

Bird Kites by George Webster

1 Introduction

I thought it would be interesting to write about bird kites (or BKs) from across the world emphasising 1980 onwards and concentrating on commercial kites rather than 'one offs'. In particular I wanted to classify BK types in some way. I ended up using their wing structures – this seems to work and produces a classification of 6 types. And it was interesting.

Definition. For this article a BK is one which is designed to suggest a bird in flight using structure, pattern and colour.

Clearly in some cases the kite shape symbolises the bird in a way which might not be apparent outside that culture. Photo 1 is a raven bird kite from Sri Lanka. No I haven't seen a raven like it. But it does have 'wings' and a 'tail' section which will move in-flight. Some variants of the Chinese Rigid Wing kites (see 4.4 below) use symbolism which to my eyes clashes with realism.

I have excluded:

- bats and pteranadons;
- bird men (New Zealand and Icarus);
- Thunderbirds and the Phoenix;
- and for all I know flying squirrels.

No multi-lines.

I've also excluded kites where the kites' plan isn't changed but a bird pattern is superimposed. Some very effective kites have been clear plastic Malays with a good bird print. I haven't seen an 'Indian Fighter' to include in the article although there are pictures of kites with a formalised bird design. I've seen a mylar fighter shaped to produce the hint of a head and tail. Back in the 1970's Helen Bushell made a very birdlike version of her trefoil delta just by putting black wingtip colour on the trailing edge. But there has to be a limit – and the Ostend Bird (Photo 2) just scrapes in.

Starting to write about BKs it soon became clear that you have to realise:

- that you are writing from a particular corner of the kite world viz Britain as some islands off the North West coast of Europe which is a bump on the left hand side of Asia.
- that even from my limited knowledge of what has been done you have to be selective while still trying to show the enormous variety of BKs.



Photo 1. Raven Bird Kite, Sri Lanka

2 History

While expert opinion has now swung to believing that kites were invented in South East Asia/South Pacific, rather than in China, it is from China that we get the earliest clear written records and they describe wooden bird kites. Not so surprising as until quite recently humans imitated the natural form which had the properties they wanted. Birds could fly, therefore the best shape for a flying device was a bird.

The earliest Chinese kite maker was Gong Shaban who, it is claimed, made a wooden kite which imitated sparrow hawks circling the sky. Others credit Motzu (also pre 380BC) who took 3 years to make a wooden bird which was wrecked after one day. His followers said 'What skill the Master has to be able to make a wooden kite fly'. He answered 'It is not as clever as making a wooden ox-yoke peg'. (We all know the feeling). A contemporary called Kungshu Phan is said to have made a bird from bamboo and wood which flew for three days (I feel for Motzu).

At about the same time Arelytas of Tarentum, a Greek, is claimed to have made a 'flying dove'.

WILL YOLEN has a photo of a clay model of a bird shaped kite in the Cairo Museum which at 2,200 years easily pre-dates the other claims. But no one is very sure.

Japan imported kites, together with its' pick of the rest of Chinese culture in 607AD.

Since flying men are excluded, Maori kites don't figure and BKs are not a feature of traditional Indonesian/Malaysian kites. This is 'not quite true' for the Malaysian Wau does have bird named variants. But they are even less bird like than the Raven from Sri Lanka.

I don't know much about the development of western BKs until the 20th century. None of the 19th century developers of kites for lifting or traction used a BK. Of those who were after powered flight, to my knowledge only Lilienthal seemed to use bird shapes (X1).

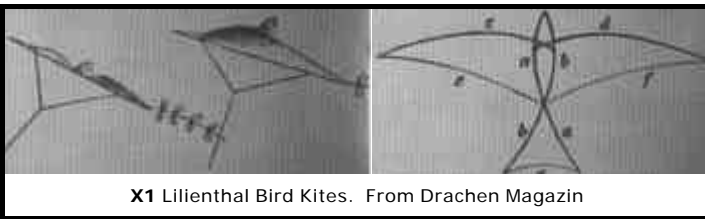


Photo 2 Ostend Bird

The layout of the article is:
 Section 2 – History; Section 3 – Compound Birds; Section 4 – Wings; Section 5 – Heads etc.; Section 6 – Exceptions; Section 7 – Omissions; Section 8 – Conclusion

Where a name appears in capitals (eg PELHAM) there will be a full reference in the bibliography at the end. The photos (2,3,4,6,10-13,20) are all by one of the Websters, 1,5,7-9,14-19,21,22 are by David of Holwick. There are sketches, plans and illustrations (X1-X17), also drawings 1 & 2.

Bird Kites by George Webster



X1 Lillienthal Bird Kites. From Drachen Magazin

So 'adult' kites in the first half of the 20th century used Malays, Conynes and box shapes from Hargreaves et al. Children's kites were largely home made so the builders had enough problems using gardening materials to get archtops, diamonds and 3 sticks to fly without going for bird designs. Of course there were some BKs sold as toys and Brookite had a compound bird design (see section 3). L L Hunts book '25 kites that fly' published in 1929 shows an Owl kite in the shape of a face-on sitting owl where the beak projects from the front surface to provide both a fin and the bridle point. The outline is to be formed by steam bending sticks made from orange crates. I don't really understand the plan but Hunt was a kite builder to the U.S Weather Bureau.

