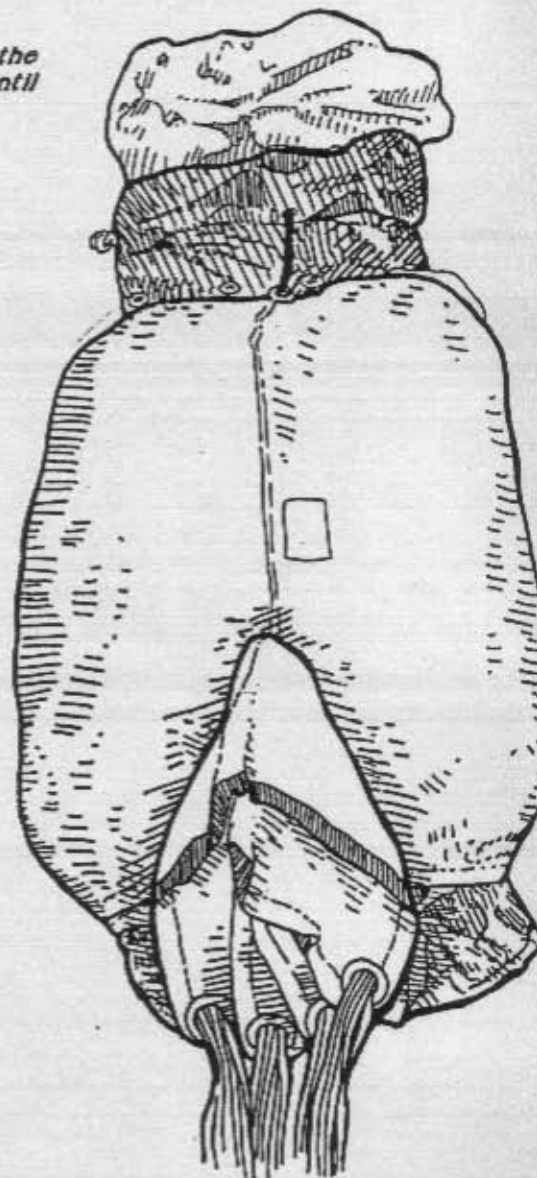
STEP 1.

Lay out, inspect, flake and fold the canopy according to the canopy manufacturer's instructions. Do not pack the canopy until any anomalies have been corrected.



STEP 2.

Fold the canopy as wide as possible, so the container will be as flat as possible. Pull the bag down over the top of the folded canopy.



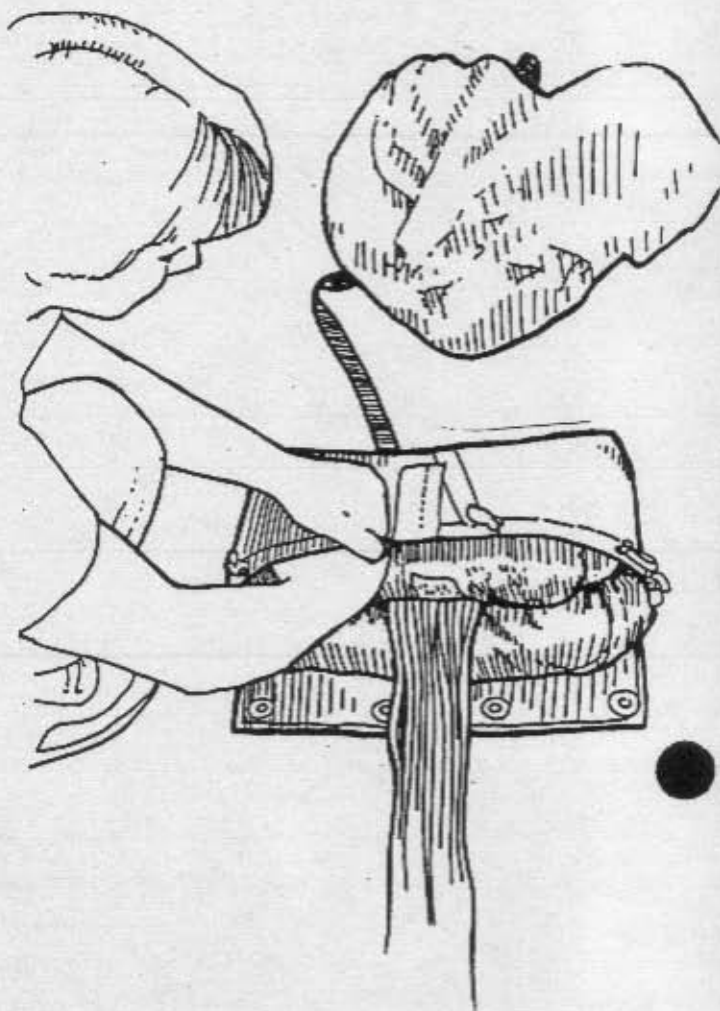
MAIN CANOPY PACKING INSTRUCTIONS



T.S.E. PAGE 6

STEP 3.

Stack the canopy into the deployment bag. Be sure to fill the corners completely.



STEP 4.

To close the bag, pass one of the centre two rubber stow bands through its corresponding grommet and insert a 1" to 2" blight of lines through the stow band. Repeat this step with the other centre stow band and grommet, followed by the band and grommet at each corner.

MAIN CANOPY PACKING INSTRUCTIONS



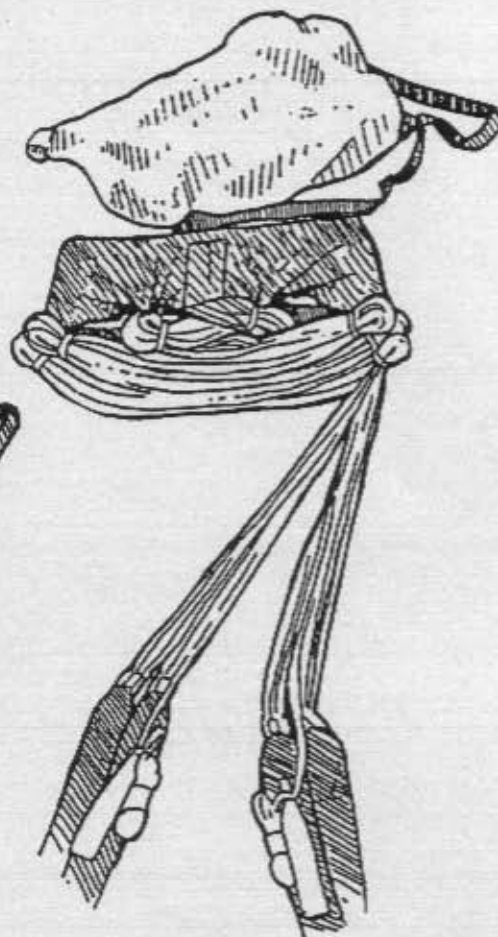
T.S.E. PAGE 7

STEP 5.

Stow the remainder of the lines across the bottom of the bag in the elastic stow bands. Keep the bights of line 1" to 2". Leave no more than 15" of lines unstowed.

STEP 6.

Use your knees or feet to "walk" on the bag, squeezing air out and distributing the bulk until the middle is no fatter than the sides.



STEP 7.

Pick the bag up by its sides and set into the container on the line stows.

MAIN CANOPY PACKING INSTRUCTIONS

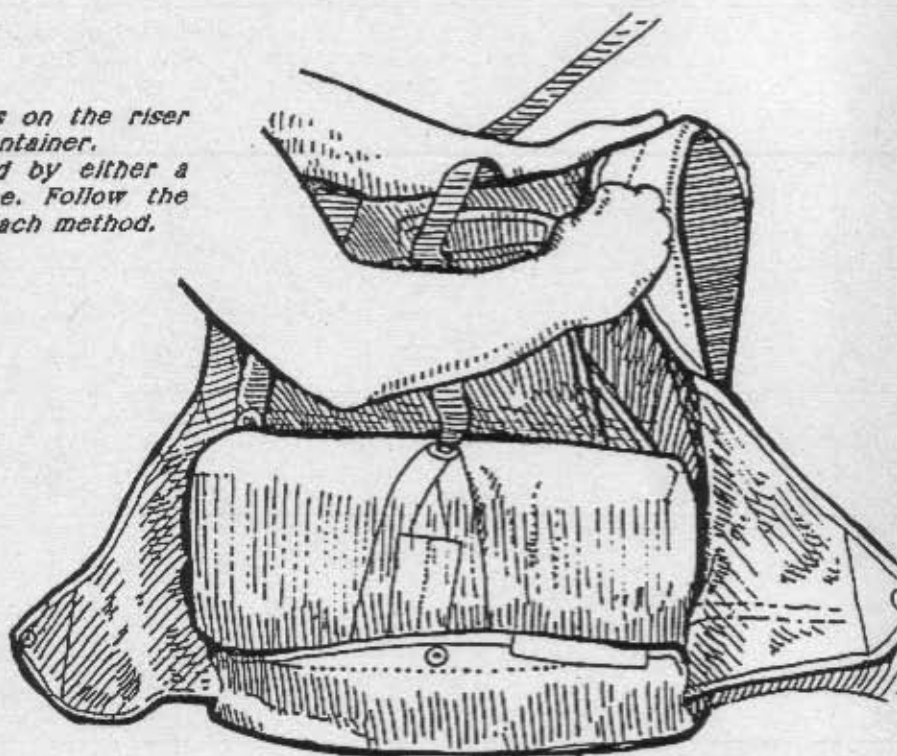


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STEP II.

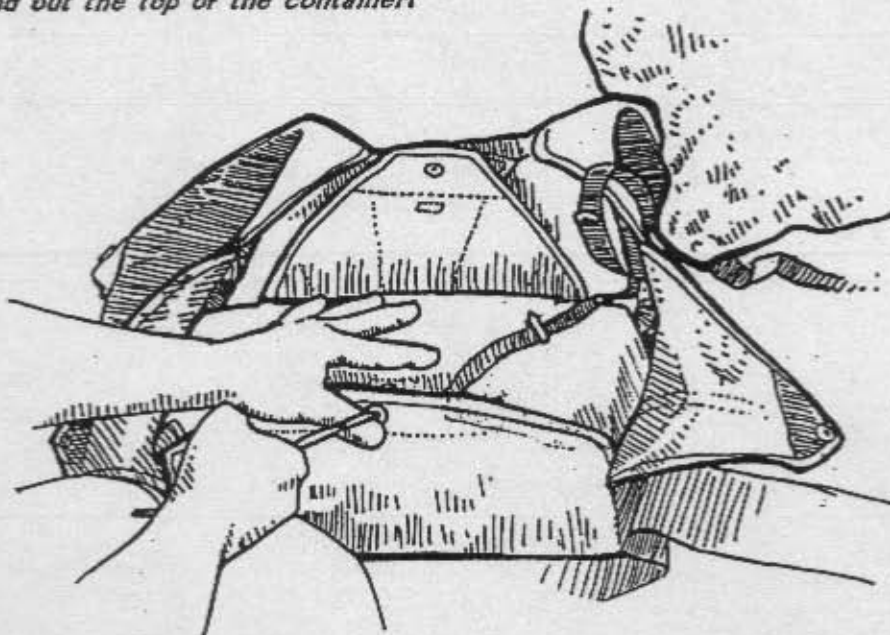
Cover the risers with the flap tags on the riser covers at the top of the reserve container.

The main canopy may be deployed by either a hand deploy, ripcord or static line. Follow the appropriate instructions below for each method.



HAND DEPLOY CLOSING THE CONTAINER.

A. Insert a pull up cord through the loop on the bottom flap. Route the bridle to the right of the pull up cord and out the top of the container.

