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Construction Plan for a 3.5m Parrot

BUILD ME, FLY ME!

Like in previous years the idea for the parrot came up during the kite festival in Fuerteventura (Canary Islands). In one of the many souvenir shops a stuffed toy parrot came to my attention. When looking at it from the side the profile immediately reminded me of my seal-kite "Robby" and I had no doubt that it would also be possible to get this one airborne.
After I successfully had built some bird kites in the size of 7 meters and had taught some prosperous workshops, it was decided to build the parrot in a smaller version. The reason for this was the great success of the "Robby" construction plan (see KITE & friends 1/2008) and it was not far to seek to let follow a plan for the parrot.

Both take approximately the same quantity of material, but the parrot is more difficult to build. Therefore experience in sewing and kite making should be given before starting this project. All who have studied the Robby plan or even built the kite will find similarities and repetitions in how both kites are made. This is intended since the Robby plan was reviewed as being easy to understand. Why changing the style after it allowed newcomers a proven entry into the making of soft kites!?!

Materials needed:

Usually I am not a friend of too colorful kites, but with the parrots one can live out the joy of color. Parrots really invite to play with colors and look for wonderful combinations. Experimenting with colors can produce surprising effects and sometimes you can even use fabric leftovers from other projects. Principally there should be a basic color. Look at the images on my homepage and you will see that the basic colors are blue at CoCo, red at Nora and yellow/green at Polly.

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It is obvious that setting up a universal materials list is somewhat difficult due to the many different options. Everyone is invited to be creative. Yet to give you an idea for the fabric required, let me show you a possible combination:
The basic light blue is used at the side panels and for the top of the wings. The belly and the bottom of the wings are violet, the back of the head and the sides of the tail are red with violet and orange, and the bottom of the tail is kept in orange. Use of contrasting colors at the tail result in interesting gradients when looking at the kite from the front. Beak and feet are yellow in this example, but may also be done in black like at Polly.

The eyes also allow playing with colors, but I suggest black for the pupil. Using colors for the verge of the eyes is not just playful, but also looks good. Because of the contrast the collar should be black and the eye angle white. The inner wing profiles and the drogue can be made from scrap. Should you choose a different combination of colors you need to adopt the quantities given below accordingly. The templates can also nicely be used with fabrics only one yard wide without having to patchwork.
Choosing white or black line for the bridle setup is just a matter of taste.

Segments

The individual segments are shown in the overview drawing. If you feel comfortable with it you may enlarge this scaled drawing (1mm equals 1cm) yourself. Easier yet, the panels can be downloaded as pdf-files from *www.kite-and-friends.de* or *www.drachenbernhard.de* and be printed. For only one parrot templates are not even needed. Simply lay the fabric on the drawing and follow the shapes with a soft pencil or felt-tip pen to obtain the patterns. If the fabric is too dark, you need to prepare templates and place them on the fabric. It might also be useful to cut out the larger segments to reduce space needed for storage. The panels do not include seam allowance. If your seams are about 2mm wide, that should work – wider seams require that you add seam allowance. Small parts for appliqué work (eyes etc.) can be cut out using a hot knife; larger parts are simply cut out with sharp scissors.

It is important to note that this plan is only adapted for building the small parrot. For the larger version details differ and reinforcements are more extensive.

The story of how the kite evolved and images of the larger version can be found using the following link: *http://www.drachenbernhard.de/dra_Coco%20&%20Nora.html*

List of Materials:

Ripstop Nylon, 0.75oz

Color 1 *(light blue)*

side panels:	3 m^2
wing top:	2 m^2

Color 2 *(violet)*

belly, upper leg, shoulder:	1 m^2
wing bottom:	2 m^2

Color 3 *(red)*

back of head:	0.5 m^2
sides of tail:	1.5 m^2

Color 4 *(orange)*

tail bottom:	1 m^2
black (neck, eyes):	1 m^2
yellow (beak, feet):	1 m^2
white (eye, valve):	1 m^2

In total approx. 14 m^2

Lines:

For the bridle:

15 m, dia. 0.5 mm, approx. 70# strength
6 m, dia. 0.8 mm, approx. 100# strength
5 m, dia. 1.0 mm, approx. 150# strength
7 m, dia. 1.5 mm, approx. 220# strength
1 m, dia. 2.0 mm, approx. 300# strength

4 m, dia. 1.0 mm for the drogue

Reinforcements:

Approx. 7 meters of simple string that can easily be sewn on, and 0.5 m seat belt webbing (approx. 1 cm wide).

