CHAPTER 10

Exceptional Kites

1 Introduction

We are now near the end of the chapters that describe different sorts of kite. My approach has been largely to classify kites by type (e.g. deltas, bird kites) and not by country of origin. It always seemed inevitable that there would be designs which are currently being flown but which don't fit the classification — I've called them exceptional.

There are, of course, some good kite types which have been omitted because they are really very similar to an included kite or because I just don't know about them.

There are some intriguing new designs from the Sauer sisters in Germany: Anke Sauer's 'Jack in the Box' kites which are essentially arrangements of paper pyramids and must be nearly 10 years old by now. See *Drachen* no. 13 (Winter 2003) and Illustration 1.

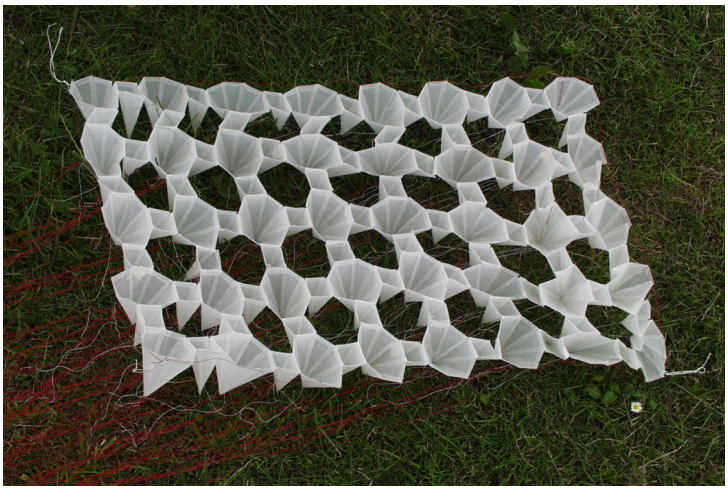


Illustration 1: Anke Sauer's Jack in the Box kite

Perhaps I should have something on miniature kites and paper kites…

What about something on asymmetrical kites — but you never see one flying in the UK. However, I did see one of the most remarkable of recent kites at Dieppe

2010. By Margrit Walter it is flat, sparred and not only single line but single bridle point (Illustration 2).

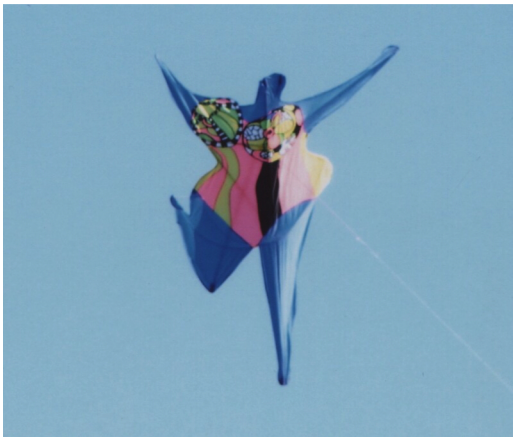


Illustration 2 kite by Margrit Walter

Anyway at the moment there are three exceptional kite types

The Chinese Dragon - Section 2

Rotating kites - Section 3

The Circoflex - Section 4

2 The Chinese Dragon

Called Centipede kites in earlier books and more usually called 'dragon-head centipede kites' in China, nothing is more spectacular than a big one flying well (see Illustration 3). Typically there is a 3D dragon's head, either bamboo framed with a paper/silk cover or carved polystyrene (or a mix). Functions vary but include rolling eyes, whiskers, flowing beards, smoke/fire breathing and impressive horns.

The body of the kite is a series of discs, each sized 0.5–1 m. with an overall length of many metres. I've seen 150 cells but I've seen an illustration of one 350m long, probably with 500 cells. Discs are framed with bamboo, each disc has a pair of balancers, which may be a single horizontal spar with an overall length of the disc's diameter x 4. The tip of each balancer comprises tassels or feathers which provide stability and which can be trimmed to balance the individual disc. These balancers are set below the mid point of the disc. Various systems of connecting the discs are in use; often three lines are used, the centre taking the considerable pull of a long dragon with two lighter lines to hold the discs parallel. The best source of data is Ha and Ha [1].

