

Small Kites

Small kites have a fascination all their own. They can be complicated and highly decorated but they can also be simple, quick to make and quick to remake if you decide to try a new version. They fly slowly indoors and look good on the wall or on a shelf. But how do you get started?

The important thing is that small kites need light materials if they are to fly well. Tissue paper is a good starting point. For a simple kite take a flat piece, iron it if it is badly crumpled, and cut a rectangle 60mm by 80mm (see diagram). Press a line 5mm from a short edge by running a used-up ball point pen gently along it, and fold the strip over to make a stiff leading edge. Do not glue the strip down. Now mark a centre line of the kite and fold it gently to give a slight dihedral. That is the kite finished. To make the tail, cut and join a strip of tissue paper 3mm wide and 900mm long. Scrumple the tail up to soften it and then straighten it out again. Glue one end to each rear corner of the kite to make a loop.

For flying line use thin sewing thread (the cheaper the better). Bridles are fiddly, so fix the thread directly to the kite 24mm from the leading edge. Use a weak glue so you can peel the line off later if you decide to move it. I use a very small drop of Copydex.

You can fly the kite indoors by walking holding the line in your hand, but it is easier if you use a stick. Find a stick about 0.8m long (a broken spar from your scrap box?) and fix the line to one end. Use a flying line a little shorter than the stick. The stick keeps the kite away from the turbulence caused by your body and hand if you walk, or you can sit in a chair and fly the kite by waving the stick slowly in a figure-eight over your head.

If you use a piece of masking tape to fix the line to the stick it is easy to change kites – of course you could use a proper clip or a clothes peg.

When this kite is working try variations. The kite will fly without a tail, but needs a dihedral angle of about 45degrees each side. Make another one, better, and decorate it. Try more interesting variations on the shape and different sizes.

For a more ambitious kite make a sparless box. Mark out a piece of tissue paper as shown in the second diagram. Press the dotted lines with your used-up ball point pen. Cut on the solid lines (I use a metal rule and a sharp craft knife). Fold over the long edge to make a stiff leading edge. Fold each of the other fold lines to 90degrees and you have a box shape. Glue the overlap. Now use a needle to thread the flying line (sewing thread) through the centre of one edge of the front box and out through the opposite edge. Glue both points so the thread is straight when the box is square. [If you decide later to try moving the tow point, cut the line off leaving the diagonal in place and then glue the line on in the new position.]

To make smaller kites which fly well you need a lighter material. 'Tissuetex' is a very light paper, less than half the weight of normal tissue; it will make kites half the size of these or smaller. The kites will also fly more slowly which is more convenient indoors. Try specialist paper shops.

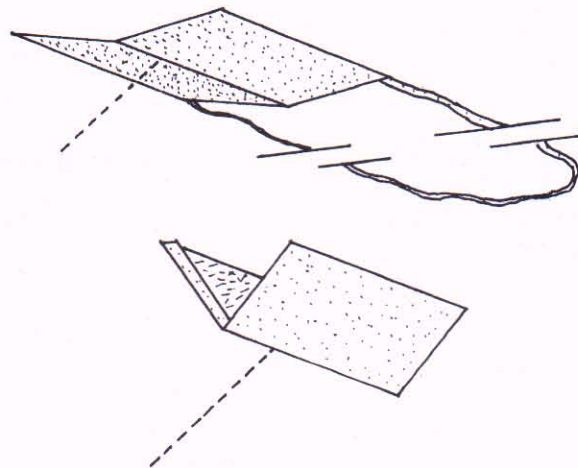
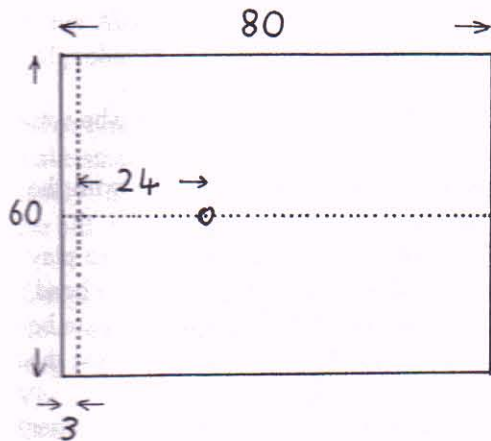
For a stiffer material which glints nicely in the lights try thin aluminised polyester sheet. This is a thinner version of giftwrap and is sold as 'space blanket' or handed out free after the London Marathon and similar events. Giftwrap itself works for slightly larger kites, but being heavier it flies faster. (*See below for materials update.*)

Next time – Small kites with spars. Good flying.

