# PATTERN MAKING FOR THE INFINITY WAND

This tutorial will walk you through making patterns for the Infinity Wand and will explain how the wand interprets them. If you get confused, don't worry...keep reading, we walk you through step by step!

First, a very high level explanation: The wand reads bitmap (.bmp) from the internal memory. Each pixel in the image represents an LED in the wand. Ideally, the image would be however many pixels wide as the number of LEDs your wand contains on one side, which is 128. So, when you have a 128 LED wand, a pattern that fits your wand perfectly would be 128 pixels wide.

←------------------128 pixels------------------→
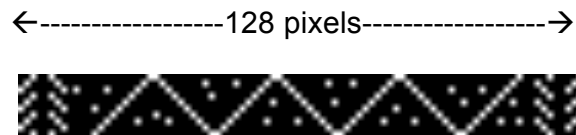
Please note, that when making graphics they are rotated 90 degrees counterclockwise than how the actual graphic will appear on the wand. So, a graphic that looks like the above white zigzag image will actually appear on the wand like this:

If a pattern isn't wide enough to fill all the LEDs on your wand, it's smart enough to fill the rest of the wand by repeating the pattern. Many of the most eye-catching patterns are very basic, small patterns like just described.

The wand displays patterns one row at a time, starting from the top of the image, and then moves to the next until it reaches the end where it then goes back to the first row. Sounds confusing, right? Hopefully, as we go step by step through this tutorial it will make more sense!

A few very important things to remember when making patterns:

- In order for the wand to display an image vertically, when creating the pattern, any graphic with orientation to the image (such as a smiley face for example) must be rotated 90 degrees counterclockwise.
- If you want a pattern to take up the full length of the wand, you will want the horizontal number of pixels to equal 128. You can play with the vertical number of pixels but generally want to keep it to 128 or less (unless you are doing long exposure photography, then the camera can capture longer trails with larger vertical pixel lengths.)
- If you want the image to appear several times on the wand, you can divide the number 128 by how many times you want it to repeat…for example, you want the image to repeat/display 4 times you would set the horizontal pixel size to 32 pixels. Then the image would fill the full length of the wand and would display 4 times in a row. So, for repeatable patterns, think of numbers divisible into 128 for a perfect display (4, 8, 16, 32, or 64 pixels wide). For example, Image 1 is 32x32 pixels and will actually appear on the wand like Image 2 when the wand is swung back and forth.

   Image 1:

   Image 2:

- Pattern names should only contain letters, numbers, '_' and '-'. Do not use spaces or periods within the pattern name.
- Our firmware does not support 32bbp patterns, but supports everything below that. Bpp = bits per pixel
- Black shuts the LEDs off, so we typically start with a black background on a pattern then design from there.
    - If the black is not #000000 blackest black, it may appear grayish white on the wand so be sure to make black areas fully black.
- Pattern names cannot be more than 25 characters long or the wand will flash red.
- If you are trying to make a more detailed pattern with a higher resolution, you can save the image mode as "indexed color" to reduce the file size. This will help with the rate patterns are loaded and the speed at which they are displayed.
- If the wand flashes red, it is an indication that there is an issue with that pattern or the pattern is corrupt. So, you will need to remove that pattern in order for the wand to continue displaying the rest of the patterns properly.
- If you have Silicone end caps, you can create patterns with 4 LEDs (4 pixels) on each horizontal end to have a different color lighting up the end caps. In this example below, the wand would display a white zigzag pattern and both end caps would light up red!


- What types of images tend to work really well?
    - Images with some black (negative space) in them
    - Zigzags create a fun bouncing effect
    - Bright colors
    - Experiment!
- We like to make a bunch of patterns then test them at once to see which ones work well, which we might need to make some adjustments to and which ones just aren't quite awesome enough.
- Do you also have a Phoenix Hoop?? The wand displays patterns differently and has different dimensions than our Phoenix Hoop patterns, so if you have one of our hoops, please keep your wand patterns in a separate folder.
- Have fun and experiment! Some of our favorite patterns have come from unexpected shapes and graphics ☺

Let's get started making our first basic pattern!

We're going to use the free image editor at Pixlr.com for this tutorial. Photoshop is our favorite tool for this, but Pixlr does a great job, and it's free.

