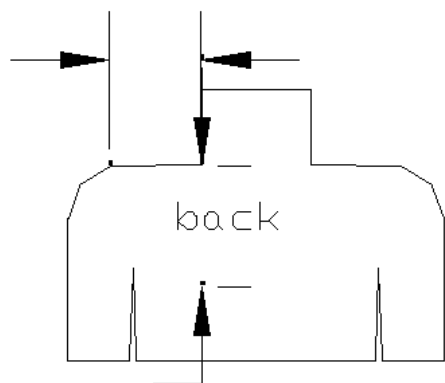
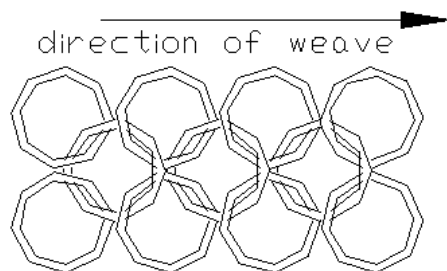


The doubler is an extra piece of maille that hangs over the shoulders as shown. It is fastened to the back with rings, and to the front with Hamata Hooks. Two studs are riveted to the doubler in the front, and the hooks are riveted to the vest. The following tutorial will show step by step how to make a Roman Army Doubler.

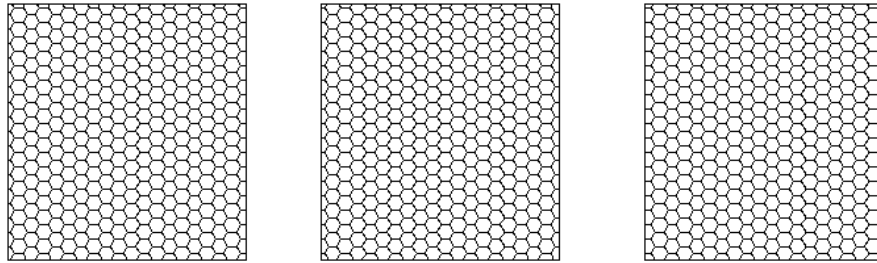


Measure the distance from the neck to the shoulder as shown. Then measure from the base of the neck to about 2 inches below the armpit.

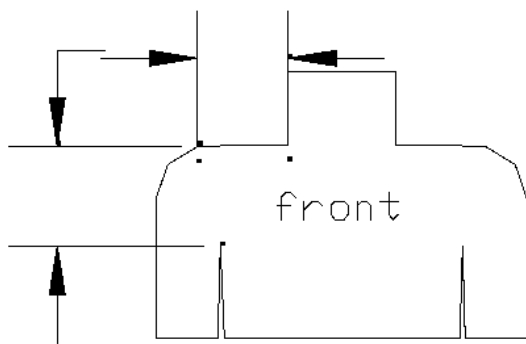
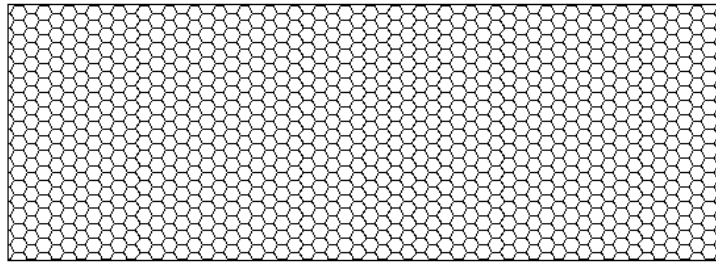


Knit 3 patches with that measurement. Arrange the patches with the direction of the weave as shown.

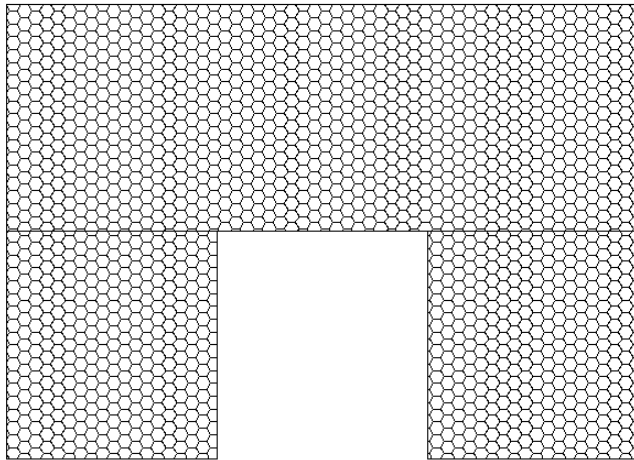
Page 2



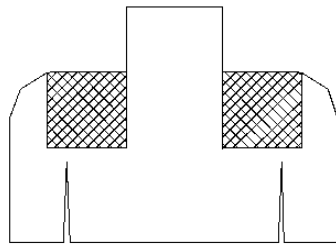
With the direction of weave shown on the previous page, knit those three patches together.



