

Orders over \$50 qualify for a free gift **Claim Yours Now**

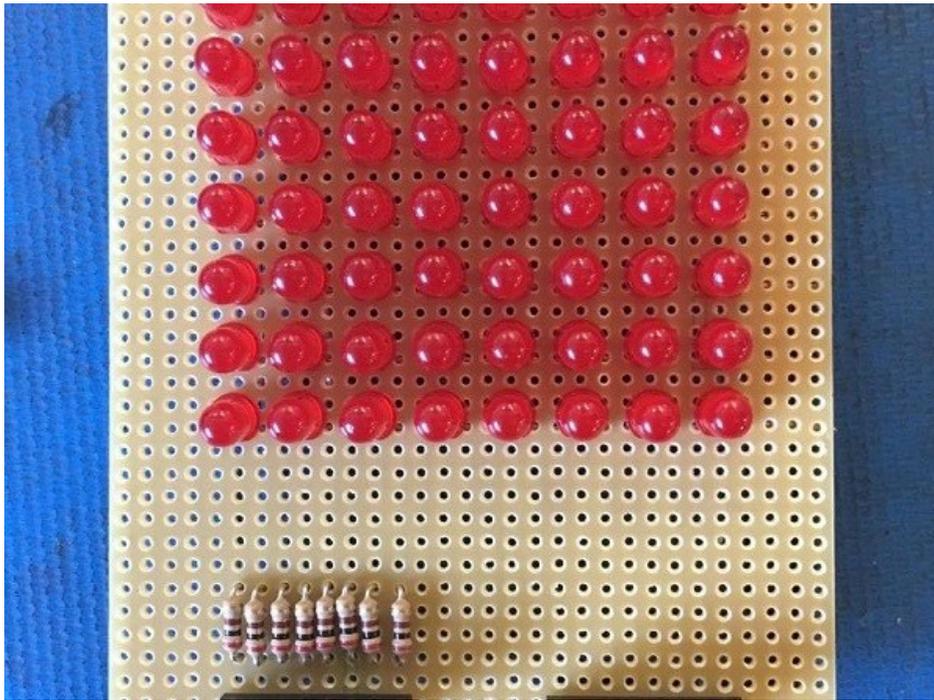


# Simply Smarter Circuitry Blog

How To's, Reviews, and Product News from Circuit Specialists HQ.

HOME ANNOUNCEMENTS DIY 3D PRINTING REVIEWS ABOUT US

SHOP ONLINE



Search



## Introduction

The Circuit Specialists blog was created to bring our visitors knowledgeable articles on products, tools, and fields in which products may be used. In some cases there will be a blog post with additional information on some of our featured products. Browse through the extensive list of post to learn more on a wide variety of information.

## How To Make An 8x8 LED Matrix

📅 February 12, 2016 👤 Cody Mack 💬 2 Comments

Learn how to make an LED matrix

Orders over \$50 qualify for a free gift **Claim Yours Now**

Scroll down further for step by step photos and more details.

1. You'll need the following parts: a prototyping board, (2) 8 pin headers, (8) 200 ohm resistors and (64) red LED bulbs.
2. Arrange the LEDs in the board according to the design you've chosen: either common row anode or common row cathode.
3. Solder the LEDs to the board, being careful to not to cross any of the anode or cathode leads.
4. Attach the 8 pin headers to feed power to the LEDs, be sure to place a 200 ohm resistor in line with each positive power lead.
5. Test your board for continuity with a multimeter.
6. Attach power to the 8 pin headers.

Today we will be starting our adventure into the deeply complex, yet totally incredible world of LED Matrices. This post is the first of an entire Arduino Matrix Programming series by Circuit Specialists.

### **First things first, what the heck is an LED matrix, and how does it work??**

Simply put, an LED matrix is a grid of lights arranged into rows and columns. LED stands for Light Emitting Diode, so like with other diodes, electricity flows through it in only one direction – from anode(+) to cathode(-); doing so illuminates the light.

By arranging the anodes (positive side) and cathodes (negative side) in a particular way, we can achieve a matrix and call upon each LED individually by sending high and low signals from our arduino device.

Led matrices come in two arrangements. Common-row anode (left) and common-row cathode (right).

[3D Printing](#)

[All Posts](#)

[Announcements](#)

[Arduino](#)

[Autotransformer / Variac](#)

[Banana Pi](#)

[Batteries](#)

[Breadboards](#)

[CEL Robox](#)

[Chemicals](#)

[CNC](#)

[Customer Spotlight](#)

[DC Electronic Load](#)

[Desoldering](#)

[Diagnose / Troubleshoot](#)

[Digital Storage](#)

[Oscilloscope](#)

[Diodes](#)

[DIY](#)

[Education Kits](#)

[Educational Labs](#)

[Electronic Kits](#)

[Electronics Industry](#)

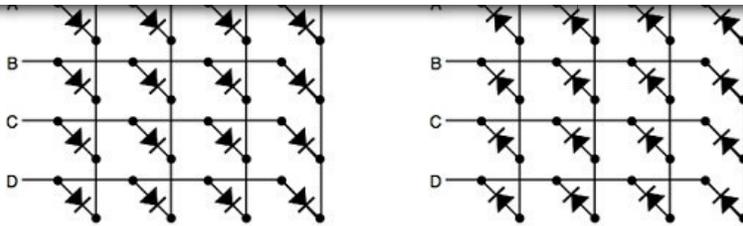
[Electronics News](#)

[Experiments](#)

[Featured Youtubers](#)

[Function Generators](#)

Orders over \$50 qualify for a free gift **Claim Yours Now**



The difference between these two configurations determine how you would call on a specific LED. With common-row anode (left), the current sources (positive voltage) are attached to rows A – D. Currents sinks (negative voltage, ground) are attached to columns 1 – 4.

Conversely, with common-row cathode (right) the current sinks (negative voltage, ground) are attached to rows A – D and currents sources (positive voltage) runs through columns 1 – 4.

Applying this knowledge, to light the top-right LED (A,4) in a common-row cathode matrix you would feed positive voltage to column 4 and connect row A to ground.

We will be building this arrangement of common-row cathode matrix in this tutorial.

### **Step 1: The Parts**

To build this matrix, we will need a few things to get us started.