Nicolas Wadsworth

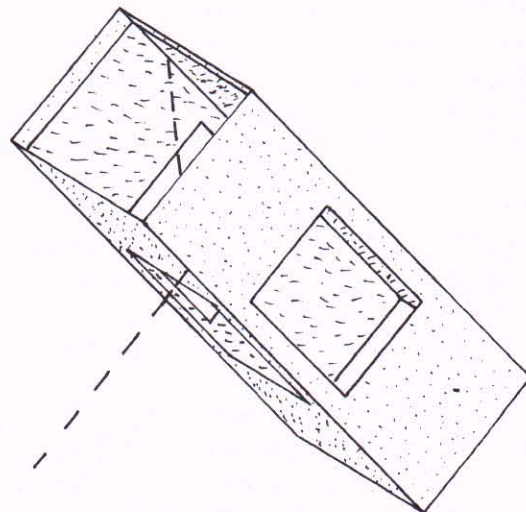
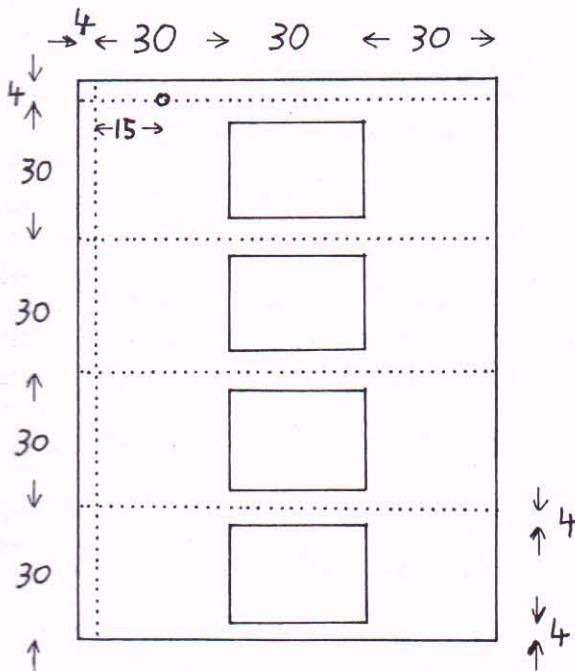
Small Kites

Simple Kite



Dimensions in millimetres

Sparless Box Kite



Small Kites by Nicolas Wadsworth

Small Kites – Continued

In the last Kiteflier I suggested two small kites which did not need spars; they used folds in the paper to provide stiffness. Avoiding separate spars makes a kite easier to construct and also helps keep the weight down which helps it fly well. However many interesting kites need spars to hold their shape.

What are the best materials for small spars? Bamboo is traditional and can be split and shaved to less than 1mm. Carbon fibre rod comes down to 0.5mm diameter and is robust. For the smallest kites glass optic fibre (the sort which is 0.25mm diameter measured over the protective plastic coat) is light and easy to handle. Combined with very light sail material such as Tissuetex it makes good kites up to about 100mm in size – depending on the particular design. (*See below for materials update.*)

Here are designs for two sparred kites which can be made in various sizes depending on the materials available. They are designed to be simple to construct in small sizes. One advantage of small kites is that there is no need to dismantle them for transport or storage, so the spars can be glued on.

Bell Quad Tetrahedral

The drawing shows the sail which is based on 60degree triangles. Cut along the solid lines and press and fold along the dotted lines. The folded-over strips stiffen the edges. Join the top corners by a spar whose length is equal to the edges of the large triangles. Fix the spar just below the tips. When the glue is dry, glue the tips of the centre triangles to the middle of the spar, bending it down slightly if necessary. Now all that remains is to find the best bridle point. A quarter of the way along the centre fold (half way along the edge of the front small triangles) is about right.

Using optic fibre and Tissuetex or space blanket this works well with the main triangles 40 or 60mm.

Microcody

Normal Cody Kites are complicated to construct and very fiddly in small sizes. This design (by Tom Vinken, Netherlands) looks very similar in flight is much easier to make.

The sail is based on squares and cuts in one piece. The drawing shows half. Cut along the solid lines and press along the others. Then fold all the dashed lines one way and all the dot-dash lines the other. The sketch shows the shape to aim at. There are only three spars: one along the centre bottom which holds the three sections together and two diagonal spars in the front section which hold the box shape and support the front wings.

15-20mm squares work well in Tissuetex and optic fibre.

Christmas Kite

With Christmas only eight weeks away, here is a simple sparless Christmas kite consisting of three identical wings joined in the centre. The exact shape of the wings is not critical.