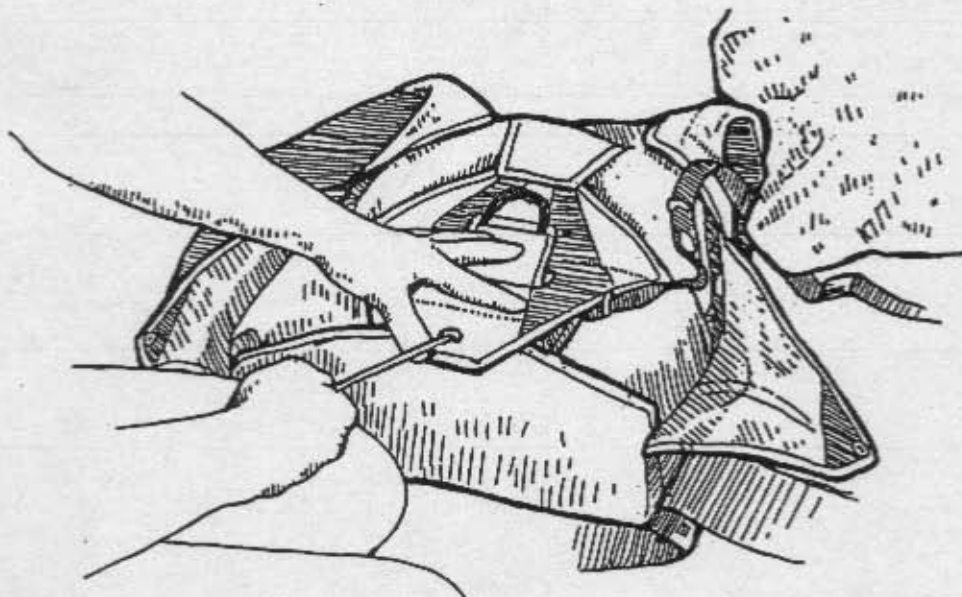


MAIN CANOPY PACKING INSTRUCTIONS

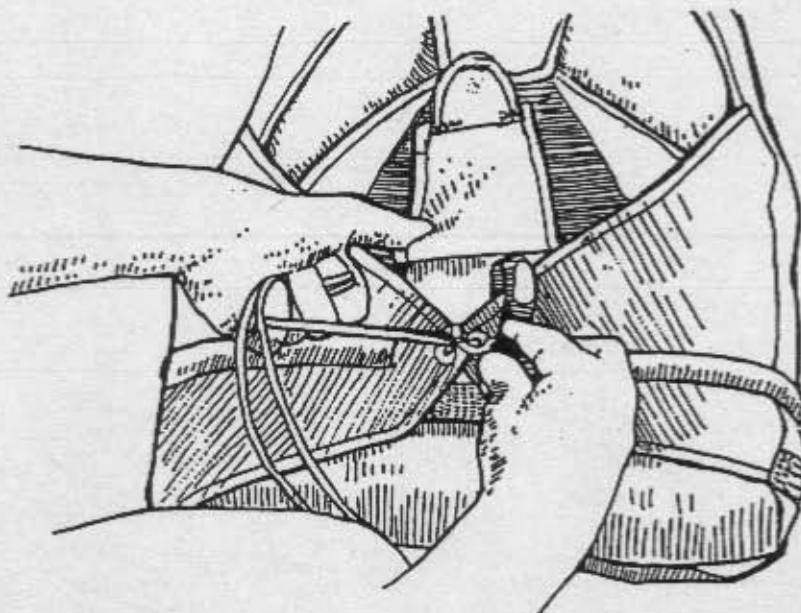


T.S.E. PAGE 10

B. Thread the pull up cord through the grommet on the flap. Pull the pull up cord through the grommets by pulling upwards toward the top of the container. Pound the bottom of the container until the locking loop comes through the two grommets. Avoid overstressing the grommets.



C. Thread the left hand then right hand side flaps using the same pounding technique. (The flaps must be closed in that order). Insert the curved pin on the pilot chute bridle through the locking loop from right to left.

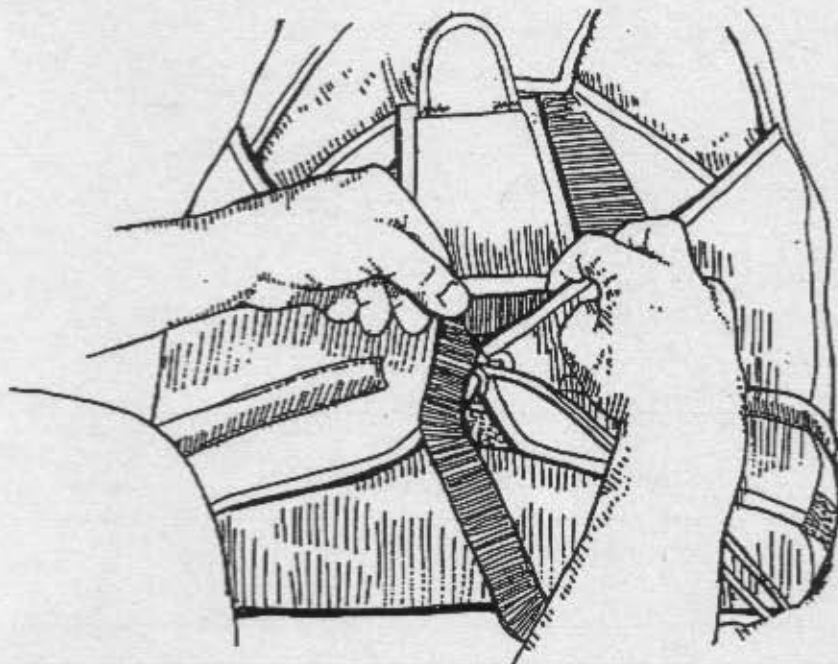


MAIN CANOPY PACKING INSTRUCTIONS

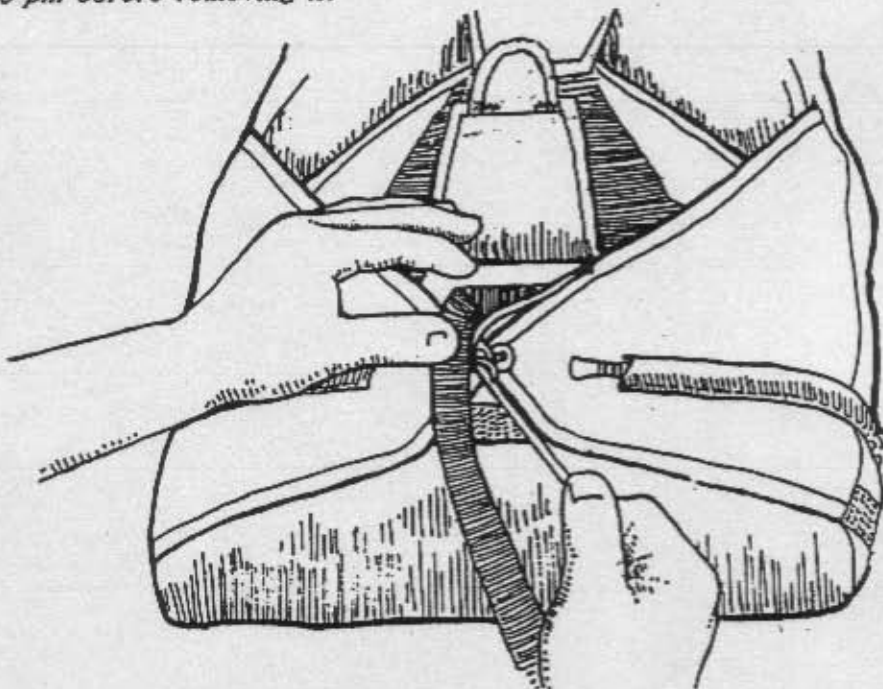


T.S.E. PAGE 11

D. Mate the small patch of velcro on the bridle to the patch on the container. This provides slack in the bridle between the pin and the pack, allowing the pin to be easily extracted from any direction.



E. Slowly remove the pull up cord to prevent excess friction from damaging the locking loop. It's best to buffer the locking loop with the curved pin while removing the pull up cord by passing one end of the loop behind the pin before removing it.



REMOVE THE PULL UP CORD OR THE CONTAINER WON'T OPEN

Thomas Sports Equipment

Issue 2, 20-10-90

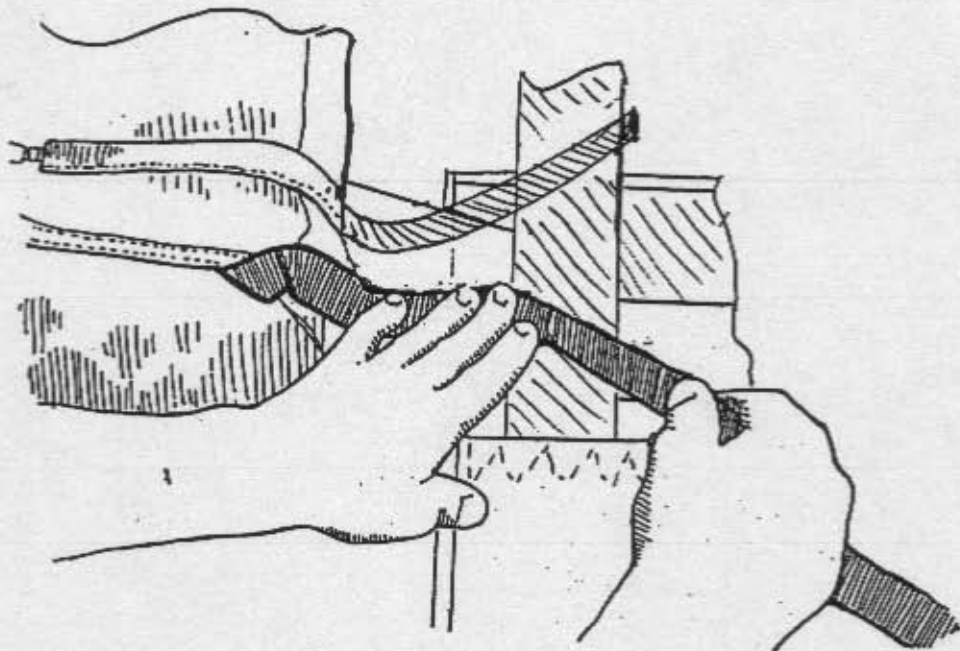
Student Zerox

MAIN CANOPY PACKING INSTRUCTIONS



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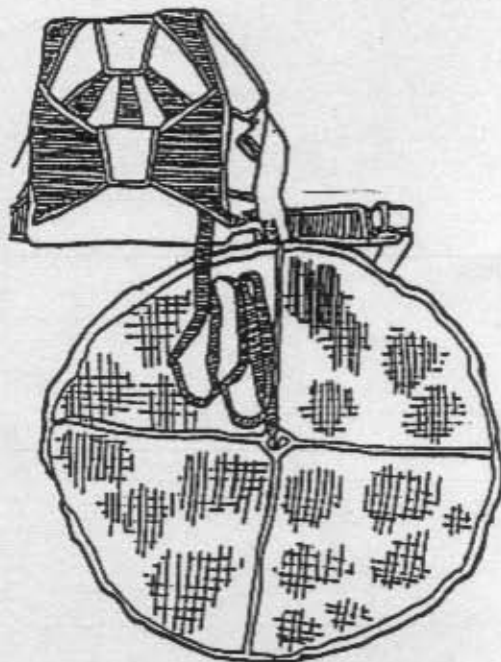
F. Mate the velcro on the bridle to the spandex pocket on the right hand leg strap. Stuff the excess bridle away under the right side main flap. Close the pin cover flap. Double check the routing of the bridle.



NOTE: It may be necessary to adjust the length of the locking loop to make the flaps mate properly. The curved pin should be held firmly in place, but move with no more than 12 pounds of pull.

FOLDING THE PILOT CHUTE.

G. Lay the pilot chute out over the leg strap, net side up so the edge of the circle is at the mouth of the spandex pocket S-fold the bridle on the half of the pilot chute over the pocket.



