1. Principles of Continuous Yarn Weaving

A woven fabric done with continuous yarn weaving is simply a series of interlocking loops. This is true when done on a rectangle loom or a triangle loom. The pins of the loom hold the yarn in place while the weaving is taking place. A single strand is woven between the two sides of the last complete loop to complete the weaving. This can be done also by weaving in a loop and then cutting and pulling out the last half of the loop. The starting yarn end and the finishing yarn end can be tied in or woven into the fabric and when taken off the loom, then all the edges are secure. On the triangle loom, the long or hypotenuse edge should be improved by finishing with a row of single crochet. Fabric created on a rectangle loom has all four sides neatly secured.

Once taken off the loom, the finished weaving will get its shape and characteristics from the yarn and the woven loops it consists of, especially after fulling or washing. The weaver keeps the strands as even as possible while weaving, then the weaving evens itself out more when taken off. An extra pin or two on the loom will not have an effect on the weaving in the long run. However, not enough pins in the wrong place can make weaving difficult towards the end when space gets limited and the yarn on the loom gets tighter. The pin arrangement is important so that you don't spend hours and hours weaving and find that near the end it gets very difficult from lack of pins, therefore space, to complete your weaving. A few extra pins: OK; not enough pins: Not So Good.

As it turns out, the 'perfect' pin arrangement for a rectangle loom changes as squares are added to the rectangle. In continuous yarn weaving, the length of the rectangle needs to be a multiple of the width.

It doesn't always work out that you just multiply the number of pins in your width by the number of squares you want and get your rectangle length. This does work for the first few squares that make up a rectangle.

If you have a rectangle loom that is 1, 2, or 3 squares long, just make the number of pins in the length of the loom 1, 2, or 3 times the number of pins in the width. Count the corner pins each time when counting the width and length. So a 40 pin width could make a square 40 x 40 pins, a rectangle 40 x 80 pins, or a rectangle 40 x 120 pins. The formulas below show how to figure the rectangles longer than 3 squares.

I have developed a continuous yarn weaving method that when used on my pin arrangements, ends up with just the right amount of pins at the completion of the weaving. The photo above shows the final single strand being woven along its final weaving path which is open all the way to the finishing pin. There is a formula for this pin arrangement, for any width and length rectangle loom, that I will show here. The one exception is that on rectangles with odd-numbered squares, there is one extra pin in the lower part of the last square. So 'perfect' it is with qualifications. Also, any other continuous yarn weaving method there is for the rectangle loom will at worst leave only several extra pins at completion, far better than too few. You can find instructions out there for these other weaving methods, including videos.

2. The Formula for Ideal Pin Arrangement, Rectangle Loom, Continuous Yarn Weaving

The rectangle of pins will have equal numbers of pins on its opposite sides. There will be an equal number of pins on each short side, and an equal number of pins on each long side. When counting pins, count the entire side, even though you will count the corner pin again when you count the side that shares this pin. Make sure you count pins with the loom assembled, as one or more of the pins in the row may be on a separate piece of wood.

Even though the precise measurement of a side might be more or less than the opposite side because of a larger space between two pins at a wood joint, the number of pins will be the same on each opposite side. You can see this larger gap in the lower left of the last photo above, the woven piece will be just fine. Making a loom from a solid piece of wood such as plywood will allow you to have your rectangle with exact spacing all around. That method of loom construction would not allow for an adjustable loom, however.

Counting pins is important in laying out your loom with the ideal pin arrangement. To make sense of the formula chart, always count your pins on the long rails from the left. Pin #1 is the pin at the far left end of your loom. With the rectangle positioned horizontally, the top left corner pin is #1 pin for the top rail, the bottom left corner pin is pin #1 for the bottom rail. You should only have to count your pins all along the length of the long rails one time. If you mark every 10 pins with a dot and every 100 pins with a larger dot, later you can quickly find just the pin you are looking for to set up your rectangle length. For instance, if you are making a rectangle 120 pins long, you will line up the row of pins on your right end rail with pin 120 on the top rail and also pin 120 on the bottom rail.

I made looms with widths in 10 pin increments. It was easy to figure width multiples to get rectangle lengths, also there are yardage charts available for 20, 30, 40 etc. pin widths. So if you choose to have a 40 pin left end rail, of course you will need to have a 40 pin right end rail. The looms I make have a moveable, modular, right end rail; that is how the length is adjusted for different rectangles. If you are making a non-adjusting loom, the parts are just the top and bottom long rails, left and right end rails. The formulas below work with any pin spacing, they are based on pin counts.

