

ARC INSTRUCTIONS



460

630

840



CONGRATULATIONS

You have purchased a Peter Lynn ARC, the new form of traction kite developed for kite surfing and kitesailing but also useful for buggying and other power kiting activities. Their basic form is of a - double skin with ribs - parafoil style kite without bridles, the flying lines being attached directly and only to the wing tips. Their shape while flying is an arch, hence the name Arc.

THE ARC IS CONSTRUCTED WITH CHIKARA, A LIGHT WEIGHT, HI-TENACITY RIPSTOP NYLON WITH A SPECIAL WATER REPELLANT COATING. INSIDE THE KITE YOU WILL FIND LOW STRETCH DYNEEMA REINFORCING LINES AND GAUZE VENTS IN THE TIPS OF EACH PROFILE TO PROVIDE EVENLY DISTRIBUTED INFLATION. THE TIPS ARE REINFORCED WITH EXCEL-STRONG CARON-FIBRE TUBES IN CORDURA SLEEVES.

1120



flying the ARC

INITIAL LAUNCHING

Arcs are difficult to launch before there is any air in them.

We advice you to use one or two people to help you hold the kite during the launch for the first time. Pre-inflate by approximately 50% . This will allow easy launching. There are three pre-inflation systems:

- 1 Open the Arc's deflation flap at the trailing edge and hold it into the wind for a minute or so (depending on how much wind there is at the launching place).
- 2 In very light winds; use a battery electric blower. (see list of accessoires) to speed up inflation.
- 3 In strong winds the use of the trailing edge flap is not necessary. With it's leading edge at about 45 degrees to the wind, stand on one wingtip of the Arc while holding the other above your head until there is sufficient inflation.

SAFETY WHILE LAUNCHING

Launching causes more injuries and damage to kites, fliers, bystanders and property than any other aspect of traction kiting. Typical causes of problems are:

- *Failure to notice lines that are reversed, snagged or tangled before launching.
- *Underestimating the wind strength or starting just as a gust arrives.
- *Launching the wrong way, right through the centre of the wind.
- *Failure to notice and avoid other kites that are already flying.
- *Launching just upwind of a parking lot, highway or transmission lines.

Enough said. Some procedures:

- 1 If in doubt of the wind strength, try a smaller kite first. Wind meters don't measure the wind where the kite will be, 25m's up- and there is no reliable correlation between ground level and there until you know a particular site very well.
- 2 Free all the lines, check that everything is ready and (for the Arc), have adequate pre-inflation, before launching.
- 3 Give clear instruction to helpers, if any (but inanimate objects can be more reliable)
- 4 Never launch while hooked into a harness
- 5 Have a plan ready for when things go wrong;

knots can become undone, lines can break, steering can be reversed, power can be too large. Be prepared to let go of the lines, when freed, the kite will come rapidly some where downwind. That's why a free down wind area is so important.

WATER RELAUNCHING

If the Arc is on its side, [foto] just pull on the top side brake until it is pointing approximately upwards at which time it will launch itself. If it's a bit "sticky" (wet kite and/or light wind) reach forward and pull on the top lines until it takes off. When the Arc is nose down with it's leading edge on the water, by far the easiest relaunching system is to pull on the brake line leaders with one hand, holding them unequally by 500mm or so. The Arc will slowly lift off the water and turn over.

Occasionally lines get twisted around the body of the kite or get caught on the rod end. Usually they can be cleared by jerking on them or allowing the kite to roll around a bit on the water.

If an Arc is floating for any great length of time, water can gradually seep in- especially if it is being thrashed by waves. This will make water relaunching more difficult, eventually to the point of impossibility or to the point where there is so much water inside that the Arc will not fly at it's optimum performance. There are release valves at each tip trailing edge that allow internal water to dribble out while the kite is flying but until most water has drained it is usually not possible to make any but careful and slow control movements without causing collapsing. Sometimes Arcs will lie folded in half on the surface, wingtip to wingtip, instead of opening out and launching. If there is sufficient wind this will fix itself eventually, but pulling in one flying line by 2m or so and then releasing usually works.

SAFETY RELEASE

When Arcs are restrained by only the line(s) to one tip or the other they stream out flat and flutter down with very little pull. The bars we supply for Arcs have an appropriate side line rigged to a strap which can be attached to your wrist or harness. Letting go of the bar

flying the ARC

immediately releases the line tension and causes the Arc to descend. Even while in the water, it is usually possible to retrieve the bar and relaunch. This safety system is also the preferred means for landing Arcs in all but the lightest winds.

