

## Mosquito Netting Frame for Cots in Tents at Camp Mach



**IMPORTANT:** The following plans are for a piece of mosquito netting I purchased from REI in June of 2007 for \$12.00. (Description: “Mobasa outback Travel Net – Single” and P/N 729006 – Do a Google search to find it.). The dimensions of the finished mosquito netting are 32” wide x 60” tall x 84” long.

If you do not purchase a pre-make mosquito netting, then you will need to buy flat netting and sew it to the finished dimensions you desire – may, or may not, be more trouble than it is worth based on the \$12.00 price.)

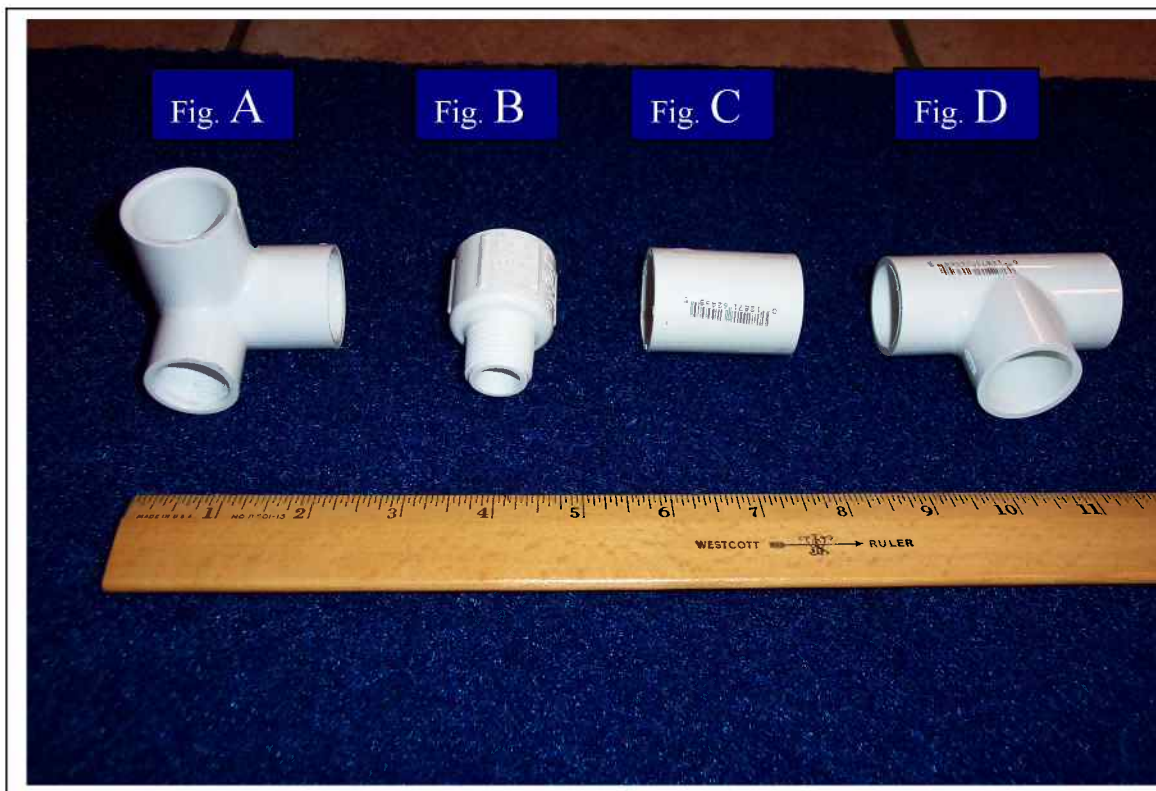
The tents at Mach are constructed (as of June 2007) such that if you are more than about 42” tall your son will have to move the frame closer to the center of the tent to accommodate the height of the frame. The frame, with the given dimensions, are long enough to fit over the cot so that the width doesn’t matter. Please remember that very few of your sons will need more than two (2) feet (24”) of width to sleep...(probably less than 20” would do.) The rest of the mosquito netting can drape over the edges of the cot and fall to the floor. Please note that if you make the finished dimensions of the frame super close to the finished dimensions of the

mosquito netting you run the risk of the netting rubbing on the frame and tearing a hole in it – thus defeating the purpose of having a mosquito netting over your son...

**Goals:** The goals of this project are two-fold:

- 1.) Provide a project that you and your son can work together on for about 1.5 hours and teach him how to use tools (measure tape to measure, pencil to mark lengths, how to use a saw to cut, bench to hold work piece – PVC pipe), how to read a plan to make something and how to glue PVC pipe.
- 2.) Provide something to support the mosquito netting you purchased for him to use at Camp Mach!