Four things affected western BK development in the second half of the 20th century:

- the development of the delta
- the spread of knowledge of the Papagaio
- wider knowledge of oriental kites
- new materials. Not only ripstop but light stiff wing spars and flexible thin spars as a base for feathers etc.

What was happening to Chinese and Japanese kites is a separate specialist area (see HA K. & HA Y., STREETER and HOSKING). Briefly traditional Chinese kites have always had a high artistic and craftsmanship content. As well as traditional designs they seem free to invent new designs. Going for western shapes hasn't always been successful (I have a flexible wing squatting Kangaroo) but they have now established quality manufacturing e.g. of Joel Scholz's Sky Delight range.

In Japan craft kite making seems always to have been in the hands of relatively few makers who kept to traditional local designs. While there has been a resurgence of interest in some traditional kites, kite flying in Japan – associated with culture and tradition – is declining.

Back to the 'west'. Kitelines Fall 1980 had a great review article 'Tal Streeter on Kites as Art' with 8 BK illustrations. Curiously he didn't include the Larus Seagull and the papagaio, probably as his main concern was the 'one off' hand built kite.

A list of some of the kites which will be mentioned later, and their dates, is given below. Several of the dates are 'by' as I couldn't research launch dates.

1983 (by) Windy Kites Seagull
 1984 George Peter's Skybird, Martin Lester's Goose etc.
 1987 Joel Scholz's Parrot
 1990 Jackites. Dove in 1996
 1992 Martin Lester's Hawk
 1996 R Tiens 'l'oiseau'
 2001 Didakites 'Ostend Bird'

3 Compound Bird Kites

There is a range of kites to consider before going on to BKs proper. None are very 'realistic'. These examples are:

- Will Yolen's Bird Kite (X2)
- Pelham's Compound bird – illustrated here from Vlieger 1984 (X3)
- The Sherbird (P3)

The basis of these kites is a Bell 2 celled triangular box (or Conyne centre section) with the 2 cells connected by a horizontal surface (Diagram 1 hopefully makes this clear). To this would be added a pointed 'head' as shown and then one of a variety of wing/tail shapes.

Yolen used a papagaio wing/tail shape. Pelham shows a type of Pearson wing. The Sherbird has a delta wing and a small winged tail. See Don's Delta Conyne (X4). A Brookite Eagle kite from about 1910 had a very similar plan but with a papagaio wing.

Obviously using the triangular sections gave the designers stability and the ability to cope with stronger winds at a considerable cost in realism. The versatility of the Bell centre section has led to the recent American 'Sky Hook Modular Kite' where a variety of wings (Delta, Conyne, etc) can be attached by velcro to the common base – not new, Brookite in 1909 had a double Conyne with detachable wings using press studs (See Paul Chapmans article in Kitelines Winter 1997).

4 – Types, classified by wing design.

Wing Designs, The obvious feature of a kite representing a flying bird is the design of the wings. I believe that, with very few exceptions, BKs can be classified into 6 types:

- 1 Papagaio
- 2 Delta
- 3 Pearson
- 4 Chinese Hard Wing
- 5 Chinese Soft Wing
- 6 Japanese

4.1 Papagaio Wings (papagaio is Portuguese for Parrot).

How and when the papagaio was developed in Brazil I have no idea, but I also know that there was only limited information about the kite in Europe and USA until into the 1970's. English kitefliers know the story that Martin Lester got into kites after being asked to make a kite as an art school project – the kite he made was based on a papagaio which he had seen some time earlier. (X5) shows Martin flying one in 1977.

The key distinguishing feature of a papagaio wing (P4) is that there is a single cross spar which extends to a firm fixing at the wing tip. This is an obvious way of adapting a basic Malay shape. Traditional papagaio wings as shown in the plan from Will Yolen (X6 and X7 the sheet of BKs from BONDSTAM) have some slack bracing lines which limit the flap and encourage a lift making shape. My own papagaio's, bought in 1982, are made from fairly light printed cotton with a cotton stuffed head and 1cm x 0.6cm spars. The method of fixing the cross spars



Photo 4. Papagaio

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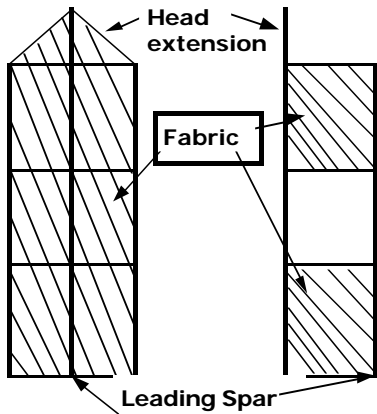
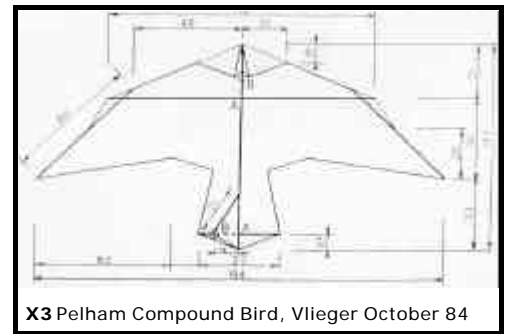


Diagram 1. To show the 'Bell' cells of a compound box.