NOTE This tutorial shows MAC based format, but PC users will have the same basic instructions. So, first go to: http://pixlr.com/editor/
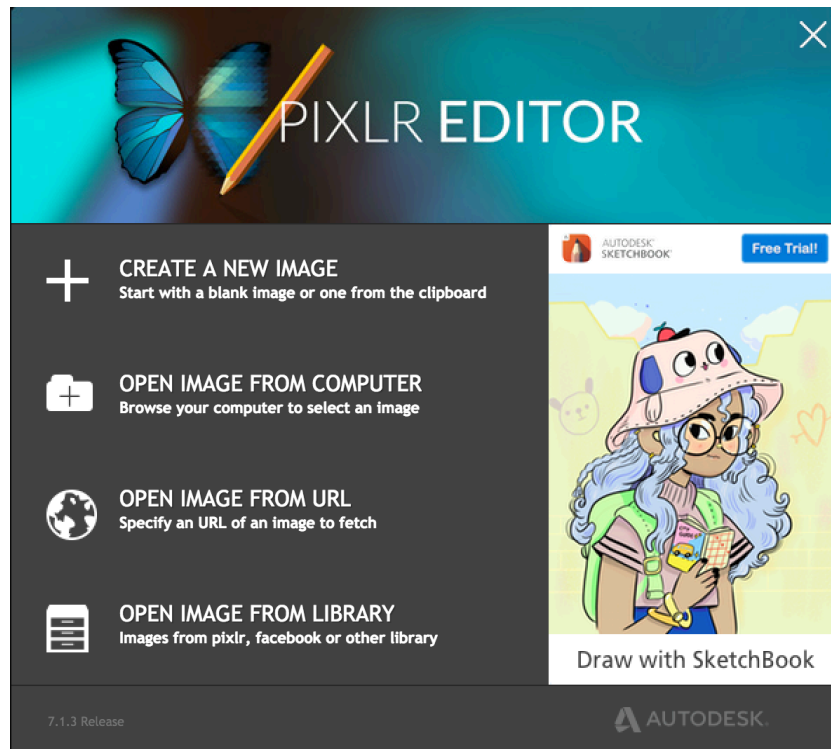
Create a new image with a height of 10px and a width of 10px, and then press the "OK" button. *Note* This is a tutorial for a 10x10 pixel pattern, if you want your pattern to fit perfectly, without