

Building a North American Style Competition Line-Touch Fighter Kite In about 2 hours

by
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The following method of building a fighter kite works really well; it doesn't require special skills and is reasonably quick, about 2 hours or less to build a kite. Obviously there are many building methods that result in successful fighter kites, but this works well for me and for those who have attended my fighter kite workshops, so I thought I would share it to fighter kite fans surfing the internet.

As you use this method of building a fighter, you will probably modify it to better suit your kite building preferences, that's what I'd expect. Please share with me the changes in the procedure that seem to work better for you! I am always eager to hear about ways to make building a fighter kite easier, better and quicker.

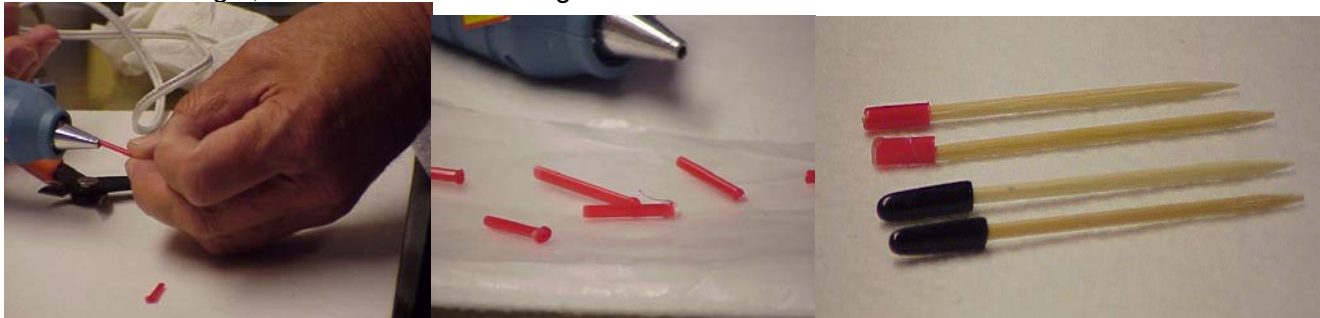
Any fighter kite you plan to build, you can adopt the following techniques. For a fighter kite skin material in this discussion, I am using black Orcon, but if you are using Tyvek, Icarex, ripstop nylon, Mylar or other plastic films, the information here applies equally.

The kite parts you'll need to make a kite:

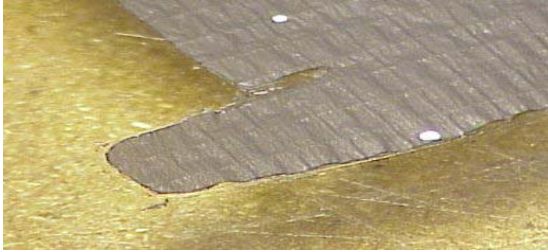
A cut out fighter kite skin from the kite plan of your choice with added wingtip tabs as described below, 1 bamboo spine, 1 carbon fiber bow, 2 vinyl end caps or short small diameter drinking straw pieces, 2 bridle stops, (heat shrink tubing), a couple of toothpicks, 2 battens if your kite design uses battens, 2 pieces of Orcon or any other tape for reinforcing the leading edges, a few other small pieces of Orcon or other tape for reinforcements, cornstarch & about 56" of bridle line. The kite parts will be bonded together using Weldwood original contact cement & a couple drops of CA (superglue) glue.

Easy bow tip attachment

A. You will need 2 vinyl end caps of 0.062" diameter or make a couple of end caps from small diameter drinking straws, the kind typically used for stirrers. The photos show the straw version. I use a mini hot glue gun to inject hot glue into one end of a straw so it travels inside the straw about 1/2" or so. Then I cut off about 1" from the glued end. And repeat the process so I have 2 pieces of straw, each with glue in one end. Then I insert a toothpick into the open ends and hold them up to a light so I can see where the glue stops inside the straw. I then trim the glued end so only 1/16" to 1/8" of the straw pieces contain glue and that the inside point of the glue is aligned, one straw to the other. Then I trim the open ends so both pieces are the same length, about 1/2" to 3/4" total length.

