Jeff MacInnis is 'the fat kid' and this is a series of articles he wrote a few years ago about fighter kiting. They are unedited. Jeff is a skilled artist, craftsman, writer and a superb fighter kite maker, designer and flyer. Bruce Lambert

the fat kid's notebook

fighter kite construction: an overview

conventional wisdom dictates: “a fighter kite at first glance is deceptively simple”. often attractively decorated, the kite appears to be little more than a cross of sticks, sail material and a piece of string. the ‘new-be’ kite builder soon learns the combination of materials, construction, size and shape are myriad and directly affect the character of flight of the kite.

there are six basic elements of a fighter kite — the spine, bow, sail, bridle, binding and flying line. our task as kite builders is to combine these basic elements in a manner that best complement each other. when our task is complete, “kite synergy” is achieved. experienced kite builders often can predict the flight characteristics of a new design. at least that is the intention. seemingly endless changes, modifications and tinkering come with the territory of being a fighter kiter. the endeavor is rewarded when the builder/pilot produces a kite that flies in a manner that suites their wants and needs. this is our mission.

practice is the great precursor to luck. although luck can play a part, building a truly fine fighter usually points in the direction of the “pursuit of perfection; always strived for, never attained”. if the journey is more significant than the destination, my advice is to: build a lot of kites, play, have fun and enjoy the ride.

fighter kite construction: a retrospective

...and from mere bits, the substantial incarnate!

in these days of rapidly accelerating technology, a lot of faith is bestowed to industry; it is difficult to imagine what life today, would be like without it. however, mass production techniques and the sciences reveals a deeply secluded void when compared to the fruits of the craftsman. no manufacturer’s conveyor belt is able to reproduce mastery the likes of a stradivarius violin, for the human hands are a medium to artistry. even more than that; occasionally grace intervenes and the hands of the craftsman author an intangible entity, known only by one name; magic.

the fact that there is a collection of parts at the ready indicates the intention to build. this is a pregnant moment, laden with many a fork in the road. every decision a builder makes directly effects the outcome of the project. a detail as subtle as the ambient temperature of the workshop could have a significant impact on the final product. as mies van der rohe so eloquently put it: “god is in the details”.

we are not building anything as complicated as a research orbiter or submarine. we are, however, constructing a machine that will operate according to the dictates of nature. the deeper we understand the union of our machine with the natural world, the nearer we approach the synchronous.

whether a builder creates a museum piece or a ‘quick and dirty’ kite, to just go out and fly; considerations abound. if you love fighter kites, i can guarantee one thing: your last kite will be different than your first kite.

“listen to the wind, it will tell you what to do”.

over five hundred years ago, the young student nasdesh puram, asked of his mentor: (unknown) “master; what is the difference between a fine kite, and one with less desirable attributes?” the reply: “very little.”

fighter kite funeral

in the event a brother/sister ceases to exist in our world, let all the flyers gather at dusk for the last fly. each must fly their second best kite high. at the reading of the words: “we give you to the wind that you fly with us forever”, all kite lines are broken at once releasing the kites. then we drink, and pee on the ground.

the half template

draw a 90 degree cross on a piece of paper large enough to accommodate a whole kite. neatness counts. i like to use a fine tipped pen. once through, both directions.

bamboo all bamboo bows are shaped differently making your template a ‘one off’. the piece of paper you are using -will- be the template. a one shot deal.

synthetics carbon fiber rod and similar materials are reliable insomuch as very consistent repeatable bows are possible. two (or more) like lengths and diameters bent to the same distance (straight line) tip to tip deliver copy after copy. the finished paper template can be transferred to a more permanent material to be reused.

bamboo bend the bow to the desired shape and secure it with a piece of thread at the tips. if loops are tied at either end of the thread it is only necessary to larks head them on to the ends of bow. if the thread slips, dab on a little rubber cement so it holds.

synthetics bend the bow to the desired shape and secure it using a piece of music wire. the wire should have small loops at either end. tape over any sharp spots. sand down the tips of the rod to points so they spring into the loop ends. don’t let the bow boink out of the fixture either. you do not want the rod with it’s sharp ends winging about the shop.

make a spine and cut it to length.

o.k. now we have a cross drawn on a piece of paper, a bow sprung into our thread (jig) or wire (fixture) and a spine cut to length.

one of the lines on the paper represents a line from tip to tip on the bow. the other or perpendicular line must be bisect the bow. this is the spine line.

measure the exact distance of the bow, tip to tip and divide by two. i like to bisect from a friendly hatch mark on the meter stick so i have a center reference point. i lay the meter stick center reference point on the spine line of the cross. then it is only a matter of measuring out away from the spine line to the correct half distance on the bow line. measure it both ways and carefully mark it. re-measure. set the bow on the paper so the tips are up to and touching the line and the marks on both sides. perfect.

now that you are confident the bow is centered on it's line and marks, pick it up and dab a little rubber cement on it. let it get slightly tacky. before it dries, reposition the bow on the paper and let set till it will not slide around.

trace along the outside of the curved bow with a fine tipped pen. it is only necessary trace half of the bow shape. from the spine line to the bow tip. don't let the dumb end of the pen sway around like a bad static kite or your line will not trace the bow accurately. remove the bow from the paper.

bamboo mark the bow so you will not forget which side is up. leave it sprung in the jig and set it in a place it where it will not be disturbed.

synthetics leave the bow sprung in the fixture and set it in a place where it will not be disturbed.

the paper now has a cross drawn on it and is marked on both sides of the bow line. half the bow curve is drawn from nose to bow line mark.

position the spine on it's line and mark on the paper where you want the nose and tail.

draw a line from the nose to an area where you want the sail to intersect with the bow.

draw a line from the tail to the mark on the bow line.

doubled edges, wingtip pockets or any folds must now be added to the drawing. if you want part of the bow to have a folded piece of sail material over it, position the bow off set from the curved line trace appropriately.

i like to cut the paper template out with an x-acto knife and a straight edge wherever possible. from nose to tail, from nose to curved bow line, from tail to wing tip, the wingtip flaps and then i fake it on the curved areas.

sail preparation

here are a couple of great tricks aiding in kite construction. both of these methods temporarily secure the sail to the building surface so parts can be accurately and neatly installed.

the first technique (among many) was shown to me by a true kite god and good friend, brian johnsen. when using non-porous synthetic sail materials, i.e. plastic sheets - mylar etc. one encounters unique handling problems. sliding around, rippling and static are three of the biggies. the following remedy makes uncooperative synthetics very manageable.

the tools necessary are: a sheet of glass large enough to contain the kite, an atomizer, a squeegy, glass cleaner, a scraper and some paper towels. i cut sails on a thick sheet of teflon using a half template and

an x-acto knife. the cut sail is then transferred to the glass sheet. to prepare the glass sheet building surface, clean throughly. spritz the surface with a little water from the atomizer and lay the sail front side down. sprits a little water on the back of the sail and dampen the blade of the squeegy. stroke the squeegy over the sail until it lays down flat. some excess water may ooze from under the edges of the sail. the sail will suck down to the glass sheet flatter than a crepe`. so flat that any foreign objects left under the sail will become annoyingly obvious. gently dab the moisture from the back of the sail with a paper towel. remove moisture from the unused portion of the glass also. depending on the seal, the sail will stick to the glass plenty long enough to add parts. i've seen them stay put for weeks.

if the material chosen for the sail is flimsy and difficult to cut accurately, try this. employing a half template, cut the sail out directly on the glass surface. to do this, squeegy half of the sail material down to the glass, fold in two and re-squeegy. cut the sail out, unfold and re-squeegy to the surface. using a whole template, squeegy the material directly on the glass surface and cut.

the second trick was developed by yours truly. it is similar in that the sail material is fixed to a surface for ease of handling but with materials that are less conducive to the previous technique. when using paper, silk, orcon, tyvec and the like for sails, i like to tape the material to the construction surface.

the tools necessary are: drafting tape. drafting tape appears very much like masking tape but differs in that the amount of adhesive is less. it is less sticky allowing a temporary fixture. again, i cut sails on a thick sheet of teflon using a half template and an x-acto knife. whether the sail is transferred to another surface matters less here. cut six pieces of drafting tape 1 and 1/2" inches long. fold a small amount of one end of the tape over - sticking it to itself. this will make a tab to grab a hold of when it comes time for removal. set the tapes aside for easy access. spread the sail on the working surface front side down. tape the nose of the sail to the working surface. insure the tape is straight and centered over the spine line. the tab end of the tape should be facing the middle of the sail. do the same on the tail end. a slight amount of tension on the sail is o.k. this may create two small furrows of ripple on either side of the center line but worry not. add two more tapes to the nose. one on either side of the center tape, tab towards the middle of the sail. do the same on the tail end. now the sail should be stuck down with three pieces of tape on either end. carefully remove the center tapes. now we have four pieces of tape securing the sail to the working surface, nice and straight with a little tension down the center line. the center line is now free of tape allowing room for the spine. set the spine. i like glue the spine on and tape the ends down using permanent tapes. remove the temporary tapes. the permanent tapes will continue to secure the sail to the working surface. use drafting tape to secure the wingtips. use the hand to brush out ripples. the spine will help to insure the wingtips are square to the center line. tape down the wingtips in an area that will not interfere with bow installation. if there are permanent leading or trailing edge tapes to be installed, it might be necessary to move the temporary wingtip tapes around.

always experiment with tape before executing construction. you won't want any accidents. drafting tape is available at art supply stores. you can make the stuff from masking tape by rolling the sticky side on cotton or flannel to suit. drag it across a pair of levi's and try it out on scraps.

crumpled sails

hey all!

ever see the shrinking dollar bill trick? no, not that one, but the one where a fresh note is repeatedly wadded up and straightened. eventually the bill appears to shrink to two thirds it's normal size.

what the heck does a parlor trick have to do with fighter kiting? besides the fact one can build a great kite for about .66 cents, the wrinkling of mylar sail material is our latest installment of from *the fat kid's notebook*.

one of the really cool *ah-haa* experiences (paradigm shifts) of fighter kite construction is the results one obtains from experimenting with different sail materials. build five like kites but with different sail materials and the kites will fly differently. use various mylars and the results will vary also.