getting cut off at the bottom of the wand, then just make your test pattern 16x16 pixels – same basic rules apply.
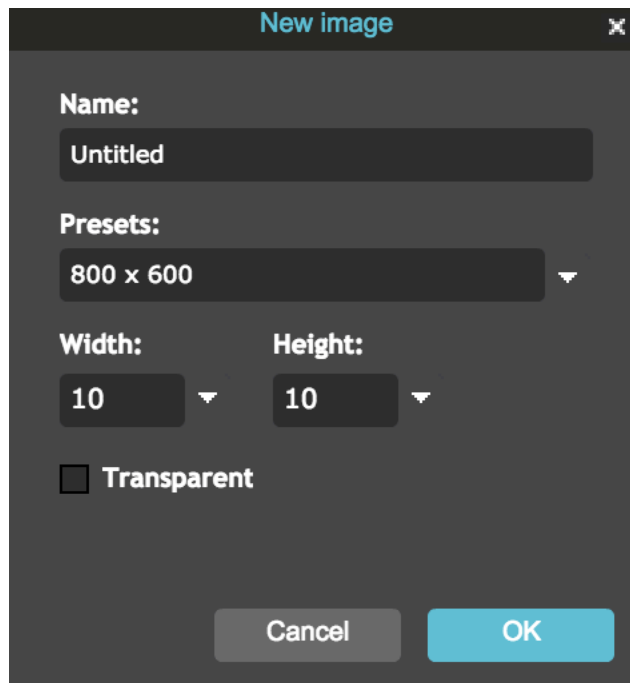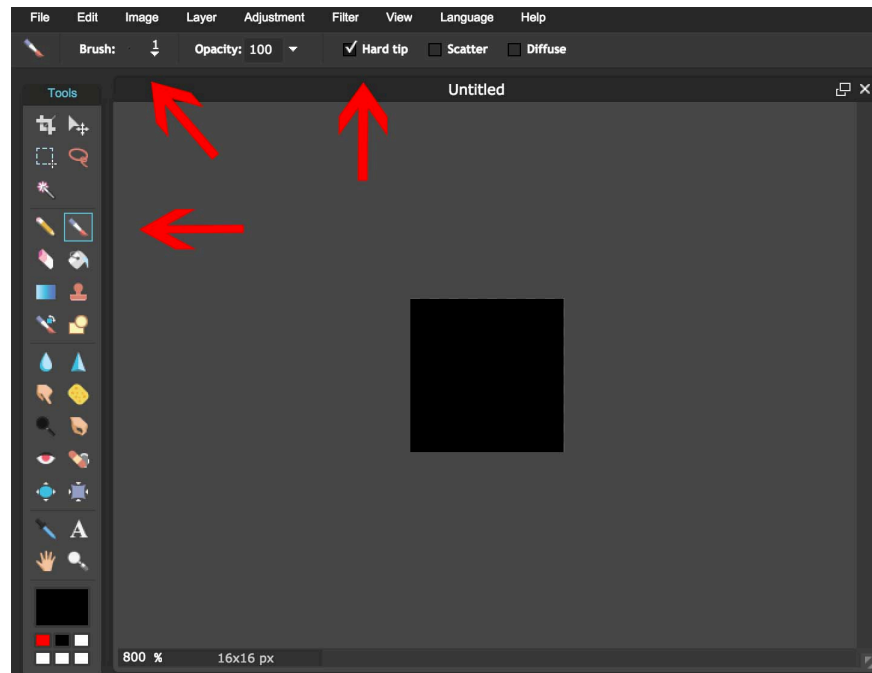
Create a black background using the "fill bucket". This should be the starting point for all patterns.
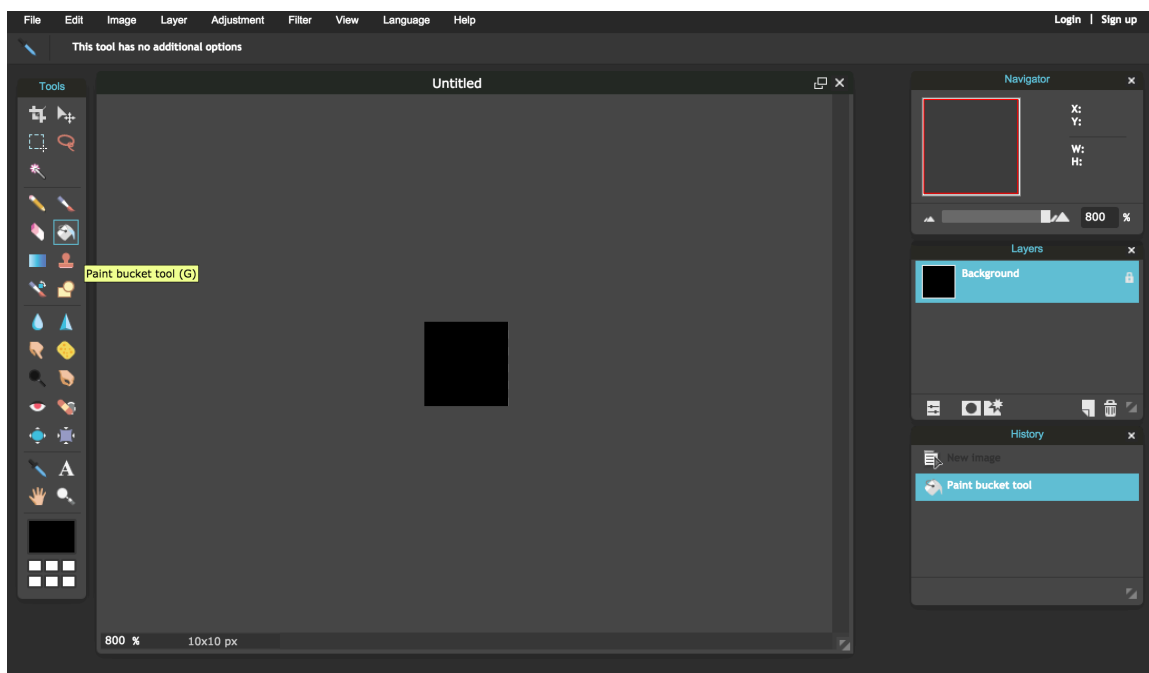
1) Select the "Brush" tool.

