



SUN PATH PRODUCTS INC.
819 - 5th AVE.
ZEPHYRHILLS, FL 34248
(813) 782-9242

1987



US Department
of Transportation
**Federal Aviation
Administration**

Central Region
Atlanta Aircraft Certification Office
1669 Phoenix Parkway Suite 210
Atlanta, GA 30349

NOV -

Mr. Michael W. Furry
President
Sun Path Products Inc.
819 - 5th Avenue
Zephyrhills, FL 34248

Dear Mr. Furry:

This is in response to your October 3, 1987, request for Federal Aviation Administration (FAA) authorization to identify the below listed JAVELIN harness/container parachute system in accordance with the requirements of Federal Aviation Regulation (FAR) Part 21, Subpart O, Technical Standard Order (TSO) C23c, Category B, and SAE Aeronautical Standard AS-8015A:

<u>Part</u>	<u>Part Number</u>
Harness	JH-101()
Container System	JC-101()

We find your Statement of Conformance dated October 3, 1987, and your Quality Control Manual, dated September 15, 1987, acceptable.

The following data as submitted by your October 3, 1987, letter will be retained on file for this authorization:

- a. Sun Path Products, Inc., Inc. Test Report, dated September 4, 1987
- b. JAVELIN Products, Inc. Engineering Drawings submitted October 3, 1987
- c. JAVELIN Owner's Manual submitted October 3, 1987

Effective this date, you are authorized to identify the JAVELIN harness, Part Number JH-101, and container system, Part Number JC-101, with the appropriate TSO markings required by the applicable TSO and FAR 21.607 (d).

This authorization is not transferable to another person or location and is effective until surrendered, withdrawn, or otherwise terminated by the Administrator.

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

The TSO specialist for your program is Charles Perry, telephone number (404) 991-2910.

Sincerely,

Jack C. Bentley
Acting Manager, Airframe Branch

The purpose of this manual is to acquaint the prospective user with the functions, packing procedures and other features of the JAVELIN harness/container system. It is NOT intended to be a course in parachute jumping. This manual should be read and understood by anyone who intends to use a JAVELIN system for sport parachuting, however, it is the responsibility of the owner to be sure that the JAVELIN is correctly assembled, packed, maintained and used. It is also the jumper's own responsibility to assure that he is qualified for participation in sport parachuting activities.

!!! WARNING !!!

PARACHUTING IS A HAZARDOUS ACTIVITY, AND THERE ARE DANGERS WHICH SOMETIMES CANNOT BE FORSEEN. NO ONE SHOULD ATTEMPT TO MAKE A PARACHUTE JUMP UNLESS HE HAS BEEN THOROUGHLY TRAINED BY AN EXPERIENCED AND QUALIFIED INSTRUCTOR. THERE ARE NO GUARANTEES THAT ANY EQUIPMENT WILL FUNCTION AS INTENDED, REGARDLESS OF HOW IT IS ASSEMBLED, PACKED, MAINTAINED OR USED. SERIOUS INJURY OR DEATH CAN RESULT FROM THE USE, MISUSE, OR ATTEMPTED USE OF ANY PARACHUTE EQUIPMENT.

!!! THE USER ASSUMES ALL RISKS !!!

JAVELIN OWNER'S MANUAL

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INTRODUCTION

The JAVELIN is a sport parachute harness/container system, featuring back-mounted main and reserve canopy containers. The reserve container is characterized by the partially exposed top plate of the pilot chute which is packed on top of the side flaps. The JAVELIN is equipped with the 3-Ring release system under a license agreement with The Relative Workshop Incorporated. Other standard features include throw-out hand deployed main pilot chute, single-pin reserve closure, step-in leg straps and "wrap-around" harness construction. This type of harness construction reduces the loading on the stitches, and allows the greater portion of the load to be taken by the webbing, resulting in a very strong harness.

The reserve container will accept either a round or ram-air reserve canopy. For ram-air reserves, the JAVELIN is supplied with the unique "MOLAR-BAG", a free-bag which features zero thickness where the closing loop passes through it, eliminating the need for any preliminary fid or preliminary pull-up cord when packing the canopy into it. This also prevents any of the canopy from coming into contact with the closing loop.

The design and testing of the JAVELIN was accomplished over a period of eighteen months, and has resulted in one of the most "RIGGER-FRIENDLY" systems on the market. There is no additional hand-tacking required during assembly of the JAVELIN with canopies, and no "special techniques" are necessary to pack it. An FAA certified rigger with standard skills should be able to assemble and pack the JAVELIN by following the instructions in this manual.

The JAVELIN harness/container system has been tested in accordance with AS-8015A, and is approved by the FAA under TSO C-23c, Category B.

PARTS LIST

The JAVELIN is shipped to the customer with the following components:

HARNES/CONTAINER

MAIN RISERS WITH CONTROL TOGGLES

MAIN DEPLOYMENT BAG

RELEASE HANDLE (CUTAWAY HANDLE)

MAIN (HAND-DEPLOY) PILOT CHUTE AND BRIDLE

* RESERVE PILOT CHUTE WITH:

BRIDLE FOR ROUND RESERVE

-or-

BRIDLE AND "MOLAR" FREE-BAG FOR RAM-AIR RESERVE

RESERVE RIPCORD

RESERVE CONTROL TOGGLES

MAIN LOCKING LOOP

RESERVE LOCKING LOOP

TWO EXTRA LOCKING LOOPS

RUBBER BANDS

JAVELIN OWNER'S MANUAL

* Only the JAVELIN reserve pilot chute may be used with the JAVELIN harness/container system. Do not substitute any other pilot chute.

All components listed above are also available individually from
SUN PATH PRODUCTS INC.

JAVELIN

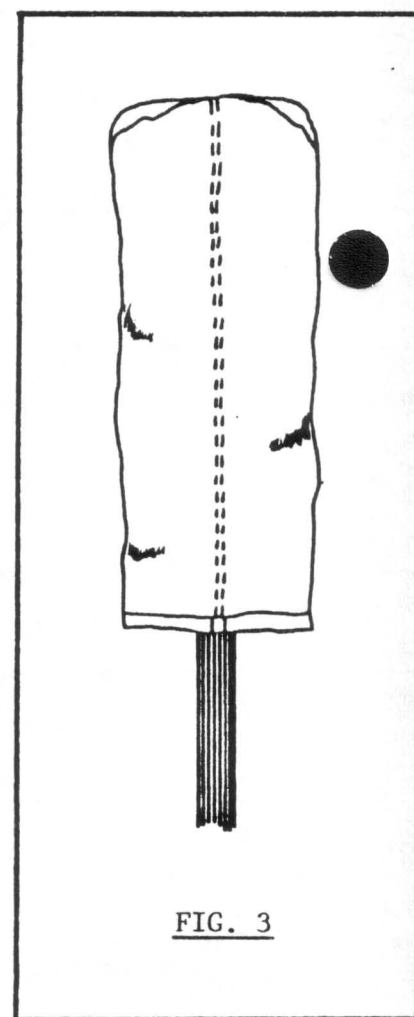
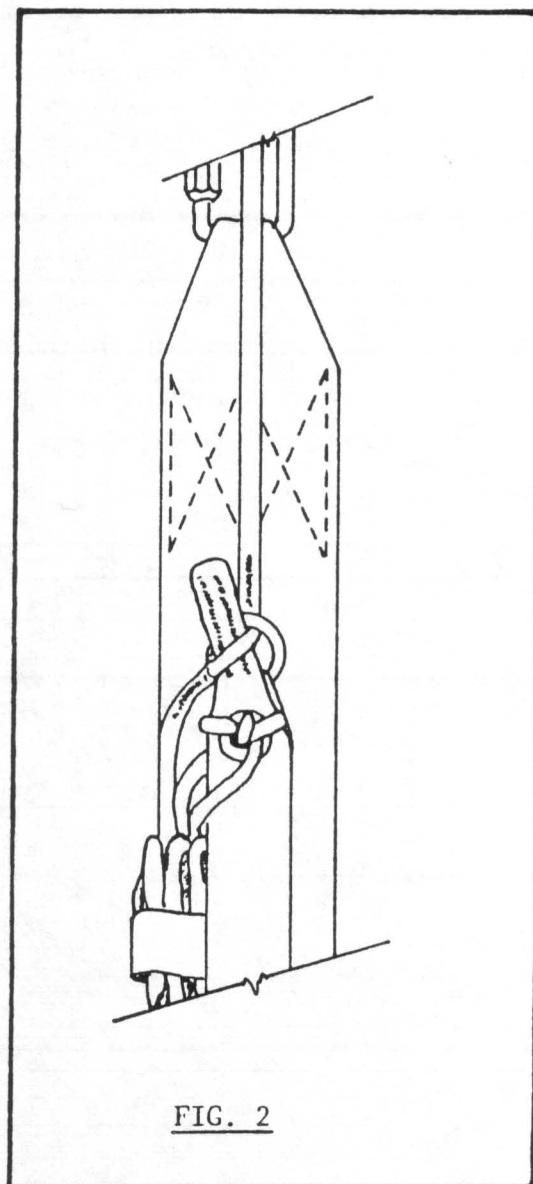
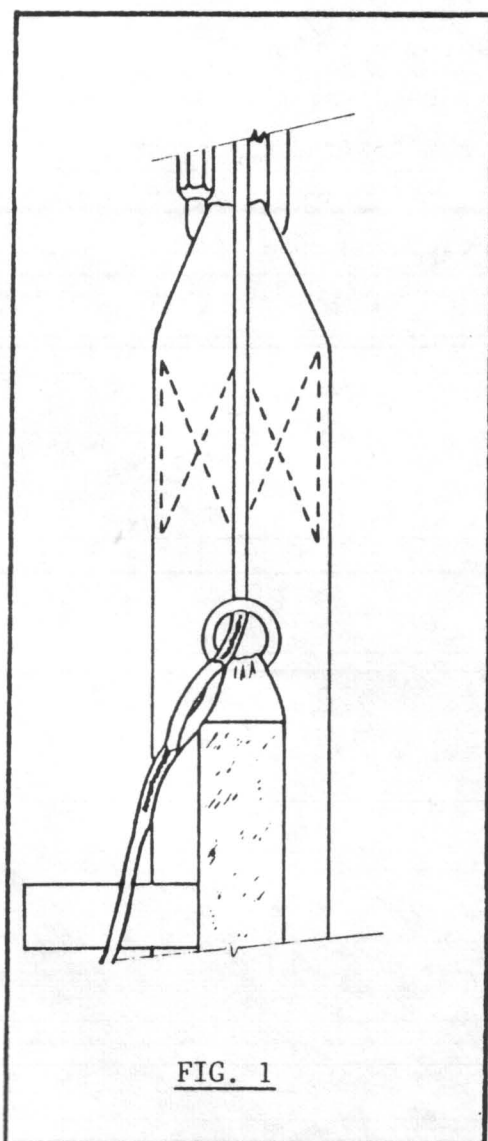
MAIN PACKING INSTRUCTIONS

This chapter deals with the procedures for packing the main canopy into the JAVELIN harness/container system. Assembly and packing of the main must be done by an FAA certified rigger or by the person making the jump.

- 1) Carefully inspect the main canopy, suspension lines, control lines, slider and grommets, connector links, etc., before assembling it with the risers. Replace or repair any worn or damaged parts. Also inspect the deployment bag, bridle, and pilot chute.
- 2) Attach the main canopy to the main risers, being sure that the canopy is facing the same direction as the harness/container system, and that each suspension line is clear from its attachment point all the way through the slider grommet to the connector link without passing around any other line. Be sure the control lines are clear from the trailing edge of the canopy through the slider grommets and through the ring guides on the rear risers to the control toggles. Each control toggle must be SECURELY tied to its control line at the location specified by the canopy manufacturer. Also be sure that the connector links are tight enough so that they cannot be loosened with the fingers alone.
- 3) Pass the pilot chute bridle down through the grommet in the top of the deployment bag and attach it to the ring on the top of the main canopy. Be sure that the stop-ring on the bridle is between the bag and the pilot chute.

- 4) Set the deployment brakes on each side by pulling the control line down through the guide ring until the brake loop just passes through the guide ring (FIG. 1). Insert the stiffened upper portion of the toggle through the loop and pull it back up tightly against the ring guide. "S"-fold the slack between the toggle and the brake-set, and stow it in the velcro loop provided, then mate the velcro on the toggle with the velcro on the riser (FIG. 2).

- 5) At this point, refer to the directions by the canopy manufacturer for flaking and folding the canopy. After flaking and folding it should resemble FIG. 3. (Be sure the slider is up as far as it will go against the canopy.)