MAIN CANOPY PACKING INSTRUCTIONS



T.S.E. PAGE 13

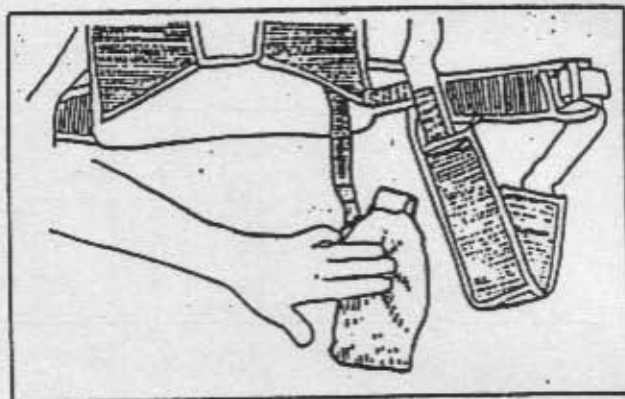
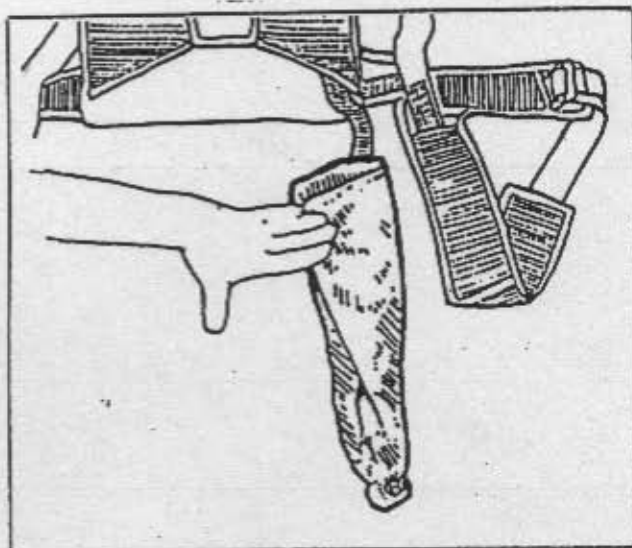
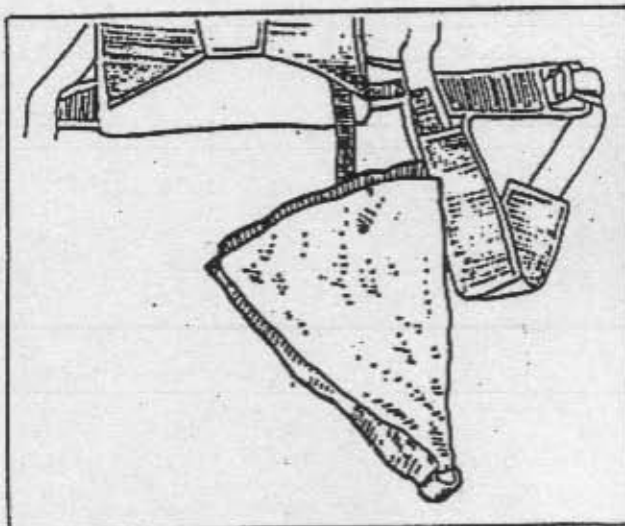
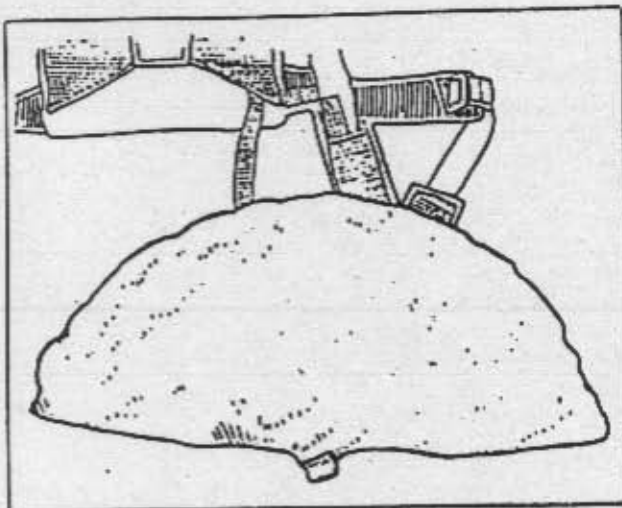
H. Fold the pilot chute in half over the bridle. Then bring the corners up to form a wide triangle.

I. Fold the triangle in half forming a smaller triangle.

J. Fold the triangle into thirds forming a skinny triangle, then fold it once more.

K. Fold the pilot chute in half so that the handle is even with the skirt.

L. Then stow the pilot chute into the spandex pocket with the toggle at the top.



MAIN CANOPY PACKING INSTRUCTIONS

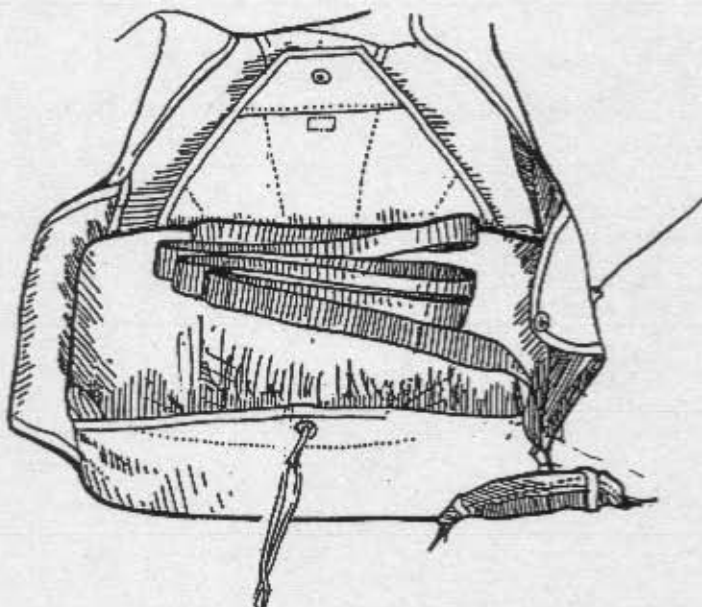


T.S.E. PAGE 14

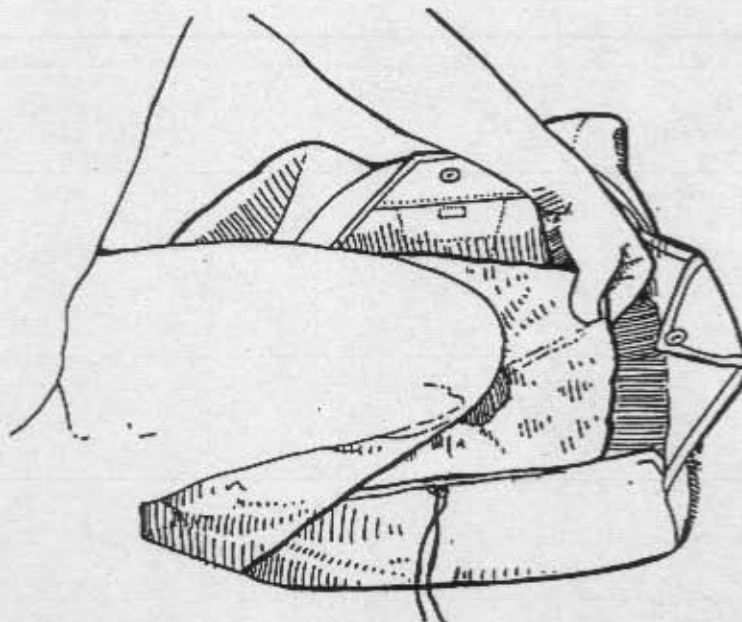
FOR RIPCORDER DEPLOYMENT

A. Insert the ripcord through the ripcord cable housing.

B. S-Fold the bridle neatly on top of the main bag, then thread the pull up cord through the bottom flap loop



C. Then compress the main pilot chute on top of the main bag and hold in place with your knee, pull the bottom flap up and on top of the pilot chute.



MAIN CANOPY PACKING INSTRUCTIONS

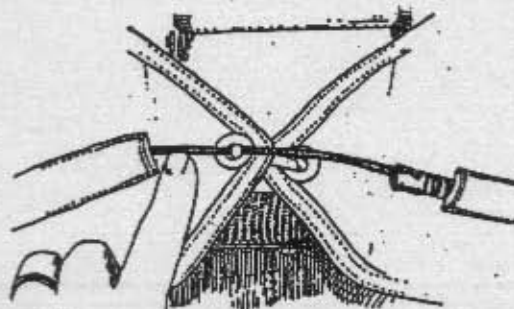


T.S.E. PAGE 15

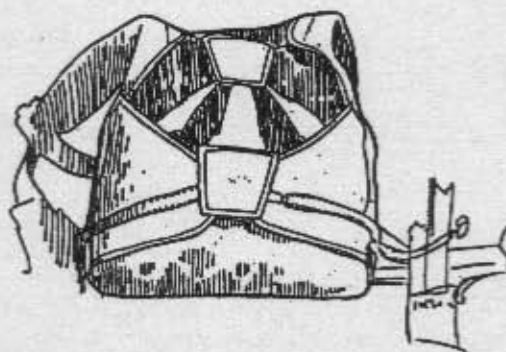
D. Repeat the closing procedure with the top, right hand and left hand flaps. (The flaps must be closed in that order.)



E. Insert the end of the ripcord cable through the locking loop. pull all the way through. the locking loop and insert it into the cannal the left main flap near the end of the cable.



F. Slowley remove the pull up cord to avoid burning the cable or locking loop from excess friction. Close the cover flap.



REMOVE THE PULL UP CORD OR THE CONTAINER WON'T OPEN

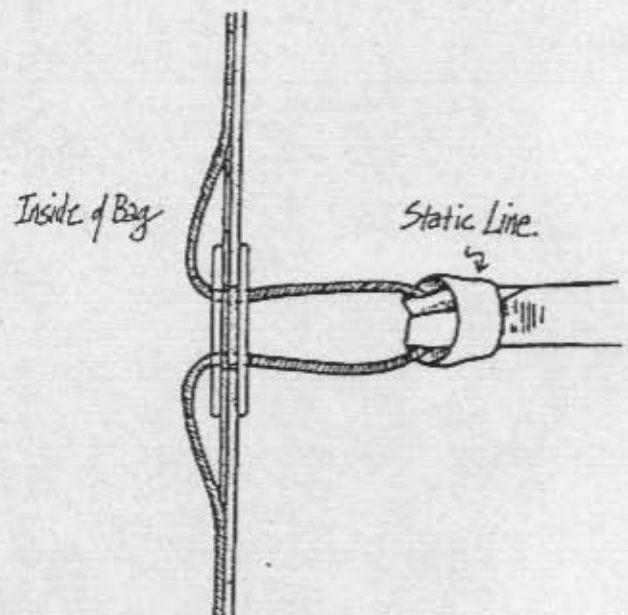
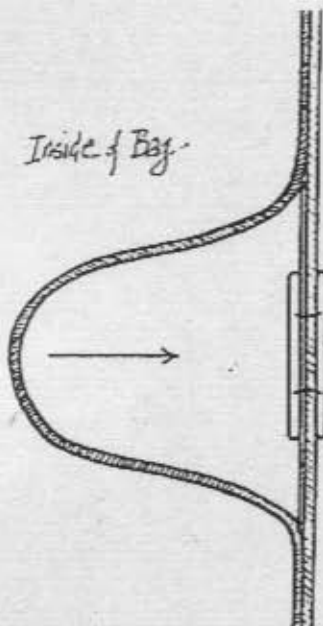
MAIN CANOPY PACKING INSTRUCTIONS



T.S.E. PAGE 16

STATIC LINE INSTALLATION & PACKING PROCEDURES

- A. If installed, remove the hand deploy or ripcord deployed pilot chute and bridle.
- B. Attach the static line to the deployment bag with a larkshead knot. As shown in diagram below.
- C. Follow packing instructions and closing the main container instructions as shown on pages 14-15 (A-F).
- D. Stow the static line in rubber bands attached to the small webbing loops installed on either side of the main container. It is the responsibility of the owner to ensure the main parachute static line is of the proper length and strength. (A static line that is too long can entangle with the control surface of the aircraft, and one that is too short may cause the main canopy to strike the aircraft's tail.)





