



4357 D PARK DRIVE
NORCROSS, GA 30093 USA
Phone (770)-279-7733 FAX (770)-279-7729

MAIN CANOPY OWNER'S MANUAL

and

PACKING INSTRUCTIONS

for all

9-Cell MAIN CANOPIES

March 2007

WARNING

- 1. TRAINING AND/OR EXPERIENCE ARE REQUIRED TO LOWER THE RISK OF SERIOUS INJURY OR DEATH.**

NEVER USE THIS EQUIPMENT UNLESS YOU HAVE:

A. READ THIS WARNING LABEL AND COMPLETED A "CONTROLLED PROGRAM OF INSTRUCTION" IN THE USE OF THIS PARACHUTE ASSEMBLY.

--OR--

B. READ THIS WARNING LABEL AND ALL APPROPRIATE OWNER/FLIGHT MANUALS, PACKING INSTRUCTIONS AND COMPLETED AT LEAST 100 RAM AIR PARACHUTE JUMPS.

- 2. LOWER THE RISK OF DEATH, SERIOUS INJURY, CANOPY DAMAGE AND HARD OPENINGS BY NEVER EXCEEDING THE LIMITS SHOWN BELOW:**

MAXIMUM DEPLOYMENT SPEED	130 KNOTS
MAXIMUM GROSS WEIGHT (JUMPER + CLOTHING + EQUIPMENT)	POUNDS
MODEL :	
SERIAL NUMBER :	
DATE OF MANUFACTURE :	

!!! THE USER ASSUMES ALL RISK !!!

PARACHUTE SYSTEMS SOMETIMES FAIL CAUSING DEATH OR SERIOUS INJURY REGARDLESS OF HOW IT IS MAINTAINED, PACKED, DEPLOYED OR OPERATED.

FLIGHT CONCEPTS INTERNATIONAL

**4357 D PARK DRIVE
NORCROSS, GA 30093 USA
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REMOVAL OF THIS LABEL VOIDS ANY AND OR ALL CUSTOMER SERVICE PROGRAMS

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ABOUT THIS MANUAL

Please read this manual thoroughly before assembling, packing, and using your Flight Concepts International, Inc. main canopy. This manual will provide you with important information that will help you better use this product.

POLICY STATEMENT

Flight Concepts International, Inc. may change any of the announcements, information, policies, rules, or procedures set forth in this manual. This manual is updated as revisions occur and may not always reflect new or modified procedures and information. Statements in this manual may not be regarded in the nature of binding obligations on the manufacturer or the seller.

PARTS LIST FOR A FLIGHT CONCEPTS MAIN CANOPY

Each Flight Concepts, Inc. Main Canopy includes the following components:

- * One (1) Canopy with suspension and control lines.
- * One (1) Slider.
- * Four (4) connector links (as ordered).
- * One (1) Flight Concepts, Inc. Main Owner's Manual.

REVISION LIST

First Edition: March 1994

Second Edition: March 1999

Third Edition: January 2001

Fourth Edition: March 2007

This owner's manual and/or the packing instructions may be revised from time to time by Flight Concepts, Inc. without notice. Product owners should contact Flight Concepts, Inc. periodically to insure the currency of this publication.

It is the intention of Flight Concepts, Inc. to aid in the education of skydivers and the general public about safe parachuting practices. Therefore, this manual may be reproduced in whole, or in part by anyone wishing to do so.

Flight Concepts, Inc. welcomes all comments about this manual, as they will help us to make future editions more complete and easier to use. Please put your suggestions in writing and send them to:

Flight Concepts International, Inc.
4357-D Park Drive
Norcross, Ga. 30093 USA

INSPECTION INSTRUCTIONS

NOTE: THE INSPECTION OF A FLIGHT CONCEPTS INTERNATIONAL, INC. MAIN CANOPY PRIOR TO BEING ASSEMBLED INTO A PARACHUTE HARNESS/CONTAINER SYSTEM, OR CAN ONLY BE DONE BY THE MANUFACTURER OR AN FAA CERTIFIED SENIOR OR MASTER PARACHUTE RIGGER. ADDITIONALLY, TO INSURE THE CORRECTNESS OF THE INSPECTION PROCEDURE, THESE INSPECTION INSTRUCTIONS MUST BE FOLLOWED EXACTLY.

