

These are supplemental Packing Instruction for the Lobo parachute only.

This is not a complete Owners Manual.

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Apex BASE Owner's Manual

Lobo Supplement
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!!! WARNING !!!

You will die. You were born. You will live and you will die. You may die while BASE jumping (parachuting) as others have. It is your responsibility to prepare yourself and your heirs for any eventuality that may arise from your participation in such activities as parachute jumping. Parachutes sometimes malfunction, even when they are properly designed, built, assembled, packed, maintained and used. The results of such malfunctions are sometimes serious injury or death.

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The Uninsured Basic Research Inc.
dba- Apex BASE
41610 Date Street, Suite 101, Murrieta CA 92562, USA
perris@apexbase.com ▪ www.apexbase.com

2-Canopies

Lobo

2.1 Description

The Lobo is a seven cell ram-air parachute utilizing I-beam construction with spanwise reinforcement. The Lobo is available in 10 square foot increments from 160 to 350 square feet. All Lobo canopies use UltraLite ripstop nylon fabric. The Lobo is outfitted with Vtec 3/7. Vtec bottom surface vents are on cells 2, 4, and 6. The Lobo control lines are: Lower Controls (LC) with 2 brake settings and 2 toggle settings; Upper Control lines (UC), 4 right and 4 left.

The parachute components include:

- Tail Pocket– installed
- Tail Gate insert– installed, center left C line, C4
- Tail Gate– removable
- Mesh Slider– removable, for sizing see Part D Specifications.
- Lower Control lines with 2 brake settings and 2 toggle settings. Counting from the toggle end #1 and #2.
- 4 - #5 stainless steel connector links, with link covers
- Dacron lines- 400, 525, and 900 pound
- Vtec 3/7- Vent Technology
- Multi 2– Multiple Bridle Attachment 2

2.2 Assembly

The canopy has three areas of assembly- the connector links to the risers, toggles to the control lines and the bridle attachment to the bridle .

Connecting the links to the risers

Each connector link will have its own continuity concerns. Be sure to treat each connector link separately for proper assembly. The 2 front links will have four lines all cascading. The 2 rear links will have four lines all cascading. The 2 control lines each cascade, into four (or five) lines.

Refer to “Line/Riser Continuity” in Part D, for proper continuity .

Tighten all 4 connector links by hand as tight as possible. Then with a 9 mm wrench apply another quarter turn to all 4 links. No other tool, only a 9 mm wrench, should be required to tighten or loosen any link. Do not over tighten any link. Over tightening can crack the barrel of the link. A cracked link may fail during use.

Slide the link covers over the tightened links. These covers are not only slider bumpers, link covers help maintain proper orientation of the link during deployment.

Assembly with a toggles refer to Section 12.2 with WLO LRT toggles or 14.2 with EZ Grab LRT toggles.

Assembly with a slider refer to Section 3.2.

Assembly with Multi refer to Section 4.2.

Assembly with bridle refer to Section 6.2.

2.3 Packing

Apex BASE Owners Manual uses a form of a PRO (Proper Ram-air Orientation) Pack. It is done on the ground (not standing - over the shoulder) with 4 spring loaded clamps. The “center” is used as a reference to the area between left and right.

2.3-1 Secure the container so it will not slide toward the canopy when pulled against and so the risers are even and will remain even throughout the packing. Lay out container so the jumper would be face down, per normal packing. Confirm proper continuity, four line check.

-1a Facing the canopy, grasp both rear risers in the left hand and both front risers in the right. Walk toward the canopy keeping all the lines in the respected hands. If the slider is on leave it at the links. Lift the canopy off the ground, give it a shake, and lay it on its left side.

-1b Collect all 3 sets of packing tabs- 7 tabs at the B, 7 at the C, and 7 at the D.

Place a clamp on the canopy at each of these groups.

-1c Dress the top of the canopy from the B clamp toward the nose. Place the fourth clamp on the top surface directly above the A lines. Drawing 2.6-1