- 1 – Prototyping Board
- 2 – 8 Pin Headers
- 8 – 200ohm resistors
- 64 – Red LEDs

Some other essential supplies include: [Soldering iron](#), [Solder](#), [Desoldering wire / rosin flux](#) (just in case), [wire](#) (we recommend 2 different colors to stay organized), [Heat shrink tubing](#)

[Internet of Things \(IoT\)](#)

[LED Matrix Tutorials](#)

[Logic Analyzer](#)

[Multimeters](#)

[New Products](#)

[Panel Meters](#)

[PCB](#)

[Power Supplies](#)

[Prototyping](#)

[Raspberry Pi](#)

[Red Pitaya](#)

[Resistors](#)

[Reviews](#)

[RF Modules](#)

[Robotics](#)

[Safety](#)

[Servo Motors](#)

[Single-board Computers](#)

[Soldering](#)

[Soldering Stations](#)

[Stepper Motors](#)

[Tutorial / How-to](#)

[Videos](#)

[Waveform Generators](#)

**Newsletter**

**Email address:**

Orders over \$50 qualify for a free gift **Claim Yours Now**

for testing purposes.

This will get the matrix built, later we will discuss what's needed to get it running.

[Sign up](#)

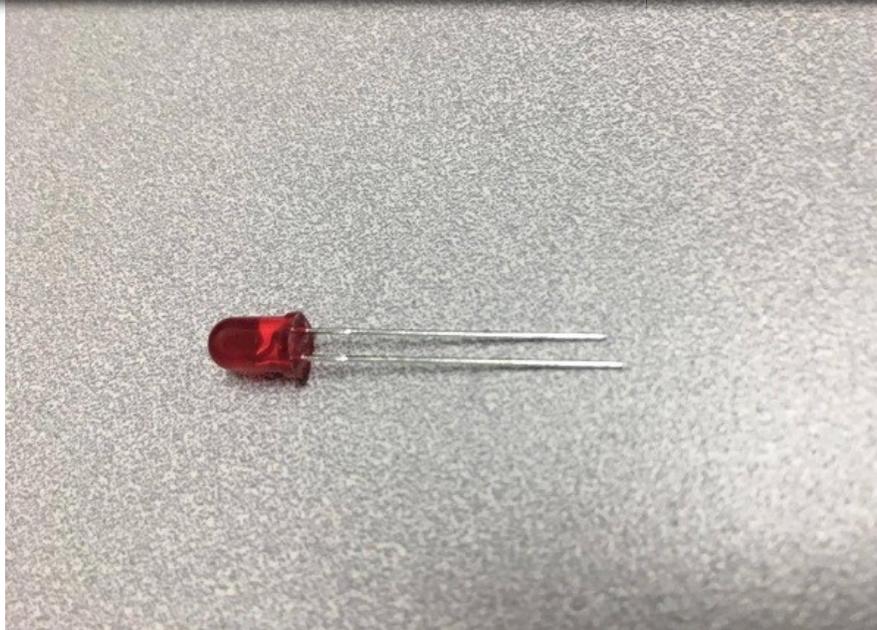
### Step 2: The LEDs

We're going to be using a total of 64 5mm Red LEDs, it never hurts to have some extra though. Circuit Specialists stocks a pack of [100 5mm red LEDs](#) you can get for only \$1.65.

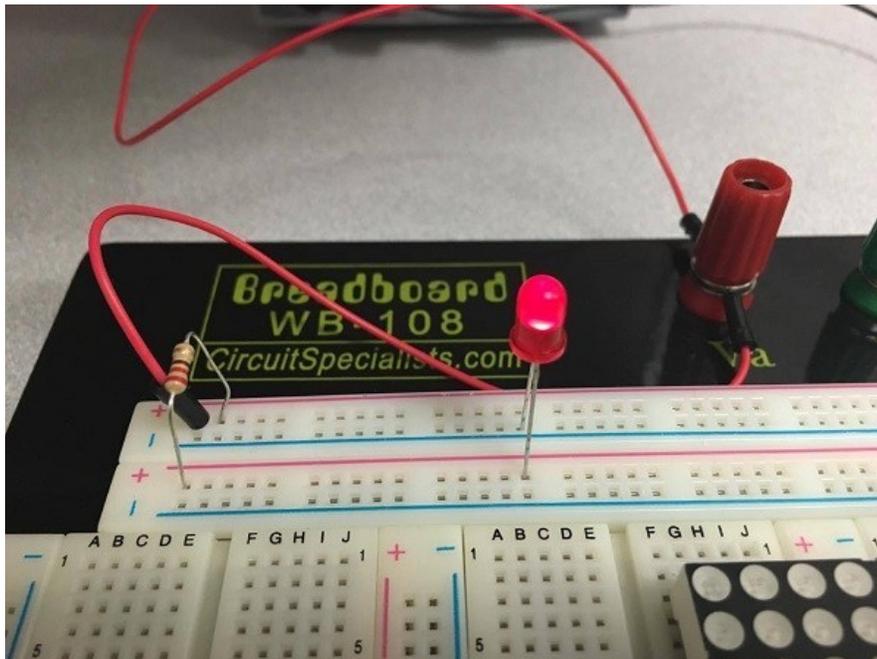


Make sure you note which side is the cathode(-) and the

Orders over \$50 qualify for a free gift **Claim Yours Now**

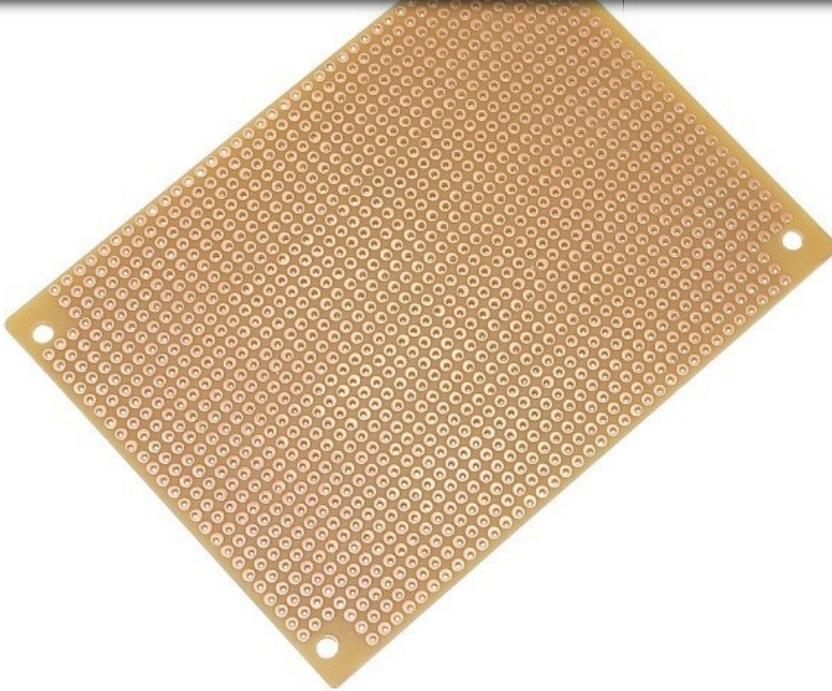


Or, you could always give it a quick test! Make sure you use a resistor!