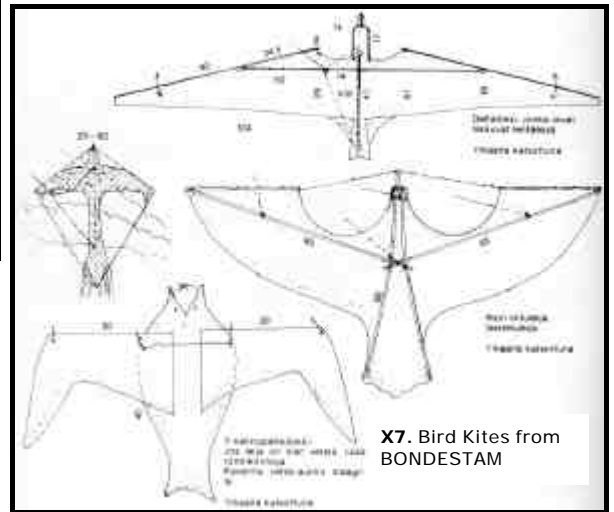
X2 Will Yolen's Bird Kite



X3 Pelham Compound Bird, Vlieger October 84



Picture 3. The Sherbird



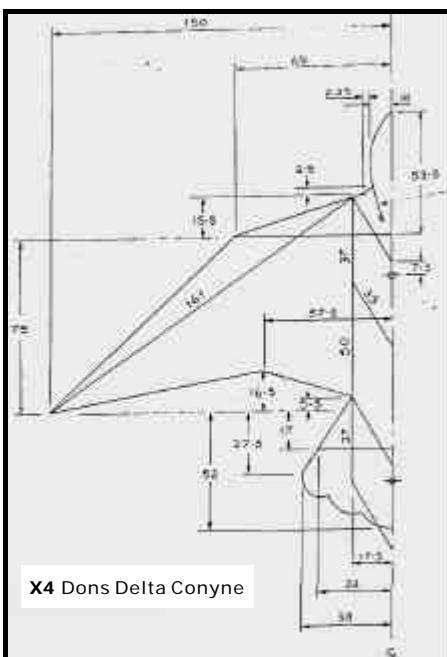
X7. Bird Kites from BONDESTAM



X5 Martin Lester Bird Kite

The world's most written-about* kite - the *falcon*

X8. Lifelike, manoeuvrable, legendary - designed by the famous Ed Hanrahan, International Kite Flying Champion. The description goes on to say "The kites dual and manoeuvre in the sky - or swoop down on the crowd and using fis h-hooks on the wingtips pick up pieces of paper on the beach hundreds of feet away - and then soar back up overhead."

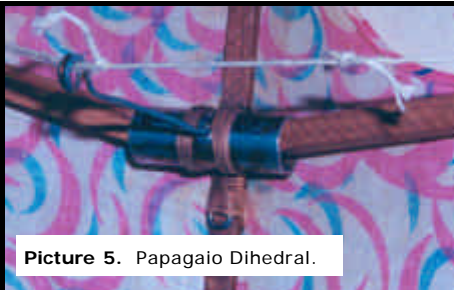


X4 Dons Delta Conyne

X6 Will Yolen Papagaio

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and dihedral is 'quaint' – see P5. A commercially produced dihedral would be far better.



Picture 5. Papagaio Dihedral.

There was considerable 'hype' about papagaios in the early 1980s (X8). Some UK fliers began to believe that Brazil wasn't just girls, Ipanma and football but beaches decorated with swooping fish hook carrying kites.

Apart from personal experience – they need a strong breeze, flew at a low angle, were 'twitchy' but not really controllable – it all looked strange when Kitelines Spring 1994 told us, and the Brazilian stand at Dieppe showed us, that the real kite of Brazil was the pipa – a fairly small paper or bamboo fighter kite with a tail.



Photo 6. Sky Delight Buzzard

The papagaio wing principle has been used on a great range of interesting kites. Joel Shholz has used it in one of his most successful designs – the Sky Delight Buzzard (P6) in which the trailing edge can be held by a carbon fibre strut.

Martin Lesters Hawk saves on spar weight with an ingenious reinforcing arrangement.

The Indonesian bird kites that I have seen have been commercially made and sold in Bali. They have brilliant colours on opaque fabrics which together with the 3D bodies (P7 and X17) and feet add to a sort of realism. Their wings have a bamboo spar attached to the leading edge and the tip of the wing which is designed to rotate around the fixing to the body so that the spar ends can be jammed into a Y fitting.



Picture 7. Indonesian Bird Kite



X17. Indonesian Bird Kite.

