

GINGA - Single line freestyler kites

The Ginga kites are single line freestyle kites that are mainly steered as fighter kites but that are also able to glide and make all kinds of tricks depending on your skills and imagination. Hence their name: Ginga. The ginga is indeed the basic move of the Capoeira, the Brazilian martial art that combines fight and acrobatics, exactly like these kites.

Their unique abilities come from a bow mixing stiff carbon and flexible glass fiber spars, and from a curved central spine that together enable them to float and loop.

The leading edges are made with carbon fiber in order to maintaining the wings' shape, but the central glass fiber segment acts as a spring to firmly tension the fabric but also, when pulling the line, the wings will bend inwards, giving stability like on any fighter kite, and when releasing the line, the wings will flap open to propel the kite in a horizontal or vertical loop. Such loops are also helped by the curved spine.

They are well balanced, able to glide away with a gentle tension control on the line, then block and pull, the kite will turn and rise. Other figures like belly launch, dive and a land, up and over, half-looping/half barrel and glide away, circle around you... are possible. Try different bridle tuning: from as flat as possible to have it gliding to its max but unstable, to as heavy as possible to steadily fly like a fighter or even static with a heavier line and possibly a tail.

They of course fly in steady winds but are great fun with a shorter line in unstable winds. They will react to each wind change, drifting away following the wind shift but keeping on floating, awaiting the next flurry. You should be able to fly them in any place that you would normally consider unsuited for kiting: in public parks behind trees or buildings...

The lightest versions fly indoor; however, they were made for outdoor flight, in light and unstable winds. In those conditions, they will deliver the whole potential.



7 different versions are proposed, from left to right: Fighter; Small; Small Stretched, UL and normal building; Standard; Vented Standard, Large (Icarex and Chikara versions). Different sizes, aspect ratios, framing, curve, fabric; to meet all styles and wishes.

Chose your version:

Small: Flies like a freestyler in light winds and like a fighter in stronger breeze. A fun allrounder, suitcase size. Height: 63cm, wingspan: 100cm. Frame: glass/carbon fiber 3 mm.

Small Stretched: a small one with a larger aspect ratio to improve light wind abilities. Made with Icarex. Height: 63cm, wingspan: 122cm. Frame: glass/carbon fiber 3 mm.

Small Stretched UL: the same one but built with lighter materials: fully framed with 2mm carbon and with less central curve. Indeed, the Small Stretched has a somewhat too much curve and makes loopings too easily when releasing the line. This works fine outdoors but it's too much for indoor and very light winds flying. Note that there is no specific template for this version, you should use the template of the Small Stretched and redraw a regular central curve, keeping only 1.2cm (instead of 2cm).



Standard: same aspect ratio as the Small, just larger in order to fly in lighter winds. The stronger frame enables it to face higher winds too. It flies much faster and is a furious freestyler. Once wind increases (2-3 BFT), line tension becomes too important to fly like a fighter kite, and beware your fingers. It also excels in unstable winds because it follows any wind shift and won't leave you unoccupied for any second. Height: 82cm, wingspan: 128cm. Frame: glass/carbon fiber 4 mm.



Vented Standard: as it says, it is the vented version of the Standard to fly in higher winds. It also flies gently in lighter winds but is a great static too in strong winds (with a heavier bridle tuning, and possibly a tail, it already successfully faced 6 BFT!).



Large/Stretched: a Standard with a higher aspect ratio to fly in lighter winds. Very stable as a glider but very acrobatic too. Works fine in Chikara, but better in Icarex. Height: 86cm, wingspan: 168cm. Frame: glass/carbon fiber 4 mm.

Fighter Ginga: It has the same outline as the Small but is essentially flat, having only a curve at the nose (as it should be on a fighter). The central curve is reduced to a pleat at the nose, on the top 20cm. There is also a small pleat at the tail to keep the fabric well tensioned. It is fully framed with 3mm carbon fiber. The curve of the spine is obtained with the pleat but also helped with a pensioner that enables also to tune the curve as desired. The spine is also thinned down to 2mm (sanded, see further down the picture of the central hook) along the curved section. Made with Icarex. Height 63cm; wingspan: 95cm. It is somewhat larger and heavier than a traditional fighter (NAFKA type) making it a slow and easy fighter, rather for a ludic flight.



Building instructions

Plans are hosted on www.windswepkites.com, as pdf files. You should print the several pages (Letter or A4 format, check on the plan), assemble the puzzle to make the plan. They are all grouped on one plan, except for the Fighter Ginga that is on a separate plan. There is no specific template for the Small Stretched UL: use the template of the Small Stretched and redraw a central curve only 1.2cm deep.

You can find a series of pictures detailing the building process and a couple of videos, figuring the Large and the Small ones in flight, on <https://picasaweb.google.com/105652092696906588489>.