- 1d Place the A clamp directly above of the container and pull tension so the container, the lines, and the A clamp are all in a straight line. With the A clamp on the ground flip the nose over and flake the top 3 cells out leaving the center cell nose in the middle. Drawing 2.6-2 Make additional folds to left and right nose. No slider – single fold facing in toward center cell. Slider – double fold facing away from center cell. Keep center cell nose exposed.
- 1e Place one hand under the entire nose fold, the other on top and grasp the canopy between the two hands. Flip the canopy over so the nose is against the floor.
- 1f Take the B clamp and stack it above the A clamp, while maintaining tension on the lines. Clear the 3 cells to the left and the 3 to the right of the center. This should be done at the top (Drawing 2.6-3) and bottom surface.
- 1g Take the C clamp and stack it above the A and B clamps, while maintaining tension on the lines. Clear the 3 cells to the left and the 3 to the right of the center. This should be done at the top and bottom surface.
- 1h Take the D clamp and stack it above the A, B, and C clamps, while maintaining tension on the lines. Clear the 3 cells to the left and the 3 to the right of the center. This should be done at the top and bottom surface.
- 1i The canopy should now be laid out with the lines and line attachments in the center, and the center cell in the center. All of the left cells should be to the left of the center and the right cells should be to the right of the center. Drawing 2.6-4
- 1j Grasp all upper control lines bringing them to the right side, exposing the left side of the canopy folds. Dress the left side of the 3 stacks of folds.
- 1k Place the left side upper control lines back over to the left and check continuity of left and right brake lines.
- 1l Grasp all upper control lines and place them so they are and near the C line attachment tabs.

2.3-2 Set toggles according to Section 12.3 (WLO) or 14.3 (EZ Grab)

- 2a Confirm proper left and right continuity between toggles and trailing edge of the canopy.

For slider up deployments refer to Section 3.3 then continue with Section 2.3-4.

2.3-3 Tail Gate – 12 lines, or 14 lines of control

If a Tail Gate is not already installed do so now. The Tail Gate insert location is on the center left C line approximately 4 inches from the line attachment tab. Find this insert and place a Tail Gate into the insert. The Tail Gate should also have a rubber band larks headed to the Tail Gate approximately 1 inch from the end. Rubber band size is 1-1/4 inches by 3/16 inch (3.2 cm x 0.5 cm).

- 3a Ensure there are no twists in the risers. Locate the rear risers, grasp the inner most line on both rear riser links (Tail Gate Friendly lines – colored). Grasp the 2 lower control lines.
- 3b While holding these 4 lines walk toward the canopy. These four line will cascade out to 12 or 14 lines. These will be the 12 or 14 lines placed into the Tail Gate. Work any other line(s) out of this group so that only the 12 or 14 lines remain, one of which should be the line with the Tail Gate. Other methods of obtaining the 12 or 14 lines may indirectly trap other lines.
- 3c Check Tail Gate position. The C line that the Tail Gate is attached to must be inside the Tail Gate, so as not to load the insert piece.
- 3d Place all 12 or 14 lines into the Tail Gate. Close the Tail Gate with 2– 3 wraps of the rubber band. Check that there are 12 or 14 lines in the Tail Gate and that the Tail Gate C line is inside the Tail Gate. Drawing 2.6-5

2.3-4 Long Folds to fit container.

- 4a Fold half of the tail over the center, be sure to pivot around the center, exposing the 3 stacks of canopy. Fold the outside edge of the 3 stacks of canopy toward the center. This is accomplished in one long fold with all 3 stacks.
- 4b Remove any of the clamps except the top (D clamp), and place it on this new fold approximately 10 inches from the top of the canopy.
- 4c Pivot the tail back into position on top of this long fold.
- 4d Repeat steps 2.3-5a through 2.3-5c for the other side. Drawing 2.6-6

2.3-5 Flaking Tail

- 5a With the tail and control lines on the left side remove any slack between the D lines and the control lines. This is accomplished by placing your hand between the D lines and control lines and pulling away from the container removing slack in the curvature of fabric between these two points.
- 5b Grasp the small portion of stabilizer (between the D and tail) pulling the fabric out to the right and keeping the seam in the center. This should place the right outer upper control line in the center.

-5c Continue to stack all tail seams in the center, pulling the fabric between these seams out to the right. These will be half cell folds. Continue all the way across, including the center cell Tail Pocket. Keep tension on all the upper control lines.

-5d Now with all the tail stacked on the right and all the seams in the center, stack all the bottom surface tail seams on top of each other. Finish with all seams in the center.

-5e Locate the center cell Tail Pocket and grasp all the tail above it. Pivot this stack of tail around the center. The canopy should be completely symmetrical at this time with the left side of the canopy to the left of the center and the right side to the right of the center. Drawing 2.6-7

2.3-6 Lift Tail Pocket out of the way to expose D line attachments.

-6a Group all D line attachments in center. Dress fabric so the center is exposed at the D line attachments.

-6b Remove the center cell from the D clamp.

-6c Place the Tail Pocket at the edge of the stabilizers. Flatten the canopy working the air out of the fabric as much as possible. Drawing 2.6-8

-6e Kneel on the canopy with both feet on Tail Pocket and knees towards the top.

