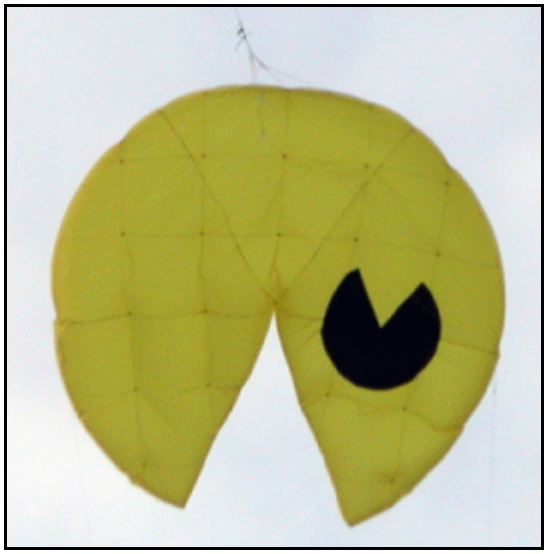
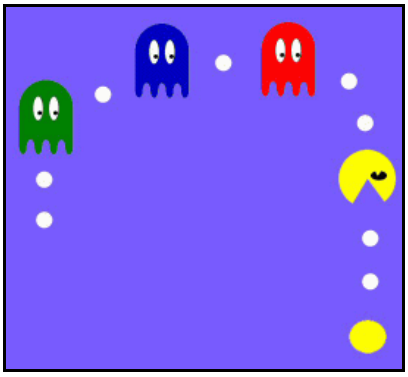
26/01/05

Pacman



Introduction

The Pacman kite is a totally soft kite that uses internal lines (as used in hot air balloons and other inflatable structures) to keep its shape. It is a relatively simple kite to make, and should take around 3-4 days of leisurely building! The kites size (3m diameter) has been chosen to make the most efficient use of 1.5m wide ripstop material. In the near future I hope to make a few Pacman ghost kites that can be flown at the same time (maybe in an arch configuration) to bring back some retro gaming memories to the kite-computer geeks out there (myself included!).



Construction

The kite is quite easy to construct if you have prior knowledge of parafoil or other soft kite construction. If this is your first soft kite you might want to read some other soft kite plans to be sure you know what you are doing, as I have not attempted to produce an absolute beginner's guide. Don't let me put you off though – what's the worst that can happen?? – you will have the fanciest windsock on the kite field!!
Note: all measurements without units are in centimetres, and all figures are not drawn to scale – so don't try to enlarge them.

Front and Back Skins

To make the most of the average size of ripstop the skins of the kite are made from five of the segments shown in Figure 1. I sketched a template on the back of some wallpaper, and then traced the shapes onto my ripstop. To get the curve I pinned a piece of string of 150 cm length to the centre point and then drew the arc with my pen. I do not mark on a seam allowance. I just try to leave between 0.5 – 1 cm when I cut out, which does not need to be accurate as it will be inside the kite when it is finished. Five segments are required for the front skin and five for the back skin. It will probably help later if you mark the centre of the arc on each segment. The MOST important part of the plan is to make sure that the angle between the two straight lines in each segment is 60°.

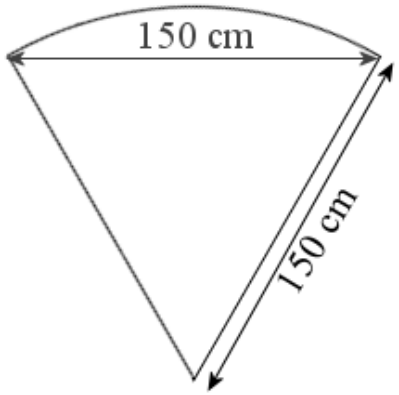


Figure 1. A segment to make up the skins. The curve is part of a circle of radius 150 cm. The angle between the two straight lines is 60°.