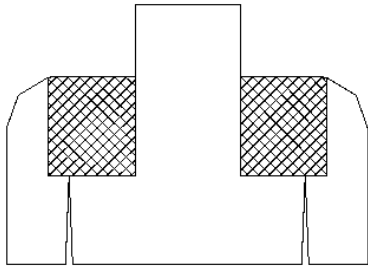
Measure the distance from the neck to the shoulder as shown. Then measure from the base of the neck to 2" below the armpit. Now make two patches using this measurement.



Knit the two patches to the large patch like so.

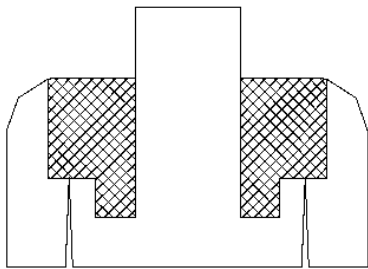


Now check for fit, if the maille does not come down even with the "nipple" on the chest, add rows of rings until it does.



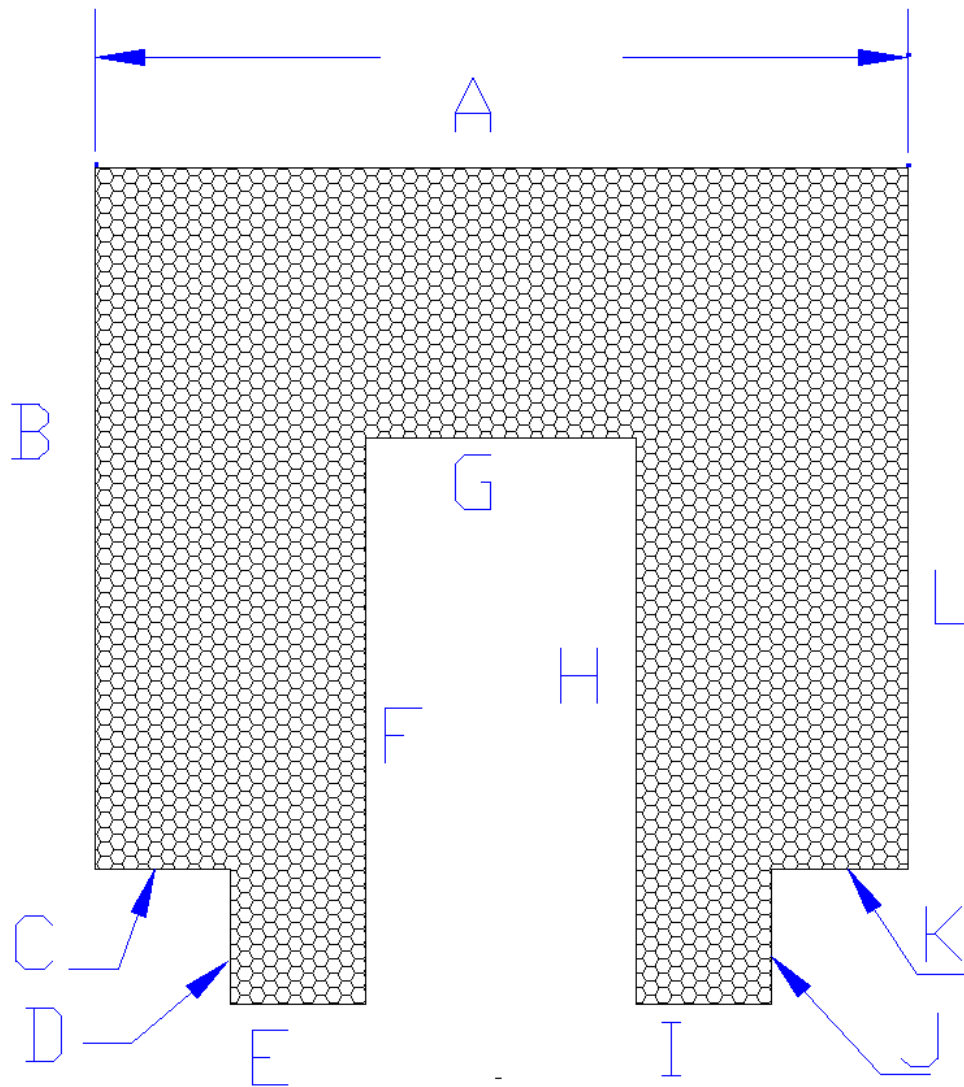
Once you have finished attaching the patches and any adjustment as necessary, try it on, it should fit smooth both back and front.

