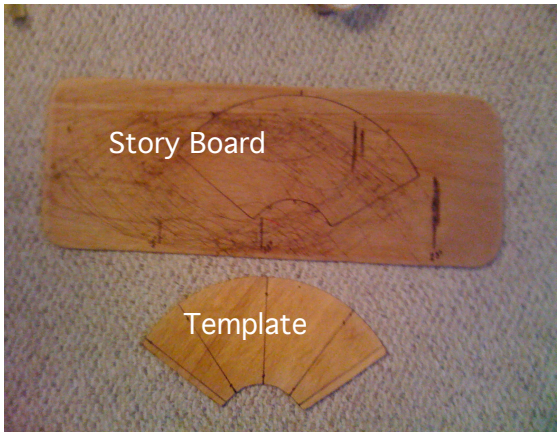
Making a Jordan Series Drogue for Frugally Enhanced Sailors

Sequence:
Do your homework- How many cones (droguettes) do you need?
What materials do you need and where will you get them?
What tools will be needed to pull this off?
Why do you want to do this yourself? (motivation can be difficult to maintain when you are on your um-teenth repetition of an apparently never-ending and very boring endeavor.
Now go to the Resource pages at the end of this document to get familiar with the whole concept and materials needed, and where to frugally find them.
(A well made Jordan Series Drogue with 125 cones assembled and complete can be found online for way under $1000 US delievered to North American addresses.)

When you know everything you need to know come back here or go buy a JSD somewhere. Be Prepared!

OK you've returned so lets get started:

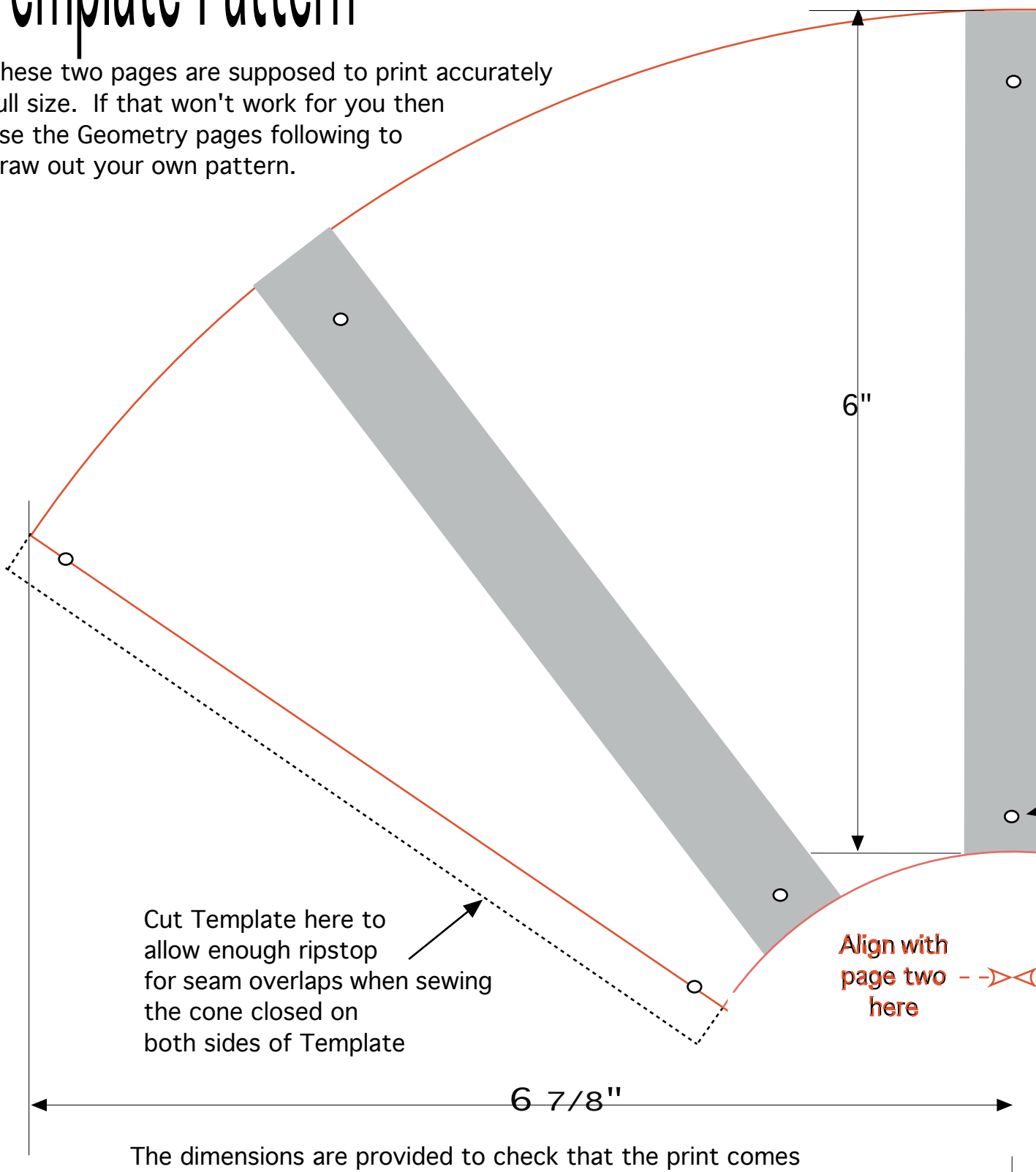
1. Your going to make a Story Board for measuring and cutting the tape and ripstop. And a Template to place on top of the ripstop which is placed on top of the Story Board so you don't burn a surface you really don't want to. I used 1/8" plywood.