-6f Wrap/tuck a small portion (2-3 inches) of the tail around the entire canopy. Do not pull any of the lines out from the center. Make the finished width of this fold even with the edges of the Tail Pocket. Do not cover the nose. Work the air out.

-6g Position all 4 clamps on the sides of the canopy at this time. Two clamps should be just above the Tail Pocket, one on each side. The other two should be even with or slightly above the D packing tab, one on each side. Drawing 2.6-9

2.3-7 Stowing the lines in the Traditional (bottom load) Tail Pocket. For Top Load Tail Pocket see page 10.

-7a Release tension from container. Sit on canopy facing container. Open Velcro closures on Tail Pocket.

-7b Optional with slider "indirect control"- Using the single stow (located between the Tail Pocket and the canopy). Grasp lines 6 inches (10 cm) below Tail Pocket. Pull the lines toward the Tail Pocket creating a bite. Locate the single stow between Tail Pocket and canopy, place line bite in rubber band creating a single stow.

Drawing 2.6-10 Then tuck the stow between the canopy and Tail Pocket.

-7c Free stow Tail Pocket (no single stow). Grasp lines 8-12 inches below Tail Pocket and pull the lines towards the Tail Pocket creating a bite, lay this bite in either upper corner of the Tail Pocket.

-7d Continue stowing lines in S-folds back and forth across Tail Pocket. Each S-fold will slightly over-lap the previous S-fold in a "shingle" fashion. Stow to within 5 inches (13 cm) of links. Drawing 2.6-11

-7e Lines MUST enter and exit between the 2 Velcro tabs at the bottom of the Tail Pocket. Moreover, the Velcro must not be required to open to facilitate line deployment.

-7f Close the Tail Pocket by mating the Velcro to its respected piece. Start by mating the corners and work the Velcro up the sides and across the bottom.

-7g Ensure no lines are trapped in the Velcro. Ensure the Velcro is aligned with its counter part completely.

Drawing 6.6-1 or 7.6-1 or 8.6-1 or 9.6-1

-7h Multi canopies only- Follow section 4.3.

2.3-8 Placing the canopy into the container. See Part B "Harness Containers"

2.4 Use

The Lobo Parachutes has numerous possible configurations. For instance, without a slider, free fall delays between 0 and 3 seconds are common but must never exceed 4 seconds. On a no slider free fall delay beyond 4 seconds there is a very high risk of damaging the equipment and/or injuring the jumper and this may be fatal. Any time the slider is not used during deployment is considered a no slider jump. Some people will use the terminology of "slider down," or "slider removed" but they are all the same in this respect, the slider offers no reefing to the opening parachute. Apex BASE will refer to this configuration as "no slider". We recommend removing the slider when not being used on slider up jumps. The act of tying the slider to the connector links is not advised due to the entanglement possibilities during deployment. If this method is used never tie the slider to the rear risers. On any no slider jumps the Tail Gate and the Line Mod should be utilized. If you are unfamiliar with either method STOP and receive training on both items before continuing.

With a slider, the canopy will open slower. Most slider up jumps are made using the mesh slider. The mesh slider allows for quicker inflation than a sail slider. Refer to Section 3.4 and Reference Chart for more information on mesh vs. sail. Consult an instructor or knowledgeable persons for more information regarding specifics.

It is typical to use large pilot chutes for BASE jumps. The larger the pilot chute the greater the effect it will have on the flight performance of the parachute. This flight performance is most notable on the landing flare. Therefore, do not expect the same type of performance when jumping a 36 inch pilot chute as with a 48 inch pilot chute. There is a great deal of knowledge and experience necessary to reduce the risk of injury and death. Gain such knowledge before making any jumps.

Water exposure can greatly affect the parachute fabric. Water damage may come in several forms, obviously water landings, but also from flights in rain or heavy mist, packing on wet or damp surfaces. Water damage will reduce the fabric's ability to stop air from flowing through it. Thus creating a more porous canopy. A canopy with a high porosity will generally open slower (pressurize slower), and will have a higher descent rate even with a flare. Packing, handling and jumping also effect the canopy's porosity. Therefore, the more jumps a canopy has the higher the porosity.