Rectangle corner formula. The formula is best shown in a chart. I have included some common rectangle widths I use. The number in the box is the pin number for the right side of that square or rectangle, the left side of the rectangle being pin # 1. This is your rectangle length in pins. The last row of the chart shows the formula for any other widths (w = width). When using that formula, add the value in the box for each square added to your rectangle. For lengths that are off the chart, I think you can see the trend.

	x 1 square	x 2	x 3	x 4	x 5	x 6	x 7	x 8	x 9	x 10
30 pins	30	60	90	119	149	178	208	237	267	296
40 pins	40	80	120	159	199	238	278	317	357	396
50 pins	50	100	150	199	249	298	348	397		
60 pins	60	120	180	239	299	358	418			
70 pins	70	140	210	279	349	418				
80 pins	80	160	240	319	399					
ANY	w	+w	+w	+w-1	+w	+w-1	+w	+w-1	+w	+w-1

Turning points formula. Turning points are the imaginary corners of the squares where the diagonal yarn is first strung when weaving with the continuous yarn method. When the yarn is started along this path, the result will be the ideal final weaving path with an opening for the last strand, and empty pins on which to turn the last strand. My instructions start the weaving at the upper left corner pin of the rectangle. The first yarn strand will go from there diagonally down to the right, meeting the bottom row of pins one rectangle width to the right. The yarn will turn around this pin and go right back up to the corner of another imaginary square on the top rail. The points where this zig-zagging takes place can be marked with a piece of yarn tied around the pins. The turning points for a specified width remain the same along the length of the loom regardless of how long you make your rectangle.

You only use the turning points that are inside the length of that rectangle, for instance, a 4 square rectangle has only 3 turning points. So you would only have to determine the first 3 turning points.

The first turning point is on the bottom rail, the second on the top rail, the third back on the bottom rail and so on. The bottom row has a formula for any rectangle width. Add the value in each box as you add squares to your rectangle. For lengths off the chart, you can see the trend.

	1st	2nd	3rd	4th	5th	6th	7th	8th	9th
30 Pins	30	60	89	119	148	178	207	237	266
40 Pins	40	80	119	159	198	238	277	317	356
50 Pins	50	100	149	199	248	298	347		
60 Pins	60	120	179	239	298	358			
70 Pins	70	140	209	279	348				
80 Pins	80	160	239	319					

ANY	w	+w	+w-1	+w	+w-1	+w	+w-1	+w	+w-1

3. Tips for Making Your Rectangle Loom

The easiest way to construct a non-adjustable rectangle loom would be to use a single piece of plywood large enough to lay out the rectangle you want to weave. You can have Home Depot cut pieces from a 4' x 8' plywood panel, 3/4' thick. If you buy a whole 4'x8' panel, you can have enough pieces to make several sizes.

If you want to make a small loom for learning, you could start with a piece 12" x 48". A loom made from this piece could weave a scarf 10" x 40" or 15" x 45"; large enough for a small child.

A drawback of having a loom made of one solid piece of wood is that the weaving will take place close to a surface. It can be done, but you might want to try it before you make a very large loom from a 2' or wider panel 8' long. A person handy with a radial arm saw, jig saw or circular saw could cut out the interior of the panel, giving the loom the open space under the weaving area. A tip if you make a loom out of a solid piece of wood - if you use 1 1/4 inch nails driven into the wood 1/2", you will have 3/4" of nail protruding. This nail height will keep your fingers and weaving hook well off the wood. I once saw a photo of a long plywood loom made from two pieces fastened with hinges so that it folded for shorter storage. There are lots of ways to construct a rectangle loom. I provide the pin arrangement formula and a few tips and plans for one method to make an adjustable rectangle loom. You could come up with your own design for construction. Your design can depend on the materials and tools available and construction skills you and your helpers have. You might get some ideas from my loom plans in Chapter 5.

Drilling holes where you want the nails makes it easier to drive them in and they end up as straight as the holes you have drilled. A drill press makes this easier and can be used with a fence in back of the piece to get all the holes lined up straight row. If you plan to drive the nails into the wood without drilling holes, you might test the nail with the wood you plan to use to see how it goes. It could be that a 'fatter' nail such as 15ga won't bend when driven into wood without pre-drilled holes. (15ga is thicker than 16ga) Plywood can take a thicker nail without splitting than plain wood. A nail that I will use with my kit, the common panel nail, might bend when driven into some wood. I recommend drilling holes if possible. My kits will have pre-drilled holes.

Mark your nail locations by using a measuring tape or yardstick. You can use a wood or metal yardstick to draw a straight line for the nails and at the same time mark their exact location by using the measuring rule. You will have a pencil marked cross or x at each place you need a hole or nail. If you put a punch mark at this spot also, it will easer to start your drill or your nail at the exact spot. This would be the time to decide on your nail spacing.

You have the formula you need to make a rectangle with the ideal pin arrangement. Decide what the rectangle width will be in number of pins, then the length of your rectangle in number of pins will depend on that.

Pin spacing. The formula works with whatever pin spacing you choose. If you are going to use one of the fractions that are on your USA rule, it is simple to use 1/4", 5/16" or 3/8". If you have a metric rule, 8 mm is about right - equivalent to 5/16", which I recommend. The table below shows widths in inches for various pin counts and pin spacings. You can multiply the desired width by the number of squares you might want to weave to see *approximately* how long your weaving will be. You can use the table to find the maximum length you can weave on your loom for a given width. For instance, if you want to weave about 25 inches wide, your weaving rectangle of 3 squares would be approx. 75". If your loom only goes out to 92 inches, you can't weave that width in a 4 square rectangle, as the loom would have to be about 100 inches long. You could weave a 4 square rectangle with a width of 22 to 23 inches with that 92 inch loom.

