MAKING BRUCE'S ALMOST SQUARE FIGHTER 'BASF'

By Bruce Lambert
kitefighter@nwinfo.net

BASF is fairly easy and quick to make and flies very well. Its performance will allow you to learn virtually all fighter kite flying skills, plus will be very effective in fighter kite competitions. However, if you just want to enjoy the fun of flying a fighter kite, flying the BASF will give you hours of pure kite flying enjoyment!

You can use many different materials for the skin of this kite, such as Tyvek, ripstop nylon, ripstop polyester, Orcon, paper, a plastic bag, or mylar or mylar-like plastic gift wrap films. The technique described here is one way I make kites using a plastic film type of material for the kite sail or skin.

These instructions are based on using a mylar or mylar-like film for the kite's skin. This material is lightweight, strong, waterproof, inexpensive and fairly easy to work with.

The particular gift wrap or floral wrap film I use is readily available at Micheal's Craft Stores for under $5 for a roll. It is called Clearphane, Cellane or other names and is available in solid transparent colors as well as some patterns. However, any gift poly-wrap mylar-like film will work just fine. A roll usually has enough material on it to make many kites! So buy a roll with a couple of friends and share your fighter kite making experience!

These instructions use 2 different types of tape to bond the kite parts together. You can apply this construction technique to any kite plan you want to make.

I suggest reading the entire instruction before you begin; this will give you an overview of what is involved. The plan diagram for BASF is at the end of this article and a full sized template is in an included PDF file.

Here is a material list for the BASF kite:

- A 17"x17" piece of polyfilm gift wrap, a mylar-like film. Position the kite pattern diagonally on the material if you are using this minimum 17"x17" size, or if your material has a grain or pattern in it, you may need it to use a 20"x22" piece in order to properly orient the pattern.

- Clear packing tape that is approximately 2" wide by about 36".

- Double sided carpet tape 2" wide. You will need about a 24" length. In the photos I used red colored packing tape so it would show in the photos, but normally use and suggest the use of clear packing tape.

- Bamboo spine 19" long. Bamboo is the best material to use for the spine of the kite.

- Bow material. If you want your kite to fly indoors, use a bow 23 7/8" of 0.04" diameter carbon fiber, for light winds, say 2mph-6mph use a 23 7/8" bow of 0.05" diameter carbon fiber rod, if you

want your kite to fly in winds from 6mph-12mph then use a 23 7/8” bow of 0.06” diameter carbon fiber rod.

- A couple of drops of Super Glue

- Optional….2- self adhesive plastic photo mounting corners

- Batten material. Battens are optional, if you choose to include them, you will need 2 pieces each about 6 1/2” long. You can use small diameter drinking straws, like is used for stirring coffee. The ones I use are red. You could also use small diameter split bamboo, carbon fiber rod about 0.03" or 0.04" diameter.

- Approximately 50” of 15# - 20# test line for the bridle. Any strong small diameter, low stretch line will work just fine, including cotton, linen or dacron.

Here are the tools you will need to make the BASF kite:

- A 24”x 20” work surface that will allow you to cut with a razor or hobby knife.
- A very sharp break-off utility knife, single edged razor blade or hobby knife with new blade
- 24” straight edge ruler
- A Sharpie extra fine point marker
- Sharp scissors
- Construction nail, about 8 penny size, and a cigarette lighter or a pencil point soldering iron.

Here's one method for making BASF

Explaining the details of how to make BASF takes many words and several photos…..but actually making the kite is quick…..probably less than 2 hours.

If you plan to make only one BASF, then you can draw the full size pattern directly onto the plastic poly film or other skin material you've chosen for your kite skin. But, if you would like to make more than one, or if friends want to make one or more, you should make a template to speed cutting out the kite skins.


Ready to make BASF.

MAKING THE TEMPLATE. You only need a template for ½ the kite. The included drawing of the BASF is to scale. An easy way to make it full size is to enlarge it on a copy machine to the size that the spine length on the finished enlarge version is 19” long. Include the spine line and one side of the kite; this is your ½ plan.

Or use the full sized template included with this article. Just print the parts of the plan, it is best to use heavier paper than copy paper, tape together and cut out.

OPTION: I put small holes in the template at the points where the bow tips will be located at the wing tips, the lower bridle connection point, the point where the bow and spine cross, and the points where the bridle attaches to the bow and the location of the battens. Through these holes I insert a ultra-fine tip Sharpie marker to mark on the kite skin the precise locations of these important points.