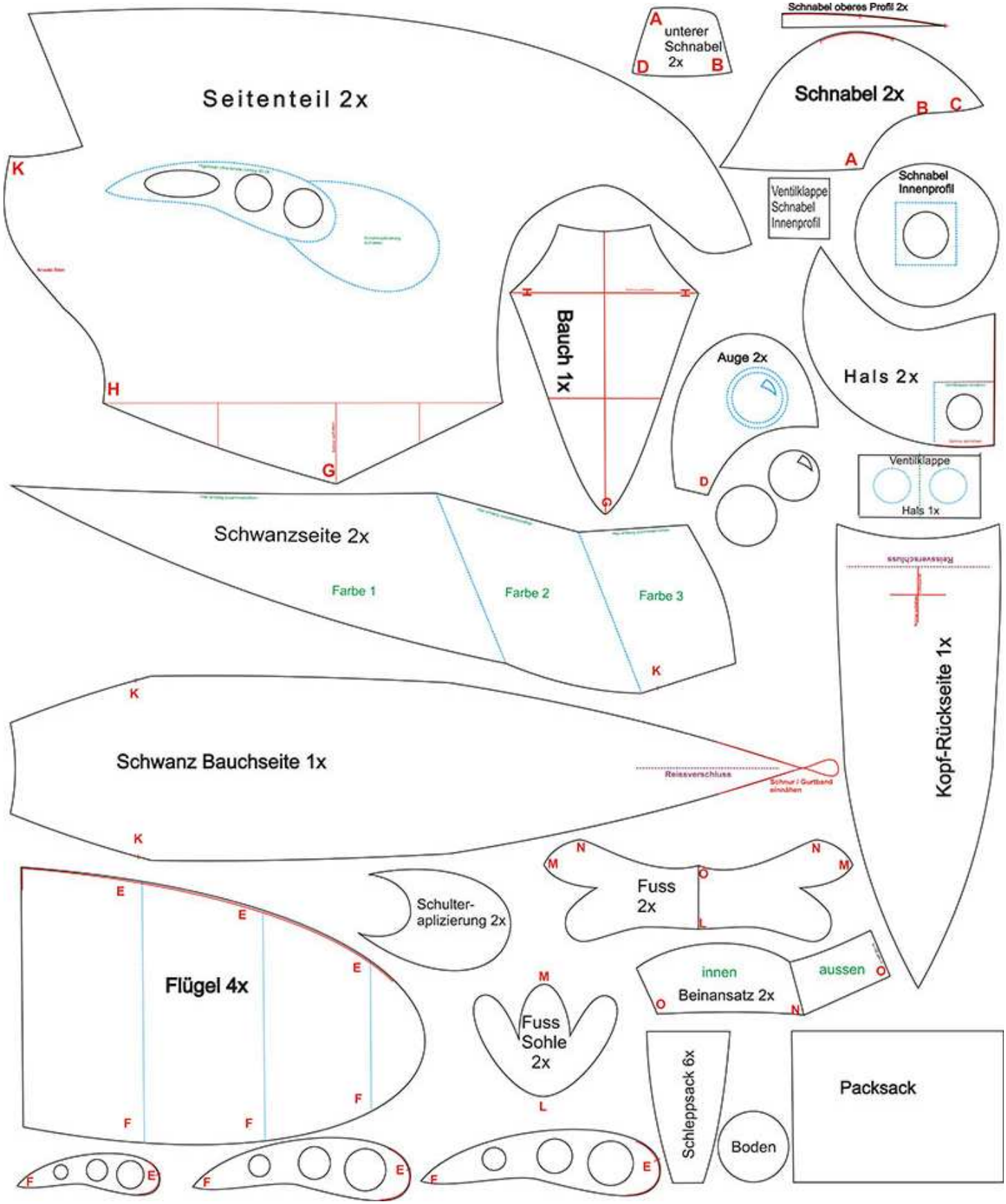
Other:

One zipper, 30cm, as air inlet for initial inflation at the back of the head. A second zipper, 25cm, at the bottom end of the tail, for de-sanding and fast deflation. It can also be used for inflation with a blower.