2.5 Maintenance

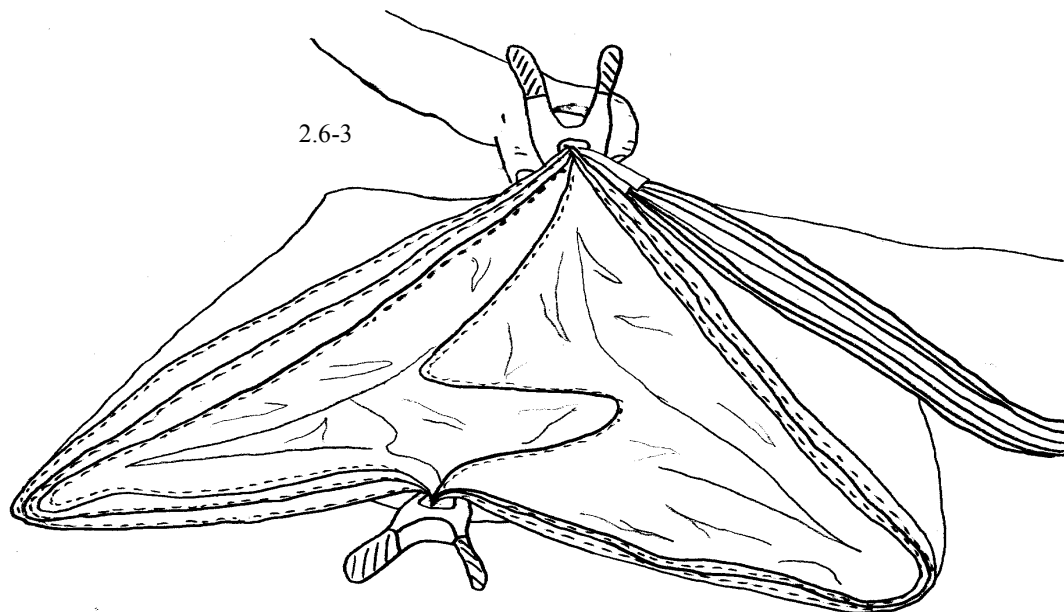
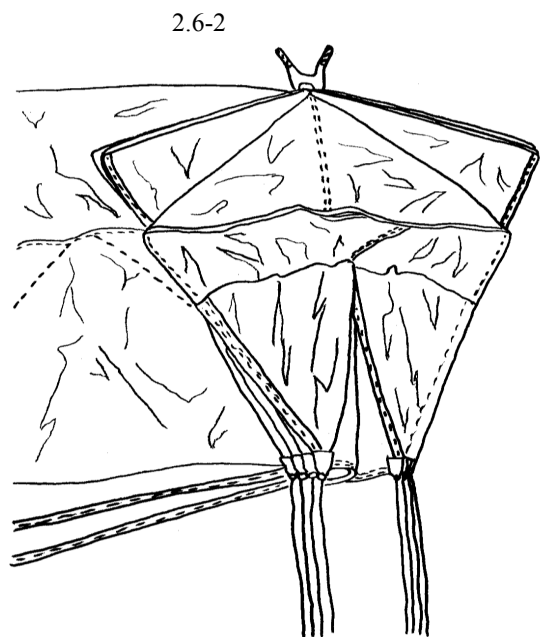
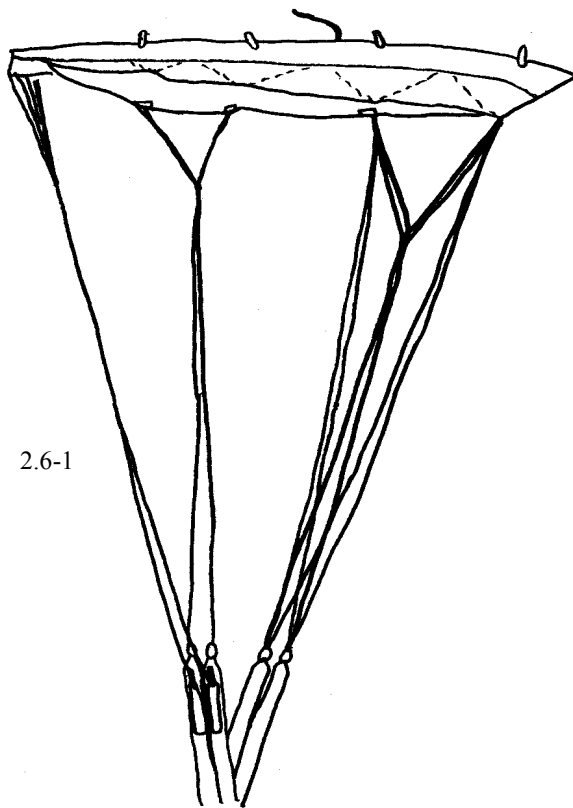
Canopy fabric is durable but not indestructible. Holes larger than 1/4 inch or within 10 inches of a line attachment or the bridle attachment should be repaired before jumping. The canopy may be repaired by qualified persons.