CAUTION NOTE**: Before you actually cut out the skin, there is one characteristic of mylar and all other plastic films I want to share with you. **Once an edge is nicked, it easily tears at that point. A nick can be small enough to be invisible. Once a tear begins, it usually continues quickly to another edge of your kite skin. Obviously you want to avoid putting nicks in the edge of your kite skin!
Here is how to minimize this potential problem. When cutting out the kite skin with a hobby knife or single edged razor blade, do not stop the knife along the cut. Make each cut with one uninterrupted pass of the knife. If you are using a template, make one pass with the knife along each edge of the template. The only place you can stop the knife without much risk of creating a nick is at the corners.
It is very disappointing to finish the kite and during its first flight, the skin tears for no apparent reason! The reason is the "nick" made by your knife hesitating, stopping and/or starting. Fortunately with a piece of packing tape it can usually be fixed….but only if you can catch it in time.

MAKING THE SKIN. Fold the skin material you have chosen in half. The side of the material you plan to have on the front face of your finished kite needs to be on the outside after the fold is completed. Fold your material so you have at least 19" along the fold. Align the ½ kite template so the spine of the template is on the crease. Now use the Sharpie pen to put dots on the material in all the holes in the template. Use a hobby knife and cut around the template. Now turn over the material and using your Sharpie, put dots on top of the existing dots so both sides will have dots at the critical points.

Open the material and lay it flat on your work surface with the valley of the fold along the spine line face upward. This is the backside of your kite skin. I use low tack masking tape to secure the kite skin to my work surface.

OPTIONAL STEP
Although I didn't include it on this kite, reinforcing the leading edge with packing tape is a recommended optional step. The kite will fly just fine in light wind without it, but the kite, even in light wind is more durable with the reinforcement.

Cut about a 12" or so length of 2" wide packing tape. When you look at the included plan, you will see the dotted lines showing where the reinforcement tape is to be applied. Using

your eye as a guide, it doesn't need to be exact, place one end of the tape on the backside of the kite skin to include about ¾" of the left wingtip hem tab and the entire leading edge all the way to the nose. Place the tape so when you extend the tape to the nose of the kite skin, about ½" to 1" of the tape width will be on the kite skin material inside of the leading edge line. This is the part of the tape that will remain on the skin of the kite as reinforcement.

After completing the left side, do the same for the right side. Trim away the packing tape along the leading edge using a straight edge and hobby knife or single edged razor blade. Only about ½" of tape is to remain on the kite skin along the leading edge.



CARPET TAPE

Next apply double-sided carpet tape to the kite wingtip hem tabs. Mark on paper backing of the tape eight 7/16" - 3/8" wide strips, the length of each will be the width of the tape, 2". Cut the pieces of carpet tape. Apply the tape to the tab area on each wing tip aligning the edge of the tape with the outside edge of the wingtip hem tab.

PREPARING THE BOW. Now you need to get the bow ready to put onto the kite skin. First, cut the carbon fiber to the correct length and sand the ends so they are rounded. You can place bridle stops on the bow at this time if you plan to use them. They are optional.

PREPARING THE SPINE. Cut your bamboo spine to 19" long. The ideal cross sectional shape of the spine is about 3/16" wide on the shinny or skin side of the bamboo and slightly less 3/16" in thickness. If you shape your bamboo spine, a sharp utility knife works well for shaving and splitting it. Before shaping it, sight along the spine and straighten any curve in the spine.

The spine should be as straight as possible when you install it onto the kite skin. After the kite is completed, you will bend the spine slightly.

The shinny or skin side of the bamboo is the side of the bamboo that you put onto the kite skin. Now the spine is ready to be attached to the skin.

Draw a parallel line to the fold line of the kite skin about ¼" away from the fold line. When installing the spine, you can use this additional line as a guide to more easily align the spine accurately on the kite skin.

PREPARING THE BATTENS. Cut the material you have chosen to use for the battens so you have 2 - 6 1/2" long pieces. The battens are now ready for attaching to the skin.

INSTALLING THE BOW. If there is any 'tricky' part of making BASF, installing the bow is probably it. Begin by peeling off the carpet tape protective paper covering on the tape you applied on the wingtip hem tabs.

Pick up the bow and flex or bend the bow and touch the tips of the carbon bow at the trailing edge on both sides of the kite skin. You want the bow tips positioned so they are just barely on the carpet tape. When you are locating the tips of the bow, keep the bow above the kite skin except for the tips, only the very tips are touching the carpet tape at this point.

While holding the bow tips in place, allow the rest of the bow to rotate down toward the kite skin. When it touches the kite skin, the ends will still be touching the carpet tape. Press the bow onto the carpet tape where it naturally touches it. Then, while holding down one side of the bow onto the kite skin, fold over the carpet taped wingtip hem tab around the bow and onto the kite skin. Burnish the tape and do the same for the other side.