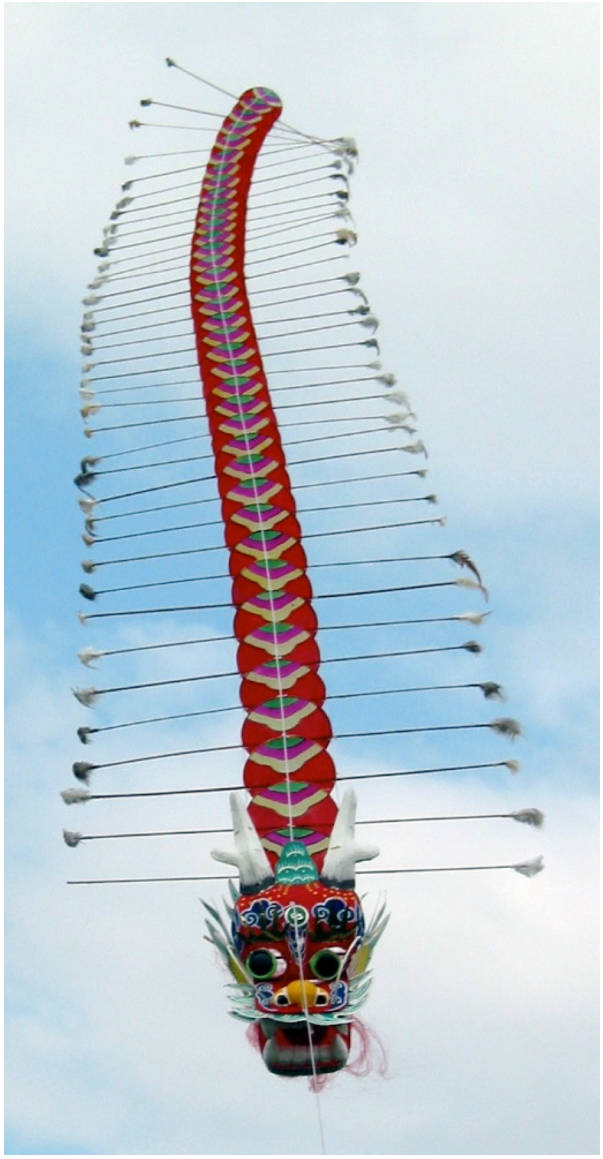


Illustration 3: a Chinese Dragon

Dragon, or centipede, kites are really a train of disc kites supporting the spectacular head. As such they are the most dramatic example of a train seen in the West. You will sometimes see lions and tigers made up of five to seven cells, stabilised by floppy feet. I have seen an illustration of a Great Wall of China kite, 100+m. long, with each cell representing a part of the Wall; also a train of asymmetrical mythical figures. There is a V formation of flying geese with one at the point and four in each line behind. A kite which has just arrived in the U.K. is 'two dragons and a pearl'. The sequence from the ground up is: tail of the dragon, body, head, pearl, head of second dragon, body tail. There is also a double dragon — two heads and side-by-side cells. I have a dragon but with a tiger's head (see Illustration 4). Of course the Chinese produce miniature dragons; a bijou version about 2 m. long seems to fly very well.

Illustration 4: Chinese Dragon with tiger's head

Certainly known in the USA in 1909 and several kite books from Pelham [2] onwards have included plans but very few are made. By far the most spectacular western versions are those designed and made by Iqbal Husain in Switzerland. Humorous kites are unusual, dramatic and well crafted ones more so (see Illustration 5). I like the crocodile head with each cell a handbag and the chicken (which sometimes lays eggs) with cells of frying pans with two or three eggs. There is also the cow's head with cells depicting burgers, packets of fries and, of course, sauces.

Back in 1992, the Northern Kite Group produced C. Wainwright's *An English Centipede Takes Flight*. Very good practical stuff.

Illustration 5: Chinese Dragon by Iqbal Husain

Difficult to fly –remember you are launching a train and not a kite with a tail– fragile and hard pulling in the larger versions; but nothing else gets such an aah! of spontaneous applause from a crowd.

3 Rotating kites

3.1

There are three distinct types of rotating kites, in addition to several kites that have a rotating propeller/sail incorporated in the design. Of the latter type most common are windmills, which may have flat or 3D bodies. In the 19th Century at least one kite (see Illustration 6) had a propeller fixed to the bottom edge at right angles to the axis of the kite (unlike the windmill where the sails are parallel to the axis) that was designed to help stability. Stability control would come from the faster rotation as wind speed increased. I don't know whether it worked and what would be the effect of a single propeller spinning in one direction; contra-rotation seems the thing to aim for. However, rotating drogues work well up to the limitations of the swivel.

