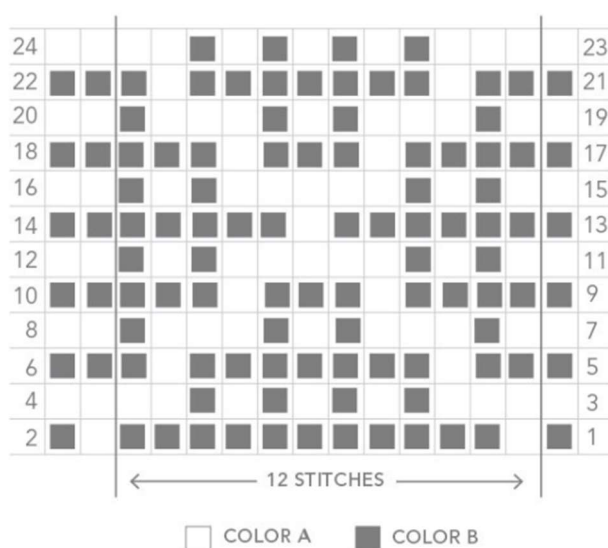


## Convert a Mosaic hand knitting chart to an electronic knitting machine diagram

In mosaic knitting, you alternate between two rows of a darker and a lighter colour, but instead of working every stitch in the row, some stitches are slipped.

The term mosaic knitting was coined by Barbara G. Walker and described in several books devoted to the technique. While the name is sometimes used more loosely to refer to all slip-stitch patterns, Walker used it to refer to a technique defined by a specific set of rules. Within the constraints of those rules, a designer can create new motifs and repeat patterns and images.

A typical mosaic knitting chart for hand knitting looks like this (you can see the finished knit here: <https://www.purlsoho.com/create/2015/06/29/mosaic-blanket/>):



The chart begins at the lower right corner on Row 1. Each horizontal row represents two rows of knitting. The rows going from right to left are on the right side, and the rows going from left to right are on the wrong side.

On every row that begins and ends with a gray square, all Colour B stitches are knitted and all Colour A stitches are slipped. On every row that begins and ends with a white square, all Colour A stitches are knitted, and all Colour B stitches slipped.

This poses a problem for the machine knitter. On a knitting machine skip stitch diagram all needles selected to be knit are marked with a black square, and those not selected will be skipped. Therefore, every even numbered row in the diagram above, starting from the bottom, needs to be colour inverted for the machine to select the correct needles to knit. That's all there is to it!

Following below is a quick step-by-step guide how to prepare the above chart for an electronic knitting machine, to be input using img2track or similar software. It can only be done exactly like this if each dark coloured stitch in your chart is represented by a square or a disk filling most of one stitch area. If your chart consists of crosses or circles I recommend following Tanya Cunningham's tutorial "Creating a Motif to Load With Img2track" on Youtube: <https://www.youtube.com/watch?v=qo3OQtMFrcQ>. Copy the chart as Tanya explains, then pick up from Section 4 in the step-by-step below.

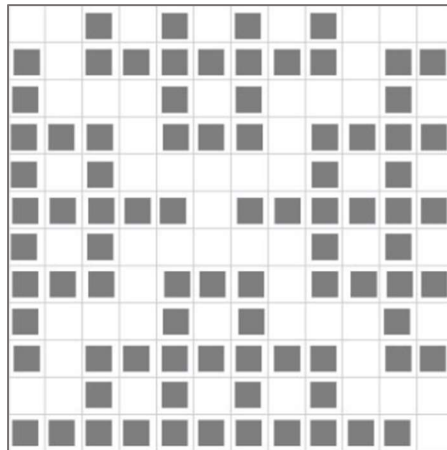
### GIMP

1. In Gimp, open a digital image of your hand knitting chart. This can be a scanned image, a photo taken with a camera or your mobile phone, or a diagram copied from a tutorial or website using Print Screen key to copy it to clipboard and then paste into Gimp.

- Crop the image, so that only the 12 repeat stitches of the pattern remain (I will come back to the end stitches at the end):

Select *Crop tool from the Tool box (looks like a scalpel)*, select the repeatable section of the pattern, crop.

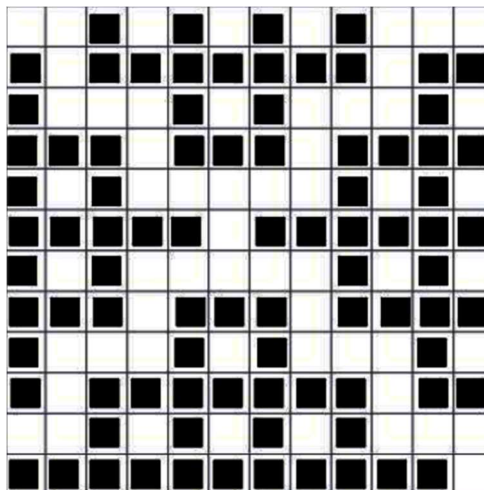
You should now have something like this:



- Improve contrast:

Colors -> Levels

Move the middle pointer under the Input Levels all the way to the right. It now looks like this:

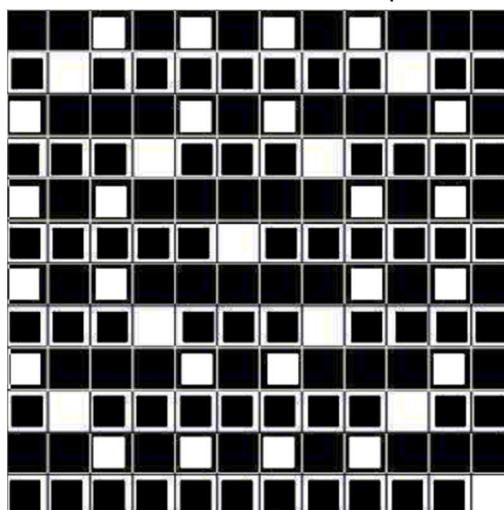


- Invert colours every even numbered row starting from the bottom:

Select *Rectangle Select Tool from the Tool Box* and mark the second row from the bottom, then

Colors -> Invert

Repeat for all the rest of the even numbered rows. You end up with this:



5. Before you proceed make sure no portion of your image is selected by clicking **Select -> None**.

Then change colour mode from RGB to Indexed:

**Image -> Mode -> Indexed**

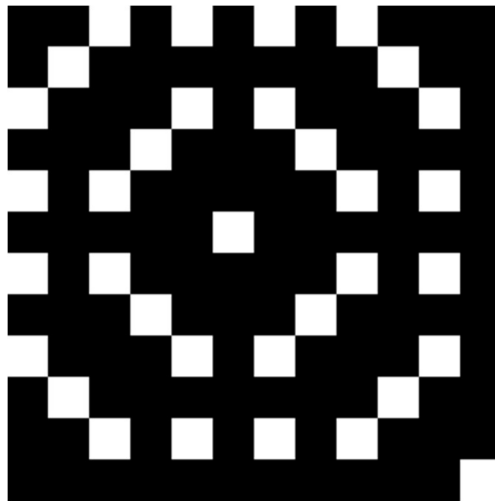
Select the "Use Black and White (1-bit) palette", and convert. The image looks pretty much the same.

6. Change size so that 1px corresponds to one stitch and one row (our chart is 12 stitches wide and 12 stitches long):

**Image -> Scale Image**

Do NOT assume that each stitch in your original chart is represented by a true square, even if it looks like it. Therefore, the scale must NOT be constrained by the original chart proportions. You ensure you get the correct number of stitches and rows by clicking on the chain link on the right so that it is open, and input 12px for Width, and 12px for Height.

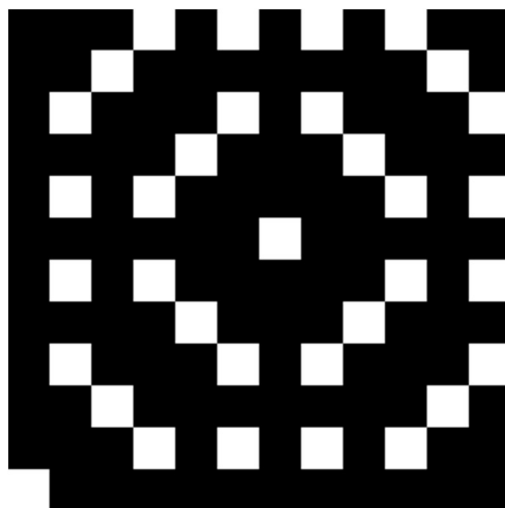
It looks like the image has disappeared, but don't worry, it's there. **Select the Zoom tool from the Tool box (looks like a magnifying glass), click on the Zoom In button below, and click on your image until you can see it again.** It now looks like this:



7. Flip the image horizontally:

**Image -> Transform -> Flip Horizontally**

This is done because we knit facing the wrong side, whereas a hand knit pattern is showing the right side. It is strictly not necessary to flip the image, as many of the mosaic patterns are symmetrical, and even if not they normally work equally well both ways. Here is our image flipped:



8. Save the image as a .png file:

File -> Export As

Select file type down at the bottom left (.png), give it a name at the top, and hit export. You now have an image that will be perfectly processed in img2track.

## Img2track

Before you select the image in img2track make sure you choose a stretch factor of 1, a width equal to the pixel width of your image (in our example 12), and number of colours equal two.

Load the image from img2track to your knitting machine as normal.

## Knitting

Remember those end stitches in our original hand knitting chart? These are easy to add when selecting how many needles you knit over. Let us say we want 4 repeats of the pattern.  $12 \times 4 = 48$ . Select 24 needles on each side of 0. Then we add two extra needles on the right, and one on the left (we flipped the pattern horizontally, remember?). By always selecting the end needles (KC1) we make sure the first and last needle always get knit, independent of pattern.

I couldn't make it work using the normal single-bed two-colour knitting as according to the Img2track manual. I might not have set it up properly, and would appreciate it if you would let me know if it does work.

What I did find worked perfectly was to set the machine up as if knitting multicolour rib (even if we are knitting single bed skip stitch):

Load track 1 into the knitting machine, and switch on the double-length variation.

When you are ready to begin knitting the pattern move the carriage outside the turn mark on the **right** side of the machine.

Select KC1 (end needles selected) and knit across to the left. You should now have needles selected for colour 1. Press in both Part buttons for skip stitch. You can choose whether to keep knitting the next two rows with the same colour, or change to the other colour. Knit two rows, and change colour. You continue to knit two rows and then change colour throughout the whole pattern.

It is very convenient and quicker if you have a single bed colour changer, but perfectly possible to manage without.

Happy Knitting the Mosaic way!! ☺

Further resources:

Barbara G. Walker: "Mosaic Knitting"

Kathleen Kinder: "Mosaic floatless fair-isle (24 stitch)"