2) Change the brush size to 1px.

3) Select "Hard Tip". This makes a nice solid pixel rather than slightly faded. Without this, the system tries to blend it with the surrounding pixels and it will appear dim.


1) Click the color selection area. This will open the color selection dialog.

2) Pick a color, any color... we used red for this example.

3) Press "OK" to close the dialog.
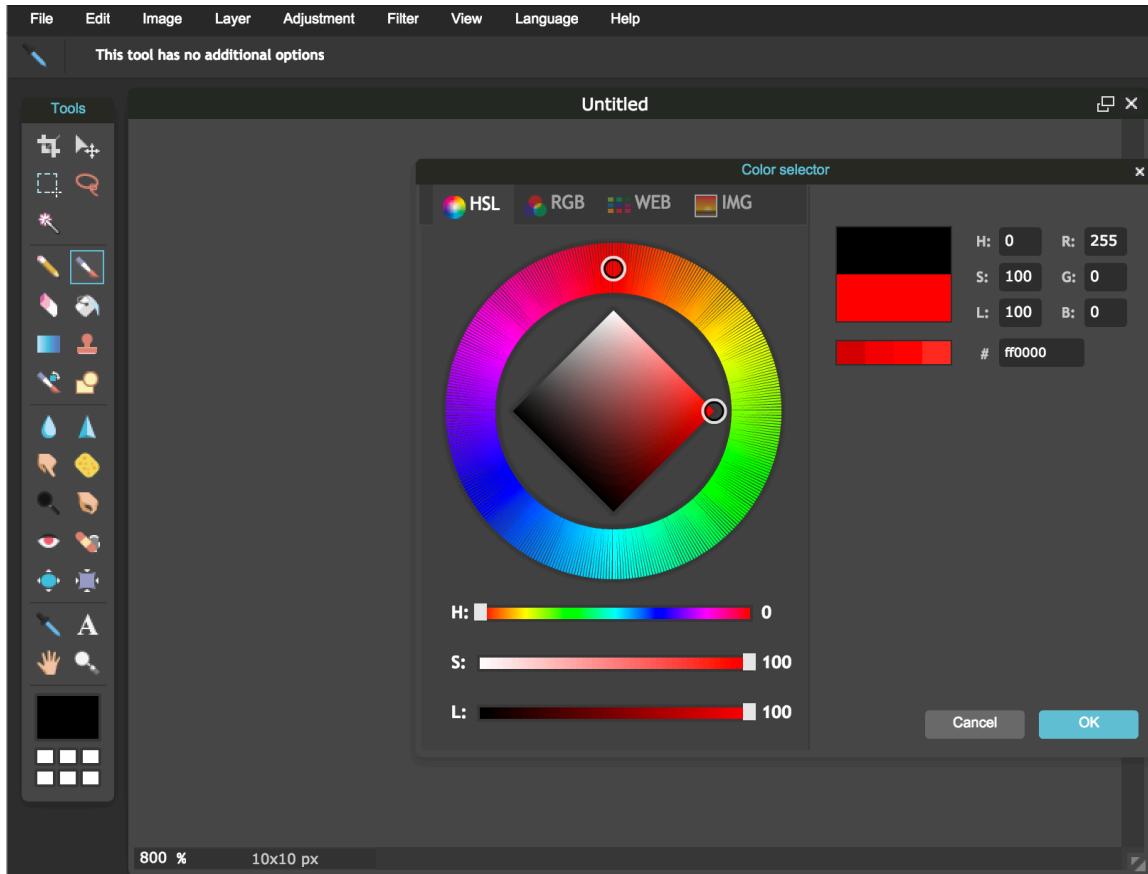
Now draw a diagonal line from the top-left corner to the bottom-right. Then draw another line from the bottom-left corner to the top-right. This will give you a red "X" graphic.

Note There's a glitch with the Pixlr system where you can't directly click on the top-left most pixel of the image. We get around it by clicking one of the surrounding