Patches should be done according to common parachute industry standards. Major repairs should be returned to Apex BASE for quality assurance. A major repair is one that has to get into any seam, reinforcement tape, line attachment or if repaired incorrectly can effect the flight characteristics of the canopy. Do not wash any canopy. After salt water landings the entire system should be rinsed with fresh water. Never pack or use a wet parachute. Contact Apex BASE if you have questions concerning cleaning or contaminants.

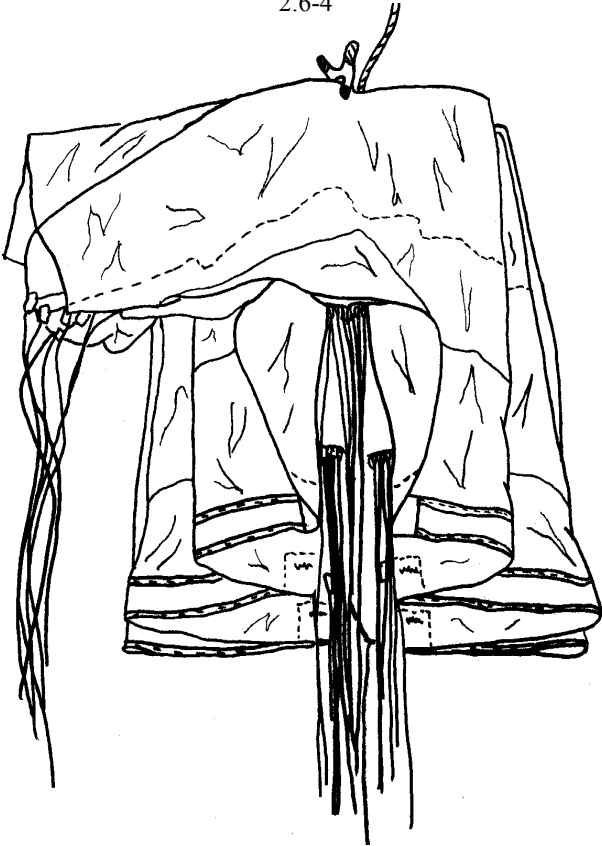
The slider is a contributor to line damage, keep the grommets free of burrs, sharp or rough spots, and keep link covers in place. This is noticeable by general wear on most of the lines, control lines specifically. However, landing and handling problems damage more lines than sliders do. The lower control lines do wear out due to slider wear as do the brake settings. Brake setting wear is highest with no slider deployments. Inspect them regularly and replace when damage is present.

Inspection of the canopy is very important. It should be inspected regularly. An inspection should take place when any flight goes unusual, i.e. poor landing, tree landings and such, and any unusual openings. Inspection must take place on the external portions of the canopy, but you must not forget there is an internal part as well. Crawl into each cell to inspect internal structure and connections. Refer to Part D – Inspection for more information.