STEP 1.) Insure that all of the correct parts were received by checking the parts list.

STEP 2.) Prior to assembly, visually inspect each topskin and bottom skin panel for any defects, rips, stains, or any other damage to the canopy or its seams. If the canopy is being inspected after a deployment, be sure to inspect each panel very carefully for any possible damage that may have occurred during use.

STEP 3.) Visually inspect each rib. Start at the leading edge and move to the trailing edge by looking inside each half cell. Inspect for any sign of defects, rips, stains, or any other damage to canopy or its seams.

STEP 4.) Visually inspect each cascade (finger-trapped line connection) to insure that they have been stitched correctly. Insure that all of the suspension lines are looped tightly onto the attachment point tapes on the bottom skin of the canopy. If a suspension line is not looped tightly, lightly pull the line away from the line attachment loop to tighten the knot around the line attachment point.

STEP 5.) Inspect the Main slider for correct installation. (See Figure 1.) **NOTE:** The reinforcement tape should face the canopy and there should not be any type of hole in this slider what so ever.

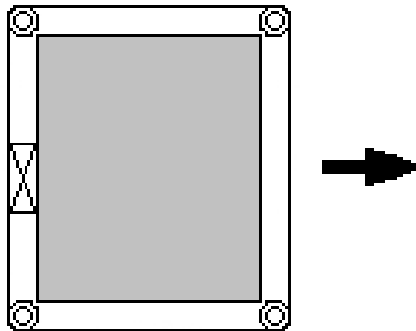


Figure 1.
(Top view of Main slider)

If the canopy is being inspected after a deployment, be sure to inspect the slider carefully for any damage, particularly around the inner surface of the grommets and the reinforcing tapes immediately around the grommets.

STEP 6.) Inspect the connector links, they should be FCI made Chinch Links (soft links), #5 zinc plated, #5 Stainless Steel or #3.5 stainless steel "Maillon Rapide" French links. Look for burrs, nicks or any other abnormality that may indicate a flaw in the link. If you find any type of burr, it can be removed with fine emery cloth.

!WARNING! Consult Flight Concepts before using any substitute links.

STEP 7.) Anchor all four connector links to the same point. Pull tension on the lines to perform a trim check according to the trim specifications chart for the particular canopy model. **Do Not Skip This Step.** (See "Trim Specifications" in this manual)

STEP 8.) Inspect the suspension lines and the control lines for proper continuity. Look for any frayed or damaged areas. If the canopy is being inspected after a deployment, be sure to inspect the lines carefully for any damage, particularly around the connector links. Each line group must be routed to its connector link without any twists, and without passing under, around, or through any other line group.

STEP 9.) Inspect the harness/container system according to the manufacturer's instructions. Inspect the control line guide rings on the back of the Main rear risers, to insure smoothness, and to look for cracks or burrs.

NOTE: To assure the proper trim when the brakes are set, measure the distance from the fold at the top of the Main rear riser to the control line guide ring. The ring must be attached 4" below the fold and on the back of each rear riser. This is a P.I.A. (Parachute Industry Association) standard. If the ring is attached at a different measurement, the break setting of the Main canopy must be modified to insure correct canopy trim is maintained. (Contact Flight Concepts International, Inc. for additional instructions)

The Main inspection process is now complete, the canopy may be assembled on to a harness/container system if no problems were discovered.

CANOPY SPECIFICATIONS

9 Cell Classic

Model	Size	*Maximum Suspended Weight	Aspect Ratio	Weight	Estimated Pack Volume
Wildfire 170	170	187	2.6	6.8	Est. 386
Clipper 195	195	214	2.6	7.0	Est. 398
Raider 220	220	242	2.6	8.3	Est. 425
Manta 230	230	253	2.6	8.4	Est. 545
Maverone 250	250	275	2.6	8.5	Est. 562
Manta 290	290	319	2.6	9.8	Est. 570
Man-O-War 320	320	352	2.6	10.1	Est. 590