i noticed early on that there was more or less a direct correlation between softness/pliability of sail material (mylar included) and softness/pliability of kite flight characteristics. just plain talkin': "soft sail — soft ride".

a little background. built a kite once that i test flew at the beach. turned out to be a delightful flyer. it occurred to me the kite would help to beat up opponents near and far and could not wait to take the little bugger to pit! took my pride and joy to the ft. warden kite makers conference and got totally hammered. damn! the kite flew smoothly in clean air but the bumpy, early spring winds of port townsend, washington showed me a kite gone berserk. the 'wiggy' piece of crap bounced to and fro leaving dreams of victory in the dewy muck. the kite would not track well in a straight line to the horizontal.

the solution appeared with altering the mylar sail by wadding up and straightening the material repeatedly. the technique left the sail material wrinkled and soft. the effect on flight characteristics kept the nose of the kite on a much more even keel allowing the track to be more manageable in bumpy air. *yes! smooooooooothed it right on out.*

feel the ride baby ...

spines

two alternatives to bamboo

my preference for fighter kite spine material is bamboo. the variety of choices bamboo has to offer is up to now unparalleled. the bamboo spine is trimmed to shape, size, weight and stiffness/flexibility from a larger piece. each spine is custom tailored to fulfill particular design parameters.

if you have an aversion to bamboo or would like to try something new, here are two alternatives worth exploring that provide good results.

the first one was initially shown to me by johnny hsiung. the spine is made from a fiber glass or carbon fiber rod running through a section of aluminum tubbing. these two materials contain one another. the rod prevents the tube from kinking and the tube allows the rod to hold the desired curve. it is first necessary to know the dimensions of the kite and the placement of the lower bridle point. the example i saw (and copied) had the tube run from approximately one inch above the bow to just short of the lower bridle point. take care when handling the tubbing for it is very susceptible to misshaping. to cut, slide a length of synthetic rod inside the tube insuring support where cutting. rotate the tube while

gently cutting with scissors. just a little at a time. sand all burs off of cut ends with 400 grit abrasive paper. deburr the inside diameter of the tube by rotating over a crochet hook or like object. make sure a length of rod will easily slide through the tube before construction. glue or tape the tube to the sail material. the rod can be cut too long for ease of handling. run the rod through the tube and secure at the nose of the kite. trim. secure the rod at the tail. trim.

this spine can be shaped to suit when the kite is ready to fly. in the event of a crash (nosing in) it will be necessary to reshape the spine. the aluminum tubbing is available at finer hardware stores. the inside diameter is approx. 0.065. the fiber glass rod is 0.063 and the carbon fiber is 0.060.

this second spine was first shown to me by ed alden. the spine is made from carbon fiber secured from nose to tail of the kite. the bend is made possible by clever placement of cleats along the length of the rod. the cleats allow an adjustable string to be tied on in a manner that induces bending of the rod to the desired spine shape. elastic bands may also be employed in place of the string. the bands allow a constant flexing and recoiling of the spine shape during flight.

carbon fiber rod when bent has a propensity to settle. hold a bent length with the hands and rotate the rod. you can feel it pop into a predetermined position. before securing the rod to the sail material or installing permanent cleats, insure the rod is rotated in the correct manner.

first fighter design

i began building fighters before i even knew what they were supposed to do. after buying the book **making and flying fighter kites** by philippe gallot - [isbn# 0-85219-807-8], — *the* classic — i managed to build a flyable version of the big indian by the fourth or fifth try. somehow i was amazed the kite was maneuverable and so much fun to fly. back then, my kiting interests leaned in the direction of organic and pretty. my first year in fighters was, material wise at least, a hold-over from a brief encounter building chinese kites. i worked mostly with paper sail materials and strictly with bamboo spines and bows. it is difficult to determine whether working so much with bamboo taxed the learning rate or not, but i am certain the kites would have been airborne sooner and more often if i had began building - working with synthetics. no regrets.

building/learning what makes a kite go, learning to fly, and learning bamboo is one thing. purposefully designing a kite for a specific task is quite another. that task was to build a competitive fighter kite. after a while, i'd learned some building skills from brian johnsen and johnny hsiung. brian and johnny used similar building techniques and materials which prompted me to follow suit. synthetic materials offered more easily repeatable and speedier results — so the eventual small adjustments i'd encounter would be dealt with more readily.

i had a stafford wallace kite that i flew the wings off of. really liked the kites handling at 3 kts. to 5 kts., but wondered what would be involved with building a similar handling model that flew in a higher wind speed range.

at that moment i became a kite experimenter.

beginning with a previously known quantity, i used the stafford kite as a starting point. one thing that intrigued me with the indian fighter was its shape. the colorful materials and appliqués of indian kites are interesting, but to me a certain preoccupation lay in the form and proportions. although electing to

stay with the size and shape, i immediately encountered a problem that stemmed from using the carbon fiber bow. comparisons between a double tapered bamboo bow and a straight carbon fiber will reveal, when bent, different bow shapes. since the leading edge of the kite is in part, defined by the shape of bow, i needed to fudge a little. the width of the kite (wingtips) and the point at which the bow crosses the spine (upper bridle point) are also defined by the bow. by the time i had the bow cut to length to accommodate these three points, the leading edge curve became slightly altered. the spine was made from 0.060 carbon fiber and aluminum tubing, the bow was made from 0.070 carbon fiber and the sail material was a heavier variety of mylar. the kite was bound with tape and glue — the bridling system was three leg.

my kite was not a stafford kite at all, but when it was stacked atop a stafford, the two kites were carbon copies in size and shape, with exception of a slightly different leading edge curve.

the 0.070 bow was a lucky guess. anything more or less in the way of a bow would not have worked as well. because of the stiffer bow, sail and spine in conjunction with its ample size - the kite flew in lighter winds (with some work) and may have even been a good indoor flier as well. it did, to my great pleasure, fly its best in winds ranging in speed from about 5 kts. to 9 kts. with an increase of pull, the kite was a lot of fun with 600 ft. ± of flying line deployed also. the added weight of my kite made available more momentum, which enabled it to fly farther off wind at closer distances. (did my first 360 with this kite) being a very fun kite, it was a bit of a tank; at least competitive wise, so i grabbed a calculator and went back to the drawing board.

what i wanted to do was adjust the ratios of the kites measurements to seek optimal performances at various wind speed ranges. it occurred to me there would be some obstacles. say for example: if i wanted the ratios reduced by 10%. no problem. all that need be done is multiply all the measurements by 0.9. that would work well if materials were available in many sizes. the more obvious hurtle was that carbon fiber rod was only available in certain diameters. 0.030, 0.050, 0.060 and so on. to accurately reduce a 0.070 carbon fiber rod by 10% would mean trimming 0.0035 inches off around the circumference to produce a rod that measured 0.063; a difficult task. the nearest available rod size measured 0.060.

the solution was to use the diameter of available carbon fiber rod sizes as a starting point to adjust ratios and proportions. since i had no way of measuring the thickness, weight or pliability of mylar or some properties of the spine — that would entail a little guess work.

the first go at a reduced size of kite began with a 0.060 rod, bamboo spine and a lighter weight mylar. interestingly enough the kite came out a bit stiff. in my minds eye i visualized the resulting kite being a more nimble handler in the same 5 kts. to 8 kts. wind speed range. to my surprise, the kites wind speed range was 9 kts. to 12 kts. i went back to the calculator using about a 5/8ths inch increase in width as a basis for an increase in overall area and a longer flimsier bow.

the alteration was just the ticket. the kite flew well in the 5 kts. to 8 kts. wind range. playing with slight variances in size, i discovered what little alterations were necessary to effect the wind speed range and handling of the kite. further experiments with kite sizes based on bow diameters also gave interesting results. using a 0.090 rod for the bow and the heavy weight mylar sail, made for a kite with very syrupy, slow forward speeds. the kite would be a good one for beginners because control input reaction time was increased. smaller versions revealed increasingly quicker turning kites. it was necessary to

slow the kite with bridle/spine adjustments just to be able to keep pace with the speed. on the smallest version, i used a 0.030 rod and a very light mylar.

by this time the outcome of experimentation was becoming a tad more predictable. the two smaller and the largest versions were discontinued to concentrate on kite sizes evolving from the 0.050 and 060. bow diameters.

as much as i played with aspect ratio, the kites always wanted to return to the classic indian proportions. to this day my cross-spared kites maintain indian style proportions with regard to lengths and widths. then i toyed with the previously mentioned size variances in addition to different sail materials, shapes, balance, bridling anything i could think of to effectively improve flight characteristics.

one of the challenges with learning fighter kite was transcending dogma. some people whos work i admire, respect and stole from, of course, had theories and ideas they readily shared. the key to taking the best and leaving the rest, is keeping an open mind while in the learning stages; continually re-evaluating, and testing for yourself. so when your kite buddies say: big kite for small wind, small kite for big wind, the bridle goes here, soft sail material is better, the spine dont have to be that straight — whatever; try it out so *you'll* know. one thing for sure, the kite will not lie to you.

spine shape

hey all!

about two years ago i went to san diego. had a couple of great days down there. hard not to. its climate heaven. i was standing on five acres of manicured grass with an uninterrupted flow of air from the ocean. the wind was 5 to 7 - on shore, 69 degrees with dozens of big puff ball clouds passing through. not bad for new years day 1998. right where i wanted to be, doing precisely what i wanted to do. fly. had a kite dialed in real good but in keeping with the curse of west coast fighter fanaticism, i decided to tweak it a little. started playing with the spine/keel shape.

tried it straight: skittish and difficult to keep on track but fast with an awesome spin. the kite would not leaf (float) on it's belly. had a tendency turn a wingtip toward the ground and knife down sideways, out of the sky. tried it with varying amounts of curve from nose to tail: speed and spin retarded incrementally the more the curve. the shallower adjustments showed a kite with more control. the radical adjustments demonstrated sluggish movement, no spin but pin point control and rock solid cobras. tried it bent backwards, concave to the wind: did not fly. tried a straight spine with the nose turned back: again, incrementally less spin, more control but a little less wiggy on a straight track to the horizontal. tried a shallow but increasing curve from tail to bow with the nose turned back:

my spine shape evolved to this configuration and is more or less what the shape of the spine was at the beginning of the session. i did learn however that even small adjustments to the "basic" shape give evident results. granted the conditions were perfect and likely assisted a great deal noticing small changes in flight characteristics. kept on playing with it until i was satisfied the kites spine was tuned to the best average adjustment. the short story being, i could tune the kite to do a specific task very well sacrificing other flight characteristics. the best adjustment being one that allows the kite to perform the widest range of maneuvers. as with most flying objects, its a give and take thing.

dinked around with it quite a while. on the way back to the hotel i sashayed up the strand and grabbed a cup of joe n' i'm all like whoa! thirtyseven inch bustlines and nineteen inch biceps as far as the eye could see. ahh, the california mating ritual. "do your own thing as long as you don't up-stage me." (i wrote that, you can use it if you want). i notice two kids heading my way carrying surfboards. surfing and surfers are double cool so i'm checking them out. i'll-be-damned if the centerline down the belly, nose to fin on the surfboards was the exact spine curve i had settled on earlier!