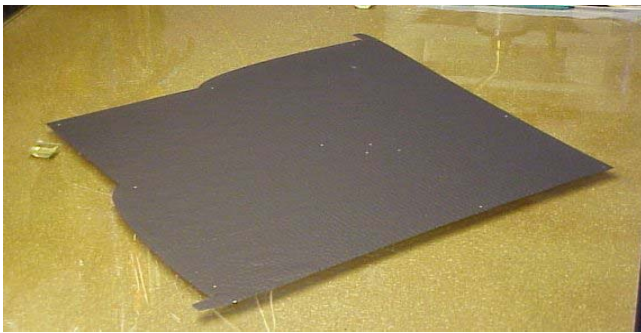


- B. Whatever kite template or plan you are using; add to the bow hems, at the wingtips, an extra long tab. These tabs should be about $\frac{1}{2}$ " wide by $\frac{3}{4}$ " long. They are used to secure the straw or vinyl end caps to the kite skin as you will see in the photos.

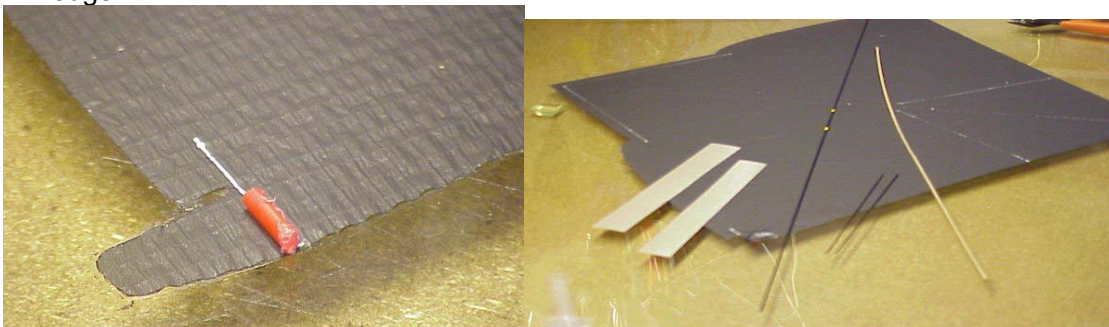


Construction Steps:

1. Smooth out the kite skin and secure it to your work surface, I like to work on a glass surface. A good way to secure it is by spraying a light mist of water on the work surface, lay the kite skin onto the water so the back side of the kite skin is facing up and smooth over it with your hands to remove wrinkles. This will secure it to the work surface quite well. Another method is to tape the skin to the work surface with low tack masking tape, I like the to use the blue masking tape.

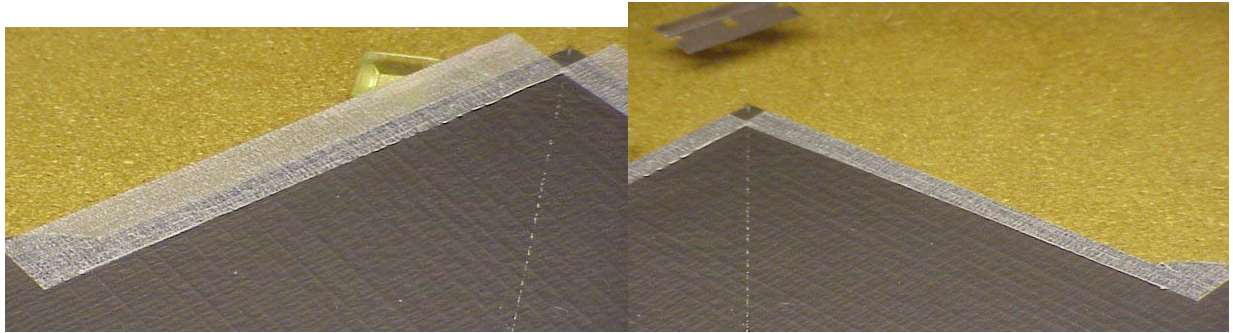


2. Using a pen that will easily write on your skin material, draw a line on each wingtip area of the kite skin about $\frac{3}{4}$ " long starting from the point on the trailing edge where the bow tip is to be located and extend the line $\frac{3}{4}$ " along the path of the bow toward the nose of the kite, see the photo. Most of the time, the exact location is an estimate. Also draw the lines of the spine, battens (if your kite uses battens) and a line parallel to the nose area of the leading edge. This line will be the guide for placement of the reinforcement tape. I usually draw these parallel lines about $\frac{3}{8}$ " from the leading edge.