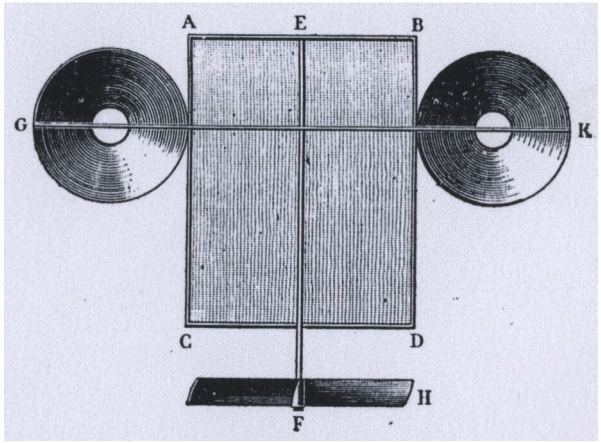


Illustration 6: Biot kite (from Lecornu)

[Invented by Biot in1880. G and K are cones (drogues), H is the propeller.]

The three types of kite where the whole thing, or at least the parts providing lift, rotate are:-

- The Rotary Wing (3.2)
- Kites rotating around an axis in line with the wind (3.3)
- Rotor kites (3.4)

3.2 Rotating Wing kites

Whereas aeroplanes have fixed wings, helicopters have rotating wings. In a fixed wing the body is pulled through the air by an engine and the airflow over the wing provides lift. With a helicopter the engine driven rotary wing provides lift and forward movement - hence the distinctive forward dip of a helicopter in fast and level flight. Kites of course use the wind not engines and those that obtain their lift from spinning rotors are akin to the autogiro. Not seen nowadays these were propeller driven aircraft with a rotor NOT fixed wing developed in the 1920's and 30's.

In the Second World War German U-Boats experimented with a man-carrying rotary winged kite which was kept aloft by the boat's speed. The Bachstelze or Wagtail flew 300m. high and improved spotting. But problems with quick retrieval led to only 200 being made (see *Drachen* no. 10 (Fall 2010)).

Commercial rotating wing kites are produced, invariably helicopter-shaped but I've only once seen one flying well (illustration 7).

Illustration 7: helicopter kite

3.3 Kites rotating around an axis in line with the wind

Box kites can be made to rotate either by having stub wings angled to give the propeller effect or by having the whole frame twisted to provide rotation. The most successful commercial version is the Windy Kite (see Illustration 8a). Nicholas Wadsworth has produced several good designs (see Illustration 9), sometimes flying two counter-rotating off the same line. I have seen bigger German arrangements of counter rotating boxes flown in frames (see Illustration 10). John Eaton has produced a superb dramatically coloured box (Illustration 11).

