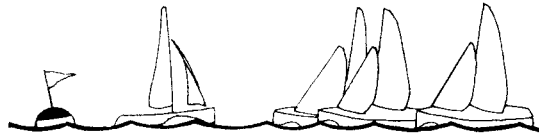


# SAILS



## MAKING SAILS...you can do it

I've always been interested in how a sail works and I imagine many of you have that same interest. In this hobby, as opposed to "people boats", most of us can afford to get into the making of our own sails. I am not a pro, nor do I make any claim to be, I just make sails for myself, and I enjoy doing it.

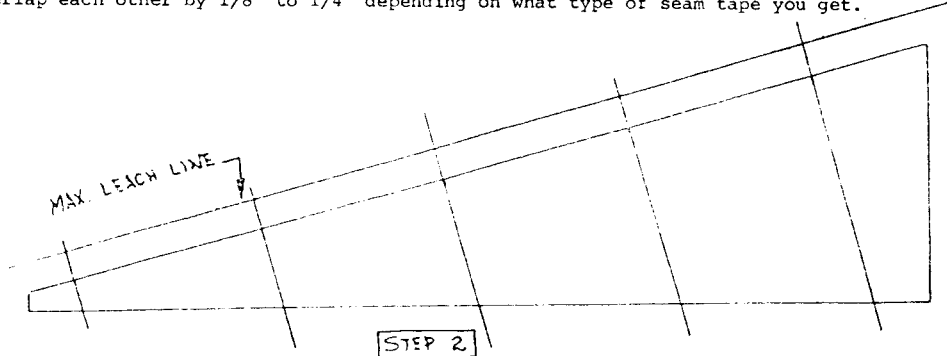
First off, you will need a flat table to cut on and large enough to lay out the sail pattern you want to make. I use a 30" by 6' door with legs. Next, you need paper for the pattern. Go to your local newspaper and ask them for an "end roll". They will most likely give you one. This is newsprint that's left over after they change rolls on the press. It comes in widths of between 28" to 32" and a roll end may have 75' to 100' on it. Enough paper for a few patterns.

**Tools:** You will need a hot-knife. If you don't want to buy one, (and I don't recommend it until you're sure you want to make more than a suit or two), use a good soldering iron. File the tip sharp, but not too sharp, and practise on scrap cloth until you get used to how it cuts. Remember, sail cloth doesn't cut, it melts! A straight edge, I bought an aluminium bar from the aluminium rack at the hardware store, 1" x 3/16" x 6'. A 2' steel square, a small square or steel rule as a cutting edge. Dacron thread. I bought a roll from a sail maker in Detroit via a friend. If you can't find dacron, you can get by with a top quality cotton over polyester thread from your local sewing store.

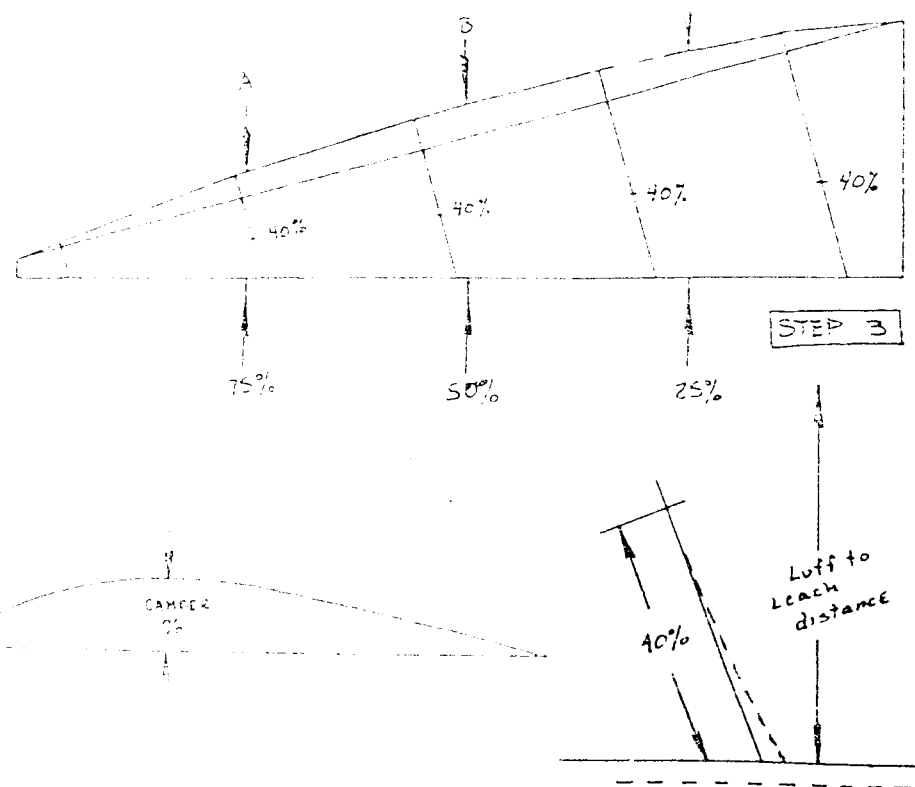
**The Sewing Machine:** The newest one you can find. Buy No.14 leather needles. Set the tension at "0". Practise on scrap cloth and select the siz stitch you want to use. **Important:** Always sew slow. Lube the needle with silicone spray using a small rag to apply.