Because of the size range of square reserve canopies available today, this manual does not contain instructions on inspection assembling and flaking. For these steps the rigger must follow the instructions provided by the canopy manufacturer.

TOOLS REQUIRED:

- 1 x T Bars
- 1 x Pull up Cords
- 1 x Temporary Pins
- 1 x Packing Paddle

1. Thoroughly inspect the pilot chute bridle, deployment bag, canopy, lines, links, locking loop, risers, container and harness.

2. Follow canopy manufacturers instructions for:-

- a. Attaching the canopy to risers.
- b. Attaching toggles and/or steering lines.
- c. Flaking canopy.
- d. Folding the nose and canopy.
- e. Setting deployment brakes.
- f. Splitting the tail.
- g. Stowing slider.
- h. Dressing the canopy.

3. Prepare the free bag so that it is ready to be packed. To do this, insert one end of the pull up cord through the grommet in the top and bottom of the bag, and tie it to the other end so that it won't slip out during the packing procedure. **Note;** Some riggers prefer to use a T bar instead of pull up cords, inserting it through the bag from the bottom. The T bar or pull up cord will be used later to pull the locking loop through the bagged canopy.

TYPICAL PRO PACKING EXAMPLE





4. Fig 1.

Dress the canopy to 4" over the size of the free bag (2" each side)

5. Fig 2,3,4.

Stack the canopy on the top of itself, making each fold no longer than the distance from the mouth of the bag to the grommets in the open part of the bag.

FIGURE #1

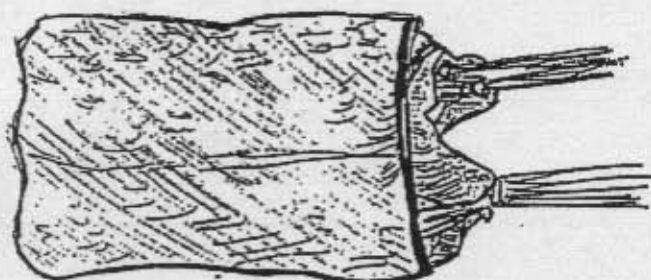


FIGURE #2

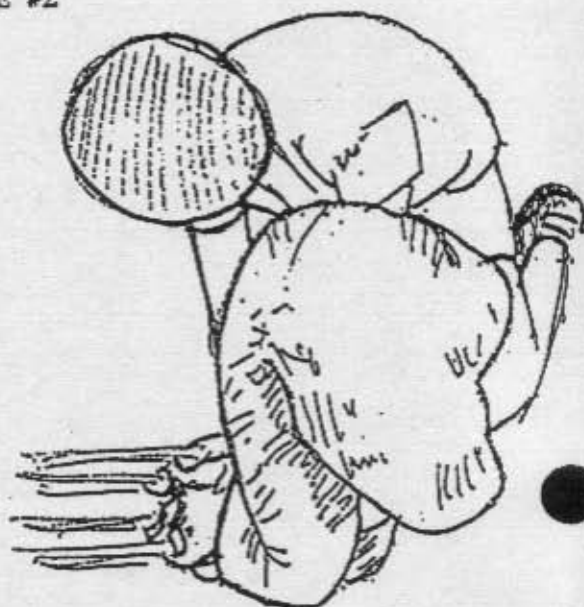
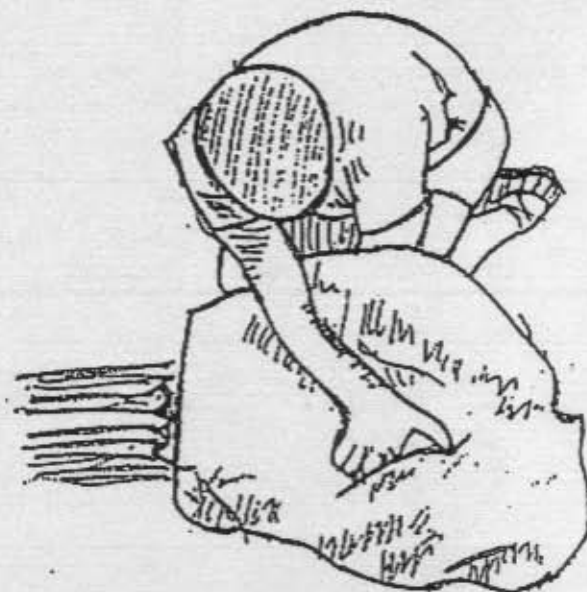


FIGURE #3



FIGURE #4





6. Fig 5.

After the canopy is stacked on itself, unfold the top portion into two sections or "ears".

7. Fig 6.

Dress each section neatly.

8. Fig 7.

Carefully slide the bag over the canopy pushing each "ear" into the top corners of the bag, filling the corners evenly and leaving a tapered shape.

9. Fig 8.

Lock the bag closed with two bites of suspension line. A "Safety Stow" is used not rubber bands.

10. Fig 9.

Stow the remainder of the suspension lines into the pouch on the underside of the bag. Use S-Folds that extend from one side of the pouch to the other. Be sure none of the lines are trapped between the velcro at the mouth of the pouch. 11. You are now ready to put the bag into the container.

FIGURE #5



FIGURE #6



FIGURE #7

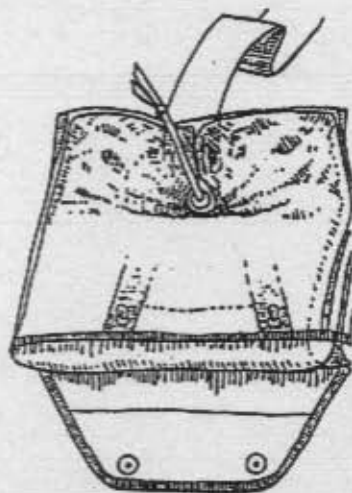


FIGURE #8

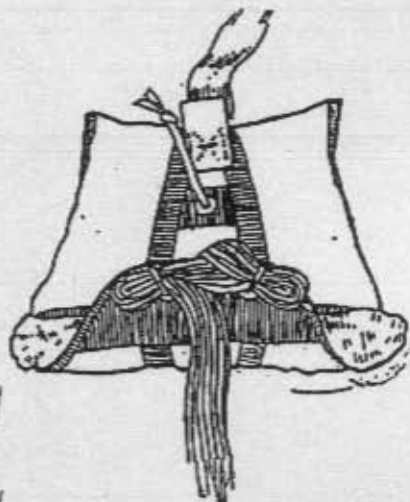
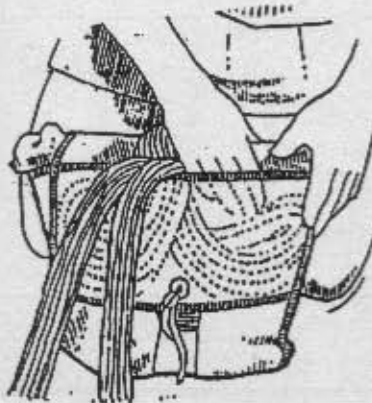


FIGURE #9



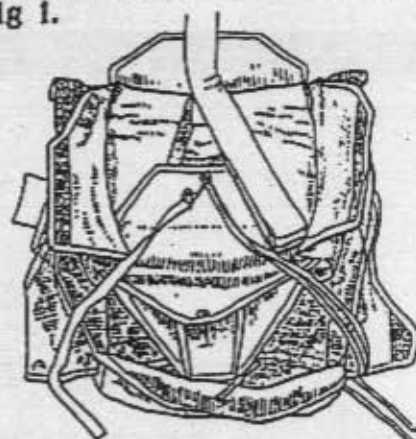


Regardless of what procedure was used to place the canopy in the bag, the same procedure is used to close the container. AT ALL TIMES.

STEP 1.

Close the inside bottom flap (#1) and secure it with a temporary pin. Make long S-folds with the bridle from the top of the bag to the bottom right hand corner of the reserve container as shown. Carefully tuck the bottom of the S-folded section under the inside bottom flap (#1). As shown in fig 1.

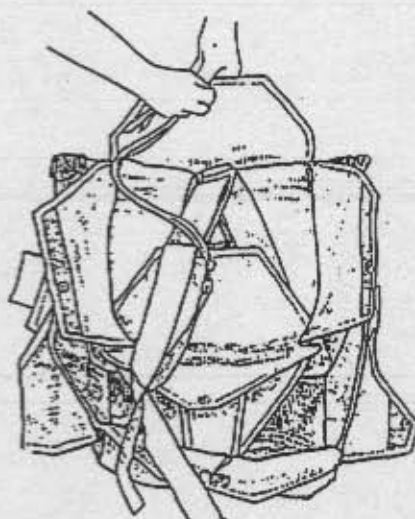
FIGURE #1



STEP 2.

Repeat this process on the left side make long S-folds in the bridle line from the top of the bag to the left hand corner of the container and tuck under the inside bottom flap as shown in fig 2

FIGURE #2



CLOSING THE RESERVE CONTAINER.

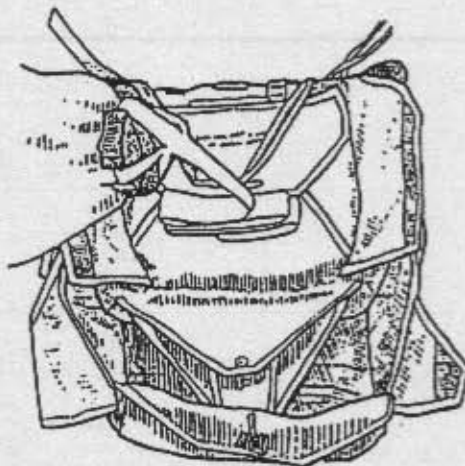


T.S.E. PAGE 21

STEP 3.

Close the inside top flap (#2) and secure with temporary pin. The bridle should come out between these two flaps. Take a moment to check the amount of free bridle at this point. There must be at least five feet left from the junction of the closed flaps to the base of the pilot chute. If the excess bridle is too short, release the inside top flap and re do the S-folds.

FIGURE #3



STEP 4.

Fold the bridle to the left and make a series of short S-folds right up to the base of the pilot chute.

FIGURE #4

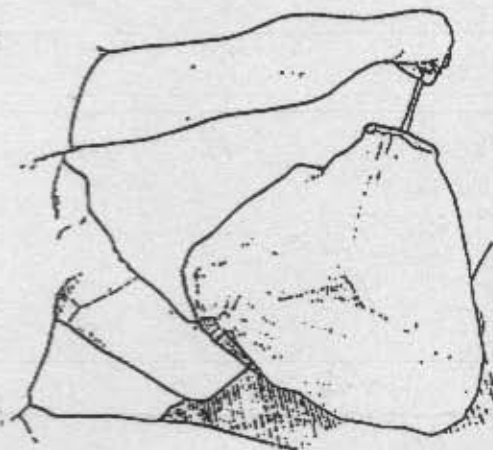


FIGURE #5



STEP 5.

Thread the pull up cord through the bottom of the pilot chute and out the top. Centre the base of the pilot chute over the two flaps. [Fig 4]

STEP 6.

Make sure the base of the pilot chute is centred over the loop, then collapse the pilot chute and lock it with a temporary pin [Fig 5]

CLOSING THE RESERVE CONTAINER.