- 6) The main deployment bag supplied with the JAVELIN has a velcro-closed split at each end. Open each end and lay the bag flat as shown in FIG. 4,

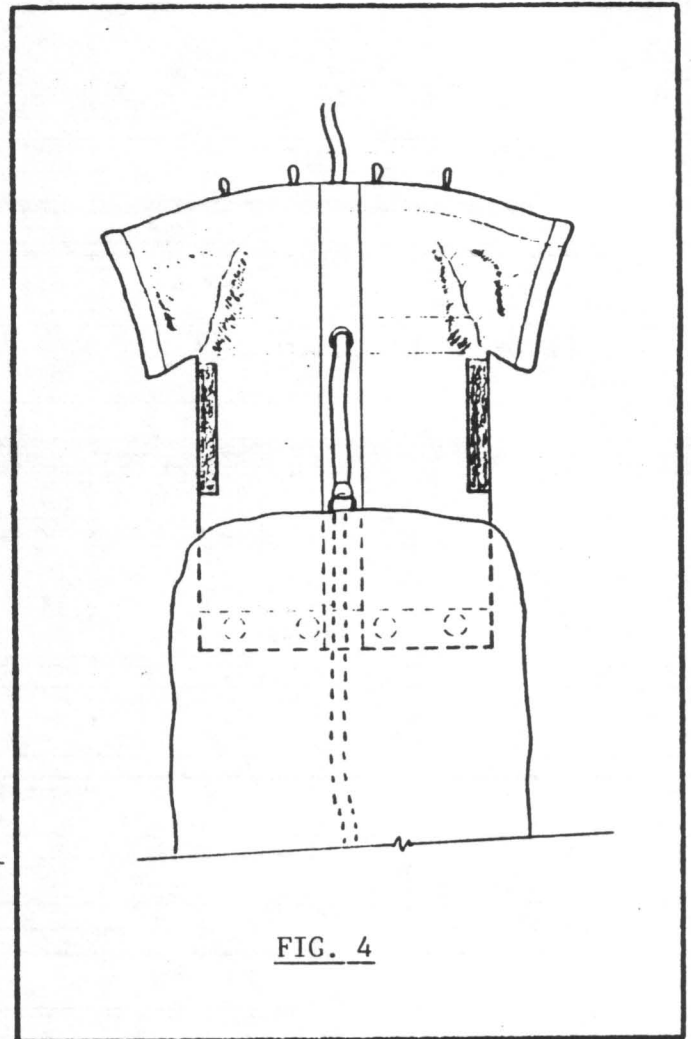


FIG. 4

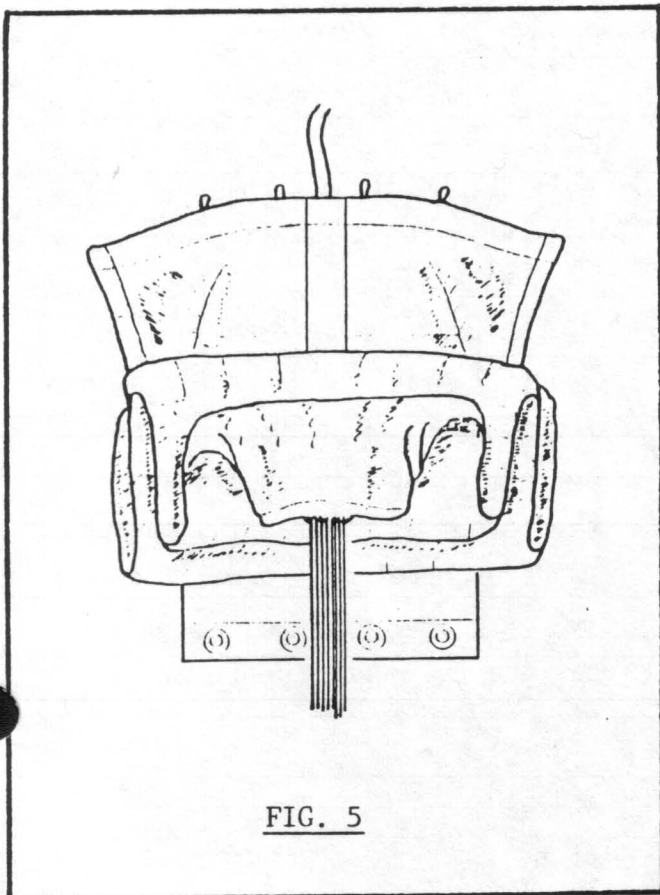


FIG. 5

then stack the canopy onto the bag as shown in FIG. 5. (The stack should be three to six inches wider than the bag.)

- 7) Make the locking stows with the suspension lines to close the mouth of the bag BEFORE closing the velcro split at each end. There are four locking stows; make the stows nearest the center first, then the stows nearer the corners (FIG. 6). After the locking stows have been made, stuff the canopy in at each end of the bag and mate the velcro to complete the closure of the bag. This technique fills the sides and corners of the bag and avoids the lump in the middle. (FIG. 7)

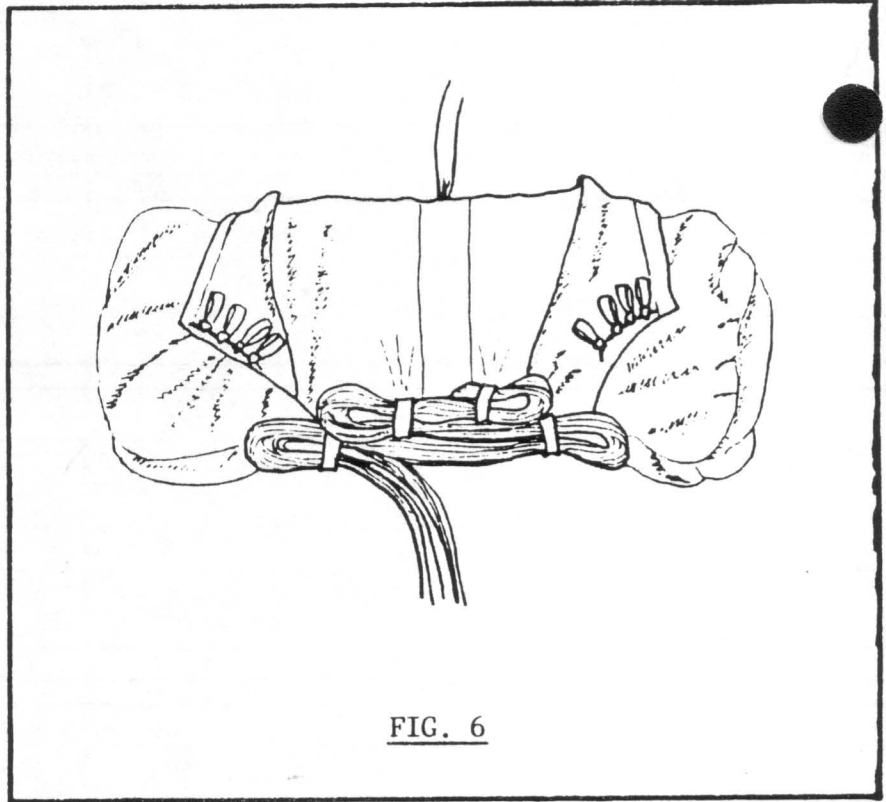


FIG. 6

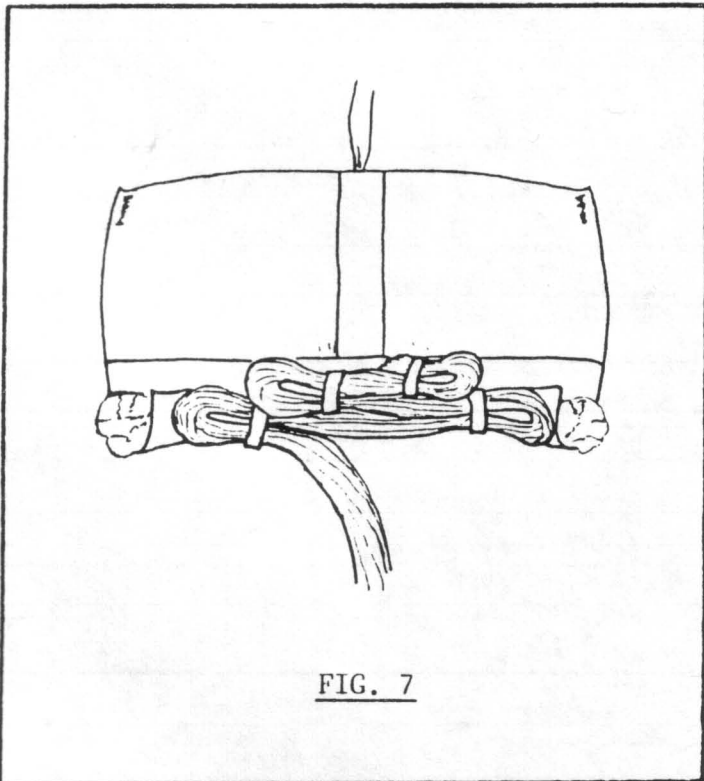


FIG. 7

- 8) Pull the bridle out the top of the bag until the metal ring of the canopy is seated against the grommet of the bag. Be sure there is no canopy fabric between the ring and the grommet. Now stow the remainder of the suspension lines across the bottom of the bag in the rubber bands at each end. Leave 12" to 15" of lines unstowed between the bag and the connector links.

- 9) Lay the risers in the "trough" between the sides of the reserve container and the riser covers, and place the connector links in the lower corners. Place the bag in the container with the line stows toward the bottom. This position is important; if the line stows are toward the top, it may be more difficult for the pilot chute to extract the bag. (FIG. 8)

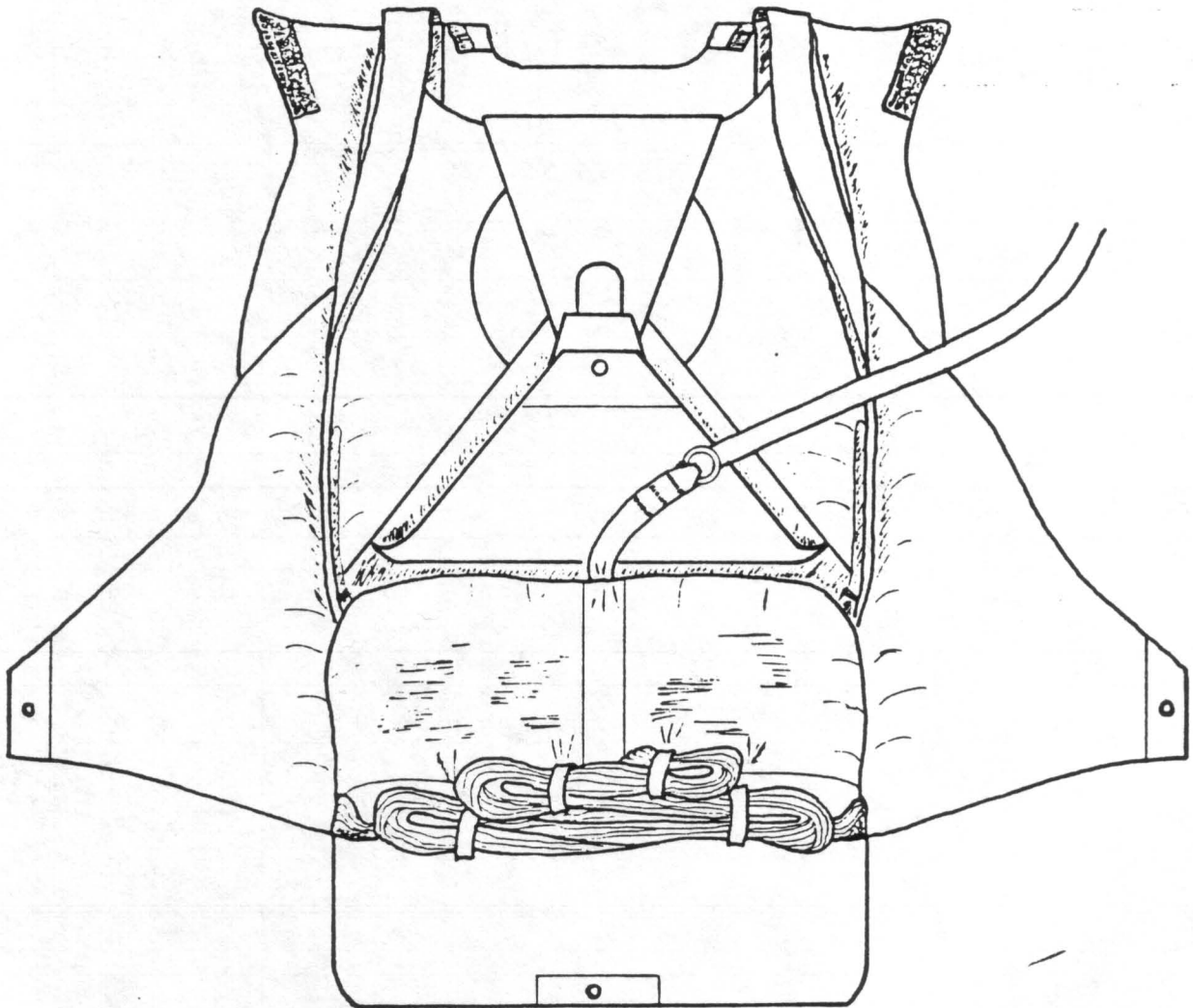


FIG. 8

10) Thread the pull-up cord through the closing loop and bring the closing loop over the top of the bag. The bridle should be routed to the right of the closing loop. Thread the pull-up cord through the bottom flap grommet and close the bottom flap (FIG. 9).

11) Close the top flap, keeping the bridle to the right (FIG. 10).

