

DOLPHIN

TM

STUDENT MODEL

PARACHUTE HARNESS/CONTAINER SYSTEM

DOLPHIN STUDENT MODEL OWNER'S MANUAL

AP 103 SEP 2007

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d//b/a

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INTRODUCTION

The DOLPHIN parachute harness/container system is manufactured by THE UNINSURED ALTITUDE CONNECTION, doing business as "ALTICO". The DOLPHIN is equipped with the well known 3-Ring release system under a licensing agreement with The Relative Workshop Incorporated, and is approved by the Federal Aviation Administration under Technical Standards Order (TSO) C23d.

The DOLPHIN features both main and reserve containers mounted on the wearer's back, and an integrated harness and backpad system that affords superior strength and comfort to the wearer. Other standard features include a choice of locations for the main pilot chute: right legpad or bottom-of-container (BOC), a CYPRES Installation Kit, a Reserve Static Line, and double layers of padding in the backpad and legpads. Simplicity of design makes the DOLPHIN easy to assemble, pack and maintain, and with normal care its rugged durability should provide many years of satisfaction.

Additional features have been designed into the DOLPHIN Student Model, including several ways to activate the main canopy: static line, throwout on right leg, throwout on bottom-of-container, and Altico's AMBIDEX which is a BOC pouch that can be opened by the jumper or by either the right or left AFF jump-master. Changing from any one configuration to any other can be accomplished quickly and easily without even lifting the bag out of the main container.

Unless otherwise specified by the customer, all DOLPHINS are equipped with the CYPRES Installation kit. For an additional charge, alternative configurations are available for other automatic activation devices

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DOLPHIN STUDENT MODEL COMPONENTS

The DOLPHIN STUDENT MODEL harness/container system is shipped from the factory with a collection of components, depending on the instruction methods used and the configurations desired by the customer.

STANDARD COMPONENTS

HARNESS/CONTAINER
MAIN RISERS WITH CONTROL TOGGLES
MAIN DEPLOYMENT BAG
MAIN THROWOUT PILOT CHUTE WITH BRIDLE
CONTAINER LOCKING LOOPS
RESERVE STATIC LINE
LOCKING LOOPS FOR BOTH CONTAINERS
RESERVE RIPCORD
RESERVE PILOT CHUTE
RESERVE FREBAG WITH BRIDLE
RESERVE BCONTROL TOGGLES
ONE EXTRA MAIN CLOSING LOOP
RUBBER BANDS FOR MAIN DEPLOYMENT BAG
RESERVE PACKING DATA CARD
TAB FOR TOP OF MAIN CANOPY

OPTIONAL COMPONENTS

AMBIDEX BOC POUCH
MAIN STATIC LINE (REQUIRES "COMBINATION" MAIN BAG)
COLLAPSIBLE MAIN THROWOUT PILOT CHUTE WITH
HACKEY HANDLE

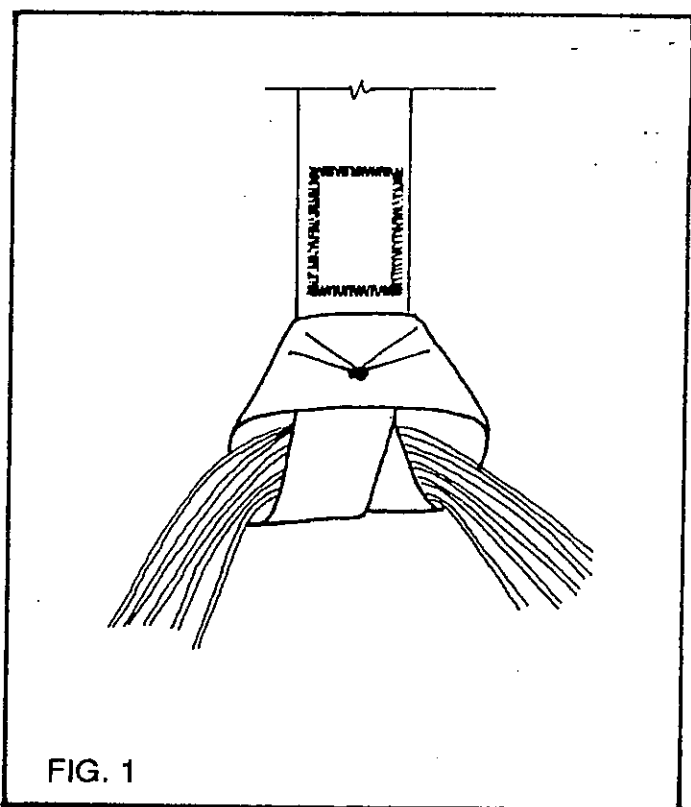
All components listed above may be ordered individually from:

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2) To assemble a round reserve canopy with the DOLPHIN STUDENT MODEL harness/container system, follow the canopy manufacturer's directions for inspection, routing and attachment of suspension lines and control lines, flaking and folding the canopy, and stowing the suspension lines on the diaper. If control toggles are called for by the canopy manufacturer, refer to pages 6 thru 8 of this manual for one method of attaching control toggles.

3) To attach the DOLPHIN reserve pilot chute to a round reserve canopy, use the bridle supplied by ALTICO. The bridle has a large loop at one end, and a smaller loop at the other end. The smaller loop should be used to attach the bridle to the canopy as shown in FIG. 1. Tack the loop securely in place, being sure that the lines at the apex of the canopy are free to move back and forth in the loop. The bridle must not be allowed to cinch down on the apex lines. Then attach the pilot chute to the other end of the bridle. (The purpose of the larger loop is to accommodate the top plate of the pilot chute.)

Only the DOLPHIN reserve pilot chute (Part No. D-71) should be used with the DOLPHIN harness/container system. Do not attempt to substitute any other reserve pilot chute unless it features a rigid top plate with a grommet installed in the middle, and uses the same type of spring as the military MA-1 pilot chute.

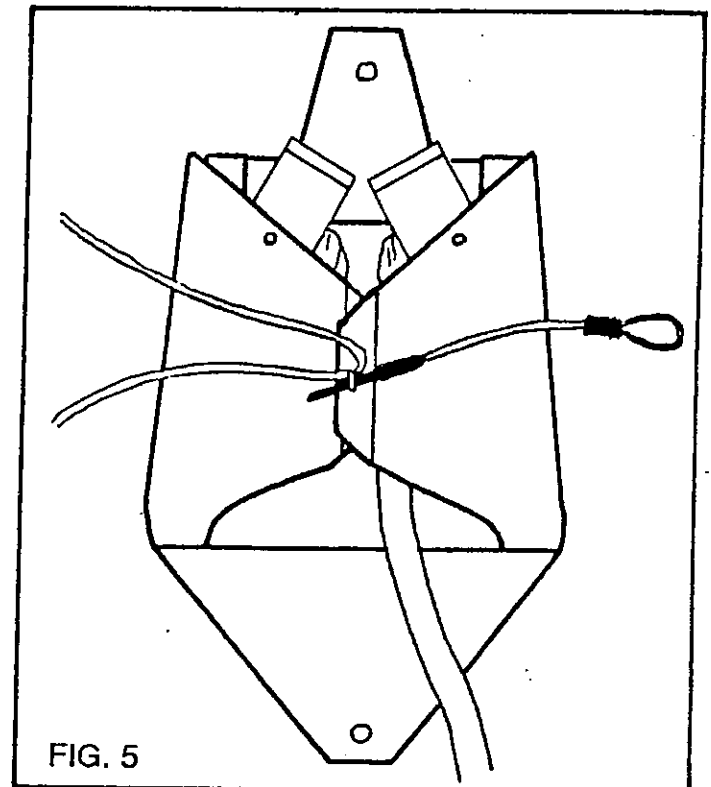
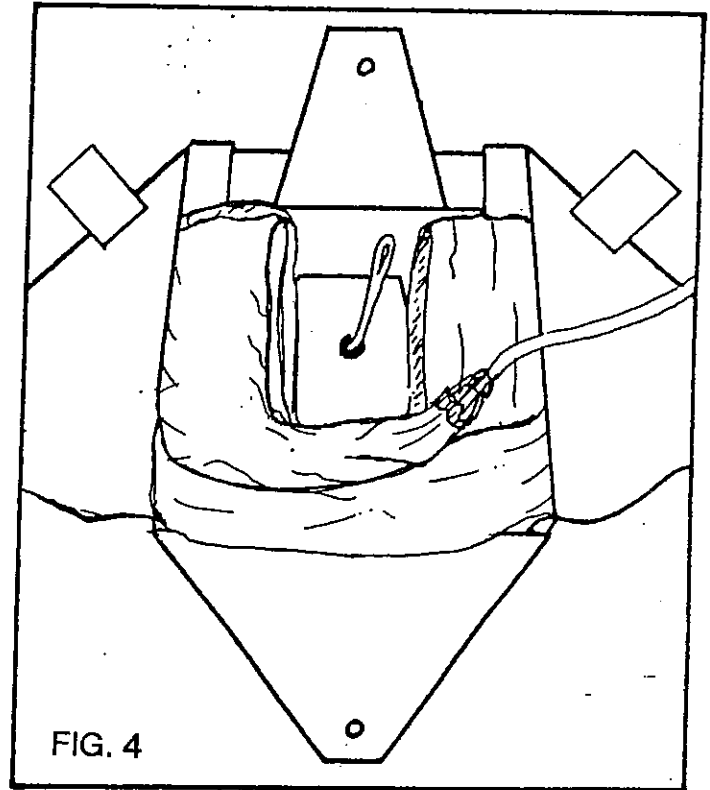


6) Make two folds up and down the left side of the container and then back across the bottom again as shown in FIG. 4. The rigger may vary the number of folds on each side and the number of passes across the bottom in order to evenly distribute the bulk. The object is to make a "U" shaped pack as symmetrical as possible, with both bottom corners of the container well filled.

