

USER MANUAL

AERODYNE RESEARCH LLC.

April 30,2024

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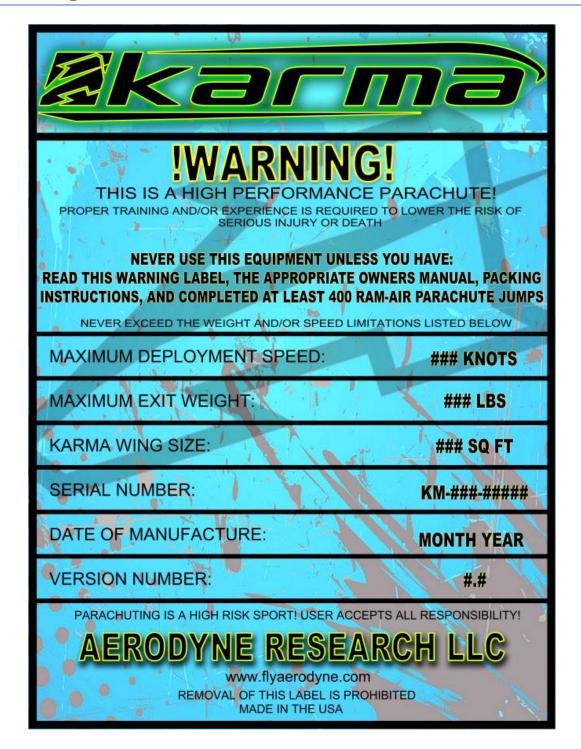
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END OF DISCLAIMER

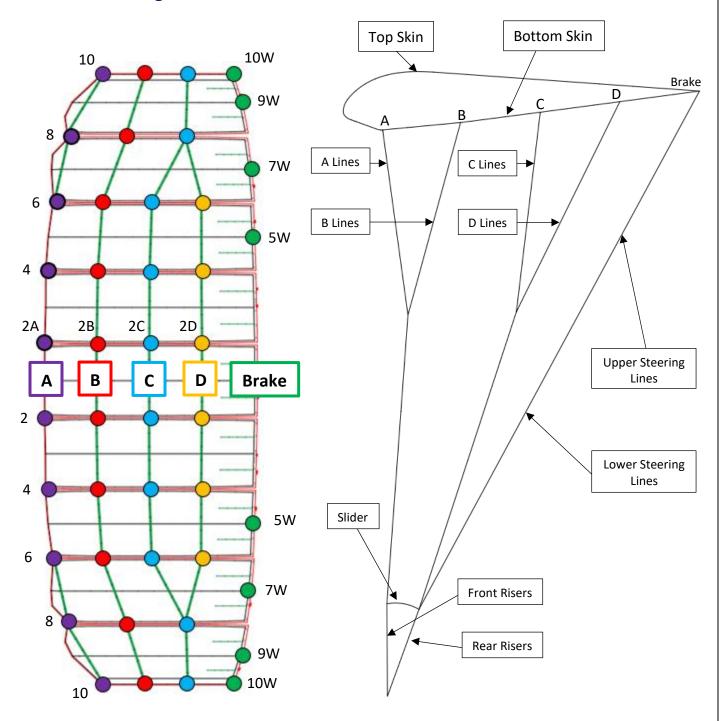
Warning Label



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1 Technical Characteristics

1.1 Line Configuration



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1.2 Technical Specifications and Limitations

TECHNICAL SPECIFICATIONS										
Wing Size ft²	Span ft	Chord Max	Chord Min	Weight kg	Weight lbs.	Volume In³				
93	14.60	5.50	3.30	3.10	6.70	310				
99	15.37	5.80	3.51	3.18	7.00	327				
109	16.18	6.11	3.69	3.41	7.50	340				
119	16.91	6.38	3.86	3.64	8.00	351				
129	18.60	7.02	4.25	3.86	8.50	368				
149	19.90	7.50	4.50	4.09	9.00	393				

Aspect Ratio: 2.65 Effective Ratio: 3.15 Tip Aspect Ratio: 4.38

Number of Cells: Conventional 9

Fabric: ZP Only

Suspension Lines: ZLX 700

KARMA Recommendations and Limitations *ALL FIGURES CALCULATED AT MAXIMUM WING LOADING*									
SIZE	STUDENT/NOVICE Not Suggested (NS)		INTERMEDIATE Not Suggested (NS)		ADVANCED 1.6-2.2		MAXIMUM 2.3		
ft.²	LBS	KG	LBS	KG	LBS	KG	LBS	KG	
93	NS	NS	NS	NS	186	84.5	214	97	
99	NS	NS	NS	NS	217.8	99	227.7	103.5	
109	NS	NS	NS	NS	239.8	109	250.7	114	
119	NS	NS	NS	NS	260	118.2	260	118.2	
129	NS	NS	NS	NS	260	118.2	260	118.2	
149	NS	NS	NS	NS	260	118.2	260	118.2	
Do not exceed the maximum exit weights listed above!									