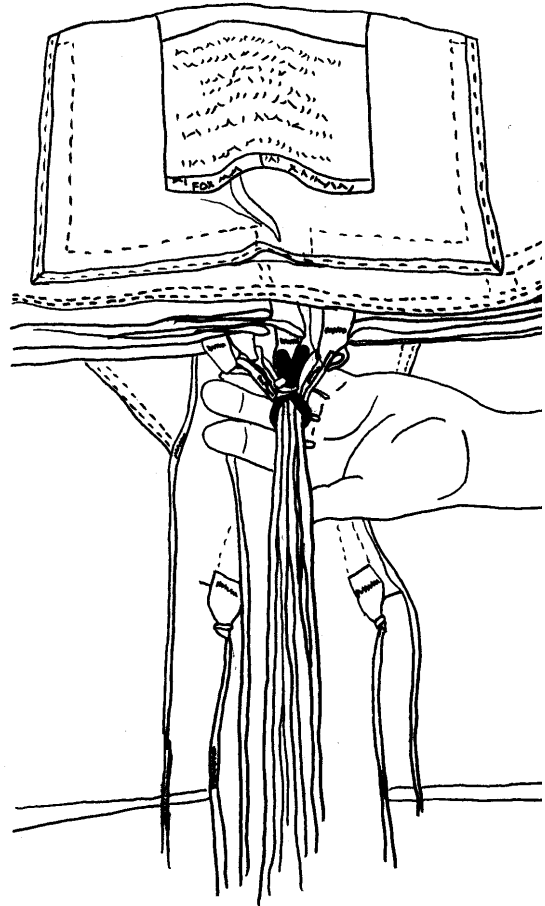
2.6 Drawings



2.6-4



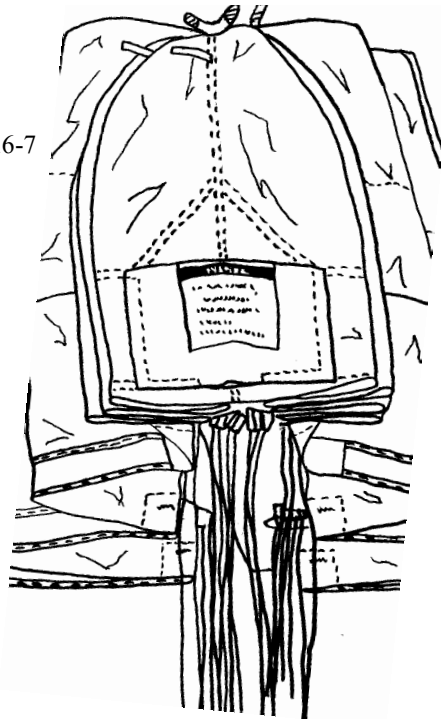
2.6-5



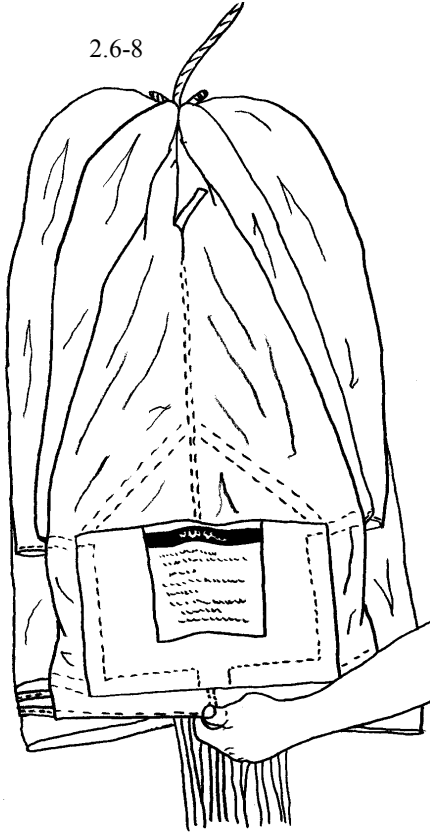
2.6-6



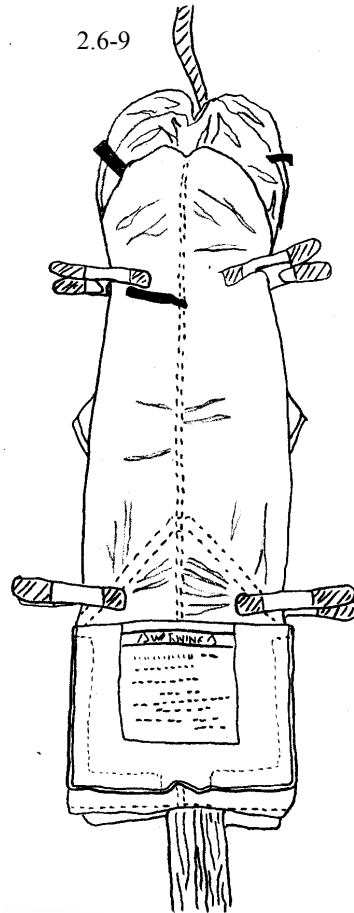
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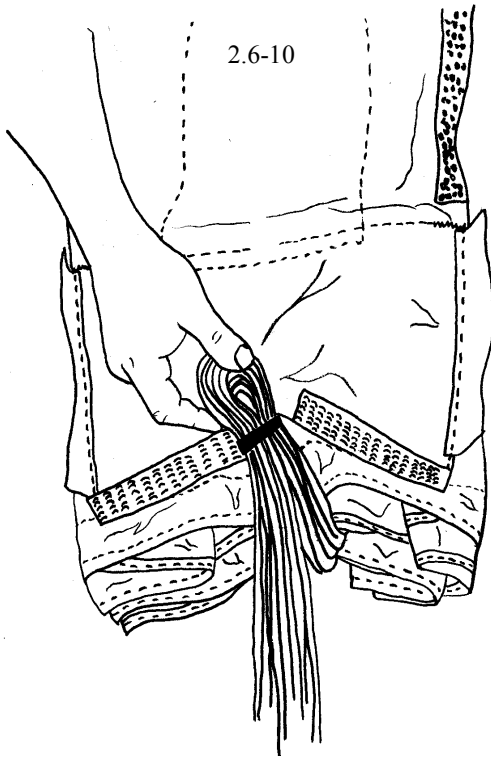
2.6-8