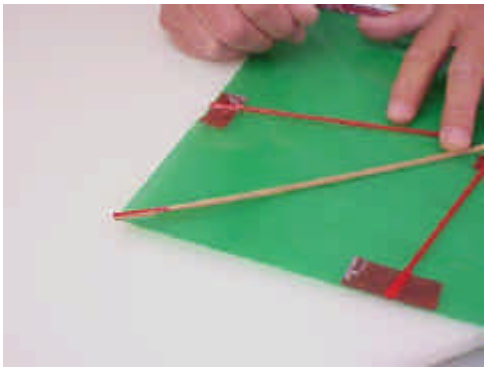
OPTIONAL and EASIER METHOD OF INSTALLING THE BOW

At the wingtips apply a self adhesive plastic photo mounting corner. To install the bow, insert the ends of the bow into the photo corner pockets. After the ends of the bow are firmly pushed into the pockets of the photo corners, fold over the double sided carpet taped hems. The hem will cover the bow, the photo corner and will attach to the backside of the kite skin. Burnish the tape well. Using the photo corners at the wingtips makes installing the bow much quicker and easier.

INSTALLING THE SPINE

Cut 2 small pieces of carpet tape, about 1/8”x 1”, and apply to the nose and tail of the spine on the shinny or skin side of the bamboo.

Remove the paper backing on the carpet tape. Lift the bow up off the kite skin and carefully slide the nose of the spine under the bow. Press the nose and tail portion of the spine onto the kite skin so the centerline of the spine is on the fold of the kite skin. The spine runs along the centerline or fold line of the kite skin. Use the parallel line as a guide for positioning the spine.



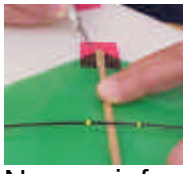
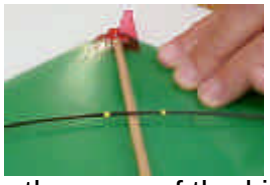
INSTALLING THE BATTENS

Cut 4 small pieces of packing tape each about 3/8”x ¾”. These will be used to hold the battens in place on the back side of the kite skin. Place the left batten in its position. While holding it there, place one of the pieces of tape on the end of the batten that is nearest the trailing edge. Be sure the tape is not extending over the trailing edge, or if it does extend beyond the trailing edge, trim it.

Next, apply a piece of the tape to the end of the batten closest to the spine. Do the same with the other batten.

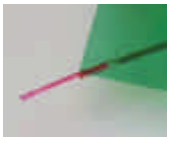
PACKING TAPE REINFORCEMNTS

Reinforce the wing tip area where the wingtip hem tabs have been folded over. Use packing tape about 1" wide by about 6" long. Apply the tape so it extends to the point the bow enters the wingtip hem tab. Position the tape so it is on both the front and back side of the kite and wraps around the wingtip hem tab and onto the backside of the kite skin. Do the same to both sides. The reinforcing tape should be about 1/3 on the front face of the kite and 2/3 on the back side.


NOSE TAPE. Now, reinforce the nose of the kite with tape. Place the kite on the work surface so it is lying on its face with the nose pointed toward you. Cut a piece of tape about 1"x1 ½" and lay it sticky side up on your work surface so that ¾" or so of the length of the tape is under the nose of the kite. Press the nose of the kite down onto the tape. With your hobby knife, cut two slits in the tape aligned so the cuts are extensions of each side of the spine. Fold the center portion of the tape over the spine. Then, fold over one side of the remaining tape onto and around the back of the kite skin and onto the spine. Do the same with the other side.

TAIL TAPE

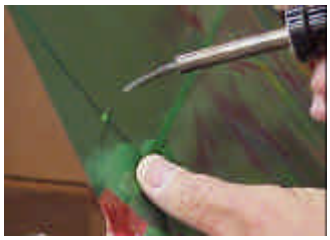


Cut a 1/8" wide 2" long piece of packing tape and apply it around the end of the spine. About ½ of the 2" long piece is on the front of the kite sail and the other half on the back of the spine.

MARKING THE BRIDLE POINTS With the kite lying on its front face with the nose pointing toward you, lay a ruler across the spine just below the bow so you can accurately measure 1" or 1-1/8" or 1-1/4" on either side of the spine center. Any of these dimensions work well for the upper bridle connection points. (the plan shows 1") Be certain whichever dimension you select you mark them equidistant on each side of the spine. Place a mark with a felt tip or silver marker on the bow and on the kite skin indicating the location of the upper bridle connections from the center of the spine. NOTE: A black Sharpie marker can be seen when applied to the carbon fiber bow, but it requires very good lighting. (In the photo, I am gluing my bridle stops to the position of the bridle connection marks on the bow, bridle stops are small pieces of heat shrink tubing that's glued to the bow at the marks. The stops are used instead of CA gluing the bridle directly to the bow.)