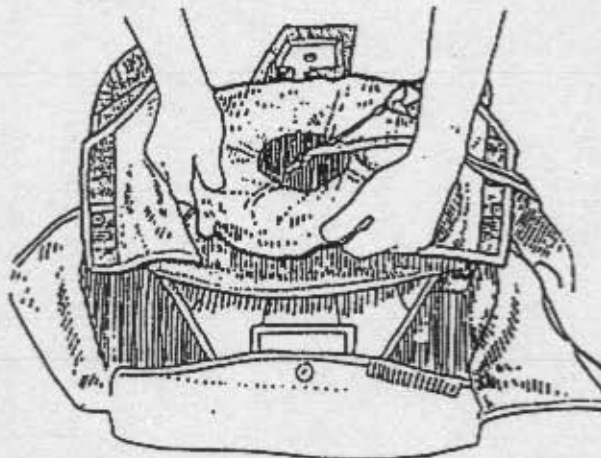


T.S.E. PAGE 22

STEP 7.

Pull all the canopy fabric out from between the spring. Folding the fabric - rather than stuffing it between the coils - reduces the bulk of the packed container. After pulling the fabric from between the spring, check to be sure the pilot chute base is centred under the crown. Now fully compress the spring to see how much loop can be pulled through the top of the pilot chute. If you can pull more than 1/2 to 3/4 of an inch through, the loop is too long. Now would be the best time to open the container and shorten the loop.

FIGURE #6



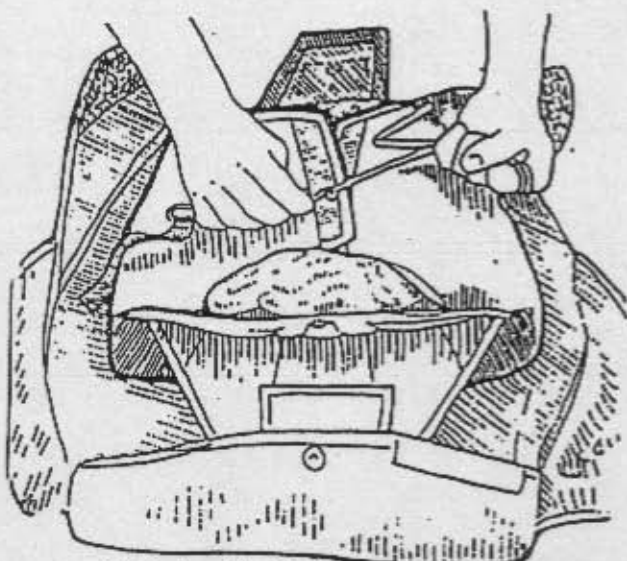
STEP 8.

Lay the fabric flat all around the pilot chute and fold it under in wide folds to the centre. Fold the top and bottom first, then the sides. Keep the fabric folds of the pilot chute out from under the open flaps. See fig #6.

STEP 9.

Thread the pull up cord through the side flaps (Flap #3 and #4) and close and secure with a temporary pin. Make sure that the folds in the pilot chute stay flat and neat. See fig #7.

FIGURE #7



CLOSING THE RESERVE CONTAINER.



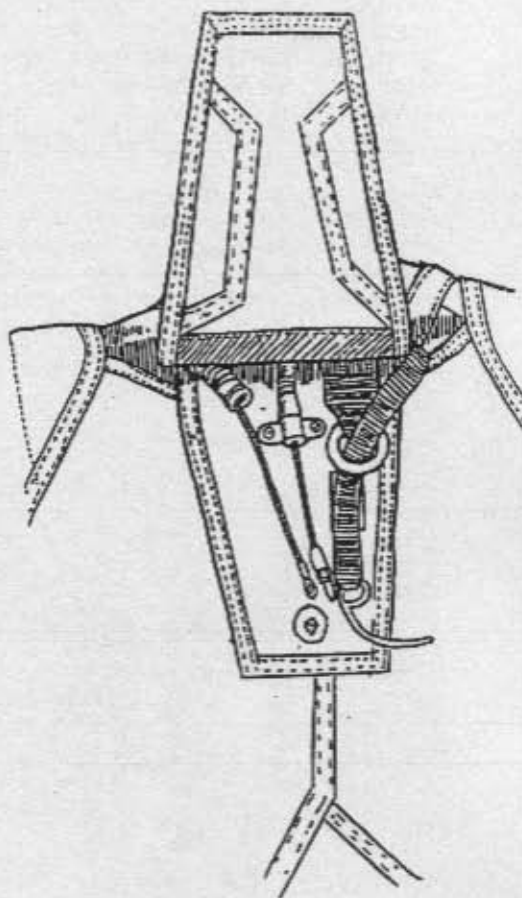
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STEP 10.

Thread the pull up cord through the outside top (flap #5) and insert the temporary pin.

STEP 11.

Thread the pull up cord through the outside bottom flap (flap #6) and insert a temporary pin. If the force necessary to close the last two flaps seems excessive this will cause a hard pull. Lengthen the closer loop. A maximum pull force of 25lbs or less is required on the ripcord pin.

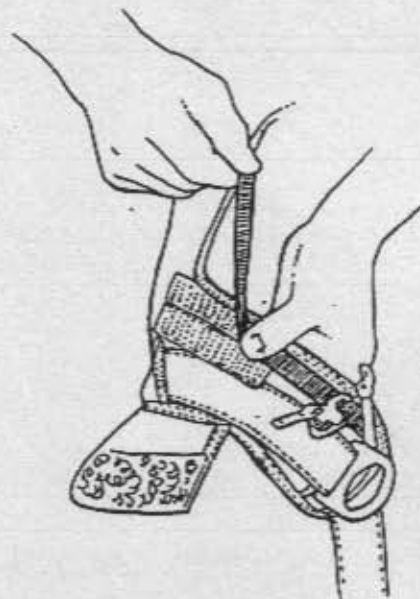


STEP 12.

Install the reserve landyard (static line):

A. Inspect the reserve landyard for damage, and replace if necessary. Check that the snap shackle is operating smoothly and the spring will retain the locking pin. Be sure the velcro is clean and sufficiently tacky to retain the reserve landyard. The pin should be curved from the eye to halfway down its length. The rest of the pin should be straight.

B. Route the reserve landyard along its velcro path from the right hand riser. Mate the patch of velcro pile to the patch of hook velcro on the reserve top flap.

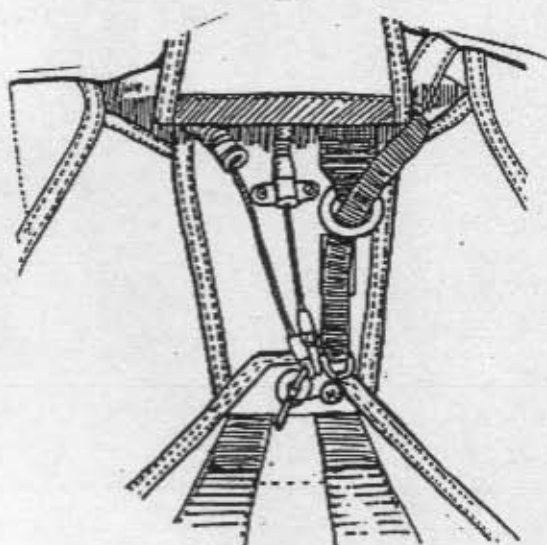
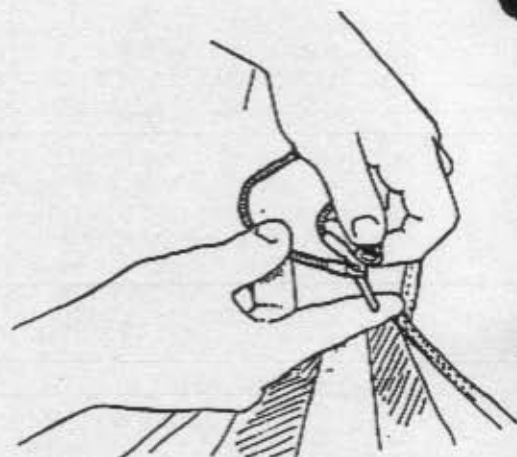


CLOSING THE RESERVE CONTAINER.

T.S.E. PAGE 24

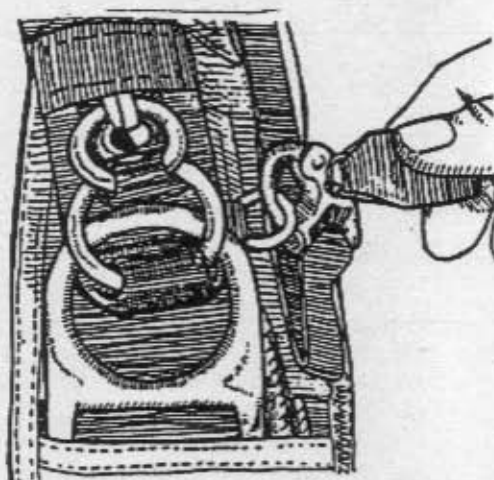
W.C. Thread the curved landyard pin through the eyelet on the terminal end of the AAD cable. Note the angle of the hole in the terminal end; it must correspond to the angle of the inserted pin.

D. After threading the reserve ripcord through the housing, insert the landyard pin through the loop at the end of the reserve ripcord cable. If the holes are aligned properly, the cables should run straight from the reserve pin to their housings.



E. Replace the temporary pin with the reserve pin. Insert the ripcord handle into its pouch on the main lift wed.

F. Attach the main parachute risers to the harness.



G. Hook up the reserve landyard shackle to the ring on the right-hand riser and mate the landyard velcro to that on the comfort pad.

STEP 15.

Place the rig on a clean surface with the backpad facing up and walk on it with your feet this will help to expell air from the container and make it flatter.

STEP 16.

Dress the container, seal, sign and log the reserve.

STEP 17.

Count your tools.

PACKING INSTRUCTIONS FOR ROUND RESERVES



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Because of the wide variety of round reserve canopies on the market this manual does not contain instructions on inspecting, assembling and folding the reserve parachute canopy. The rigger must refer to packing instructions provided by the canopy manufacturer for this information.

TOOLS REQUIRED

- 1 Temporary packing pin.
- 1 Pull up cord (48" of 550 cord sheathing).
- 1 Packing paddle.

The reserve flaps are numbered 1 through 6 for reference. Close them in that sequence.

It's a good idea to read all of these instructions before starting to pack the reserve.

STEP 1

Attach the canopy to the risers with the steering modifications and/or data panel facing to the wearers rear. If using L-bar links, make sure thier screws are thoroughly tightened. If using rapid links, tighten them snug, plus a quarter turn.

STEP 2

Follow the canopy manufacturers instructions to set up the steering system.

STEP 3

attach the Zerox reserve pilot chute to the apex of the canopy using the bridle line provided. The smaller loop of the bridle line wraps around the apex lines and the large attaches to the pilot chute see figure 1. Do not substitute other bridle lines ! because the lenght of this bridle line is important for a fast deployment. Do not substitute another pilot chute for the Zerox pilot chute

STEP 4

Inspect the entire reserve system carefully, beginning with the pilot chute and ending with the harness.

STEP 5

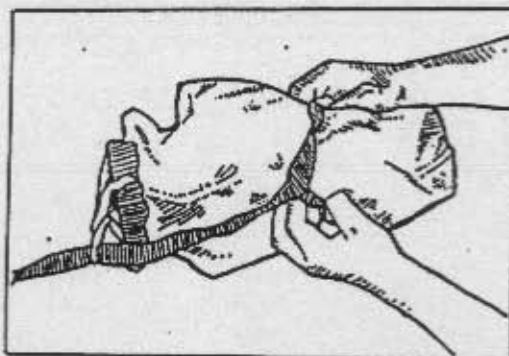
Flake the reserve canopy according to the manufacturers instructions.

STEP 6

If your reserve canopy does not have a diaper or other deployment device, fold the skirt up parallel to the radial seams, then long fold the canopy into fifths.