Sewing and Building

All seams are sewn from the left side which will later be inside the parrot. In positions where stress occurs lines are sewn on as reinforcements – in these cases you must close the seams using a simple seam as described. At positions where later on the bridle or drogue lines are attached, these sewn on lines should cross. This avoids damage to the fabric during flight. In the plan the positions of the lines to be sewn on are marked by red lines. Since the body of the parrot is relatively round and drag forces are moderate, there is no need for inner tensioning lines. Such additional lines are sometimes used in soft kites to keep the profile flat or to better distribute forces from the bridle. It is however necessary to use inner profiles in the wings. Furthermore, the beak which will later be in the wind needs a valve flap to stay inflated during flight.

For your convenience a table showing the translations of all German terms and descriptions used in the following drawing can be found at the end of this document!



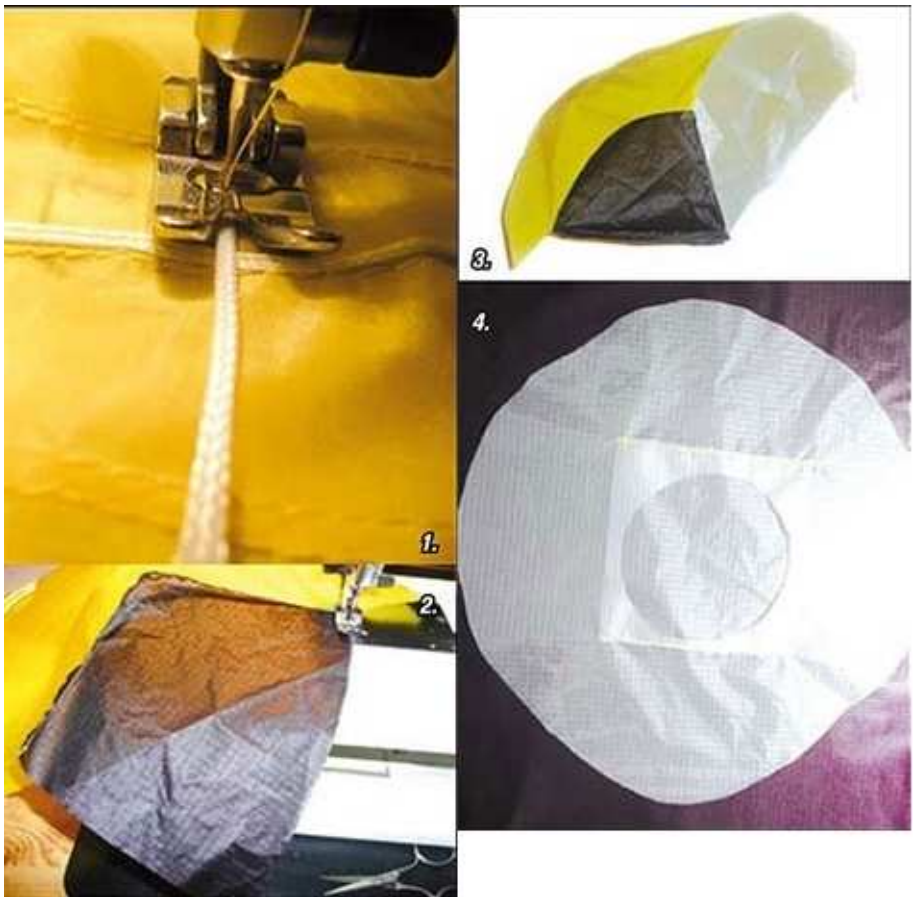
Giving the eyes a viewing direction

The Eyes

At the small parrot the eyes are not three dimensional. The pupils are simply appliquéd onto the white eye. Putting a bit of light on the eye makes it livelier and one can determine a direction of view. It is a good idea to give the eye some contrasting outline around the pupil. The completed eye is fixed with a simple seam in proper position on the white eye piece.

Beak

The two yellow beak halves are joined on top by the two small profile stripes. Like shown in the drawing at the same time the central middle seam is closed, we sew on a line, and in intervals of 16cm short pieces of line for bridle points are attached. The black bottom pieces of the beak in a first step are sewn between A and B and afterwards the beak tip is closed sewing from C to D. Now the valve flap is sewn on inside.



Assembly of the beak

The valve flaps should be made from light colored fabric to not shine through (white, yellow). The valve will be cut according to the panel and gets a center hole of dia. 10cm. Now, onto this a square of 12 by 12 cm is sewn on. It is important to only attach it at the top and bottom and leave the sides open as air inlet. The square will be on the inside of the parrot and prevent air escaping while the circle hole is on the outside to allow air flowing into the parrot. Once you have sewn this in you have mastered a first difficult task.