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2 Assembly and Operating Instructions

2.1 Inspection before Assembly and Packing

- 1. Ensure that the Karma size is compatible with the harness/container and deployment system with which it will be used.
- 2. Complete a thorough inspection of the canopy, including, but not limited to the following:
 - Top Skin.
 - Bottom Skin.
 - Ribs.
 - All stitching on fabric.
 - Bar-tacks on the line set.
 - Slider.
 - Soft Links.

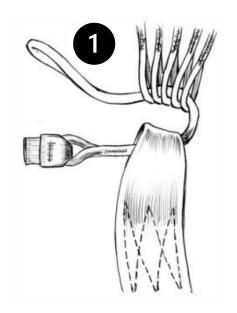
Take note of any worn, damaged, corroded, or incorrectly rigged components which must be repaired or replaced before the canopy is packed for use.

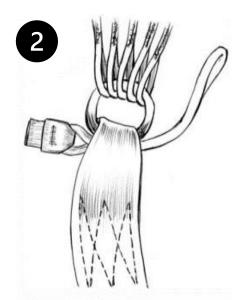
WARNING!

IF ANY DAMAGE IS FOUND ON THE CANOPY, DO NOT JUMP UNTIL IT HAS BEEN ADDRESSED BY THE MANUFACTURER.

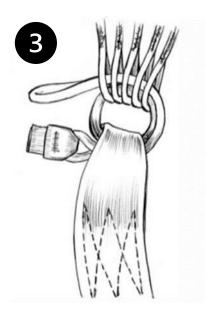
2.2 Installing soft links

- 1. Pass the Soft Link through the riser and suspension line loops.
- 2. Pass the Soft Link through the riser again.





- 3. Pass the Soft Link through the suspension line loops again.
- 4. Pass the loop-end of the soft link through the loop at the tab-end.





5. Feed the loop-end of the soft link over the tab. Creating a "Lark's head" knot.

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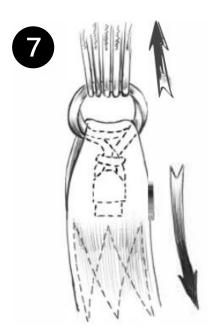
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6. Pull tight, ensuring that the Lark's head is secure.





7. Tuck the tab away. Then, while holding the suspension lines and riser, give a sharp pull to set the soft link.



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2.3 Assembly

1. Hang the canopy by the tail and ensure that the suspension lines are free and clear of each other.

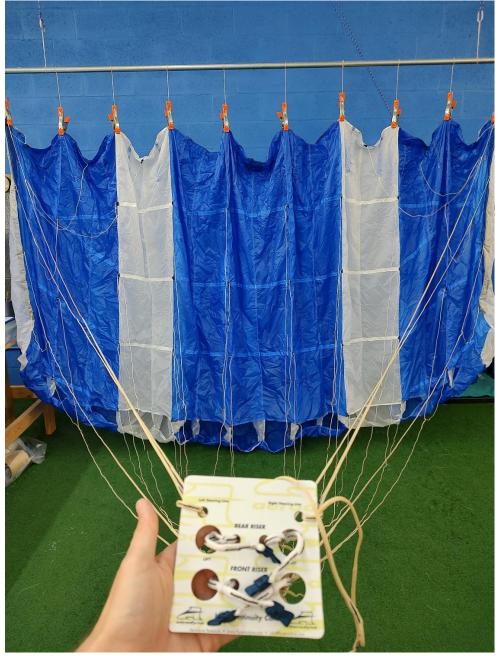


Figure 2.1 Hanging the canopy by the tail.

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2. Take the Removable/Collapsible slider and orient it such that the release cables are facing towards you, away from the canopy, and that the collapsing pull tabs are pointed towards the tail.

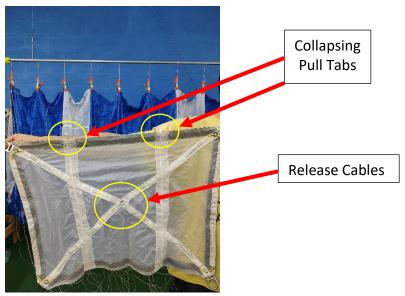


Figure 2.2 How to remove or collapse the Karma slider.