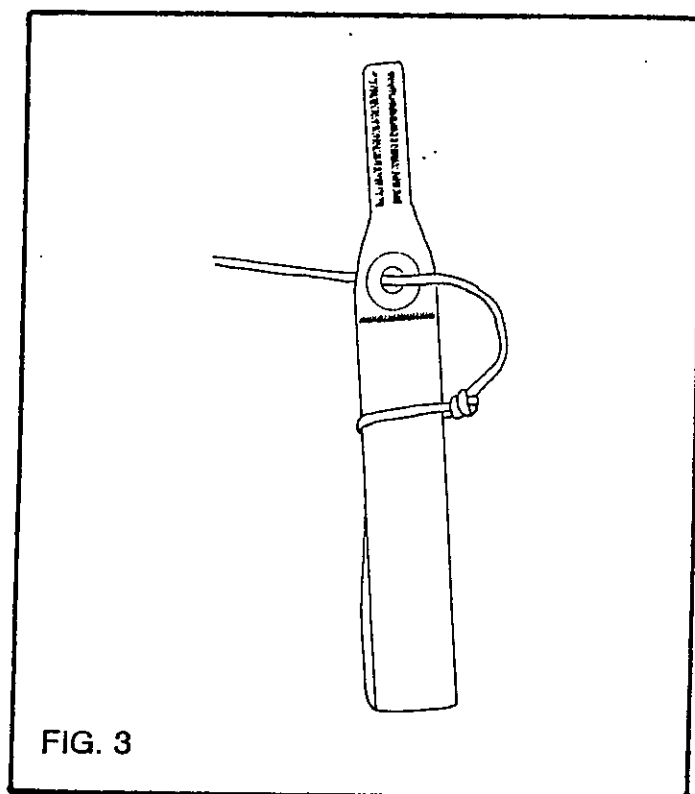
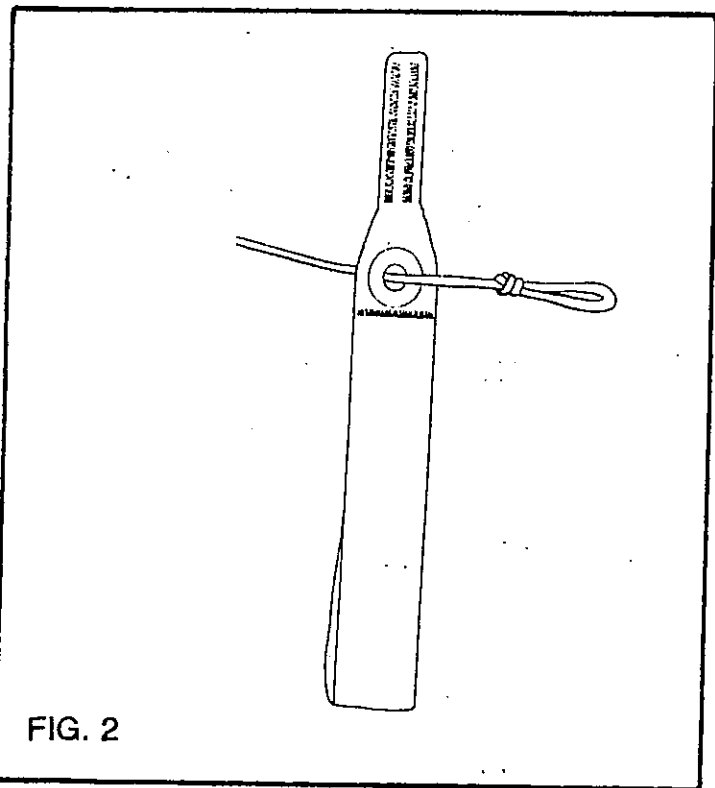
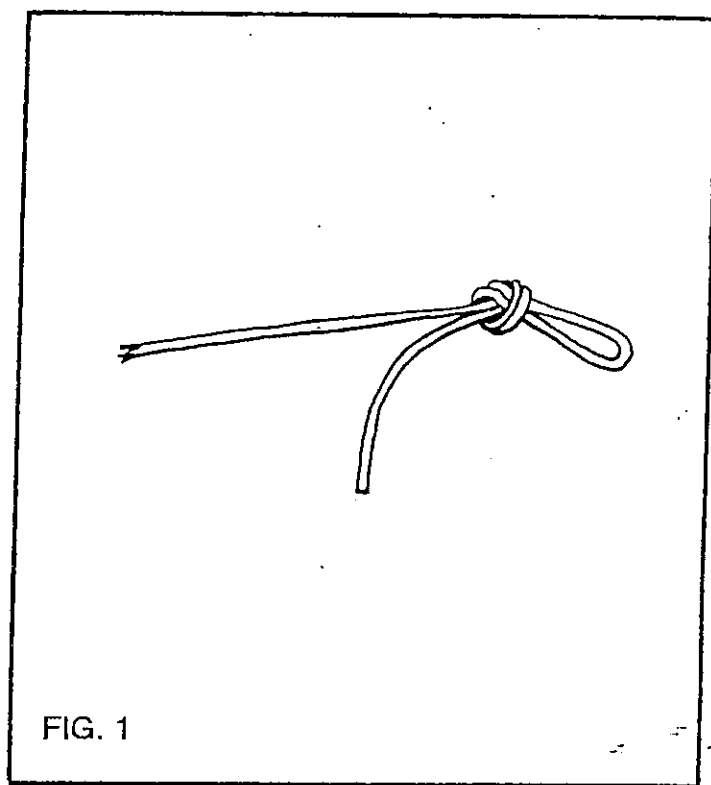
7) Wherever the apex of the reserve canopy ends up, it *must not be packed into either of the bottom corners !!* The bottom corners are formed in a somewhat "pocketed" shape, and may tend to grip the apex of the canopy, which could retard deployment of the reserve.

8) Route the bridle out the bottom of the container and close the side flaps, either side first, securing with a temporary pin (see FIG. 5). Leave the tuck flaps out until all but the top flap have been closed. They will be used then to help "dress" the container.

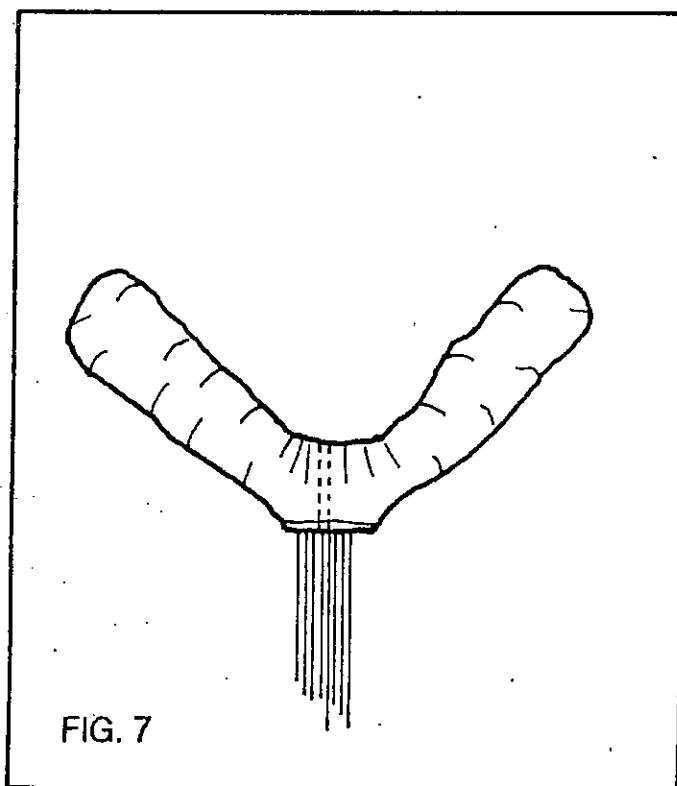
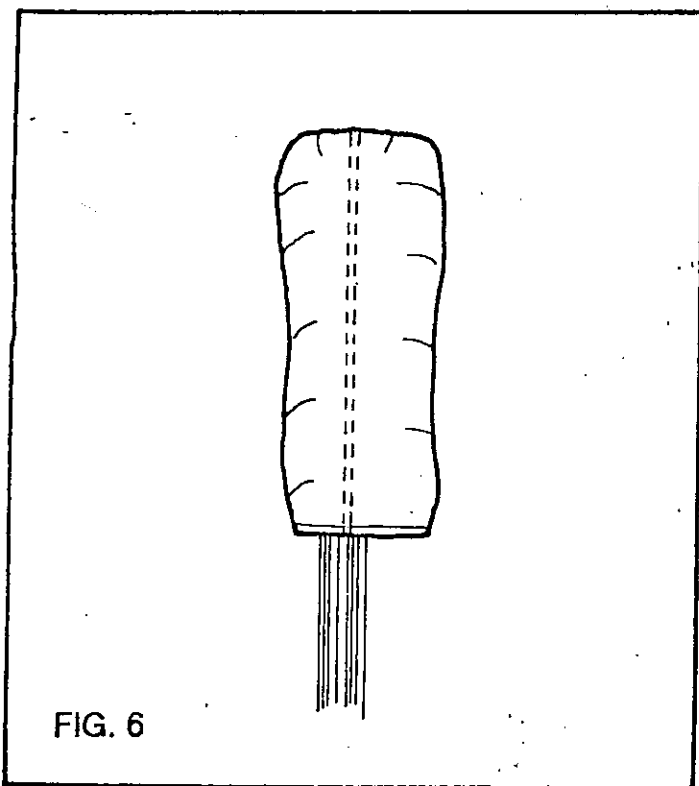
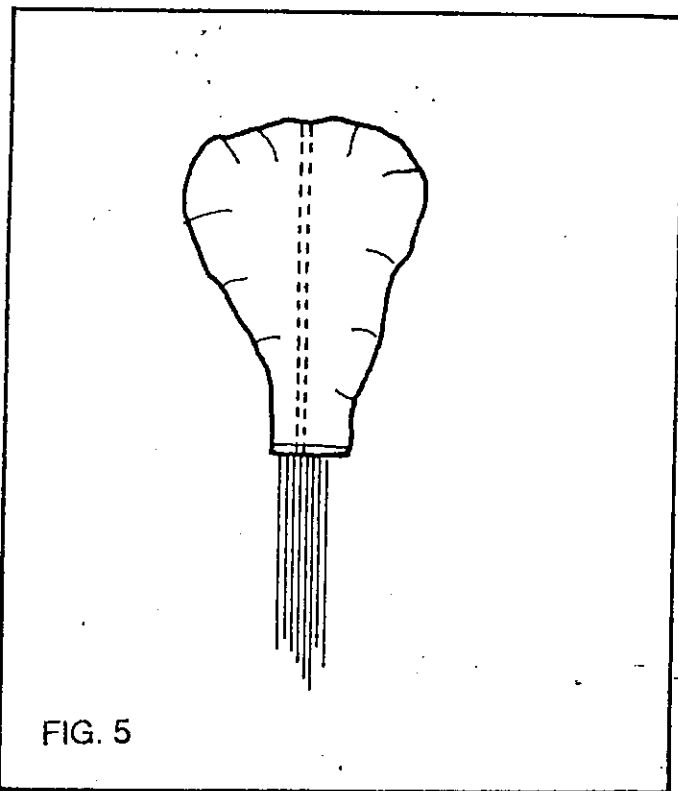
The remainder of the reserve packing method for the DOLPHIN is exactly the same regardless of the type of canopy. Refer now to FIG. 11 of the Ram Air Reserve Packing Instructions, and continue with Step 7.



Double the control line back on itself below this mark and tie an overhand knot as shown in FIG. 1. The loop should be approximately 1" long, and the mark should be on the canopy side of the knot when it is tightened. Cut the remainder of the control line to a length of approximately 8" (with scissors, *not* a hot knife), and fingertrap the end into the control line. Do not sew the fingertrapped part. Now pass the knotted end of the control line thru the grommet in the toggle as shown in FIG. 2, and then put the lower end of the toggle thru the loop as shown in FIG. 3. Tighten the loop on the toggle as close to the grommet as possible. (The control line should exit the grommet on the velcro side.)



3) ALTICO recommends the "Pro-Pack" method of packing the reserve canopy, however, some manufacturers may still recommend the older "conventional" folding method. If the manufacturer of the ram air reserve canopy recommends the Pro-Pack, the canopy will look like FIG. 5 after it has been flaked. The conventional method will look more like FIG. 6. For either method, follow the manufacturer's instructions to this point, and then spread the canopy to either side of the center cell. Now compress and roll the center cell downward until it resembles the "V" shape shown in FIG. 7.



6) Lay the reserve risers into the reserve container so that they lie flat with no twists. The connector links should now be in the bottom corners of the container. Thread the pullup cord thru the reserve closing loop and then pass both ends up through the grommet in the free bag. Lay the bag into the reserve container so that the line stow pouch is on the underside, and the locking stows are toward the lower end of the container. Route the bridle out the bottom of the container and close the side flaps, either side first, securing with a temporary pin (FIG. 11). Leave the tuck flaps out until all but the top flap have been closed. They will be used then to help "dress" the container.

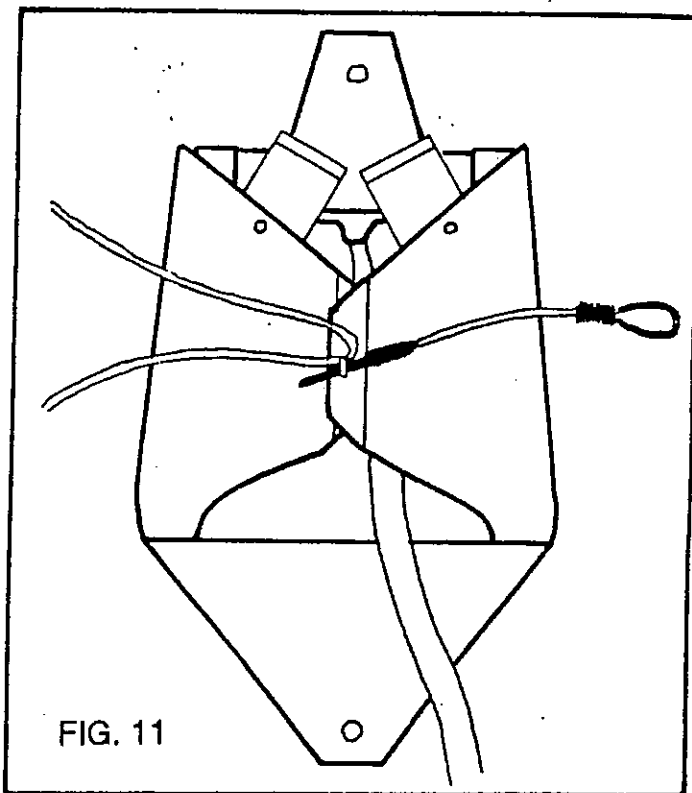


FIG. 11

7) Fold the bridle in "S" folds between the side flaps near the bottom of the reserve container as shown in FIG. 12. Make the stows as wide as possible, but not so wide that any of the bridle would be exposed when the bottom flap is closed. *Be sure that none of the bridle is tucked under either side flap!* Tucking any bridle under a side flap would tend to retard the launch of the pilot chute.