The Back of the Head

…is simply an elongated triangle. It would be easy if we wouldn't have to put in a zipper and webbing reinforcements according to the drawing. The zipper allows easy and fast inflation prior to starting the kite, and the reinforcements are necessary for attaching a loop/string to fly the parrot with a lifter kite. Where the webbing crosses simply use a large darning needle or shoemaker's awl to get a line through and make a loop. The best is something strong like sleeved Kevlar weighted approx. 330# (150daN). A snap hook or swivel is used to attach the parrot to the line of the lifter kite when the parrot isn't allowed to fly free. [Editorial note: This is a good idea under gusty conditions when the parrot has a hard time flying.]

Head with lifter attachement points and zipper

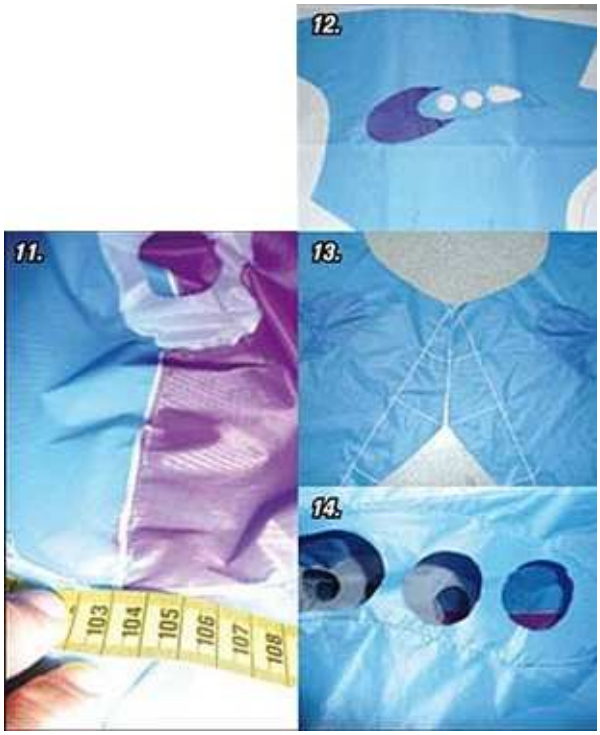
Wings

Who has done foils before knows how difficult it is to attach the inner profiles. Don't panic, the parrot has only three in each wing. Mark the position of the inner profiles with a pencil line on the upper and lower profile of the wing. Next, both parts are joined at the front end only! (Remember that you need to make a left and a right wing!) Where the plan shows it, sew a line in for the bridle attachment. Also, at the front rounding of the inner profiles a line is sewn on. When the profiles are sewn in, these lines and the one at the front rounding of the wing make crossing points E to attach the bridle lines. When all is prepared, you start sewing the inner profiles on one side of the wings.

The profiles will be adjusted at point (E) and you sew until reaching point (F). When all three profiles are joined, it is time to deal with the other side. Now you have to decide whether you want to close the back seam from the inside or later from the outside, which is much easier. To get to the seam on the inside it is necessary to close it from one profile to the next one because otherwise it can not be reached it anymore. This is done by first closing the back seam until reaching the tip of the profile, then entering the needle in point (E), turning the fabric, and sewing the profile on. It is much easier to just close the back with a simple double folded seam. When you are done with the wings, the most difficult part is done.