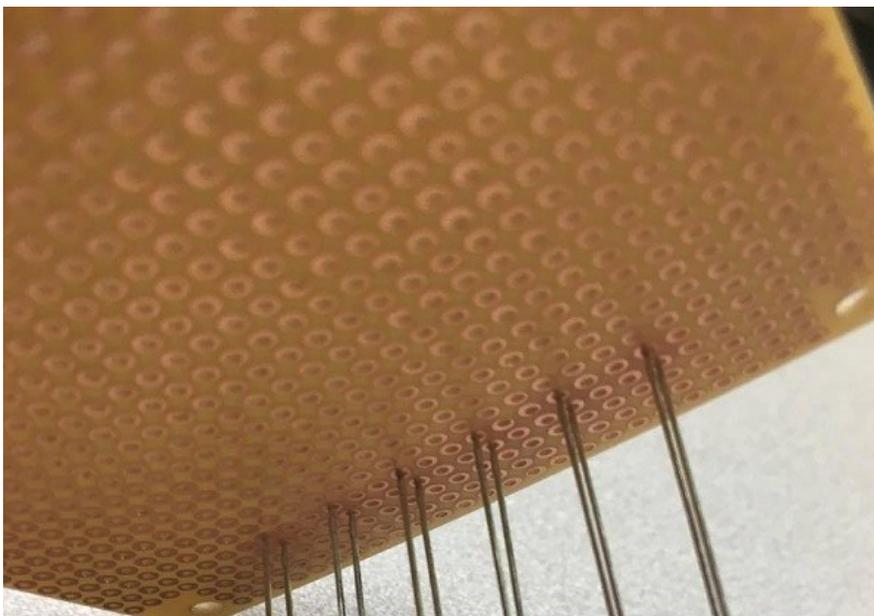
Now, we will begin arranging our bulbs on our perf board. We recommend the 3 x 4-1/4" [Solderable Perf Board](#) model: 64-8934.

Orders over \$50 qualify for a free gift **Claim Yours Now**



### Step 3: Arranging the LEDs

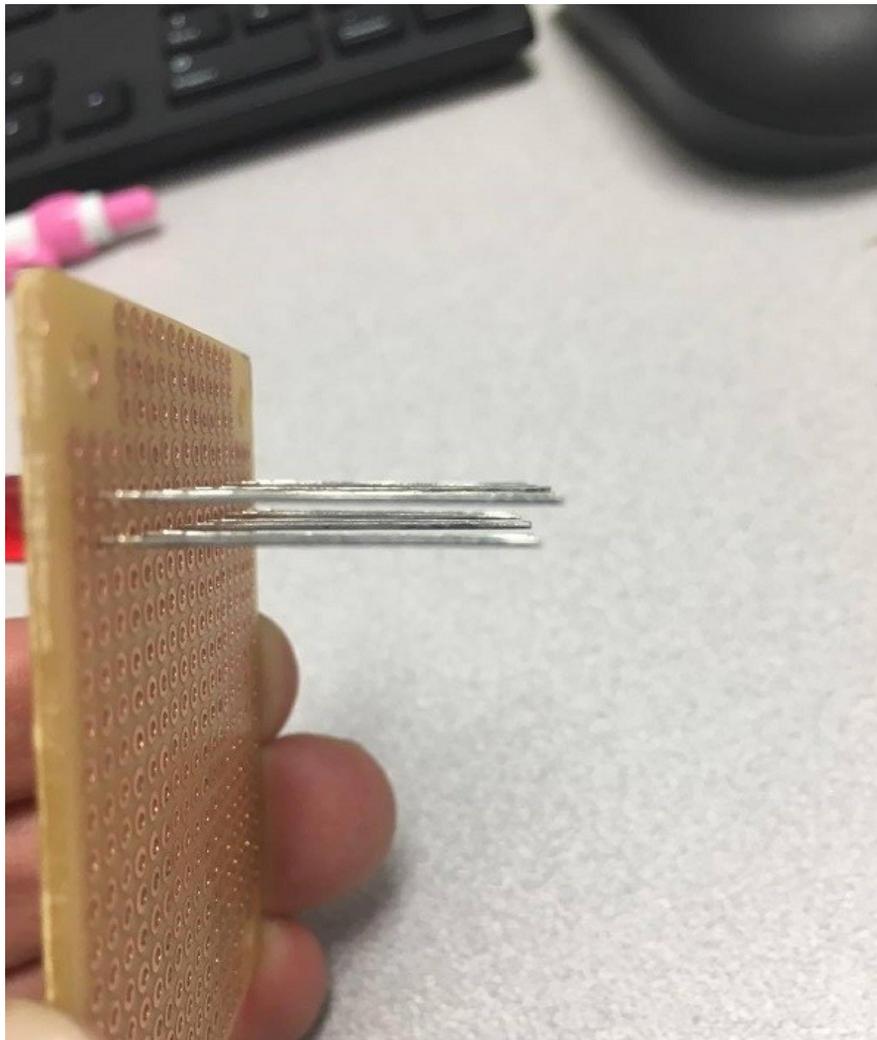
Because we've opted to use the common-row cathode arrangement in our matrix, we will be inserting the pins of the LEDs into the perf board in a particular fashion. It is extremely important to be diligent in this process.



Orders over \$50 qualify for a free gift **Claim Yours Now**



As you can see, we've opted to keep the long side (anode) on top, because we will be bending them vertically.