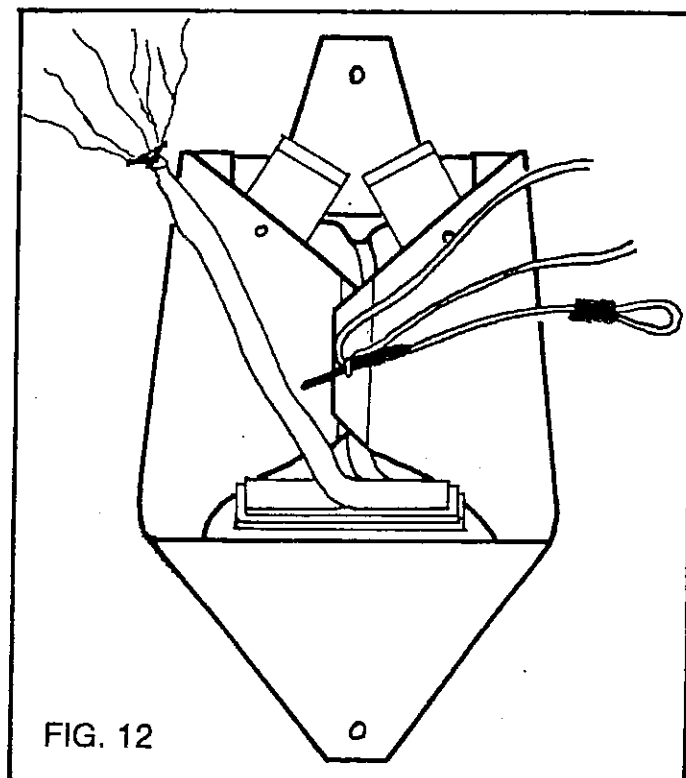
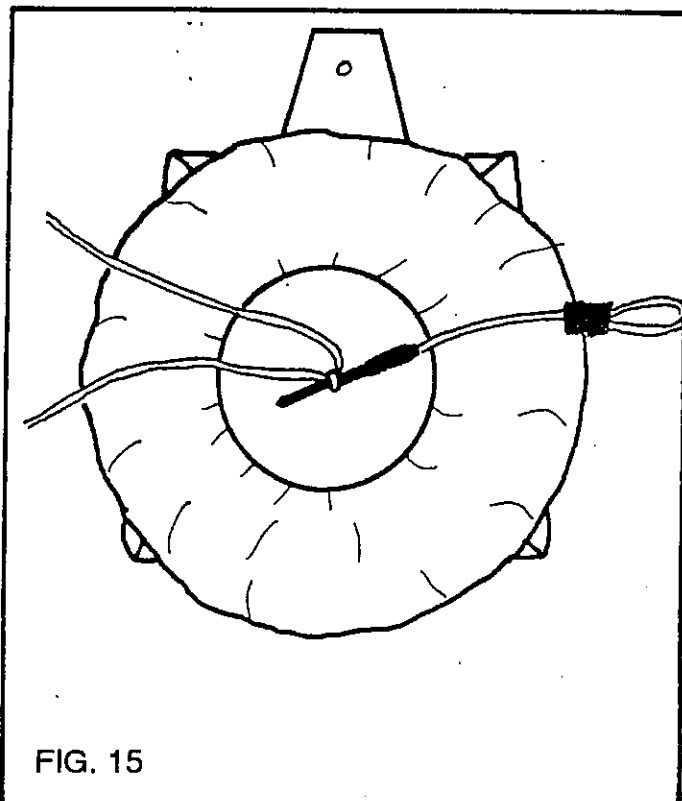
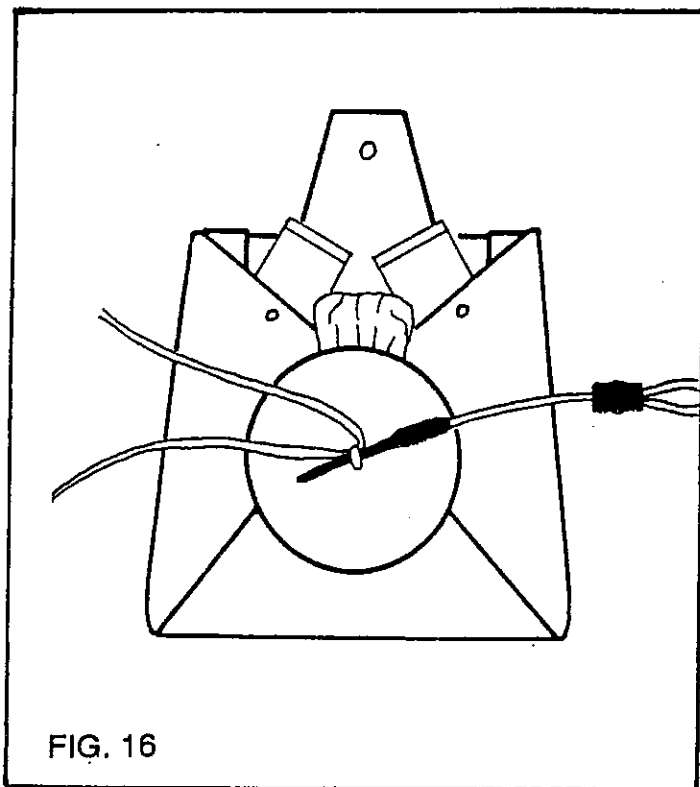


FIG. 12

10) Carefully tuck *only the mesh* of the pilot chute under the edge of the top plate as evenly as possible all around until it resembles FIG. 15. Then tuck the fabric of the pilot chute canopy under the top plate as evenly as possible, starting at the bottom and coming up around both sides.



Usually this will leave a small wad of fabric at the top as shown in FIG. 16. Tuck this under the top plate last, *being absolutely certain that none of it is tucked under either side flap!* This is very important; any fabric under the side flaps will tend to hinder the launch of the pilot chute.



11) Push the tuck flaps down over the reserve deployment bag. This will help dress the top of the container before closing the top flap. Now be sure that the reserve ripcord has been threaded thru its housing, and that the handle is in its velcro pocket inboard on the left main lift web just below the chest strap.

At this point, please read the section in this manual entitled THE RESERVE STATIC LINE (RSL). If it is decided that the RSL will be installed, continue with these instructions. If the RSL will not be installed, skip to step 12.

Immediately after exiting the end of its housing, the reserve ripcord is passed thru the small ring on the end of the Reserve Static Line (RSL), and then thru the same type of ring mounted on the reserve top flap (see FIG. 17). The velcro on the RSL should then be mated to the velcro track provided on the rear surface of one of the reserve front risers.

Early models of the DOLPHIN were equipped with RSL's mounted on the wearer's right, as shown in Figures 17 & 18. Later models have the RSL on the left, which will appear as a mirror image of Figures 17 & 18.

Route the RSL over the shoulder so that the end with the bronze snap-shackle exits from under the reserve riser just behind the main support ring of the harness (see FIG. 18). There should be about four inches of the RSL remaining so that when the main canopy is assembled with the DOLPHIN, the snap-shackle can be attached to the ring on the main riser.

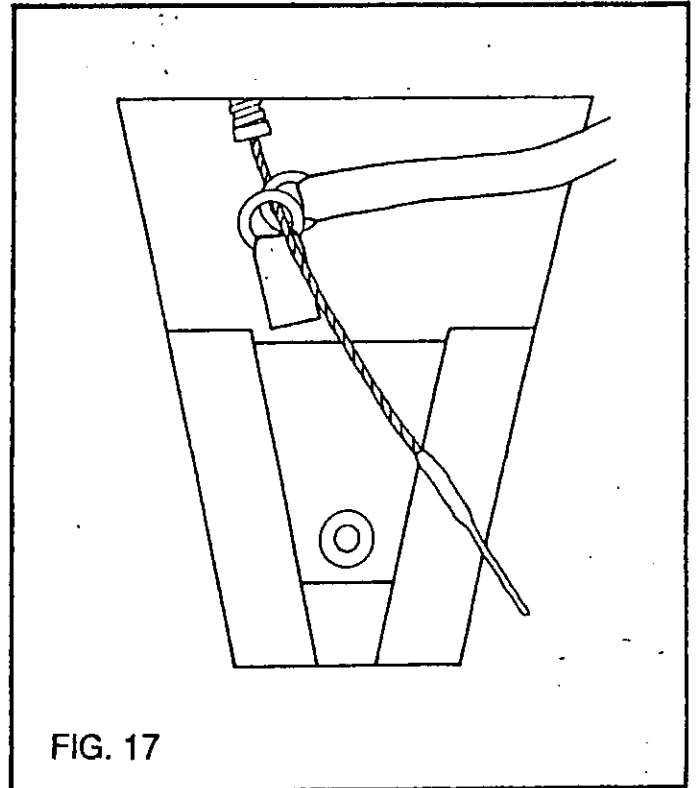


FIG. 17

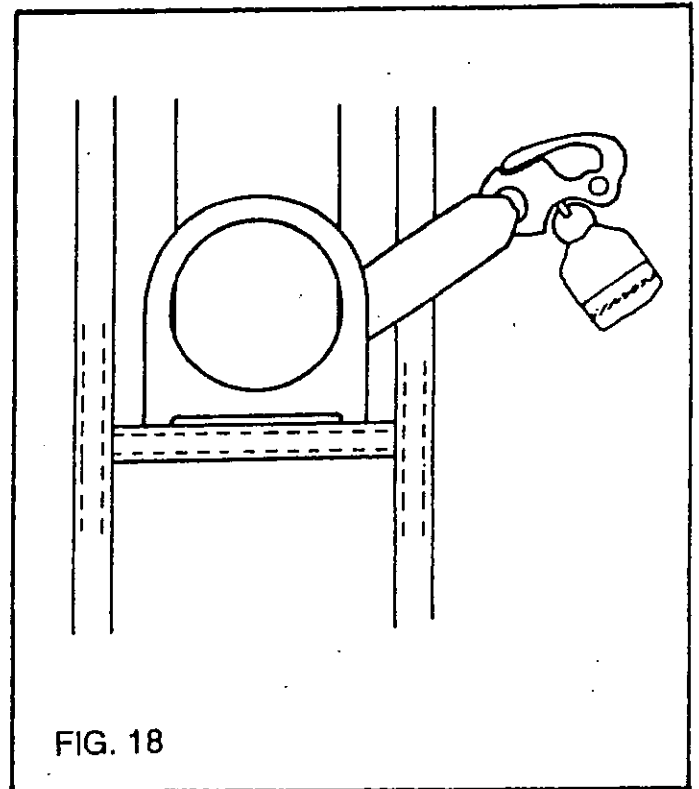


FIG. 18

THE RESERVE STATIC LINE

Back in the late 60's and early 70's a system was devised for opening a chest-mounted reserve container "automatically" after disconnecting from a main canopy in the air ("cutting away"). Called the "Stevens System" (after its inventor), it was simple and effective, consisting of a lanyard attached at one end to a main riser and at the other end to the reserve ripcord handle. However, many "experienced" jumpers were reluctant to continue using the Stevens System after they were off student status. The system was highly visible and in some cases rather bulky, and it labeled the wearer as a "student" or "novice" jumper.

In the years since it was first introduced, the Stevens System has undergone many variations, and so many refinements have been added (including adaptation to the present "piggy-back" type of parachute rig) that it is now simply known generically as the "Reserve Static Line" or "RSL" for short. It is still simple and effective, and in most cases there is little or no added bulk.

The DOLPHIN features an RSL which is unobtrusive from the front, and completely invisible from the back. A jumper need not worry about appearing to be a student or novice while wearing the DOLPHIN RSL. You can wear the DOLPHIN RSL and still be "cool an' groovy"...

A study of parachuting fatalities over the past fifteen years reveals a significant percentage which resulted from a cutaway followed by no reserve deployment or by reserve activation too low for deployment. Many of these could have been prevented by the use of an RSL. For this reason the RSL is a standard feature on all DOLPHIN harness/container systems. During the design and testing of the DOLPHIN, the live tests of the RSL resulted in consistent activation of the reserve within 3/10 of a second after cutaway.

INSTRUCTIONS FOR ASSEMBLING AND PACKING A MAIN PARACHUTE CANOPY INTO THE DOLPHIN HARNESS/CONTAINER SYSTEM

Assembling and packing a main canopy into the DOLPHIN harness/container system must be accomplished by the manufacturer, or by an FAA Senior or Master Rigger, or by the person who will make the jump with the parachute being packed.