**Step 1:** Lay out the basic sail shape on the paper. Allow about 1/4" to 1/2" stretch on the luff, depending on the length. Maybe 1/8" on the foot, if it's over 15" or so. Check the Class specs for all measurements.

**Step 2:** Mark on the leach line. This is the widest the sail will be at any one point. Mark out the panels at 90 degrees to the leach line. The panels are 12" wide, but overlap each other by 1/8" to 1/4" depending on what type of seam tape you get.



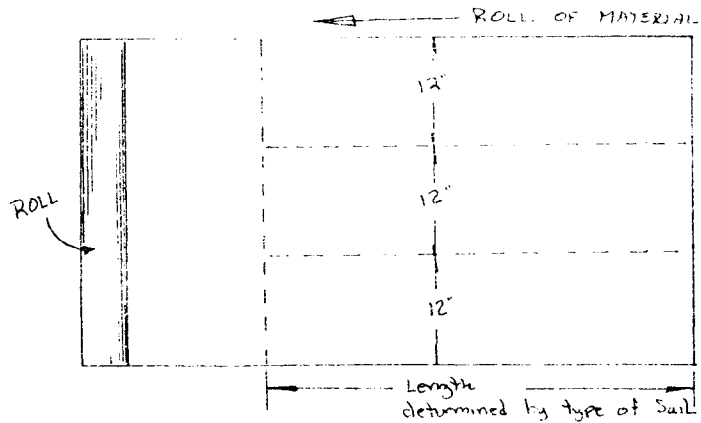
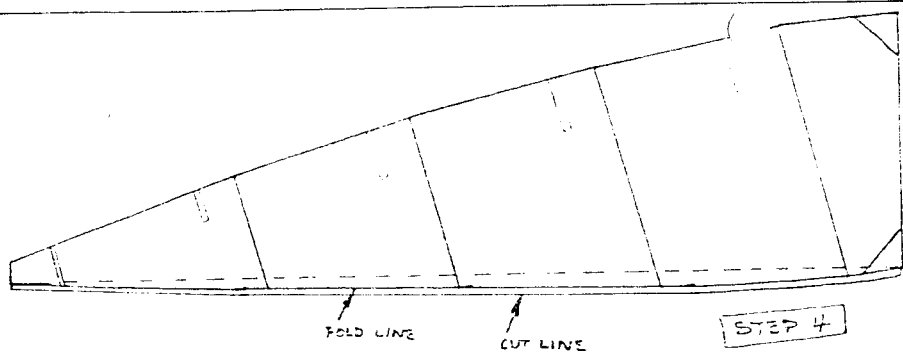
Mark out the shape of the leach and if the foot is going to have an arc in it, mark this out. Next locate the 25, 50 and 75% points on the luff. Now locate the point on each seam that is 40% in from the luff. Using the formula below, measure the width of the sail at the 3 points, (25-50-75) and mark the results at each point on the luff. Draw the arc of the luff with the line passing through each mark. This will give you a sail with the draft set well forward to centre. Single panel sails are made this way.