The final papagaio BK is the 'l'oiseau' developed by Ramlal Tien in, I think 1996. This kite, and the Sentinelle were attention grabbers at Dieppe 2000. Nothing could be further from the original papagaio than this superbly elegant kite using high tech materials. I hope that the 2 photos (P8 and P9) give an impression of its grace in flight and its elegant structure. Two things that don't show – there

are small whiskers near the wingtips, the curved keel is narrowly 3D. But if you haven't seen one you would miss the other great attribute of the kite – it is very happy to be

played with in the wind rather than simply looking serene in the sky.

4.2 Delta Wings

From the earliest days of delta development it was recognised that adding a 'head' to a fairly high aspect ratio wing plan produced a type of bird e.g. several Van Sant designs in older books. There was a favoured commercial kite with such a good bird print that it was claimed to have been mobbed by birds (NB. None of my bird kites has been assaulted by real ones who seem about as interested as they are in other soaring designs. But a sparrow did once perch on the line).

The key feature of the delta is, of course, the flexible mounting between the spreader bar and the leading edge spar. The necessity of a keel gives some 3D to the body although the ideal fin depth was usually too deep to help realism. Dan Leigh (P10) produced an elegant and quasi-realistic design by outlining the body with two light longerons, losing the fin into the body colour and using other colour to produce a quietly realistic BK.

I have included two Japanese delta BKs: the Hiroi Owl (X9); a paper and tyvek model from NISHIBAYASHI (X10).

One of the most innovative kite designers of the last 15 years has been Joel Scholz. His Buzzard has already been mentioned but for me his greatest design has been his parrot (P11). The photo shows the design to be a standard ratio delta with a long tail made interestingly from the extended spine and two light spars pocketed but not spread. I have seen a train of about 20 parrots more than once at the Bristol festival. They have wonderful colour combinations and are easy and reliable fliers.

However for me the greatest of the type is the George Peters Skybird (P12). Like all of his kites it is strongly built, designed to fly stably in a good range of winds and has a wonderfully rich colour scheme (honest!). The keel just shows in the photo; the tail is well displayed.

My final delta BK is the most recent. The Ostend Bird came on the market in 2000 in a range of sizes. As Photo 2 shows it is not wildly realistic (and sometimes makes me feel it is a Beijing swallow designed by committee) but it is a good flier with real 'sky presence'.

4.3 Pearson Wing

I'm not at all sure that this wing type was developed by Alick Pearson, the famous flier at the Round Pond Kensington from 1925 into the 1980s. Certainly his wider frame stems from his Roller kite; nor was he the only Round Pond flier to build birds. However it is my tribute to a great kiter.

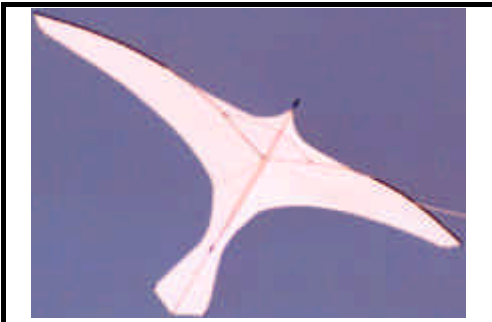
My Pearson BK (P13) is not a great example, one of the last he made, but hopefully the bad photo still allows the rakish outline to be seen. The distinctive wing plan can be seen on X7.

W.H.BRICK has a development of the wing to be used in small plastic BKs.

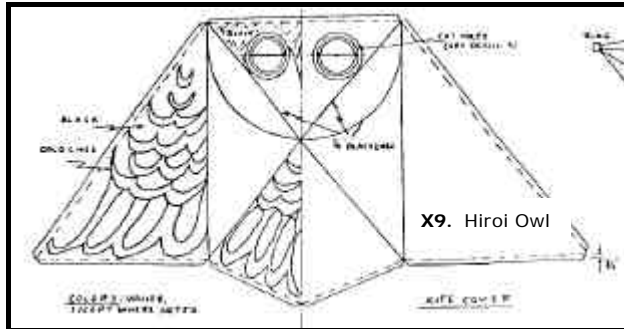
4.4 Chinese Rigid Wings

(A note on types of Chinese Kites. Chinese books classify their kites into 6-8 types. There is no agreed system and matters are complicated by problems of translation. The best book for this is by HA K. and HA Y. A simple classification is:

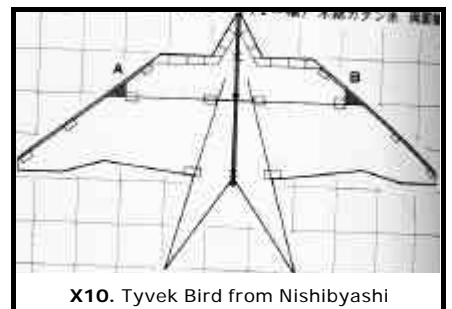
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Picture 8/9. 'l'oiseau' developed by Ramlal Tien.