- 1) Carefully inspect all components of the main canopy, following the canopy manufacturer's directions:
 - a) Main pilot chute(s) and bridle(s)
 - b) Deployment bag
 - c) Main canopy
 - d) Suspension lines
 - e) Connector links
 - f) Risers

- 2) Attach the canopy to the risers and be sure that the connector links are sufficiently tight. A good rule-of-thumb is, "finger-tight plus a quarter-turn with a wrench." Assembling the canopy to the risers should be done by a rigger or by someone who is qualified to do so by experience with parachute equipment.

- 3) Attach the risers to the harness/container system according to the chapter in this manual entitled "THE 3-RING RELEASE SYSTEM."

5) Check the continuity of the suspension lines to assure that each line goes from its attachment point on the canopy down thru the slider grommet to its respective connector link without passing under or thru any other line. Be sure that each control line is clear from its attachment on the trailing edge of the canopy down thru the slider grommet and thru its respective guide ring on the rear riser. Each control line must be *securely* attached to its control toggle. For a simple and effective way to do this, see pages 6-8 of this manual.

6) Set the deployment brakes by pulling each control line downward until the brake-set loop is just below the guide ring on the riser. Push the stiffened portion of the toggle thru the brake-set loop and pull the control line back upward until the toggle "locks" against the guide ring. The resulting slack in the control line should then be "S" folded approximately 2" long and stowed in the piece of loop velcro provided. Secure the control toggle to the hook velcro on the riser. The right brake-set should resemble FIG. 4; the left one will appear as a mirror-image of FIG. 4:

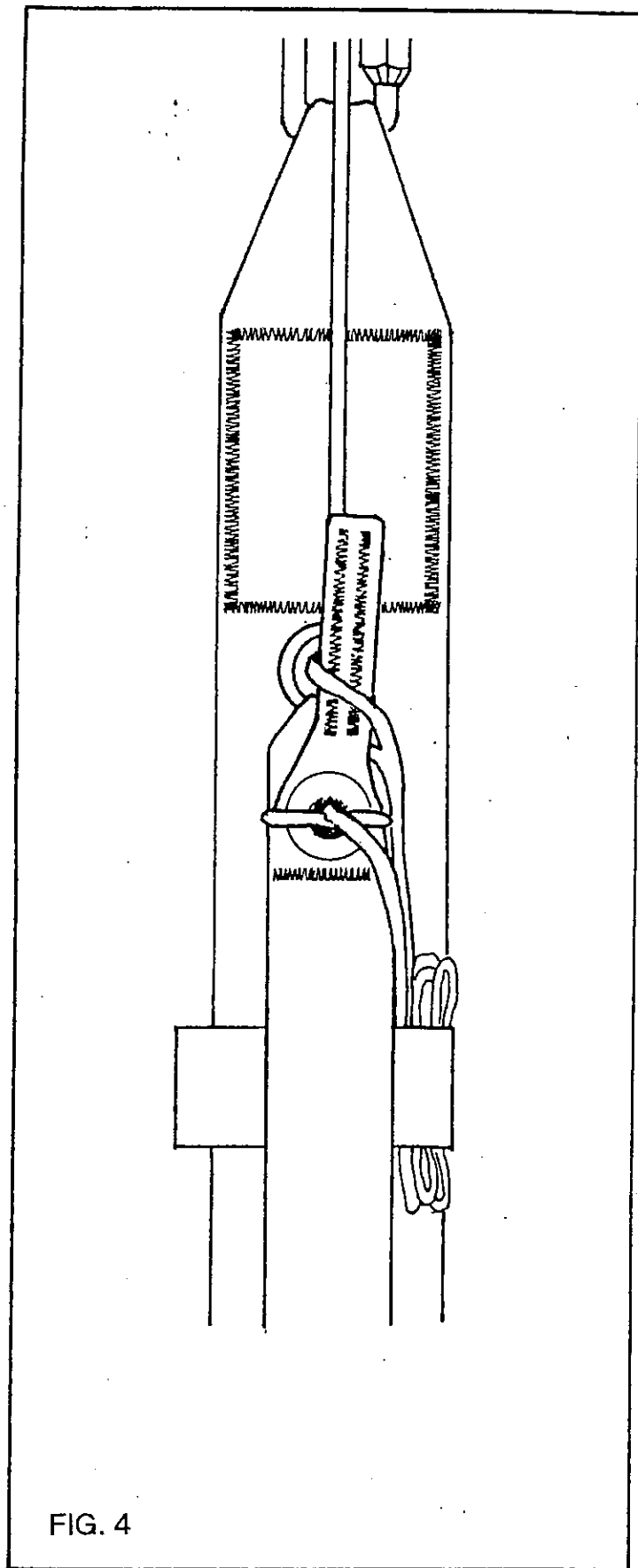
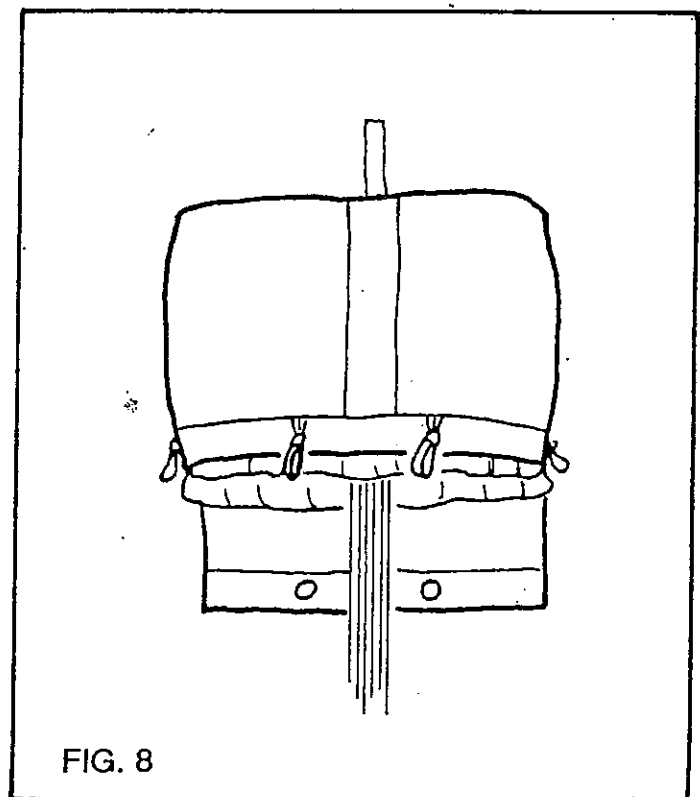
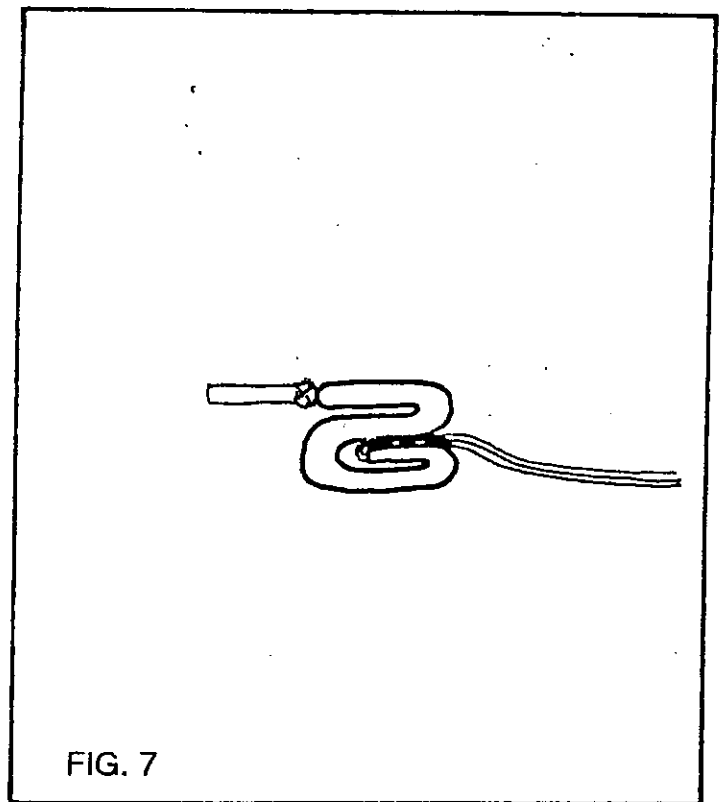


FIG. 4

"S" fold the rest of the canopy on top of the first fold (FIG. 7). When stuffing the canopy into the deployment bag, be sure that the blue tab sticks out thru the grommet in the top of the bag. (One way to assure this is to use a pull-up cord.) Continue stuffing the canopy into the bag, being sure that no canopy fabric is trapped inside the bag between the metal ring and the grommet in the top of the bag. Try to fill all the corners of the bag so that the bulk of the canopy is evenly distributed. See FIG. 8.



10) Insert the pullup cord thru the container locking loop, then lift the bag straight back over the reserve container and set it in the main "pack tray". Lay the main risers flat against the sides of the reserve container and close the riser covers over them. See FIG. 11. (Be sure that the line stows of the main bag are always toward the bottom of the container. If the bag is turned so that the line stows are toward the top, it may require more force for the pilot chute to extract the bag from the container.)

(((NOW IS THE TIME TO DECIDE WHICH CONFIGURATION WILL BE USED FOR DEPLOYMENT OF THE MAIN PARACHUTE CANOPY.)))

FOR THROWOUT DEPLOYMENT, CONTINUE WITH STEP 11 ON THIS PAGE BELOW.

FOR STATIC LINE DEPLOYMENT, GO TO STEP 11-a ON PAGE 30.

FOR RIPCORD DEPLOYMENT, GO TO STEP 11-b ON PAGE 34.

THROWOUT DEPLOYMENT:

11) Using the connector link provided, connect the throwout pilot chute's *blue* bridle to the *blue* tab which is sticking out the top of the main bag. Lay the bridle out to the right and close the bottom flap as shown in FIG. 12.