2. Print out the "Template Pattern page one" full size and with a ruler check both measurement lines, vertical 6" and horizontal 6 7/8". If they do not measure the same as the drawing then adjust your printer % to get as close as possible, then print both pages. With sissors cut out the Template Pattern and tape the two pages together. Use it to mark your Plywood (?) pieces for cutting and drilling.

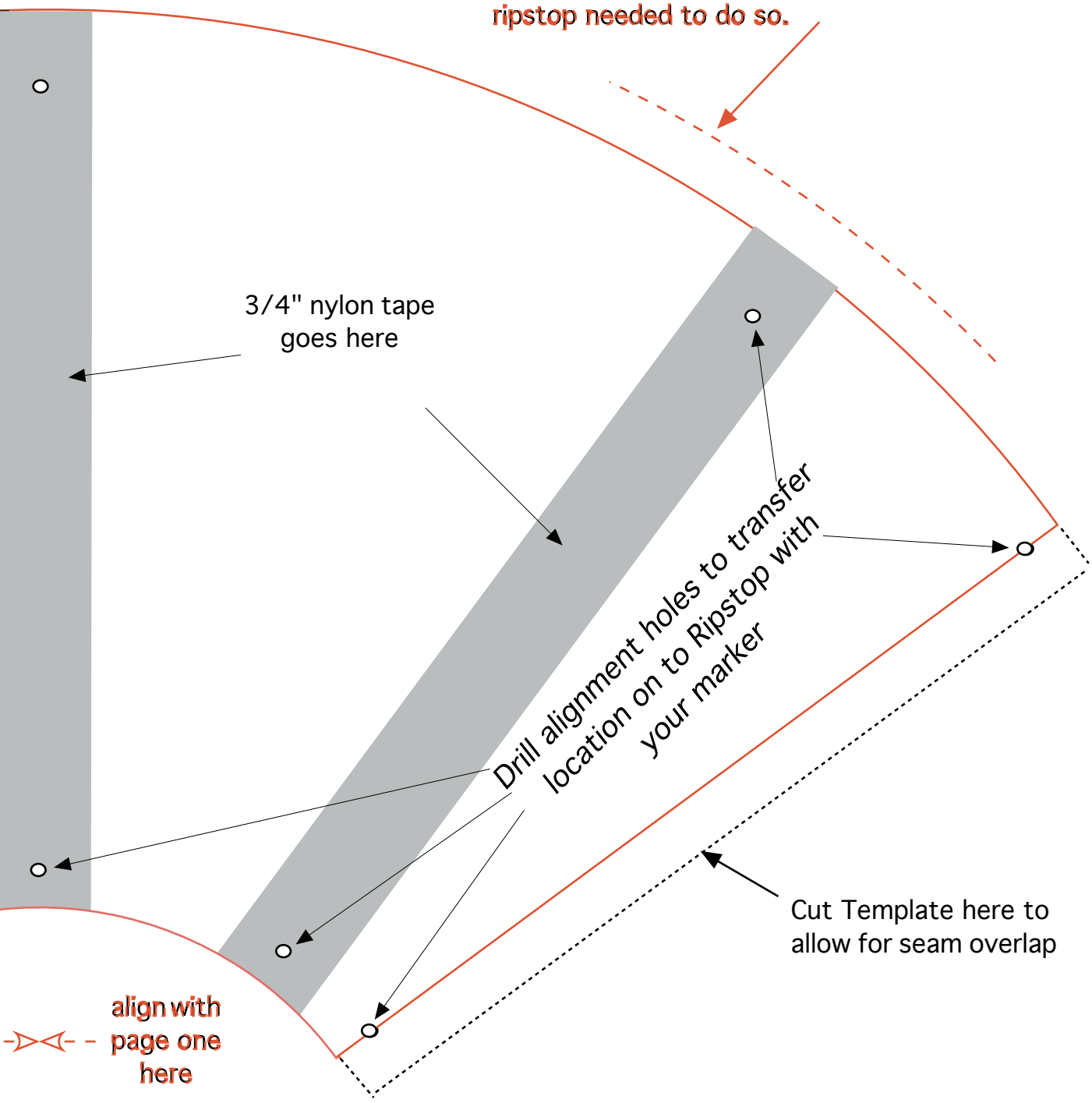
Template Pattern

These two pages are supposed to print accurately full size. If that won't work for you then use the Geometry pages following to draw out your own pattern.



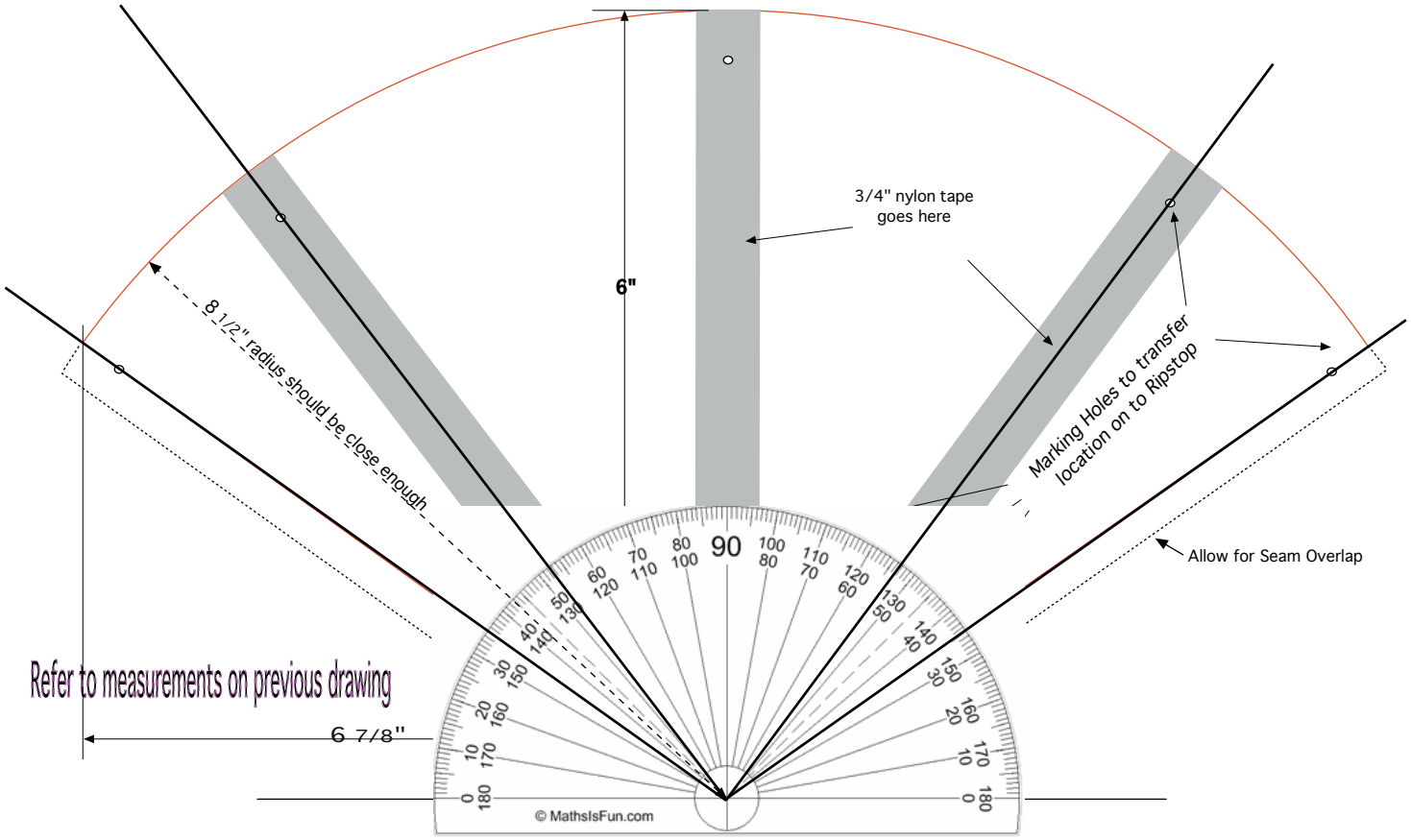
The dimensions are provided to check that the print comes out the correct size. I did the drawings in a drafting program and it may not digit well onto you printer.