Number of pins	1/4"(.25)	5/16"(.3125)	3/8"(.375)
20	4.75 in	5.94 in	7.125 in
30	7.25 in	9.1 in	10.875 in
40	9.75 in	12.2 in	14.6 in
50	12.25 in	15.3 in	18.375 in
60	14.75 in	18.44 in	22.125 in
70	17.25 in	21.56 in	25.875 in
80	19.75 in	24.7 in	29.625 in
90	22.25 in	27.8 in	33.375 in

As you can see, there is one less space in a row of pins than there are pins in that row. So instead of 40 pin width measuring 40 x .25” = 10 inches, it is actually 9.75 inches. It would be easier to round off the number when multiplying the width with the number of squares you want the rectangle to consist of. But then when you are dealing with a large number of squares adding up, the difference adds up. Remember the pin formula is based on the number of pins, not inches.

Marking a row of nails, using 5/16" as an example: Start by marking a spot that will be your rectangle corner pin. Put the end of your ruler at that spot. Move along the ruler 5/16" and mark the 2nd spot. Keep going until you have that row done. You just have to make sure you are adding the

fractions right. For 5/16" spacing, I just count 5 marks on the ruler if the marks are 1/16" increments. If the ruler has 1/8" marks, just move ahead 2 1/2 marks each time.

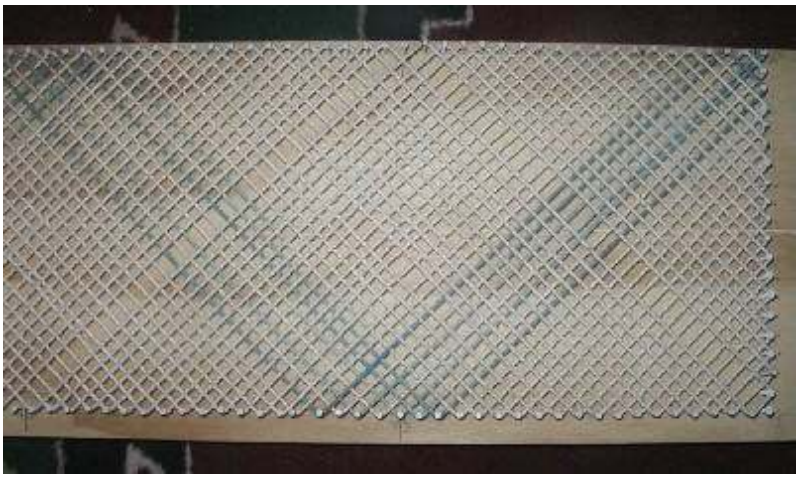
Remember that you always count a rectangle corner pin again when counting the row of pins that share it.

I have made looms that have 1/4 inch spacing for weavers that want a close weave and use finer yarn. It takes patience to weave a large shawl or fabric using 1/4' spacing. But then that's the challenge. All the photos on page 1 show a 1/4" loom and the resulting scarf. When using 1/4" spacing, you might want to use brad-head nails to keep from crowding the nail heads. When using 5/16" spacing, panel nails with a wider head still leave room between nail heads to work with a hook, but you can use any nail for a pin. use any nail with the understanding that some wood will split if a row of nails is driven into it. A nail with too large a diameter can even split wood with a hole drilled into it. It pays to test your nails in a piece of scrap wood ahead of time.

The photo above shows a large scarf woven on a 5/16" Hideaway Homestead modular rectangle loom with panel nails. The loom piece in the photo is the moveable end rail. The loom was set at the 15.5 inch width (50 pins) and the 5 square length. The finished scarf now measures about 12.5 inches wide by 78 inches long, 90 inches long with the fringe.

A weaving done by the continuous yarn method is a bias fabric and can stretch lengthwise; more or less depending on the yarn used. Warp and Weft weaving done by warping the loom in one direction first and then weaving across these warps with a shuttle makes a square-woven fabric that does not stretch nearly as much. But that weaving is not nearly so interesting as this continuous yarn weaving which makes diagonal patterns in the fabric.

4. Testing a Rectangle Loom



This applies to continuous yarn weaving when you need to have the width and length of your rectangle of pins at just the right ratio. Take yarn or string and lace it on the pins in the same order that you would weave. You start by making a slip knot around the upper left corner pin. This lacing is much faster than actually weaving. Also could have the benefit of finding the yardage for a project. The proof that the pin arrangement is correct is that there is one single weaving path left after the last complete loop is laced on. In the close up here, you can see the uniform open path and the empty pins that the last single strand can turn on. The finishing pin is in the lower right corner. This will test the turning points. You can see a penciled arrow bottom center where I have marked the last turning point of the starting strand. If you are measuring yarn this way for a project, the actual yardage may be slightly more when actually woven.