!que milagro!

surfboard shapers have a design component they call "rocker". if a board is floated on the surface of a swimming pool, rocker is the relationship of distance from nose/tail to waterline. rocker helps to determine where the deepest part of the curve is along the nose/tail line. the rocker of a kite spine can be observed by placing the it on a flat surface.

"so uhh, fat kid - does that mean if i set my spine just like mr. smarty pants fighter guy my kite will have optimal performance?" "no." it means try it out and see what happens. as always i encourage experimentation. no one can teach you. you must learn for yourself. in a few days i go over a spine shape for a high wind scenario. totally different deal, same goal.

installing a bow using "bruces' bow setter"

when making a kite, i prefer to use contact cement to hold the kite parts together. after i have applied the contact cement to the bow, spine and the kite sail in the appropriate places, i wait for 15 minutes for the glue to dry.

after the glue is dry on all the parts, including any leading edge stiffeners, the first part i install on to the kite sail is the bow.

when i am ready to install the bow of a kite, this is how i go about it.

first of all, i have to tell you about the device i use to assist me. i call it *bruces' bow setter*. all it is, is a piece of formica about 24 long and 2 wide with notches in it. i had some scrap formica, so i used it. a yardstick would work just as well.

i cut notches into the bow setter precisely where i want the bow tips to be located on the trailing edge of the kite. i do this by laying the bow setter on the kite template and marking the location where the notches need to be. the notches in the bow setter are aligned with the exact location i want the tips of the bow to be located.

at the point in the kite making process when i want to install the bow, the kite sail is lying flat on the worktable with contact cement already applied and dry. next, i lay the bow setter across the kite sail and align the bow setter so the notches in the bow setter line up with the right and left bow tip positions marked on the sail, (i mark them using an ultra fine tip marker through a small hole drilled in the template at the location where the bow tip is to be). then i secure the bow setter to the worktable using masking tape.

i use carbon fiber rods for the bows in my kites. carbon fiber, is not as uniform around its circumference or along its length as it may appear. for example, if you hold a 24 length of carbon fiber

rod with one of the ends in each hand and try to compress or bend the piece, you will notice the carbon fiber will rotate around its axis like it is trying to find its natural bend or position. this is the way i want the bow to be oriented, so it has found its natural bend.

after the bow setter is taped in place, i bend the bow so it can find its natural bend and place the tips of the bow in the appropriate notches of the bow setter with the arch of the bow pretty much vertical or perpendicular to the worktable. next, i allow the bow to slowly rotate toward the kite sail so the arched part of the bow ends up laying on the sail.

next, i fold the hem of the fabric over the bow from the wing tip to the point where the bow and the leading edge form 2 different and separate angles. then i remove the bow setter. my next piece to install is the spine.

assembly — putting it all together

...and from mere bits - the substantial incarnate!

sweet. the sail is nailed down to the working surface, the spine is installed and the bow is sprung into the fixture - at the ready.

here's the disqualifier. what we're getting into at this stage of the game is the binding. the fifth element of kite construction. binding is all the stuff that unites the various components of the kite into a one piece unit. that's right, glue and tape. of all the things i have been taught or learned building kites, the binding required the most time to absorb. still absorbin'. i get real tweekie at assembly time. i thin glues, measure tape and handle it with tools, paint the bridle material, re-measure, do tests with scraps, curl my tongue out the corner of my mouth, get all hunched down over the piece, re-re-measure, put a dab of tape on there and stuff like that.

all the while i'm thinkin' - see. "if this is the last kite i ever build. will i do my best. am i doing my best work right now. every second. is there gonna' be love in this kite, or what. after i'm dead and gone and somebody picks up one of my kites, we're talking to each other, you know. my love is still here. so the disqualifier is, the techniques involved are so detailed (the way i'm doing it now) that written descriptions of the process would be too complicated. that's it. involved, detailed and complicated. to describe in words anyway. to top it off i stop in the middle of the whole deal, install the bow and then continue. what we need to do is get together and trade kite secrets. or at least use pictures. so for now i'll just go over the basics.

think of the binding not as nails "and" wood, but wood "with" pegs. the binding should work with and complement the whole.

always incorporate components to serve double or multiple duty when possible. for example. a piece of tape can be an adhesive, a stiffener, a weight, a bumper, a spine reinforcement, a contrasting colored nose locator - lots of things.

so far kite symmetry has been an automatic. a sail cut with the half template, a reliably consistent synthetic bow - the spine and all ... the following tasks require a more conscience effort because you'll be working a little at a time, one operation at a time on either side of the kite.

here's a bunch a' tricks:

- less is more.

- execute one task at a time. then do the other side if necessary.

- make a tab at the end of the tape roll every time its used. less fumbling.

- tape is only half stuck when first applied. to remove. do it quick and in a direction away from the center of the kite or away from a sharp corner. to stick. burnish it down with a tool.

- remove air bubbles by piercing one end of the offending bubble with a needle and deflate toward the hole with a burnish- ing tool.

- slightly recess tapes that run parallel to an edge. keeps the dirt out.

- if a tape runs up to and touching an edge. run excess tape on to the working surface and trim later.

- tapes that run over the spine or other part ought to look like there spray painted on. use a tool for this too.

setting the nose and tail tapes square. a reference line is drawn at a ninety degree angle to the spine near the nose and tail. the tape is started by tracing the line on the working surface. continue over the nose of the kite spine and all. trim tape to remove kite from working surface later. make the reference line with a square using the spine as a starting point. the distance from the nose/tail that the square is set is determined by the width of the tape. if the spine is tapered this must be accounted for.

cutting/measuring tape. hang an overlong length of tape from above, sticky side away. assuming the end is cut to angle use static from your body to draw the dry side on to your finger. grab the sticky side with a plastic palette knife. hold a small steel straight edge on the dry side and measure from the bottom of the tape. scissor to length. the end of the straight edge makes it a cinch to cut ninety degre. angles. drop the strait edge and scissor and you got the measured tape on the tool. install. look ma. no fingerprints on my mylar kite!

trim corners from tapes that are exposed and flat to the sail surface. that way its less likely the tapes will be loosend, trapping dirt, bridle, flying line etc.

make a booger. with an acid brush glob some artists quality rubber cement directly onto the working surface and let dry. roll up into a snot ball. to remove errant or extra rubber cement from kite, roll the ball over portion to be removed. don't misplace rubber cement on fibrous sail material, paper, tyvec ect. pulls the hairs right out by the roots. plan, measure calculate.

thin rubber cement with bestline solvent thinner. contains heptane - really stinks. thank you trenton new jersey. "gentlemen, no matter what the time nor what happens, we march on trenton in the morning. is that understood?." (gen. george washington). can make ya' goofy too. yippee. whoops, just busted my glasses. start with an amount of thinner then add the cement.

making straight folded hems. place a heavy sheet of paper between the working surface and the material. etch the hem line with a plastic knife and a straight edge. leave the straight edge in place, slip the knife under the hem and stroke along the straight edge - all the while increasing the angle thus beginning the fold. works good on ickyrex too.

whew, just be glad we are not trying to make a bamboo bow with written instructions. if you can use any of this type of information and are less than familiar with its contents worry not. its just like art in kindergarten but a little more advanced. n' boy oh boy there is a heap of materials out there to mess around with. just as many tricks and techniques too.

yeah, go ahead and get the leading edge, nose and tail tapes put on there and next time we'll install the bow. got to thank brian johnsen for some of this stuff. a lot of other people as well. oh and all the indian guys i took lessons from but never met. thank you brian, thank you other people and thank you indian guys. the rest. well its just love i guess.

setting glued spines

o.k. so i'm a geek for glued and taped kites. all i can say is, they've been working for me. the built in obsolescence (more or less) for most kites made in the world is set at uhh ... one tangle. i read a book once that told of an indian gentleman who managed to hold on to his favorite paper kite for seventeen years. he had a reward out for this particular kite in the event of a downing. all the children in the neighborhood promptly returned it when found.

the kite happy flock in my neck of the woods most often return home with their war birds. most of their fighters are taped and glued. like an indian kite they are made to fly. less attention is payed to longevity of a kite made with love than a kite made to last. just plain talkin': i ain't too crazy about ripstop fighters. "hey fat kid, maybe it don't fly as good as yours but i've flown it for four years!" "i see. that is interesting." taped and glued kites can easily last a season and much longer. less of my kites burn out than get stepped on or slammed in car doors. car doors work pretty good on ripstop fighters too though. enough, let's build.

alright, the sail is stretched out on the working surface with a spine at the ready. if you are using a bamboo spine like your beloved fat kid, cut to length and straighten it out. it takes me as long to straighten a bamboo spine as it does to make one. about twenty minutes. three things are required: nimble wrists, clever fingers and patience. to avoid ascension to the heights of mediocrity, get it perfect. check the straightness by laying the spine on a flat surface. both on it's back and on it's side. if you are not using bamboo adjust accordingly.

the spine is already cut to length, check it by laying it on the sail. remove. with a straight edge mark the building surface beyond the nose and tail of the sail directly down the center line. the hard outside shell portion of the bamboo spine will contact the sail. the grain side is up. mark the ends of the grain side dead center. use a pencil for this for later erasure. (just in case you are building a museum piece) check your work. lay the spine on the sail with the lines and marks set. perfect, now here's the trick. lay a straight edge on the sail (nose to tail) up to and touching the spine. re-adjust so the lines and marks are set. remove the spine without disturbing the straight edge. if your spine is made with a taper the straight edge will be off set so it is farther away from one end of the center line from nose to tail. if your spine does not have a taper the straight edge will be off set from the center line at equal distance nose to tail. apply water based flexible drying glue to the hard outside shell of the spine. carefully set it

aside for maybe ten minutes. * (more on this later) now, with the glue beginning to get tacky, hold the straight edge down with one hand insuring it does not move. install the spine up to and touching the straight edge. run your fingers up and down the length of the spine forcing it into the straight edge. remove the straight edge. yes! gnat's ass.