3. Prepare the spine. This may require some shaping of the bamboo using a knife, or may only require cutting to length and straightening, or maybe only cutting to length.
4. Many fighter kite makers don't feel there is any benefit in reinforcing the leading edge of the kite near the nose, but I always do it. I find it adds durability to the kite if not also improving its performance. If you are going to reinforce the leading edge near the nose, now is the time. Use a piece of Orcon or other type of tape you may have about $\frac{3}{4}$ "-1" wide and the length of the nose leading edge. Align one long edge of the tape to the line drawn on the kite, and allow the balance of the tape to extend onto the work surface. Smooth out the tape. Cut away the excess tape using

a straight edge and razor blade if your nose leading edge is a straight line, use the template as a cutting guide if the nose area leading edge is curved. Cut along the leading edge of the skin.

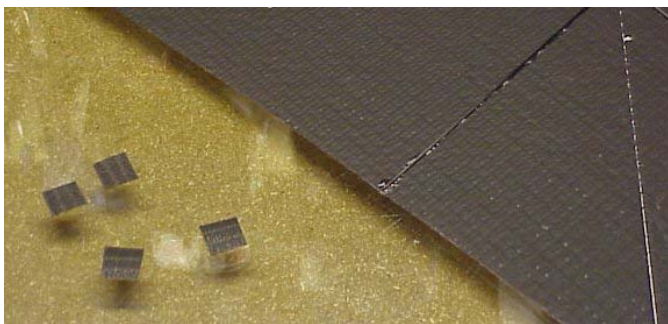


5. If your kite plan uses battens, smooth the ends of each batten.

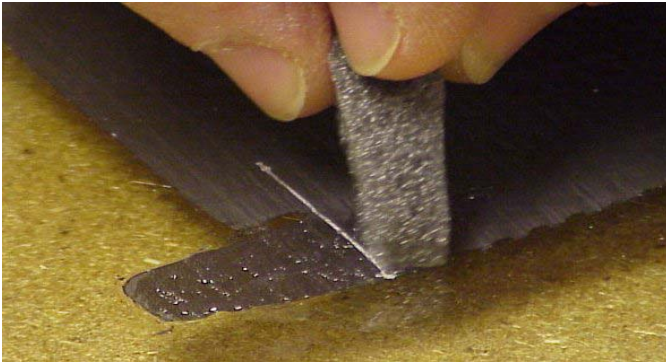
NOTE: When gluing, here's a method that works pretty well and is easy. Pour a small amount of contact cement into a lid of a small bottle, mini cupcake paper, or anything that is disposable. Then dip the glue spreader into the glue container and spread the glue where you need it. The glue spreader I use I make from a piece of closed cell foam pipe insulation that I buy at the hardware store. I cut a slice about $\frac{1}{4}$ " – $\frac{3}{8}$ " wide from the foam pipe insulation and cut that slice into 3 pieces. Each piece I use as a glue spreader. These are easily shaped with scissors to any width or shape and are disposable.



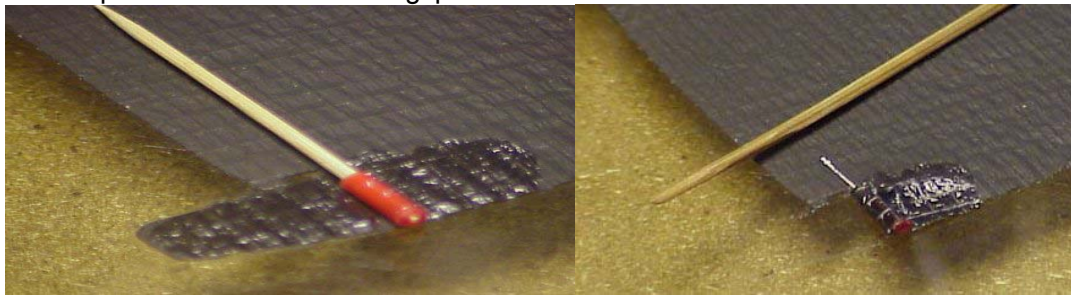
6. If your kite uses battens, apply glue along the drawn lines of the batten locations and place battens on the glue line and press them firmly into the glue while the glue is still wet. I also secure the ends of the battens with small pieces of tape. The 4 small pieces of tape are shown below.