Illustration 8a: rotating box

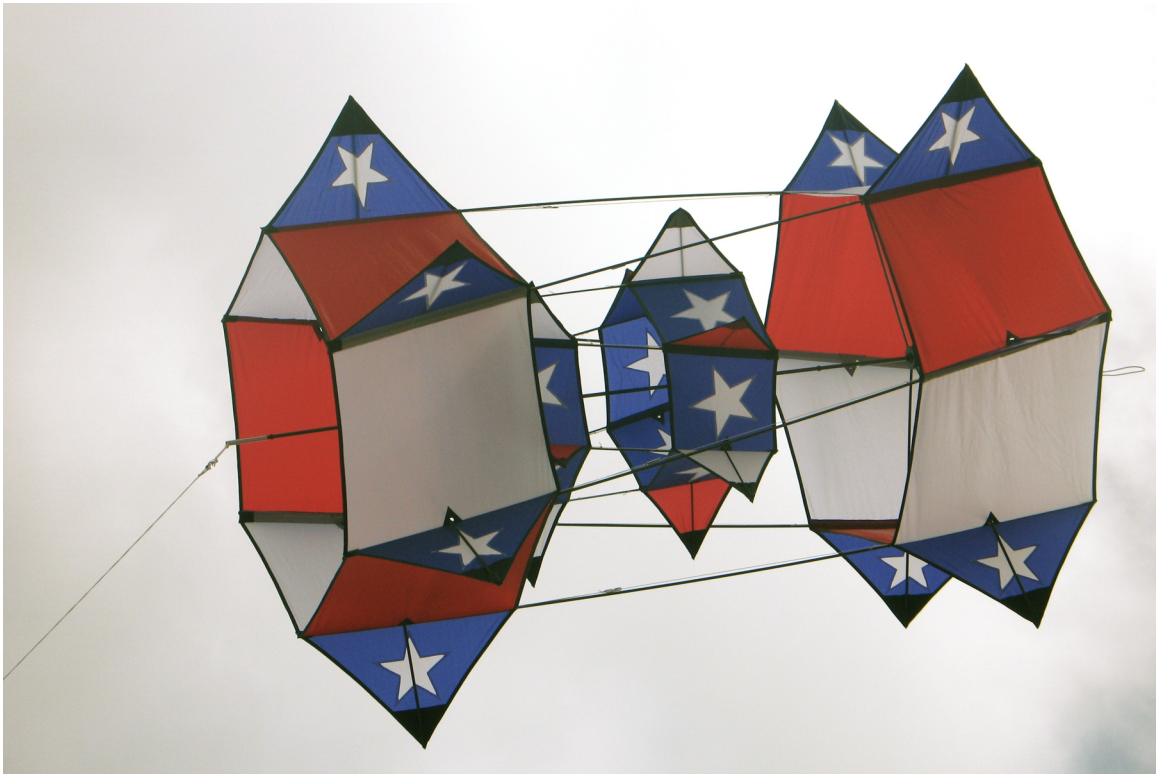


Illustration 8b: counter-rotating box
[the inner segment rotates in the opposite direction to the outer segments]

THE WADSWORTH SPINNER

This kite is almost as simple to make as a normal box kite but it spins rapidly in the wind. It works well made of plastic sheet, green garden canes and sticky tape or of ripstop and ramin dowel. No doubt you could use carbon fibre.

The two sails are each 1 unit by 4 units. A 30-40cm unit is quite suitable. Four spars are fixed at an angle as shown. The spreaders are attached to the spars 0.4 of the way back from the leading edge of the box. In the rear box the two spreaders run right across the diagonals of the box. In the front box there are four half length spreaders which fit into a enthral boss. I made the boss from a short length of wooden broom handle.

In each case as the last spreader is sprung in the box springs into shape with the spars bent and the box faces curved. (There are also some wrinkles.) The length of the spreaders should be adjusted so that when in place they are sightly bowed, keeping the sail taut. Start with the spreaders 1.45 units long and shorten carefully. In the front box the spreaders should bow forward so the bridle point is not more than 0.3 units behind the leading edge.

When complete join the two boxes by 6 lines in a zig-zag from corner to corner. The kite is flown from a pivot on the central boss in the front cell. To prevent the line twisting it is tied to a stiff wire looped behind the head of the pivot.

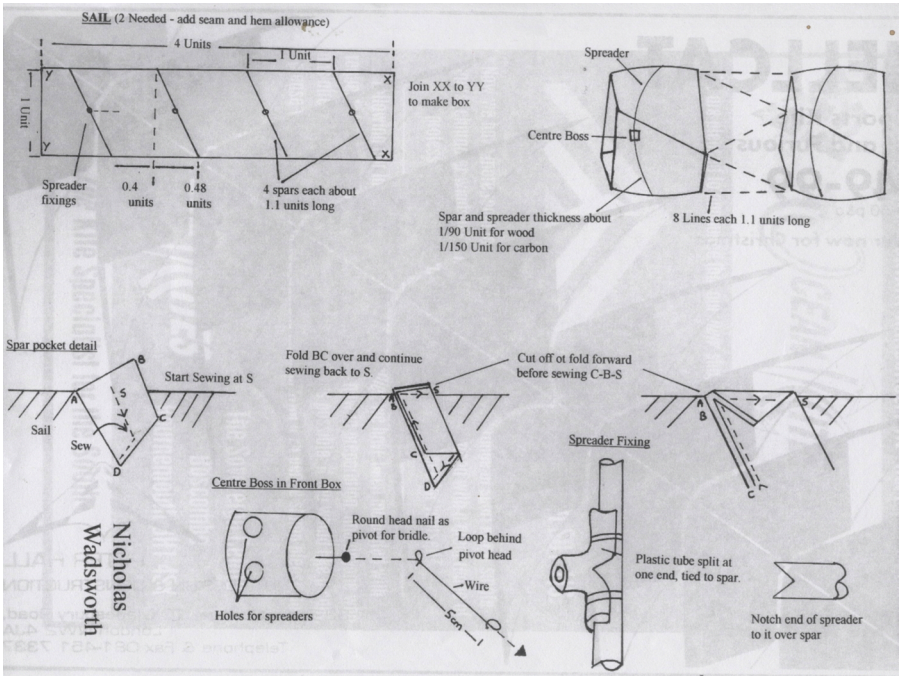


Illustration 9: Nicholas Wadsworth's spinning kites (photo shows two kites)