* i like to let the glue get tacky before installation for a number of reasons. firstly, it has less tendency to ooze out from under the edges of the spine when "squeezing in". also there is another thing that can happen when using paper. high fiber papers like feather paper or mulberry are porous. even glaced gift wrap leaks a little. if the glue is wet when setting the spine, its pretty easy to glue the kite sail to the working surface. oh no! silk, glasseen and other materials begin to ripple up into a frightful mess when coming in contact with water. that's why its a good idea to let some of the water evaporate from the glue before installation. of course there are options when selecting adhesives. always experiment with scraps before execution. yeah yeah i know, you could always experiment with glued and taped ripstop too. it might be fun watching the fat kid have a seizure!

setting the bow

some of this stuff is redundant to the "wrinkles" and "half template" articles.

setting the bow is made easier since the process making a template lent hints of things to come. the bow is now sprung into the fixture, pre-fitted and at the ready. the sail is either squeegeed or taped to the working surface and the spine has been installed. reinforcements in the way of leading edge tape, nose/tail tape, battens, folds or whatever are applied also. lay the bow down on the sail temporarily to check (again) for fit. remove. cool.

dab a glob of contact rubber cement (artists quality) on the wing tips of the sail with an acid brush and spread. only about 1" square inch. dab a glob at either end of the bow also. bout' 1" from the tips up. while the cement is still wet, set the bow and position. i get that warm fuzzy feeling when the bow aligns perfectly to the shoulders and the wingtips of the sail. almost as much as when i was a teenager and collette lablanc pulled her blouse up over my head! ooo la la. not quite but almost. she was ab-so-lutely ravishing. (that one goes out to you pappy)

now don't touch that mother till the cement dries ... when dry, gently push the bowtips into the wingtips of the sail with a tool or sum'um' - for better adhesion. its just kind of tacked down temporarily. now we make the incisions. i don't know about your kite sail but mine has about 3/8ths of and inch seam material along the outside curve of the bow from shoulders to tips. near the tips the seam widens to a long triangular shape. eventually this extra material will be folded, glued and taped over the bow. take a look at the back of an indian kite - you'll see what i mean. um, now we make the incisions. all we're going to do is make a small tab at the end each wingtip to begin containment of the bow. the slice will be located 3/8ths of and inch from the tip. i like to use a curved x-acto blade. i start at the out side of the bow and stick the point of the blade down into the seam. then rotate the blade to the edge of the seam to make the slice. if you drag slice vise rotate slice, yer' on yer' own. might tear the sail.

ok. roll the tab halfway over the bowtip. slip a plastic pallet knife beneath the tab and gently stroke back and forth slowly increasing the angle of the knife. umm, both sides. this will insure adhesion. before you tuck in the tab nice and neat, remove the jig.

this is a pregnant moment laden with many a fork in the road. if that damn bow boinks out'a there mad mary will get angry enough to spit, yer' gonna' hate it - and pretty little collette? well, if yer' a woman she'll scratch your eyes out. if you are a man she'll make you cry … anyway, use the knife to finish the job, quick. burnish the tab with best seal possible. good and tight. try and not get any chunks a' debris on the cemented parts of the wingtip that are still visible. that's some nice work my friend. trim tapes that run from sail to work surface. remove and handle with care. now go ahead and admire it for awhile.

wrinkles

"hey fat kid, how you do dat'?"

"what?"

"make kites without wrinkles on the wingtips."

wrinkles drove me nuts. hated them. when i made a kite with pockets for the bow there was not much noticeable wrinkling. the road to a lighter kite took a detour through a tensioning challenge.

stopped making pockets and began to fold and glue a seam around the bow. i also wanted to center the bow on the sail dead nuts. to do that i put the bow in a jig to hold it to the same curve it has when loaded onto the sail. it turns out that the wrinkles appeared after the sail material had been secured and the jig was released from the bow. pretty ugly. bad enough on paper kites or kites that had low reflective sails. on glossy mylar, wrinkles hollered at me from across the park. the reason for the ugly wrinkles is the bow changing shape slightly due to releasing the jig changing the point of tension.

the remedy for wrinkles using my bow loading technique is this. when loading the bow onto the sail, the first folds of sail material need to support the bow at the same point of tension as the position of the jig on the bow. my finished kites, as seen from the back, have a skinny triangle of sail folded over the bowtips like an indian kite. but i don't fold the whole triangle of sail over the bowtips when first loading the bow. i tack the bow into position and then make a small slice from the bow to the edge of the sail. the slice is on the leading edge just a half an inch from the trailing edge. after the small tab is folded and glued i remove the jig. at that point the kite is loosened from the building surface. when the jig is removed, the transition of tension point from the jig to the sail is less. the tab is enough to temporarily support the bow until the rest of the leading edge seam can folded and glued. when doing this take care not to force the bow around. let the bow define the position of the seam.

high wind spine shape

"oh no, not you again! ya' gonna' muck up another shovel full of hot gas n' confuse us with all yer' mr. bighead fighter kite wizardry?"

hope not. i'm just a guy that made a few good kites and got lucky in a couple of pretty big kite fights. i had a lot of "want to" in one fight i was in. spent over and hour fine tuning the kite. good thing too because the wind was blowing like hell. oh yeah — the kite i used was the same design i flew on new years '98 in san diego. pretty much a 5 to 8 machine. definitely the wrong choice but it was all i had left come game day. sixteen to twenty knots and just cold enough to be uncomfortable. the yaw attitude stays the same. dead solid centered. the pitch attitude and spine shape have more leeway in adjustment

and directly influence each other. in big wind conditions you'll notice a lot of hyper kites in the air and heaps of uhh ... grounding. what i did was adjust the kite to slow down. just enough to allow reaction time. the spine/keel shape helped a lot here. the bend for big wind is a sharp, small radius curve just up from center. it had a slight nose bend also but the center bend came out kind of radical. a kink really. this wedge type bend seemed to deflect nearly as much air out the front of the kite as it did out the back. the kite positioned very near zenith in a hover. i could hold the line taught and get it to sway to either side by leaning my body. out on the sides close to the ground, the kite behaved well and instilled confidence in down wind sweeps. a sweep at any less than ten feet in altitude even at close distance is a suicide mission. on the sides i could swing it down to four or five feet.

guess it was enough. at the end of the day i came out with two more points than my closest competitor. 'thanks' for the lesson guys and thank you johnny hsiung for showing me the spine bend.

alright your fatness, but is there a happy medium spine shape between the san diego adjust and the big wind adjust? most likley. check it out and tell me what you find.

finishing it off

well, it seems i have some decision making to do. in twenty minutes it will be *golden girls, chicago hope* or *best of tough man*. before i grab the cheddar corn, pepsi and settle down in front of the devils eyeball for an evening of mind numbing pop entertainment, let's take a look at that kite buddy!

neat. the project looks more like a kite than ever! the spine and bow have been united with the sail and the whole thing has been set free from the working surface. outstandin'. only four things left to do now. complete installation of the bow, balance, bridle and (this is the best part) fly. could be a few little nik naks here and there but that is really about it.

at this stage i like to cut the holes for the upper bridle legs. the reason the bow is only hanging on by it's tips is in part to accommodate this operation. the rule of thumb for distance between upper bridle legs is 1/10th total width of the kite. its a rule of thumb, not a law etched in granite. (experiment)

to accurately distance the holes, set a straight edge of appropriate half width on the back of the kite. set it along side the spine, under the bow. place a reference mark on the sail up to and touching the straight edge opposite the spine and under the bow. place a clear tape over the reference mark. the tape is to protect the hole from tears via the bridle. the tape should be larger than the eventual diameter of the hole. repeat on other side. i bought a set of hole punches at a used tool store. they work great for the way i cut holes because they have part of the shaft milled out. this allows me to peek down through the inside of the punch and see the reference mark. the results are very accurate. then i send the punch home with a mallet, the working surface is switched for a thick teflon sheet to accommodate whacking. i slide a piece of paper beneath the sail where being punched. delivers clean cuts that way. holes can also be burned through synthetic sail material with a hot paper clip. if you do this take care not to apply heat to the carbon fiber bow. man, when bridle holes are well centered i get a warm fuzzy feeling. almost as good as ... well, you get the picture.

now let's seal the deal on the bow. lay the kite back side up. place an object between sail and bow. this (bow jack) will keep the bow from touching the sail until the time is right. spread contact rubber cement on the sail seam and bow between the the wingtips and shoulder. an inch wide swath of cement

is ok here because when the seam is folded over the bow it will need a cemented surface to adhere to. don't sweat a little extra cement, it comes off later. let dry ...

beautiful, now let us begin meditation on ripples. get your plastic pallet knife ready and remove the temporary bow jack. if the bow does not contact the sail where you want, tease them apart with the knife and support the bow by hand. the basic move here is to hand brush any ripples on the sail in a direction under the bow. at this time let the bow and sail make contact. do the other side. the kite should now lay flat with the sail and bow making slight contact. if it is necessary to tug a little here and there to pull out remaining ripples, take care to not try and manipulate bow position or compress. ok, you know the drill. slip the knife under the seam and gently stroke along the bow from shoulders to wingtips. slowly increase angle of the knife and roll the seam over the bow. try and do this in stages, both sides.

i like to get the seams on both sides folded half way over and then burnish them down good and tight. looking swell, ya' still got'cher contact rubber cement booger? roll it over remaining and visible cement to clean. with any luck the inside end of the seams are in close proximity to the shoulders. take short lengths of tape and reinforce these areas front of sail to back over the bow. measure them and apply them symmetrically or mad mary will hack up a hair ball. cut two 1" inch tapes. apply them to the back of the sail, over the bow, between the shoulders and the bridle holes. this secret of the pyramides keeps the nose section of the leading edge nice and tight aiding speed, control and off wind work. tell them you got it from the fat kid.