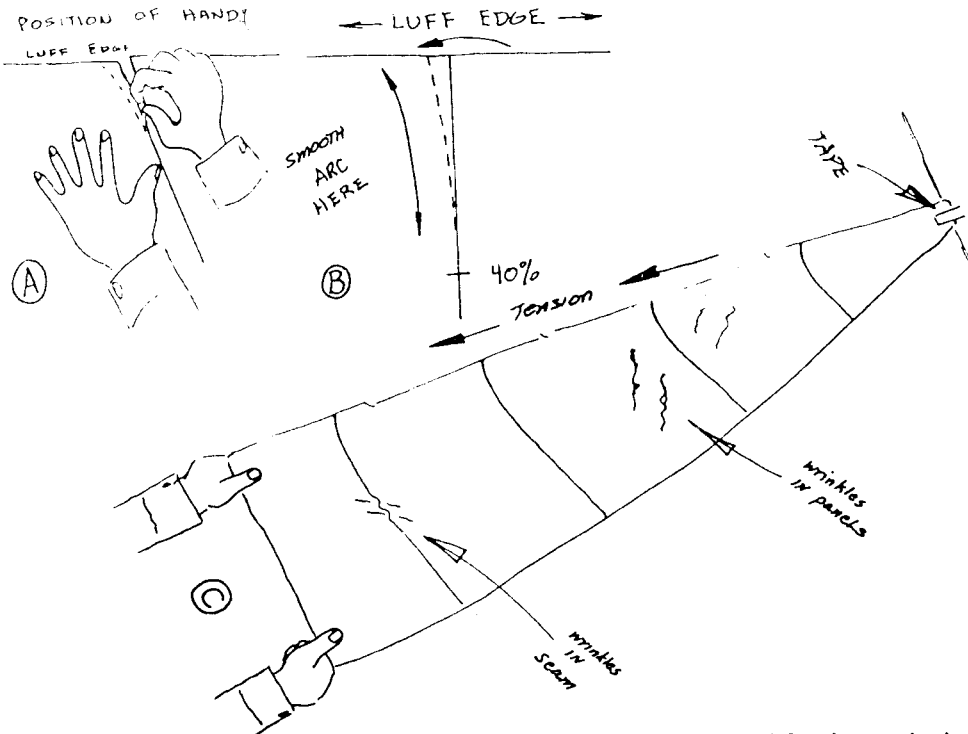
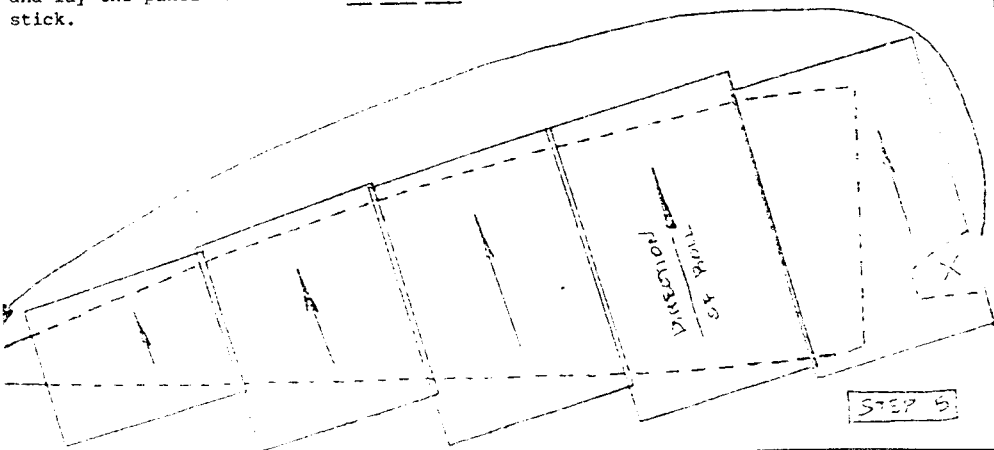
CAMBER % =	1/15.....	.012 x width of sail	
	1/13.....avg.....	.016 x width of sail	HEAVY WIND
	1/10.....	.027 x width of sail	
	1/7.....very full.....	.054 x width of sail	LIGHT WIND