Note: If you want to fold over and sew the leading (top) edge of each cone be sure to modify the Template Pattern and the finished Template to allow for the extra ripstop needed to do so.



OR if that didn't work-

Here's the geometry, draw up your own



Now the Story Board. A Story is written in many ways. I am a visual person and when I read other's writings, it is the pictures and illustrations that have priority. So for you, if you need the droll, written step by step then I've added a few #'s for you. I believe that to make anything one must first take a swim in the medium and here we are talking nylon tape and nylon ripstop. Before you are finished with your series drogue you are likely to learn to hate nylon, or I hope learn to love the lovely medium it gives us. To think of retrieving 125 or more cones of wet cotton overwhelms me. Cotton for T-shirts, nylon for series Drogues. So with all nylon components (except I use polyester sail thread V92 for the sewing) the end result is nylon; tape, cones and rope.

#3. The Story Board will tell you over and over and over and ... where to cut the tape! This is important because the tape is what aligns each cone to the line. It does not need perfection, nothing in life does, but still if you were a cone with three legs would it not be better if they were the same length? I think it is that simple, not much more to it. So lets get this thing mov'n.

The Story Board is to be your own creation from what is at hand or easily aquired. It could be made of cardboard or mat-board or 1/8" plywood from my scrap pile as I did. It could be metal if it doesn't steal all the heat from the hot-knife you will use. It is yours and if it doesn't work first time try something else, I did. The Story Board is like a carpenter's story board as it sets the dimensions, it is quick to refer to and provides an easy measure without constant refering to a tape or ruler. This Story Board will also be the cutting board when the ripstop is lying upon it with the Template on top of the ripstop and the hot knife in your hand. If you use cardboard then make multiples of each, they don't like the heat. My plywood ones are still going strong and good for at least another drogue.

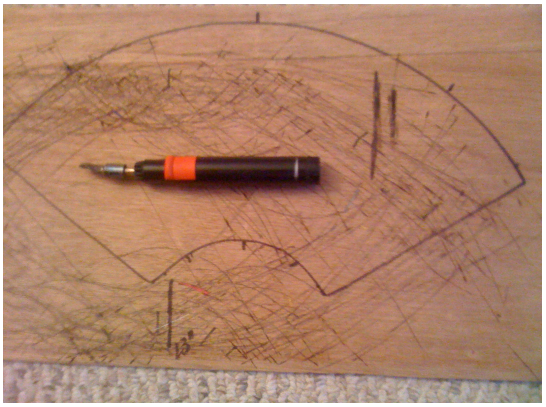
Make it nice, something you feel good about, you will be spending a lot of time with it.

The Story Board needs to be larger than the Template in both dimensions. Horizontally it must be over 23", vertically more than the height of the Template. I would think 30" wide by 15" high would be the smallest practical and useful Story Board.

#4. Cut it out and round the corners and sand silky smooth all edges of your Story Board so it does not snag your ripstop. Do the same to your Template after drilling the alignment holes which need to be big enough to allow the end of your marker to touch the ripstop underneath. Smile and be proud.