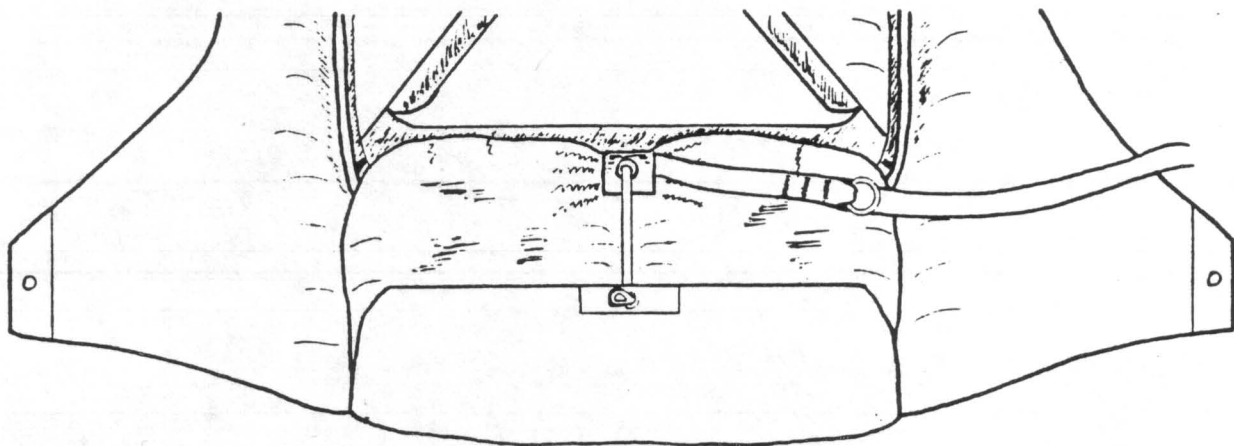


FIG. 9

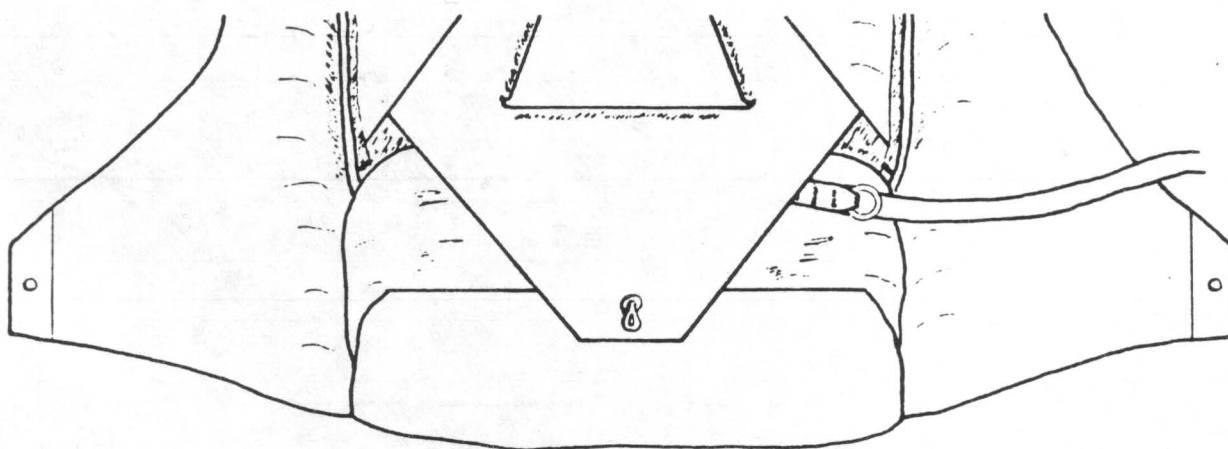
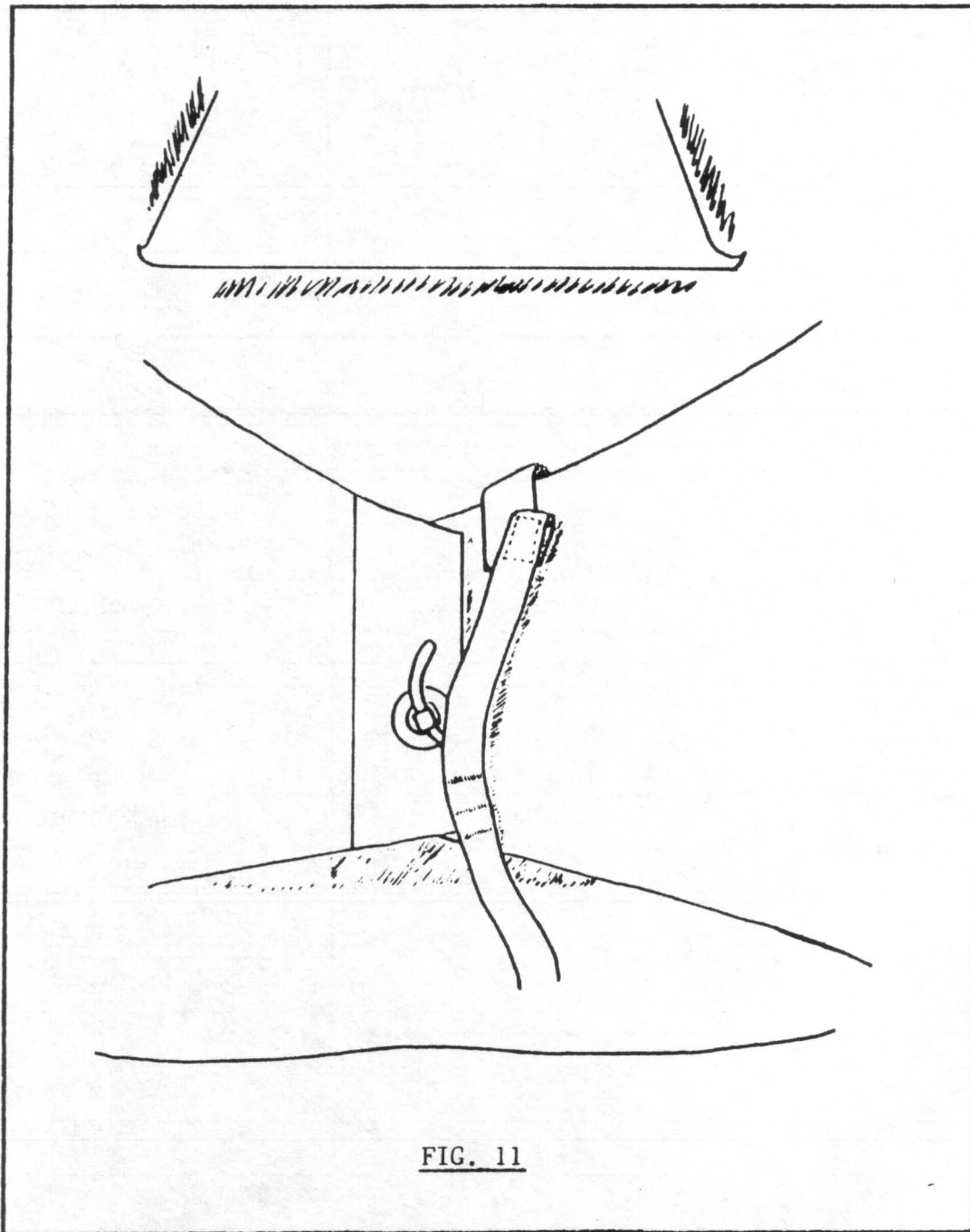


FIG. 10

- 12) Close the right side flap, then the left side flap, routing the bridle out the upper right side of the container. To close the container, insert the curved pin attached to the bridle into the closing loop. Remove the pull-up cord SLOWLY to avoid wearing the loop. Mate the two small velcro pieces together on the bridle just above the curved pin. This is very important; it assures that the pilot chute will have sufficient slack to extract the curved pin (FIG. 11).



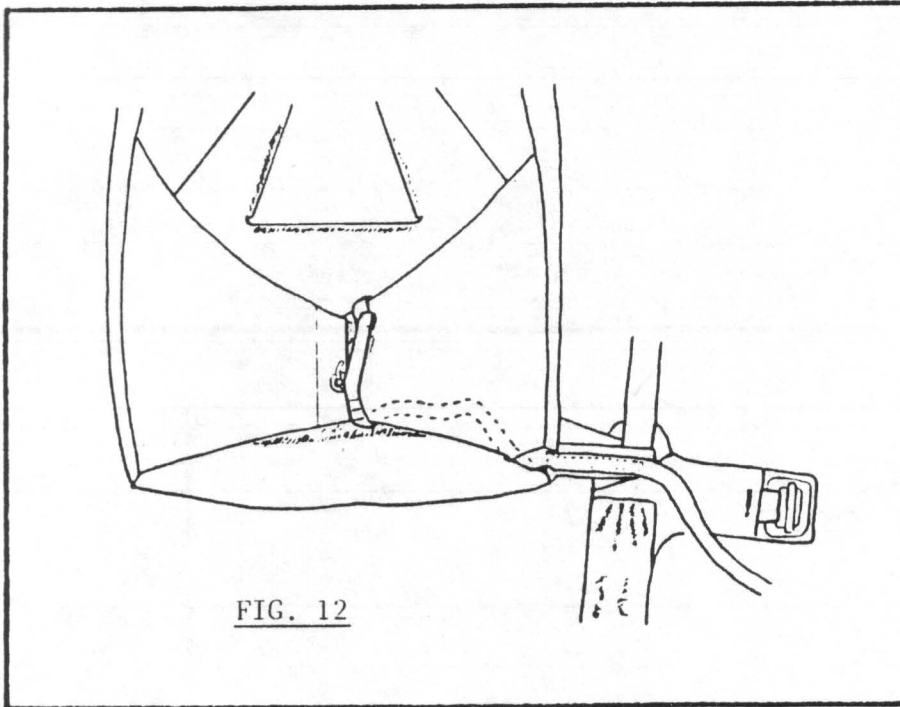


FIG. 12

- 13) Mate the velcro on the bridle to the velcro on the lower right side of the main container and harness-lateral. The excess bridle between this velcro and the curved pin should now be tucked under the right side flap (FIG. 12).

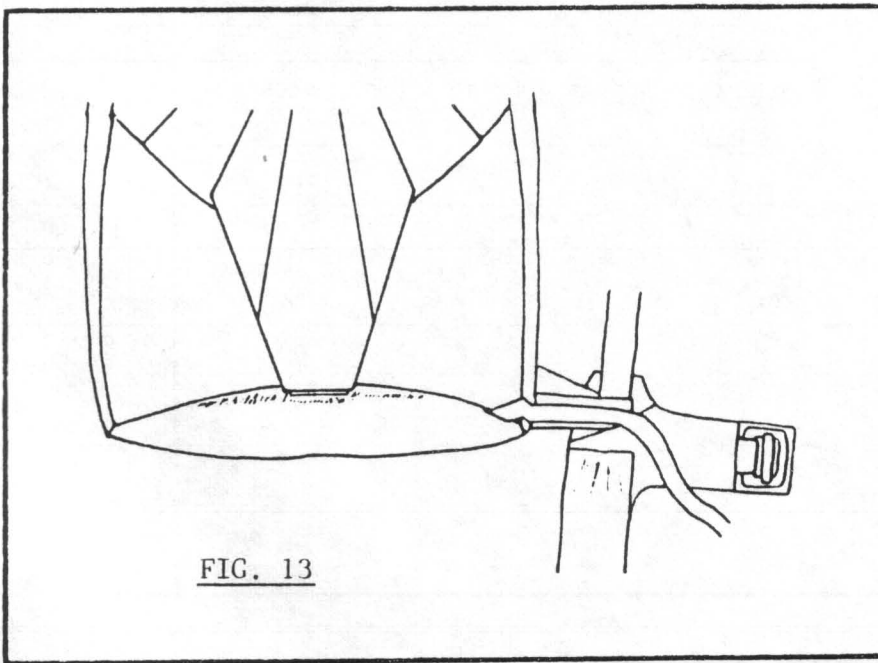


FIG. 13

- 14) Close the top flap protector by tucking the "tongue" underneath the flaps (FIG. 13). At this point be sure that the bridle goes from the container to the pilot chute without passing under or through any part of the harness.

15) Lay the pilot chute out flat with the mesh side up, and fold the pilot chute in half over the bridle (FIG. 14). Now fold the curved side up to a point just under the handle (FIG. 15).

16) Fold the pilot chute into thirds (FIG. 16), and then roll it tightly into a cylindrical shape (FIG. 17).

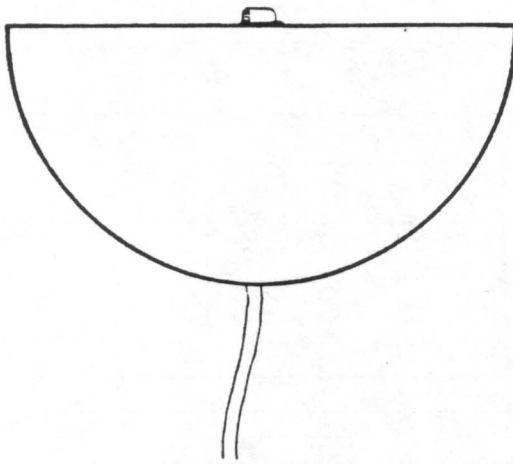


FIG. 14

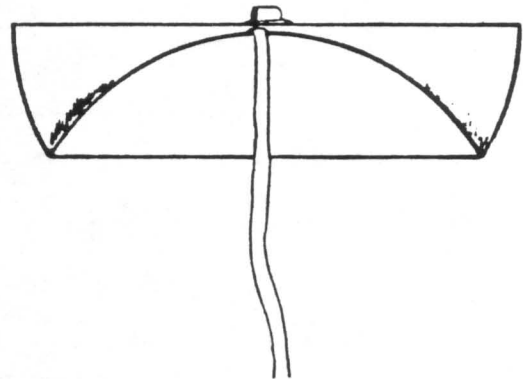


FIG. 15

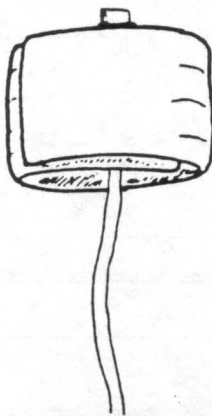
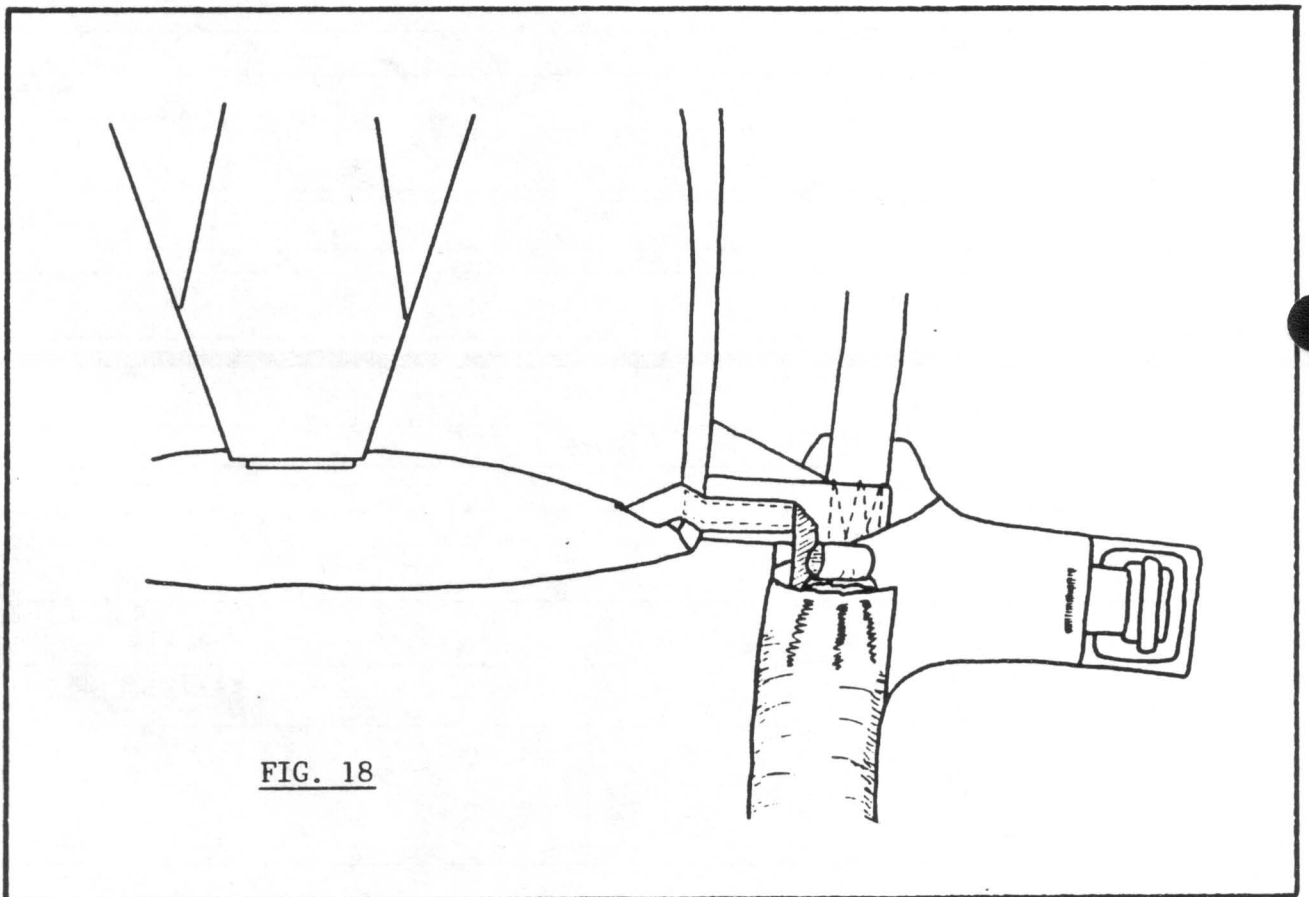


FIG. 16



FIG. 17

- 17) Using one or two fingers, push the bridle, one fold after another, into the pilot chute pouch. Start at the end nearest the harness, and continue until all the bridle is in the pouch. Then stuff the rolled pilot chute completely into the pouch, making sure that the handle sticks out the top for an easy grip. (FIG. 18).