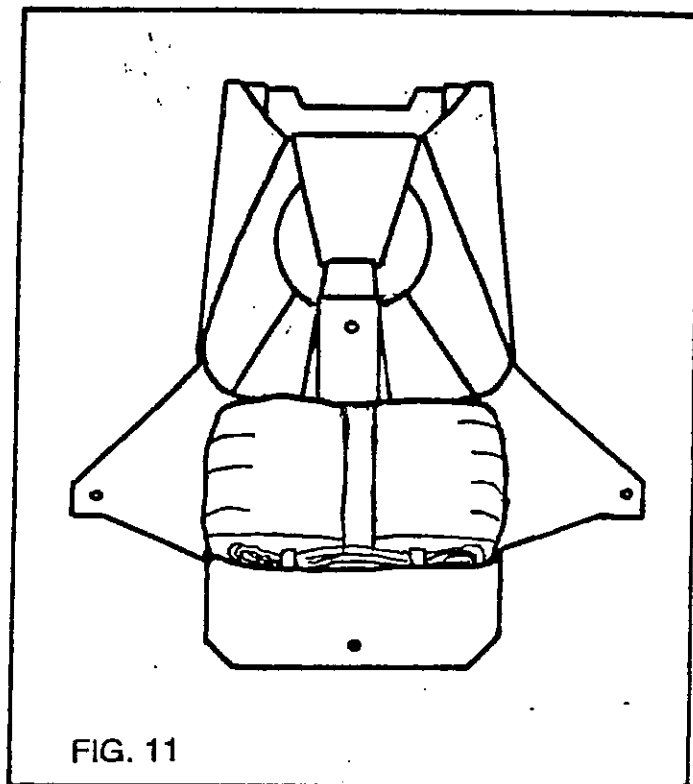


FIG. 11

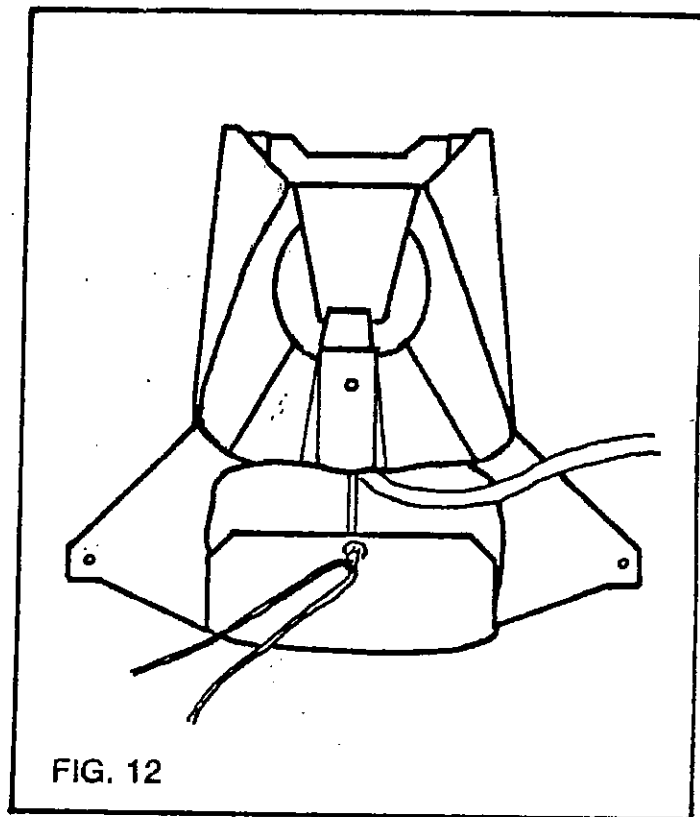
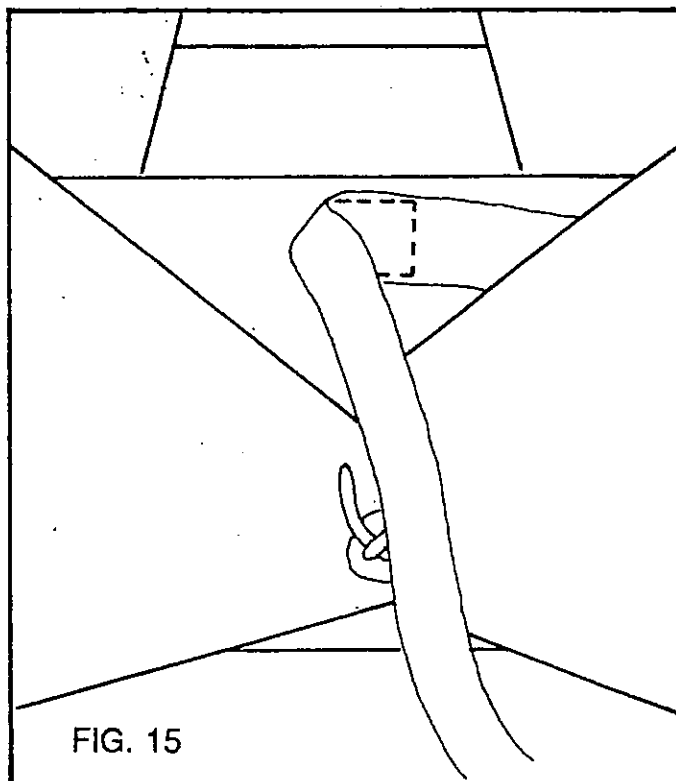


FIG. 12

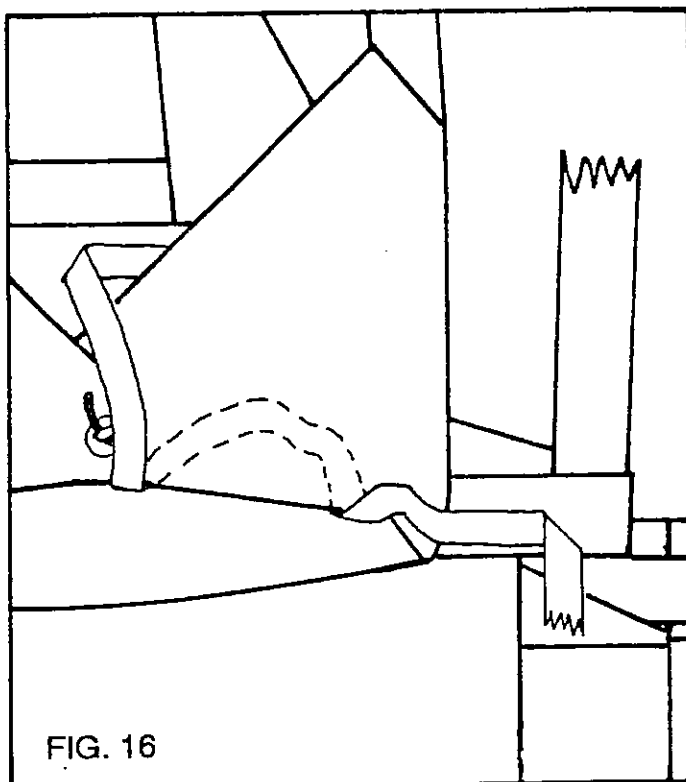
14) Mate the small patch of velcro just above the curved pin on the main bridle to the corresponding patch in the center of the main top flap as shown in FIG. 15. This is important because it assures that the pilot chute has enough slack to withdraw the pin.

To pack the pilot chute in the pouch on the right leg strap, continue with Step 15a. To pack the pilot chute in the pouch on the bottom of the main container, skip to Step 15b.

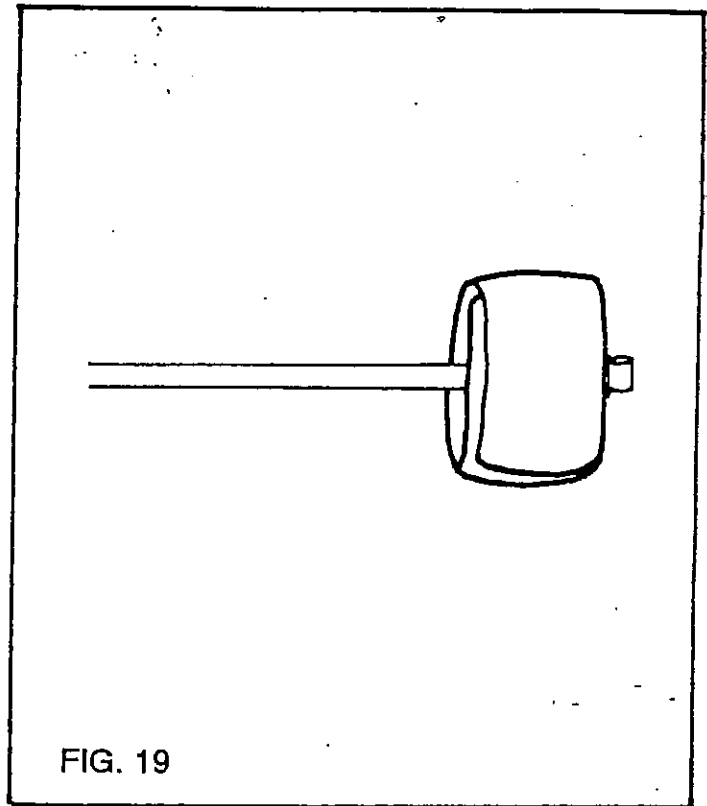


15a) [For pilot chute pouch on right leg strap]. Mate the velcro on the bridle to the velcro track provided near the lower edge of the right side flap. This will lead the bridle along the container to the harness near the mouth of the pilot chute pouch. There will be some slack in the bridle between the curved pin and the velcro track. Tuck this slack up under the lower edge of the right side flap as shown in FIG. 16. (Skip Step 15b and go to Step 16.)

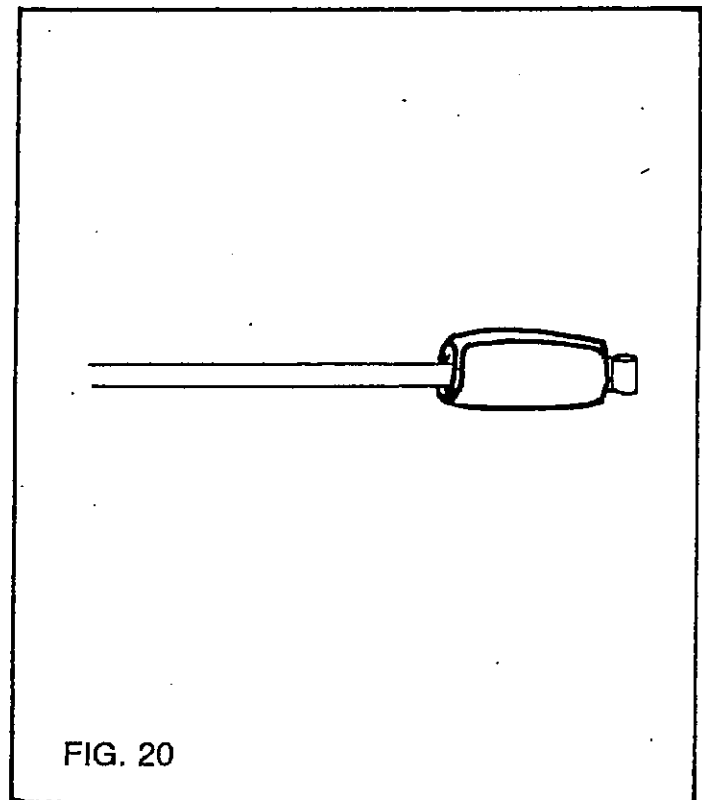
15b) [For pilot chute pouch on bottom of container]. Tuck some of the bridle up under the lower edge of the right side flap, similar to what is shown in FIG.16, but simply let the bridle exit from the lower right corner of the container. (Continue with Step 16.)



18) Fold the pilot chute in thirds as shown in FIG. 19.



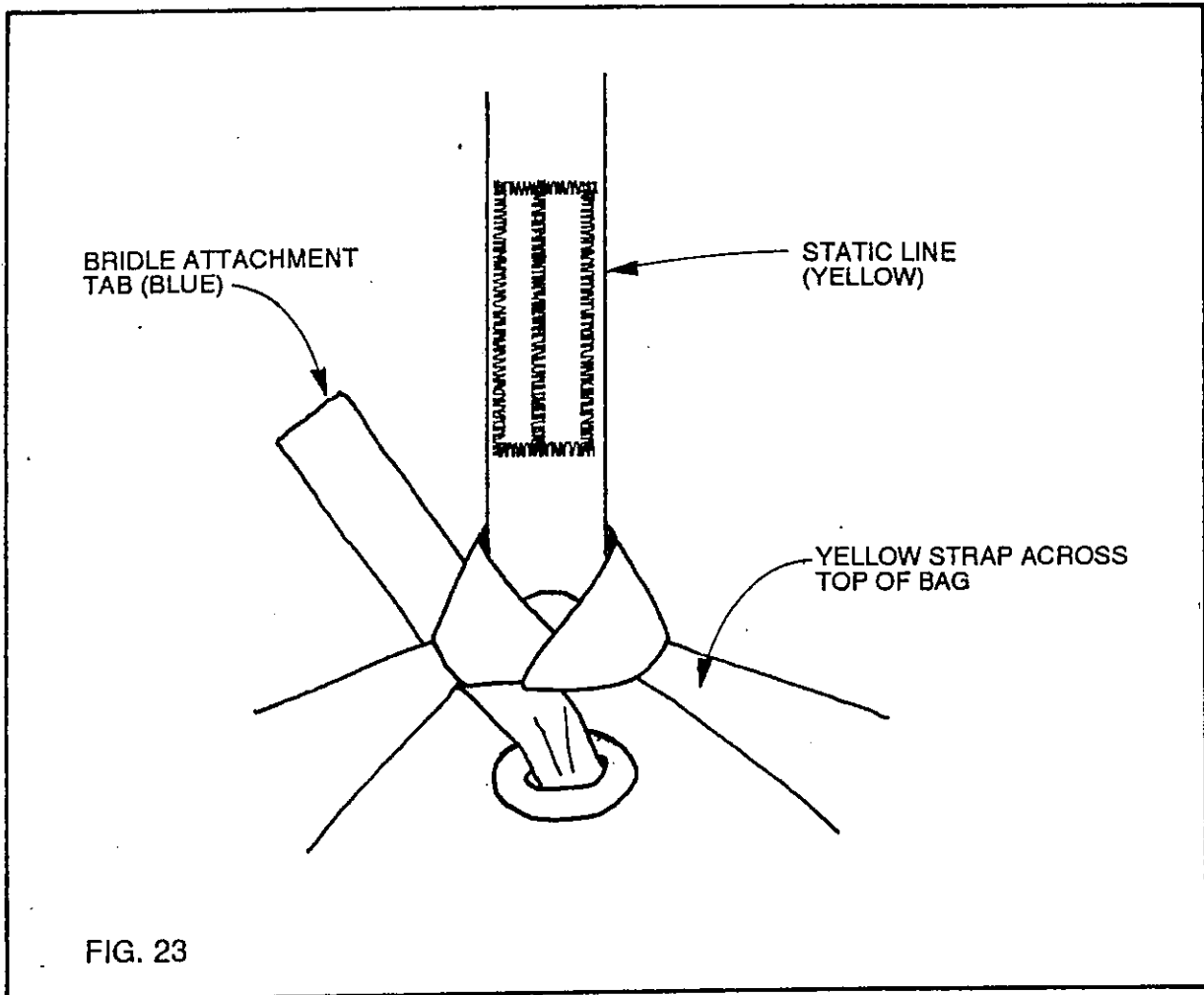
19) Roll the pilot chute as tightly as possible so that it resembles FIG. 20.