Now to put the final touches on the maille part of the doubler. Knit two more patches approximately  $2\frac{1}{2} \times 4$  inches long

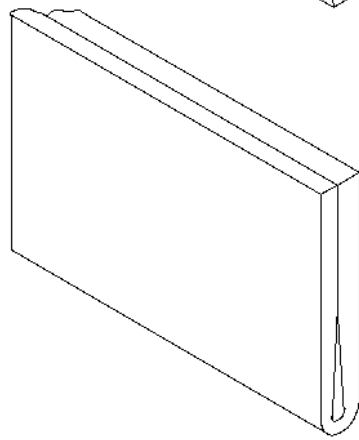
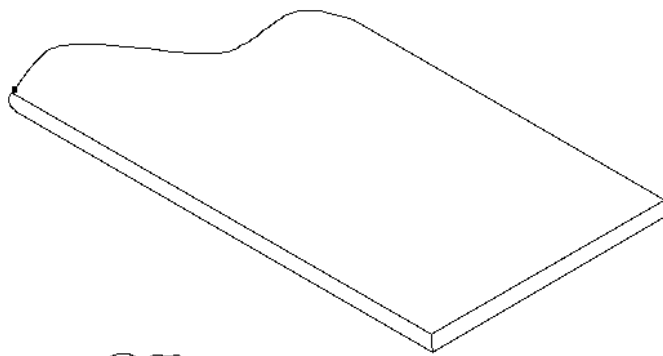


Attach them to the front pieces as shown.

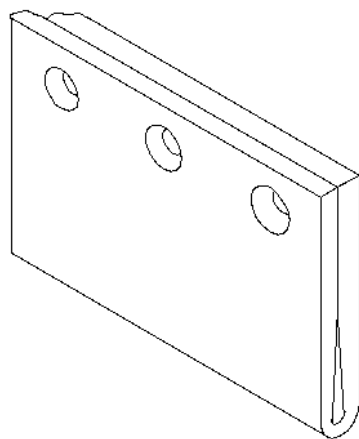
This is where the fun begins, putting the studs and leather trim on the doubler. The method I will show you is not the only one, but it is the one that worked best for me.



Lay your doubler out flat and measure as shown  
Take a piece of 5oz leather, and cut a 1" strip the same length.  
Measure each edge and record the measurements, then cut leather strips as needed.  
make sure to cut a separate piece for sides A thru L

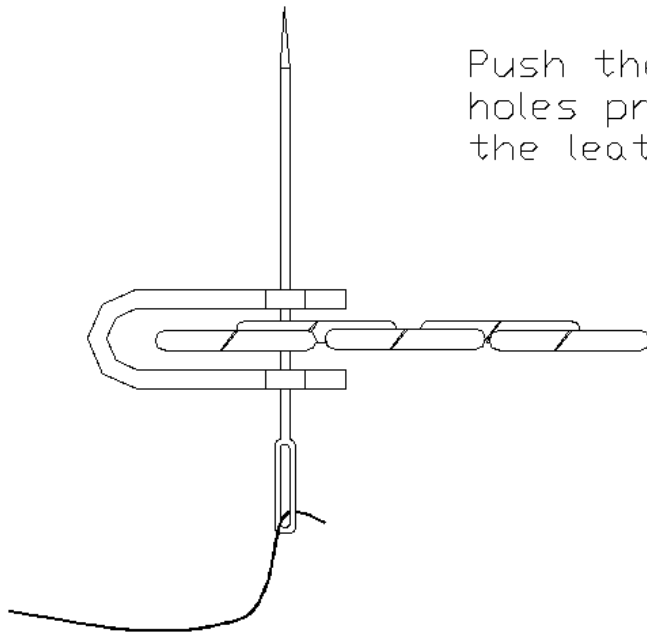


Take one of the leather strip you cut and fold it in two as neatly as you can.