STABILITY

Arcs are very stable. Luffing is almost impossible. Apart from broken tip struts (rare), tip or shoulder collapses caused by under-inflation are about the only problems they have. There are two main causes of inadequate inflation:

- 1 Damage: Fabric and construction are robust, so Arcs are not easily damaged in normal use but any holes or tears in the skins will allow air to leak out, reducing internal pressure. For flying, minor damage to the lower skin or the top skin in the centre span area is not too serious, but holes in the upper skin tip areas are critical. Of course all holes will let water in so should be repaired promptly. See "Construction and Repair".
- 2 Trailing edge flap open: If the Velcro seal of the deflation flap becomes undone, air will leak, but it should be very obvious if this happens.

STALLING

If Arcs are set with their brakes too tight, they will stall when hovered directly down wind in light winds. This tendency is more of a problem for earlier Arcs and for ex-windsurfing kitesurfers than for experienced kitesurfers (who instinctively keep apparent wind speeds up in this situation). A simple and useful de-stalling technique for Arcs is to reach forward and pull on the top lines until the kite gets moving (usually just a few seconds). When using the brake doubling bar this is most easily done by pulling on the brake lines at their cross over point- which is central and at just a convenient arm's reach. This has the effect of releasing the brakes not tightening them.

INVERTING

Very occasionally if an Arc overflies completely

then drifts back it may invert (top becomes bottom AND left becomes right!). It will fly inverted but will be semi-stalled and unusable except for downwind. The re-inversion technique is mainly simple: Land the kite nose down, allow it to roll over downwind once then relaunch (in fact it will usually relaunch itself). There will then be a single twist in each side front/brake lines but this will not constrain performance (and it is possible, at some risk of total catastrophe, to pass the bar up through the lines and untwist them). The only tricky bit is to land the Arc nose down slowly enough so as not to burst something when flying in strong winds. But Arc's are strong so it's not that difficult- no-one's popped one doing this yet.

CONSTRUCTION AND REPAIRS

All panels are taped and sewn for strength and water proofing. Line loads are taken into the Arc via Dyneema cording sewn to the inner surfaces of the upper and lower skins. For spanwise strength there is a 300kgm cord sewn from tip to tip. For small puncture type holes, clear mylar repair film works very well and is always colour matched. For repairing structural damage open the trailing edge(unpick the sewing thread without damaging the ripstop sailcloth), stick fabric patches on using double sided adhesive tape and then oversew. The tape's adhesive layer improves joint strength and seals the stitching. Always use new tape to stick the trailing edge before re-sewing but it isn't necessary to also remove any old tape that is still in place.

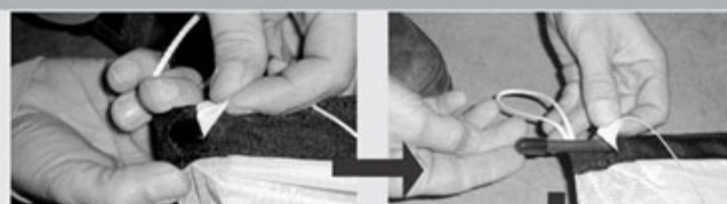
PACKING

Open Velcro seal, at the trailing edge (=at the rear of the kites), fold the Arc tip to tip and roll up, squeezing the air out and finishing at the centre.

Based on original text from Peter Lynn, Ashburton New Zealand, July 3 '00.

Note: there have been some changes in construction details of the Arc during its first year of production (2000) 'Early' Arc models might therefore differ from the description supplied in this document. Vlieger Op, The Hague, The Netherlands, December, 2000-12-16 www.vliegerop.nl

set UP



WINGTIP SPARS



LINE ATTACHEMENTS



DEFLATION FLAP



ready for takeoff



set UP

WINGTIP SPARS

Your Arc is supplied with two carbon spars that need to be inserted into the black webbing sleeves that are located at each wingtip. You will find the opening underneath the white Velcro 'flap'. The spar fit is fairly 'tight' you might need a small spoon-like instrument to squeeze the end in. The Velcro flap can then be folded in as well for extra security against spontaneous popping out of the spar. SEE 1-2-3

FLYING LINE

Arc's are capable of producing very large power surges, for kitesurfing we therefore recommend the use of high quality low stretch - Dyneema lines of 300 kg breaking strength on all four lines. In case of less intensive powerkite activity like buggying, 200 kg will be sufficient. Best result will be achieved with a length of 30 mtr (20 mtr length are an absolute minimum).

LINE ATTACHEMENTS

Make overhand knots in the rope loops that you can find at the wingtips. Flying lines usually come with sleeved end loops. Attach each of the four flying lines (as shown) with a 'Larkhead' knot on the 'rope-loop' at the wingtips.