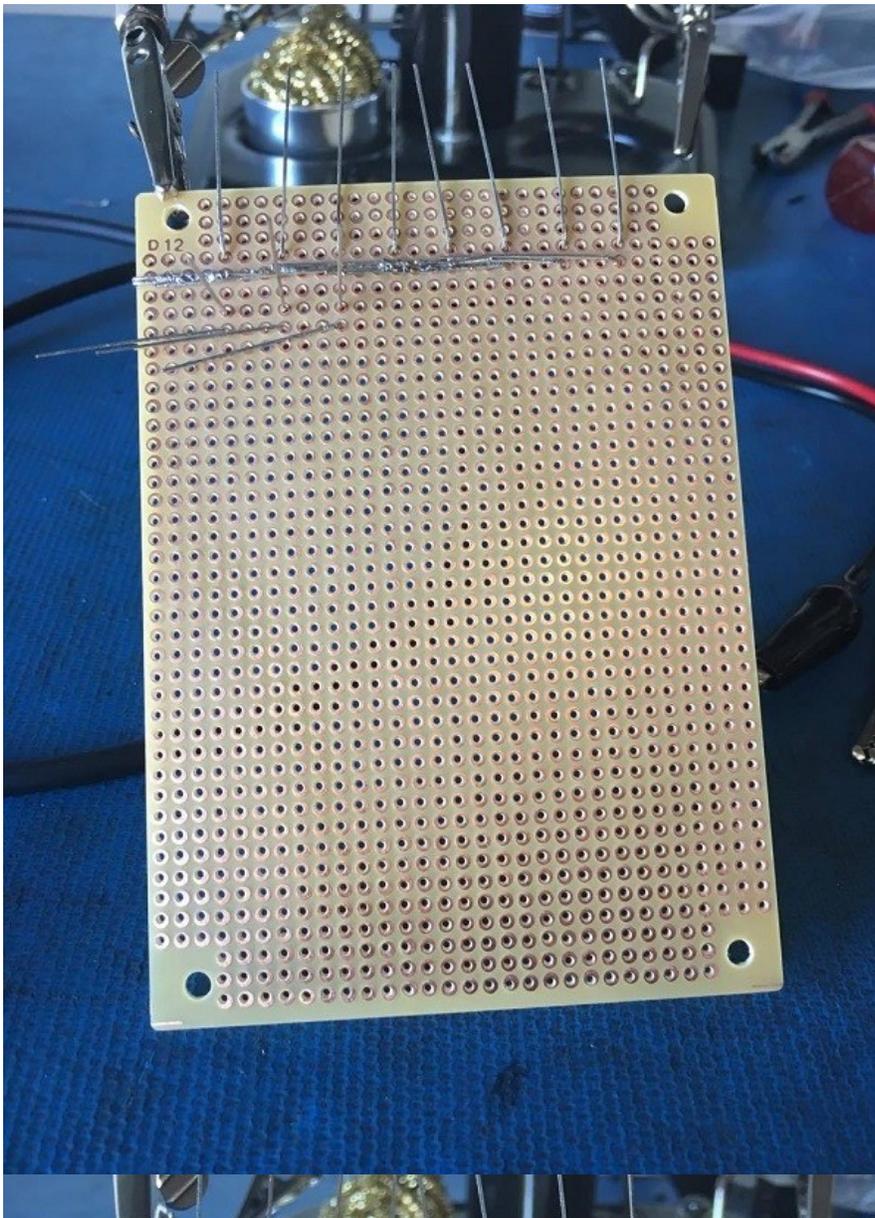


Orders over \$50 qualify for a free gift **Claim Yours Now**

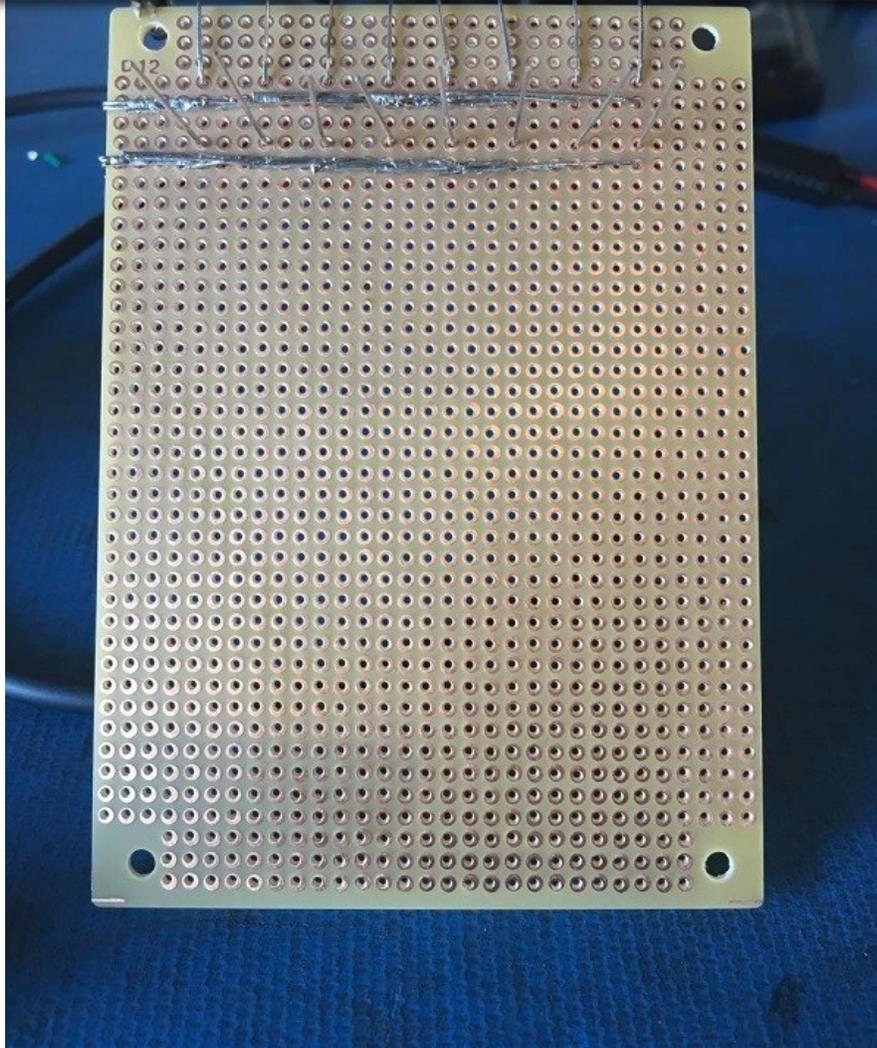
Now the fun begins....

#### Step 4: Soldering the Matrix

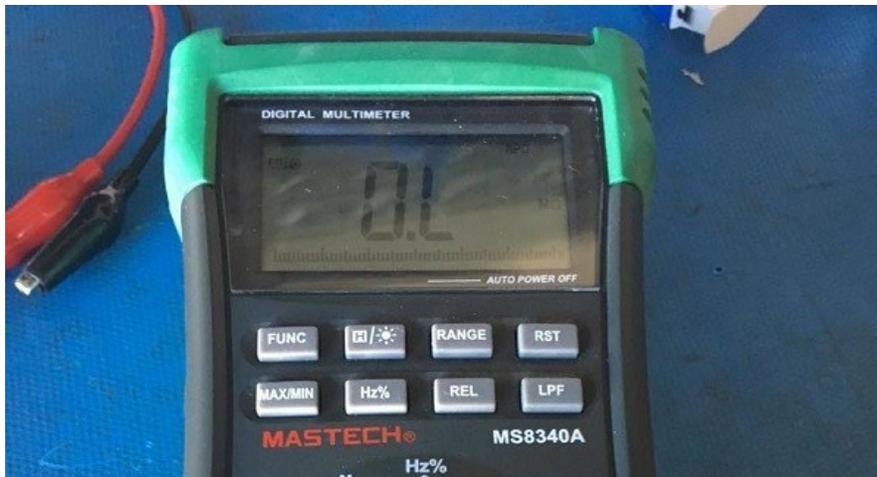
Our weapon of choice for the soldering portion of this build is the CSI Premier 75w [Soldering Station](#). We will also be taking advantage of the immensely useful ZD10Y [Helping Hand System](#) (it makes ALL the difference).