#5. Mark your Story Board on a line at 7", 13" and 23". You can mark from left to right or east to west it only matters which hand is your dominant one. For me it is west to east. This line of marks is for cutting and marking the 3 pieces of tape for each cone.

I drew an outline of the Template on my Story Board, it was not necessay, but I did use it a several times when a cut piece of ripstop was missing an alignment mark or two.



Now you have everything needed to use your hot knife and get to cook'n.

I use a butane hot knife because I have two and they work well. A solder gun with a small tip will work just as well. You probable will not need more than a 25-35 watt pencil gun to do the job. You want enough heat to melt but not burn the tape or the ripstop. A little experiment and adjustment will provide just the ticket. Keep it cool enuf to avoid smoke while providing enuf to smoothly make the cuts. I suppose the perfect tool is available if money is no object, but then you wouldn't be reading this far; or you're still here because you are comfortable with being responsible for the trouble one can get into at sea and want to give yourself the advantage of the best possible construction & total control of something you will never likely need to deploy.

6. Next cut three 23" pieces of tape for each cone you need for your boat, and mark each from your Story Board so that they are much the same. Please break this process into smaller bits. It drove me nuts and was amoung the most boring and seemingly worthless things I have ever undertaken. A strong shot of whiskey and a good bull session with friends helps somewhat, but the object is still to **make something** you hope to never have reason to see again after it is stowed away. I used lots of colors of ripstop which was laying around in my scraps bin followed with new ripstop I bought on ebay for $38.

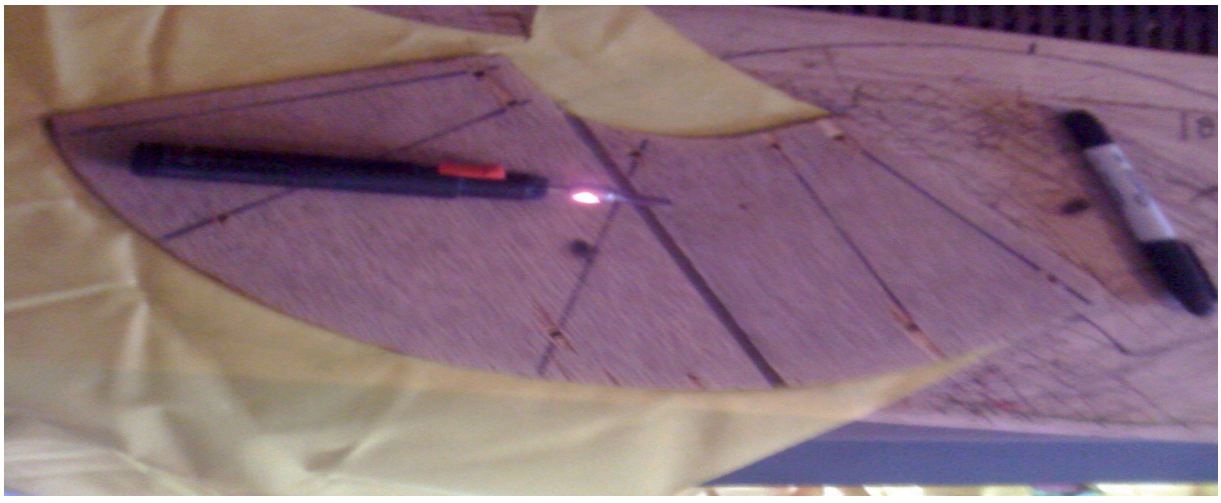
I think after losing my ability to think clearly and critically because of the repetiveness of this process I needed to move on and so I sewed up a cone or two. Best thing I could do looking back, because not only did I get a break from the monotonous cutting and marking but that now I was to begaining to understand the depth of thought and engineering Mr. Jordan put into designing this excellent idea.

Now we have a pile of pieces of tape which are 23" long with 2 marks on each piece and the marks are at 7"and 13" from one end. The number of 23" pieces of tape is 3 times the number of cones we need for our JSD.

Next cut the cloth. Some use sissors to make the cuts, after all it is ripstop.
For me it is easier to use my hot knife and I get the benefit of a sealed edge.
To each their own.

7. Get out the ripstop and drap it over the Story Board, put the Template on top and heat up your hot knife. Follow the outside edge of your template and cut the ripstop to a whole bunch of these pieces. One for each cone needed. Remember to mark each at the alignment holes in the Template after the cut or you will have to go back later to do so.