pixels and dragging the cursor onto the first pixel, then we change our color back to black and erase any pixels that we didn't mean to draw on.
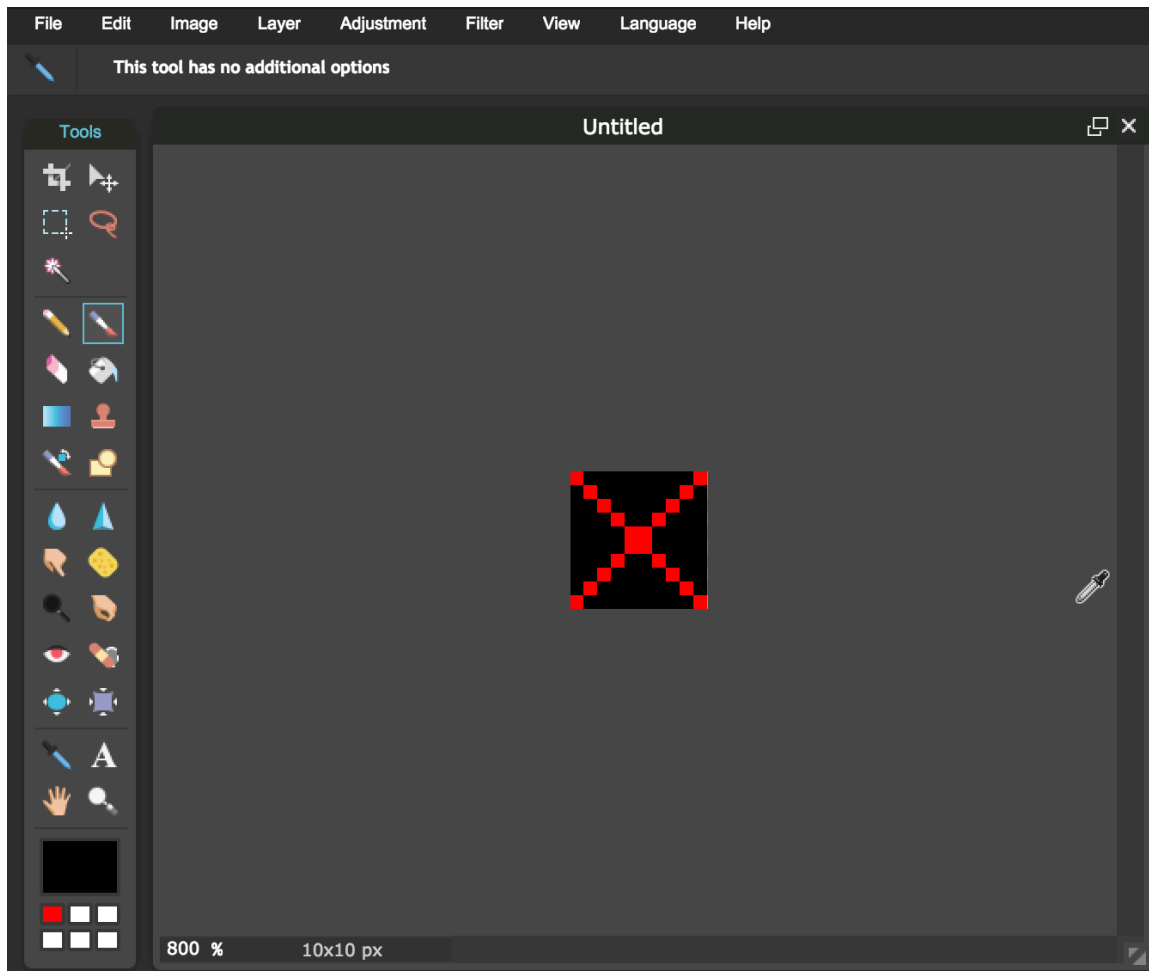

Now for a closer look at the pattern we created. This illustration is just to help explain how the wand interprets the image.
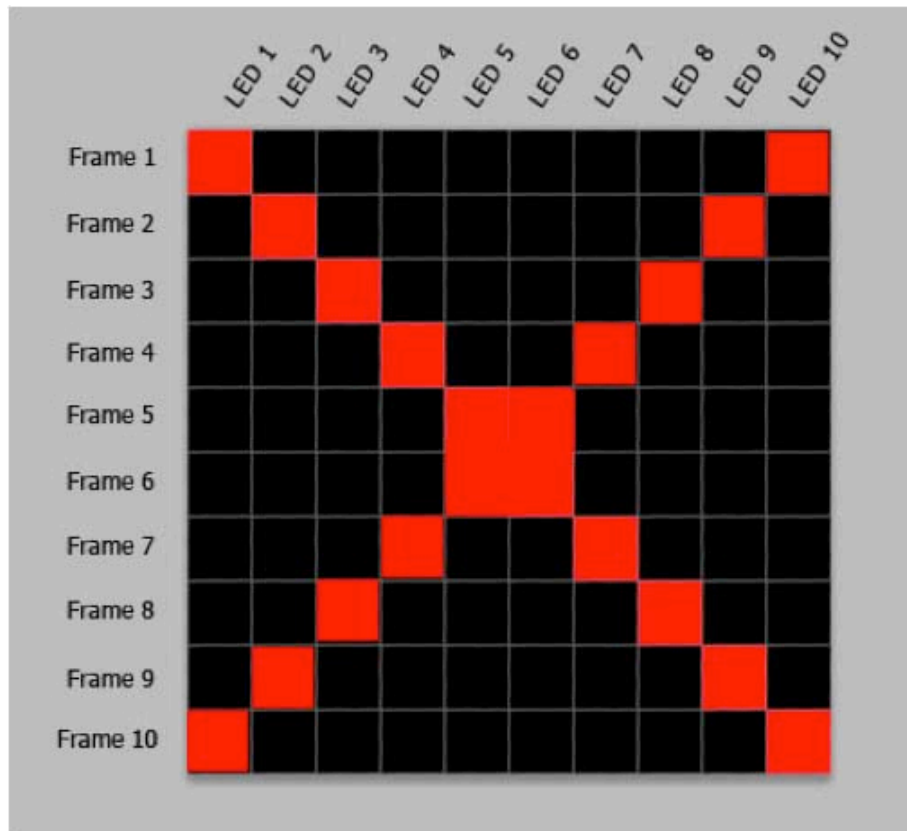
As you can see, I've labeled each row and column to show you how the image will appear on the wand as the image is scanned from top to bottom.