STATIC LINE DEPLOYMENT:

(To be continued after Step 10 on page 24)

11-a) Attach the static line to the main bag by passing the loop end under the yellow strap on top of the bag, and then passing the metal snap thru the loop. Tighten the loop as shown in FIG.23. Ignore the blue bridle attachment loop; it will simply be extracted from the bag during deployment and remain with the main canopy.



IMPORTANT!!!

ALWAYS FOLLOW THE COLOR CODE !!! ATTACH THE YELLOW STATIC LINE TO THE YELLOW STRAP. FOR FREEFALL CONFIGURATION ATTACH THE BLUE BRIDLE TO THE BLUE TAB. NEVER ATTACH YELLOW TO BLUE OR BLUE TO YELLOW !!!

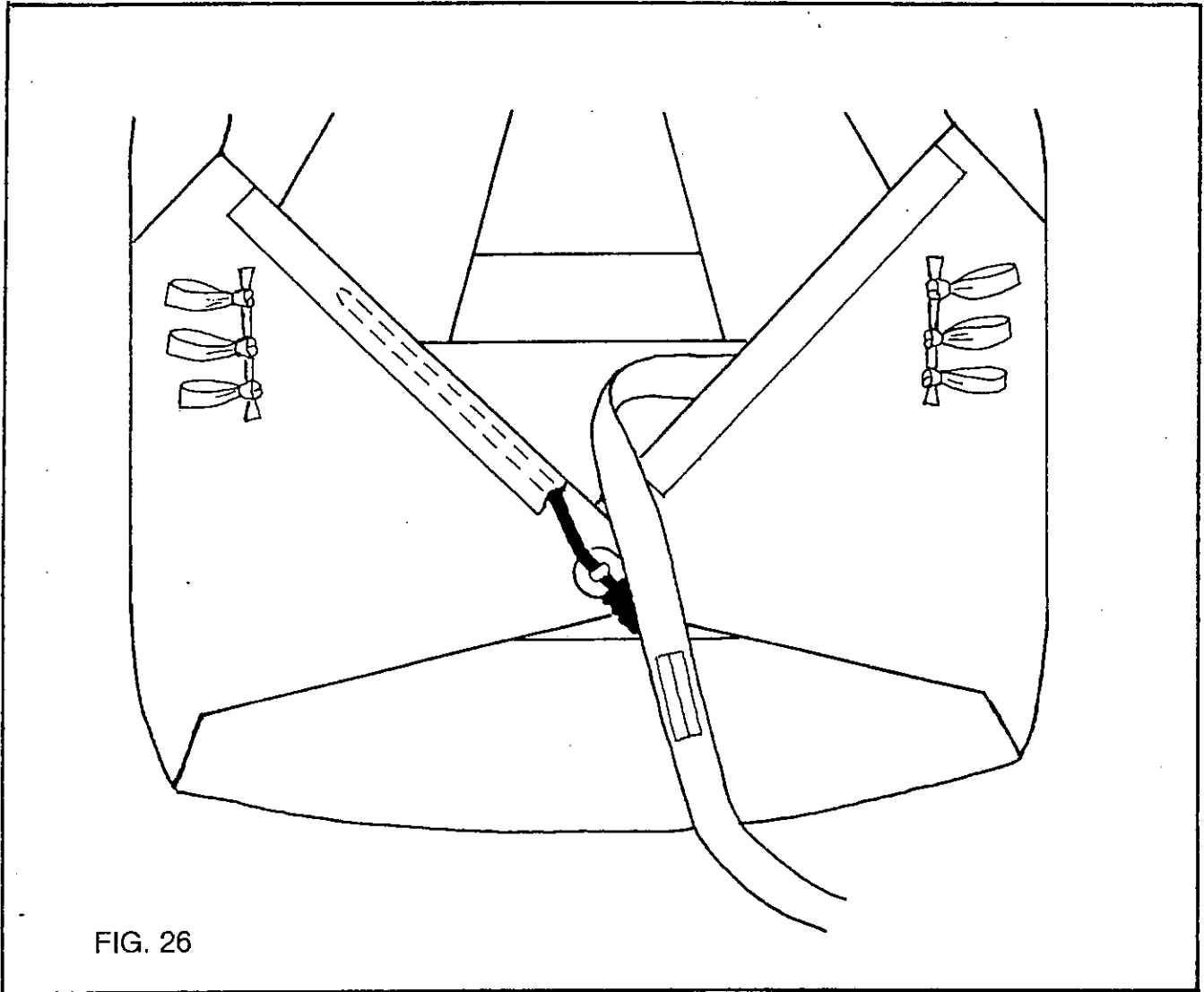


FIG. 26

14-a) There is an "excess cable channel" along the upper edge of each main side flap. After the cable is inserted thru the closing loop, the excess length may be stowed in one of these channels as shown in FIG. 26.

RIPCORD DEPLOYMENT:

(To be continued after Step 11 on page 24)

11-b) Using the connector link provided, connect the spring-loaded pilot chute's *blue* bridle to the *blue* tab which is sticking out the top of the main bag.

Install the black plastic ripcord by inserting the cable all the way into the ripcord channel as far as it will go until the handle is in position for deployment.

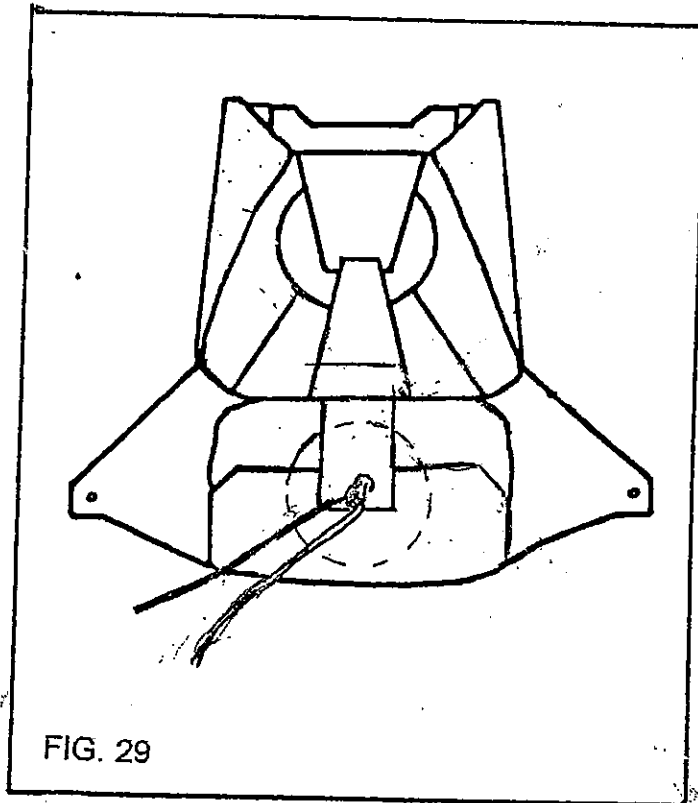
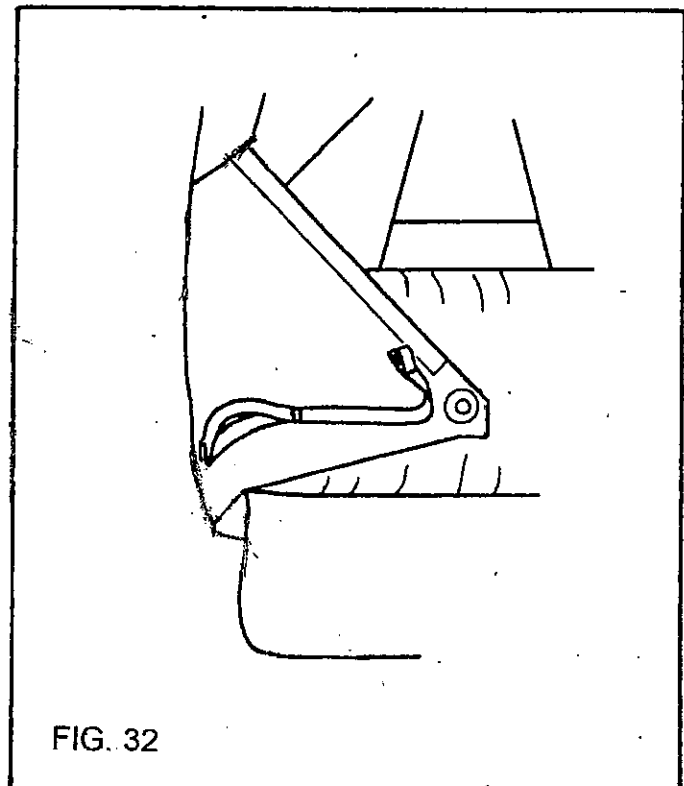
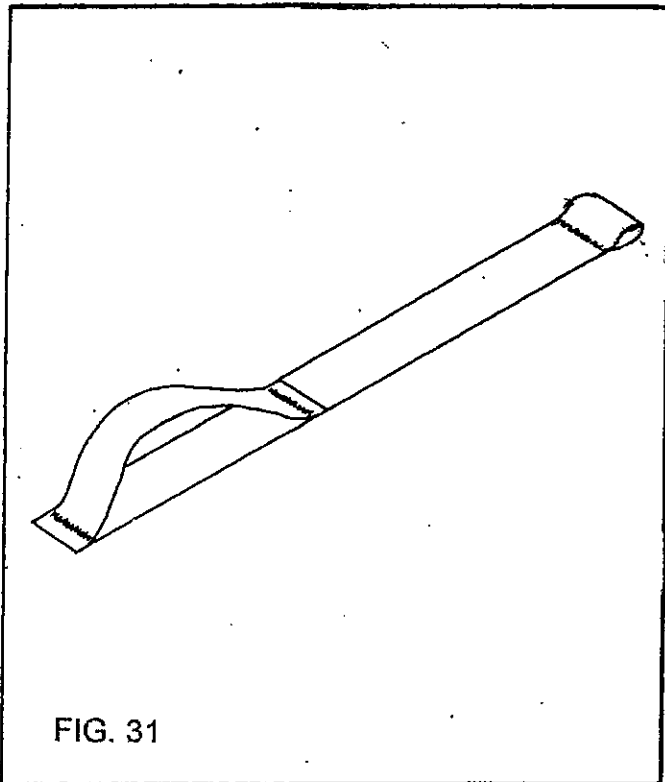


FIG. 29

12-b) "S"-fold the bridle on top of the bag, and then set the base of the pilot chute on top of the folded bridle. Compress the spring, pushing the canopy fabric and mesh in between the turns of the spring, and close first the bottom flap, then the top flap over the compressed pilot chute. The main container should now resemble Fig. 29.

INSTALLING THE LEFTSIDE AFF HANDLE

FIG. 31 shows the Leftside AFF Handle, also known as the "LEFT YANK". Its installation and operation are very simple, and it enables the leftside jumpmaster to open the main container without having to reach around the student.



- 1) To install the Left Yank, mate it to the velcro track on the middle of the left main side flap before closing the main container (FIG. 32). The large loop (the grip) is to the left, and the small loop is closest to the grommet of the left side flap.

USING THE LEFTSIDE AFF HANDLE

The presence of the AFF Leftside Handle (also known as the "Left Yank") should be an item on the gear check performed by the jumpmasters before boarding the aircraft with their AFF student. Jumpmasters must also assure that the Left Yank is protected when the student is boarding or moving about in the aircraft in order to prevent accidental activation.