Side Pieces

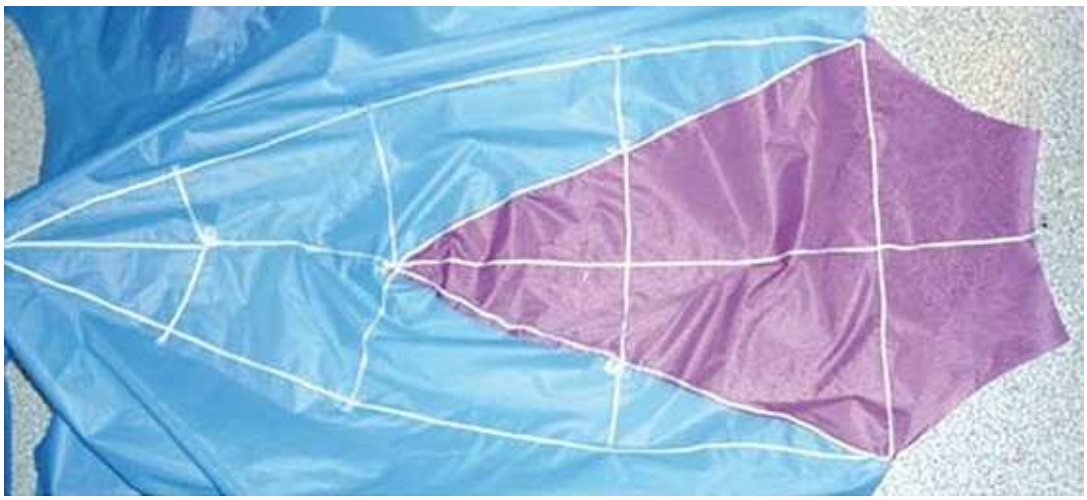
The sides of the parrot are the largest parts but they still fit onto 1 meter wide ripstop. Cut them following the construction plan and mark the positions of the wings, shoulders, and strings to be sewn on. The shoulders and strings can already be sewn on and the respective openings for venting be cut out. One of the venting holes has a larger, oval shape and the wing will be attached here. Please make sure the wing actually fits and put it on the markings on the side. If your wing is a bit out of shape, correct your drawing on the side or make a new wing. Sew the wing on from the „left“ side beginning at marking E on the line you drew. You continue until you reach the end of the wing. You then stop, start at point E again, and sew the other half on as much as you can. Eventually you will reach the point, you won’t be able to go on and you have to start sewing through the vent hole. This somewhat difficult endeavor is shown in the next images.



Side pieces with wing positions

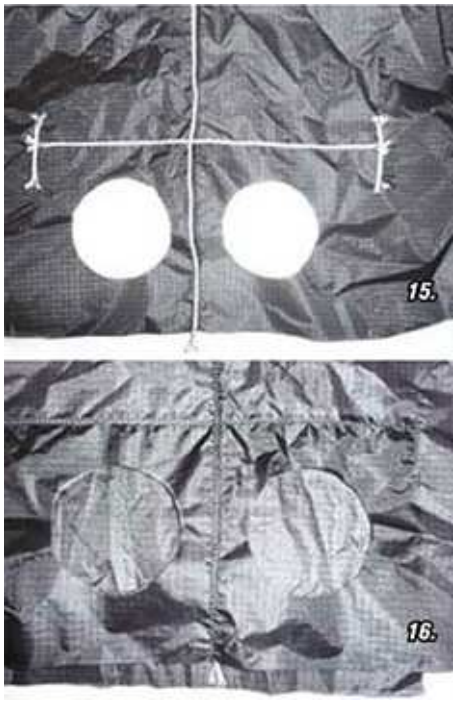
The Belly

First cut it out and attach it to the sides from top G to the beginning of the legs H. Next, sew on all lines indicated. You already can determine all later bridle points.



Belly with reinforcement strings

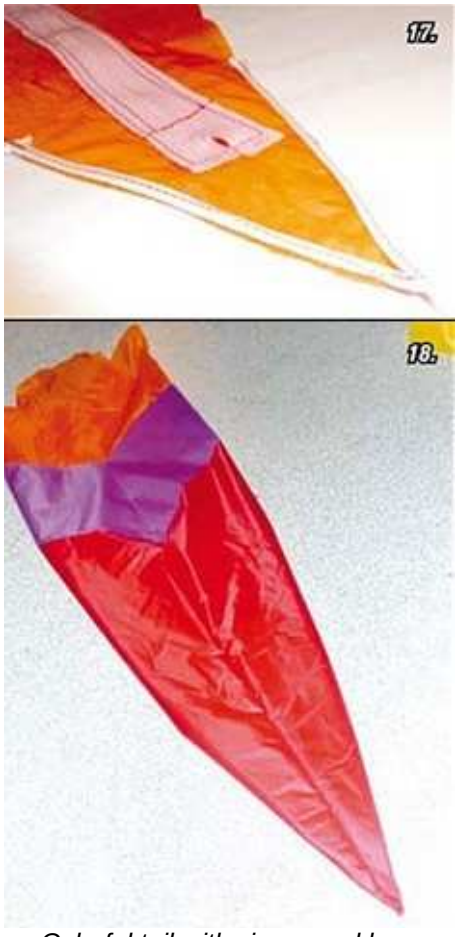
The Throat



Throat with air intake

The black throat of the parrot will hold the air inlets. According to the drawing two holes are hot cut. Both throat parts are next being sewn together along the middle. When you close this seam you have to attach the respective strings and sew them in. Behind the openings the rectangular valve flap is attached. Make sure only to sew on the top and at the lower edge just the two tips. Three sides need to be left open to allow for sufficient airflow into the kite. Next the two white eye pieces are sewn together and joined to the throat beginning in the center. Now, the construct is attached to the sides of the parrot, again starting from the center. Please do not forget to sew in the respective strings.