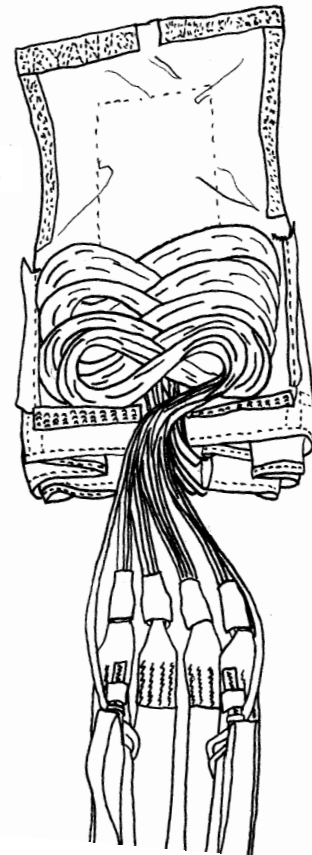
2.6-9



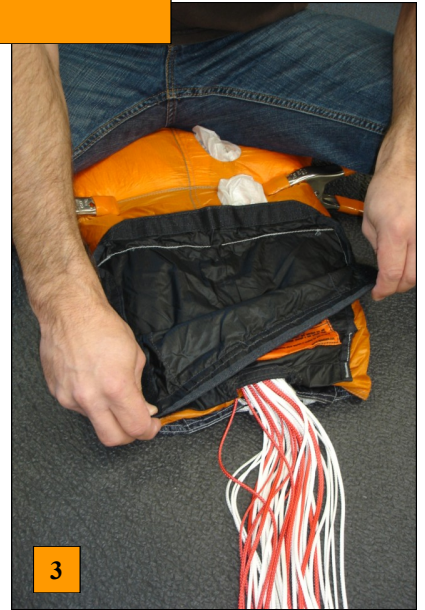
2.6-10



2.6-11



Top Load Tail Pocket



3- Sliders

3.1 Description

A slider of any type is a reefing device, designed to slow the parachute inflation to a speed that is acceptable for the user and the equipment. There are several different types of sliders: sail, mesh (large hole and small hole), split, spider, bikini, and more. We will be working primarily with the mesh, with an occasional look at the sail. A mesh slider is a slider made of mesh rather than a solid piece of ripstop fabric as in the sail slider. Lobo parachutes have three different sizes of sliders. They should not be interchanged among sizes.

Lobo 160 through 200 use the PN 1724 slider measuring 17 x 24 inches.

Lobo 210 through 250 use the PN 2024 slider measuring 20 x 24 inches.

Lobo 260 through 350 use the PN 2328 slider measuring 23 x 28 inches.

The sliders will be marked with a PN number as well as a "RF" and "LF" indicating right front and left front. The lines that pass through the respected grommet must come from the Right Front riser and from the Left Front riser. Maintaining this relationship between slider and risers will insure the slider is installed properly with regard to aspect ratio of the slider matching the A/R of the canopy, and will keep the grommet and canopy relation proper.

3.2 Assembly

Installing and removing the slider must be done with order and attention to continuity. By developing a consistent and repeatable routine - slider installation or removal can be accomplished with efficiency and accuracy.

3.2-1 Removing the slider. Starting with control lines, to rear risers, to front risers.

-1a Place slider to within 12 inches of connector links. Confirm proper continuity from the container and risers to just above the slider. Place harness with container up and rear riser on top of front risers. Fan riser out slightly so the front risers are inside and rear to the outside.

-1b Slide link covers up off link toward the line. Loosen links with wrench (9 mm with #5 Rapide links). Note barrel location of each link. They should be facing inward.

-1c Remove control lines from toggle. Remove the control line from the guide ring on the riser and the slider grommets. Re-attach toggle to control line Section 14.2, and lay to the outside.

-1d Open either rear connector link and remove it from the riser maintaining control of the link. Be careful not to damage the riser during this step, the inside of the connector link, threaded area, can be very sharp. Pass the connector link through the slider grommet and re attach to the respected riser and finger tighten.

-1e Repeat for other side of rear riser.

-1f Work the same routine for both front risers.

-1g Tighten links with fingers until snug, then add a quarter of a turn with a wrench. Do not over tighten, over tightening may cause link barrel to crack.

-1h Slide link covers in place. Check continuity, all four links and control lines.

3.2-2 Installing the slider. Starting with front riser, to rear risers, to control lines. Opposite of removal.

-2a Get good continuity from the container and risers to just above the connector links. Place harness with container up and rear riser on top of front risers. Fan riser out slightly so that front riser are inside and rear to the outside.

-2b Slide link covers up off link toward line. Loosen link with wrench (9 mm with #5 Rapide links). Note barrel location of each link. They should be facing inward.