ZP Manta

Model	Size	*Maximum Suspended Weight	Aspect Ratio	Weight	Estimated Pack Volume
ZP Manta 185	185	185	2.6	6.9	Est. 460
ZP Manta 200	200	200	2.6	7.4	Est. 513
ZP Manta 230	230	230	2.6	8.2	Est. 566
ZP Manta 260	260	260	2.6	9.3	Est. 619
ZP Manta 290	290	290	2.6	10.4	Est. 672
ZP Manta 320	320	320	2.6	11.5	Est. 725

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Sentry

Model	Size	*Maximum Suspended Weight	Aspect Ratio	Weight	Estimated Pack Volume
Sentry 99	99	119	2.65	4.1	Est. 294
Sentry 110	110	132	2.65	4.5	Est. 333
Sentry 120	120	144	2.65	4.9	Est. 373
Sentry 135	135	162	2.65	5.6	Est. 413
Sentry 150	150	180	2.65	6.2	Est. 453
Sentry 170	170	204	2.65	7.0	Est. 493
Sentry 190	190	228	2.65	7.8	Est. 533
Sentry 210	210	252	2.65	8.6	Est. 573
Sentry 230	230	276	2.65	9.5	Est. 610

FLIGHT CONCEPTS INTERNATIONAL, INCORPORATED

Rage

Model	Size	*Maximum Suspended Weight.			Aspect Ratio	Weight	Estimated Pack
		Advanced	Expert	Maximum			
Rage 90	90	117	135	153	2.8	3.8	Est. 225
Rage 100	100	130	150	170	2.8	4.1	Est. 250
Rage 110	110	143	165	187	2.8	4.5	Est. 275
Rage 120	120	156	180	204	2.8	4.9	Est. 300
Rage 130	130	169	195	221	2.8	5.6	Est. 325
Rage 140	140	182	210	238	2.8	6.2	Est. 360
Rage 155	155	202	233	264	2.8	7.0	Est. 395
Rage 170	170	221	255	289	2.8	7.4	Est. 430
Rage 185	185	241	278	315	2.8	7.8	Est. 465
Rage 205	205	267	308	349	2.8	8.6	Est. 500
Rage 230	230	299	345	391	2.8	9.5	Est. 570
Rage 260 - T	260	N/A	N/A	260	2.8	9.5	Est. 630

Manufacturer's Recommended Maximum Suspended Weight (defined as: Jumper or (Jumpers/Tandem)+ Clothing + Equipment) jumping in near perfect conditions.

The two types of fabric for all models is: F-111 (1.1 oz Nylon Ripstop, 0-3 CFM) or Zero Porosity (1.2 oz Nylon Ripstop, 0 CFM).

The two optional types of line are: 725lb. Microline or 525lb. Dacron

TRIM SPECIFICATIONS (in inches)

The line specifications in this chart are given under the condition that all four risers are anchored at the same point, and that the control line guide rings on the rear risers are 4" below the upper fold at the end of the riser. (Line lengths May Vary Depending On The Link)

These dimensions can be verified by laying the canopy on its side (See Figure 1.) and anchoring the measuring instrument at the link. (See Figure 2.)

The dimensions given are from the link to the top of the line loop at the canopy.

The dimensions given can vary due the link size and or the attachment method.

The maximum tolerance for the trim specifications are +/- 1 inch.

The number one is located at the end rib.

The measurements on the steering lines are with the brakes set.

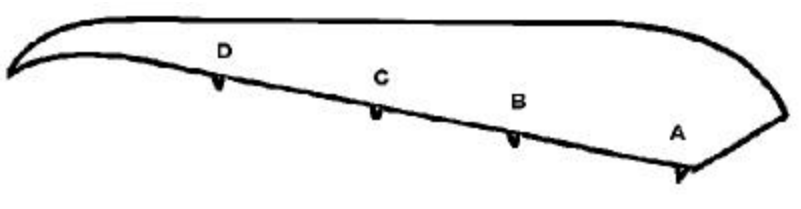


Figure 1.

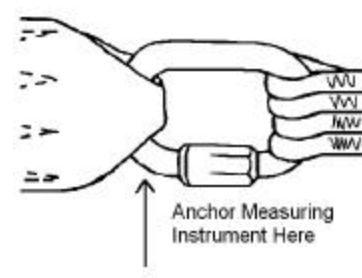


Figure 2.