if you have already determined the exact position of the lower bridal point, stick a small hunk of tape over spine and sail on there. if you are not sure of the position of the lower bridal point. stick a three inch long piece of tape along the spine and sail somewhere between center of balance and the tail. keep it tidy.

i don't know about you but mad mary, collette and i are jumping up and down positively squealing with pre-pubescent delight at the site of what you have accomplished. do you want to balance, and bridle this sweet machine on your own? if you like i'd be happy to show you how his royal fatness does it. right after i roll up this here bomber and do a last minute assessment of preview guide. dig it. the history channel. oh dude! did you know these like bonded and licensed grave robbers with ivy league degrees like rooted n' looted up a bunch a really cool caucasoid and mongol skeletal remains in north america datin' back to umm, uhh like the ice age n' junk 'bout 15,000 years ago. heavy man, whoh ...

balancing and bridling

holy smoke! got so excited about my t.v. show i almost for got to tell ya' about the nose guard. find a neat way to apply a small piece of reinforced packing tape to the nose of the kite, and or ... go down to the hardware store and grab a can of dip-it. this stuff is used to coat the handles of hand tools. its a liquid rubber. thins well with bestine solvent/thinner. mask off the tip of the nose with drafting tape and apply with a clean but cheap art brush. remove the drafting tape before the stuff begins to dry. dries to touch in 15 minutes. takes a few hours to fully cure. great bumper.

right about the time i really became hooked on building fighter kites i had the pleasure and fortune of meeting mr. gopal das. he asked to fly an all bamboo and paper kite i had made. i was flattered he took the time to complement the kite. the only advice he had to offer was in regards to a slight balance

condition. i asked, “how good does it have to be?” his response. “it must be perfect.” well i figured hell, this guy grew up in bengal and he has been flying patang all his life — the possibility exists the critique just might be worth consideration. guess it does kind a’ make sense, i spoze’. oh baby, did it ever.

ok. we’re going to make a triple leg bridle, but to begin we’ll make a two leg (sort of fake) bridle to dial in the balance of weight from wingtip to wingtip. grab about 7 ft. of 10lbs. to 15lbs. pound test dacron kiteline. the braided or the cheap crap. take about 5ft. of it and submerge into acrylic paint that is wet enough to pour. if it’s color coordinated with the kite i might get a little misty out of fondness for your style. clear matte medium works good too. pull the line out of that mess, squeegee, and let dry. takes about 10 minutes. with the remaining 2 ft. of line, rubber contact cement the ends to the front of the kite. the upper end goes dead nuts on the center of the spine, right between the bridle holes. the lower end goes on the center of the spine at the lower bridle point. hang the kite from over head so it is parallel to the floor (don’t do this out side or in drafty areas) nose to tail. what we use for ballast will also protect the sail material just under the bow at the wingtips too. cuz’ what we’re usin’ for ballast is tape.

how out of balance is it? it should not be too bad, just a little off. cut two pieces of tape, one longer than the other. at the wingtips use the long piece for the light side and the short piece for the heavy side. just stick them on temporarily at the end of the tapes. the majority of the tape can be hanging off the edge of the sail. make adjustments by adding tape or by scissoring off. once its “perfect” remove the tapes and stick them on the back of the sail along the trailing edge. a small portion of the tape can be rolled over the bow to the front of the sail. remove temporary line.

yer’ bridling material dry yet? wrap the ends of the line around either index finger and stretch. makes it straight, don’t it. got a good feel to it too. i love this trick. the advantages are multi fold. it will hold an adjustment knot, its water proof, neat, pretty and it don’t twist. not only does it not twist during flight, it is very easy to detect even a half twist in the stuff when tying on the bridle. plus it has the kindness to accurately and easily allow removal of that annoying half twist or so when tying on. it’s a good thing.

there is a school of dogma concerning the bridle length of fighter kites. (quite a bit of other junk too). i’ve tried different lengths and got a free kite lesson ala a head bending paradigm gaga in the process. listen to your mentors and then try it out for yourself. if you have been considering a fighter kite tattoo; toy around with the idea of getting the “listen to your mentors” line burned into the skin. then send a picture of it to the nafka web site! hard core only baby.

poke the end of the line through bridle hole via the front side of the kite twice around the bow and back out. tie an overhand knot. now tie a double over hand knot. do it again through the other bridle hole. leave a loop that is about 4" or 5" inches long doubled over. 8" or 10" inches total. cut the rest off and trim the tails short.

at this point you may consider larks heading an adjustment bead at the center of the upper bridle legs. good thing to do if your building a high wind kite. ain’t necessary for a low wind kite.

with the remaining length of line tie a 1" or so loop at the end. a double overhand is good, a bowline is better. larkshead the long line loop to the upper bridle leg loop - or bead. flip your kite over and pierce the sail with a darning needle at the lower bridle point, both sides of the spine. hold the kite belly down

- up over your head and stroke the line to de-twist. if you can hang the darning needle on it, its easy to see. thread the needle with the free end of the line and sew two wraps around the spine. ok, it should look like a letter “y” hanging out the front of the kite. make sure the total length of the bridle does not allow the wingtip to pass through (try the length thing later). to secure the bottom bridle point tie a single over-hand followed by a double overhand knot. we’re almost there. with what is left of the bridle line material, make a tow loop. tie a double over hand knot and trim. its just a circle. stretched out into a loop its about 3" inches long. larkshead it on to the lower leg of the bridle. with the straight edge used to set the bridle hole marks, set the knots on the bow equidistant from the spine. use clear fingernail polish to cement. center the knot of the lower bridle point on the spine. goop on a little fingernail polish front and back.

i like to tie my upper bridle loop on with the knots mirroring each other. one is tied one way and the other is tied backwards. no biggie, it is just out of respect to the spirit of the kite. out of respect to symmetry. also the trimmed tails point away from the eventual on-rushing wind. we’ll hook up some time and i’ll show ya’. we’re so close now! all we have left to do is table tune and test fly.

ever heard the line … “a fighter kite at first glance is deceptively simple.”? next time you hear someone say “jeez, it don’t look like it’d be that hard to make one.” just give them a soft buddha smile and embrace their naïveté. things always look easy when you know what you are doing. maybe it ain’t that hard to make one — but it ain’t no cinch makin’ a good one. and a great fighter kite? well, a great fighter kite requires a great deal of love. a great deal of love and a little magic.

high wind dimensions

hey gordon … here you go.

the sail is made from the same mylar i sent you. the wingtips are glued. there is about a 6" inch distance from 1" up the bow from the tips to the shoulder that makes a hollow sleeve containing this section of the bow. this allows for unrestricted movement of the bow. if you need a drawing lemmy' know.

like i said, these proportions are not my usual. this kite has its drawbacks but it did manage great stability close to the sand. found the laminar layer real good. did not fall in love with it though — the kite ain’t got a name.

what i was trying to do was make the kites wingtip to wingtip line also the center of balance point on the spine. missed it by 1/4". if i make another I’ll use a little heaver hunk of tape on the tail or taper the spine to accommodate. i stuck a piece of big red chewing gum on the tail to fake it with.

length	16 3/4"
width	19 5/8"
weight	8.6 gr
bow - carbon	0.060"
bow length straight	22 1/2"

measurements	from tail
lower bridle point	4.6

distance to point on spine where a line from wingtip to wingtip intersect	9 3/4"
balance poin	10"
bow length straight	22 1/2
bow tdc	14 11/16"

cord	5 1/16"
distance from bow tdc to nose	2"

bridle	three leg
distance between upper legs	1 7/8"
distance from bow tdc to lower leg	10 3/16"

table tuning

table tuning gives a point of reference to begin flight testing/fine tuning.

the first thing to do is to impart a slight bend to the spine. observed from the back of the kite, the spine curve will be concave. the bend is gradual from about the area of the lower bridle point smoothly increasing in depth to about the area of a point roughly between the center of balance and the bow. the curve continues to an area near the bow. at about the area of the bow impart about a 15 degree or so small radius bend to “kick” the nose back. an imaginary line running from tail to nose will reveal 3/4" inch depth of the total bend/curve + or -. experiment.

remember how i harped on testing materials with scraps? the pliability of spine material is a good thing to know before spending hours on the construction phase. if you have chosen to use bamboo for spine material, (good choice) listen to it carefully upon bending. some bamboos bend more easily than others. all but the stiffest and driest of bamboos will “complain” before their backs are broken. upon over stressing you will hear faint crack- ling shortly before the big “snap”. there are ways to stress relieve bamboo but for the most part this should be done prior to construction. if the spine snaps, consider it an inexpensive kite lesson. if it worked, set the kite on a flat surface, front side up. the curvaceous spine and nose kick make the kite appear as if it were some sort of evil bottom fish. sort a’ like a skate or something.

there are perhaps a handful of knots kiters’ in general should be familiar with. check a good kite, macramé or marlinspike book for drawings and details. fighter kiters’ can sail along quite nicely knowing but a few knots. i use seven (usually not all at once) knots to construct and secure the adjustable three leg bridle. the overhand, the double overhand (similar), the larks head, the square knot, the prussik (related), the bowline and the tiller hitch.

to demonstrate the way bridle adjustment knots work, try this. cut two lengths of twine, like in type and diameter, 1 foot long and color them differently. loosely square knot them together at the centers. say for example one is black and one is pink. hold the ends of the black twine and pull. cool huh? now grab the ends of the pink one and pull. is that bitchin’, or what? alright, re-adjust it so you again have the square knot (this is nothing more than two interlocking larks heads). hold both ends of the black twine in one hand and stroke the knot until it tightens. now hold a black end in one hand - a pink end in the other and tug. see what i mean. pull the ends of a like colored twine and the knot comes out. slide it

to another position and re-tighten. a very fighter conducive hunk of marlinspike, ain't it? tip: avoid using waxed line, spectra or any slippery type materials for the bridle. if your design requires these types of materials (slippery), you'll need to learn some specialized knots and applications. the bridle should be constructed with like types and sizes of material. check out the article "finishing it off". it contains a great trick regarding treatment of bridle material.