The Left Yank is positioned mid-container so that the leftside jumpmaster may reach it with either hand. The standard color for the Left Yank manufactured by Altico is red for easy visibility on the black container. If the leftside jumpmaster has made the decision to activate the main parachute, the Left Yank should be *vigorously* pulled upward and back as far as the arm can reach.

* * *

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 lbs. on the large harness ring exerts a force of only ten pounds on the white loop. (Opening shock usually totals about 1,000 lbs., or 500 lbs. 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.

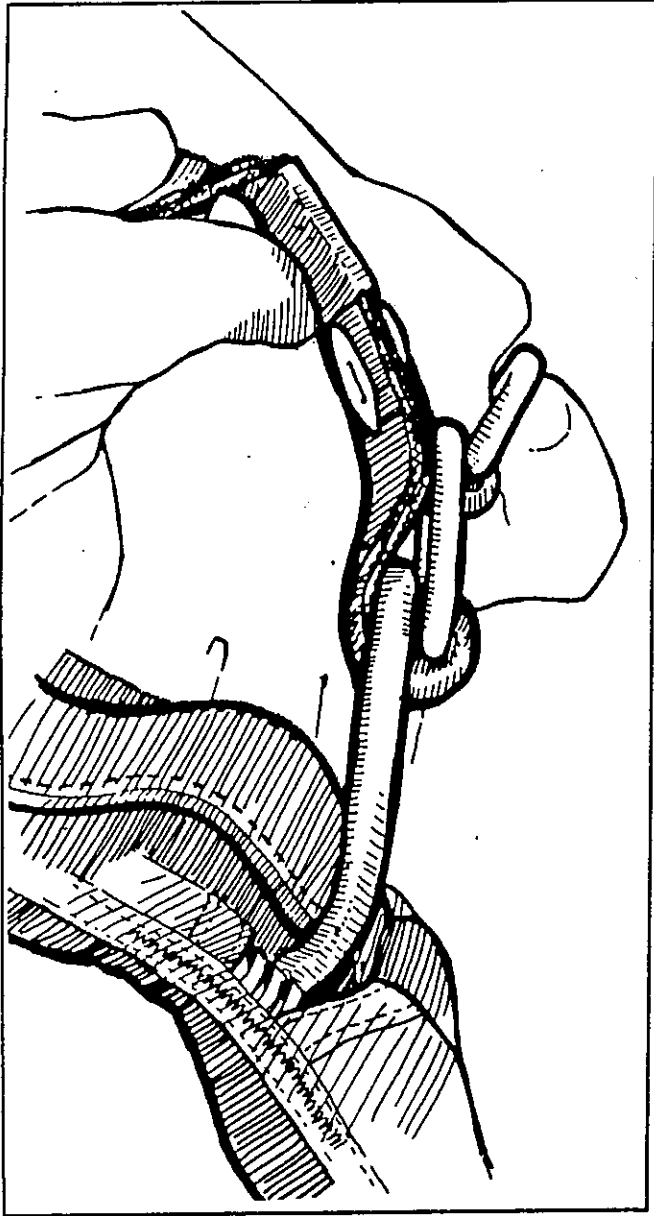
That's why it's important to keep foreign matter like bits of grass and sticks out of the 3-Ring assembly. A small stick in the white loop could prevent a riser from releasing.

It is also important to understand one of the properties of the nylon components of the system.

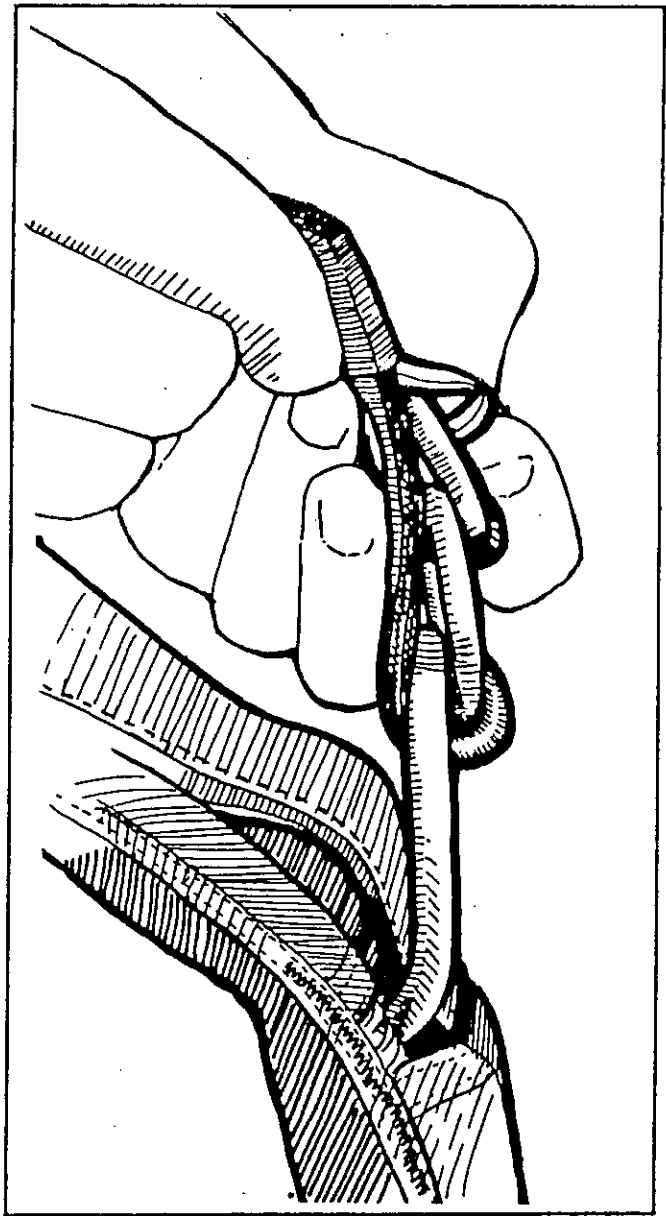
When nylon stays in the same position for a long time it begins to conform to that position, or take a "set." If the 3-Ring Release system stays assembled for too long, the nylon can become so stiff that the low drag from a malfunction (such as a streamer) won't pull the riser off the rig.

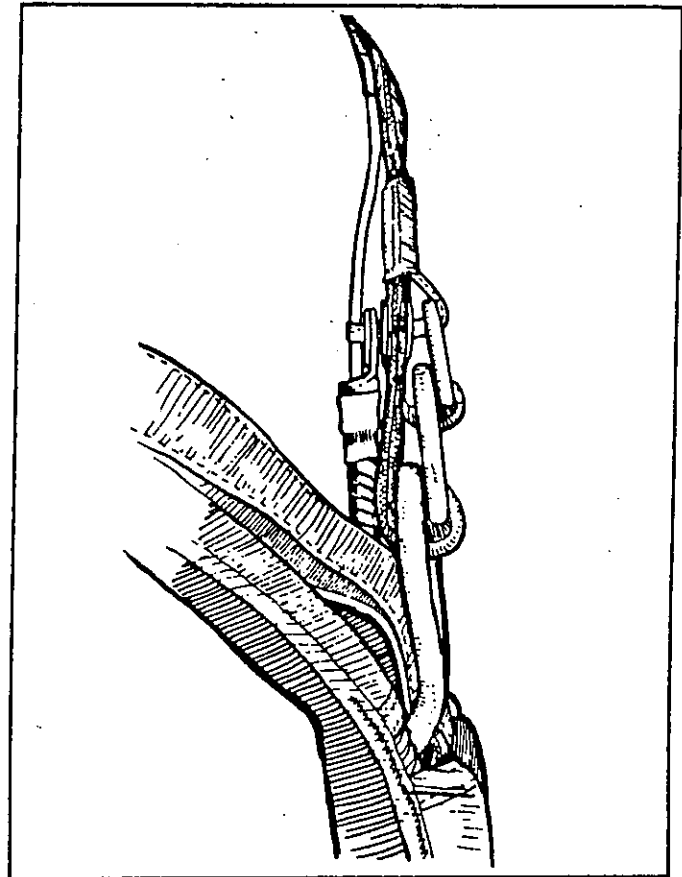
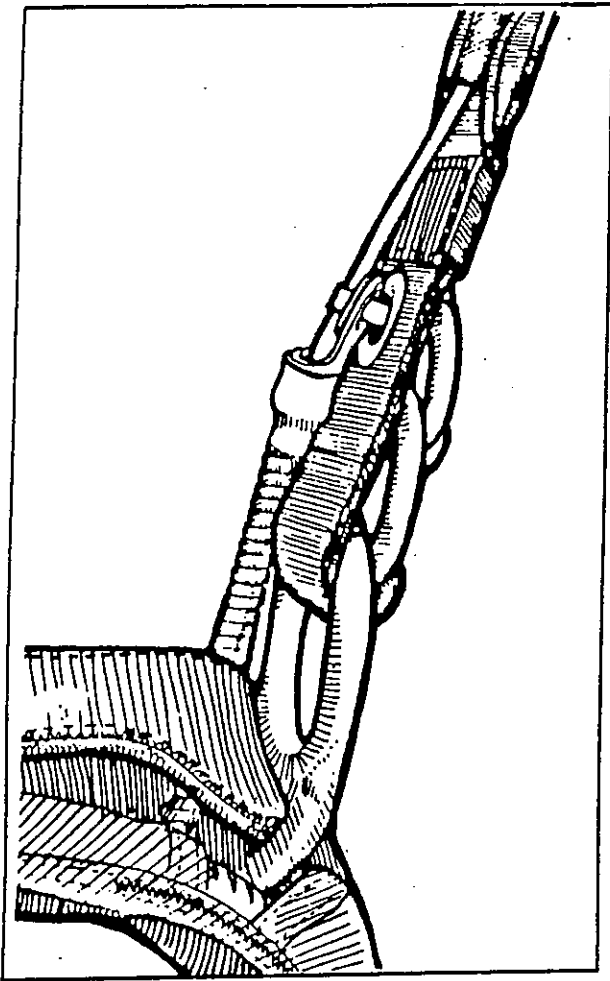
The 3-Ring Release system must be disassembled, flexed and inspected every month. Procedures for this are listed in the following care and maintenance chapter of this manual.

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 smallest ring only and then through the riser grommet so it pokes out the back of the riser.





PRE-JUMP INSPECTION

Before jumping the DOLPHIN, check the 3-Ring Release System for the following:

1. Each ring passes thru only one other ring.
2. The white loop passes thru only the small ring.
3. The white loop passes thru the grommet on the end of the cable housing without twisting.
4. Nothing passes thru 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. If your release handle has a tendency to hide itself under your main lift web, undo the Velcro and twist the handle in a counter-clockwise rotation (when wearing the rig) so the handle will stick-out and slightly forward for a better grip.

NOTICE

If a DOLPHIN has been fitted with 3-Ring risers produced by any manufacturer other than ALTICO, it is important that they be checked for proper configuration. The side view above shows a correctly built 3-Ring riser attached to the harness ring and put under moderate tension. Note the following: (1) The rings overlap each other and maintain metal-to-metal contact with each other. (2) The rings are aligned in parallel planes. (3) The smallest ring is not pulled snug against the grommet; the white loop is long enough to give it some play. (4) The white locking loop goes straight down thru the center of the riser grommet on its way to the cable housing end fitting; it does not extend past the edge of the grommet hole and then turn back upward toward the hole. If your riser configuration does not match this illustration, the 3-Ring release might not function correctly. You should contact a rigger or ALTICO before jumping with those risers.

7) 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 with the white loop.