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9 Cell Classic (Line lengths May Vary Depending On The Link Used)

Model	Wildfire 170	Clipper 195	Raider 220	Manta 230	Maverone 250	Manta 290	Man-O-War 320
Total "A" Line Length	109.5	122.0	132.5	132.9	132.5	146.0	146.0
Total "B" Line	112.3	126.0	137.0	137.1	137.0	151.0	151.0
Total "C" Line	118.3	131.0	143.0	143.5	143.0	158.0	158.0
Total "D" Line	127.5	140.0	153.0	153.5	153.0	169.1	169.1
Total To Tail w/Brakes Set	124.5	134.0	147.3	147.4	147.3	164.5	164.5

ZP Manta (Line lengths May Vary Depending On The Link Used)

Model ZP Manta	185	200	230	260	290	320
Total "A" Line Length	118.9	123.6	132.5	140.8	148.6	156.1
Total "B" Line	121.8	126.6	135.8	144.4	152.5	160.2
Total "C" Line	127.3	132.3	141.8	150.7	159.1	167.1
Total "D" Line	133.9	139.2	149.3	158.7	167.6	176.1
Total To Tail w/Brakes	129.0	134.1	143.8	152.9	161.5	169.6

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Sentry (Line lengths May Vary Depending On The Link Used)

Model Sentry	99	110	120	135	150	170	190	210	230
Total "A" Line	94.5	99.5	103.9	110.1	116.0	123.4	130.4	137.1	143.4
Total "B 1" Line	94.2	99.2	103.6	109.8	115.7	123.0	130.0	136.6	142.9
Total "B 2-5" Line	96.9	102.0	106.5	112.9	119.0	126.6	133.7	140.5	147.0
Total "C 1" Line	96.0	101.1	105.6	111.9	117.9	125.5	132.6	139.3	145.8
Total "C 2-5" Line	101.5	106.9	111.6	118.3	124.6	132.6	140.1	147.3	154.1
Total "D 1" Line	96.1	101.3	105.7	112.1	118.1	125.6	132.7	139.4	145.9
Total "D 2-5" Line	109.0	114.8	119.9	127.0	133.9	142.4	150.5	158.1	165.4
Total To Tail w/Brakes Set	101.3	106.9	111.8	118.7	125.3	133.6	141.3	148.7	155.8

Rage (Line lengths May Vary Depending On The Link Used)

Model Rage	90	100	110	120	130	140	155	170	185	205	230	260
Total "A" Line	93.9	98.9	103.7	108.3	112.6	116.8	122.9	128.6	134.2	141.2	149.5	158.3
Total "B 1" Line	92.8	97.8	102.5	107.0	111.3	115.5	121.4	127.1	132.6	139.5	147.7	157.9
Total "B 2" Line	97.4	102.6	107.6	112.3	116.8	121.2	127.5	133.4	139.1	146.4	155.0	162.9
Total "B 3-5" Line	96.0	101.2	106.0	110.7	115.2	119.5	125.7	131.5	137.2	144.3	152.8	163.2
Total "C 1" Line	91.8	96.7	101.4	105.8	110.1	114.2	120.1	125.8	131.1	138.0	146.1	157.5
Total "C 2" Line	102.8	108.3	113.5	118.5	123.3	127.9	134.6	140.9	146.9	154.6	163.7	170.0
Total "C 3-5" Line	100.9	106.3	111.4	116.3	121.0	125.5	132.0	138.2	144.1	151.7	160.6	170.0
Total "D 3-5" Line	107.8	113.6	119.1	124.3	129.4	134.2	141.2	147.8	154.1	162.2	171.7	182.3
Total "D 2" Line	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	180.8
Total "D 1" Line	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	158.5
Total To Tail w/Brakes Set	101.2	106.8	112.2	117.3	122.2	127.0	133.8	140.3	146.5	154.3	163.7	165.8

PRO* PACKING INSTRUCTIONS (PROPER RAM-AIR ORIENTATION)

Step 1.) Start with the Flight Concepts Main canopy laying on its left side. (See Figure 1.) The harness must be placed facing down, with the top toward the canopy.