jeez, four paragraphs and there are only a couple of wise cracks and no jokes. arrgg, i'm loozin' it! no sweat, i'm only half way through one tattered dusty notebook and i got two more waiting in the wings — back stage. ample opportunity for a bunch more a' some juicy snappers.

all we're going to do now is adjust the bridle to a general setting to facilitate !*flight testing*! there are only two knots to deal with; the knot (or bead) at the crotch of the "y" where the upper and lower bridle legs join and the knot where the tow loop and lower bridle leg join.

first the "y". this knot (or bead) controls the roll attitude. a kite with maladjusted roll attitude imparts yaw. the kite will not track straight if this adjustment is off. first, the crotch of the "y" should be centered over the spine with both upper bridle legs being generally equal in length. cinch the knot down.

hold the bridle of the kite so the nose and tail are approximately- 1" above the flat surface. what we're shooting for is the wingtips to be level and equidistant from the surface. the "y" adjustment is very sensitive and should not require un-tying. if one of the wingtips is high, hold the "y" knot (or bead) and pull the upper bridle leg to very slightly lengthen. this also effectively tightens the knot. repeat tugging on the high side bridle leg until the head, the square knot, the prussik (related), the bowline and the tiller hitch.

the knot joining the tow loop and lower bridle leg is less sensitive. it can be loosened and re-tightened in 1/8th" or so increments. adjust it so the tail of the kite touches the flat surface while the nose hangs about 1" above. cinch it down. that's it!

hang in there little buck-a-roo! all we gotta' do now is get vertical. i'm gonna' go grab my kite box, meet you on the field. oh - hey, you ever seen the picture my wife took of me; the one i got proudly and conspicuously displayed on the front of my kite box? its a real killer diller'. you might say; "moving". i'll show it to ya' when we hook up on the field. regresso ahorita (i'll be right back). yes!

test flying / fine tuneing

let's light this candle! table tuneing gives a reference point to begin flight tests. all of the attention to detail, symmetry, weight balancing and so forth lead to this moment. most likely this moment will not be an exercise in the swoop loop and whack, feverish uncontrollable spinning or any other undesirable flight characteristics. the kite should fly right off of the table. most likely not at it's best but fly. if the wind conditions are amiable and your kite is suited to them, well enough. all ya' gotta' do is fine tune your new baby and fly the wings off the little bugger. if the wind is not friendly to your kite that day or the kite is not suited to the conditions, the quality of flight will remain a mystery for the time being. remember this. i rooted out my first ever fighter book and skimmed it three times looking for an appropriate quote. could not find it. (i'll try and fake it) i do not at this time require a crash coarse in international copyright law or a free savate lesson

[wed: sabot; wooden shoe, used by saboteurs in the gears of machines during labor disputes, more often as a rochambeau accessory in the martial art of sabot]

but here goes. in the book *making and flying fighter kites* by phillippe gallot [isbn# 0-85219-807-8], mr. gallot, aka. phig, aka. pappy, aka. the pope said: (pray for me) “do not believe your kite is no good.” he is a very sweet man but he ain’t pullin’ your manjha. the kite reminded me of his words many times. i’ve made kites that were actually very good but was not aware because of initial test conditions. not until the kite was matched to the conditions was it willing to play. try them out on different days with different conditions at different locations. one thing for sure, the kite will not lie to you. it is more than willing to tell you what it prefers. be patient and willing to listen.

tune the roll attitude until there ain’t no roll attitude. roll will impart yaw. yaw will impart a turning tendency. you need the kite to track straight up and down, straight back and forth. give it a chance. make a dozen or so passes both ways. example: a left turning tendency on the ascent shows a kite veering to the left. on the dive the kite will veer to the right. left sweep, the kite will veer towards the ground. right sweep, the kite will veer towards the sky. the opposite is true of a right turning tendency. the direction a kite veers is indicative of the corresponding wing being slightly tipped forward. if the kite veers to the left, hold the knot (or bead) at the “y” of the upper bridle leg and lightly tug on the left side leg. this will “micro adjust” the upper bridle. continue adjustments until it tracks straight.

the lower leg or tow loop knot is less sensitive to range of adjustment. this knot may be loosened and moved in 1/8th" or so increments. also the tow loop adjustment provides more leeway lending to personal preference of performance. the table tune is set low. this “friendly” setting lends to easy control via lazy forward speeds and retarded spin rate. dink with it. the higher or closer to the nose the tow loop is set the more radical the speed and spin. low is mild, high is wild. somewhere in between is a happy medium. this adjustment may be utilized to accommodate different conditions. please enjoy.

prepping an indian fighter kite

when you enter a kite shop and see indian fighters with bridles, or what appear to be bridles on them, chances are they are not for you. with one exception i can think of, indian fighter kites are not flight ready off of the shelf; bridled or not. store owners string the kites up for reasons more business oriented than for the convenience sake of their. customers. if you require a flight ready indian kite, ask your dealer for a “stafford wallace” kite. check the back of the kite at the tail for a sticker that includes the word “staffordized”. these kites have been prepared and test flown so they will fly right out of the package. if you choose to go it on your own — so you still have enough change left over from your ‘twenty’ to grub divine at wendy’s, keep reading’.

all you have to do is reinforce areas susceptible to tearing, bridle, balance, form the spine and stress relieve. find out if your kite shop can get quality kites that measure from between 15 inches and 20 inches wide. this size range is more conducive to western tastes. if your looking for an indian style manjha truck, buy kites that measure at least 23 inches wide. for durability sake, avoid kites with overly decorative appliqué. tell your dealer you want them un-bridled.

reinforce the nose and tail of the kite using 3/4 inch clear scotch tape. over lap three or four pieces on the nose to protect in the event of a crash. one or two pieces on the tail ought to do it. arrange these tapes so they stick to both sides of the sail. the tapes can be applied so they alternate both directions, up

and down — back and forth, but make sure at least one tape on the nose and tail goes over the end of the spine.

in the area of the kite sail where the nose-leading-edge section meets the bow, there should be paper, mylar or foil reinforcements. tape over them with 1 inch long pieces. arrange these tapes so they are stuck to both sides of the sail, over the bow.

stick a 1 inch long piece over the spine (back of kite) just under where the bow crosses. center the tape over the spine and under the bow. this will be the upper bridle point.

place your finger on the spine of the kite and find the balance point. identify the point between your finger and the apex of the tail fin. 1 inch toward the tail from that point is where the lower bridle leg will be. stick a 1 inch long piece of tape over the spine (back of kite) at this point.

with a darning needle and 2 1/2 feet of heavy (9 lbs.) cotton button thread, sew through the front of the kite, two wraps around the point where the spine and bow meet. make sure the thread goes around both spine and bow. tie a single overhand knot followed by a double overhand knot, snug but not too tight. center the knot directly over the spine at the front of the kite. the remainder of the thread should drape down the front of the kite.

sew through the front of the kite, two wraps around the spine at the lower bridle point. the entire bridle length should not allow the wing tips to pass through. single overhand, double overhand, snug but not too tight — center the knot directly over the spine on the front of the kite.

glue the knots. using elmers craft bond, or like water soluble flexible drying glue, goop on a little glue front and back to the lower leg and the front only at the upper leg. let dry and trim the thread tails to about 1 inch. (tow loop later)

do this next operation in a draft free area. hang the kite by the bridle so the spine is level with the floor. in all probability the wing tips will not be level. the high wingtip is the light side and the low wingtip is the heavy side. add small bits of tape just under the bow — at the back of the sail — on the light side until the wingtips begin to level. now add appropriate amounts of tape (over the bow) to both sides (front and back) of the sail at the wingtips until the balance is um, “perfect”. this both balances and reinforces.

make a loop with 9 lbs. button thread. the loop stretched out should be about 3 inches long. larks head the loop onto the bridle. i like to apply the loop so the knot does not obstruct the bridle or the section where the flying line hooks on.

up to now, you have already done considerable work, so let's take it easy during this next operation. it means the difference between a kite and a wall hanging. hold the kite at the nose and tail so you are looking at the spine on the back. slowly draw the kite spine back and forth over the head or knee while applying slight bending pressure. listen very carefully for cracking sounds. if pressure is not relieved when cracking sounds are heard, they are oft followed by a distinct ‘snap’. impart a slight curve to the kite spine. the majority or deepest part of the curve should be between the center balance point and the area where the spine meets bow.

if that went o.k., it may be safe to bend the nose back a little. lay the kite on its front. place your finger alternately on either side of the bow along the spine to use as a fulcrum. gently bend the nose section back incrementally; just a little. whew!

flip the kite over and hold it above the surface of a table by the tow loop. adjust the position of the tow loop until the tail just touches the table and the nose hovers 1 inch ± above. lock down the larks head.

ok, let's get vertical. test fly the kite by doing horizontal and vertical sweeps at an altitude no less than 20 ft. if your kite will not climb well, adjust the tow loop up in slight increments. get those sweeps going and check for straight tracking. give the kite some time so as not to be confused by other variables; gusts, bumpy air etc. there are no guarantees the bow will have a symmetrical spring rate. example: if on a climb you notice a turning tendency to the left, the bow is stronger on the right side as you view the front of the kite. to stress relieve the bamboo bow, hold the kite viewing the back side. hook your pinky over the leading edge on the strong side, so you can massage the bow with the thumb between the spine and the nose-leading-edge reinforcements. stroke back and forth (its kind of like strip milking a cow) and test fly. repeat as necessary.