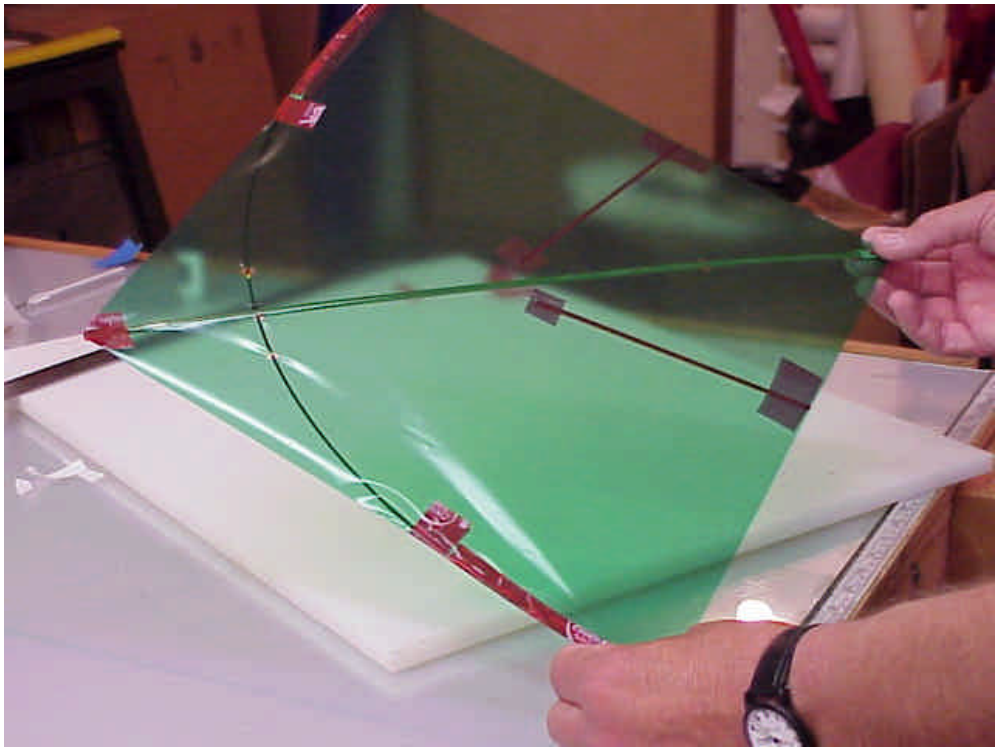
Also mark the location of the lower bridle connection at a point 6" toward the nose from the tail of the spine. Make a mark on either side of the spine at that point.

MAKING HOLES FOR THE BRIDLE



Using a small diameter soldering iron, touch the hot soldering iron to the kite sail at the dots on the lower part of the spine, at the points were the upper bridle connections are located on the bow. If you want to tie the bow and spine together, make holes for that at the crossing of the spine and bow. You could also use a lighter or candle flame to heat a nail hot enough so it will melt the kite skin material to make the holes in the kite skin.

FINISHED KITE BEFORE BRIDLING



BRIDLING THE KITE. For the bridle cut 3 pieces of bridle line, one 12” –13” long, another piece about 22” long and the third about 7” long.
Fold the 7" piece in half and tie the ends together using an overhand or figure eight. Trim the ends and set this approximately 3" long loop aside. This will be the “tow connection loop”.

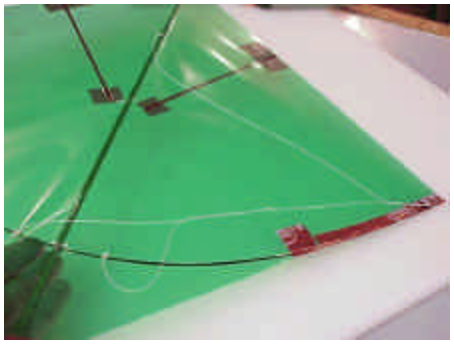
Next tie one end of the 12” piece of line to the bow through one of the holes in the front face of the skin. Use any knot that will hold well and is easy for you to tie. After the knot is tied, slide the knot to the mark on the bow and place a drop of CA glue to secure it.

Then tie the other end of the 12” line to the other bridle

connection point you marked on the bow. Slide the knot and glue with CA glue just as with the other bridle connection. When I tie the knots, I usually have about an inch or so of line that is a tail that I later trim off. Trim the tails so they are only about ½" or so.

With the 22" piece, loop about 4" of one end over on itself and to form about a 4" long loop. Tie an overhand knot there to form a loop. Attach this looped end to the 12" upper bridle line you tied to the bow. Attach it using a larkshead knot. Center it on the upper bridle yoke and tighten.

Tie the loose end of the 22" bridle line through the lower bridle attachment holes you made in the skin and tie it around the back of the spine. Before you tie it, pull the bridle line toward one wingtip of the kite. When tied, the bridle should not be long enough to extend over or outside of the wingtip. Tie the lower bridle point and trim the tail of the line.



Attach the 3"-4" loop you made earlier to the lower bridle line using a larkshead knot. This is the point where you will attach your flying line; it's called the 'tow connection loop'.

The reason a larkshead knot is used to connect the bridle parts is that a larkshead knot is adjustable and lockable. It provides for many of the tuning adjustments required to correctly tune the kite.