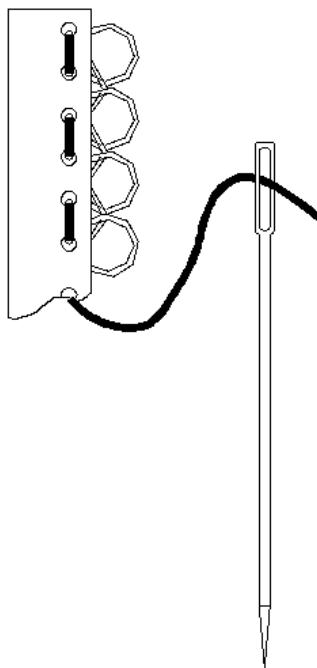


holding the piece as firmly as possible and using a 1/16" hole punch, evenly punch holes the entire length of the strip.

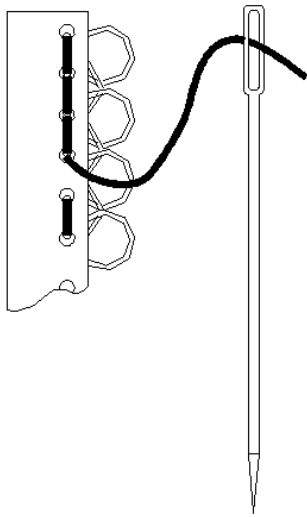
Using either hemp cord or Waxed linen cord about 1/16 dia. sew the leather to the maille.



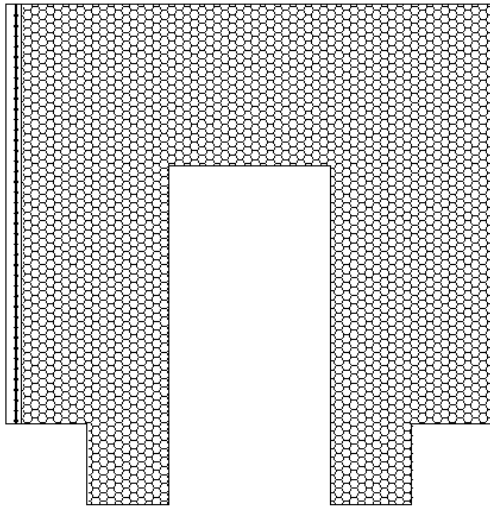
Push the needle through the holes previously punched in the leather.



Sew in a snake pattern until you reach the end of the strip.

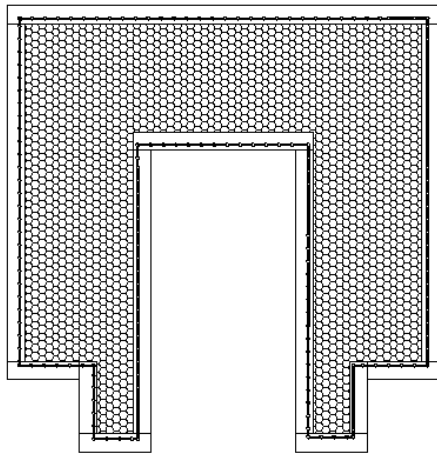


After you reach the end of your piece, loop back and fill in the gaps it should look the example shown here.



Continue until you have sewn leather around the entire perimeter of the doubler.

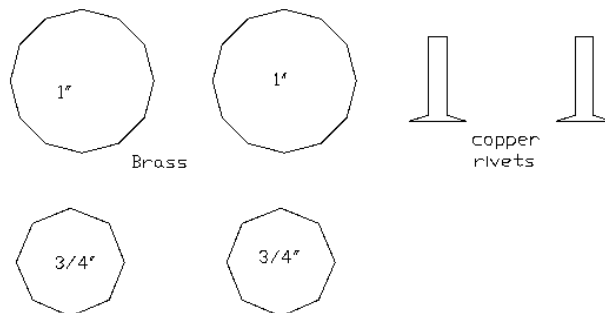




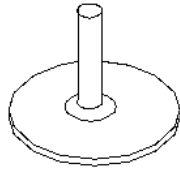
Once the leather is sewn into place, you can dye it or just apply a coating of Neetsfoot oil.