Picture 10. Bird Delta by Dan Leigh



X10. Tyvek Bird from Nishibyashi



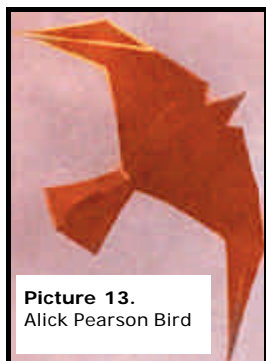
Picture 11. Joel Scholz Parrot.



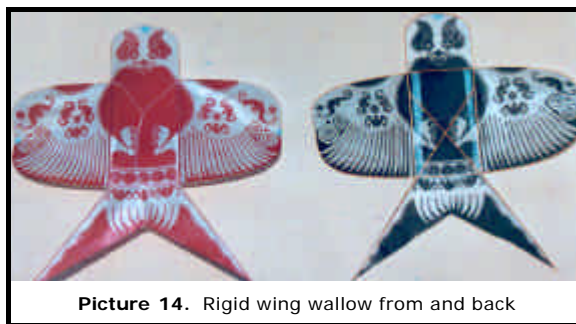
Picture 12. George Peters Skybird.



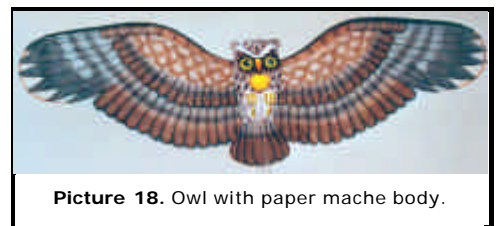
Picture 16. Silk Bluebird



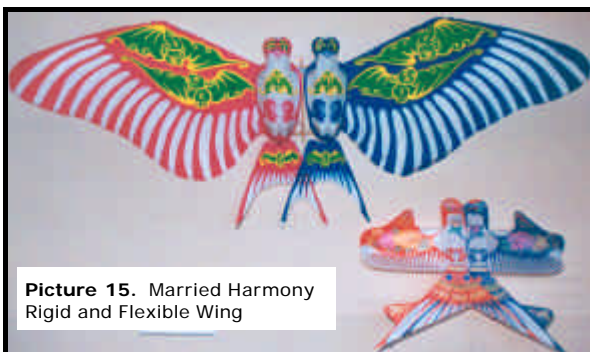
Picture 13. Alick Pearson Bird



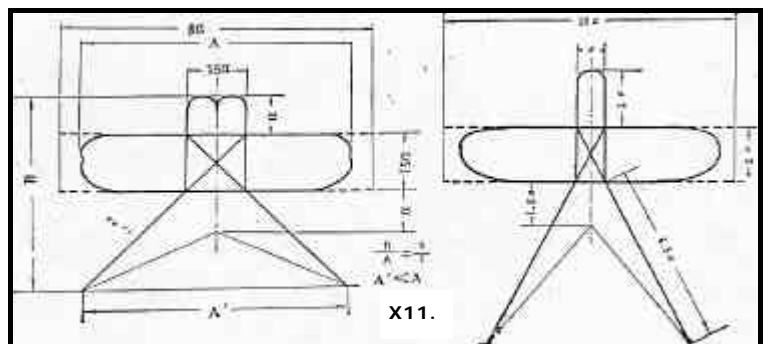
Picture 14. Rigid wing wallow from and back



Picture 18. Owl with paper mache body.



Picture 15. Married Harmony Rigid and Flexible Wing



X11.

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Rigid Wings (aka Hard Wings, Plank Wings)
 Flexible Wings (aka Soft Wings)
 Flat (the amazing range of shapes)
 Multiple Layered (aka Series Strung) e.g. Dragons
 Cubic (aka three dimensional) eg Chinese Lanterns and 'the first box kites?'
 Umbrella carrying – don't ask).

Rigid wing kites are designed to fly well in the stronger winds found in Northern China – basically north of the Yangtze. The classic design of the rigid wing swallow (P14) is said to have been developed in the 18th century by a famous author Cau Xugin. Up to 6 types of rigid wing swallow can be found including fat (adult male), slender (adult female), fledgling etc. An interesting variant is a twin bodied kite symbolising married harmony. Photo 15 shows the sentiment interpreted in both rigid and flexible forms.

While the plans (X11) and photos are helpful about the wing shape, two things are probably not clear. Firstly there is a tight line which runs along the face from wing tip to wing tip. Secondly this line and the sloping of the bamboo wing edges gives each wing at the tip both pronounced dihedral and a cup effect. Wings are said to be 'date stone' shaped. These two features mean such kites do not pack flat and are not usually broken down. So only small rigid wings seem to be here in the UK where we commonly get neat little kites printed in tyvek or silk. But 2m versions exist.

Do look at the Ha's book if you can – it includes notes on the aesthetics of rigid wing kites eg what are the preferred proportions. It also looks at the development of rigid wings to allow lucky or desirable symbols to be incorporated. Chinese kites often have decorations which are based on different words having the same sound. So lu means a deer and large salary – hence a reason for deer on a kite. More so for bats. However, I get lost when these creatures depicted on rigid wings (which anyway look very realistic to me) then change the profile of the kite (see smaller kite in P15).