I think after losing my ability to think clearly and critically because of the repetiveness of this process I needed to move on and so I sewed up a cone or two. Best thing I could do looking back, because not only did I get a break from the monotonous cutting and marking but that now I was begining to understand the depth of thought and engineering Mr. Jordan put into designing this excellent idea. Suggest you do the same before going on much farther. In fact it might be best to cut and mark a few tape pieces and ripstop to sew up 2 or 3 cones early on and see what you have gotten yourself into.



Sewing is easy enough as long as the machine is set up with the needle and thread matched to the job at hand. I use V92 polyester sailmaking thread with a #20 needle. The machine is an old Japanese made 45 pound "portable" that can sew leather, but most any home machine which can handle a #19 or #20 needle should work. Some use V69 thread with a #16, 17 or 18 needle. Nylon thread is also acceptable but there are lots of other uses for polyester thread around boats.

8. If you will be folding over the leading edge of the cones now is the time to do so and sew it. Next sew each 23" tape onto the ripstop with the 10" tails toward the boat and the 7" tails toward the aft end of the series drogue. Run two zig-zag seams along each side of the tape and be sure to lock the stiching at each end by sewing back over.

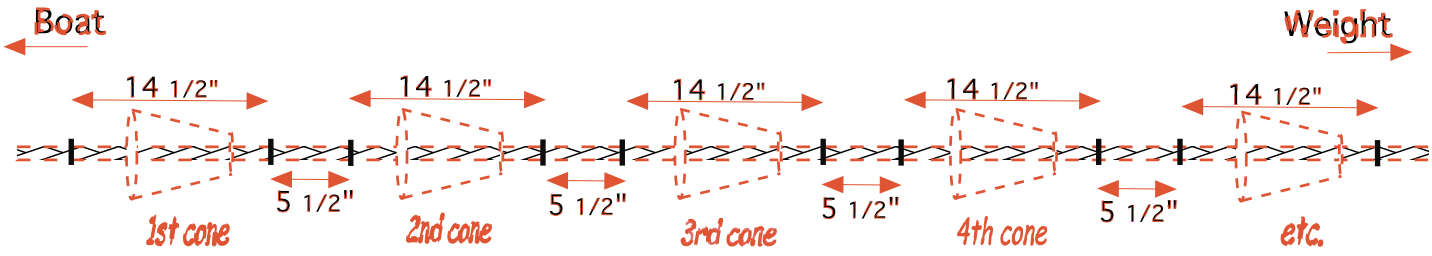
With the three tapes to the inside fold the ripstop in half on the six inch axis and align the extra cloth to sew the seam with two rows of stiches which completes the sewing of a cone. Be sure to sew back over each end to lock the stiches.

Push the 6" tails through the little hole and turn the cone right side out so the tape is on the outside of the cone and the 10" tails are at the big end of the cone. If it is what you want then go ahead and make a hundred plus more.

Put it all together. Go back to the plan you drew up and decide how you want the JSD constructed. You will have the Bridle which is simple enough, just allow for the conection to the Leader Line and whether it will be a continuous part of the JDS or connect to a separate Drogue Line that has the cones on it. You may want to splice eyes with or without thimbles in some of the ends before you build the Drogue Line. If you have previously finalized your plan then it will be obvious how to proceed in the right sequence. Remember that the farther a cone is from the boat the less potential force which can be applied on that area of line. Some have reduced the sized of the Drogue Line by using smaller diameter line for one or more sections farther from the boat. All of the above paragraph should already be decided, and you should have a firm plan if you did your homework in the beginning. If not then stop now and get up to speed.

#9. Place the cones on the Drogue Line. Some thread their cones over a length of plastic pipe then thread the line through the pipe which allows one cone at a time to be slid off the pipe as needed. I found I could take six to eight cones stacked together and easily drop the end of the line through stack which is held in one hand, the line in the other. 20-25 cones can be easily slid along the line at once. I think this is faster than the pipe unless you're into mass production. Feed them onto the trailing end of the line with the big end toward the boat.