18) Close the riser covers over the main risers (FIG. 19).

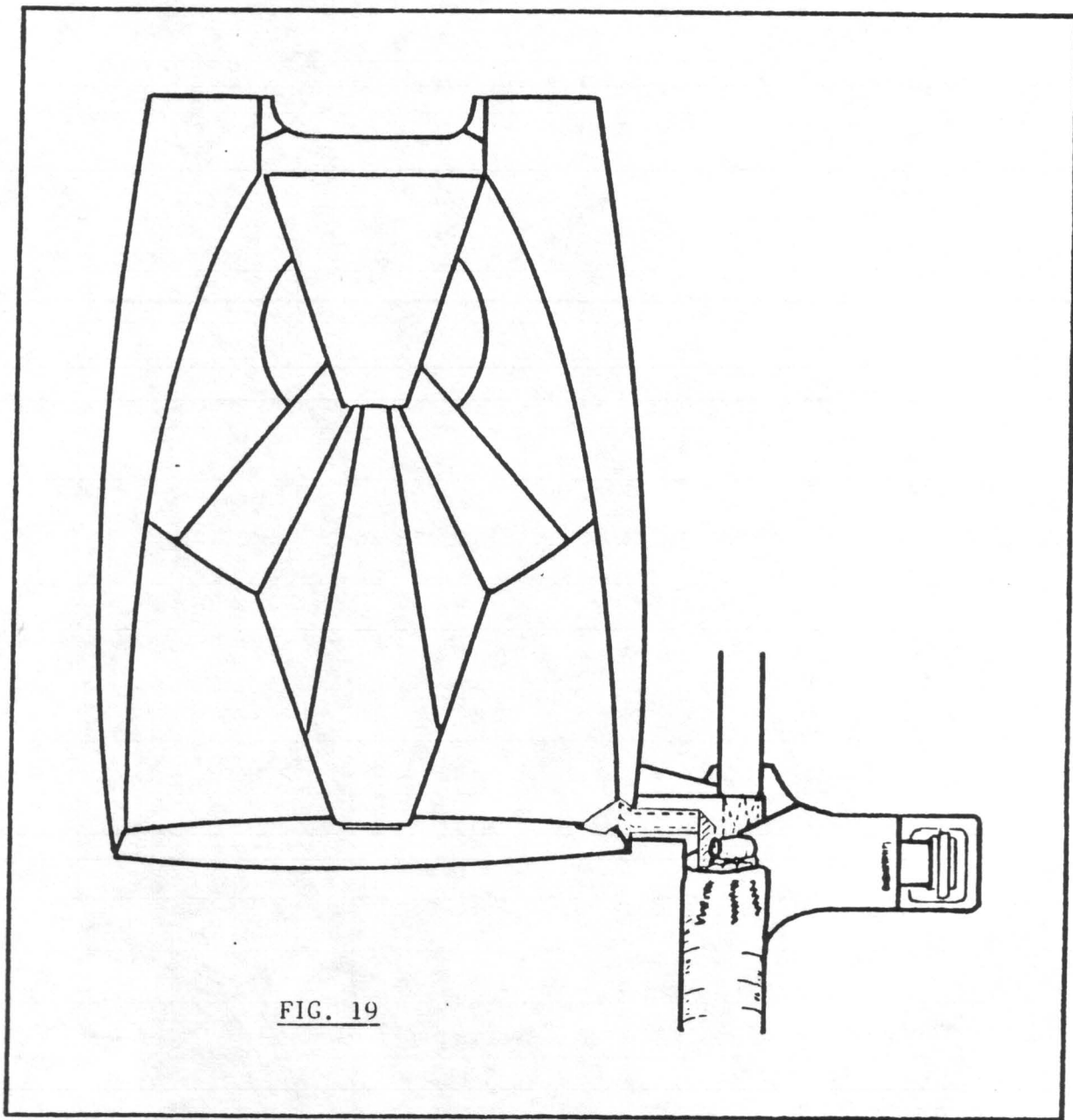


FIG. 19

JAVELIN

ROUND RESERVE PACKING INSTRUCTIONS

This chapter deals with the procedures for packing a round reserve canopy into the JAVELIN harness/container system. Assembly and packing of the reserve must be accomplished by an FAA certified Senior Rigger or Master Rigger, or by the manufacturer of the harness/container system.

REQUIRED TOOLS:

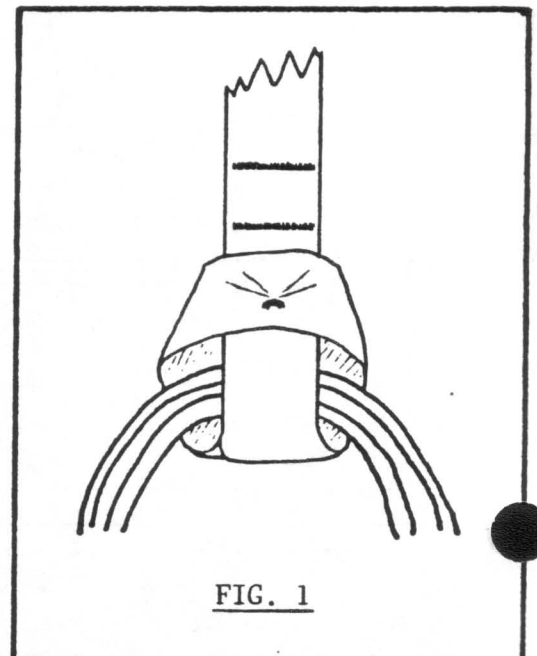
- One temporary pin (preferably with warning flag attached)
- One pull-up cord (48" minimum length)
- One packing paddle or "long bar"

OPTIONAL TOOL:

.22 calibre rifle cleaning rod

- 1) Make a thorough inspection of all components of the reserve parachute:
 - a) Reserve pilot chute
 - b) Reserve bridle
 - c) Reserve canopy, lines, connector links
 - d) Harness/container system

- 2) Attach the bridle to the apex of the reserve canopy. The smaller loop of the bridle should be used at the apex, and the loop should be tacked securely with enough slack so that the loop will not bind the apex lines. The apex lines must be able to move freely thru the bridle attachment (FIG. 1). The large loop of the bridle must then be attached to the pilot chute. (Only the JAVELIN reserve pilot chute may be used with the JAVELIN harness/container system. Do not substitute any other pilot chute.)



- 3) Follow the canopy manufacturer's directions for the inspection, attachment to risers, routing of control lines (if present), and for flaking the reserve canopy.

- 4a) If the canopy is equipped with a full diaper, all stows of the suspension lines will be made on the diaper. Do this in accordance with the canopy manufacturer's directions. Then lay the risers in the reserve container so that the connector links are in the lower corners (FIG. 2), and go to STEP 5.

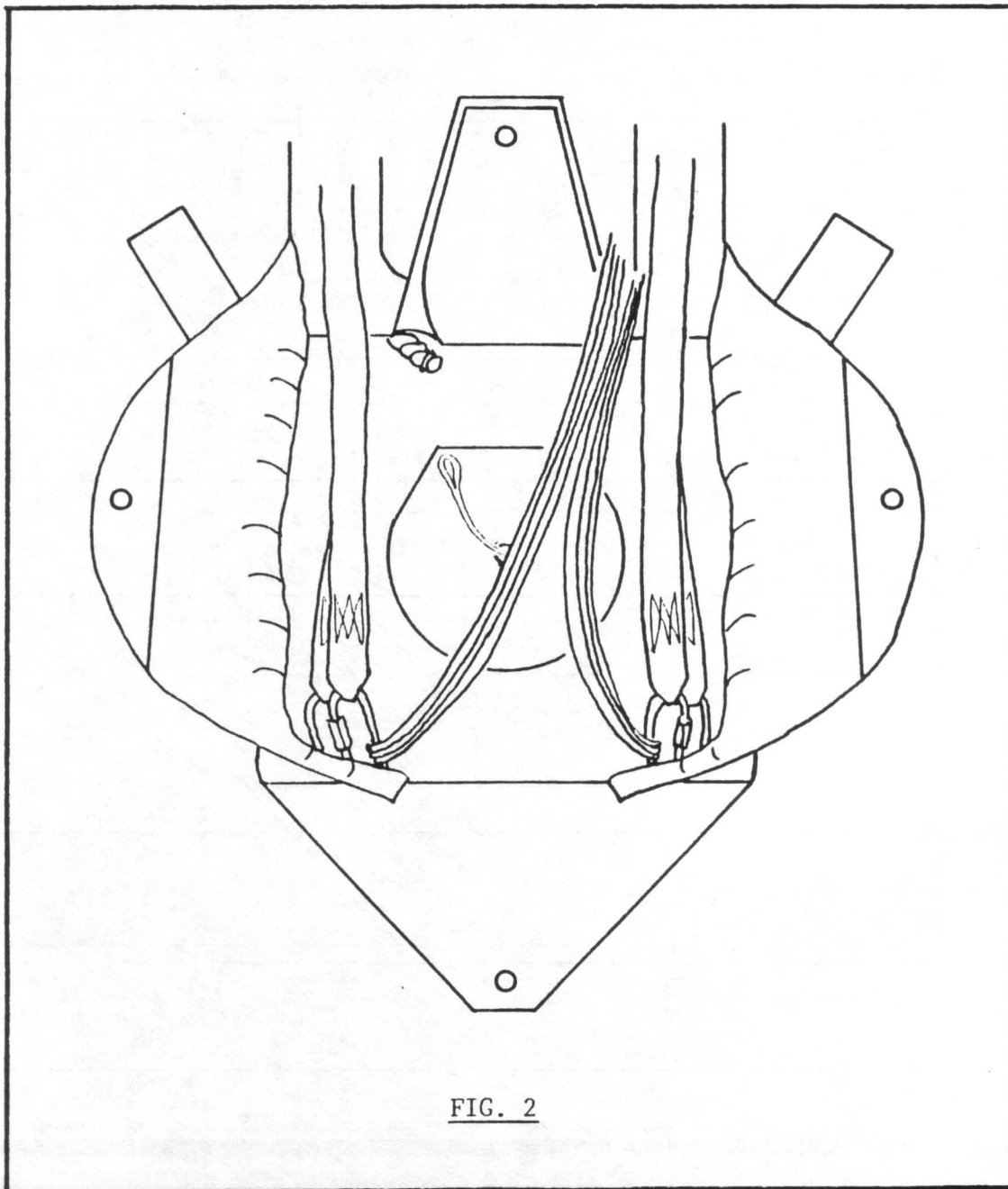


FIG. 2

- 4b) If the reserve canopy has no diaper, or is equipped with only a partial diaper, the suspension lines must be stowed in the container. Lay the risers in the container so that the connector links are in the lower corners(FIG. 2), and make the first stow of suspension lines in the lower left corner. Continue upward, making the stows the full width of the pack tray. (FIG. 3).

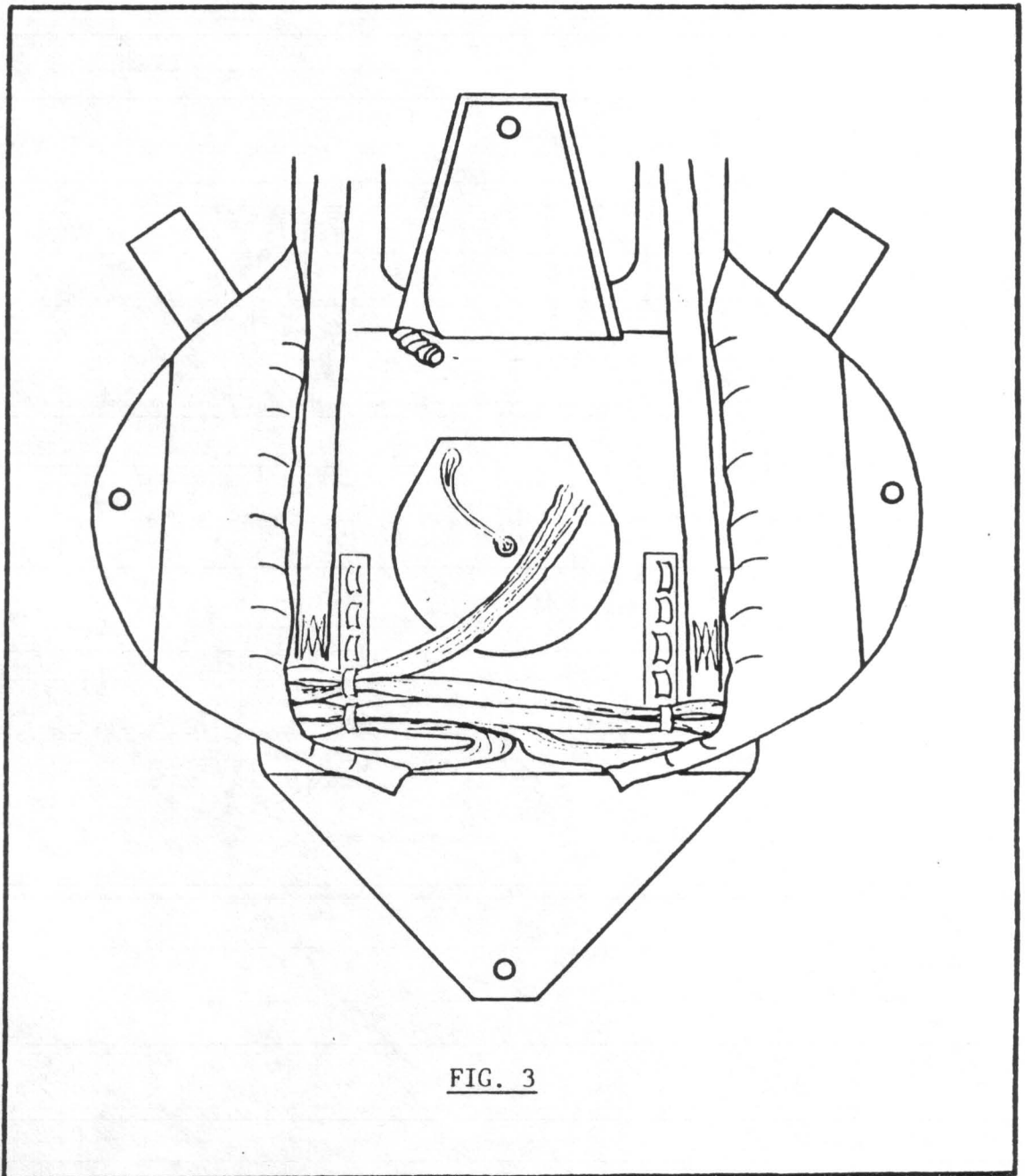


FIG. 3

- 6) Fold the canopy up and down the right side of the container, then make a fold across the bottom of the container, on top of the diaper or skirt (FIG. 5).