Illustration 10: rotating box with frames

Illustration 11: John Eaton spinning box

3.4 Rotor kites

The simplest rotor kite is a vane free to rotate at right-angles to the wind. The idea goes back at least to an American patent by J. Donaldson in 1948 and every few years since then it seems a 'new' rotor kite has been marketed — including about 20 years ago a double rotor where the kite had an aeroplane fuselage with rotors at a dihedral replacing fixed wings. To the best of my knowledge, and unlike other kites in this section, rotor kites exist in their own right and are not a scaled down or wind-driven version of anything else.

In the U.K. undoubtedly the most common rotor which has been marketed over more than 20 years is the UFO Sam kite, patented by the late Ken Sams. Great fun and mysterious for those who don't understand how they fly, they tend to suffer from two problems common with rotors:

- fragility
- the difficulty of providing a cheap light axle and bearing which can cope with rapid revolution

Sams wrote an interesting book [3] with instructions for a variety of 'UFO Gliders'.

Illustration 12: Sams UFO kite

How they fly involves difficult aerodynamics and is quite different from conventional kites. There is a brief explanation on Sams' book p. 48. Essentially the spinning blades produce vortices (spinning air, or horizontal tornadoes) from each tip where the air on top goes down and that below, up. The kite receives its lift between the two vortices. Perhaps the explanation of conventional kites' lift in Chapter 12 will help.

I don't know of a 'hand crafted' rotor kite now although there was a Dutch model about 20 years ago.