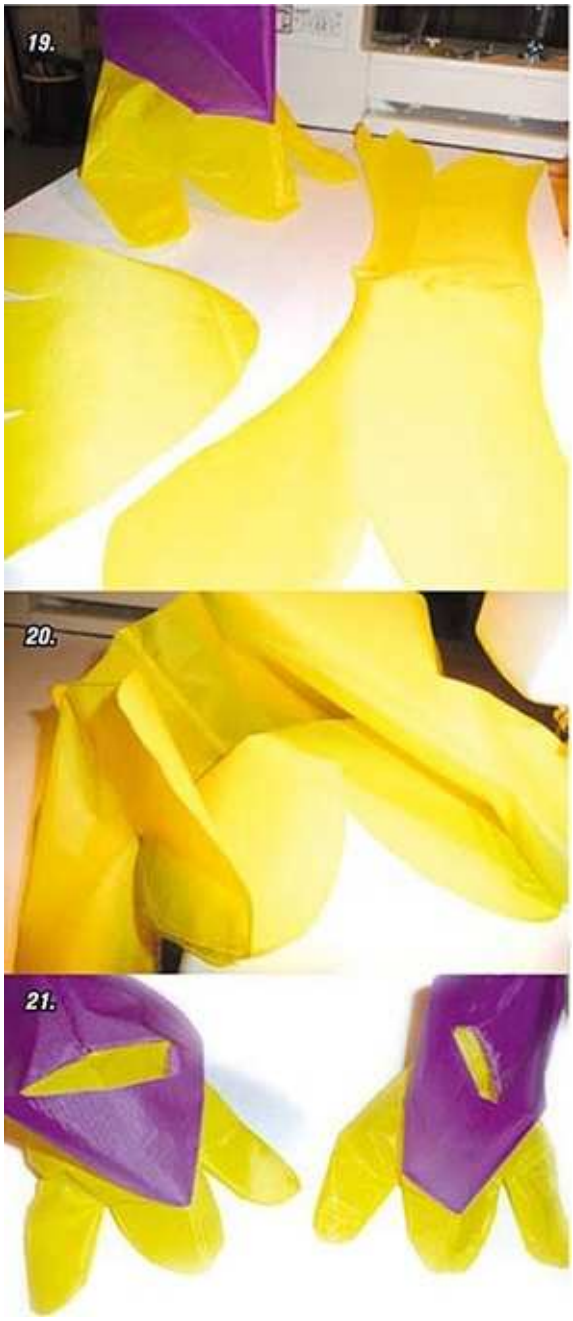
Slowly but surely the bird gets its shape, but there are still some components to be done.



Colorful tail with zipper and loop

The Tail

The tail consists of the two sides, which should have three different colors following the color scheme of the parrot, and the tail bottom piece. A short zipper in the latter is useful for inflating the parrot with a blower and de-sanding after a trip to the beach. It is not absolutely necessary, but recommended. The tip of the tail gets a loop of strong line to later attach the drogue to it. Beginning at the tail end, the segments are joined up to point K.



Three dimensional feet

The Feet

The feet are being built of the upper leg segment and the actual foot. These should be of different colors, where the leg very well may be in the color of the belly. The foot consists of a sole and two sides. To keep sewing simple capital letters are shown on the templates again. First join the two foot side pieces between points 0 and L to form a kind of butterfly shape. Next sew it to the sole beginning at point L working your way to M. When you are done on both sides, you can close the two sections M to N. Your leg segment should now fit into the circular opening between point N and point O. Please remember that you need a left and a right foot! Before the feet are finally attached we will proceed with the body now.

Assembly

You are nearing the point of completion of the project and can now seam up the individual parts. Continue with the head and sew on the beak between the eyes first. Start at the bottom side of the beak at point D and sew along the half round eye section, first counter-clockwise, then clockwise. The back of the head must now fit exactly on the still unoccupied top of the beak. When this piece is inserted, you can sew the sides together from the left side until you reach the position at which the tail will be attached. If everything has been put together in a correct manner it will now be evident where the tail has to be placed.

Now turn body and tail right side out and go on sewing centrically on the top side. First the nearly right-angled corner is inserted, and you continue to sew up to point K. From here sew further and attach the piece of belly to the still open side.