3. Insert the risers through the slider rings as shown.





- 4. Identify the four line groups:
 - Front Riser Left
 - Front Riser Right
 - Rear Riser Left
 - Rear Riser Right

There will be 10 suspension lines (5 each) between the Front Left and Front Right groups. There will be 8 suspension lines (4 each) between the Rear Left and Rear Right groups.

5. Refer to section 2.2 Installing soft links and attach each line group to its respective riser.

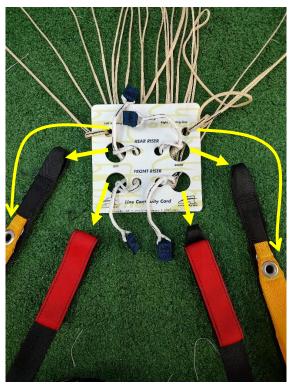


Figure 2.3. Line Continuity card.



Figure 2.4 Suspension lines attached to risers.

- 6. Check the line continuity to ensure that a line group was not twisted as it was attached to a riser.
- 7. You may now move the slider from the risers towards the canopy.

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8. Starting at the tail of the canopy, trace the upper steering lines down to the lower steering lines. Ensure that the steering lines do not wrap around any suspension lines and remove any twists in the steering line.

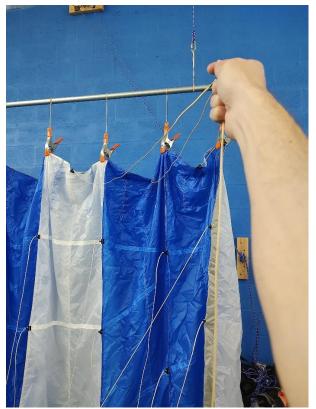


Figure 2.5 Upper steering lines are clear of suspension lines.

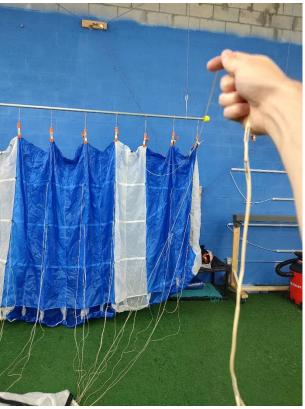


Figure 2.6 Ensuring the line is clear all the way to the end.

9. Route the left steering line through the left **rear** slider ring; the right steering line through the right **rear** slider ring.

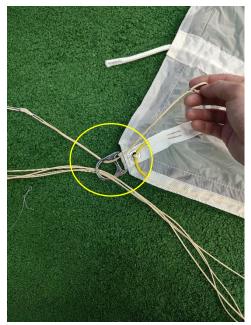


Figure 2.7 Left steering line through left rear slider ring.

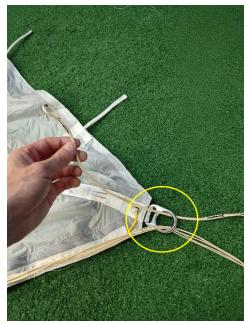


Figure 2.8 Right steering line through right rear slider ring.

10. Route the steering line through the guide ring located on the rear riser.



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- 11. To attach the steering lines to the toggles, start by passing the loop-end through the grommet on the toggle.
- 12. Pass the handle of the toggle through the loop-end of the steering line and then maneuver the loop-end down towards the grommet on the toggle as shown.



Figure 2.9 Route steering line from bottom of the toggle.



Figure 2.10 Route the handle of the toggle through the loop end of the steering line.



Figure 2.11 Maneuver the loop-end down towards the grommet on the toggle.

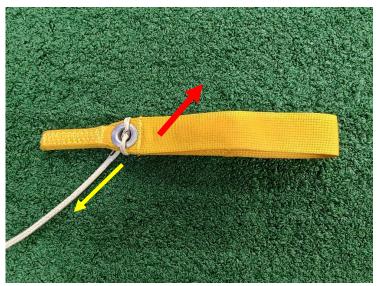


Figure 2.12 Pull the steering line and the toggle to tighten.

- 13. Refer to the user's manual of your harness/container to set the brakes.
- 14. Refer to the user's manual of your harness/container to attach your main deployment bag to the pilot chute bridle attachment point.

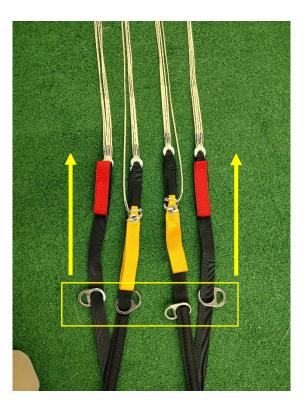
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2.4 Packing

After assembling and inspecting the canopy and harness/container, lay the parachute system out on a smooth, clean surface.