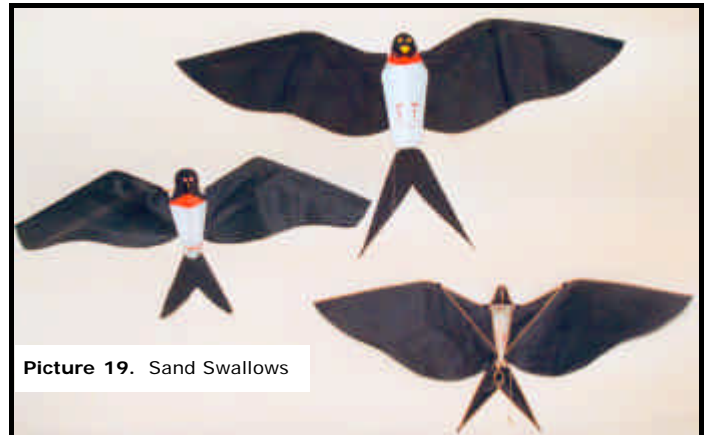
4.5 Chinese Flexible Kites

Flexible wings are those where only the leading edge is supported. While there may be some sub-structure on eagle kites all the wings have loose trailing edges. They are seen as being more suitable for light winds. They produce a wide range of bird kites, many of which are extremely realistic.

The photos show:



P16 – a silk blue-bird with a boat shaped body and papier mache head.
 P17 – a heron with 3d body, neck and head. Realistic 2D legs. You may spot the sequins stuck on the wings by the seller to 'flash it up' for the Malaysian market!
 P18 – an owl with a papier mache body
 P19 – three sand



swallows. For me this is the most graceful Chinese design. The one on the right has a hinged tail. The others have 3D bodies. All are designed to fly in pairs at each end of a flexible bamboo strip which is bridled in the middle.

It would seem that some Beijing kite makers now make both rigid and flexible wing kites.

4.6 Japanese Wings

I have never seen a live Japanese BK but I have seen some similar insect designs. They do not seem to be a popular design, TAL STREET shows 1 in 50 illustrations in his 1974 book. WAYNE HOSKING illustrates 'over 340' kite types of which 7 are BKs. Many Japanese kites are very local, particularly by decoration. Apart from those heavily influenced by China, the BKs use a wing more familiar to us from the Yakko kite or a class variant. The hawk (X12) has a 3D body with a single bridle point. The bird (X13) has a flat body and wings which are 'pointed Yakkos'.

To describe a yakko wing, if you haven't held one is really beyond me but diagram 2 tries to do this. I have included a plan from the OHASHI book (X14) as this shows on the left the material for one wing and thus the depth of the pocket to 'spill' air at the wing tip.

Two points on Japanese wings. Firstly they are unlike any other wing forms known to me with the nearest the Chinese Rigid Wing. Secondly remember that Japanese kites are made from paper which means that the pockets are much stiffer than western ripstop yakko wings.

A final puzzle is that I have seen several 19th century Japanese prints which show a bird kite – but its wings are more like a high aspect ratio Sode flown with considerable dihedral.

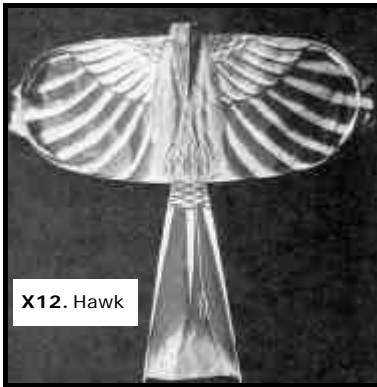
5 Bodies, Heads, Tails and Feet

5.1 Bodies.

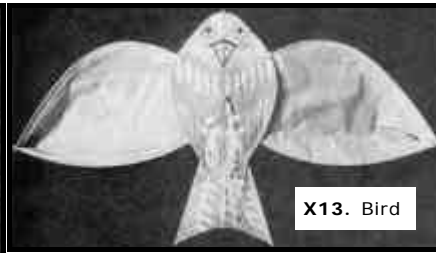
Whereas papagaios usually has 2D bodies, deltas, coming from a design using a central keel, naturally have some 3D, or may use a tunnel keel.

Without doubt the Chinese are the greatest exponents of realistic (and 3D) bird bodies. Traditionally many of the bodies covered with paper or silk. Some of the bigger 'craftsmen made' birds have bodies accurate in all dimensions but even the widely produced Tientsin bird kite, which folds into a box shows how bamboo can be split, shaped and formed to fit together into joints, holes and slits all without nails or adhesive. I have yet to see a western equivalent.