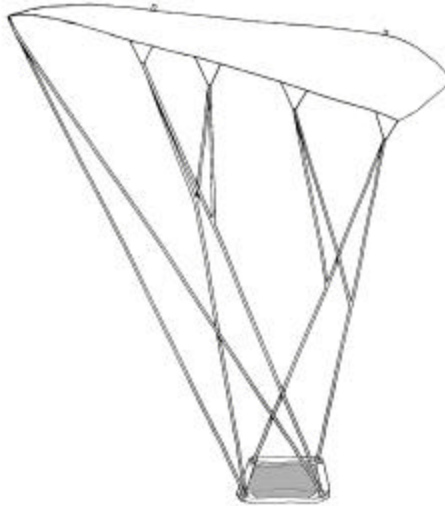


Figure 1.

Step 2.) Clear the control lines. Insure the control lines pass directly from the trailing edge of the canopy, through the correct grommets in the slider, and directly through the control line guide rings. **WARNING!** The control lines must not pass under, through, or around any of the suspension line groups.

Step 3.) Insure the suspension line groups are routed correctly through the slider grommets to their respective connector links, and are placed on the link correctly. **WARNING!** The suspension line groups must not pass under, through, or around any of the other suspension line groups.

Step 4.) Set the brakes by pulling the control line down through the guide ring until the brake loop “cat-eye” just passes through the guide ring. (See Figure 2.)

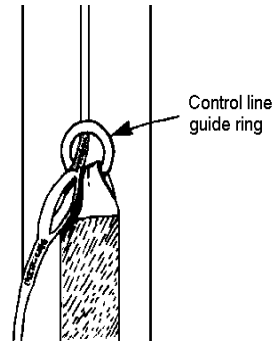


Figure 2

Step 5 Insert the stiffened upper portion of the control toggle through the loop and pull the control line back up tightly against the ring guide. (See Figure 3.) Fold the remaining brake line according to the harness / container manufactures instructions. Insure both deployment brakes are set before continuing the pack-job.



Figure 3

Step 6.) With the harness / container system secured, apply tension to the lines, and step between the right and left line groups and grasp the right line groups in the right hand and the left line groups in the left hand. Push the slider toward the canopy, and walk forward. Pick up the canopy by the suspension lines and allow it to hang downward (See Figure 4.) Push the slider up as far as it will go until each slider grommet comes to its respective slider stop.

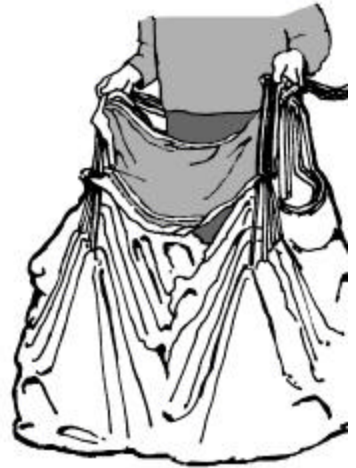


Figure 4

Step 7.) Step out from between the line groups and hold them in one hand. Clear the bottom seams of each cell with the “knife edge” of the hand. (See Figure 5.) This must be done between the “A”, “B”, “C”, and “D” line groups. Clear the four seams of each cell to the left and right. After all the seams are cleared on each side of the canopy, clear the trailing edge between the control lines.

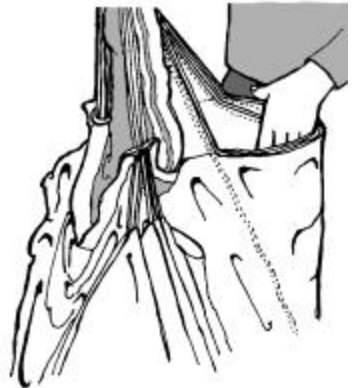


Figure 5

NOTE: Figure 6. is a graphic representation of what the canopy folds should look like when Step 7 is done correctly. The bottom surface of the canopy and the control lines will be symmetric. Clear all nine cells at the nose and insure the canopy is facing back toward the harness/ container system. **Don't forget to clear the stabilizers.**