STEP 7

If your canopy is equipped with a diaper or similar device, close it according to the manufacturers instructions



PACKING INSTRUCTIONS FOR ROUND RESERVES



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STEP 8

Placing the canopy in the pack tray follow the next set of instructions and look at the figures provided.

NOTE

A different packing procedure is used if the Zerox is equipped with an FXC 12000 AAD follow the instructions under B.

B. With FXC 12000 AAD

Place the reserve risers into the reserve container with the links lying between the line stow loops and grommet stiffener plate. Fan the riser ends out rather than stacking them on top of each other. Stow the lines vertically on the opposite side of the FXC power unit, starting from the outside working towards the middle of the container. NOTE: If the canopy has a diaper with the lines stowed on it (a full-stowage diaper) then stow the lines on the diaper instead of stowing them in the pack tray. Then lay the diaper and lines on the opposite side of the container from the power unit.

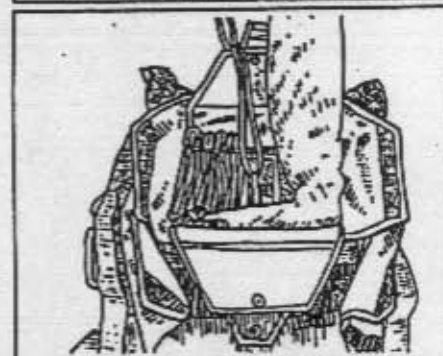
STEP 9

Check the length of the reserve closing loop the length from the stiffener plate to the end of loop should measure approximately 2 to 2 1/4 inches for small canopies like the pioneer K-XX and the National Phantom 22 canopies. For other canopies, the loop will have to be lengthened accordingly.

Two factors determine the correct loop length. First it should not take an excessive amount of effort to close the last flap #6. And when the container is closed, you should not be able to compress the pack more than 1/4" inch when you push down on the top of the pilot chute. If excessive play in the spring has developed after the reserve has been packed for a while open the container and shorten the loop.

STEP 10

Insert the pull up cord through the reserve locking loop.



PACKING INSTRUCTIONS FOR ROUND RESERVES



T.S.E. PAGE 27

STEP 11

Fold the canopy into the container

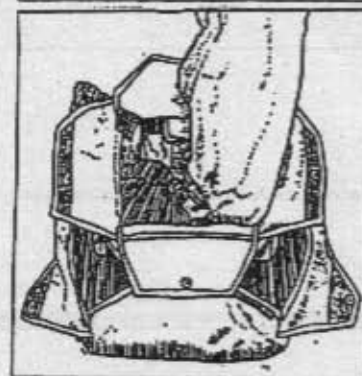
A. The First Fold. For a canopy without a diaper, place the canopy skirt into the bottom left hand corner of the container and lay the first fold of the canopy from left to right across the bottom of the container.

For a canopy with a two bight diaper (such as those built by Strong's Ent and Pioneer) place the diaper enclosed skirt in the bottom left hand side of the container with the line stows facing towards the top (wearers head end) of the container. Lay the first fold of the canopy from left to right across the bottom of the container.

For a canopy with a full diaper on which the lines stow vertically (such as Strong Ent Iopo lite), lay the diaper enclosed skirt in the bottom left hand corner of the container against the dividing wall between the reserve and the main container. The stows should face up (towards the wearers head). Lay the first fold of the canopy from left to right across the bottom of the container. For a canopy with a piglet style (full) diaper with the lines stowed horizontally fold the diaper enclosed skirt lengthwise for about 1/3 of the length, and place it in the bottom left hand corner of the container against the wall that divides the reserve and main container. Lay the first fold of the canopy from left to right across the bottom of the container.

B. The remaining folds for a canopy with no diaper or a two bight diaper. The canopy can now be S folded into the container. Make the folds slightly wider than the container. This will help fill out the sides better. For a canopy with a full diaper such as the preserve 4 and the Phantom's even out the bulk by making one or two short folds into the container corner opposite from the skirt. The subsequent fold can then be made across the entire width of the container, on top of the diaper to give the container its proper thickness. Then S fold the rest of the canopy towards the top of the container, making each fold slightly wider than the pack tray. With small canopies such as the Phantom 22 and the Pioneer K-XX the best appearance results from having no more than two folds above the loop. With larger canopies it may be necessary to fold extra canopy above the loop, as well as to lengthen the loop. Make the folds above the closing loop slightly wider than the container to fill the space under the side flaps.

CLOSING THE RESERVE CONTAINER See pages 20-24 .



INSTALLING THE FXC 12000 AAD.



T.S.E. PAGE 2

STEP 1.

Installation of the FXC Model 12000 on the Student Zerox requires a small hole terminal fitting on the activation cable and longer screws. This fitting is available from FXC or Thomas Sports Equipment.

STEP 2.

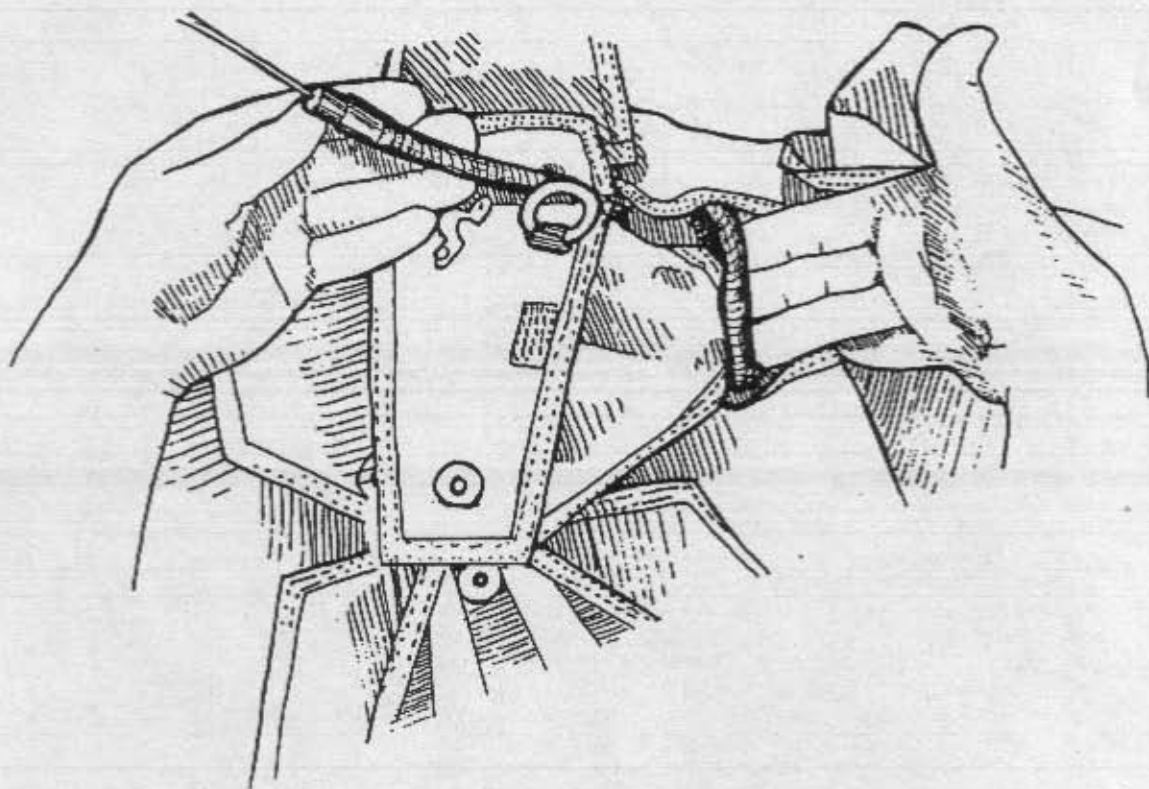
Inspect entire AAD assembly. Cock and arm the unit.

STEP 3.

Insert activation unit into pouch on the wearers right hand side of the reserve container. The activation cable should extend towards the right and the sensor cable to the left.

STEP 5.

Route the activation cable along the right hand side of the pack tray. The cable end is threaded from left to right through a small slot in the container yoke near the upper corner of the reserve pin protected flap.



INSTALLING THE FXC 12000 AAD.



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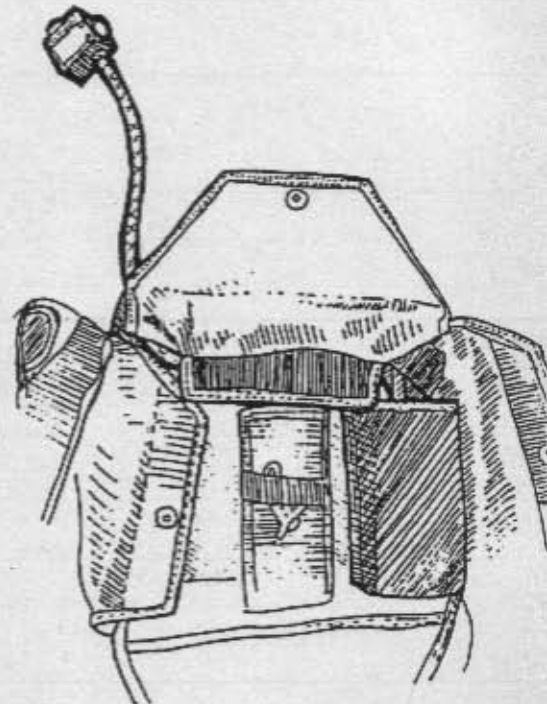
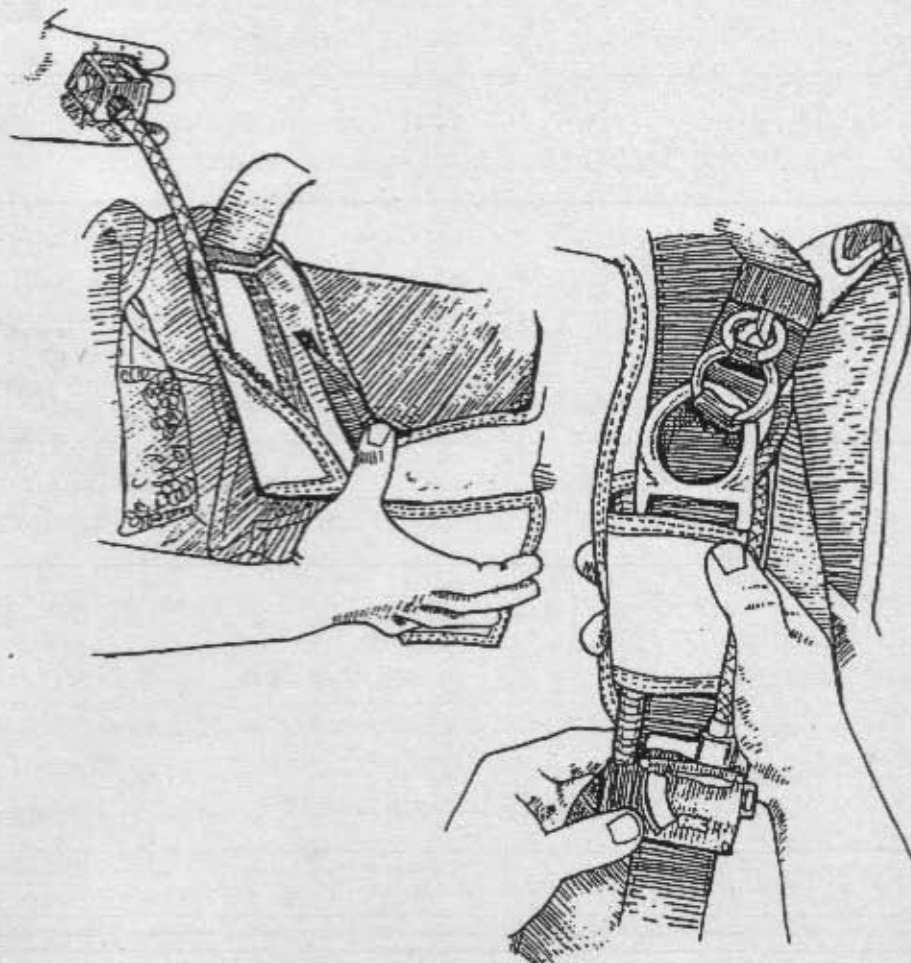
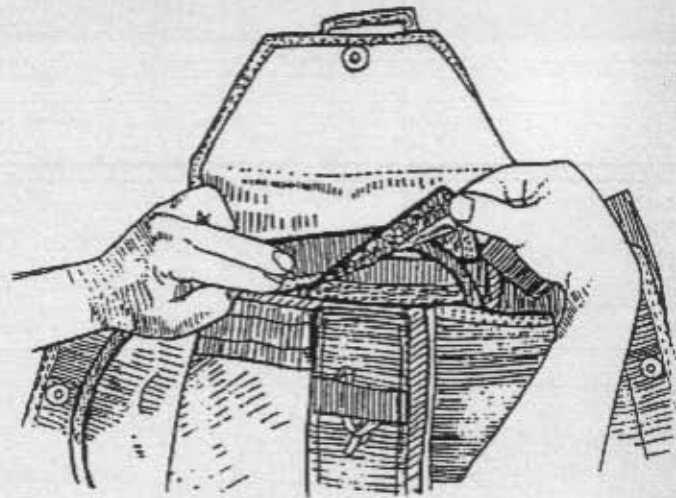
STEP 6.
Attach the AAD pin puller to the bracket connected to the pin protector flap.