Cut out the two pieces as shown. Fold the bottom (trailing) edges over. Do not glue them. Glue the flap on the single piece to the double one, keeping the dotted lines over each other. Fold at the dotted lines so the three sections make equal angles, taking care not to warp the sails, and attach a bridle. Decorate to taste.

This works well 60mm high in tissue paper and will go smaller in Tissuetex.

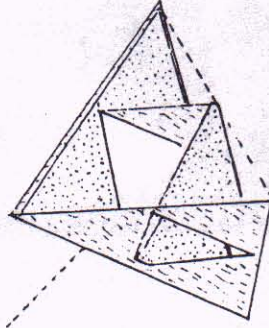
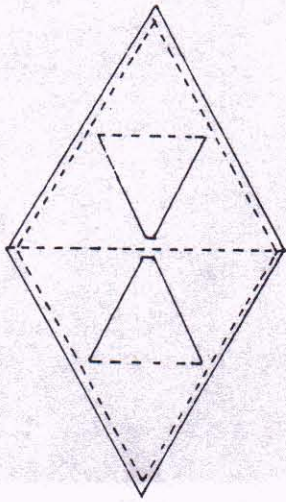
When you have experimented with these designs, make your own. Take any successful kite and try to make it smaller, using the lightest materials you can find. For well supported kites try the thinnest plastic bags from local stores. These come in a range of colours. The thinnest are the same weight as Tissuetex, but floppier.

Finally let me emphasize again – small kites must be light to be stable and very small ones must be even lighter.

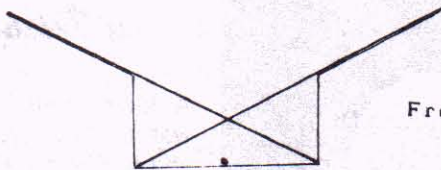
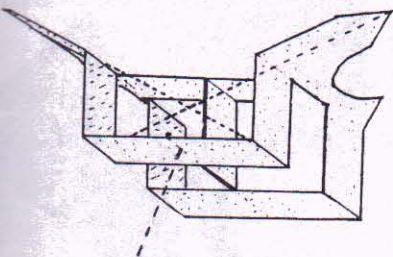
Good flying.

Nicolas Wadsworth

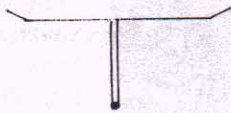
Small Kites - Continued



Bell Quad Tetrahedral



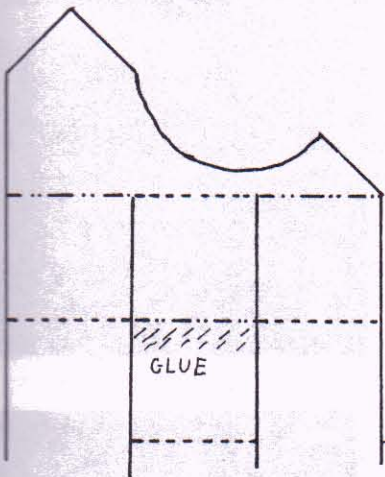
Front Section



Middle Section

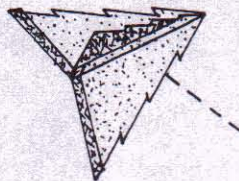
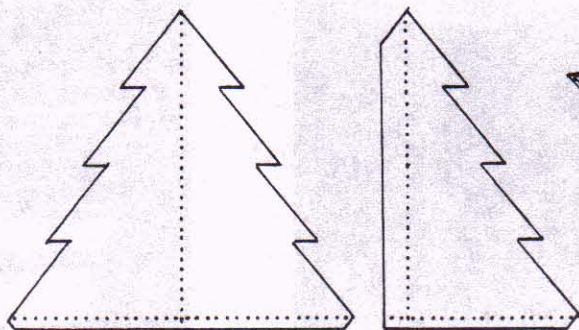


Back Section



Centre Line

MicroCody



Christmas Kite

Materials Update

Spars

I guess the optic fibre I used is not available, although I have some left. Carbon fibre comes down to 0.25mm diameter, see www.freeflightsupplies.co.uk It is not much heavier than the optic fibre I used and much stiffer.

Bamboo can be split and shaved much thinner than I indicated. It just needs practice.

Boron fibre is available from a few places. It is about as stiff as the optic fibre (the 0.004" is a bit stiffer and the 0.003" a bit less), but much lighter (and expensive).

Sail materials

Some Supermarket plastic bags are quite light. Local shops have smaller, lighter bags.

www.freeflightsupplies.co.uk has thinner aluminised polyester sheet (and even thinner clear sheet). Try other specialised suppliers.