Mark cone placement on the Drogue Line(s). Use your Story Board to lay out the measurment for cone placement. Going from the the leading (closest to boat) end of the Drogue line use my Sharpie marker to place a mark at 14 1/2" followed with another mark another 5 1/2" toward the trailing (weighted) end. I liked placing several cones worth of marks then splicing and tying the cones, then more marks, more cones, etc.



Using the tool of choice feed each end of the tape into the line under the outer braid, but not into the inner braid. I found a 1/4" Samson Braided Rope Fid with a pusher rod to be better than a latch hook, forcep, or bent wire. It was smooth with no damage to fibers and much faster than the others. Tie the ends off. (I used figure 8 knots toward the boat end and overhand knots on the trailing end. It was easy this way and it is the boat end which will have the most force applied.)

Onward until done. Stow it away and watch your weather windows.

May You Never Need to See the Monster Again!

Pleasant Voyages,
Brian

March, 2012

135 cone drogue less tha $250 total, but I did get a deal on the rope.

Resources Info & Video

Do Your Homework. Visit these great sites and soak in everything you can Then using the charts, techniques, suggestions and cautions and everything else you now know, design and draw out your JSD just as you intend to build it. List materials needed, tools to find or make, print out anything you might need close to hand. When I was teaching you would have been given dates when each step was to be completed, but you lucked out so now your on your own.

This guy bought a kit, see what he has to say. Sure you want to build from scratch? Probably works out to around $6-7 per hour or less for your time.

http://www.wbryant.com/StellaBoat/Projects/canvas/drogue/index.htm

http://www.seriesdrogue.com/

http://www.acesails.com/A_3.htm

http://www.sailrite.com/Series-Drogue-Complete-Kit-107-Cones

http://www.cruiser.co.za/JordanDrogue.pdf

http://seriesdrogue.com/coastguardreport/

http://www.jordanseriesdrogue.com/pdf/JordanSeriesDrogue.pdf

Sailrite and Ace sails have info on constructing the series drogue including videos on utube

A little more searching will result in tons of additional sites.
Good Luck

RESOURCES

Materials

Cones are made from Ripstop Nylon 1.5 oz. cut to the Pattern. You can get approx. 15 cones per 39" wide yard. Several sources on ebay sell for $3 to $12 per yard. Many of the yards are 60" or more in width which provide many more cones per yard. I bought an additional 6 yards 60" width for $38 including shipping.

Why wouldn't Tyvek work? Any opinions? Better yet, any Facts?

Nylon Tape is 3/4" x .015" thickness cut to 23" lengths.
10" goes at the boat end of the cone, 6" sewn to cone, and 7" to the tailing end. Use a tape your sewing machine can handle and has approx. 200# or more tensile strength. The tape is known as Grosgrain tape or ribbon, Nylon Webbing, or Nylon Tape. I found mine on ebay for $35 for 1500' x 3/4" with 600# breaking strength, Military Spec T-5038. Lots left over for other boat projects.

Thread should be a good quality polyester or nylon outdoor thread. Polyester sail making thread is highly recommended and has many other uses aboard.
I purchased from http://www.thethreadexchange.com. $23 for 4200 yards, lots for other projects.

Rope should be top quality from a known reputable manufacturer, there are parachutes manufactured in some countries I would not use, same thing. I had the great good fortune to be first in line to a chandlery going out of business. Had all the rope needed. Some shopping around can turn up good stuff a low prices. If you don't wish to wait for such opportunities contact manufacturers/wholesalers about buying full rolls, one can't have too much line aboard.

Resources

Tools

Electric soldering iron if needed, Weller makes many suitable models to be used as a hot knife. Careful to be able to keep the heat low enough so it doesn't smoke and burn. Probably 25-35 Watts is enough. Need a very small tip. These can be found in flea markets or pawn shops for a few dollars. I use one when I need to cut line larger than 5/8"

Samson Braided Rope Splicing Kit (should have one aboard regardless of whether it is used for this project) imho

Sewing machine needles: http://www.schmetzneedles.com/ I dulled 3 needles, cost under $3.

Sewing Machine: most any sewing machine that is in good operating order should be able to handle this project. Ripstop sews easy and the tape is not thick webbing so a sharp needle and good thread, careful adjustment and a little pratice will do the trick. Beg, barrow or (buy?) Keep your bobbins loaded with the same thread as comming into the machine. Use the right needle thread tension, adjust the presser foot. I hate to do so myself but if all fails read the manual.