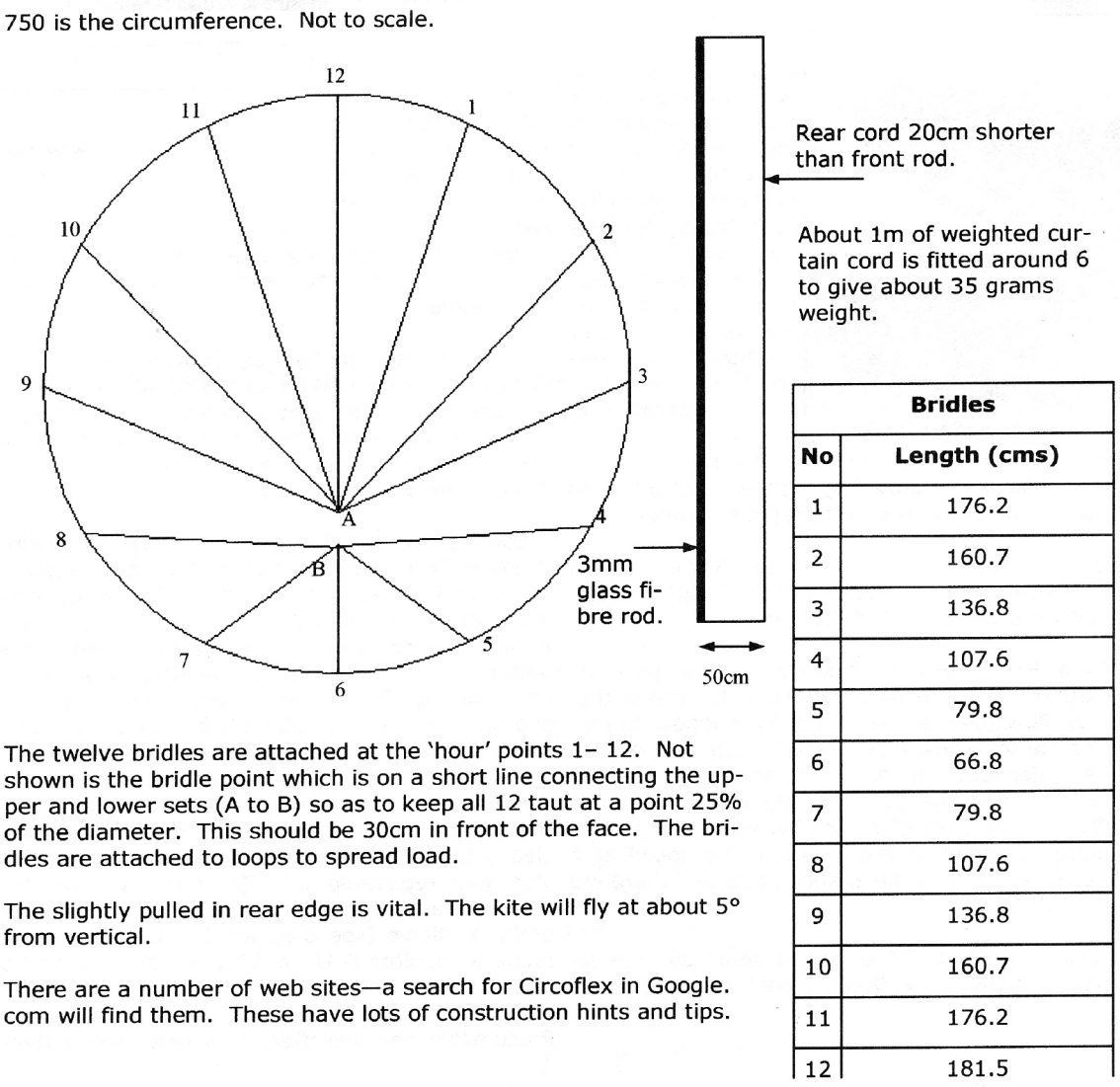
3.5 The Circoflex

Tubular lantern kites are a traditional Chinese design that fly bridled from a point on the leading edge. Newman and Newman [4] have a plan (p. 98) and an illustration of an American battery of eight on a frame. Far more frequently seen are cylindrical drogues with a stiffened leading edge and a three or four point bridle.

The kite developed by Ton Oostveen & Helmut Schiefer in 1996 marked such a break from those designs that it is by general consent a new design of kite. If you

were determined to look for an ancestor it would be Lecornu because of the bridle/flying angle arrangements.

According to an article in *American Kite* (Summer'97), the kite stemmed from a problem Oostveen had had in 1993 flying a 3 m. rok supporting a 7 m. windsock (with a message on the hazards of drunken driving). He started to develop a better bridling system for the windsock that resulted in its flying independently. He could also shorten the resulting tubular kite from 8 m. circumference and 4.5m. long – ultimately to 7.5m. circumference and 50 cm. long. There was rapid development during the summer of '96; the kite was then taken to the Dieppe Kite Festival and was clearly the outstanding kite of the show. The design was registered in 1996 but the inventors have made the construction and dimensions generally available (see Illustration 13). Details can be found in Moulton & Lloyd [5] and *Kite Passion* No 3 March 1997. See Illustration 14 (*Kiteflier* 121 (October 2009)).



Bridles	
No	**Length (cms)**
1	176.2
2	160.7
3	136.8
4	107.6
5	79.8
6	66.8
7	79.8
8	107.6
9	136.8
10	160.7
11	176.2
12	181.5

Illustration 13: plan of the circoflex

Illustration 14: the Circoflex

Presumably because there isn't a restrictive patent I've not yet seen commercially produced Circoflexes but they do appear at kite festivals in various sizes and proportions. For me they are at their most dramatic in silver and gold where often the bridles can't easily be seen and they are startling and mysterious. However I remember a green ripstop Circoflex on Saturday evening at Portsmouth 2002. All the other kites were down except this one high above the funfair area. Not many looked up but those that did might well have wondered about the upright green ring steady in the sky.

I've only seen one development of the original idea — at Fano 2009, flier unknown. See Illustration 15. The ragged training edge does give it the look of something entering our sky from space. Or with the right colours it could resemble a gas ring on its side ... or whatever ...

Illustration 15: another Circoflex

4 Bibliography

[1] Ha, K. and Ha, Y. (1990*) Chinese Artistic Kites.*
[2] Pelham, D. (1976*) Kites.*
[3] Sams, K. (1991*) Flying Toys.*
[4] Newman, L. S. and Newman, J. H. (1974*) Kitecraft.*
[5] Moulton, R. and Lloyd, P. (1997*) Kites.*