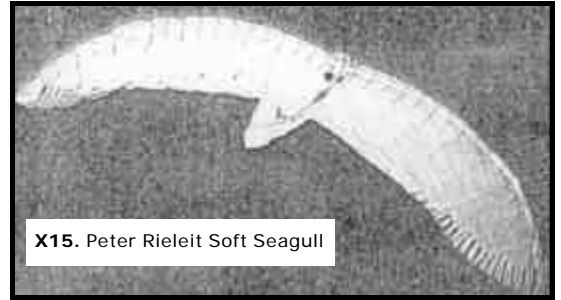
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X12. Hawk



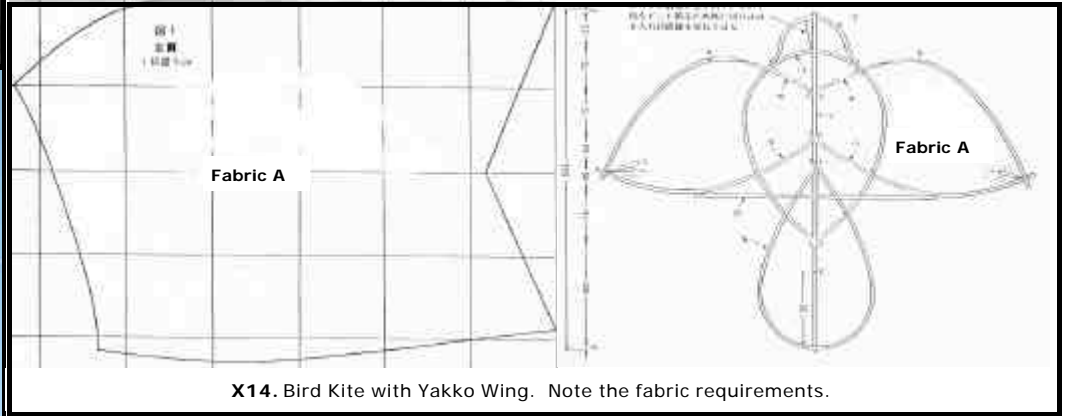
X13. Bird



X15. Peter Rieleit Soft Seagull



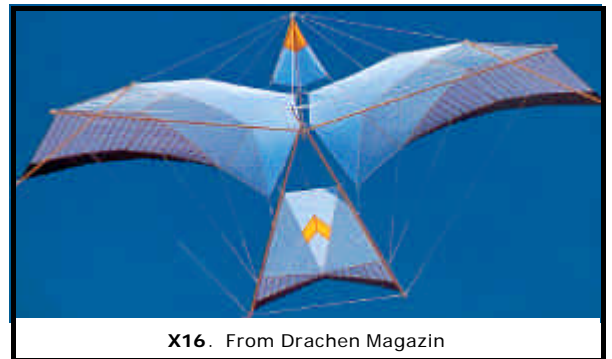
Picture 20. Canada Goose



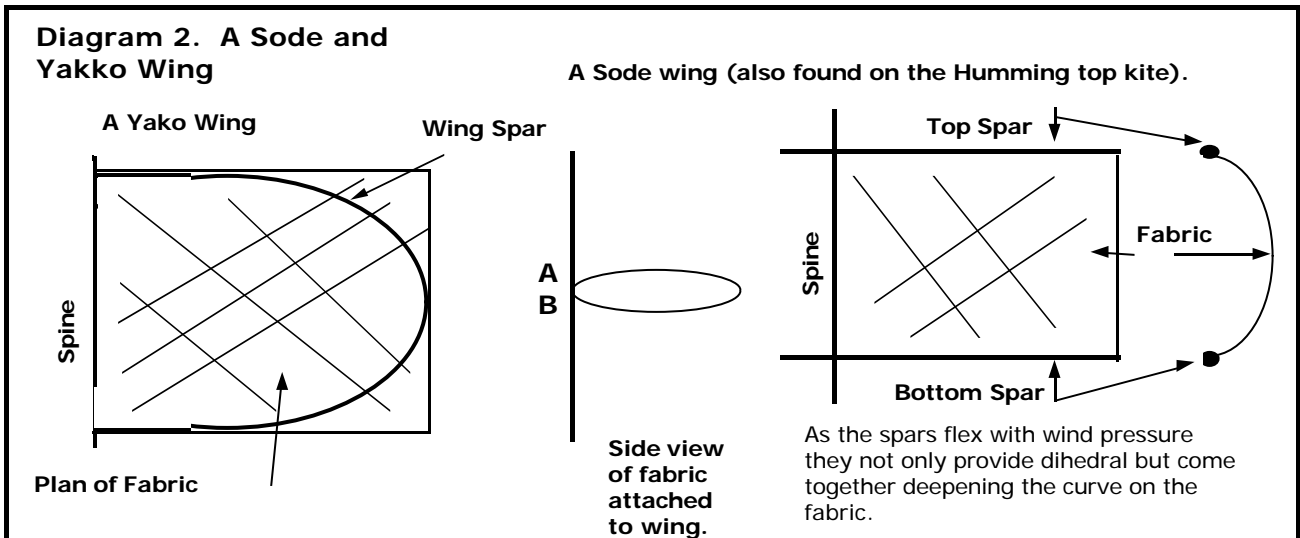
X14. Bird Kite with Yakko Wing. Note the fabric requirements.



Picture 21 and 22.
Stan Swanson Condor.