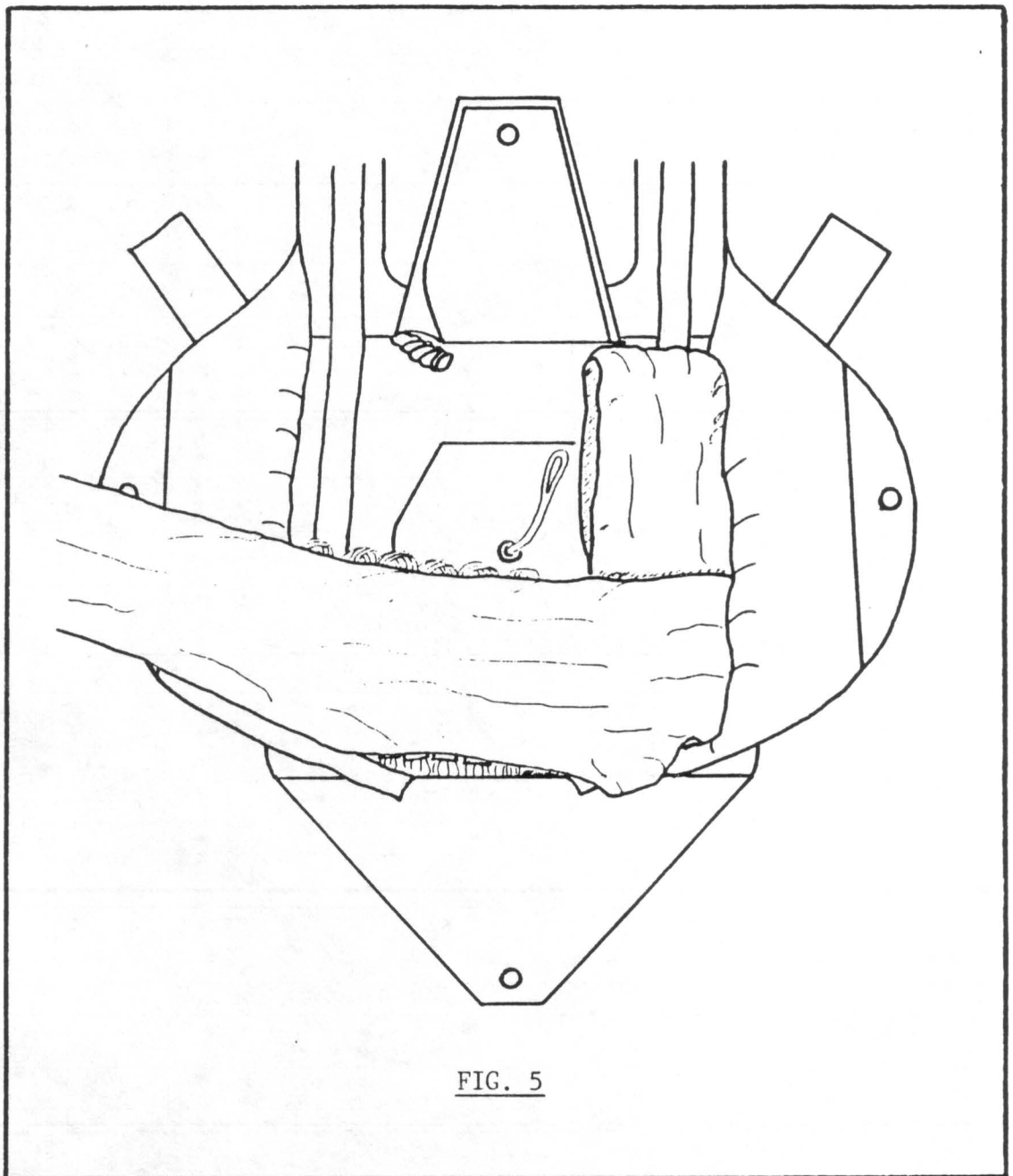


FIG. 5

The distribution of bulk may vary with the size of the canopy or the shape of the container, and it is left to the rigger's discretion how many folds to make on each side and how many times the canopy may be folded across the bottom of the container. As long as the stack is basically "U" shaped and the bulk of the stack is kept away from the center of the container, the pack is more likely to be correctly shaped after the flaps have been closed.

A HELPFUL HINT

Be sure that the lower corners of the reserve container are filled as you fold the canopy into the container. If there is slack in the lower corners, it may be difficult to close the container or to make the container look neat after it has been closed.

ONE NOTE OF CAUTION:

Do not stuff the apex of the canopy down into the lower corner of the reserve container. Doing so might delay (or even prevent) extraction of the apex by the pilot chute.

- 8) Thread the pull-up cord through the closing loop and close each side flap in turn, routing the bridle out the bottom of the container. Try to keep the bulk of the canopy away from the center of the container while closing the side flaps. Secure the side flaps with the temporary pin (FIG. 7), then push the tuck flaps in under the folded canopy at the upper edge of each side flap.

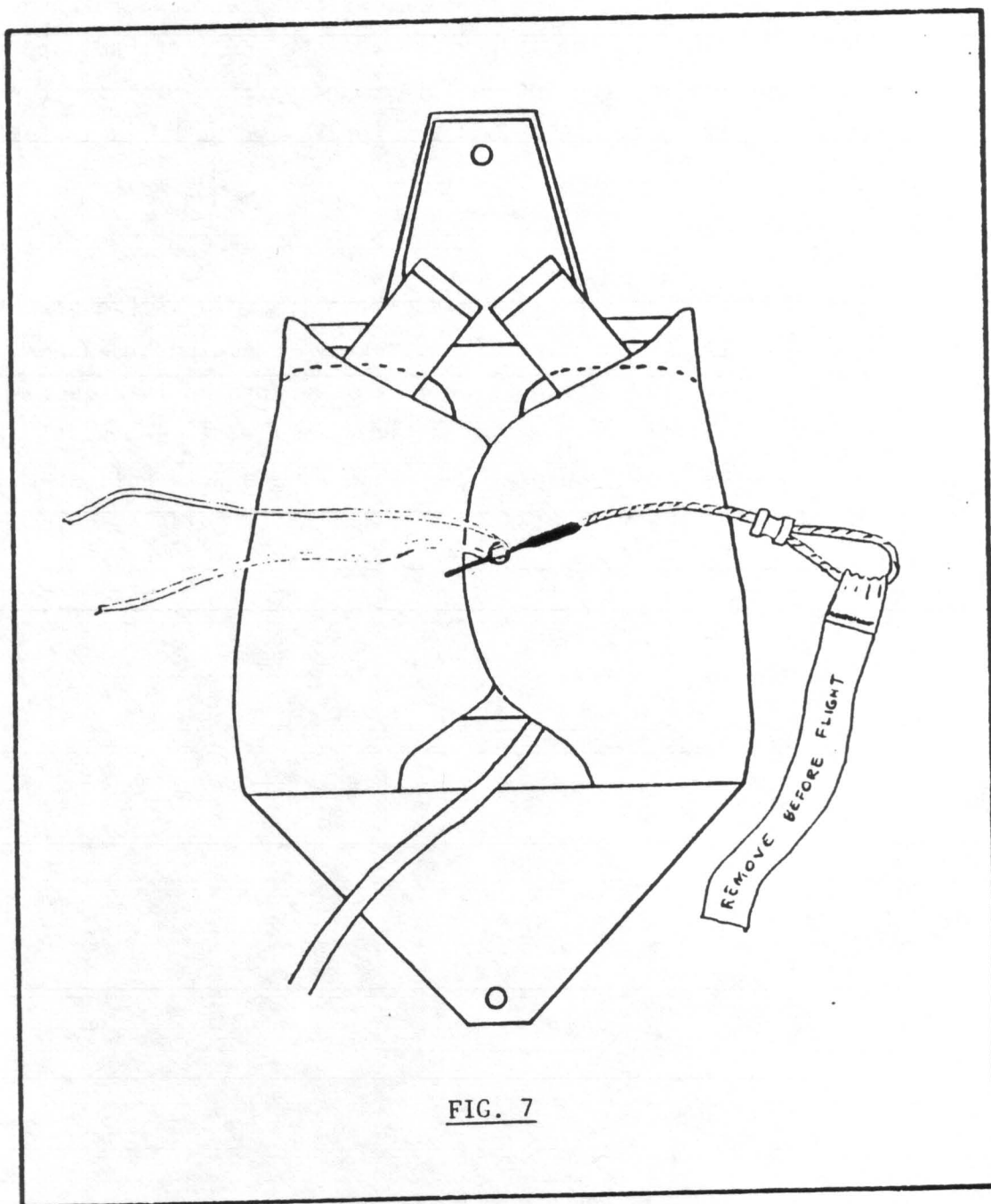


FIG. 7

- 9) Pass the pull-up cord up through the pilot chute and out through the top plate. (This is easily accomplished with the .22 calibre rifle cleaning rod mentioned as an optional tool.) Seat the lower end of the pilot chute on top of the side flaps, and keeping the pull-up cord tight, compress the pilot chute and lock it with the temporary pin. Now pull all the fabric out from under the top plate so that the pilot chute canopy appears round. At this point check the length of the closing loop. If the pilot chute top plate can rock back and forth or from side to side, the loop is too long. Shorten the loop so that when the pilot chute is compressed and locked with the temporary pin, the top plate will be firmly seated in the "nest" formed by the "U" shape of the stacked canopy.
- 10) On each side of the top plate make a roll or fold in the pilot chute fabric parallel to the side of the reserve container, and push this roll under the top plate. Fold the bridle in accordion folds across the bottom of the container on top of the side flaps. The width of the folds will vary with the width of the container; a simple rule-of-thumb is: "make the folds as wide as possible, but not so wide as to be seen after the bottom flap has been closed". (FIG. 8)

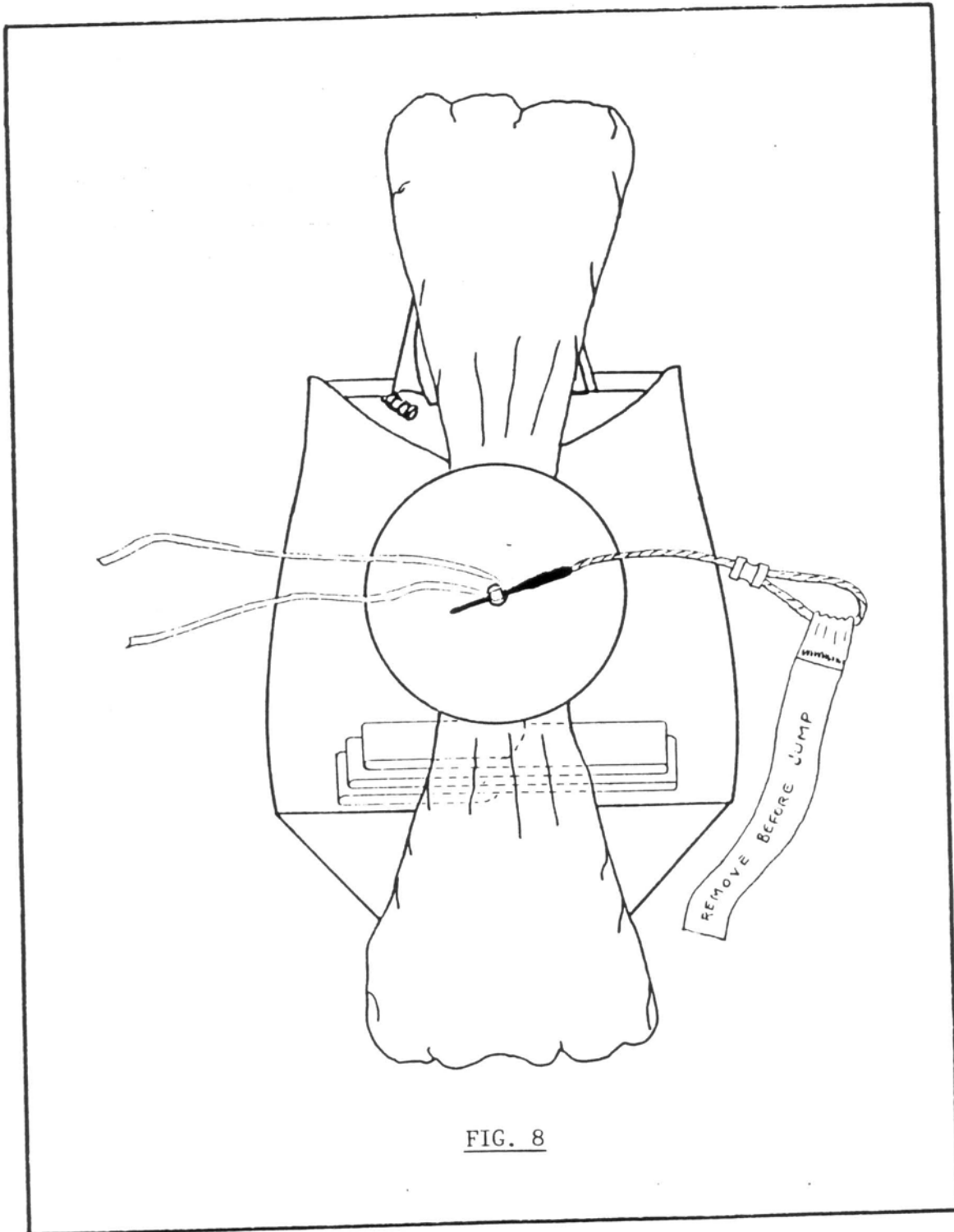


FIG. 8

- 11) Part of the lower half of the pilot chute which now extends downward can be tucked under the top plate (but not so much as to cause the top plate to tilt forward). The rest should be arranged in a loose fold or roll and laid on top of the folded bridle. Close the bottom flap and secure it with the temporary pin. (FIG. 9).