PRE-TUNING YOUR KITE

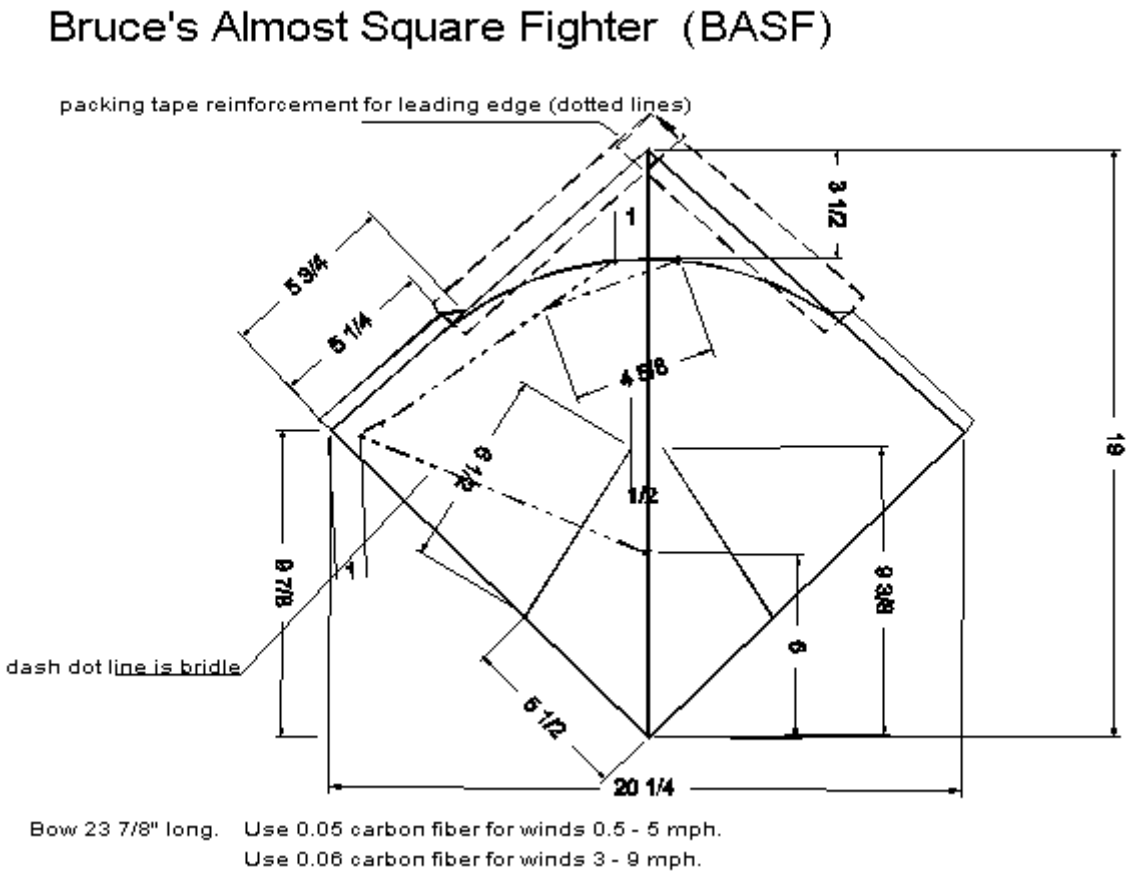
Place a slight rocker bend in the spine of your kite. You want the bend to push the front of the kite skin outward.

To bend the spine, place the front face of the kite against your stomach. Then gently press on the back of the bamboo spine at various points from the nose to a point close to where the wingtip line would intersect the spine. The spine is being pushed into your stomach. And at the same time you're pressing the spine, push the nose of the spine away from your stomach about an 1" – 2". The heat of your stomach and the gentle pressure of your fingers pressing the bamboo will create a slight bend in the bamboo. The bend is required to allow the kite to spin and turn.