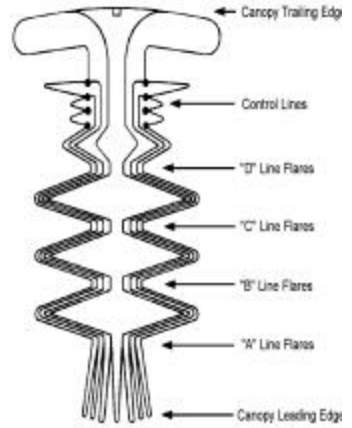


Figure 6

Step 8.) Place the trailing edge of center cell (indicated by the Data-panel) under the thumb and lift the canopy. (See Figure 7.)



Figure 7

Step 9.) Gather the leading edge of the canopy together with the other hand approximately 12 inches from the top skin trailing edge. (See Figure 8.)



Figure 8

Step 10.) Maintain the grip on the canopy and gently swing the canopy outward and away. Place the canopy on the floor and apply tension to the lines. **NOTE:** If the canopy is placed on the floor with a twisting motion, it will not spread out evenly. Insure the nose is facing downward toward the floor. The center seam of the center cell (indicated by the data panel) should be in the center of the canopy bundle. (See Figure 9.)

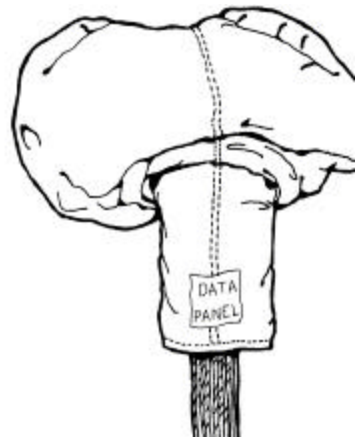
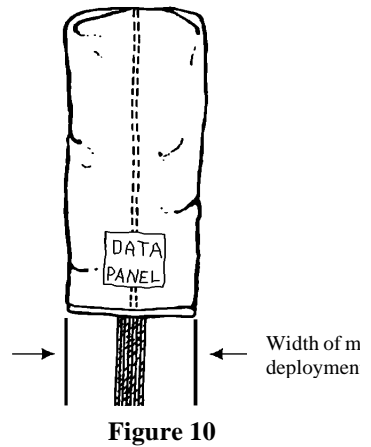


Figure 9

Step 11.) Kneel on the trailing edge of the center cell of the canopy and center the middle seam of the center cell in the middle of the canopy bundle. “Cocoon” fold the bundle by spreading the center cell of the canopy to the approximate width of the main deployment bag and tuck the outer edges of the material under the bundle. (See Figure 10.)



Step 12.) “S” Fold the bundle and place it into the main deployment bag. Close the deployment bag and complete the pack job in accordance with the harness/container manufacture’s instructions.



OPERATING INSTRUCTIONS and LIMITATIONS

1. Although it is not always possible, it is highly desirable to have a good "face to earth" body position for the deployment of a main parachute. It is considered ideal to be slightly head high during and just after pilot-chute deployment. During the deployment, try to keep your shoulders as level as possible to help keep the left and right line groups loading evenly during deployment.
2. As the opening canopy pulls you head high, visually check the canopy to insure that the deployment is complete. Grasp the control toggles and pull them down sharply to release the brakes. If there is an end cell closure, or if the slider has not come all the way down the lines to the connector links, pump the control toggles by pulling them downward and returning them to full flight. This will usually clear any end cells closure and/or bring the slider down. Repeat if necessary.
3. As soon as possible after releasing the brakes conduct a control check to find the stall point of the canopy by pulling down the toggles slowly until you feel the canopy stop flying and start to "fall off" backwards. (Recover from the stall by smoothly bringing the toggles back up to shoulder level.)
4. A properly deployed and functioning canopy can be controlled with the control toggles by simply pulling down on the right toggle to turn right or pulling down on the left toggle to turn left. As long as one toggle is pulled down further than the other toggle the canopy will continue to turn in the direction of the lowest toggle. The further the toggle is pulled down, the faster the turn will be. **Stalls and turns should be executed only when altitude permits. WARNING! no stalls below 1000 feet, and no turns should be done below 500 feet. (Except for minor course corrections on final approach.)**