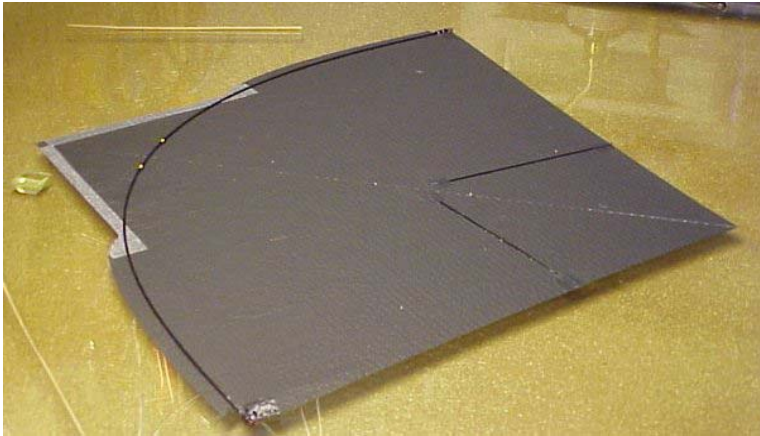
7. Apply glue to the wing tip tabs as well as the area of the kite skin inward of the tabs that the tab will come in contact with when folded over to hold the end caps. Also apply glue to the end caps. To do this I put the end caps on toothpicks to hold them and apply glue, then lay them on a piece of waxed paper to dry. Allow the glue to dry for a few minutes.



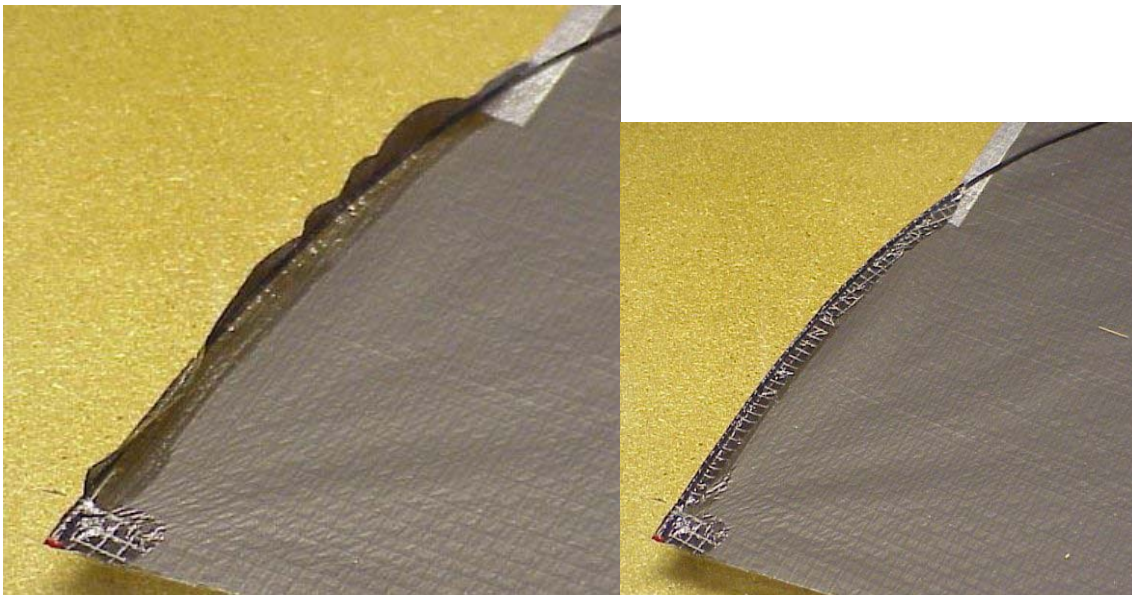
8. Apply glue along the spine line.
9. Apply glue to the entire length of the spine on the “skin” side of the bamboo. Set aside to dry.
10. Using a toothpick as an aid, precisely locate the end caps on the line you drew at the wing tip & press them onto the glue. Then, while pressing the toothpick against the kite skin to hold the end cap steady, use a hobby knife or single edged razor to make a cut from inboard end of the end cap to the edge of the kite skin hem. After making the razor cut, fold the wing tip tab over the end cap so it wraps snugly around the end caps and onto the kite skin. Remove the toothpick and repeat the process on the other wingtip.