When the neetsfoot oil has dried, you will want to mount the studs for your Hamata hooks. To make the studs, you need to find or manufacture 2 x 1" circles of brass, and 2 circles 3/4" brass.

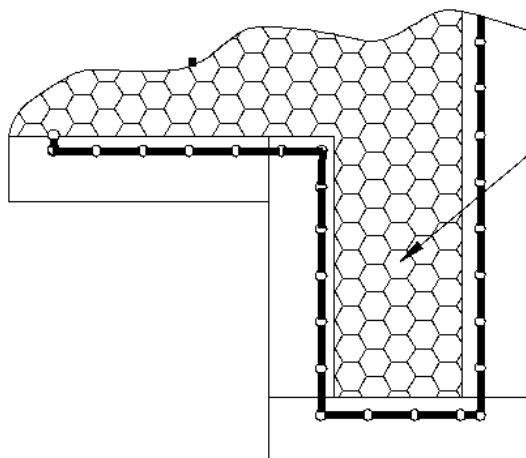
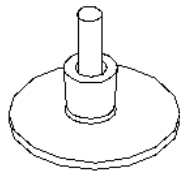
You will also need 100 degree countersunk rivets.



Solder the rivets to the center of the  
1" circles

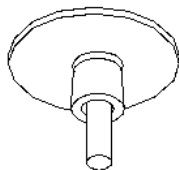


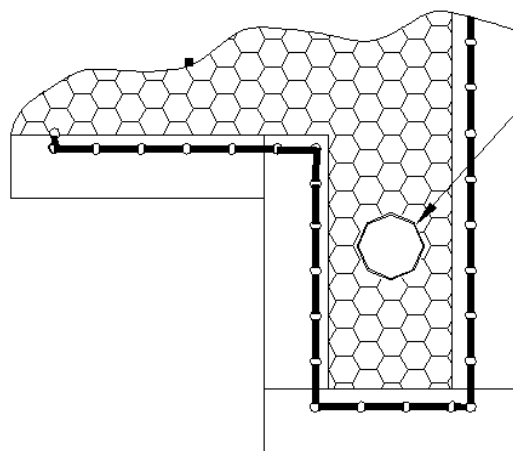
find a 1/4" spacer and place it over the rivet  
as shown..



location of stud

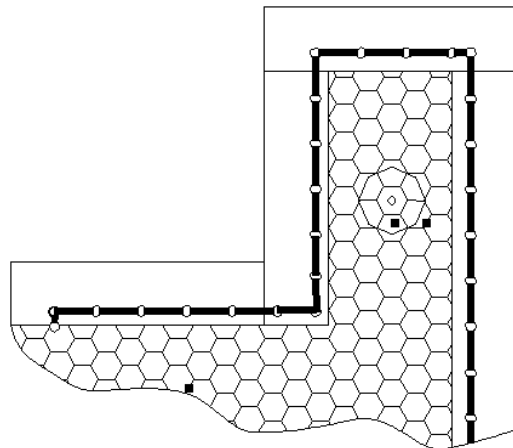
place the stud through a ring  
in that location.





Stud

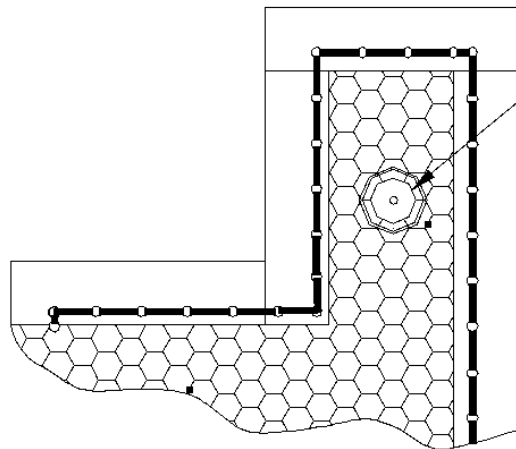
The placed stud should look something like this



holding the stud in place, flip the piece over. You should see the copper rivet sticking through the rings on the other side.