**Pictures of Components you will need:**



**List of Parts Used:**

Ref . Fig .	Qty	Home Depot SKU	Description	Price EA. as of 6/25/07	Comments
A	4	B 613- 525	PVC SIDE OUT Elbow	\$1.55	Connector shown in the left of the picture that has three (3) holes at right angles to each other – like something that would make up the corner of a

					box.
<b>B</b>	4	A 294- 020	$\frac{3}{4}$ x $\frac{1}{2}$ MADP	\$0.64	Connector shown next to the left in the picture. Adapter with threads at one end that will screw into one hole that is different on the PVC SIDE OUT Elbow above. This adapter has a $\frac{3}{4}$ opening on the other end to which you will insert the legs of the frame.
<b>C</b>	2	A 188- 077	$\frac{3}{4}$ PVC CPLG	\$0.19	Connector just to the left of the Tee (which is to the far right) in the picture. This is a short connector whose purpose is to connect two pieces of the same diameter pipe to one and another.
<b>D</b>	4	A 17- 197	$\frac{3}{4}$ Tee SSS	\$0.28	Connector shown in the right of the picture that looks like a "T" with a very short vertical. This looks the same as its description a 'TEE' This piece will be used at the bottom end of the legs. The 'bottom' portion of the TEE will be used to connect the pipe used as the 'stretcher' between leg widths.
	4	A 193- 712	$\frac{3}{4}$ x 10 feet PVC Pipe	\$1.50	A 10 foot length of $\frac{3}{4}$ " inner diameter PVC pipe. Can't quite get the last piece out of 3 lengths, need 4 – gives you a little room for error if you make a mistake ;-)
	1		PVC CEMENT	\$2.56	PVC Cement – Clear (color doesn't matter)

**Cut the following pieces:**

Qty	Length	Description
4	32 inches	Legs
4	24 inches	"Stretchers" across width
4	38 inches	Two together make the length of the frame on a side

**Important!:**

- 1<sup>st</sup> 10 foot piece of  $\frac{3}{4}$ " x 10' pipe - Cut three (3) pieces 32 inches long for the legs. This will leave a single piece of 24" long for one of the "stretchers."
- 2<sup>nd</sup> 10 foot piece of  $\frac{3}{4}$ " x 10' pipe – Cut three (3) pieces 38 inches long for traversing the length of the cot. This leaves a waste piece of approximately 6".
- 3<sup>rd</sup> 10 foot piece of  $\frac{3}{4}$ " x 10' pipe – Cut one (1) piece 38 inches long and three (3) pieces 24" long for three (3) of the stretchers. This leaves a waste piece of approximately 10".
- 4<sup>th</sup> 10 foot piece of  $\frac{3}{4}$ " x 10' pipe – Cut one (1) piece 32" long for the last stretcher. This will give you a left over piece of about 88" long to use for 'mistakes...'
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### **Attaching the Connectors to the PVC Pipe:**

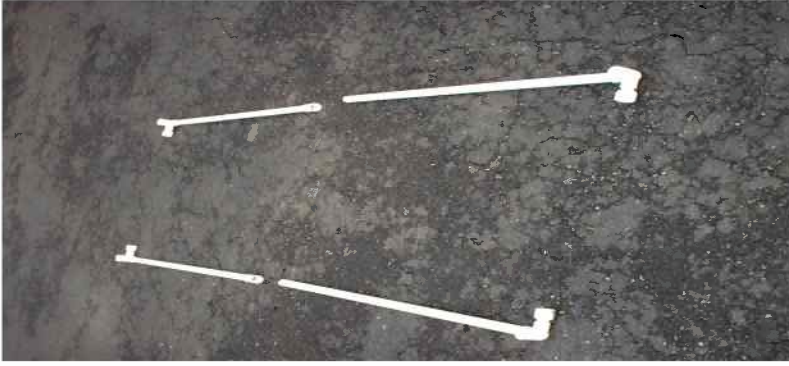
As you can see from the picture of the finished frame, it is basically a big box. We will use the  $\frac{3}{4}$ " x  $\frac{3}{4}$ " x  $\frac{1}{2}$ ", 3-way right-angle elbows (and  $\frac{1}{2}$ " to  $\frac{3}{4}$ " adapter) to make the four (4) top corners of the frame. We will then use the Tees at the bottom of the legs so we can attach a cross piece for added stability.

First: Screw the  $\frac{1}{2}$ " to  $\frac{3}{4}$ " adapter (Fig.B) into the  $\frac{1}{2}$ " threaded end of the  $\frac{3}{4}$ " x  $\frac{3}{4}$ " x  $\frac{1}{2}$ ", 3-way right-angle elbow (Fig. A). This will now be used as one of the top corners. (Screw them in tight, or if you want, you can use the PVC cement to make them permanent.) (Make up a total of 4 of these corner assemblies.)