**Step 3:** For additional draft or to just shift the draft back, mark at each seam for broad-seaming. I use this method: for high aspect 36 and 50 sails, where the width is about 10 to 12", broadseam the two bottom panels about 3/16", the next panel 1/8", then about 1/16" on the rest. This will give medium draft in most cases. For wider sails increase to 5/16" or 1/4" for the bottom two and 1/16" less for each panel there on up. In all cases broadseam each leach end seam about 1/16" to prevent its rounding off.

**Step 4:** Mark out your reinforced corners, and head, one layer on 36/600 and most 50/800 and two layers on larger sails. Mark the cut line on the luff, 3/8" is about right for most sails. Mark the batten pockets. The pattern is now finished and you're ready to lay on the cloth. I don't know what to tell you about where to get sail cloth. I get mine from a sailmaker, but I am not sure he is willing to sell to everyone. However, you will have to buy from some sailmaker, so ask for 2.2 oz. While you're dealing with him get the seam tape, also. Battens should be made out of very thin material, plastic offers the largest variety. Keep the batten thin and just long enough to do the job. You can sew on pockets for the battens or you can sew the battens into the seam of the panels. I've had very good luck with the latter, using a zig-zag stitch on the seam which crosses over the batten and holds them in place. Roll the cloth out on the table and measure off the length you need. 36/600 sails require about three feet off the roll. 50/800 take about four feet. Cut off this amount and then cut it into three even strips as shown in the drawing. Roll the three strips together keeping them all the same side up and in the same direction they were cut.



**Step 5:** Starting at the foot lay down one of the strips and cut it off allowing some overhang as shown in the drawing. I allow about 4" at the leach and about 1 1/2" along the luff. Tape the cloth down with masking tape so that it won't shift and then put the seam tape on the top edge ending it at the edge of the sail. Don't remove the paper from the top side of the seam tape yet! (Seam tape is double stick tape.) Now lay on the next panel and overlap the seam the width of the tape. Cut it off and tape it down. Put the seam tape on. Go on with the rest of the panels until the entire pattern is covered with cloth. Check to be sure all the panels are lying smooth and in position. Now fold back each panel carefully, remove the paper from the seam tape and lay the panel back down. Do not rub the tape firmly...just enough so that it will stick.



**Step 6:** Trim off some of the access material along the luff, foot and leach. Mark the corners of the sail and the head and also the 40% point on each panel.

You are now ready to do the broadseaming. In drawing A, we see the positions of the hands. Drawing B shows a close up of what you are going to do. Remember, in broadseaming, you must be careful not to stretch one panel more than the other. The pressure applied must be equal. Sometimes you have to do, and re-do a panel several times until it lays right. This is why you do not rub the seam tape down firm! Do each panel.

In drawing C, we see how to secure the head of the sail to the bench or table and by holding the tack and clew you check for flaws in the broadseam. The sail must lie smooth. Here is where the sail maker earns his pay. It may take several attempts before you get the cloth to lie right. Keep at it...it will back over the pattern, using the corner and heat marks, you put on the cloth. Tape it down and trim off all excess material leaving the sail as it's drawn on the pattern.

**Step 7:** Fold the luff edge and add the reinforcing to the head and corners. These can be "spot welded" to each other using the hot knife. A very light touch will melt the two pieces together, holding them in place until they are sewn. The sail is now ready to sew.

Roll the sail to prevent wrinkles and starting at the top, sew the head and each seam and corners. As you sew down the sail roll and unroll it. I use the pinch type bobby pins to hold it rolled up. After you have sewn all seams and corners sew up the luff edge, add grommets to head and corners and you're done. Good luck and good sewing.

BILL WEBB

This article was originally published in the American Model Yacht Association magazine about 5 years ago when Bill Webb was its editor. It remains the most clearly written explanation of simple sailmaking I have seen.

**SAILS**