DEFLATION FLAP

To prevent air leakage during flight the flap located in the middle of the trailing edge needs to be tightly folded and closed with the Velcro seal as shown in the pictures.



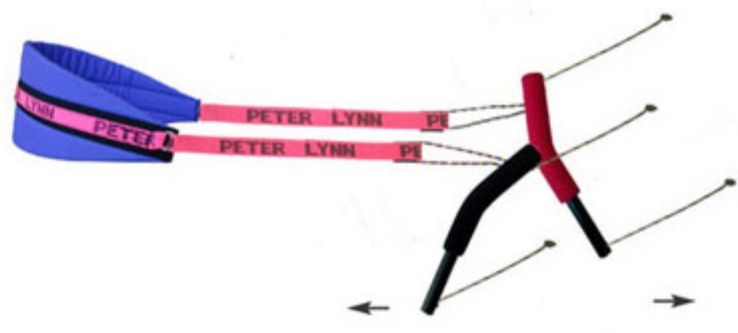
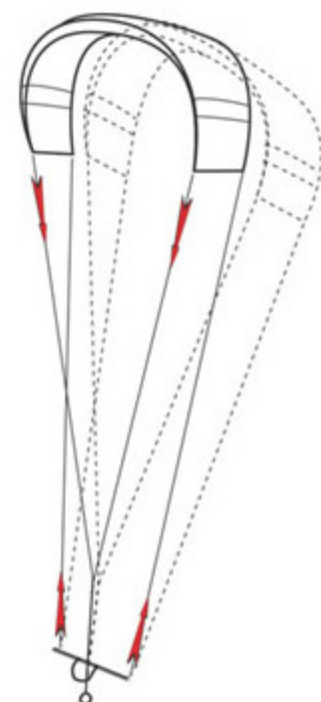
control BARS

ON THIS PAGES YOU WILL FIND THE FOLLOWING OPTIONS FOR FLYING LINE SET UP:

Controlbar versus handles. Arcs can be flown with either. Bars are physically easier to use, and allow faster turning of the larger sized Arcs. Handles, by allowing control of each line individually, have a slight advantage in some circumstance- for example during relaunching.

The standard bar we supply for Arcs is of conventional form with the brake lines attached directly (via adjusters) to the bar's ends and both mains going to a line which is connected to the centre of the Bar. We also supply Bars that have a 'de-powering' system or so called 'brake doublers'. The brake doubler makes the steering a bit heavier but also a lot faster and are useful with the 1120 and sometimes the 840 series Arcs. The basic technique for flying Arcs from conventional style four line handles, is to take the main kite pull through the harness most of the time while holding the handles much nearer to their brake ends than is conventional with C-Quads or 'foils'. This applies the brake force that Arcs require for reasonable steering without wrist overload.

Probably the choice comes down to which system you are most familiar with.



4-line handle setup with backstrap

control BARS

important INFORMATION

THIS NEW ARC IS RADICALLY DIFFERENT FROM ANY PREVIOUS KITE DESIGN. IT IS IMPORTANT THAT YOU GO THROUGH THIS WHOLE MANUAL CAREFULLY IN ORDER TO UNDERSTAND AND APPRECIATE THE KITE'S DESIGN, PRE-FLIGHT SET-UP, TECHNIQUE OF FLYING, AND ITS POTENTIALLY DANGEROUS AMOUNT OF SPEED AND POWER.

SAFETY PRECAUTIONS

SAFE LOCATION

- stay away from power lines, roads, airfields, railway lines
- never launch your kite on crowded beaches
- do not fly over bystanders
- make sure there is a 'clear' downwind area at least three times the distance of your flying line length

SAFE WHEATHER CONDITIONS

- never fly kites in thunderstorms, lightning or gusty/stormy winds
- do not go kitesurfing in offshore winds

SAFE KITESURFING

- We strongly recommend the use of helmet

and floatation device. Also a safety knife to cut flying lines in case of emergency is recommendable.

- Do not kitesurf in spots already in use by swimmers, surfers or windsurfers
- Stay safely away from other watercraft and shipping lanes.
- Never go further out to sea than you can safely swim back
- Always make sure there is a capable person on shore that knows keeping watch and ready to provide (or call for) help in case of an emergency.

GENERAL RULES FOR SAFE KITEFLYING

- Powerkites are no toys, they should not be flown by inexperienced persons and certainly not by children.
- Learn to fly kites with smaller models and start in light winds.
- Never use kites for paragliding or parachuting.
- Never use the Arc or any other type of kite or kite accessoire for jumping of high places or any other manlifting activity

FEATURES OF YOUR ARC

The Arc is a kite of the 'closed foil' type, with air entry by several soft fabric non-return valves along the leading edge. These valves prevent air escaping and resist water entry even when partially immersed.