'that stafford kite sounding more appealing?

the bridle — length / lower pick point experiment

here is a good method for determining bridle length and where the lower pick point should be attached. this method employs a fully adjustable lower bridle leg, and several points about the lower spine to accommodate finding the 'sweet spot'. this experiment will work with either a two leg or a three leg bridle system; maybe more.

flat kite bridle lengths vary. many paper indian kite bridles are long; rigged in a manner that allows the kite to pass through the bridle. nearly all western style kites are rigged so the bridle is too short to allow the wingtips to pass through. an extreme example of flat kite bridle length can be seen on the "thai cobra" kite. this two leg system calls for about twelve feet of line — doubled over — making for a six foot long bridle. the thai kite, with its lengthy rig, allows for very minute adjustments about the pitch axis.

begin by leaving an ample amount of bridle leg dangling from the upper attachment point. in the general area of the lower attachment point/points, tie five (more/less) loops an inch or so apart in succession. the loops need only be an inch or so long. the first loop may be located at the center balance point of the kite, with the following loops attached incrementally toward the direction of the tail. the last loop may be at the tail kite — if you like.

the attachment loops allow the kite experimenter choices as to 'where' the lower pick points may be tried. the extra bit of lower bridle leg allows for choices of 'length'. use a tiller hitch knot to temporarily secure the lower bridle (any length) on to any loop. use an adjustable tow point — and tune to suit. try the various settings in different conditions on different days. play with it.

adjustment bead alternative

if yer' like me, sometimes you just got's 'ta use a bead for the upper bridle adjust on your fighter kite. here is a hot idea for making your own!

“sculpey iii creative clay” (not clay) is a craft product made from pvc and a plasticizer. this soft material is sculpted to suit and cured with heat resulting in a hard, light, and durable mass.

although the finished pieces may be painted, they come out of the oven with a real nice texture to them like fine abrasive paper (that way the bridle won’t slip). cured pieces may also be drilled, carved or sanded. the gunk is sold in 1 oz. bars or kits, available in 12 colors and is reasonably priced. grab a slab and play around with it some.

available at art, craft, toy and hobby stores, or, write our friends at polyform – ‘the sculpey people!’

polyform products company, inc.
elk grove village, il u.s.a.
60007

intended for use by ages 6 and up.

the fat kid

coriolis, moving, velocity, rotation, imparts an acceleration that is, perpendicular to the object's flight path. the result is a curved trajectory. the magnitude of the acceleration is proportional to the object's speed and varies with its latitude (from zero at the equator maximum at the poles (latitude: 45.5 degrees north or so slack float drifting a 10mph wind. 10mph coriolis acceleration is only one twenty one thousandandth the acceleration of gravity. rate of six thousandths of a degree per second. in an hour, flight by 21.5degrees. clockwise southern hemisphere, direction reversed.air at 10mph, miles coriolis acceleration. (which is anangular rotation rather than displacement). the coriolis acceleration difference lattitude 10 mph.45.5 degrees height latitude (16)is45.500004 degrees north. coriolis acceleration 0.000000000104 feet-per-second-squared angular acceleration 0.00000000442 degrees-per-second-squared. resultrotation 0.0286 degrees (clockwise from coriolis acceleration rotation 16.5degrees! coriolis aerodynamics

gordon (dr.) schmidt wrote [snip]

aerodynamics is everything when it comes to making fighters spin.

cutting out – mushing

with special attention to indian/indian hybrid fighter kites, this installment reviews two related fighter performance glitches. although these two examples feature undesirable flight characteristics, neither of them is an indication of a poor kite, and both of them are easily remedied.

from a height of 1 foot, drop a well worn bar of soap length ways into a filled bath tub. the soap tracks straight until it breaks the water line. then it abruptly switches direction followed by a reduction in speed. this demonstration exemplifies what happens to a fighter kite when it is “cutting out”. like the bar of soap, the kite suddenly changes direction from a steady track and forward velocity is momentarily retarded - resulting in a loss of control.

cutting out is not a freak encounter with a performance barrier. the fighter pilot will know in advance 'something' is not right. the clincher is when an attempt is made to leave the power zone straight down wind. this is when the symptom of cutting out becomes obvious. more later ...

from a height of outstretched arms overhead, slam a full pot of steaming oat meal full force onto the hood of your car. this example may be loosely defined as "mushing", and is similarly indicative of loss of control. (ah-humm) however. mushing can be described as fighter kite performance that sort of emulates static kite flight characteristics — with basic maneuvers being difficult to execute. forward speed is slow, forays out of the power zone are near impossible, and a single spin can take an unreasonable length of time and distance.

the cause of cutting out and mushing stem from bow strength of the kite. for cutting out to occur the kite is likely under powered. i.e. the spring rate of the bow is too stiff for the present wind condition providing little dihedral variation with a tendency toward the 'flat'. for mushing to occur the kite is likely over powered. i.e the spring rate of the bow is too soft for the present wind condition providing little dihedral variation with a tendency toward the 'swept'.

when the bow of a fighter kite is flat or swept, the effect is predictable. although fighter jockeys have different preferences with regard to performance, to one degree or another all of their kites will have one thing in common: variable dihedral. meaning: increments of dihedral between flat and full sweep; on and off. with a kite well suited for wind conditions, the increments of dihedral should flow evenly, uninterrupted throughout total bow travel. this is the heart and soul of what makes a fighter kite what it is. its what makes it go.

the most simple remedy for cutting out and mushing is switching kites better suited for wind conditions. yer' kite is probably pretty good, just not right now. save the 'cut out' kite for a stronger wind, and the 'musher' for a lighter wind. one fix i heard about was of a limp kite in a strong wind. the clever pilot decided a reduction in sail area would turn the trick. this on the spot alteration was executed by poking holes in the sail with a hot cigarette.

for the prepared kite enthusiast, nothing beats a good arsenal. if your preference of kite has a standard shape or proportion, start from a medium sized kite and build several like examples in 1/2 inch wide increments both larger and smaller. this will provide a starting point, even when subtracting the predicable shape and sizes. other construction considerations are so varied they'll provide plenty of opportunity for adjustments and tinkering.

fly hairy!

squeeking and honking

the combination of a stiff breeze, waxed flying line and resonant sail material provide the fighter kite enthusiast with the unique opportunity for some big laughs. run your hands up and down on the taught flying line and sounds resonate from the kite. annoy kite pals and onlookers with your hilarious antics. the more astute may want to paint appropriate graphics on the kite for embellishment. a horn, a flock of geese or two lovers completing the circle of life. those inclined to genius might try fixing a tin can to the end of the waxed line to fashion a flying megaphone. hmmm, doppler effect!

bukas

hey all!

took a kite building class from ken conrad a couple of years ago. the buka dako. only learned about five or six things.

the classic proportion is 1.3 to 1.

get the leading edge straight and square.

if you use round carbon fiber: make a jig out of house hold items to hold bends in the rod. set up so the ends of the rods lay flat. glue paper cards onto the ends of the rod. the results being when the rods are installed on the kite they will be aligned to the natural bend — the cards being a temporary indicator.

there is rectangular carbon fiber rod available. check it out. i've seen two sizes.

bow adjustments can be made by wrapping the bow line around a small amount of the leading edge spar that protrudes from the kite.

line tensioners. there are a variety of them in — kiting in general.

ken uses a real cool knot. old school from japan. it grips or slips depending on what you want it to do.

buka dako's pull like a mule. i'm talking' 150 lbs. test line, gloves — all that stuff.

ken conrad runs great winds kite shop in seattle wa. he's a true kite god and real nice guy. if you show up some time (bring money) maybe he'll show you the knot or give you some tips if he ain't too busy. he's usually a ft. wordon too.

while yer' at it take a lesson from bruce, dennis, chuck or brian. these guys have been working on buka hybrids. quite a bit different than the big old hairy japanese kind a' kite.

artsie craftsie

the words kite and beauty are synonymous. one should think the mere presence of a kite embellishing the sky is enough in itself. not to be out done by other cherished things throughout the ages, the kite naturally beckons decoration.

disclaimer
some folks go snakes at the mere mention of the word art. although the fat kid and a few others are over qualified and very gifted in the creative arena-, do not let lack of talent dissuade you from making your kite beautiful. even if you have a recessive art gene, you already learned everything you need to know about art in kindergarten, so chin up little buckaroo!

example
if you saw a really great flying fighter kite with a photographically realistic, airbrushed rendition of the signing of the declaration of independence on it, like the one on the (ahhumm) one dollar food stamp, you might think it was pretty cool and get all flustered because you know you could never make one like it and say aw hell with it and want to quit and stuff.

check this out.

i know this kite-guy named larry. larry had little or no experience with arts and crafts. two things he does have though are: a lot of want to, and the raw confidence to try anything. larry also has a pathetic little condition that reveals it self in the form of hyper-sensitive saliva glands. larry simply puts his natural gifts to work drooling on select areas about the kite and quickly finishes it off with a rattle-can of auto primer. when the goober and paint are half dry he wipes the kite off on his ever soiled bib. the incredible results being as visually stunning as his masterful technique. hey, if larry can do it-; ya know what i mean? *

ol lare was already a good kite builder prior to his foray into the artistic realm, but there were some things that he is very aware of. he knows that the incorporation of aerodynamics and control of aesthetics bring with it — design considerations a plenty.

the larry factor: lift, weight, thrust and drag — added to — line, shape, form, color and texture. that's enough stuff to keep the average kite experimenter busy for a while, but lets look at a few things:

take a four foot wide, 18th century pennsylvania dutch quilt, and stretch it over 1/4 inch carbon fiber rods. pretty, ain't it? but as a fighter, it is very near ineffective. at the other end of the spectrum is a kite designed to be a pure flyer. it is likely to be more industrial in appearance while being considerably less decorative. although both pieces possess aesthetically pleasing qualities, one has the vast majority of its design features in the decorative bent, while the other strives for the purely functional. the adage goes: form follows function. the function of the highly ornamental piece is to be decorative while being only reminiscent of a fighter kite. the pure fighter kites function is to fly well. with little or no attention paid to its looks, any aesthetically pleasing qualities the pure flyer possesses are more or less incidental.

the good news is, there is a lot of room to join together the extremes of the purely functional with the purely decorative. the vast middle ground of good-flying-beautiful kites is rich with possibilities. not unlike the lessons learned building flyers, the aesthetic arena is fraught with dos and donts that become more obvious with practice. the decision making process will become more involved when a certain percentage of design parameters are aesthetic.

let the kite aid with the decision making process.

the number one consideration is neatness. do the cleanest work possible.