Reinforcement Lines

Figure 2 shows the positions of the reinforcement lines. The lines are sewn onto both skins in a grid arrangement. For marking out I found it easiest to start with the central vertical line and then mark each side separately. Once you have marked out the grids sew 2 cm x 2 cm reinforcement patches (Dacron or heavy weight nylon) at each intersection point – this is where the bridles and internal lines will pass through. Next sew on the lines – I used 70 Kg Dyneema as I had a roll knocking around, but you may use a lighter (and cheaper) line.

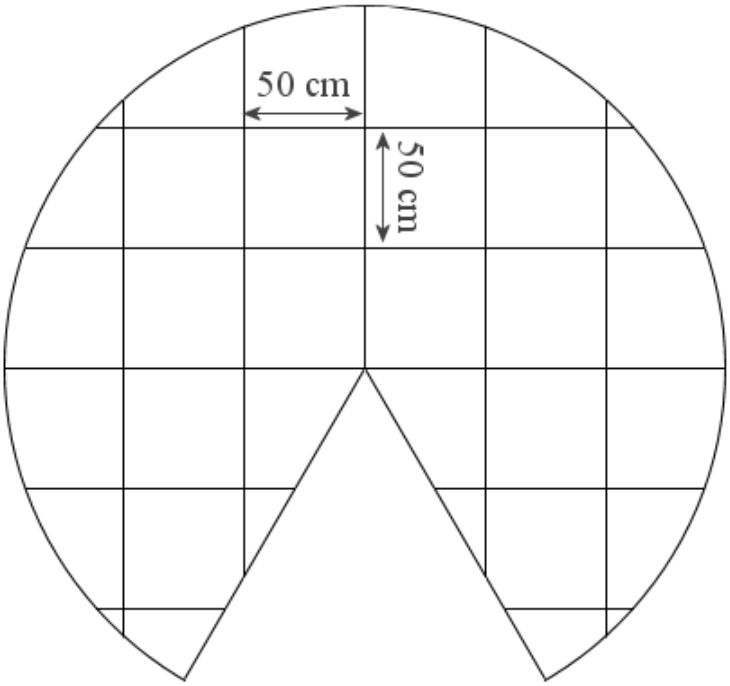


Figure 2. Reinforcement lines positions.

The Eye

Now cut out the eye and position it as shown in Figure 3.

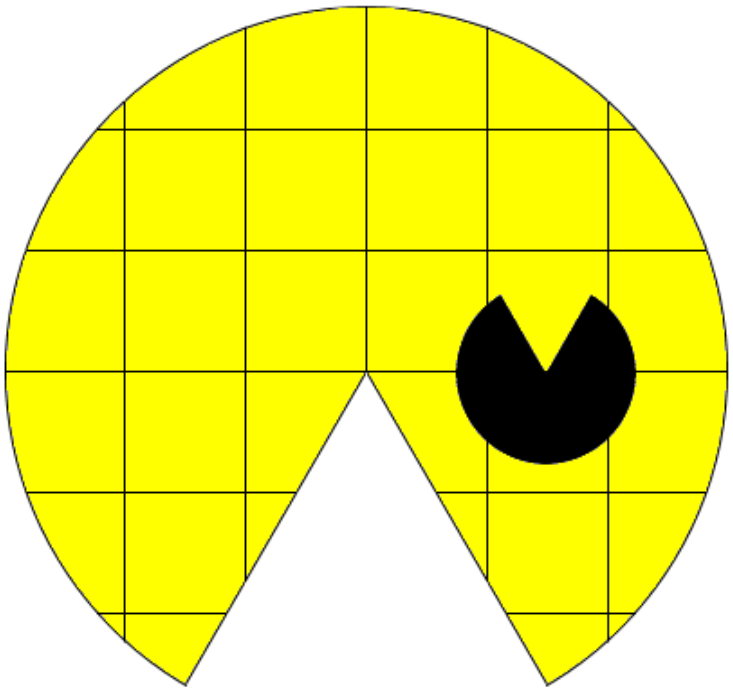


Figure 3. The finished bottom skin with the eye attached.