Orders over \$50 qualify for a free gift **Claim Yours Now**



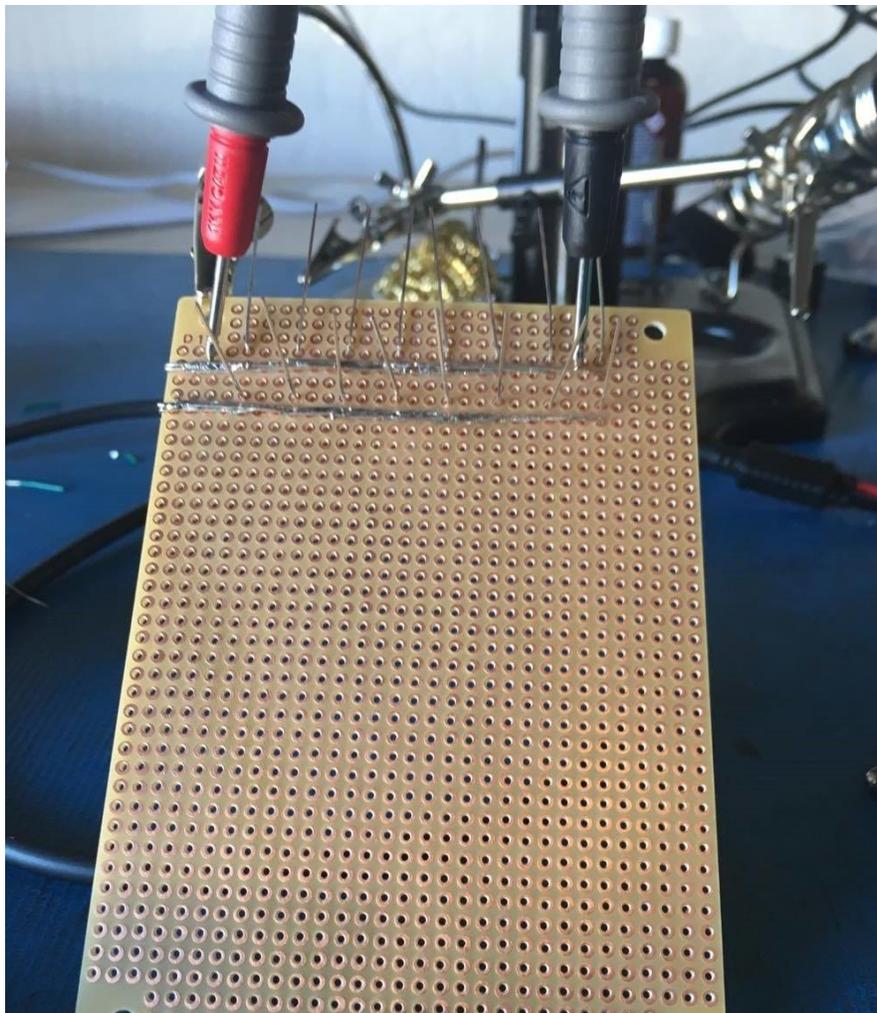
Once we've successfully soldered a row of cathodes, we can test their conductivity using a [multimeter](#) set to continuity mode.



Orders over \$50 qualify for a free gift **Claim Yours Now**



Leads set to each side of the row.



Orders over \$50 qualify for a free gift **Claim Yours Now**

Any reading besides "OL" means you have a complete circuit.

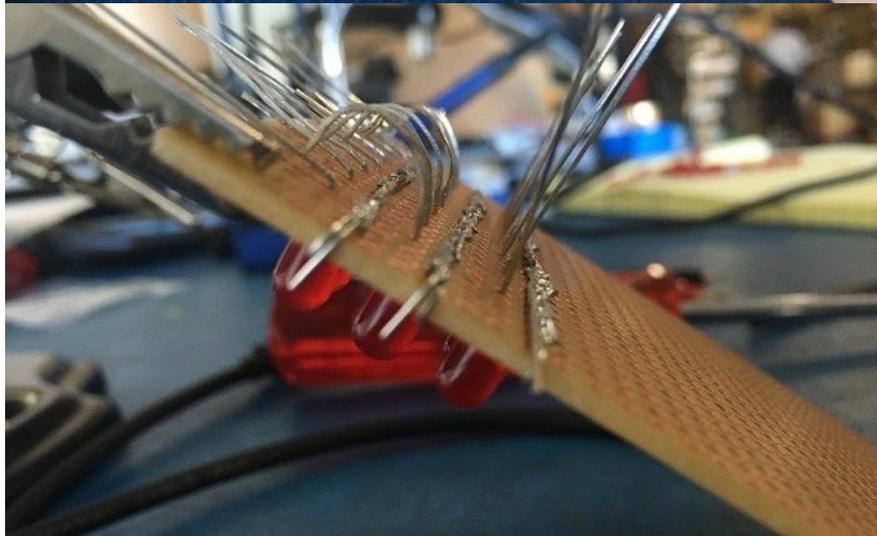
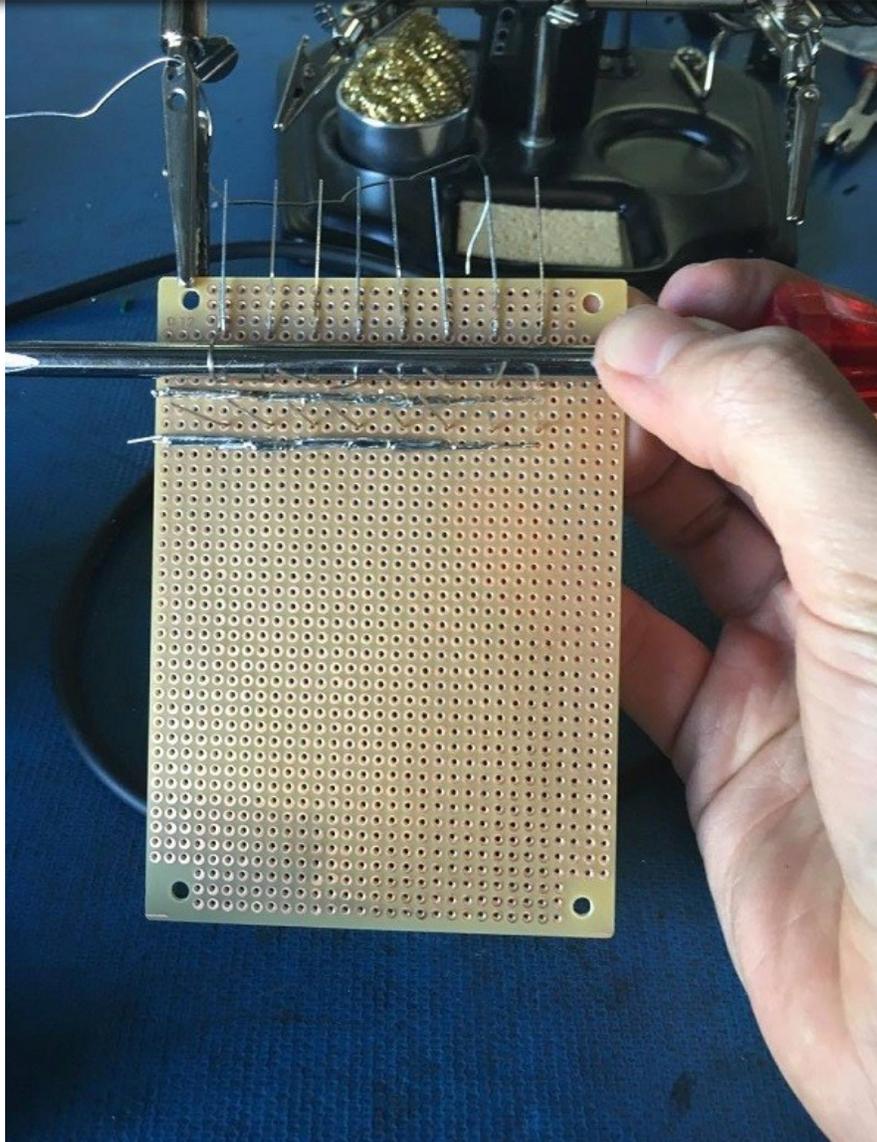