X16. From Drachen Magazin



Bird Kites by George Webster

Javanese kites are well known for their furry bodies – even though birds have feathers.

5.2 Heads

Obviously the limitations here are the usual ones of (weight, lift and drag) vs realism. Some kites just use a point, some have a design to suggest a head (Dan Leigh), some illustrate a head in 2D (J Scholz. Heads may be 3D and stuffed (papagaio) or inflated (Martin Lester's designs).

Heads are sometimes designed to move – which when in the air affects the flight. I've never seen that but I do remember the big eagle (X17) had a snapping beak – a child scarer.

5.3 Tails

While papagaios may just have cords and flapping material, earlier BKs tended to use a light cross spar. Chinese flexible wings may have flowing tails, probably because local birds are so equipped. Several designs have hinged tails (I have seen one translation 'the tail rans down, which can help tremble the flying').

However, by far the most popular tail arrangement for current western BKs is the length of fibreglass or something fitted under tension in a curve between two pockets (see Buzzard, Condor, Ostend Bird, etc).

5.4 Feet

If feet are shown at all it is usually simply on the surface. But non-western hawks etc often have extremely realistic 3d talons. And cranes and flamingos have featured legs (eg Martin Lester's Flamingo).

6 Exceptions

I can think of three important exceptions to the wing classification scheme.

6.1 There is a large (4m) multi-bridled soft seagull made by Peter Rieleit in about 1995 (X15).

6.2 Martin Lester made a range of semi-inflatable bird kites following on from his 1993 shark. Of these the best all round flier was probably the Canada Goose. The photo (P20) is not a good one and the wing spars should be hidden in the kite. Martin's breakthrough was to realise that quite a small air intake aperture would inflate a relatively large and complex design. Life sized and naturally coloured the goose shows off the advantages of having 3D wings and looks good.

6.3 The third exception is Stan Swanson's Condor (P21, P22). He has designed other kites since but for me nothing compares to this massive full sized bird. Feathers give a final touch to its natural look in the sky. One photo shows it in flight, the other displays the unique construction method which relies on his ability to drill massive but light plastic fittings. I hadn't flown it for some time before the photo and had forgotten what an excellent flying machine it is,

7 Omissions

Here are brief notes on some kites which have been excluded on grounds of time/space and lack of details.

7.1 Small kites which are largely designed for children but which are interesting BKs. The little Windy Kite where a printed, detailed bird has its wings spread via fibreglass on a curve. The Jackite – brilliant little toyvek and fibreglass cardinals and blue birds. It was their dove which was used in the opening ceremony for the 1996 Atlanta Olympics. Various books (and the Kiteflier) have paper outlines to cut out and

spar lightly with drinking straws.

7.2 Various American builders of eagles, particularly the Bald Eagle (lucky you! try the idea of flying a heraldic lion).

7.3 Finally the most complicated BK I've come across. Just the illustration in Drachen Magazin 1996 (X16). I suppose a Pearson wing with rigging.

8 Conclusions

Unlike many other kite types, BKs haven't got generally larger in recent years. Obviously kites designed to be realistic are restricted by the size of the real birds. Interestingly the largest – the albatross – hasn't been made to my knowledge (the albatross has a wingspan of up to 3.8m with a very high aspect ratio – could be a challenge for Martin Lester). The smallest BKs I know are Charlie Sotichs' plans in DAN KURAHASHI.

I couldn't have written a thing without once more looking up books but particularly looking through Kitelines, The Kiteflier, American Kite and Drachen Magazin. The loss of Kitelines looks more serious to me as time goes by as I am not yet convinced that web sites provide the same record of kite flying activity.

I hope that you have found something of interest – perhaps a new kite to look out for or a design to build. I have provided a few detailed plans but, as before, my focus has been on being informative and perhaps inspiring the experienced builder to try something new. (*The plans will be published in the next issue due to space constraints*).

Next up – perhaps the legacy of Bell, Conyne, Eddy and Hargreaves for kite flying today – or I might write up 'who invented the kite?'

As ever your comments and criticisms might be welcome,

TAL STREETER 'The Art of the Japanese Kite'. 1974. The classic book on the subject.

WILL YOLEN 'The Complete Book of Kites'. (?) 1975. Good also on compound birds.

DAVID PELHAM 'The Penguin Book of Kites'. 1976. Several BK plans.

TSUTOMI HIROI 'Kites, Sculpting the Sky'. 1978. By a great kite maker.

HA KUIMING and HA YIQI 'Chinese Artistic Kites'. 1990. The best book on Chinese kites – but really only the Ha family kites.

W J BRICK. 'On Bats, Birds and Planes'. 1997. A small book of interesting small kites.

RON MOULTON and PAT LLOYD. 'Kites'. 1997. Good plans for a wonderful seagull.

WAYNE HOSKINS. 'Kite of Japan'. 2000. Comprehensive range of types – 7 BKs.

DAN KURAHASHI. 'Japanese Kites – Concepts and Construction'. 2000. Interesting plans – including Charlie Sotichs' hummingbird with bamboo as thick as a hair.