Building steps:

Sail:

- Following the plan, make a cardboard template for the chosen version.
- Lay the cardboard template on two layers of fabric, aligning the straight grain of the fabric with the leading edge.
- Pay utmost attention to making it symmetrical; hence starting at once with two layers of fabric. It is rather frustrating to ending up with a kite continuously turning in the same direction.
- Pencil the central curve (spine), assemble both layers along the central curve with a soldering iron, welding thin dots every 5cm.
- Cut (with a cutter, not hot cut to avoid they get soldered) the leading and trailing edges.
- Cut along the central curve, 1/2cm away from the pencil line/soldered dots.
- Straight stitch along the penciled central curve.
- Open both wings, open the left 1/2cm apart and crease it flat on both sides of the central stitch. Keep it flat with a (triple) zig-zag stitch.
- For the vented version you have first to make the vented wings apart, and then to assemble both wings the same way.
- Lay a strong reinforcement strip (eg mylar) between the nose and the leading edge spar pocket. That section of the leading edge will eventually be firmly tensioned and must be stretchproof.
- Lay wing tips, tail and nose reinforcement patches, the leading edges spar pockets (2 inches wide, folded in two).

- The trailing edge is hemmed with a strip of fabric folded and sewn. There is no hemming margin on the template. The Small Stretched does not need a hemming.
- The central spar is ideally maintained in place with a long pocket but that is a little bit tricky to place because the central curve has to be tensioned straight on a curve surface to make it possible to lay straight a strip of fabric (see the picture on the picasa gallery). You can also just use a series of fabric loops or simply hand stitch the central spar every 5cm (that works fine but it is less easy to take the spar out if necessary).
- Finish the sail with closing the leading edge spar pockets, add a bullet proof nose and a the tail tensioner: a piece of strap folded in two to keep in place a short segment of spar that will take all the tension, but keep the fabric flat. Make a string loop at desired length to bring the tension.



- I have used Icarex (polyester) and Chikara (nylon) fabrics; both work fine, with the expected differences, however, I recommend polyester for the lighter versions.

Frame:

- Leading edges: carbon fiber, of the same length as the spar pockets. If you are using hollow 4mm carbon fiber, insert a piece of reinforcement to avoid the spar to be crushed by the ferrules when curving the bow into position.
- Central bow segment (glass or carbon fiber depending of the versions): it must be longer than necessary: when connected with the leading edges spar, the bow should cross the spine halfway between the nose and the central cross. Then, it is pushed backwards and inserted into the central cross, bringing hence a lot of tension in the sail and giving the 3D hollow shape to the kite. Start initially too long and carefully trim the central segment (1/2cm each time) until you have found the correct length. Its length depends on its stiffness; you have to tune it according to the quality of glass fiber you are using. I use the less stiff possible glass fiber (ie, lowest quality...) in order to have this segment as long as possible to maximize the spring effect.



- Central cross: the easiest is a 4mm open central cross from Eolo Gaila (available on line or in Europe in the Decathlon sport shop, as the soft glass fiber spar). You can also sew open a standard central cross to obtain the same shape. Another option is to glue (epoxy glue, then epoxy cement reinforcement) a tube segment perpendicular to the nose tube and to trim it open. Last option is to shape a segment of aluminum into a hook and to bind it (thin thread + cyanoacrylate glue) to the nose tube.



- Central spar: cut it initially 5-8cm longer than the central curve, you will be surprised by the amount of stretch when tensioning (fabric is in the bias), then trim it to the desired length. Nose tube: place a segment of 6mm tube over the central spar in order to maintain the central cross at the correct distance from the nose. If you make your own central hook, attach it to that segment of tube (see on the pictures). This segment reinforces the nose and brings some weight at the nose to balance the kite for better gliding abilities.

Battens:

- The larger versions gain in having battens; the Fighter should also benefit from having battens. Three battens work fine, dividing equally the trailing edge and pointing towards the nose (important for folding the kite). Any light and thin spar works fine, approximately 20cm long. Either make clean spar pockets or, simply glue them (contact glue) onto the sail and add hand stitches at both ends. You can start flying without battens and decide later if you wish to have it flying more silently and faster with battens.

Bridle :

- Make either a simple bridle or double the upper bridle to correct an imbalance. The bridle is as long as possible but just too short not to get tangled in the wing tip. Tune the kite as flat as possible to maximize its gliding-floating abilities and to make it unstable, trickable.

Nose weight:

- Some gliding kites benefit from having some weight added at the nose. I do not add weight; I prefer to keep the kite rather floating than gliding. The Gingas are not made to glide as much as possible but to be freestylers. When floating, the kite is unstable and ready to react to any input. They glide gently if you keep a slight tension in the line, just to keep the nose pointing downwards as necessary. However, give a try with some nose weight if you prefer it this way.

In case of question, join the discussion on the forum of www.kitebuilder.com.

Have fun.

Bon vent.
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