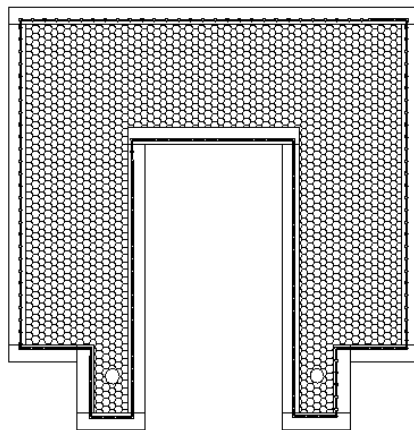


Take one of the 3/4" discs and drill a 1/8" hole in it.



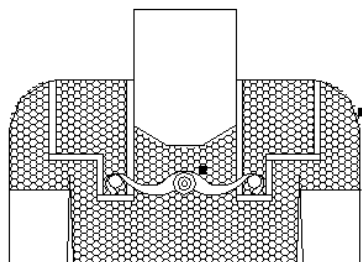
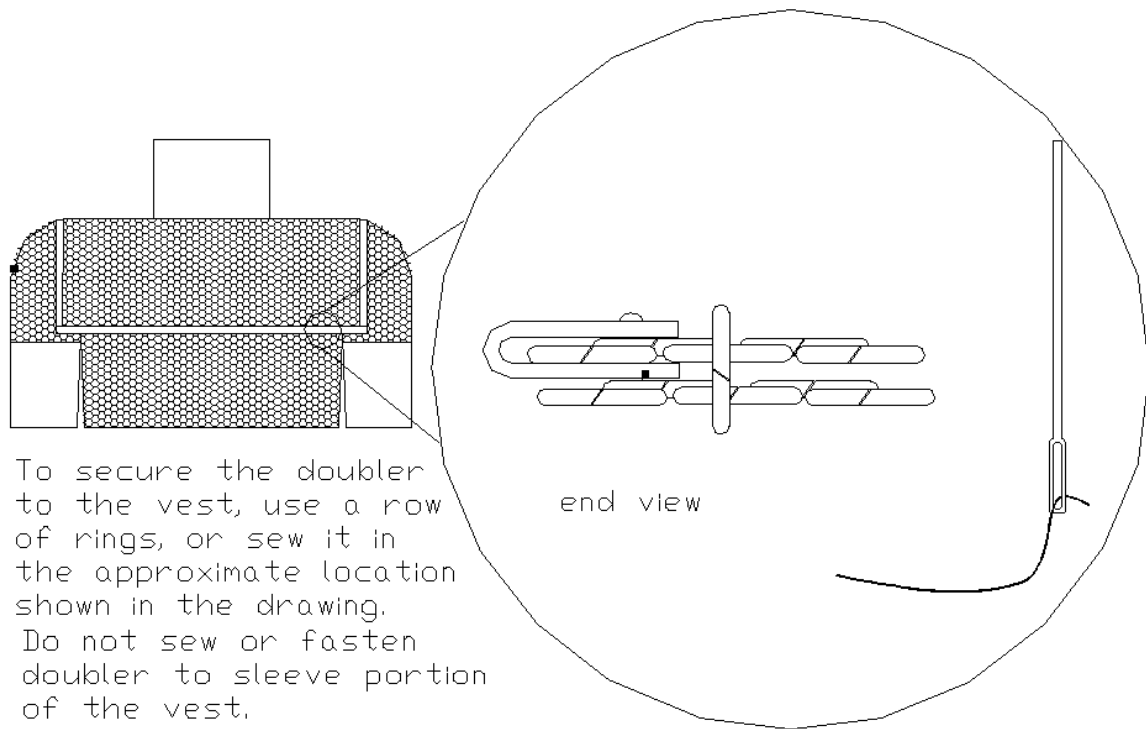
3/4" disc

Place the small disc over the stud and push down firmly, hold the disc in place with a pair of pliers and "mushroom" the rivet with a hammer. Do not hammer too hard, as the rivet will bend. The Large disc will now be secured to the doubler.