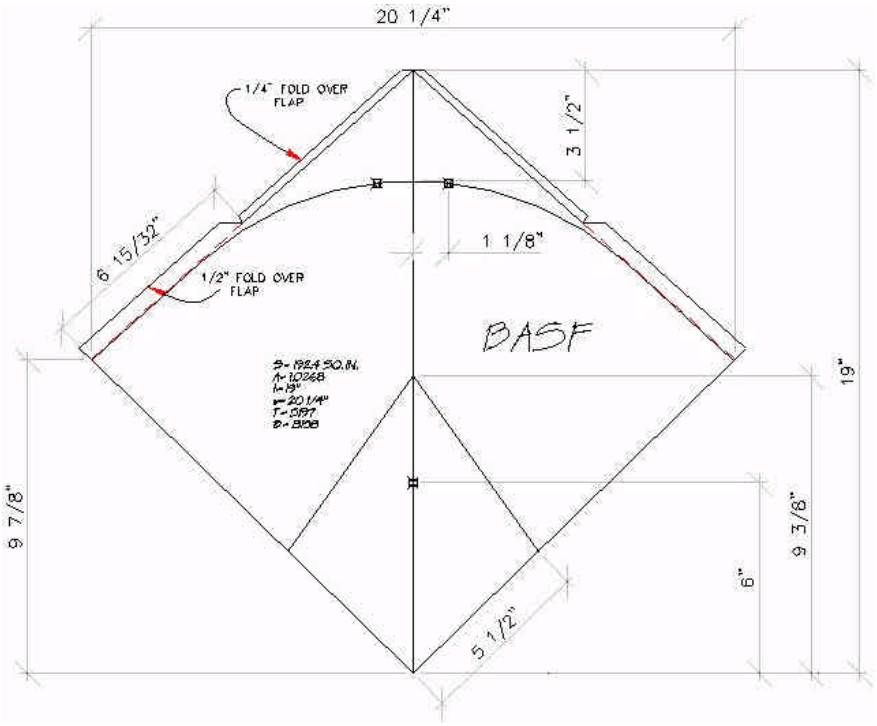
BRIDLE PRE-TUNING. Position the 'tow connection loop' along the lower bridle line so when you hang the kite by it, the nose of the kite is about 1-1/2" – 2" higher than the tail of the kite. An easy way to do this is to hang the kite over a table and have the tail touch the table and measure the distance to the nose from the table. Also position the upper bridle connection so it is in the center of the upper bridle yoke. This bridle set up will allow your kite to fly. To tune it further to better match your preferences, read about tuning a fighter kite.

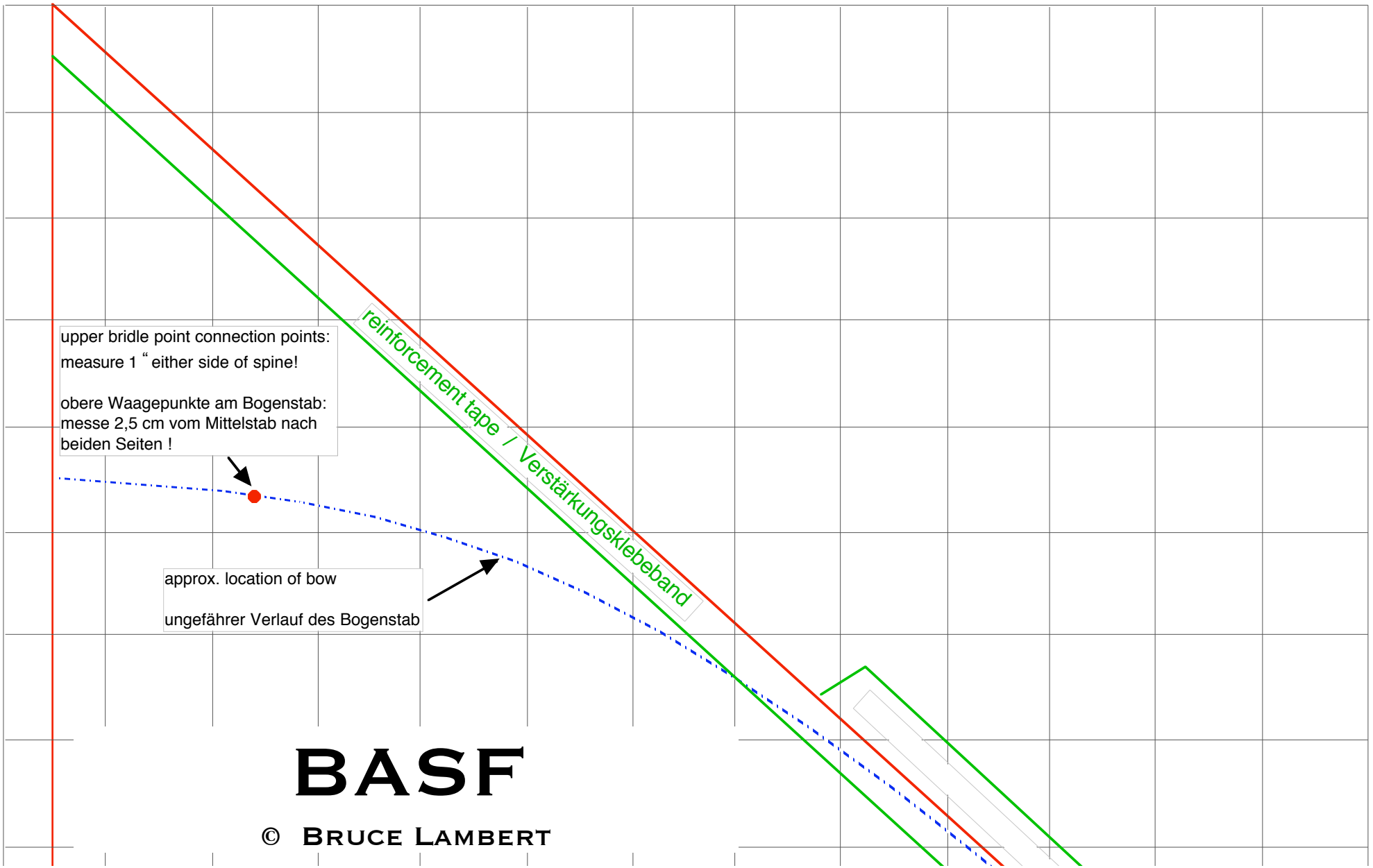
CONTRATULATIONS!! YOU HAVE MADE A GREAT FLYING KITE! HAVE FUN WITH IT!
If you have questions, please email me at kitefighter@nwinfo.net