STEP 7.
Route the censor unit cable under the velcro flap across the top of the reserve container and under the velcro flap on the left side where the reserve risers will be placed.

STEP 8.
Route the censor unit cable under the velcro flap on the left hand shoulder yoke.

STEP 9.
Attach the censor unit to the type 17 loop provided on the fabric panel below the large harness ring.

STEP 10.
Inspect the entire assembly. Log the installation on the packing data card and in your log book.



THE 3-RING RELEASE SYSTEM



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INTRODUCTION

The 3 Ring release system was invented by the Relative Workshop in 1976. It was the first practical release that allowed parachutists to jettison their main canopies in one motion by simply pulling a single handle. Not only is the 3 Ring easier to operate than previous canopy release systems, it is also more reliable. Failures of a properly built and assembled 3 Ring system are virtually unknown.

Once the main is jettisoned, the only things left on the harness are two smooth rings that cannot snag a deploying reserve. Some other popular release systems can and have interfered with the deploying reserve.

Modifying the 3 Ring Release

The great reliability of the 3 Ring system results from the proper functioning of every one of its individual components. Therefore, the owner should not modify the system in any way.

These modifications (among others) will cause the system not to work properly:

- Substituting risers that don't have type 2 sheathing for the locking loop. Don't use risers that have loops made of kevlar or solid cord.

- Not using a breakaway handle with cable with the special yellow coating. This Teflon impregnated coating is important; other plastic coatings may cause the cable to bind in the housings or loops, making it difficult or impossible to jettison the risers.* Using a breakaway handle with cables of the wrong length. The length of the cables is critical to ensure each riser releases in the proper sequence. Replacement handles are available from Thomas Sports Equipment.

GETTING TO KNOW THE 3 RING

Knowing how the 3 Ring release works will help you assemble and inspect it properly. Begin by peeling the release handle from the velcro on the harness. Peeling, rather than pulling, makes it easier to separate the handle from the webbing. Look behind the risers near the harness and observe the movement of the yellow cable as you pull the handle. When the cable clears the white loop, the release is disengaged. Now slowly pull one of the risers off the harness. As you pull, you'll notice that the white loop gets pulled through the grommet by the action of the smallest ring. Each ring forms a lever with a ten to one mechanical advantage as it passes through the other. A force of 1,000 lb on the large harness ring exerts a force of only ten pounds on the white loop (opening shock usually totals about 1,000lb. or 500 lb on each riser.) Because of the mechanical advantage provided by the 3 ring design, only a force of approximately a pound on the top ring keeps the release together. That's why it's important to keep foreign matter like bits of grass and sticks out of the 3 ring assembly. When nylon stays in the same position for a long time, it begins to conform to that position or take a "set". If the 3 ring release system stays assembled for too long, the nylon can become so stiff that the low drag from a malfunction (such as a streamer) won't pull the riser off the ring. The 3 ring release system must be disassembled, flexed and inspected every month.



ASSEMBLY

Before assembling the 3 ring release, make sure the risers aren't twisted or reversed. Lay the Tear Drop face down, as you would to pack it.

1 Thread each cable into its housing and stick the handle to the harness. The handle should be positioned as close to the ends of the housings as possible so that no cable is exposed.

2 With the rings of the riser facing towards the floor, pass the ring on the end of the riser through the large harness ring from above. Fold it back toward the canopy and risers.

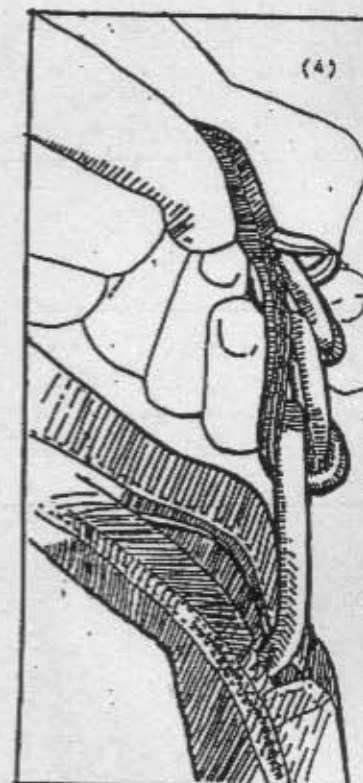
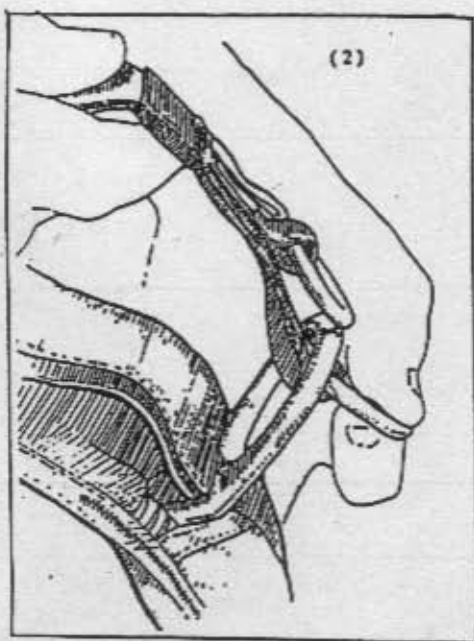
3 Thread the smallest ring through the middle ring in the same way, but make sure it doesn't pass through the large ring.

4 Bring the white loop over the small ring only and then through the riser grommet so it pokes out the back of the riser.

STEP #2

STEP #3

STEP #4

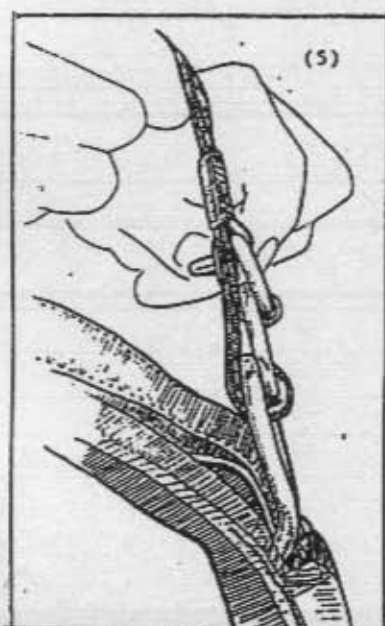




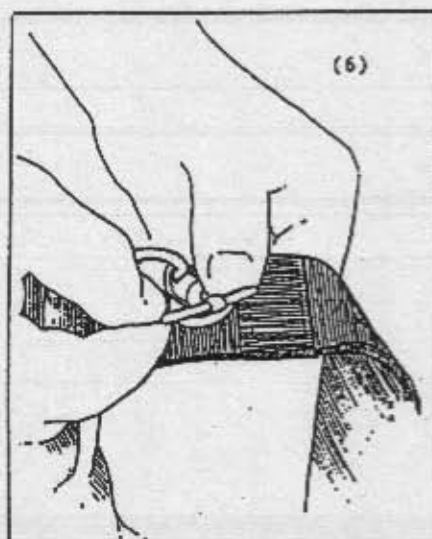
ASSEMBLY

- 5 Continue threading the white loop through the grommet on the end of the cable housing. The flat side of the cable housing grommet should be against the riser.
- 6 Thread the yellow cable through the white loop making sure the loop isn't twisted. Be careful with the cable so you don't bend it too sharply or kink it. Insert the free end in the channel on the back of the riser.
- 7 Repeat the above steps with the other riser.

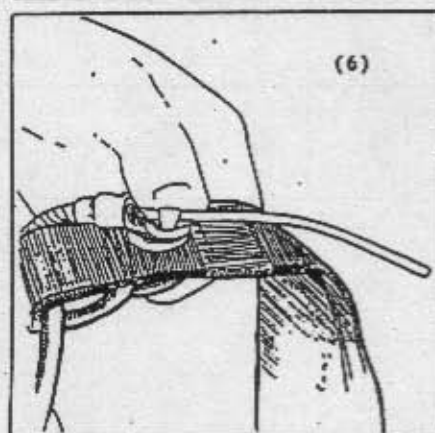
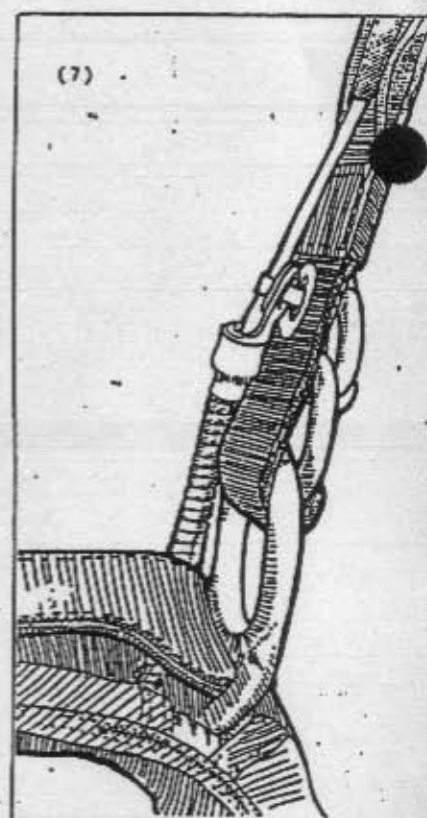
STEP #5



STEP #6



STEP #7

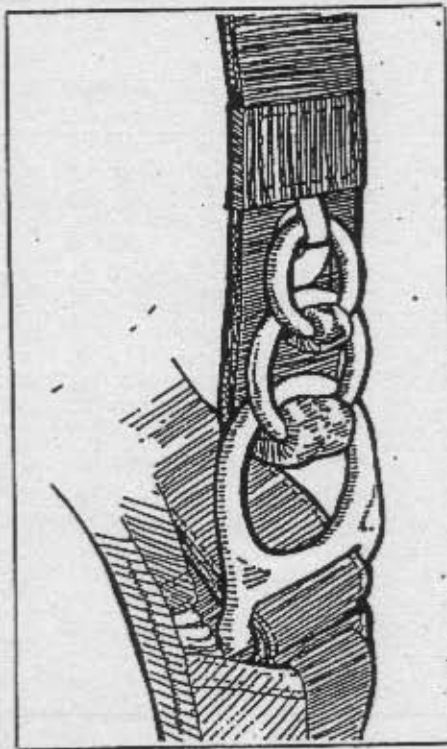




PRE-JUMP INSPECTION

Before jumping the Tear Drop check the 3 ring release system for the following:

1. Each ring passes through only one other ring.
2. The white loop passes through only the small ring.
3. The white loop passes through the grommet on the end of the cable housing without twisting.
4. Nothing passes through the white loop except the yellow cable.
5. The 3 ring release handle is securely stuck to the harness, and no cable is visible between the handle and the cable housings.