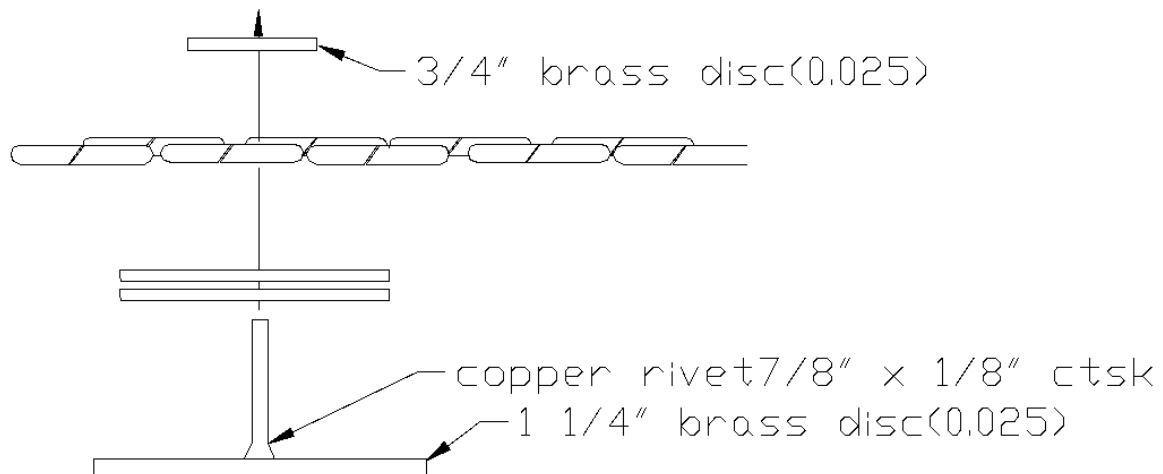
Do the same with the other chest tab. Make sure that both large discs are facing the same way.

The Doubler is now ready to be mounted on the vest.

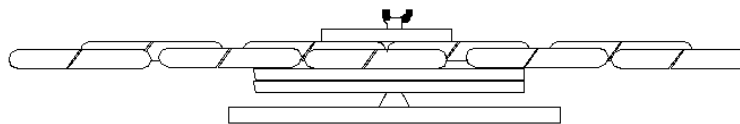


Fasten the front portion of the doubler to the front with "Hamata Hooks". These are riveted to the vest

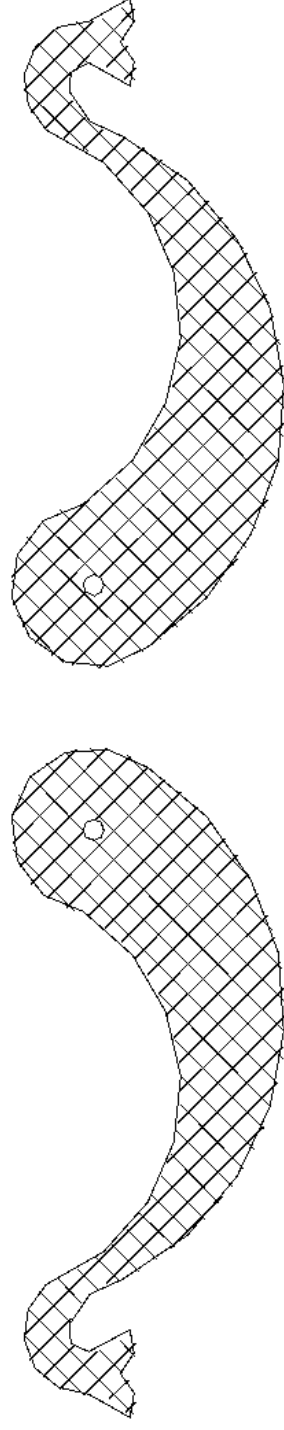
Choose a location mid point of the neck and about 3 inches down. Make sure that the hooks are located higher than the or on the same line as the doubler tab studs.



Mount the hooks using a 7/8" rivet soldered to a 1" to 1 1/4" disc of 1/16" brass, as shown above.



Taking care not to damage the chainmaille, cut the copper rivet leaving 1/8" above the small disc. With a hammer gently "mushroom" the rivet, such that the assembly is secure, but that the hooks can still move.



# Hamata Hooks Template

Hooks shown actual size

copy this page then cut  
your template from the copy.

Use 1/16" to 1/8" brass sheet to make your Hamata hooks.