Edging Strip

The edging strip should be cut according to Figure 4.

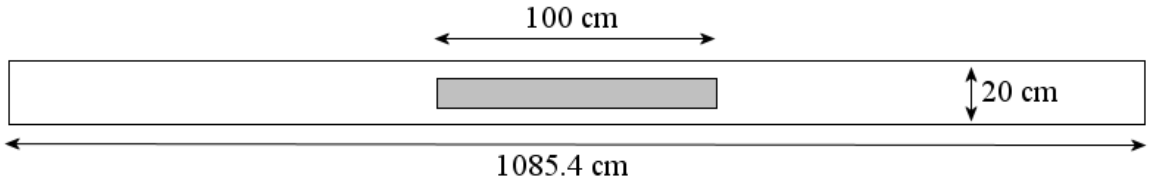


Figure 4. The edging strip, with the mesh in the centre.

I have calculated that it should be 1085.4 x 20 cm, however in practice I have found that the length falls short, or you end up with some left over, due to material stretching when sewing diagonally across the grain of the ripstop. So make sure that you leave a little extra that can be cut off if it is not needed when you are finally closing off the kite. In the centre at the edging strip there should be a 100 cm x 15cm of mesh to let the air in. Once

you have sewn the mesh onto the edging strip you should sew the edging strip onto the bottom skin. Start sewing from the middle (at the top of the kite) and around to the centre of the kite. Then sew the other side. Now sew the back skin to the edging strip in the same way, so that the seam will be on the inside of the kite, (see other parafoil plans if you don't understand), leaving enough open to allow you tie in the internal lines and bridle lines.

Internal Lines

Now sew and tie in the internal lines to the lengths shown in Figure 5.

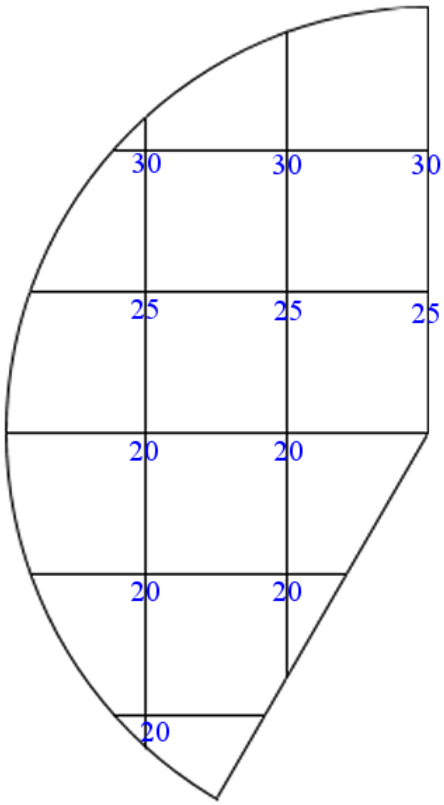


Figure 5. The internal line lengths for one half of the kite (the other half is a mirror image).

The lines should be sewn so that they pass through the reinforcement material and out the kite, pass diagonally over the reinforcement lines and back through the skin and tie your favourite knot!

Bridle Lines

Tie your bridle lines to the kite in the same way as the internal lines, except on the outside of the kite. The bridle consists of primary and secondary lines. Figure 6 shows the primary bridle lengths.