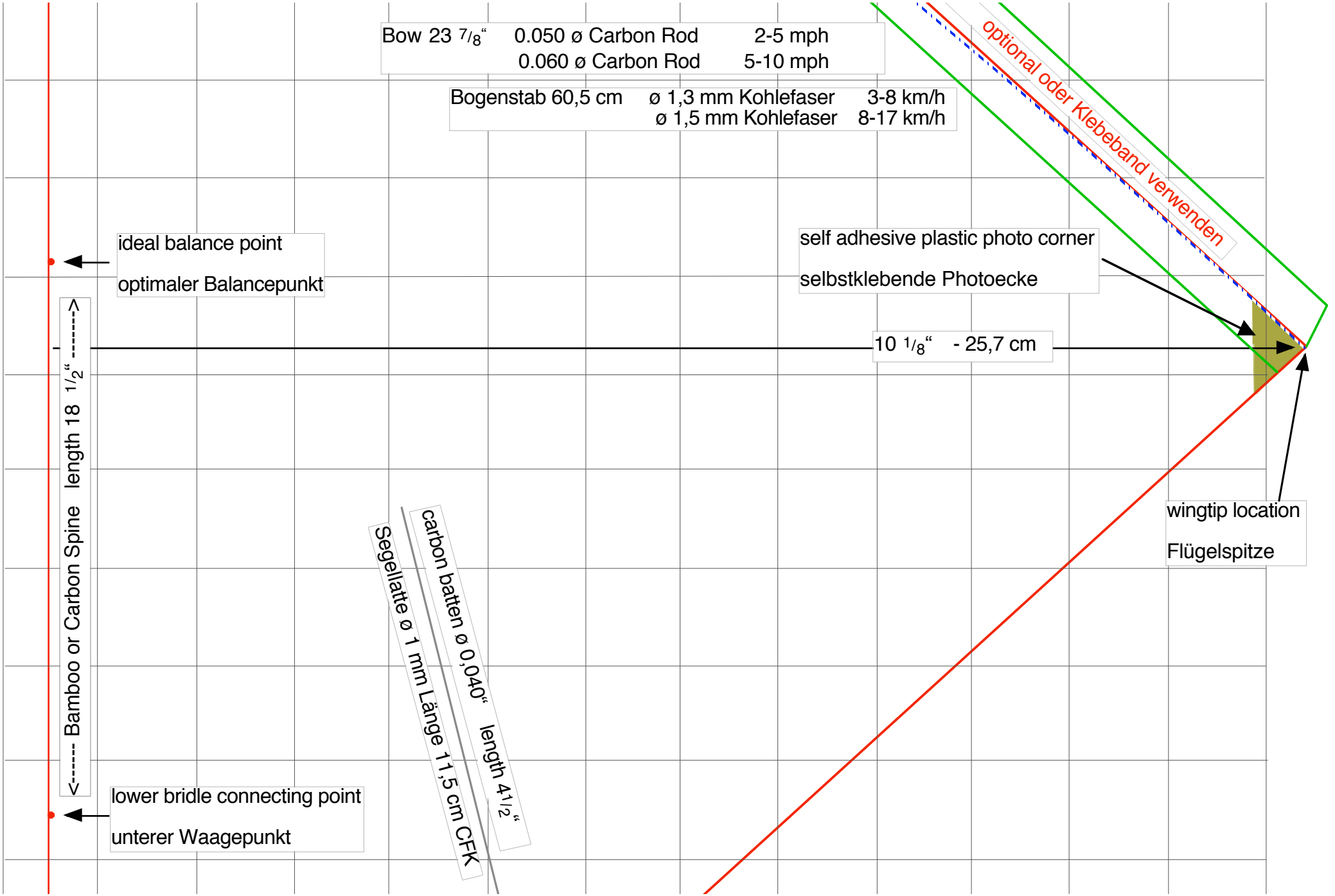
Here are two diagrams or plans of the BASF kite. On the pages following them is a 3-part full sized printable template that was drawn by Mathias Rosbund based on a tracing of my original template for the BASF.