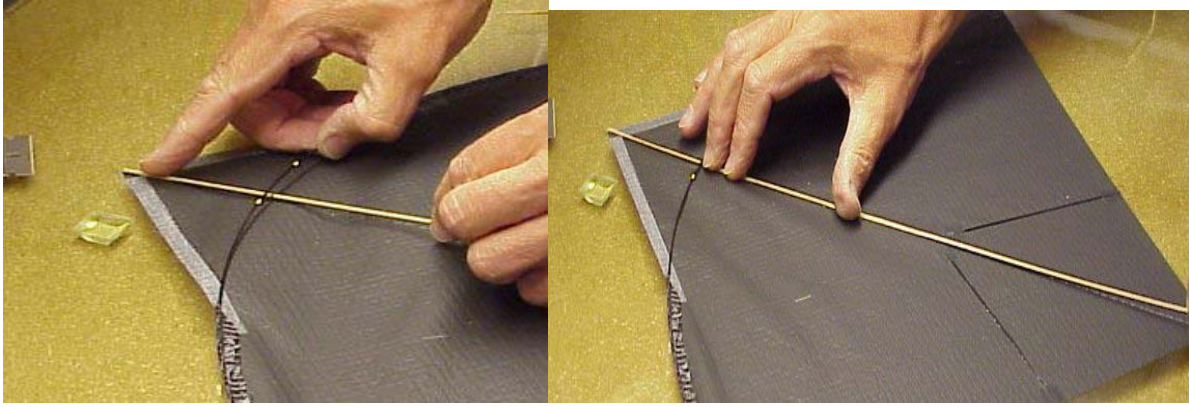
11. Prepare the bow. This requires cutting it to the proper length for the kite plan you are making and smoothing off the ends with sandpaper and sliding on 2 heat shrink pieces (each about 1/8” long) for bridle stops. Slide the stops near the center of the bow. Bridle stops are not necessary, CA glue can secure the bridle to the bow instead if you want to skip this step.
12. Insert each end of the bow spar into one of the end caps. Check to be sure the bow is located near or at the point it is supposed to at the spine and also at the points where the leading edge shape changes. If the bow doesn't match up at those points, adjust the length so it does. Because of using end caps, the part of the end cap filled with glue, or the thickness of the vinyl will reduce the actual length required for the bow, but only a tiny amount, usually less than 1/8". In some kites it won't make any difference.



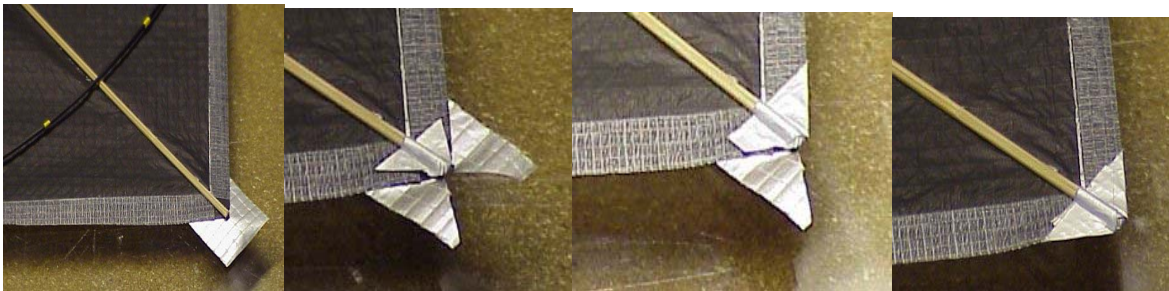
13. Apply glue to the bow and the bow hem area on both sides of the kite. Let it dry for a few minutes.
14. After the glue has dried for a few minutes, fold over the hem to enclose the bow on both sides of the kite. During this process, be careful not to distort the shape of the bow while you are folding over the hem. To minimize distorting the bow shape during this stage, I use a small piece of waxed paper laid on top of the bow, then with one hand press down on the waxed paper to secure the bow to my work surface while I wrap the hem around the bow.