Here's a close-up of the first frame of the pattern. On this frame, the first and 10th LED of the wand will be red. LED 2-9 will be off. Since the pattern is only 10 pixels wide but the wand has many more LEDs, the pattern will repeat, so LED 11 will be red and 12-19 will be off…this will repeat to fill up the wand.
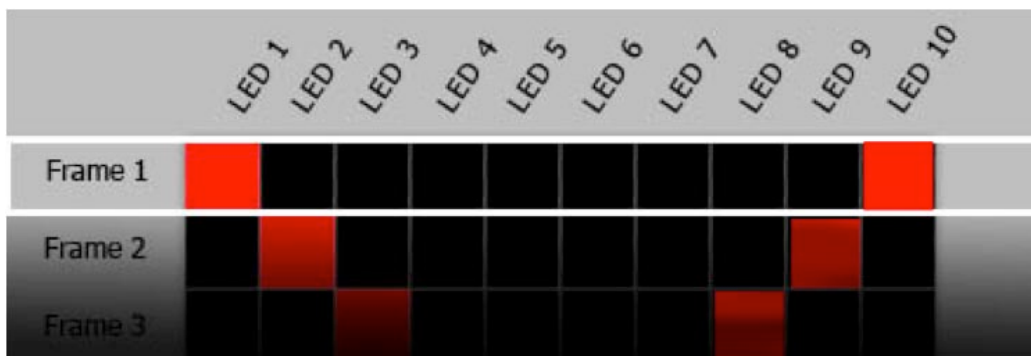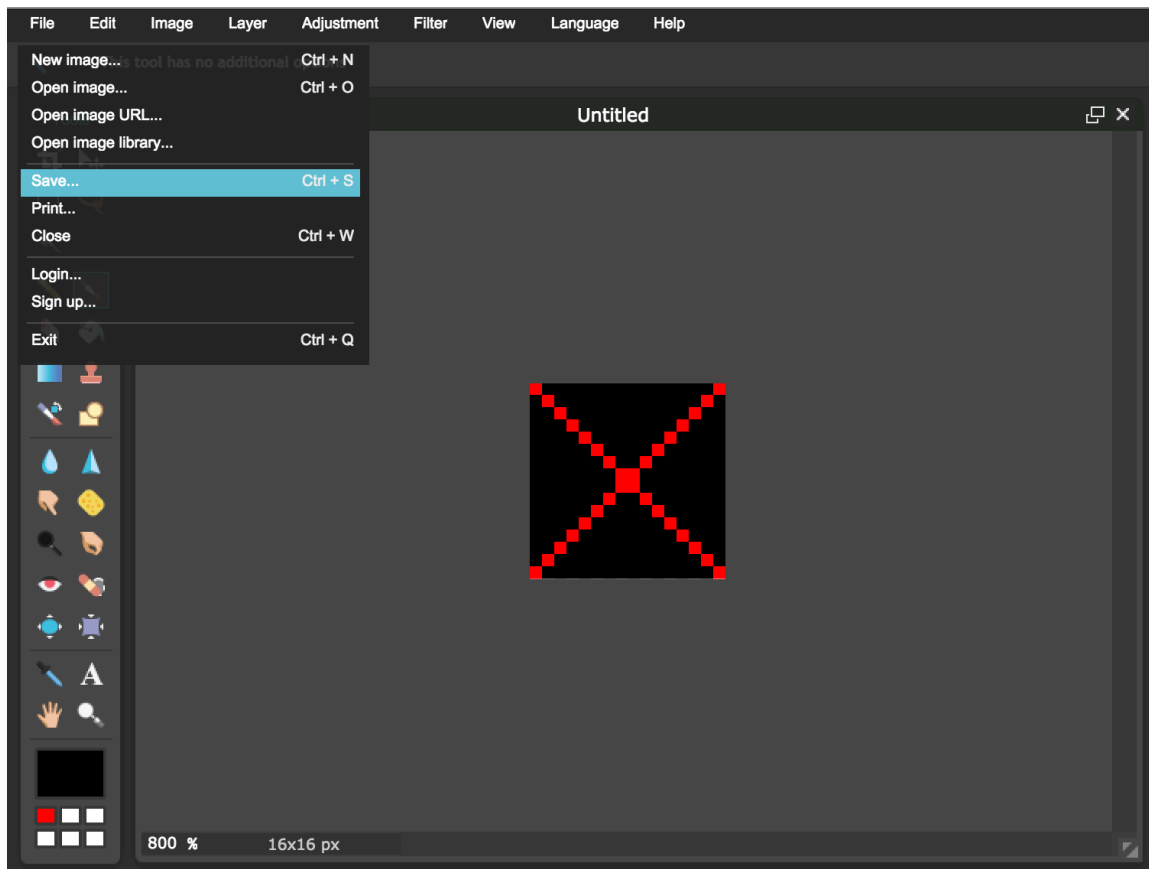