There are no internal bladders that require pre-inflation. Static wind pressure is all that is required to maintain full inflation. When floated on water, the Arc has considerable volume (much greater than for single skin inflated tube kites). This will cause them to drift downwind faster than a floating person and keeps the kite's lines under tension, a must for relaunching from deep water. Water relaunchability is possible in

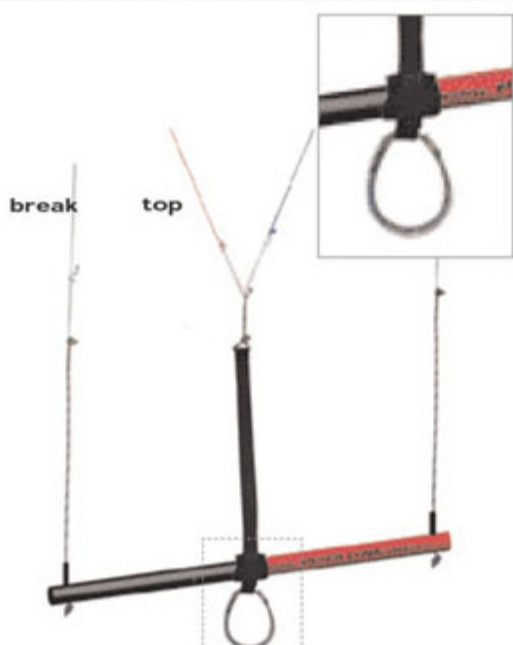
strong or light winds and from any position in the wind-window. Trouble-free water-relaunch is further ensured by the fact that the Arc functions without any bridles. The flying lines connect directly to the kite, line tangles are virtually eliminated. Arc's are always used in '4-line mode'. Power-up or De-power is by control of angle of attack of the complete foil, a much more efficient method than brake-line control as in traditional foils. One size of Arc is therefor useable in a very wide windrange. Control is possible by a straight standard kitesurfing bar, 4-lines handle or our special new twistgrip bar (available from spring 2001)

SPECIFICATIONS

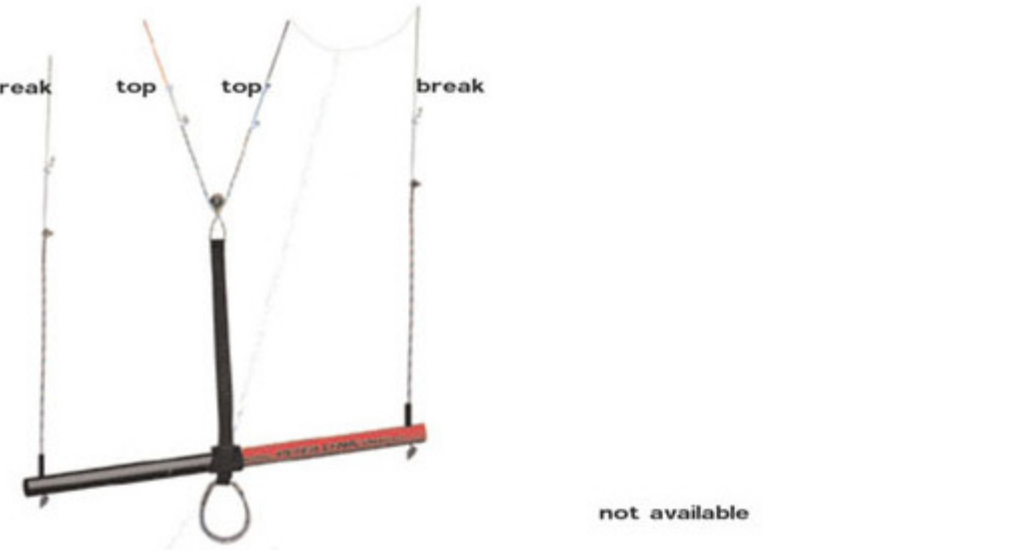
	flat area	projected area	windrange (kitesurfing)	weight	flat wingspan	chord centre	chord tip
ARC 460	4.6 m²	3.3 m²	25-50 km/h	1.1 kg	460 cm	160 cm	82 cm
ARC 630	6.3 m²	4.5 m²	20-40 km/h	1.4 kg	540 cm	165 cm	95 cm
ARC 840	8.4 m²	6.0 m²	15-30 km/h	1.7 kg	620 cm	190 cm	110 cm
ARC 1120	11.2 m²	8.0 m²	10-20 km/h	2.2 kg	710 cm	220 cm	127 cm



1 easy bar setup without powercontrol



2 standard bar setup with powercontrol



3 controlbar with steering doubler



4 twistgrip setup