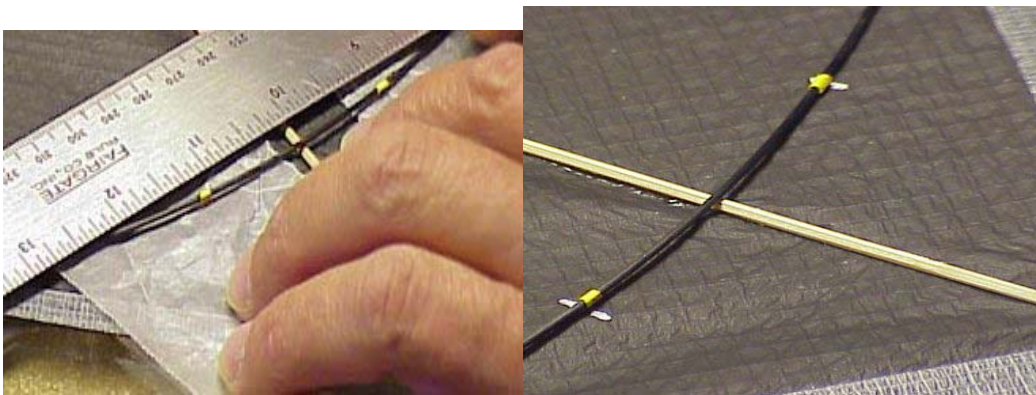
15. **Carefully** lift the bow enough to allow the spine to fit underneath it. Slide the spine under the bow and touch only the nose end of the spine onto the very tip of the nose of the kite skin. Then slowly lay the spine along the glued spine line on the kite skin. Be very careful not to allow the glued side of the spine to touch the glue on the spine line of the kite skin until you have the spine properly positioned above the line. One way to help avoid a “mistake” is to put a strip of waxed paper on the glued spine line, lay the spine on the wax paper, position it, and pull out the waxed paper while holding the spine in place.



16. Cut 2 pieces of Orcon or tape of your choice about $\frac{1}{4}$ " wide x about $\frac{3}{4}$ "-1" long. Apply one piece to each of the wing tips at the point where the bow exits the end caps. This will secure the wing tip tabs that you created with the razor cut to the bow and the rest of the bow hem.
17. Cut a piece of Orcon or tape of your choice about $\frac{3}{4}$ " square and apply to the nose of the spine to the kite skin. This secures the nose of the spine to the kite skin. See the photo about the way to cut and wrap the nose of the kite with the tape.



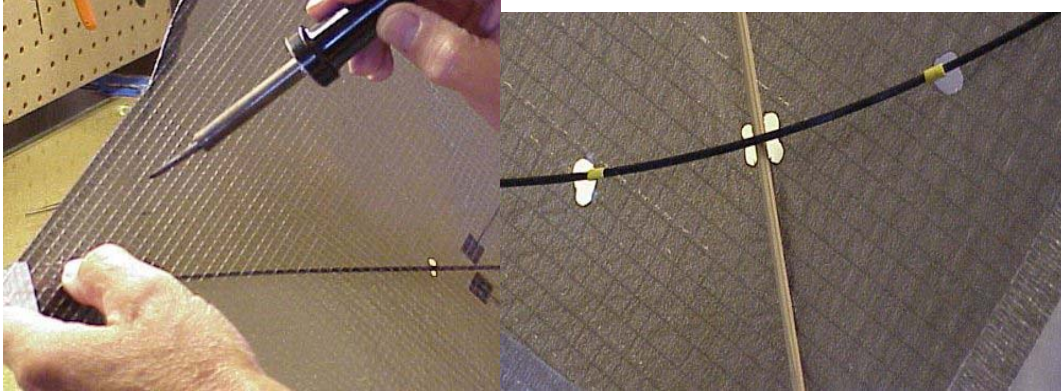
18. Cut a piece of Orcon or tape of your choice about $\frac{1}{4}$ " wide and about 1" long and wrap it around the end of the spine to secure the tail of the kite skin to the tail of the spine.
19. Place the kite face down on your work surface with the nose pointed toward you. Place ruler across spine near the bow and mark the bow and the kite skin $1\text{-}\frac{1}{4}$ " either side of the spine center or whatever distance your plan calls for. See the photos for details.