5. A soft landing can usually be made by landing into the wind, and using a "Flaring Technique". This procedure is accomplished by pulling both control toggles downward smoothly to the full brake position just before landing. (Full brake position is usually with the toggles just above the stall point.) With the canopy facing into the wind and at full flight (toggles up as far as you can reach) start the flare when your feet are approximately 10-12 feet off the ground (depending upon the speed of the wind) smoothly bring the toggles down to the full brake position. When this is done correctly, the canopy will immediately change its angle of attack and this flattening of its angle of attack will allow for a very soft landing.

6. Varying wind speeds and other weather conditions may dictate variations of this technique. When in no wind conditions, it may be helpful to start the flare about six feet higher and then bring the toggles down just slightly slower, thus allowing the canopy more time to slow it's forward speed before landing. In higher wind conditions it may not be necessary to bring the toggles down quite as far to produce a flared landing.

7. If an emergency situation has left you with a broken control line, it is possible to control the canopy by pulling down on the rear risers. The canopy will turn in the direction of the riser being pulled downward. However, you must be very cautious when attempting a flared landing with the rear risers, particularly when one brake is still set. **WARNING! A riser flare can produce a very sudden stall, and it only takes a few inches of pulling to cause a stall. For this reason, the rear riser-flare should only be attempted in an emergency situation and ONLY if there has been ample time and altitude to practice the maneuver prior to landing. Under no circumstances should anyone try this maneuver unless they have practiced it at a SAFE ALTITUDE, furthermore it is recommended that only the very experienced skydiver ever attempt this type of landing.**

8. After landing, the canopy will normally deflate if there is little or no wind. However, if the wind is strong, there still exists the danger of being dragged by the inflated canopy. If you are landing in strong winds, release one of the toggles immediately upon landing, and pull the other toggle (hand over hand if necessary) until the canopy has fully deflated.

9. Avoid landing downwind of trees or large buildings. Large ground objects produce turbulence which can be dangerous to a parachutist on final approach. It is considered good practice to fly your canopy at quarter-brakes if you expect to encounter turbulence.

CANOPY CARE AND MAINTENANCE

These suggestions have been provided to help you prolong the life of your parachuting equipment.

1. It is very important to have the trim checked on your canopy every 200 to 300 jumps. If the trim is out of tolerance by more that 1" to 1.5". please consult FCI before continuing to use this product. (Please see the Trim Specification section of this manual for further information.)

2. Avoid dragging any part of the parachute across the ground. Do not pack on rough surfaces, such as concrete.

3. Do not leave the canopy exposed in the sun any longer than is absolutely necessary.

4. Do not wash the canopy. Over time it will increase the porosity, which will reduce the performance of the parachute. If it is necessary to remove grease spots, or any other type of stains, use mineral spirits on small areas.

5. If you must store your gear for a prolonged time frame, store the canopies, unpacked, in plastic bags. Insure the storage room is dry and that it has a constant moderate temperature to prevent mildew and damage from extreme heat.

6. Do not use Ripstop Tape or any other material that includes gum or other adhesives to make small repairs.

WARNING - DISCLAIMER - NO WARRANTIES

!!The user assumes all risk!!

This Flight Concepts International, Incorporated product is a high performance parachute. Serious injury or death can result from the use, attempted use, or misuse of this parachute, regardless of how it was maintained, packed, or deployed. This product is sold without warranty or suitability for any particular purpose, either expressed or implied. The manufacturer does not guarantee the reliability, dependability, or performance of this product. Furthermore, no one should attempt to use this product, or wear it as a parachute unless that person has received training in the use of this type of parachute by a qualified Instructor.

Additionally, it is understood and agreed upon that by the use of this product by the Buyer or any other subsequent user of this product, that the manufacturer and the seller shall not be deemed or held accountable, upon or under any guarantees or warranties, expressed or implied, statutory, by operation of law or otherwise, beyond that expressed herein. It is further understood that the purchase or use of this product constitutes an assumption of any and all risk associated with such use.