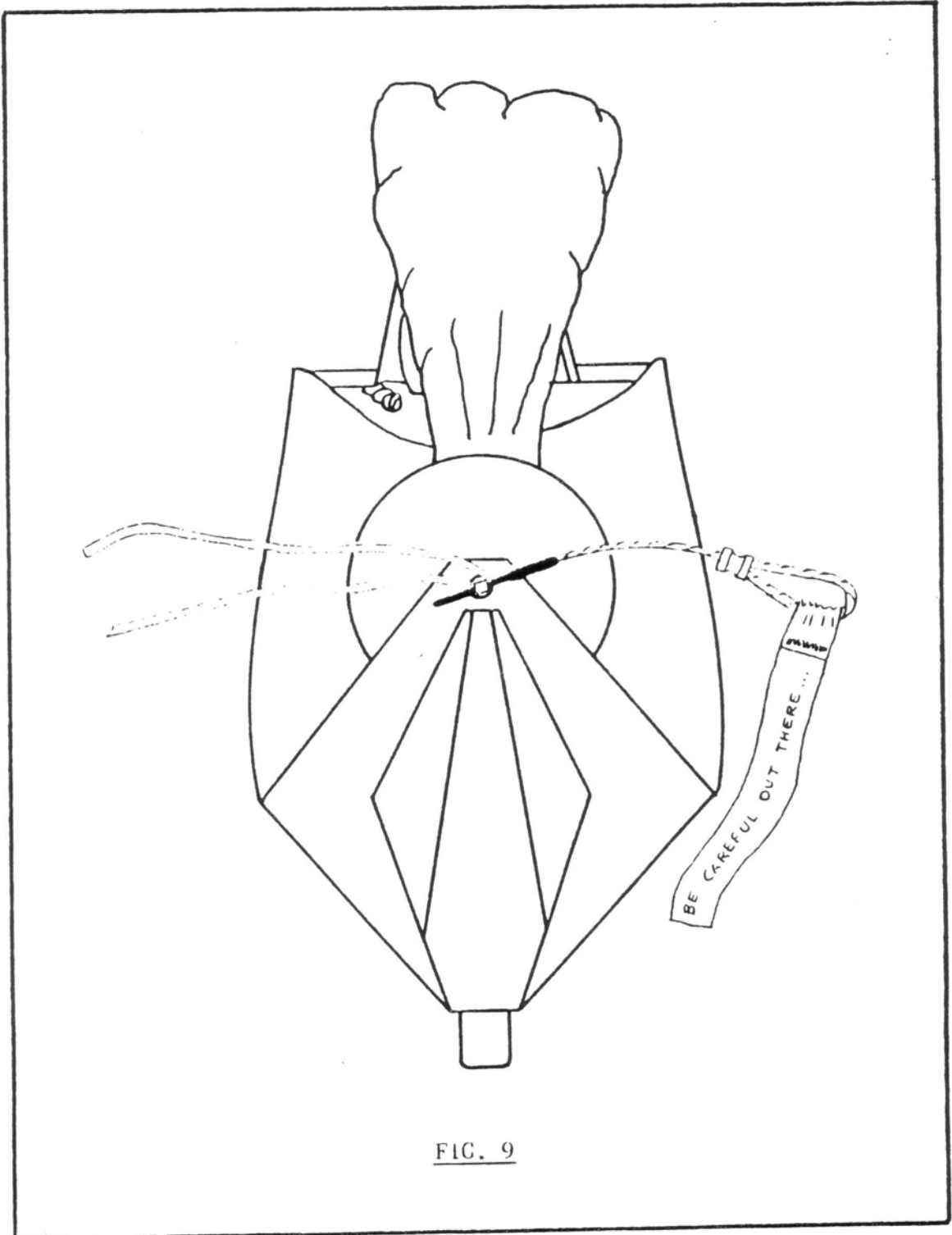


FIG. 9

12) The pilot chute fabric extending upward from under the top plate can now be pushed into a narrow, loose roll and placed in the space just under the top closing flap between the folds of canopy. Be careful not to tuck any of this pilot chute fabric back under the side flaps; this would tend to retard the launch of the pilot chute. Close the top flap and secure it with the ripcord pin. (Be sure that your temporary pin is accounted for at this time!) (FIG. 10) Insert the ripcord handle into its velcro pocket just below the chest strap on the inboard edge of the left main lift web.

13) Seal the reserve container and log the work done on the packing data card and in your rigger's log-book. Place the completed data card in the pocket provided on the underside of the reserve top flap cover.

14) COUNT YOUR TOOLS.

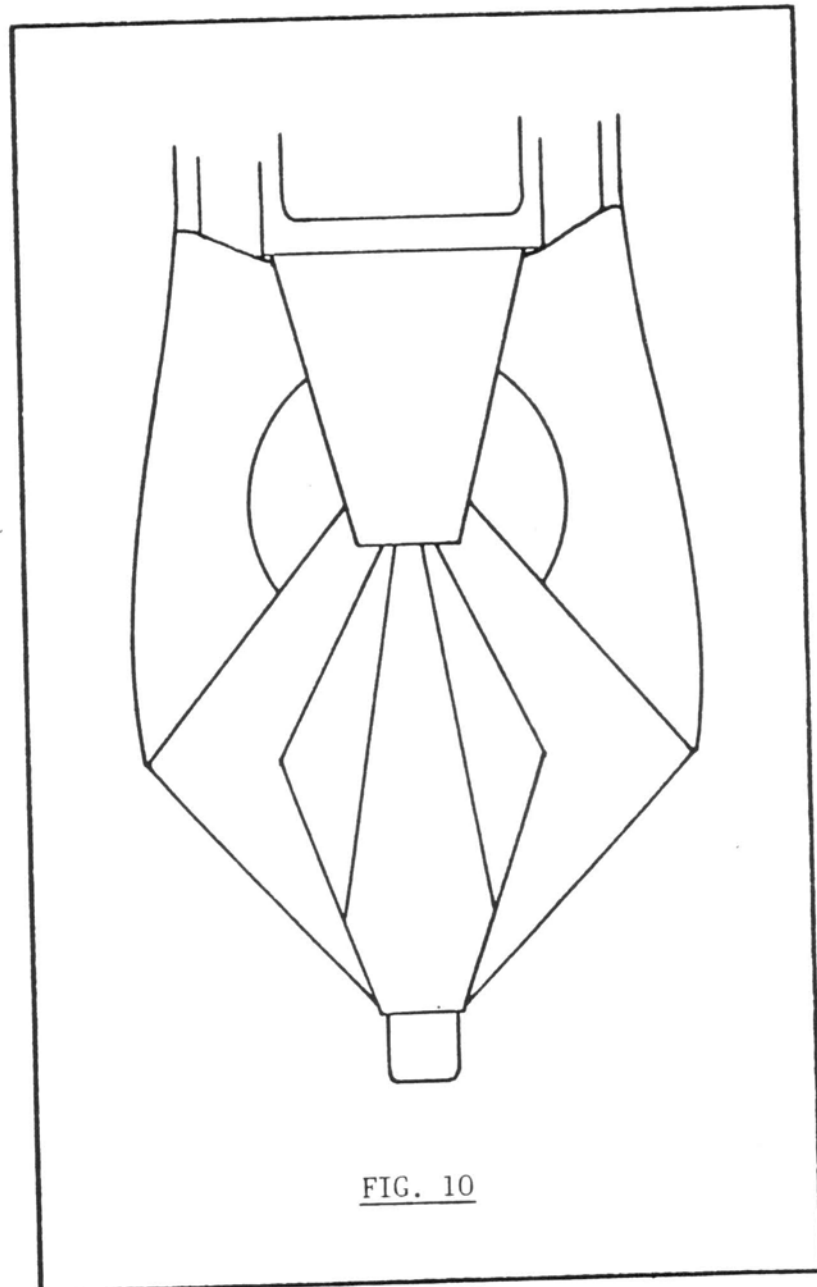


FIG. 10

JAVELIN HARNESS/CONTAINER SYSTEM

RAM-AIR RESERVE PACKING INSTRUCTIONS

This chapter deals with the procedures for packing a ram-air reserve canopy into the JAVELIN harness/container system. Assembly and packing of the reserve must be accomplished by an FAA certified Senior Rigger or Master Rigger, or by the manufacturer of the harness/container system.

REQUIRED TOOLS:

- One temporary pin (preferably with warning flag attached)
- One pull-up cord (48" minimum length)
- One packing paddle or "long bar"

OPTIONAL TOOLS:

- .22 calibre rifle cleaning rod
- Two 6-inch strips of 1" velcro loop

- 1) Make a thorough inspection of all components of the reserve parachute
 - a) Reserve pilot chute
 - b) Reserve bridle
 - c) Free-bag
 - d) Reserve canopy, lines, slider, connector links
 - e) Harness/container system
- 2) Follow the canopy manufacturer's directions for the inspection, attachment to risers, routing of control lines, attachment of control toggles, setting deployment brakes, and for flaking and folding the reserve canopy.
- 3) If the manufacturer of the ram-air reserve canopy uses a "conventional" packing method, the canopy should look similar to FIG. 1 after it has been flaked and folded. If the manufacturer of the ram-air reserve canopy recommends the "PRO-PACK", the canopy will resemble FIG. 2. In either case, it will be necessary at this point to spread the top end of the canopy into halves by pushing down into the center from the top and spreading it outward into a "V" shape. (See FIG. 3.)

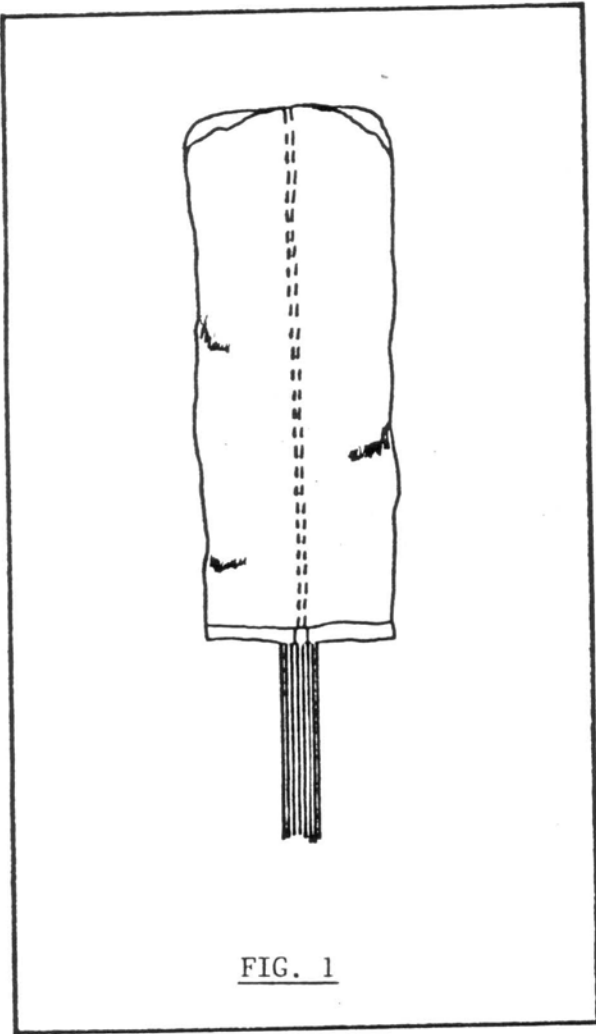


FIG. 1

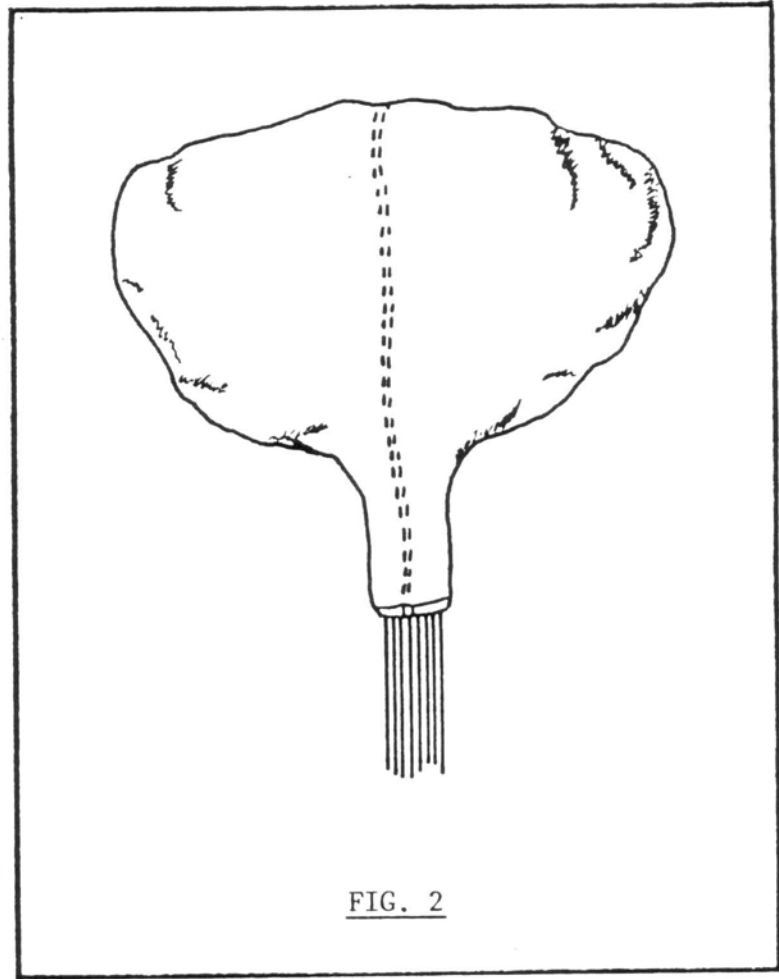


FIG. 2

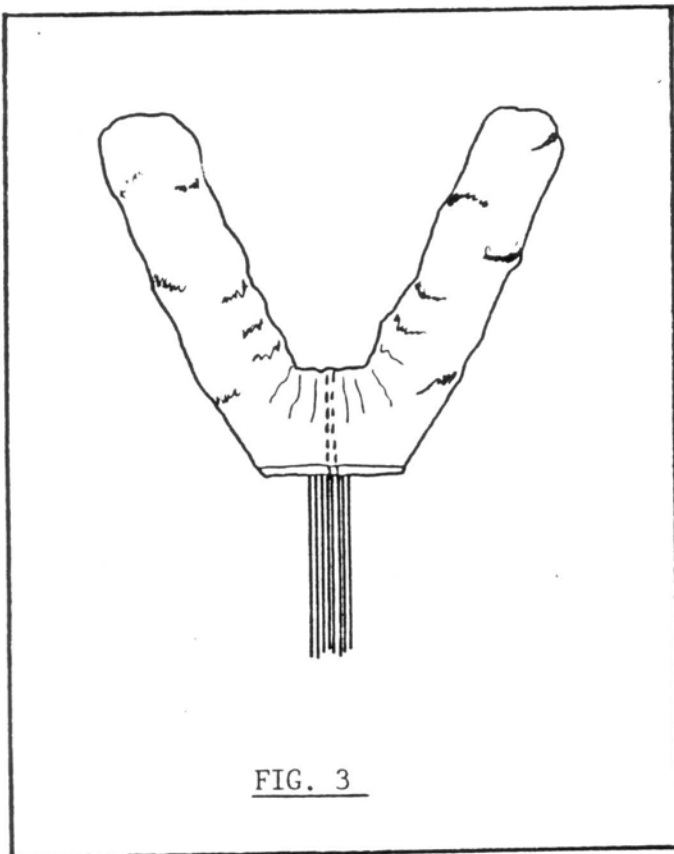


FIG. 3

To keep the canopy symmetrically divided, use the seam in the top of the center cell as a reference. At this point be sure that the slider is as far up as it will go against the slider stops.