the number two consideration is weight. excessive weight is a gihugeic killer of pretty fighter kites. slapping on a thick coat of house paint with a four inch brush to an already, near over weight, (stiff) tyvec sail will lend to beauty but will negatively affect flight performance. just as easily, weight can be used to an advantage. say for example you find the kite you are flying needs a small bit of weight near the nose or tail to enhance spin. fighter kiters often use a dab of putty or chewing gum as ballast. if you are using bamboo for spine material, another solution is to build your next edition of the same kite with a tapered/shaped spine providing added weight in the appropriate place. an aesthetic solution could incorporate a colorful direction indicator on the nose or tail of the kite along with weight providing ballast as well. mask off an area (decisions) of the kite and douche it with the house paint and industrial brush to achieve both requirements simultaneously. when your line of thinking is in this ilk, you are an engineer.

then again many coloring techniques do not adversely affect weight as much. using dyes and ink such as marker pens, turn the trick rather nicely. on many sail materials, dyes and ink also open up many possibilities of translucent and opaque effects. that's the stuff that makes stained glass windows work. immaculate! if you elect to adorn your kite with two capricious swallows, where ya gonna putem? lots of choices, huh? placement of decoration served more than one purpose with the direction indicator example. when weight is not so much an issue, there are less restrictions and more opportunities. here's just one. on a good fighter kite, the pivot point of spin is located somewherebetween three points: the wingtip, the center of balance and the upper bridle point. placement of a well-drawn swallow centered on either pivot point will compel this kiter to weep tears of joy. if your line of thinking is in this ilk, you are an artist.

i noticed once that-, that horrific shit icky-rex, and the ever rare and luscious chinese kite silk have a characteristic that enables sunlight to be reflected a certain way. when a kite made from these materials is positioned on a correct angle to the sun, they flash. the effective angle so slight that reflected sunlight is briefly seen about the moving kite. on a spin the flashing pulsates. imagine this phenomena used in conjunction with decorative possibilities. lightning, einstein, the virgin mary, pills, mt. pele; that's what i'm talking' bout!.

perhaps your artistic tastes lay in the sculptural. i had a kite made of orcon#an-36b.the straight leading and trailing edges of the kite were formed by the wind to produce a rolling back of these areas. the rolled back leading and trailing edges were assumed to create excess drag, but who knows. i sketched out a line along the border of where the roll and the flat part of the sail intersected and made a template appropriately. got pretty lucky with this go because the results were two fold both sculpturally and aerodynamically. the kite flew better and it had a lovely curvaceous perimeter. with respect to fighter kites, shape is a tricky area. one of my early mentors, ed alden once said, among other insightful stuff: there is not a one magic shape. if you are experimenting with kite shape and are hell bent on producing a kite with a men's underpants theme, you might consider building a western style buka dako. (buker daker) the rectangular shape of this kite, complementing the rectangular outline of briefs or boxers, may be more conducive to good over all results. if your line of thinking lay in this ilk, most fighter people will understand, but you might get your ass kicked by a multi-line sport kiter. i don't think ed would get it either.

appliqués are a must visit area with respect to looks and fly. the combinations of weight, color, texture, opacity, yada yada yada, of various sail materials are numerous. they can be used together to assist creating the bellows shape of a kite sail under working load. or, perhaps you might try using a hard and slick mylar for the nose area to smoothly receive the onrush of wind, while a soft textured orcon is used throughout the rest of the sail to dampen and direct escaping air out the back. gold and black? red and white? how about a clear film nose area with some sharp scary teeth on it? eyes?

appliques most often require a lot of measuring, preparation, gluing, technique, and a bunch of other junk obviously not mentioned, not necessarily in any order, but definitely not excluding template making. in order to make an inlay, the builder must first make two templates. the two templates will trace each other in outline with about a quarter inch or so size difference (width of tape?). the smaller template is used to aid in cutting out the sail area. the larger template is used to aid in cutting out the piece to be installed. to accurately install the piece, use drafting tape to secure one edge of the kite sail to the working surface. with one edge taped down, the sail can be flipped back and forth on the working surface like a page in a book. the sail along with the cutout area will repeatedly contact the working surface after moving and replacing. then it is a matter of locating the spot on the working

surface where the inlay piece should be set. glue and reset the sail; nailed it! do a few kites like this and you'll teach yourself a lot of stuff. like how to avoid gluing your hours of hard labor to the working surface, all kind of little tricks and stuff. you might even want to take a crack at making several kite skins at a time via the indian trick . do you think the indian kite makers consider which side of the sail to glue the seams and appliqués on?

i've mentioned this before here and there in the notebook but i cant over emphasize the importance of experimenting with scraps prior to execution . it's faster and saves a lot of anger or remorse induced headaches from boning it big time and screwing up the kite. mistakes are good! just try and keep them down wind of your museum piece. if nothing else, aspire to do the cleanest work possible.

there is a ton of stuff people do to celebrate beauty. we aint even scratched the surface. man, if you dig this kind a jazz and gots ta gitcha some mo, find this book: *kite craft* by newman and newman, [isbn #0-517-51470]. it's out of print homer, so you need to do a used book search or steal it from the library of congress. remember that crack about the recessive art gene? that wasnt you, i was talking about somebody else . hopefully something somewhere will inspire all of us to follow that voice in our heads that says: i think i could do it better next time that is the sound of our creative nature calling; one of the marks of an artist.

*laurance (larry) langendorf, is a artist from lake ronconcama long is. n.y. painter - langendorf took the long way home in his many exploits only to be welcomed back with open arms as the latest darling of the new york art scene. developer of the spit resistance technique, mr. langendorfs signed bibs command prices in excess of $40,000.00. larry, as he likes to be called, is also a torch bearer for the otherly abled. much adored by his clamoring throngs, larry keeps a hectic paris-new york party calendar, balancing his dedicated volunteer and work ethic.

superglue

in the heat of kite battle, the fingers are often cut due to mis-handling flying line. cotton line can deliver annoying nicks, the slicing effects of synthetics can be likened to a trans-dermal cheese knife, and manjha? oh baby, i don't play manjha — but somehow i know the stuff has enjoyed sampling deep-tissue-human-meat millions and millions of times.

i saw a couple of guys fly cutting line last summer and they used a leather sleeve over the index finger of the finesse hand. i'm thinking', "come on you guys, its like wearing a 'rubber' or something." thank goodness our western flying line is no more abrasive than necessary, cus' we all like doing it in the raw. we still take a few cuts though.

here is a great trick i stole from dog handlers of the 1100 mile ididerod dogsled race. this extraordinary example of human and animal endurance developed a preventative foot care measure for canids by applying "super glue" to the pads of the feet. the dried glue provides a tough measure of protection from the elements. works good for kite fighters too.

simply apply "super glue" or "crazy glue" to areas of the fingers susceptible to cuts. the index finger tips, backs of the knuckles etc. after applying glue do not close the hands or touch anything until the glue has dried; about three minutes. apply two or three coats before flying. additional coats may be applied if needed for consecutive days.

on rules u.s.a.

warmed my heart to no end reading of “fighter girl” and “kite bum” duking’-it-out on the beach, with one flyer seceding victory to the other. a truly pure kite fight. let us all applaud sharon and charlies’ show of class. no doubt their example is in kind, the same taught to us all when we began flying.

in the west, the art and sport of competitive fighter kiting is evolving, and with that — the rules. fighter kite etiquette naturally evolves friendly in character - protocol follows suit.

nfka rules, guidelines and definitions attempt to embody the playful spirit of two comrades standing at a line drawn in the sand. few and loose, the nfka rules try to design an extremely flexible and level playing field accommodating local preferences and situations. the current unfinished rules document ‘is’ at this time a rough draft, and ‘is not’ etched in granite; as a last word or holy grail of kite fighting.

preliminary drafts of the rules document were arduous in that what appeared to be a simple game became detailed in explanation. in part, the reason for this is: in a casual kite fight it is assumed contestants know what is expected. when the need arises, custom and convention are ‘hashed-out’ on-the-spot; occasionally tangles are re-flown. in a sanctioned event, there is an air of finality that spawns a very competitive atmosphere. to make expectation well defined and available to all, the nfka is taking on the responsibility of writing these customs and conventions out of respect for the game and as a courtesy to its enthusiasts.

as stewards of the game, the nfka is aware it may have a profound and lasting influence on the sport of western fighter kiting. it is our duty to nurture the purity of the game devoid of ego or stifling politics. the interests of the game are better served if rules descriptions develop naturally by means of the self evident and remain un-imposed.

[please note: since this article was written in 2000, the nafka competition rules have evolved and continue to evolve.]

robotic fat kid

did a notebook once about a futuristic fighter kite made of an omni-plastic material. the article was a kind of dream-scape, but i'm not sure if anyone got the joke. some simple detective work reveals the dream occurring precisely at midnight new years 2000. while revellers in our time zone welcomed the new year (or watched it on television) the fat kid slept; ha ha. well, here's an article almost as ‘ging ging’ nutty, crazy, wild, and way out. i sincerely hope the mention of it does freakish things to your frontal lobe. ya’ ready? here goes!

a fighter kite ‘flying-machine’!

yeah, that’s right, a machine that flies the kite.

at least when you finish laughing i won’t have to waste much time arguing feasibility. the technology is already here. aside from the presents of robotics in manufacturing or private research, i’ve personally seen two examples of this science used for fun stuff. one is robotic sumo wrestling. two or more machines are pitted to see which one can remove the other from a 3 foot circle. robot sumo attracts competitors/experimenters from both the amateur and university level. another really neat

robot is the snooker playing machine. i think it was developed at cambridge university. if it would have been built at georgia tech. they would have programmed it to play nine ball. anyway, the machine consists of an armature with a box containing a brain, gizmos, sensors and a short little cue stick. the multi-jointed crane and box navigates its way around on a track attached to the rail of the table. it does miss once in a while, but the student researchers said it once stacked 27 racks in succession. “at’s a’ blooody stroong gaime’ a’ snoooker, maigh’!” so, the only thing i see standing in the way of a robotic fighter kiter’ is the desire to build one. maybe call it the “fat kid mark-1’ or something.

(what; ya’ gonna’ program it to ground-out? ha!)

it’d be pretty cool though. the machine i visualize probably looks much different than the eventual/theoretical first working model. i’m sure it could be built no larger in size than a garbage can or an old r-2 unit. fully automated, pre-programmable to task or skill level, — hell, the thing could even fly compet- itively. if yer’ still laughin’, think about this. according to the n.f.k.a. rules, competing with a fighter kite flying machine is totally legal.

the fat kid