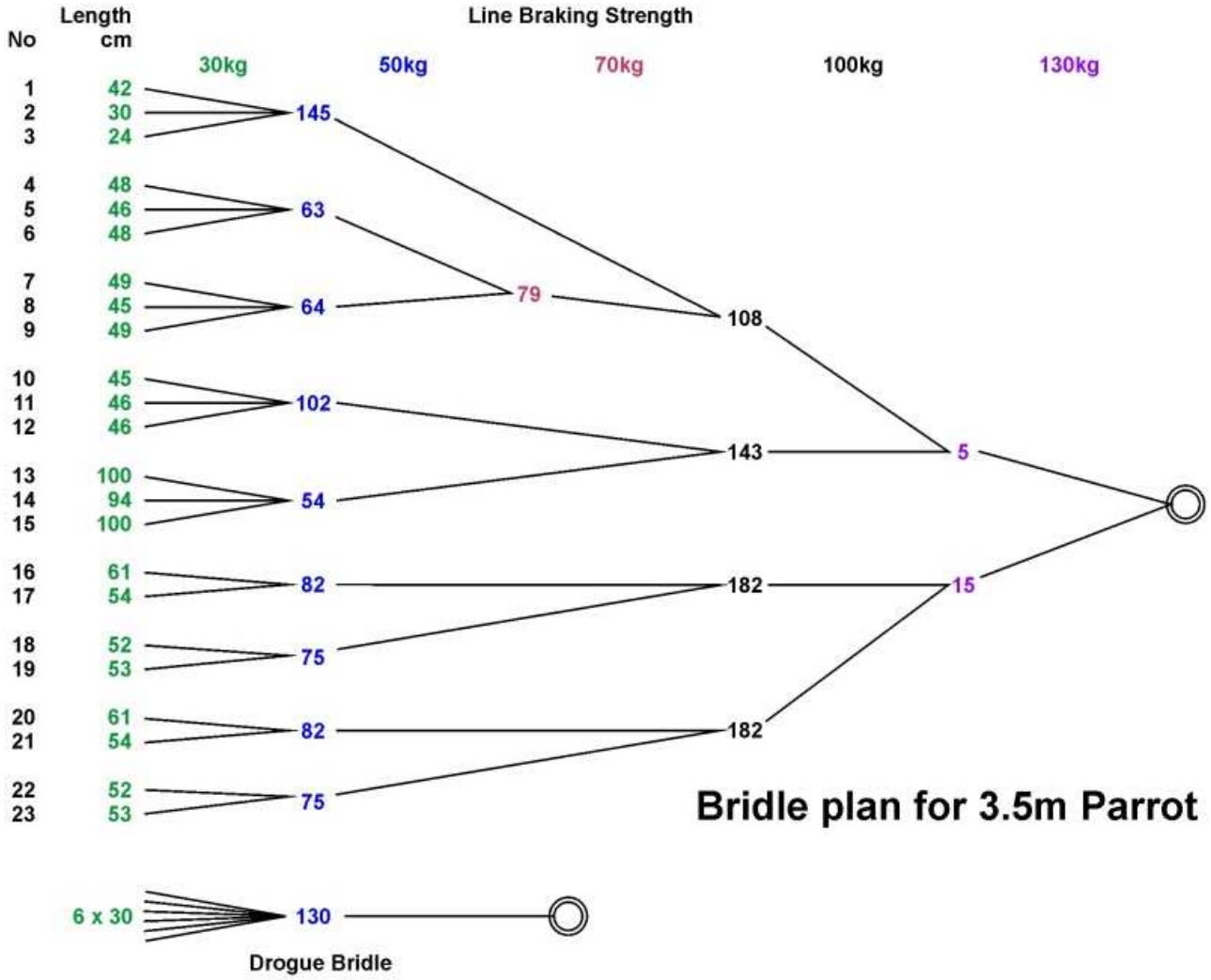
Assembling the pieces

Now the same game on the other side. You will be able to close the last seam between tail and belly only by sewing through one of the leg openings. When these seams all are closed, only the leg holes are still open. Now again check right and left leg and insert one through the opening of the other one. For inserting the second leg you must pull the opening out through an open zipper to have all seems on the inside.

Before resuming with bridle attachment points and bridle your new parrot can be inflated already with a small exhaust fan, blower or a hair dryer.