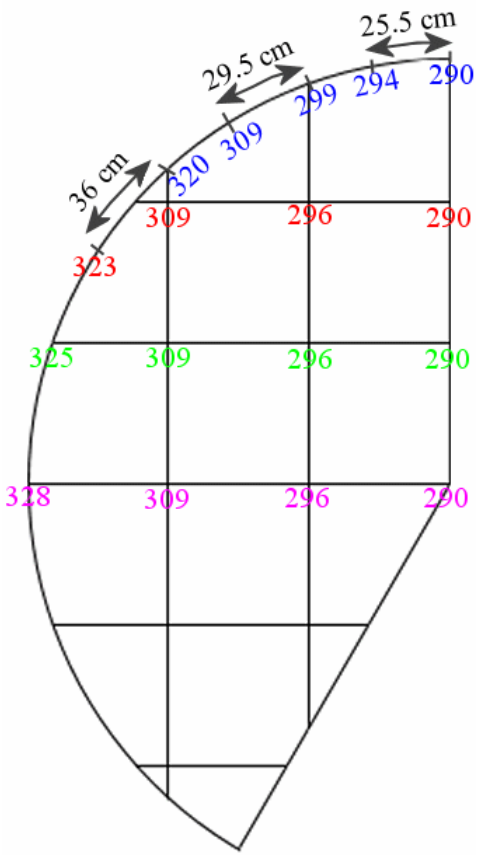


Figure 6. The primary bridle lengths. The bridles of the same colour shold come together and join onto the corresponding secondary bridle (see Figure 7).

The primary bridle lines are grouped together in rows indicated by the colours of the line lengths in Figure 6. The secondary bridle lines, shown in Figure 7, should be connected

to the primary groups of the same colour (again, see other parafoil plans if you don't understand).

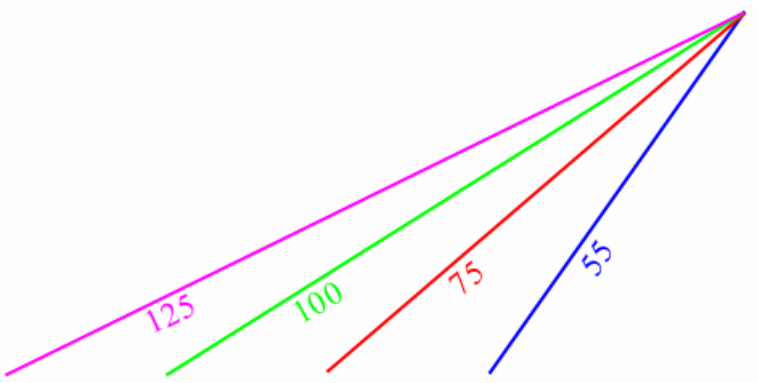


Figure 7. The secondary bridle lengths.

For primary bridle lines you only need a breaking strength of about 50 lb, and for the secondary about 200 lb. Sew a small loop of line through each of the outer rear bridle points (marked with the bridle length 328 in Figure 6). When you fly the kite these loops are where you will attach your drogues. The drogues should be attached in a Y configuration. Each part of the Y attached to the kite should be about 4m long.

Finishing Touches

After all the lines are attached you can close the kite. You will have to roll it inside-out to keep the seam inside the kite. Sew the open part of the last seam, but leave a small gap to allow you to turn the kite the correct side out - then close the kite as neatly as possible.

Flying Tips and Other Stuff

Ensure the kite is fully inflated before allowing it to take off. If you don't then the front will collapse as the kite rises to its apex. I have tested the kite with a 15m tube (20 cm diameter) attached like a skipping rope - this produced enough drag to stabilise the kite. I

will create a series of drogues in the near future to replace the tube tail - I'll add these to my plans page when they are done!

Please send me a photo of your kite if you decide to make one. I will post it on the website. If you modify the plan I'll also be interested to hear what you have done and how successful it is. I have already know there is someone who is interested in turning the kite into a smiley face - maybe someone could make a whole range of web forum 'similes'!!

Finally - *good luck*!!

If you want to email me use the following address, with ***kites*** as the subject – messages with other subjects will be sent to my junk mail folder and will not be read!!

dave_wade69@hotmail.com

You can also catch me at the Kite Builder Forums (http://kitebuilder.com/forums/) with the user name ‘TS’.