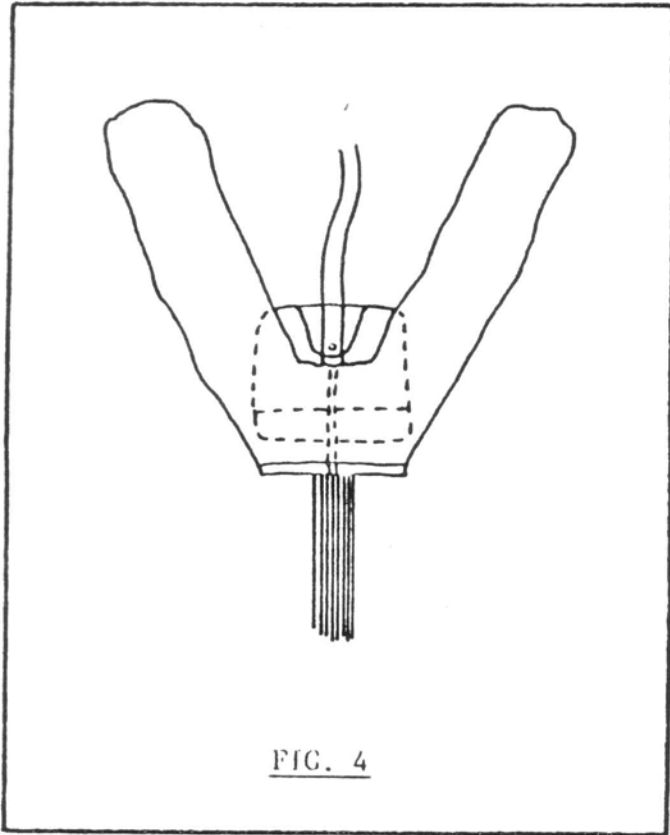


FIG. 4

4) Place the reserve deployment bag in the "V" formed by the canopy as shown in FIG. 4. Do not substitute any other deployment bag. Only the JAVELIN "molar" bag may be used in the JAVELIN harness/container system.

Stuff each half of the canopy into its respective side of the upper part of the bag. (It may be helpful to kneel on the lower part of the canopy with the closing flap under it to keep the bag in position while stuffing its "ears".) (See FIG. 5.) After stuffing the ears of the bag as much as is practical, the remainder of the canopy (and the slider) can now be pushed or folded into the center-bottom of the bag.

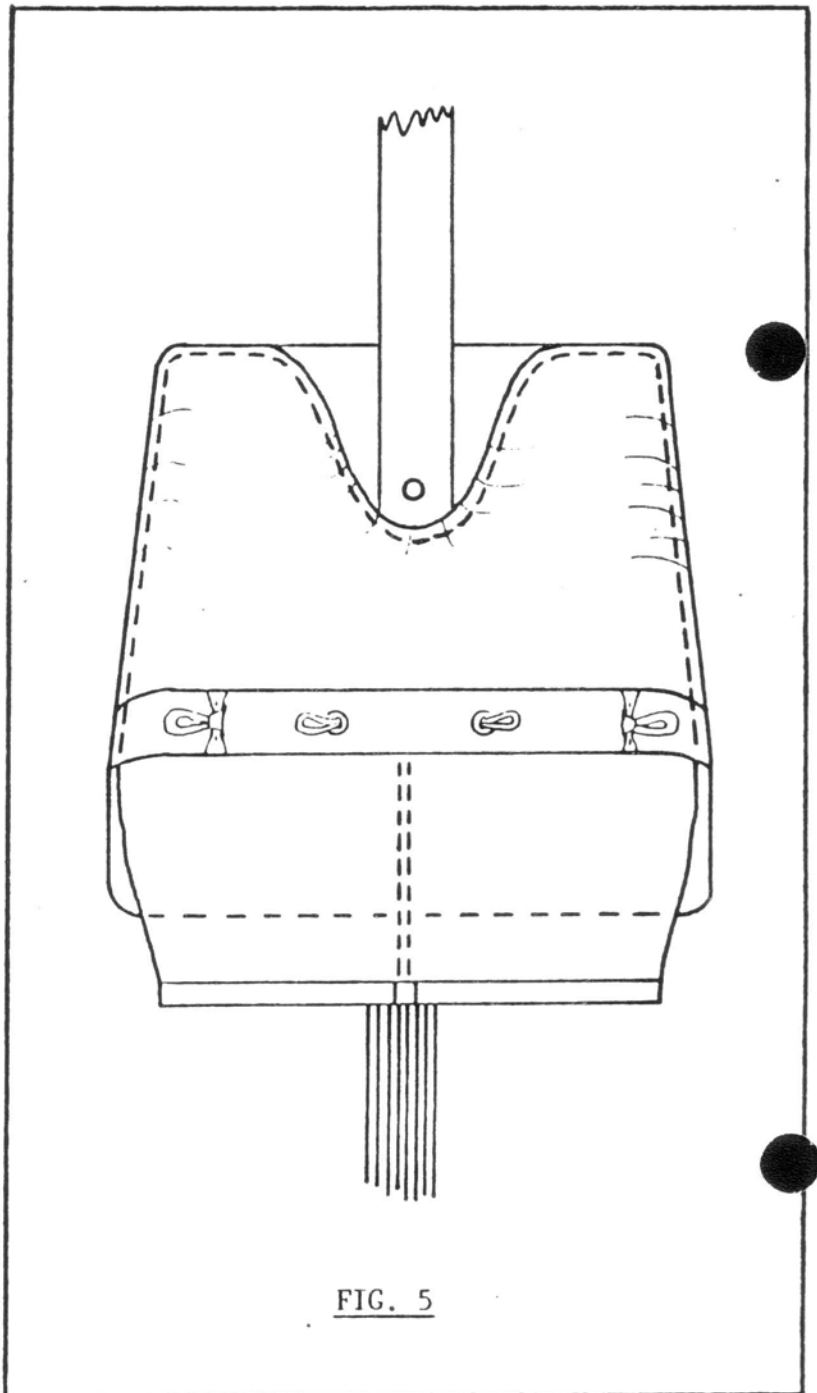


FIG. 5

- 5) Lock the mouth of the bag by making two stows with the suspension lines in the "safety-stow". (This is the loop made of 1/8" shock cord.) The third and fourth locking stows are made in rubber bands close to the sides of the bag (FIG. 6).

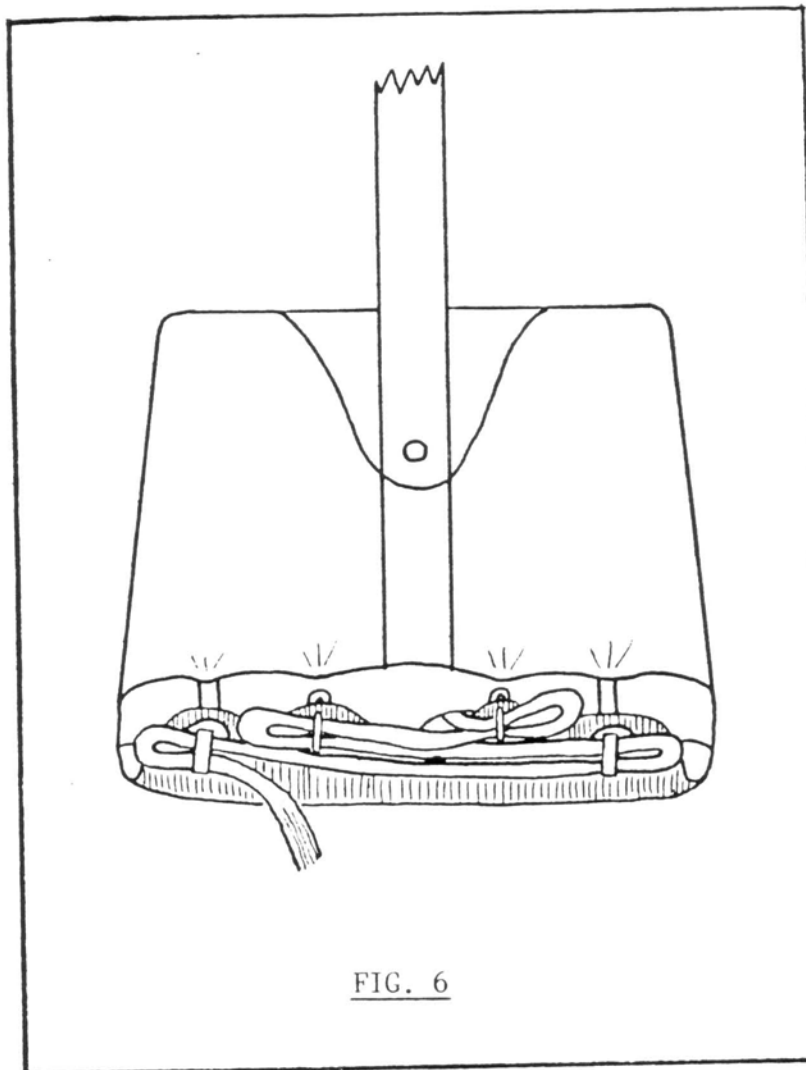


FIG. 6

- 6) After the four locking stows are made, stow the remainder of the suspension lines (to within 6" to 12" of the connector links) in the line-stow pouch on the back of the bag. This is where it is useful to use the velcro strips mentioned in the list of optional tools. Cover the hook velcro on the pouch with the strips of loop velcro while stowing the lines in the pouch. Make the "S" folds of the lines the full width of the pouch. To close the pouch, remove the strips of loop velcro and mate the velcro at the mouth of the pouch, being sure that none of the suspension lines are captured by the closure (FIG. 7).

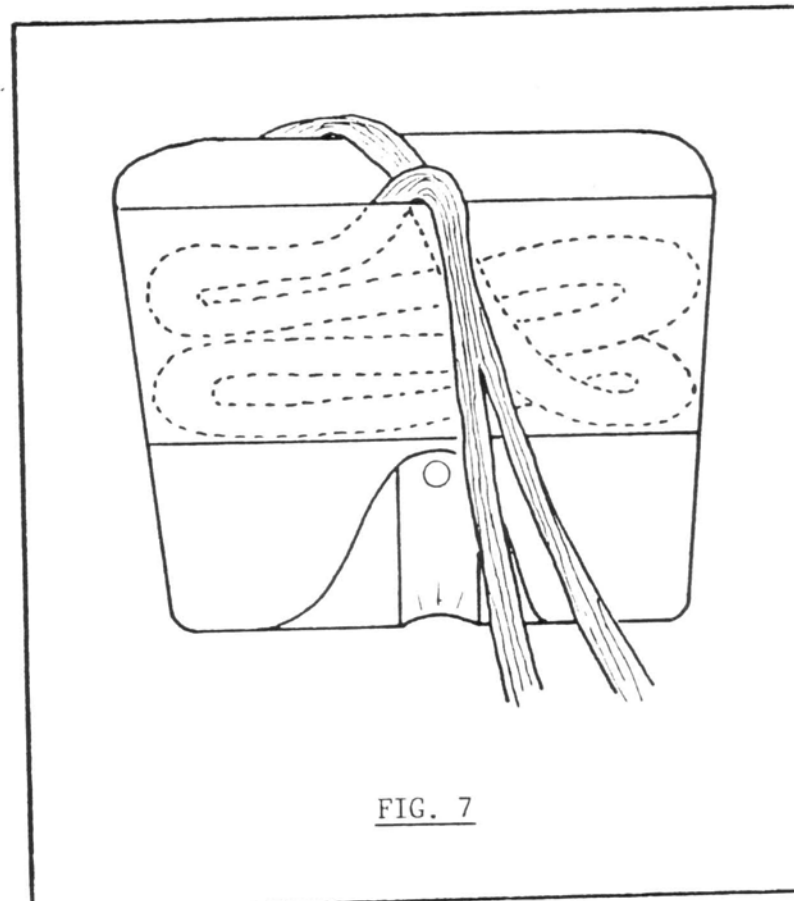
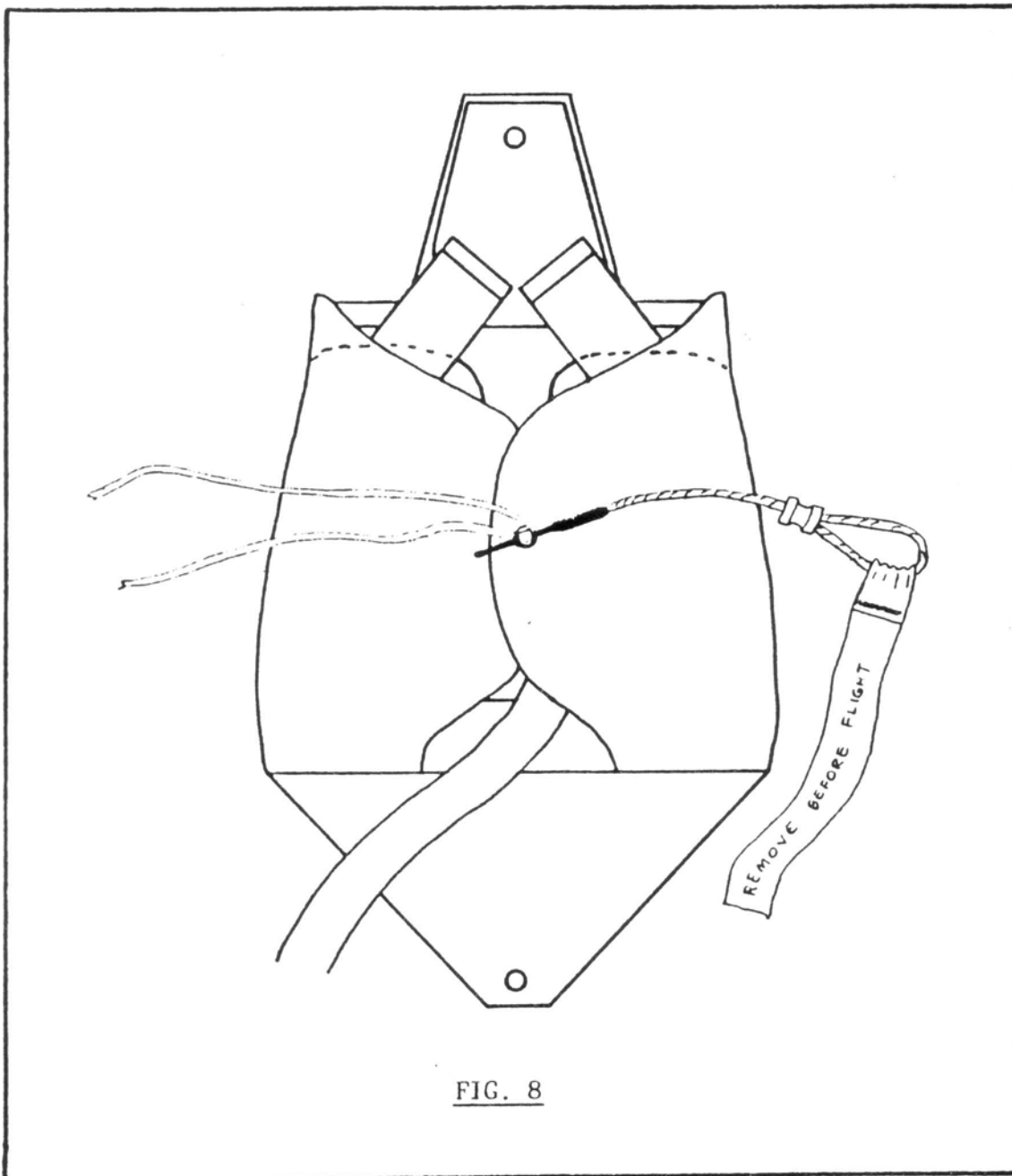


FIG. 7

- 7) Lay the reserve risers in the container so that the connector links are in the lower corners of the container. Pass the pull-up cord thru the closing loop, then thread it thru the grommet in the bag. Lay the bag in the container with the line-stow pouch on the under side, and route the bridle back along either side of the closing loop. Close each side flap in turn, securing the flaps with the temporary pin. Push the tuck flaps under the ears of the bag. The bridle should now exit the container at the bottom (FIG. 8).