The Bridle

First you need to create bridle attachment points from 100# line. Using a strong darning needle pierce it through the fabric as close to the reinforcement linecrossings as possible, around the line crossings and back out again. Knot loops made from short pieces of line of about 10 cm in length (approx. 4 inches). The bridle lines will be connected to these loops with a larks head.



The compound bridle uses lines of various weightings. At the body it starts with 70 pound lines, followed by 100 pound lines. These will be collected by 150 pound lines, at last followed by 220 pound lines. These final 4 lines then sum up to a short length of 300 pound line until a snap hook completes the bridle. All bridle lines get a stopper knot at one end and a loop at the other end for making a larks head.

In this manner it is easy to combine and trim the bridle lines later. The bridle plan reads from top beginning with the head to the belly and wings.

All bridle measures are netto, thus you have to add 10cm for the knots and loops.

On the head a short line is added to allow flying the parrot attached to the line of a lifter kite. The tail tip gets a loop to attach the drogue.

Bridle attachment points

Finished bridle of the little Ara

Positions of bridle attachment points

The Drogue

The six segments of the drogue can be done according to the colors used in the parrot for some harmony. Hot cut the segments so that you don't have to close the seams. The pieces are sewn together and six short lines (approx. 30 cm each) attached. A line of 1.5 meter is used to attach the drogue to the parrot tail.

Colo(u)rful drogue

Finally you can build a kite bag out of the 30 by 40cm rectangle onto which the round bottom is sewn on. The side is then closed and a seam is created for the line to close the bag.
Now the small parrot is finished for its maiden flight. Hanging it into the line of a carrier kite naturally facilitates the first flight. Through the opened zipper at the head it is easy to fill the bird with air. When it is inflated to some extent, you can close the zipper. The remaining pressure needed will be built up by air coming in through the valve flap. Even though the bridle should work, due to different sewing techniques and knot tolerances some trimming and fine tuning may be necessary.

A bit of flying will help stretching the fabric and lines. Depending on the line used, some knots will have a tendency to open in the beginning. After some flying with drag on the bridle this will no longer happen.
If everything is correct, your bird will fly in even wind also without the lifter and will give you a lot of joy. The flying line does not need to be too strong, depending on the wind a 150 to 250 pound line will do.

Have fun building the kite and flying it!
We appreciate comments regarding the plan and images!

Questions and contact with the author: info@drachenbernhard.de
More images and downloadable plan: www.drachenbernhard.de

Acknowledgements:
My special thanks go out to Jan Nelkenbrecher of http://www.burgenlandkiter.de for the excellent adaptation of the drawings; for continuous advice to my kite friend Karl-Ulrich Körtel, http://www.raberudi.com; and for the realization on my homepage to Andreas Napravnik, http://www.drachenbaendiger.de. The tricky translation was done by Kai Griebenow, http://kaiskitesite.synthasite.com/; and last not least Karsten Schneymann, kamas@arcor.de, signed responsible for the pdf-job.

Bernhard Dingwerth
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Terms and discriptions used on templates:

Note: Some of the terms are only visible when the drawing is viewed in full size. See downloads!

German	***English***
Ansatz Bein	position of leg
Auge	eye
aussen	outside; outer side
Bauch	belly
Beinansatz	position of leg
Boden	bottom
Farbe	colo(u)r
Flügel	wing, wings
Flügelansatz (ohne Schulter) Umfang 103cm	wing position (without shoulder), girth / circumference 103cm
Fuss	foot
Fuss Sohle	bottom of foot
Hals	throat
Hier entlang zusammennähen	Sew along this line
innen	inside; inner side
Kopf-Rückseite	back side / back piece of head
Lifterpunkt	attachment point for lifter kite
Packsack	bag, storage bag
Reissverschluss	zipper
Schleppsack	drogue
Schnabel	beak
Schnabel Innenprofil	beak inner profil
Schnabel oberes Profil	beak upper profil
Schnur / Gurtband einnähen	Sew in string / belt webbing
Schnur aufnähen	Sew on string
Schnur einnähen	Sew in string
Schulteraplizierung	shoulder appliqué
Schulteraplizierung Aufnähen	Sew on shoulder appliqué
Schwanz Bauchseite	tail, lower side (the “belly side”)
Schwanzseite	side of tail
Seitenteil	side piece
unterer Schnabel	lower beak / bottom piece of beak
Ventilklappe annähen	Sew on valve flap
Ventilklappe Schnabel Innenprofil	inner profil of valve flap for beak