

# KITES FOR CONNOISSEURS

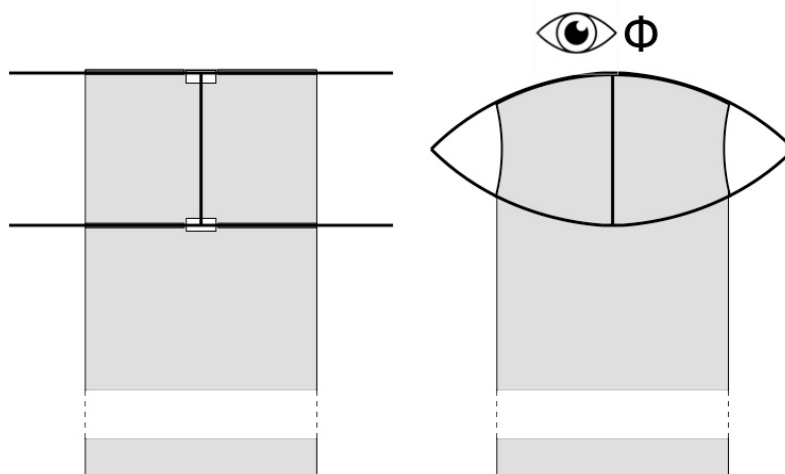
## EYE PHI

ANDREAS ÅGREN  
andreas@windman.se

This plan may be used for personal use only



*Kites for Connoisseurs* is a collection of plans for kites designed by Andreas Ågren. These kites often have a unique technical twist. The plans can be found at <http://windman.se/kite-plans> and they may not be used for commercial purpose without written consent.



The *Eye Phi* frame started as a challenge:

My good friend Kevin Sanders from Adelaide, Australia, like me loves the Balinese kites and is a frequent visitor to Sanur International Kite Festival.

One time, as we were admiring the smooth ripple of the long tails of the Janggan kites in the sky, we started to discuss if it would be possible to apply the tail of the Janggan kite to a Western kite. So the challenge was on.

My thinking was that the kite itself, i.e. the lifting part, should be as insignificant as possible to create an illusion of just a flying tail, in contrast to a real Janggan where the body and head is very elaborated.

I was thinking of again using the only trick I know: the in-sail dihedral like in Sverker, but a kite like that would be too prominent. Suddenly it dawned upon me that I could probably get the in-sail dihedral by doing it the other way around: instead of tweaking the shape of the sail I could tweak the shape of the cross spars.

So by making a frame in the shape of the letter H, turn it 90 degrees, putting a long piece of cloth on the frame and then bend the spars so the tips meet and the frame gets the shape of an eye with the sail curving behind: voila! There is the in-sail dihedral!

This 'Vented wing' is by no means a new idea, only maybe the way to create it is new. It is so simple and obvious to make so I am not claiming that I invented it: only that I discovered it.

I gave the frame the name *Eye Phi* for obvious reasons. It needs a tail for steady flight, how long I don't know. Certainly it can fly tail-less for short moments but will inevitably dive sooner or later.

## Principle plan of a kite using the Eye Phi frame.

You have a long piece of cloth.

Measure the width and calculate the measurements for the sections of the frame. The measurements don't need to be particularly accurate.

The material in the frame could be either carbon or fiberglass.

For a cloth width of 1.5 m.

- 6 mm carbon. The centre section (B1) should be carbon rod, the side sections (B2) should be carbon tube.

or

- 8 mm fiberglass. The centre section (B1) should be fiberglass rod, the side sections (B2) should be fibre glass tube.

For a cloth width of 0.75 m.

- 4 mm carbon. The centre section (B1) should be carbon rod, the side sections (B2) should be carbon tube.

or

- 6 mm fiberglass. The centre section (B1) should be fiberglass rod, the side sections (B2) should be fibre glass tube.

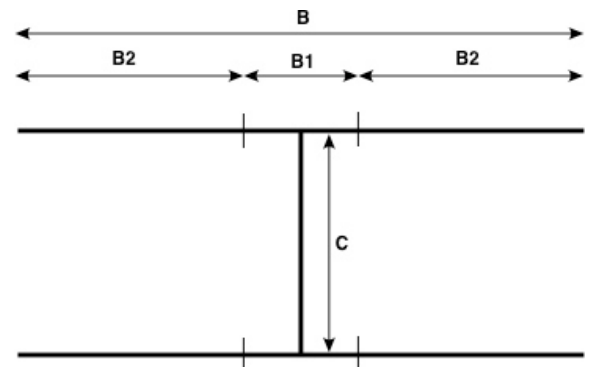
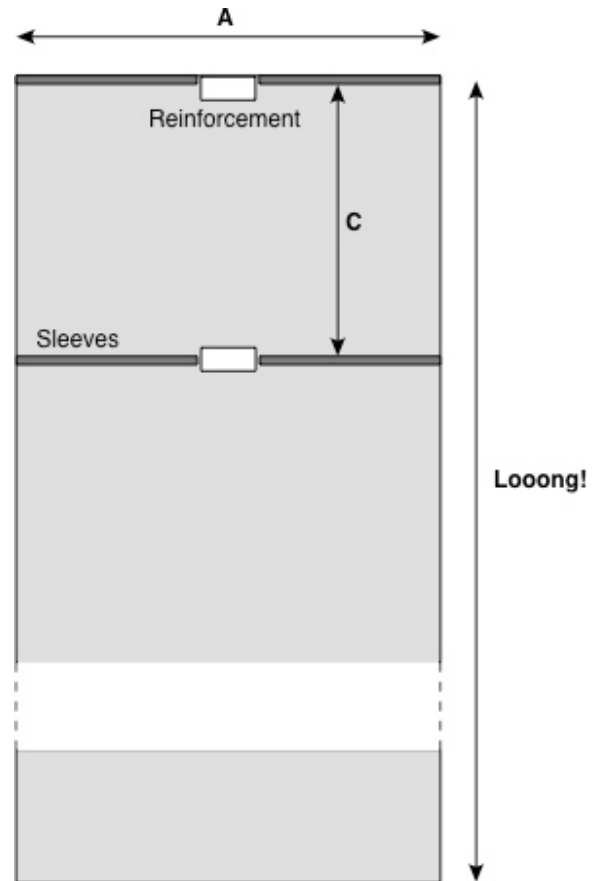
### Connectors

- T connectors for spine spar.
- Ferrules on cross spar centre section.
- Reinforced plastic tube for joining the cross spar ends at the wing tips.

A string would be needed from the sleeve ends on the cloth edge to the wing tips to tauten the cloth.

### Bridle

A two-point bridle fixed around the T connectors. Length of bridle line is approximately  $6 C$ , with towing point approximately  $2.7 C$  from leading edge.



$$B \approx 1.6 A$$

$$C \approx 0.65 A$$

$$B1 \approx 0.25 B$$

$$B2 \approx 0.37 B$$