Checking our work along the way will save a TON of frustration later.

**Now, we will start soldering the anode columns.**

It's absolutely critical that the anodes DO NOT touch the cathodes. Here, we're using a screwdriver to assist with the

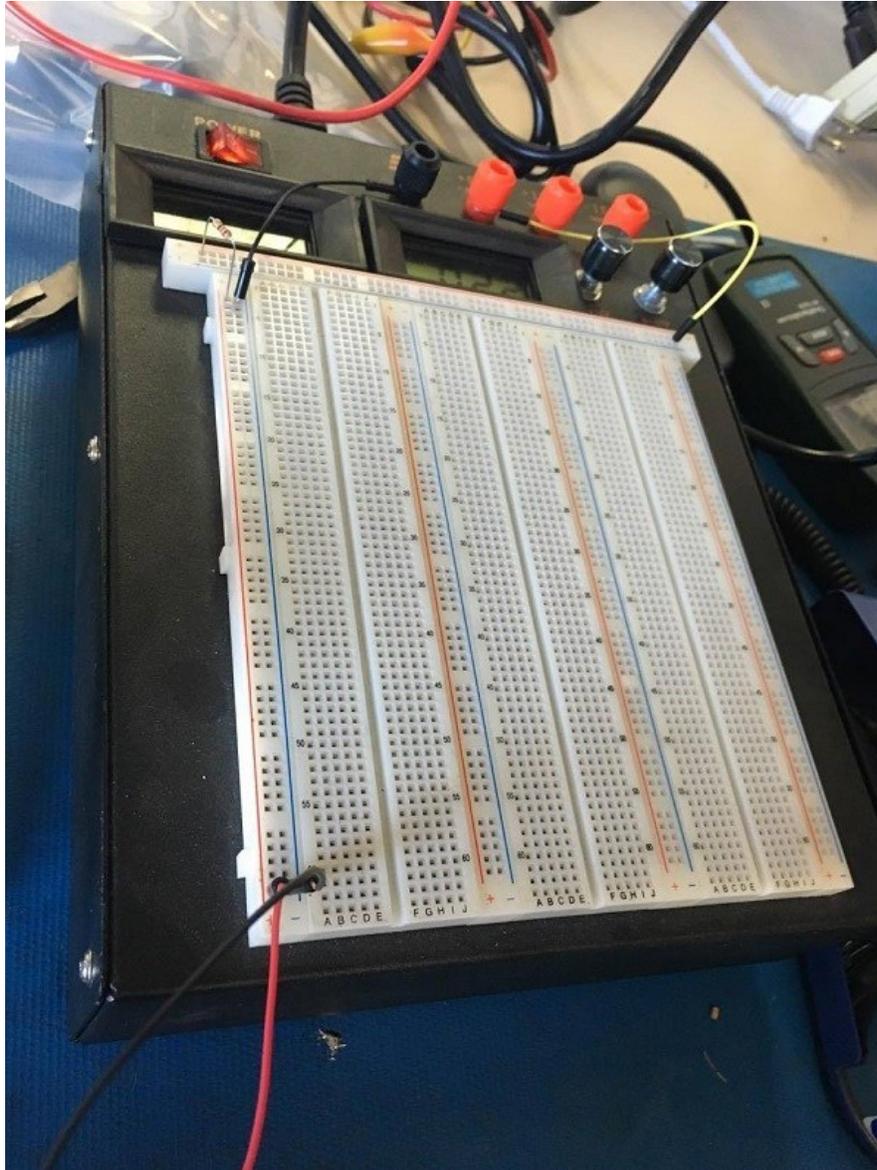
Orders over \$50 qualify for a free gift **Claim Yours Now**