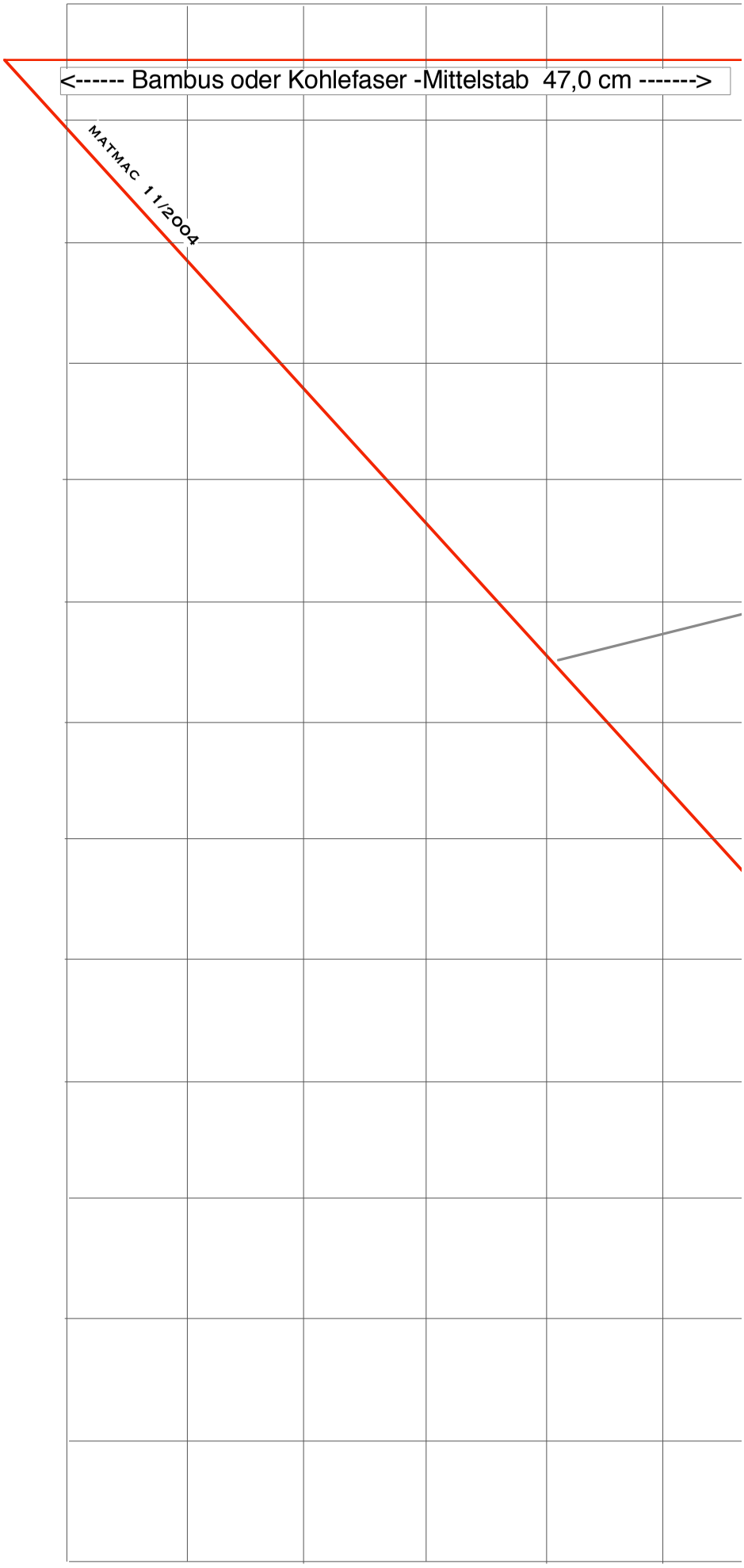


Here's a more refined version of the diagram produced by Dennis Ische.




upper bridle point connection points:
measure 1 “ either side of spine!
obere Waagepunkte am Bogenstab:
messe 2,5 cm vom Mittelstab nach
beiden Seiten !
reinforcement tape / Verstärkungsklebeband
approx. location of bow
ungefährer Verlauf des Bogenstab
BASF
© Bruce Lambert


Bow 23 7/8“ 0.050 ø Carbon Rod 2-5 mph
0.060 ø Carbon Rod 5-10 mph
Bogenstab 60,5 cm ø 1,3 mm Kohlefaser 3-8 km/h
ø 1,5 mm Kohlefaser 8-17 km/h
optional oder Klebeband verwenden
ideal balance point
optimaler Balancepunkt
self adhesive plastic photo corner
selbstklebende Photoecke
10 1/8“ - 25,7 cm
<----- Bamboo or Carbon Spine length 18 1/2“ ----->
wingtip location
Flügelspitze
carbon batten ø 0,040“ length 4 1/2“
Segellatte ø 1 mm Länge 11,5 cm CFK
lower bridle connecting point
unterer Waagepunkt


<------ Bambus oder Kohlefaser -Mittelstab 47,0 cm ------->
MATMAC 11/2004