Refer to your harness/container user's manual to set the brakes and cock the pilot chute.

1. If the slider was removed, move the slider rings onto the suspension lines.





2. If the slider was collapsed, ensure that it is moved onto the suspension lines.

It is normal, and recommended to stow the toggles, and begin prepping the slider after landing to help save time and keep things organized while traveling from the landing area to a suitable location for packing.

3. If the slider was collapsed, push the locking tabs back into the channels. Then pull both ends of the slider to retract the cables. Ensure that the slider is returned to its maximum effective surface area.



Figure 2.13 Locate locking tab.



Figure 2.14 Insert the locking tab into the channel.

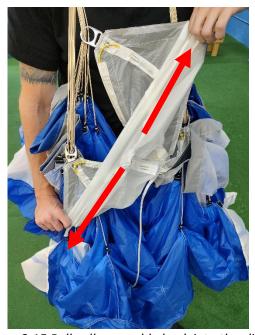


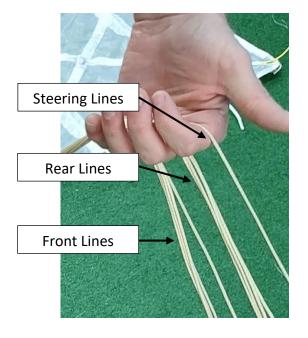
Figure 2.15 Pull collapse cable back into the slider.

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4. Take the line groups at the risers and walk up to the canopy, letting the line groups slide between your fingers but with enough grip to remove any slack. The line groups should not conflict with each other. If they do, consult a certified rigger to assess the issue.





- 5. If the slider was removed, follow steps 5 8.
- 6. Set the release cables on the slider by pulling the 4 yellow cables at the corners of the slider, one at a time, to their full length.

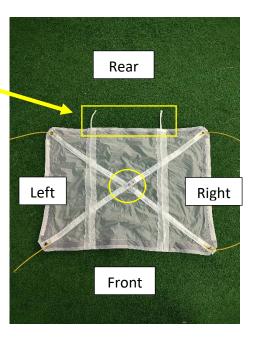




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7. Orient the slider such that the release cables are facing towards you, away from the canopy, and the collapsing pull tabs are pointed towards the tail of the canopy.





8. Route the release loop through the narrow section of the slider ring, wrapping around, and insert the loop through the grommet on the slider.





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9. Insert the yellow cable through the release loop and stow the excess in the cable pocket on the side of the slider.





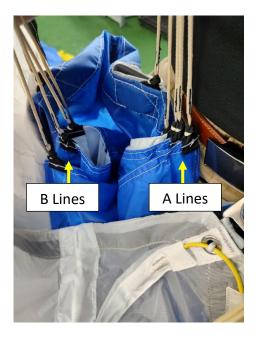
- 10. Take the canopy in one hand and clear the nose by flaking the leading edge.
- 11. Holding the nose firmly, shake the canopy vigorously to clear the fabric from the lines inside.

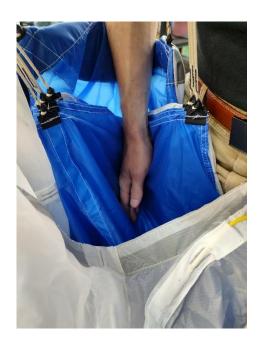




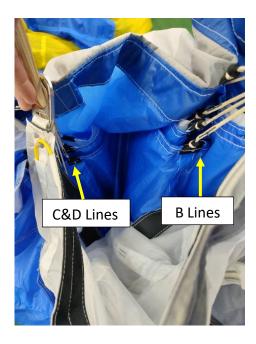
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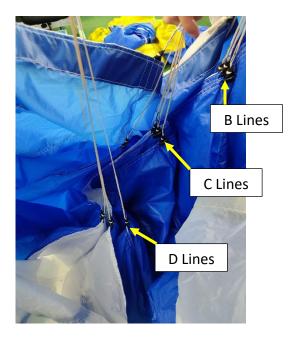
12. Separate the A & B lines on one side of the canopy. Reach into the canopy between these groups and move the fabric away from the center.





- 13. Separate the line groups B to C, and C to D in the same way.
 - a. NOTE: There are only three D lines per side.