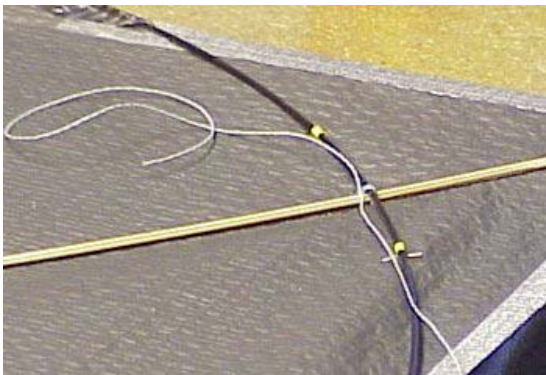
20. Put a small piece of paper between the bow and the kite skin at the point where the bow was just marked, this prevents CA glue from bonding the bow to the kite skin. Apply a small drop of CA glue on the bow at a point just inside (toward the spine) of the mark on the bow and slide the "stop"

to the mark on the bow pushing it through the CA glue. Wipe off excess glue. Do the same on both sides. If you are not using bridle stops, only mark the bow and kite skin.

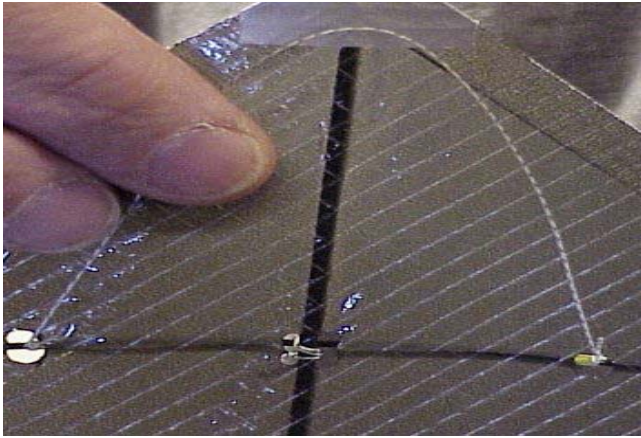
21. The marks you make on your kite skin will guide your soldering iron for making holes in the skin for the bridle. Plus if you plan to tie the bow and spine together you will need holes in the skin at that location also.



22. Wax the entire 48" length of bridle line. Cut a piece of bridle line about 12" long and tie the bow and spine together with it, if you are planning to tie them together, otherwise, skip over this step. The knot should be on the back of the kite. Some fighter kite makers do not tie the bow to the spine; it's your option. I always do.



23. Cut a second piece of bridle line about 12" long. Outside of and next to the bridle stop on the right side tie one end to the bow. The line must enter and exit on the front face of the kite through the hole in the kite skin. See photos for details. Next, tie the other end of the line to the other side of the bow through the hole in the skin. BUT BEFORE you secure that end to the bow, make sure the loop of line you about to create is too short to reach the nose of the kite. When pulled toward the nose, the upper bridle loop should not extend beyond the nose of the kite. When the length is determined, then tie the second end of the upper bridle yoke to the bow. If you aren't using bridle stops on the bow, now is a good time to CA glue the bridle line to the bow. Glue the bridle onto the marks you made on the bow.



24. Cut a 3rd piece of bridle line about 24". Fold over about 3"-4" of line at one end and tie an overhand or figure eight knot, making a about a 2"-2 1/2" long loop on that end of the line. Using a larkshead knot, or a prussik knot, attach this loop to the upper bridle yoke.
25. For a 3-point bridle arrangement, tie the remaining end of this line to the lower bridle connection point on the spine, this should be identified on your kite plan. If the lower bridle point is not identified on your kite plan, place it at 1/3 of the length of the spine, measured from the tail of the spine. HOWEVER, be sure the bridle line length, when pulled toward a wingtip, does not extend beyond the wingtip, then secure the knot to the spine.
26. If you use a 4 point bridle, see the photos for details.



27. Cut a fourth piece of bridle line about 6" long. Fold it in half and tie an overhand or figure eight knot tying the loose ends together. You will have a loop about 2-1/2" long. Using a larkshead or prussik knot, attach this 2"-3" loop to the long bridle line. This loop is the point where you will attach your flying line to the kite, it's the tow connection loop.
28. Using a small brush, dust with cornstarch all the areas of the kite skin that have exposed glue. This removes the stickiness of the glue, so grass and sand won't cling to the kite when flying and it won't stick to other kites in your kite box.
29. Now it's time to tune this baby and enjoy flying it!!

If you have questions about building, tuning or flying fighters and/or about getting specific fighter kite materials, please don't hesitate to email me kitefighter@yahoo.com

BigGrins, Bruce Lambert