-2c Position slider so the tape is towards the canopy. Open right front connector link, remove link from riser, pass link through the "RF" grommet in slider. Place link back on riser without losing proper continuity. Finger tighten link.

-2d Open left front connector link, remove link from riser. Remove any twist in the slider tape between the two front grommets. Pass link through the "LF" grommet in slider. Place link back on riser without losing good continuity. Finger tighten link.

-2e Repeat similar procedure with respected rear links passing through the rear slider grommets. Slider tape should be facing canopy.

-2f Disconnect the control lines from the toggle. Pass the right control line through the right rear slider grommet then the right riser guide ring. Assemble toggle to control line, Section 14.2.

-2g Repeat for left control line.

-2h Tighten links with fingers until snug, then add a quarter of a turn with a wrench. Do not over tighten, over tightening may cause link barrel to crack. Slide link covers in place.

-2i Check continuity, all four links, both control lines, and slider orientation.

The line continuity must be checked separately from slider continuity. Check all four line groups and control lines separately. Anytime the slider is used during deployment, i.e. "slider up" the control lines must pass through the respected slider grommet and the guide ring on the riser. See Drawing 14.6-5. In the event of a premature brake release a control line that does not pass through the riser guide ring is dangerous and may prevent the slider from coming down .

For direct slider control install a rubber band on the right center C line attachment tab. The Tail Gate is optional.

3.3 Packing

The packing method described in this manual is accomplished by keeping the slider at the links until the slider is ready for placement.

Pack the parachute as described in Section 2.3-1 through 2.3-3e.

3.3-1 Slider placement.

-1a Acquire proper continuity with the slider, keeping a left and right separation with the front slider grommets closest to the canopy. If assembly of the slider is correct the slider tape will be up.

-1b Pull slider so the front grommets come in contact with the bottom of the stabilizers (B line slider stops) on both left and right.

-1c While slightly lifting the tape between the two rear grommets, pull them up to the bottom of the stabilizers (C line slider stops) on both the left and right.

-1d The tape and fabric between the front and rear grommets should be placed between the B-C fold of the canopy. This will take place on both sides, left and right.

-1e When packing with a bag type deployment device such as a POD or sleeve, see Section 2.3-5 to continue.

When packing with a tail pocket deployed free packed canopy, see Section 2.3-5 or continue in this section with 3.3-2 "Stowing the slider." Read 3.4 for information on direct control and indirect control of slider.

3.3-2 Stowing the slider, direct control.

-2a Lift the center of the slider so that it puts equal force on all four grommets against the stabilizer stops. Fold the top of the slider, so the slider is now only 1-2 inches (2.5-5 cm) beyond the rubber band located in the C line attachment tab.

-2b Place a stow(s) of slider in the rubber band. The resistance placed on the slider by this rubber band will vary due to type and size of rubber band, number of wraps on rubber band, individual methods and deployment speed. Drawing 3.6-1

-2c Continue with Section 2.3-5.

3.4 Use

The slider is used to slow the opening of a parachute. How much it will slow down is dependant on several factors including but not limited to some of the following: canopy age and individual characteristics; type of suspension line; canopy fabric type and condition; deployment airspeed; packing method; deployment method; slider control method; type, shape and size of the slider; pilot chute size; and more. It is important to understand the desired deployment sequence of a ram-air (square) parachute. A square parachute's lines need to be deployed from the risers to the canopy. If a slider is being used during deployment – the lines should be completely deployed before the slider is allowed to move down the lines. To help achieve this sequencing, controlling the slider is necessary either directly (3.3-2) or indirectly (2.3-7b).

During a "direct control" deployment the release force exerted on the rubber band will vary due to several factors some of which are listed above.

When using a deployment device such as a bag, the need to control the slider directly or indirectly is not necessary. The bag device is maintaining control during a normal deployment in which the bag remains closed until line stretch is complete.

The use of a mesh or sail slider is an individual's choice. Some factors to evaluate may be canopy performance, opening altitude MSL and AGL, deployment airspeeds. Refer to Part D – Reference Chart for more information.

3.5 Maintenance

The slider is exposed to high speeds during deployments. Burns on the tapes and fabric may appear and are indications of friction during deployment. This friction may be problematic and packing should be reviewed and adjusted to remedy such problems. Slider grommets must be kept clean and free from burrs and sharp edges that

may damage the canopy, stabilizers, lines or may prevent the slider from coming down. Insure proper seating of grommets to fabric. Replace damaged sliders with the proper sized slider from Apex BASE.

3.6 Drawings

3.6-1