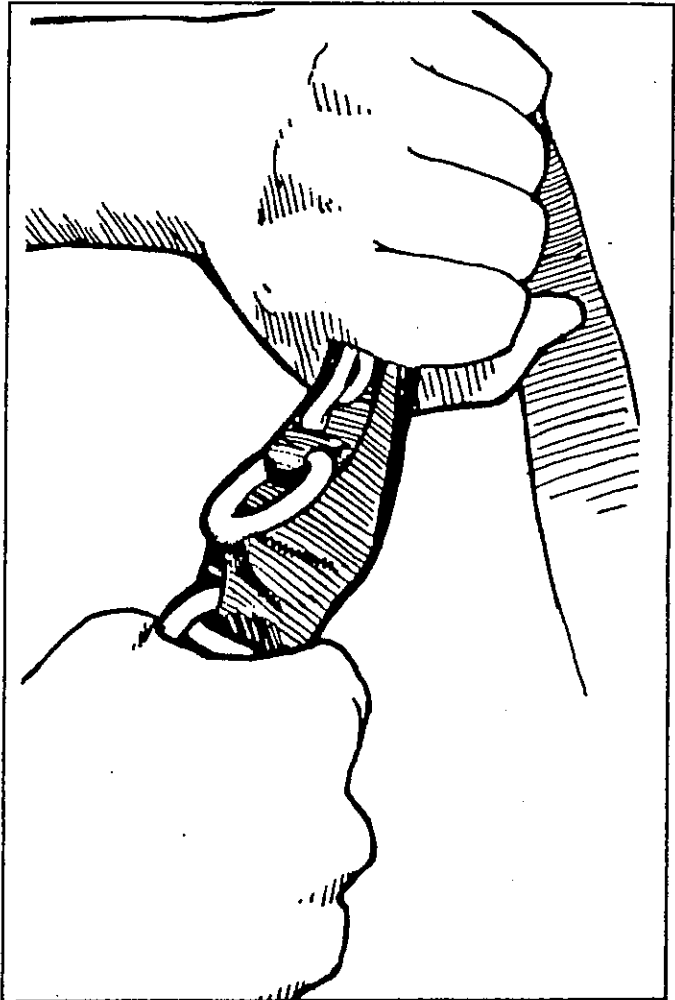
8) Check the housings for dents or other obstructions. Use the cable to do this.

9) Clean and lubricate the release cable with a light oil such as "3-in-1" brand or silicon. 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. Too much oil will require more force to extract the cable during a breakaway.

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

11) If any wear is found, consult with ALTICO or a rigger before using your DOLPHIN.

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



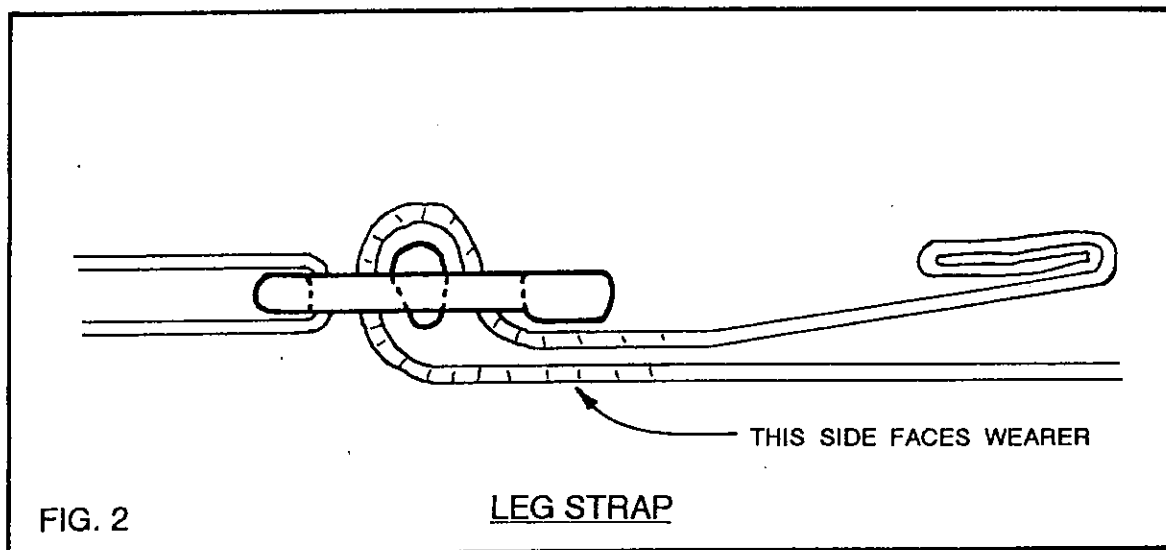
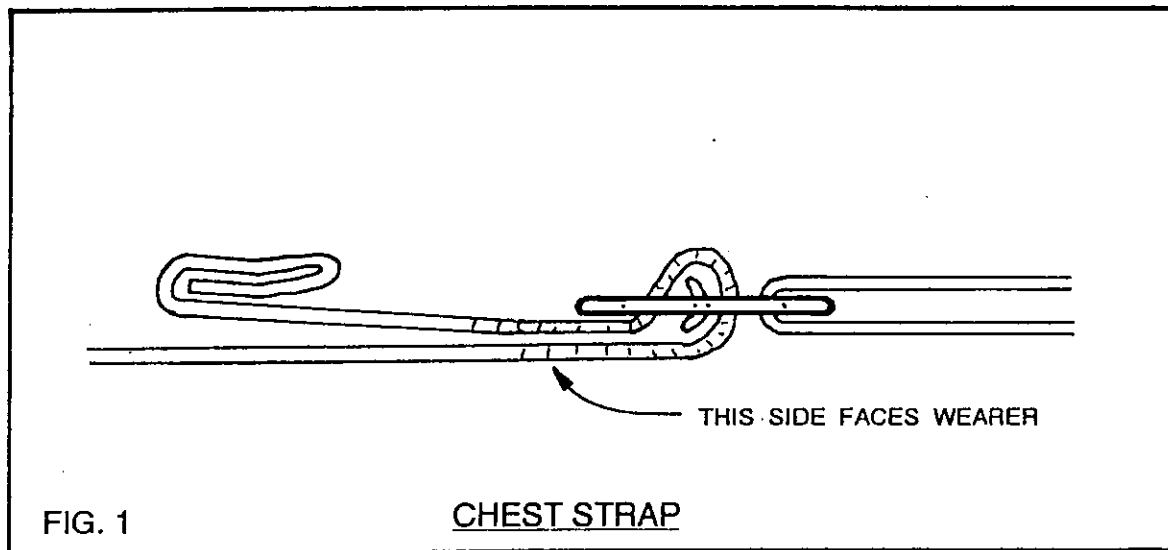
ALTICO appreciates any comments from users that relate to the safety, operation or maintenance of the 3-Ring Release, or any other part of the DOLPHIN harness/container system.

REPLACEMENT PARTS

Altico supplies replacement parts for its products at a reasonable cost. When ordering parts for your rig, include the model number and date of manufacture so that the proper items can be supplied. This information appears on the label that is sewn to the rear surface of one of the reserve risers. For a complete list of replacement parts, see page 1 of this manual.

After donning the DOLPHIN and tightening all the straps, take a moment to physically locate all the handles: main pilot chute handle, cutaway handle, reserve ripcord handle. Be absolutely sure that you are very familiar with the location of all three handles, and that you can find each one with your eyes closed.

Be sure that each legstrap has been correctly threaded thru its corresponding friction adapter. FIG. 2 shows the correct threading. This is very important, because an incorrectly threaded strap may not hold in its friction adapter when a load is applied to it.



DOLPHIN MAIN DEPLOYMENT

This section is intended only to acquaint the user with the design and intended function of the DOLPHIN harness/container system. It is *not* a course in parachute jumping. No one should attempt to make a parachute jump unless instructed and supervised by a qualified instructor.

THROWOUT DEPLOYMENT

Whether the DOLPHIN is equipped with a "throwout" pilot chute on the right legpad or on the bottom of container, the activation of the main parachute is much the same: while maintaining a stable face-to-earth position, grasp the handle at the mouth of the pilot chute pouch and with one motion, extract it and throw it vigorously *straight out* to the side. This is done to place the pilot chute in "clean air" for maximum drag.

It is generally considered ideal to be in a slightly head-high position during deployment, so that the area of the "burble" (turbulent air over the jumper's back) is reduced in size. Also, it is not advisable to hold on to the pilot chute after extraction from its pouch. Using the pilot chute for a "wave-off" could cause the drag on the bridle to open the container before the pilot chute is released. This is an out-of-sequence condition which may cause entanglement.

RIPCORD DEPLOYMENT

Whether the ripcord is packed with the handle at the right legpad or at the bottom of container, activation consists of locating the handle and pulling it vigorously as far as the arm can reach while maintaining a stable, face-to-earth position.

* * *

Obviously, for the jumper to survive, cutting away *must* be followed by reserve deployment, and it must be initiated while there is sufficient altitude for reserve deployment. To activate the reserve, locate the metal handle in its pouch just below the chest strap on the main lift web. Pull it *vigorously* downward and outward to full arm's length. Again, it must be emphasized that these decisions and actions are the responsibility of the individual jumper.

If it is decided that there is not sufficient altitude for a cutaway, the jumper then must simply activate the reserve and hope that it won't entangle with the main.

In the case of a *total* malfunction (nothing has come out of the container, or it has become impossible to extract the pilot chute), the jumper will still be falling at high speed. It may be advisable in this case not to waste time and altitude cutting away from a canopy that is still in the container, but to simply activate the reserve. There are several schools of thought regarding when and if to cutaway, and it is best for the student to heed the instructor and develop a rehearsed plan of action for each emergency scenario.

S O S

If the DOLPHIN is equipped with the S O S (Single Operation System), the cutaway of the main canopy and the activation of the reserve are both incorporated into a single handle. This is the metal handle located in a pouch just below the chest strap on the left main lift web. To cutaway the main canopy and activate the reserve at the same time, simply pull the metal handle *vigorously* downward and outward to full arm's length.

Obviously anyone who uses the S O S *must* be trained specifically for the S O S configuration. If that person transitions to the more common type of gear used by most skydivers (a dual-action system), the transition training is *extremely* important and must be emphatic and thorough.

Please read the section in this manual entitled "THE 3-RING RELEASE SYSTEM," for further information regarding operation, inspection and maintenance of the release system.

* * *

- 4) **RISERS** - The control line guide rings should be inspected to assure that their attachment to the riser is secure. Also check the riser's locking loop for fraying, and check the grommet for any sharp edges which might damage the loop.
- 5) **CONTROL TOGGLES** - The attachment of the control line to the control toggle is important. Check for fraying and be sure that the knot is secure. If a control line breaks or a toggle comes off the line when the jumper is near the ground, the jumper may not have time to regain control before landing.
- 6) **CLOSING FLAP GROMMETS** - Inspect for any sharp edges that may fray the closing loops. Replace if necessary.
- 7) **FLAP STIFFENERS** - If a stiffener is cracked or broken it must be replaced
- 8) **CLOSING LOOPS** - At the first sign of fraying, replace the closing loop. (They're cheap or even free at most parachute centers.) If a closing loop breaks at an inappropriate time, it can cause a world of trouble.
- 9) **HARNESS** - Look at all exposed parts of the harness webbing and check for fraying or cuts. If the edge of any harness webbing is worn or cut to a depth of more than 1/8", it must be repaired or replaced. Broken harness stitching must be repaired before it becomes critical.
- 10) **RESERVE RIPCORD** - During the required periodic repacking of the reserve, inspect the cable for broken strands of wire, particularly near the swaged fittings. If any strands are broken, replace the ripcord. If the ripcord pin is bent at an angle of no more than ten degrees, it may be carefully straightened with pliers and a vise, provided that the pin is protected from abrasion by buffers of wood, plastic, cloth, or any other material which will not scar the pin. This may only be done *once* per pin.
- 11) **HOUSINGS** - Be sure that the hand-tacking on both the release housings and the reserve ripcord housing are secure.

COMPATIBILITY STATEMENT

The functional tests of the DOLPHIN reserve container were performed using the FIRELITE, MAVERICK and SHARPCHUTER reserve canopies. All tests resulted in successful deployments as expected. These tests indicate that the DOLPHIN reserve container is compatible with any ram air reserve canopy which can be deployed from a free bag, provided the pack volume of the canopy is compatible with the size of the reserve container.

It is difficult to assign an absolute figure for the pack volume of a canopy or a container, because pack volume is greatly affected by changes in temperature and humidity. A canopy that is easy to pack in a given container in a warm and humid environment may be almost impossible to pack in the same container in a cold and dry climate.

It is the responsibility of the rigger packing the reserve to determine that the respective volumes of the canopy and container are compatible. Overstuffing the container may result in damaged grommets, excessive wear at "hard points", or increased pull force required for reserve activation. On the other hand, a pack that is too loose may allow shifting of its contents, and it may not provide a firm base for launch of the pilot chute. Another danger of too loose a pack is that the closing pin may simply fall out.

To assist in matching the volumes of canopies with container systems, the Parachute Industry Association (PIA) has compiled a Canopy Study which may be used as a rough guide. This Canopy Study (PIA Technical Standard 104.7) lists the pack volumes and square footage for most canopies of present and recent manufacture, and is an ongoing project sponsored by the Technical Committee of the PIA. Future editions may be obtained by contacting the PIA Store, P.O. Box 2206, Santa Barbara, CA 93118.