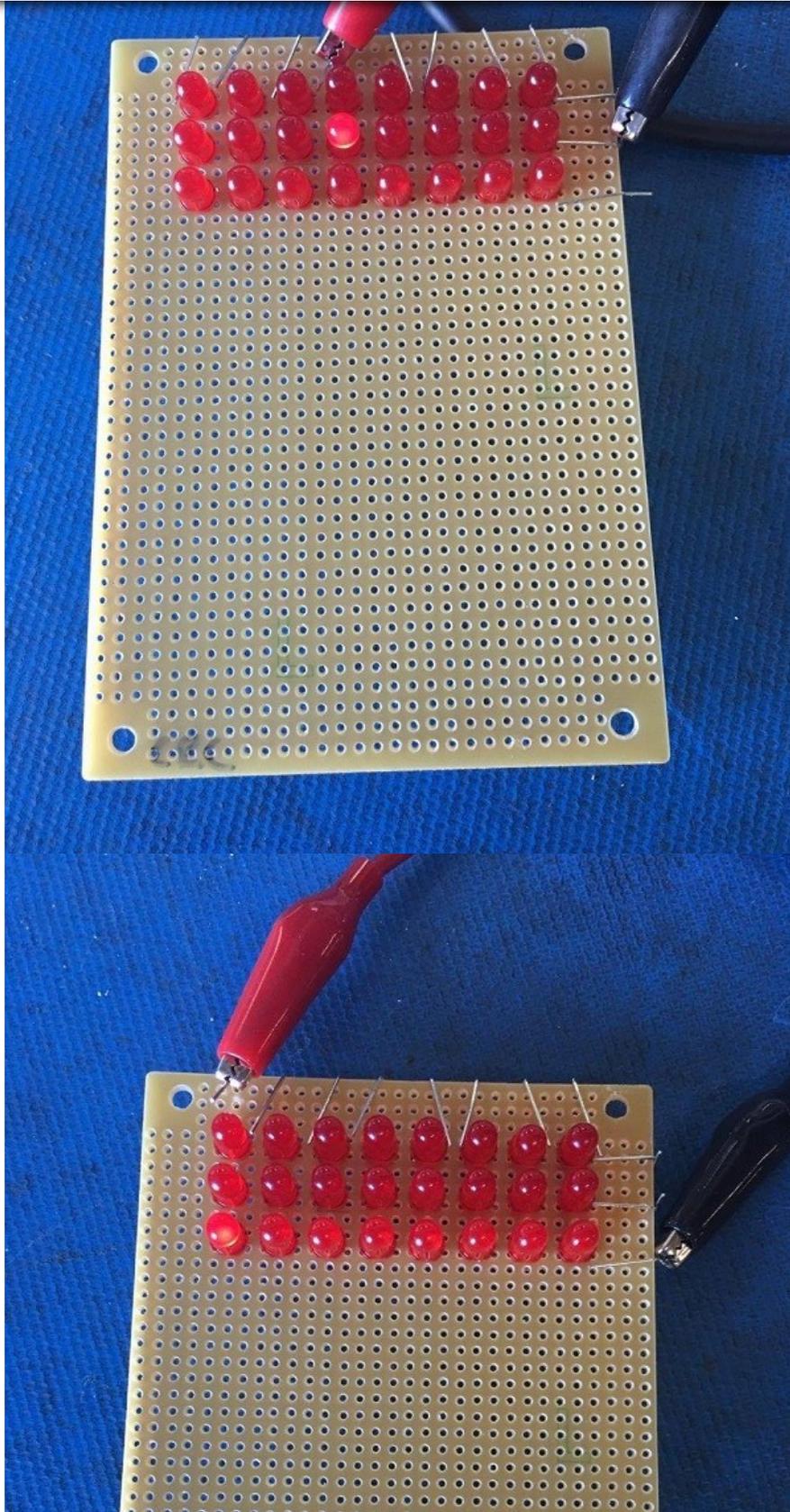
Orders over \$50 qualify for a free gift **Claim Yours Now**

Now, let's check our work again. Connect ground to your rows, and power to your columns... make sure you use a resistor!

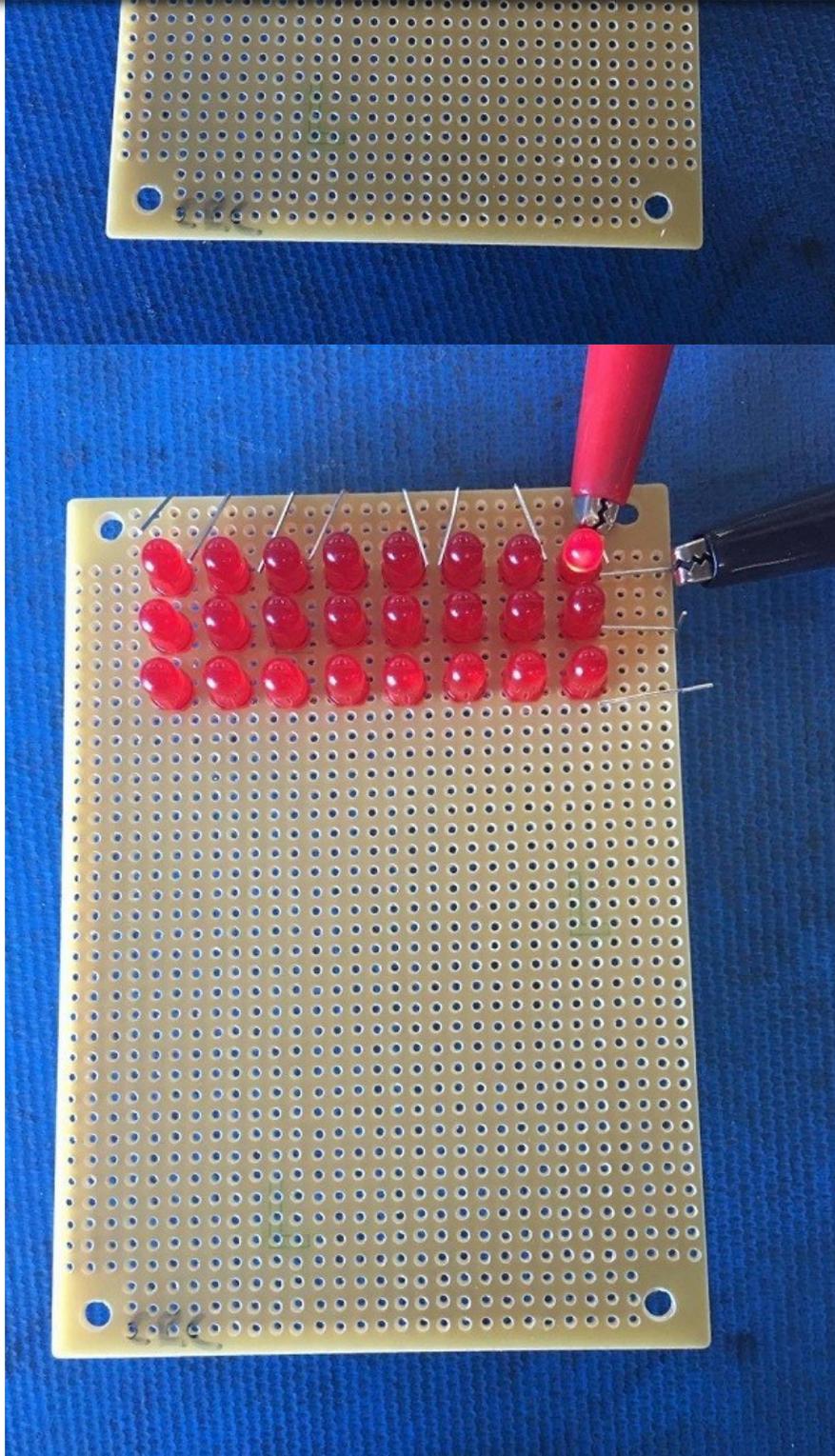
A [powered breadboard](#) makes this process extra easy, but any breadboard will do.