- 8) Pass the pull-up cord up through the pilot chute and out through the top plate. (This is easily accomplished with .22 calibre rifle cleaning rod mentioned in the list of optional tools.) Seat the lower end of the pilot chute on top of the side flaps, and keeping the pull-up cord tight, compress the pilot chute and lock it with the temporary pin. Now pull all the fabric out from under the top plate so that the pilot chute canopy appears round. At this point check the length of the closing loop.. If the pilot chute top plate can rock back and forth or from side to side, the loop is too long. Shorten the loop so that when the pilot chute is compressed and locked with the temporary pin, the top plate will be firmly seated in the "nest" formed by the "molar" shape of the bag and the side flaps.

- 9) On each side of the top plate make a roll or fold in the pilot chute fabric parallel to the side of the reserve container, and push this roll under the top plate. Fold the bridle in accordian folds across the bottom of the container on top of the side flaps. The width of the folds will vary with the width of the container; a simple rule-of-thumb is, "Make the folds as wide as possible, but not so wide as to be seen when the bottom flap is closed". (See FIG. 9.)

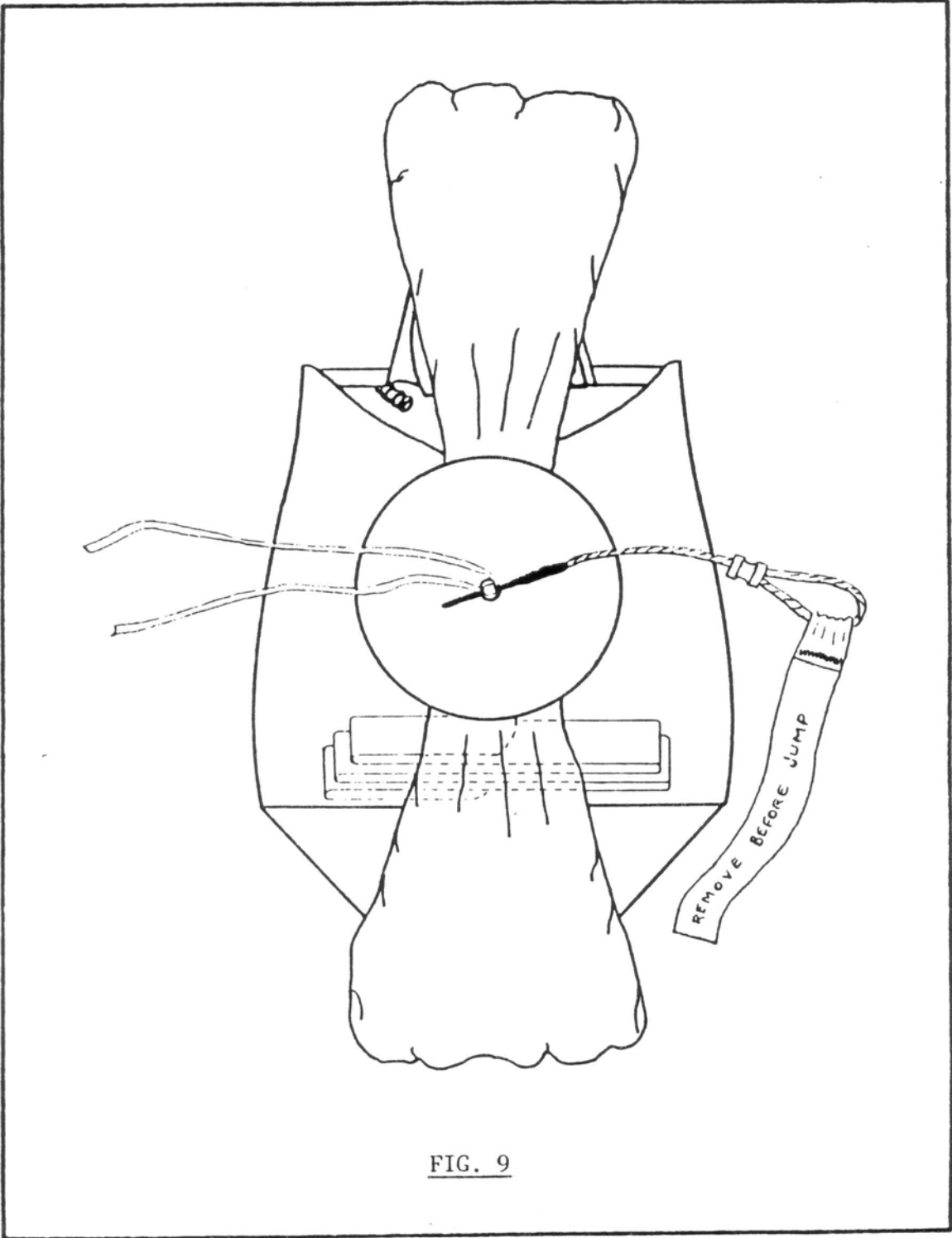


FIG. 9

- 10) Part of the lower half of the pilot chute which now extends downward can be tucked under the top plate (but not so much as to cause the top plate to tilt forward). The rest should be arranged in a loose fold or roll and laid on top of the folded bridle. Close the bottom flap and secure it with the temporary pin (FIG. 10).

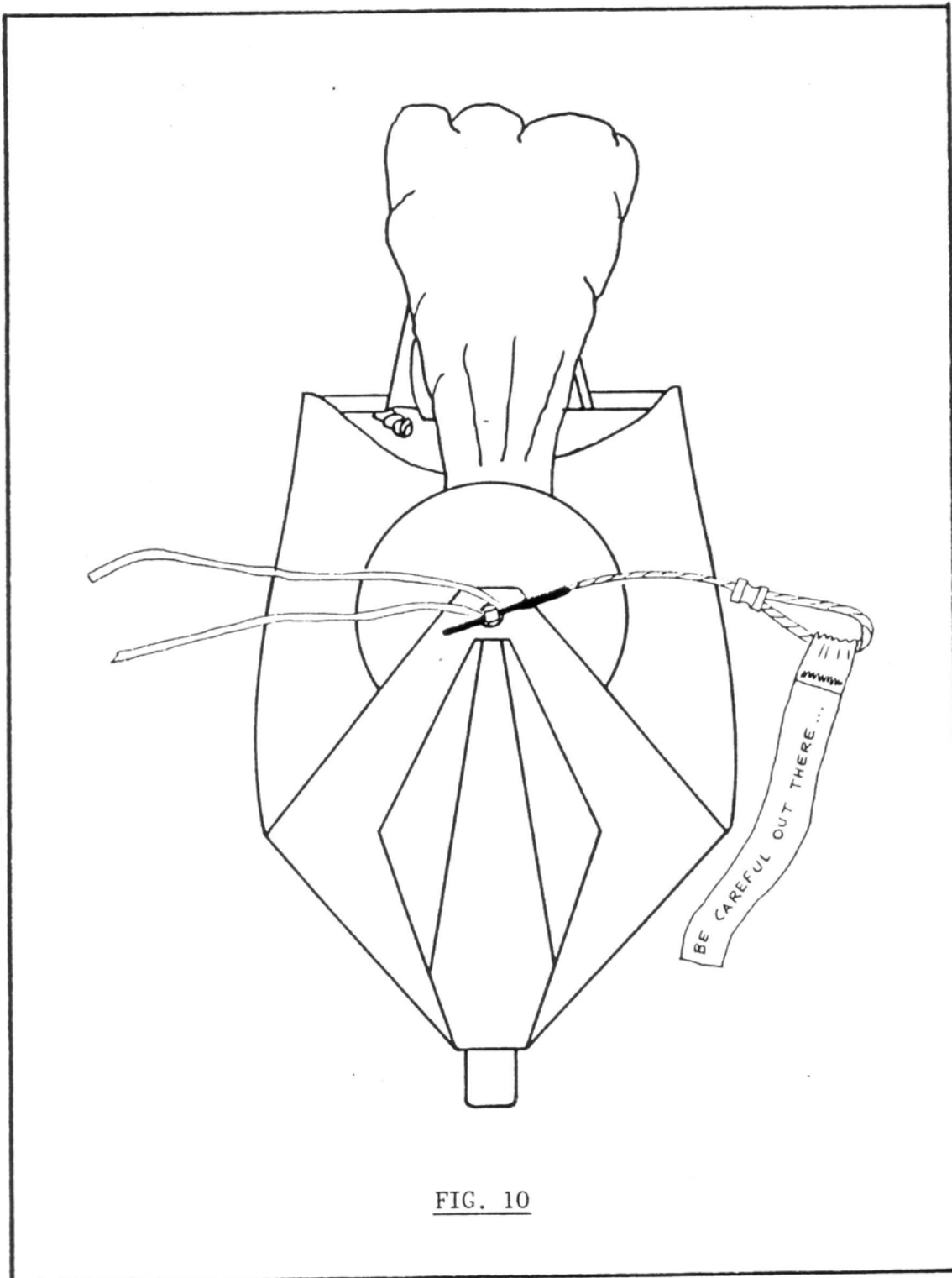


FIG. 10

- 11) The pilot chute fabric extending upward from under the top plate can now be pushed into a narrow, loose roll and placed between the ears of the reserve deployment bag. Be careful not to tuck any of this fabric back under the side flaps; this would tend to retard the launch of the pilot chute. Close the top flap and secure it with the ripcord pin. (Be sure that your temporary pin is accounted for at this time!) (See FIG. 11.) Insert the ripcord handle into its velcro pocket just below the chest strap on the inboard edge of the left main lift web.

- 12) Seal the reserve container and log the work done on the packing data card and in your rigger's log-book. Place the completed data card in the pocket provided on the underside of the reserve top flap cover.

- 13) COUNT YOUR TOOLS.

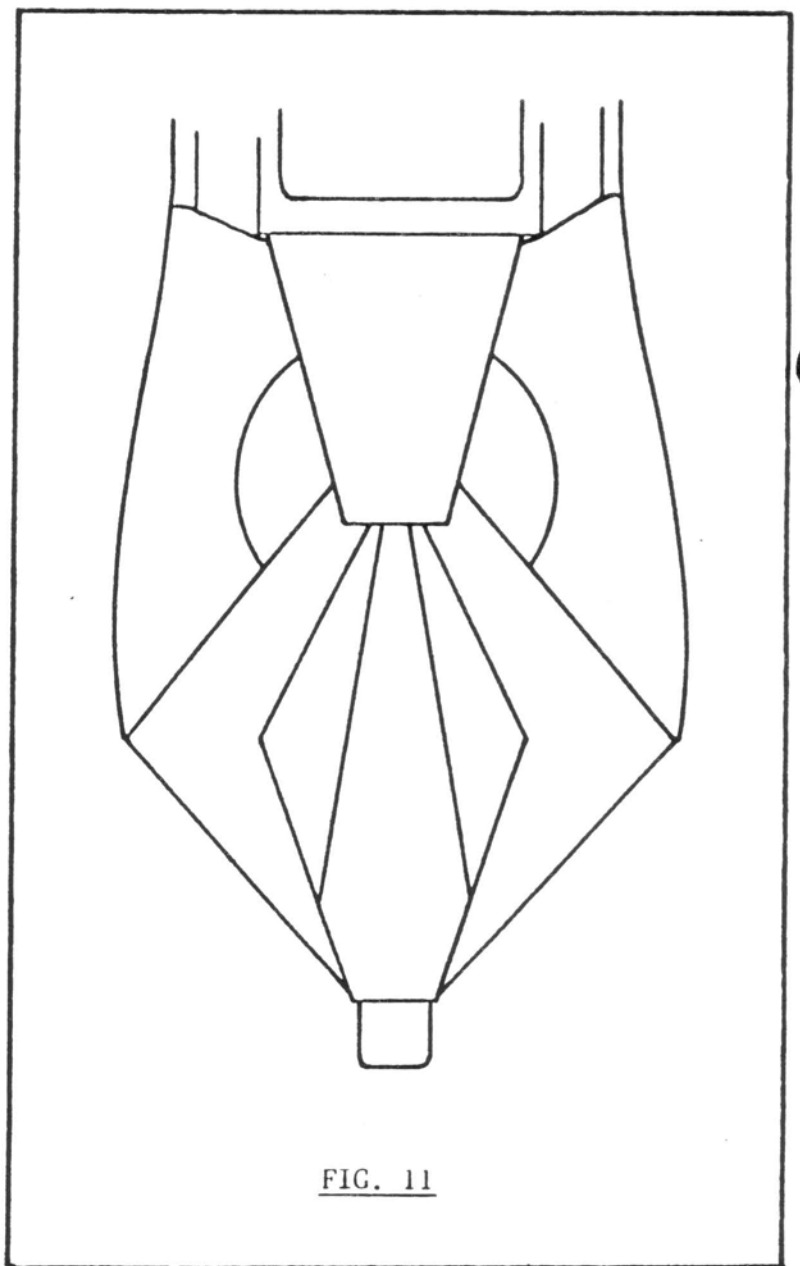


FIG. 11