MAINTENANCE & CARE OF STUDENT ZEROX

INTRODUCTION

Your Student Zerox will last longer, look better and function correctly if it is maintained. A Student Zerox actually requires very little maintenance unless it is subjected to unusual conditions such as a jump into salt water or a muddy landing.

INSPECTION

The best approach in maintaining your rig is to periodically spend a few minutes examining every detail on it. This inspection should be done at least once a month. If any wear or damage is found, it should be rectified immediately. Putting off repairs may result in a malfunction.

In addition to inspecting the rig yourself, ask your rigger to inspect the entire assembly when the reserve is repacked.

Particular attention should be given to these areas:

1. Breakaway System. Refer to the 3-ring section in this chapter for detailed information on inspecting the canopy releases.

2. Reserve System. This includes the reserve ripcord, Locking loop, pins, handle, housing, container and associated sewing. You should not attempt any repairs or modifications to any of these items unless you are an appropriately rated rigger. You can, however, spot little problems before they become major.

3. Harness. The harness should be inspected periodically for broken stitching or frayed webbing.

4. Main Container. Inspect the plastic stiffeners in the container flaps and replace any that are broken. Replace any grommets that are badly deformed or pulling out of their setting. A rigger must replace grommets or plastic stiffener.

5. Main pilot chute. Check the centerline (a length of nylon tape inside the pilot chute that extends from the handle to the base) of the main pilot. It must be firmly sewn at each end; there must be no broken stitches or torn fabric.

Inspect the seam that joins the pilot chute mesh to the pilot chute fabric. If the mesh is torn or badly frayed, replace the pilot chute.

6. Locking Loop. The main container is held shut with a locking loop made of nylon suspension line sheathing. This loop is subject to wear. If it wears out and brakes the main canopy may release prematurely and a malfunction may occur. Replace the loop with a duplicate if wear is noticed.

CAUTION

Never jump a Student Zerox with a worn locking loop.

7. Velcro. Velcro tape has many applications in parachuting. However, it wears out and loses its adhesive ability after a while. It also gets "clogged" with dirt and bits of grass and should be cleaned occasionally. Velcro on the main pilot chute bridle should be replaced after several hundred jumps.

MAINTENANCE & CARE OF STUDENT ZEROX

CARE



Your Student Zerox is manufactured mostly from nylon. Nylon is very durable, but is susceptible to damage from several sources:

1. **Sunlight.** The ultraviolet rays in the sunlight quickly and permanently weaken nylon. Keep your Student Zerox out of direct sunlight as much as possible.
2. **Acid.** Nylon is also damaged by acids. Keep your Student Zerox away from hanger floors, dirty car trunks and similar areas where acids may be found. If such contamination does occur, immediately and thoroughly wash the rig with plenty of warm soapy water. Until a rig can be washed, baking soda will neutralize most acids. If acid damage occurs or is suspected, a rigger should thoroughly inspect your Student Zerox.
3. **Oils and Grease.** Most petroleum compounds do not weaken nylon; they simply stain it. Such stains should be promptly removed by a rigger using the proper petroleum solvent.
4. **Water.** Water will not damage your Student Zerox, but may cause some fabric colours to run. Salt water will rust the hardware if not promptly and thoroughly washed off with plenty of fresh water. Your rig will maintain its new appearance longer if it is kept dry.
5. **Soil.** Soil will not damage your Student Zerox. Brush off the soil after it has dried and gently wash with warm soapy water. Be sure that the soil is not in the housings, snaps, 3-ring release, reserve ripcord pins or loops. Consult a rigger if your rig is heavily soiled or extremely dirty.
6. **Abrasion.** Nylon quickly frays if dragged over concrete or other rough surfaces. Do not drag your rig on the concrete while packing.

REQUIRED PERIODIC MAINTENANCE FOR THE 3-RING

The Booth 3-Ring Release System has been in for many years with excellent results. Although the system is as durable as the rest of the harness and container assembly, it requires periodic maintenance and inspection to ensure proper operation.

Generally, it is NOT recommended that the risers be attached to the harness when new and "forgotten". Like all skydiving gear, the 3-Ring Release should be carefully inspected and operated on a regular basis.

The procedures below should be done at least every month. This is especially important if the rig has not been used for a month or more, such as during the winter. Immediate inspection is required if it has been subjected to some abuse such as a drag across the runway, a water landing or exposure to a lot of dust or sand.

1. Every month operate the 3-Ring Release system on the ground. Extract the cable completely from the housings and disconnect the risers.

MAINTENANCE & CARE OF STUDENT ZEROX



REQUIRED PERIODIC MAINTENANCE FOR THE 3-RING

2. While the system is disassembled, closely inspect it for wear. Check the white locking loops (the ones that pass over the smallest ring and through the grommet) to be sure they are not frayed.

3. Check the velcro on the breakaway handle and main lift wed to be sure it is clean and adequately holds the handle.

4. Check the cable ends for a smooth finish. the ends are finished at the factory to have a smooth, tapered surface. This prevents the cable from hanging up in the loop. Check the cable ends and consult a rigger or the manufacturer if a blurr or "hook" is present.

5. Check the stitching, including that which holds the large rings to the harness and the hand tackings that prevent the housings from sliding through their keeper. (This keeper is a loop of webbing located in the chest strap a few inches above the release handle.)

6. Take each riser and vigorously twist and flex the webbing near where it passes through each ring. The idea is to remove any set or deformation in the webbing. Do the same thing to the white loop.

7. Check the housings for dents or other obstructions. Use the cable to do this.

8. Clean and lubricate the release cable with a light oil such as "3-in-1" brand. Put a few drops on a paper towel and firmly wipe the cable a few times. A thin, invisible film should remain, too much will attract grit and dirt, or the oil could become tacky in cold weather, requiring more force to extract the cable during a breakaway. You can also use a silicone spray, this makes a better job of it but is not always available.



9. Inspect the security of the fittings at the end of each housing. If one of these fittings were to come off the housing, a riser might release prematurely.

10. If any wear is found, consult the manufacturer or a rigger before using the Student Zerox.

11. Reassemble the system. Double check it. Make sure the risers aren't reversed.

Thomas Sports Equipment appreciates any comments from users that relate to the safety, operation or maintenance of the 3-ring release.

It's important to maintain the system even more frequently in humid, muddy or freezing conditions. If the Student Zerox becomes immersed in mud or muddy water, clean the 3-ring release system with a mild solution of soap and water. Any rusted components must be replaced.

REPLACEMENT PARTS.

Thomas sports Equipment supplies replacement parts for its rig at a reasonable cost. When ordering parts for your rig, include the serial number #, Type and date of manufacturer of your Student Zerox so the proper items can be quickly supplied. This information is written on the manufacturing label on the back of the left rear reserve riser.



A novice may find himself/herself under their reserve canopy if his/her automatic activation device on the Student Zerox malfunctions, or if it was improperly operated, or if he/she descends below the preset altitude at a high rate of speed.

The instructor must develop specific procedures for the equipment being used and teach them to the student. Here are general guide lines:

If the reserve canopy is completely inflated and the main container is still closed, the jumper should land under the reserve canopy as he/she was trained by the instructor.

If the reserve canopy is completely inflated and the main container is open but the main canopy is not inflated, the main canopy should be jettisoned using the brakaway handle.

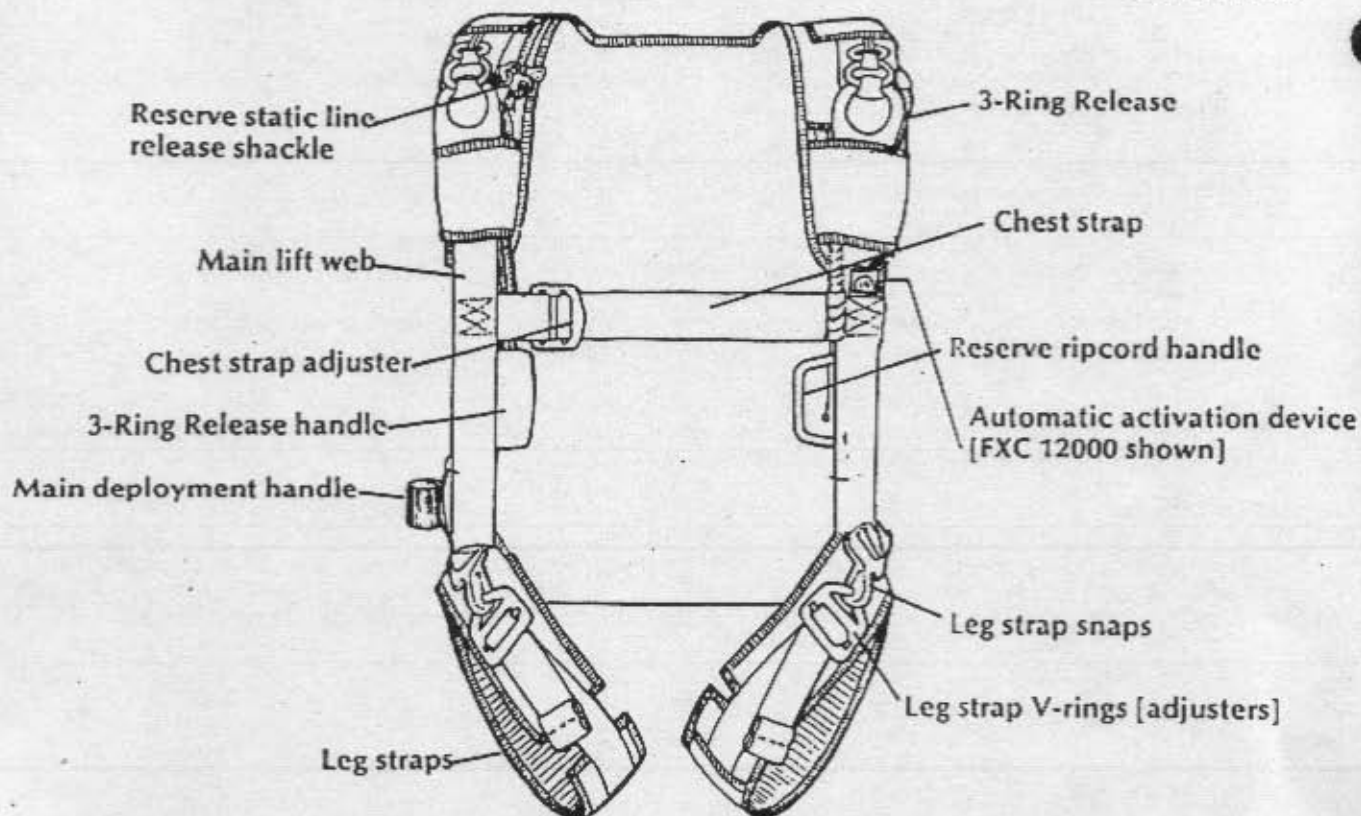
If both the reserve and main canopy are open and inflated, the jumper should respond as he/she was trained by their instructor. If the main canopy is a ram-air, many instructors teach their students to jettison it and land under the reserve.

OTHER EMERGENCYS

A skydiver may be faced with a number of emergencies not listed here, including those in the aircraft, during climb out or exit, in free fall, under canopy, during landing. As stated above, trained for any and all emergencies must be provided by the students instructor.

THE FRONT OF THE STUDENT ZEROX

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THE BACK OF THE STUDENT ZEROX