This is how the first frame will appear once the row has been repeated to fill the wand.
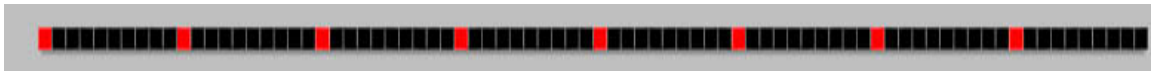
Great! You've done it! You have now successfully created your first pattern. Now, let's save it to the wand.

Click File, then Save...

Name your pattern something awesome! Remember, pattern names should only contain letters, numbers, '_' and '-'. Do not use spaces or periods within the pattern name, and keep it under 25 characters.

**You want to make sure that you select "BMP (Large but non-destructive)" as your image Format.
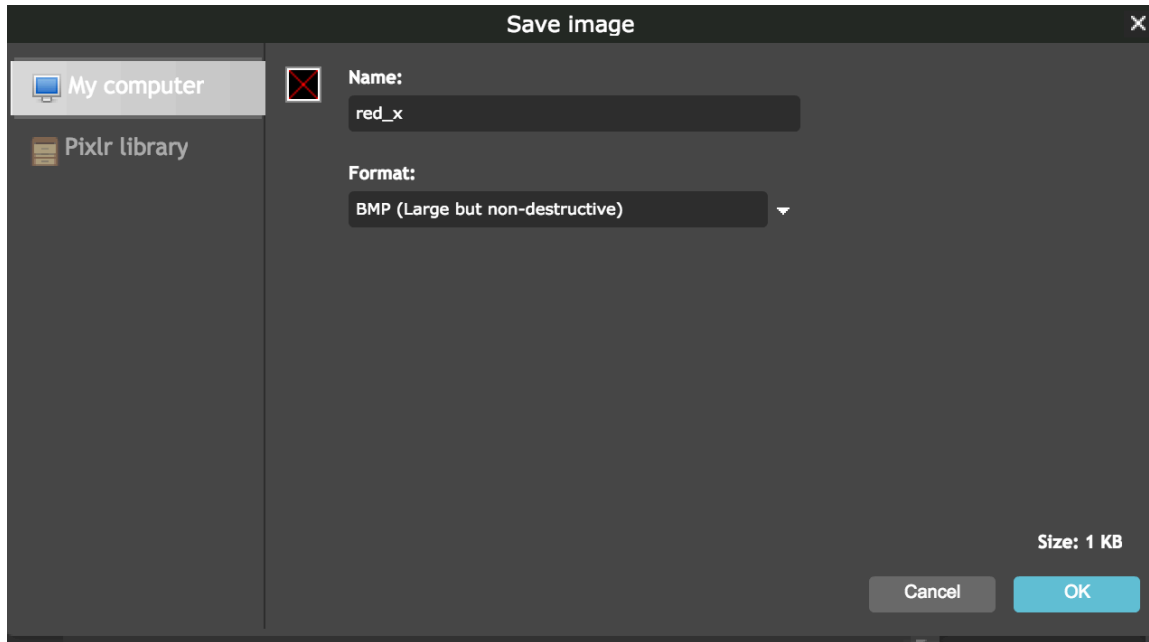

Click "OK" and it will prompt you with the option where to save.