14. Repeat steps 4 & 5 on the other side of the canopy.

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- 15. While keeping the nose pointed towards yourself. Ensure that the slider is seated as close to the canopy as possible.
- 16. Spread the fabric of the slider between the four line groups. ("Quartering" the slider)



17. Pick up the tail of the canopy where the warning label is located. **Do not lift the tail** higher than the slider rings as this can cause some slack in the D lines.





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- 18. Clear each side of the tail and bring them around the canopy towards the nose.
- 19. Join the two edges of the tail together and gently roll/fold them to help keep things in place for the next step. Do not excessively roll the tail as this can disrupt the C and D lines and cause off-heading openings.





20. Gently lay the canopy on the floor while maintaining line tension as shown.



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21. Carefully push the air out of the canopy while keeping the slider as close to the slider stops as possible.

WARNING!

OF A HARD OPENING AND SERIOUS INJURY OR DEATH IS
SIGNIFICANTLY INCREASED.

22. "S" fold the canopy as required for the deployment bag. Then gently slide the canopy in the deployment bag.



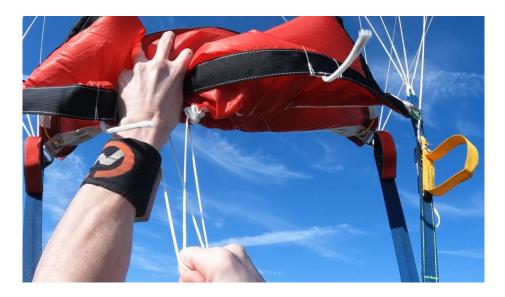


23. Refer to the user's manual of your harness/container for instructions on closing and stowing the lines on your deployment bag. As well as properly seating the deployment bag in your harness/container followed by closing the container and securing the pilot chute.

2.5 In Flight Use

2.5.1 Removing the Slider

1. Reach up to the release cables in the center of the slider. With one hand, hold the slider in place and pull the release cables with the other.



- Maintain a firm hold on the release cables and pull the slider off the risers over your head and off to the side. Do not pull straight down as this could release one or both of your toggles.
- 3. Stow the slider securely to avoid losing it during flight.
- 4. Carefully maneuver the slider rings down past the controls.



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2.5.2 Collapsing the Slider

1. Reach up to the collapsing pull tabs. Pull until the locking tabs are revealed.



- 2. You may leave the slider in its current position above the controls.
- 3. If you elect to use a slider keeper, carefully maneuver the slider rings down past the controls.

WARNING!

- 1. DO NOT MAKE A TURN CLOSE TO THE GROUND
- 2. CONSULT A PROFESSIONAL CANOPY COACH BEFORE ATTEMPTING HIGH PERFORMANCE LANDINGS.

3 Maintenance

Jumpers are encouraged to inspect their canopies during every pack job and to perform preventive maintenance. Follow the provided guidelines to inspect your canopy during normal use.

3.1 Routine Inspections

- 1. Visually inspect the canopy for defects or damage to the fabric, tapes, and seams. Any holes or tears must be patched. No ripstop tape patches are allowed. Any damage that requires the replacement of an entire panel or cell must be done by the manufacturer.
- 2. Check that all slider stops are present, intact, and secure. There are four slider stops, one on each of the outer A and C line groups.
- 3. Check that all line attachment tapes are secured and free from wear.
- 4. Check suspension and steering lines for wear and continuity. Lines that are worn or have broken strands must be replaced.
- 5. Inspect the soft links for serviceability.
- 6. Check the slider for correct installation; the reinforcing tape must be facing the canopy. Inspect the surface of the rings for nicks and sharp edges. Inspect the fabric for wear and tear.
- 7. Using the manufacturer's manual as a guide, inspect the harness/container system into which the canopy will be packed. Check all stitching for wear or snags. Inspect hardware for damage and corrosion.
- 8. Inspect the pilot chute, bridle, and deployment bag. Ensure that the bridle is securely fastened to both the pilot chute and bag.
- 9. Check the porosity in the following cases:
 - After 250 jumps.
 - After any situation or abnormal condition where damage to the canopy is reasonably suspected. (i.e. Getting wet, hard openings etc.)

3.2 Proper Storage

Textile and other materials used in the construction of all parachutes are sensitive to environmental elements. The parachute must be stored in a room where the temperature is kept between 15°C (59°F) and 30°C (86°F), and where the humidity is kept as low as possible.

Further, the parachute must be protected from:

- Sunlight
- Temperatures exceeding 93°C (200°F)
- Acid and corrosive agents (e.g. Soda, Battery Acid)
- Rodents and Pests
- Chlorine
- Smoke

It is recommended to use a carry bag to store parachutes that are not in use.

END OF KARMA USER MANUAL