**Remember:** The  $\frac{1}{2}$ " x  $\frac{3}{4}$ " adapter will be the end that supports the leg.

2<sup>nd</sup>. **LAY OUT ALL PIECES BEFORE GLUING PARTS TOGETHER!** Once glued, if wrong it is scrap and can't be fixed! Now we assemble the corner pieces to the top rail pieces of pipe that are 38" long. (This is done to minimize the number of pieces that your son will have to assemble at Camp Mach.) Lay out the four 38" long pieces that will be the top rails as shown. In the picture below, the corner assemblies you made above are oriented with the  $\frac{1}{2}$ " x  $\frac{1}{2}$ " adapter end pointing towards the middle. This means that after you glue the corner assemblies to the top rails when you rotate them with the  $\frac{1}{2}$ " x  $\frac{1}{2}$ " adapter end pointing towards the ground, the  $\frac{3}{4}$ " opening of the 3-way connectors will be ready to accept the 24" stretchers which form the width of the frame.



Once you are sure they are laid out and oriented correctly, one-by-one glue the corner assemblies to the rail pieces. When you are done, you should have 4 top rail pieces, each with one corner assembly permanently glued on the appropriate end as shown in the picture above.

3<sup>rd</sup>: Choose two (2) of the top rail assemblies NEXT TO EACH OTHER and FROM THE SAME END. To the end of each of those top rail assemblies, glue one (1) of the couplings.

4th: For each of the 4 legs (32" long pieces of pipe) glue one end of the pipe into one of the LONG ends of a TEE.

So at this point you should have a total of 12 pieces. All of the connectors should be attached to pieces of pipe so that your son will only have 12 pieces to take to Camp Mach (and return home with!)

### **TIPS:**

#### **» DON'T BUILD THIS FOR YOUR SON – MAKE HIM DO IT!**

Remember, your son will be the one setting it up and tearing it down at Camp Mach. The more he is involved with the creation of the frame from start to finish he will know it inside and out. Remember, you will NOT be there to help him at Camp Mach – he needs to be able to do it on his own!

» **Identify pieces** that should fit together by marking with colored markers, numbers, symbols or any means you feel appropriate. For ours we used four colored markers (Sharpies) to color the ends of the pipe and the connector into which they should be inserted. We used one color (black) for the bottom stretchers, a 2<sup>nd</sup> for the upper stretchers (red), a 3<sup>rd</sup> for the legs into the top rails (blue) and a 4<sup>th</sup> for the end of the top rail the coupling (green).



» **Carrying Case:** Scott V. told me a very useful tip – use the canvas/cloth/nylon bag that a folding camping chair comes in! (also known as a ‘captain’s chair.’) You can pick them up every day for \$15 or less – sometimes as cheap as \$5/each on sale. Otherwise use a stuff/ruck sack you may have lying around. This makes it easy for your son to carry and keep pieces from getting lost.

» Have your son Erect/Teardown the frame several times before he goes to Camp Mach. He needs to know how to do this as he will be on his own – not only for erecting it, but taking it down at the end of the week as well. Do it over several days, several times – if he hesitates at all, he probably needs to do it again.

### **Final Dimensions:**

Final dimensions of frame as prepared above is 27” wide x 37” tall x 77” long

**Availability:** When I spoke with Scott V. he showed me a frame that used  $\frac{1}{2}$ ” PVC pipe for the vertical legs and for the ‘stretchers’ that connect the bottom of the legs across the width of the frame. (The stretchers are used for stability purposes so the legs don’t wobble as much.) Unfortunately when I went to Home Depot to purchase the parts, they did not appear to even carry the  $\frac{1}{2}$  x  $\frac{1}{2}$  threaded adapter to be used with the  $\frac{3}{4}$  x  $\frac{3}{4}$  x  $\frac{1}{2}$  by 90 degree elbows that are threaded on the  $\frac{1}{2}$  opening. I thus used what Home Depot carried – the  $\frac{1}{2}$  threaded x  $\frac{3}{4}$  adapter – and used  $\frac{3}{4}$  pipe for the legs as well. This added a little more weight, but not too much. Also I didn’t have to go to hunting for the other parts and allowed me to purchase only one size pipe – all from the same store ;-)

**Weight:** Total weight of all pieces is just about 8 pounds.

**NOTE:** The information given here is a culmination of a sketch given to me by Pat R. which we believe came from Ken W. or Tom M. along with an extended conversation and a showing of previously built frames with Scott V on 6-25-07. Please feel free to make your own modifications and improvements. Just make sure to share it with all!

**Errata:** 7-2007: Thanks to Nancy H. for clarification of the mosquito netting used and that the length of pipe cut from the 4<sup>th</sup> 10 foot pipe should be 32” (and not 24”).)