From here you can either save it to you computer, or directly to the wand.

If you're saving directly to the wand, you'll need to plug in your wand and turn it on. After 20 seconds or so, your computer should recognize that the wand has been plugged in and a removable drive will show up labeled "WANDA."

Click on the "WANDA" removable drive and save the image to the root level of the device. The wand does support sub-folders but it's more confusing and a little difficult to navigate into them with only the key-chain remote. So again to keep things simple, just save it to the root for now. (Image on next page)
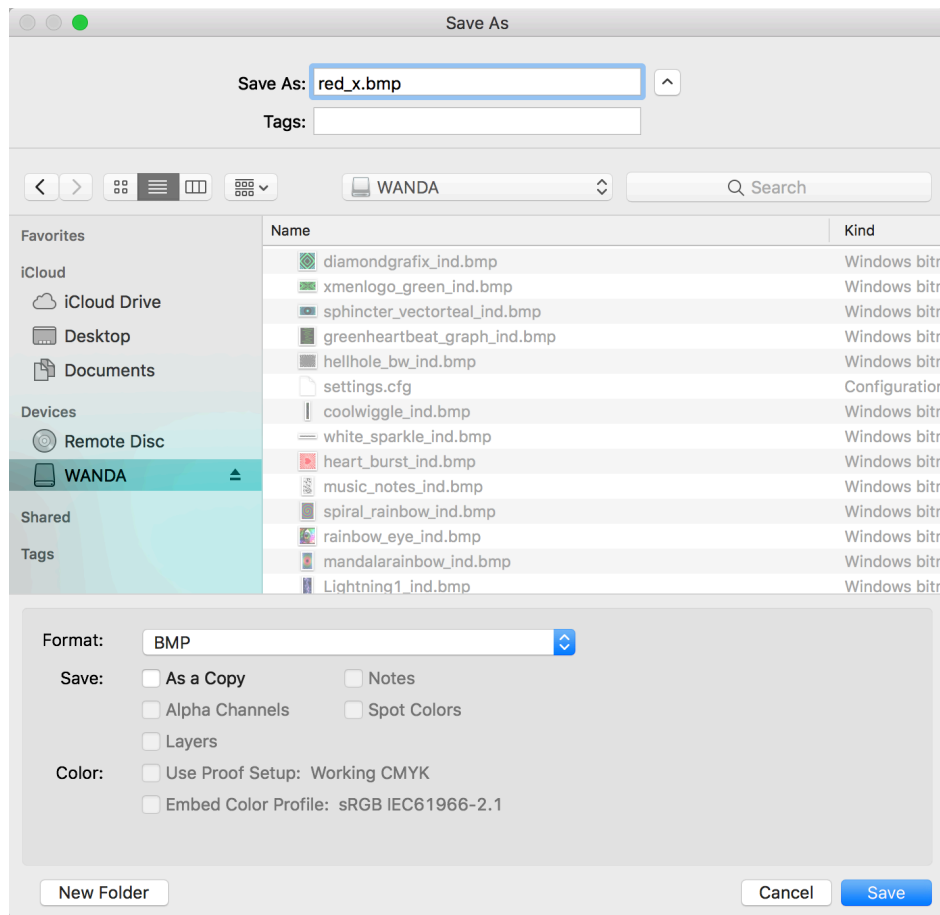
NOTE The Infinity Wand can only support up to about 200-220 patterns in one folder. This also depends on the size of the images themselves. We like to stick to 15KB or less if possible. Anything above about 15KB in size (or around there) can't be held in memory for the fastest possible frame rate. Larger patterns can cause a gap between patterns as it takes longer to load due to the size. Lowering color depth may also help decrease file size.

So, if you add enough patterns, you might get a warning that the pattern couldn't be saved to the wand. If this happens, you'll need to remove a few of your least favorite patterns before you can save any new ones.

After you have saved the pattern, eject the wand drive and turn off your wand. Then reboot it to see your lovely patterns in action!

If you have any questions feel free to email us at support@spin-fx.com and we would be happy to help you!

CREATE | INSPIRE | SHINE