Orders over \$50 qualify for a free gift **Claim Yours Now**



Orders over \$50 qualify for a free gift **Claim Yours Now**

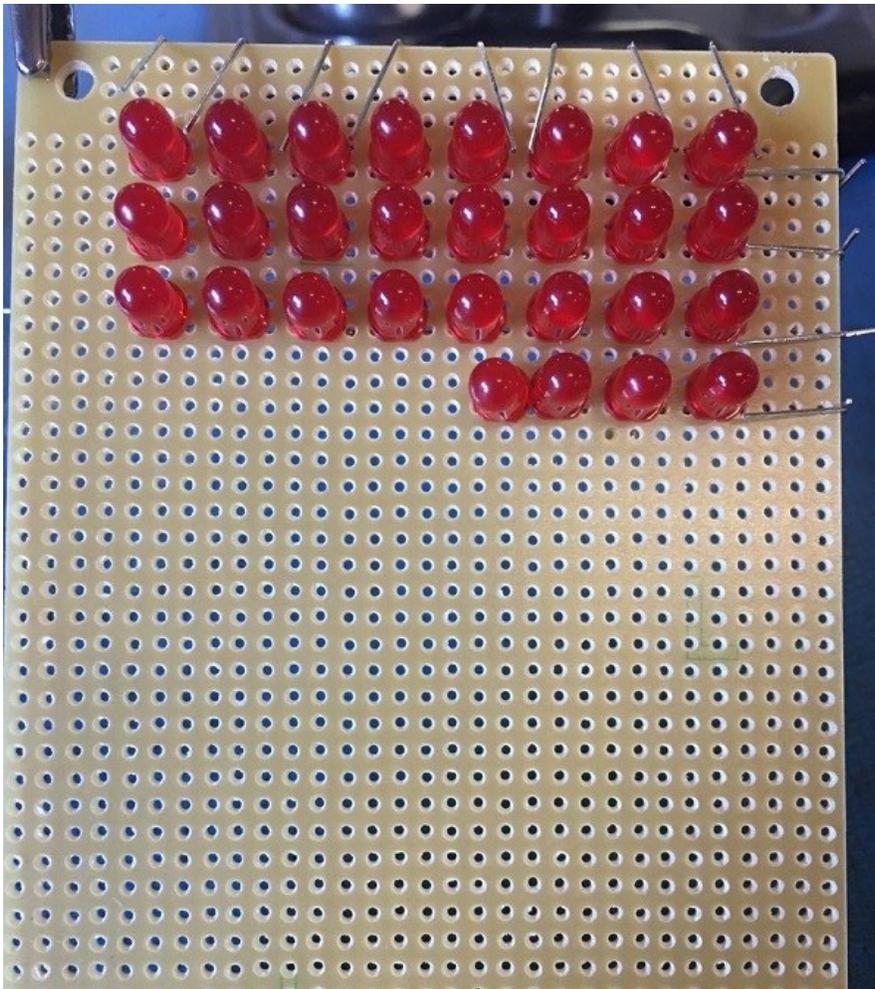


This is what will happen if you do not use a resistor (blown bulb)....

Orders over \$50 qualify for a free gift **Claim Yours Now**



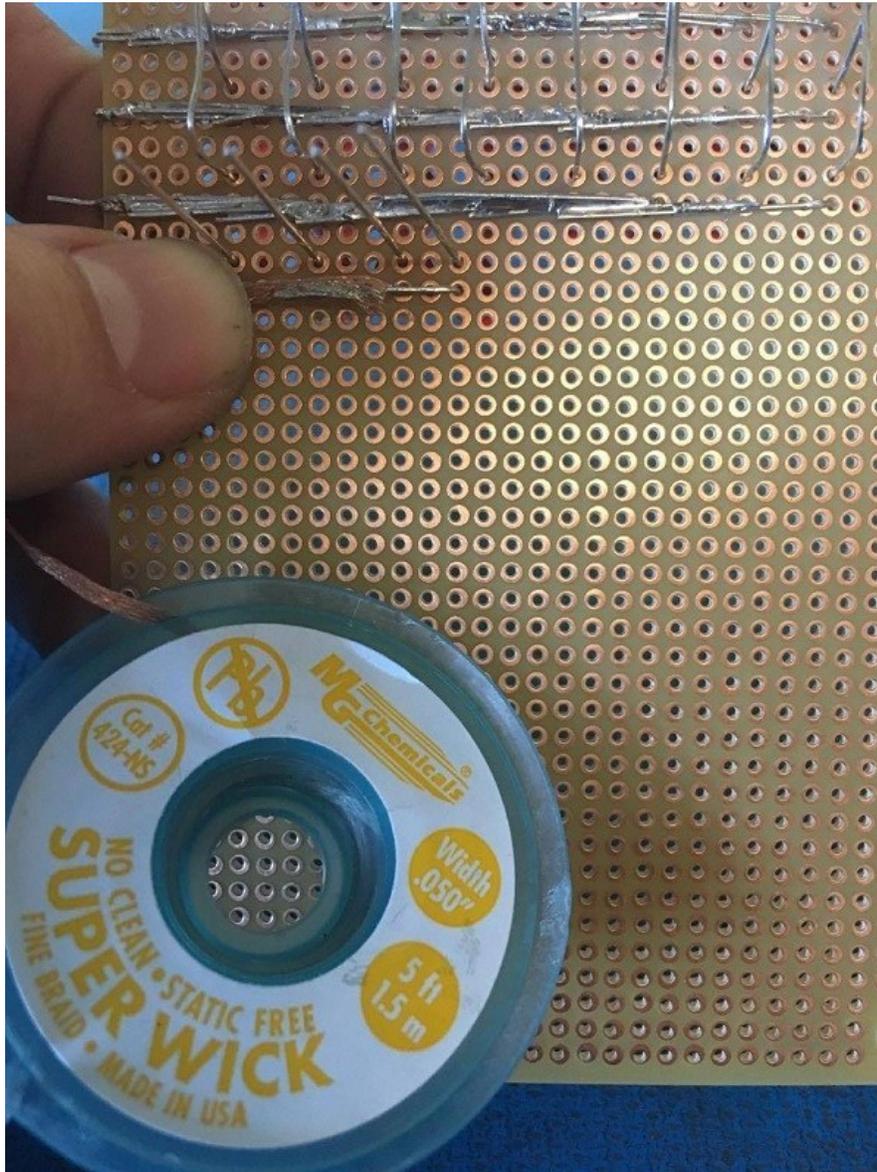
Another easy mistake you might want to avoid (doh!)...



Orders over \$50 qualify for a free gift **Claim Yours Now**



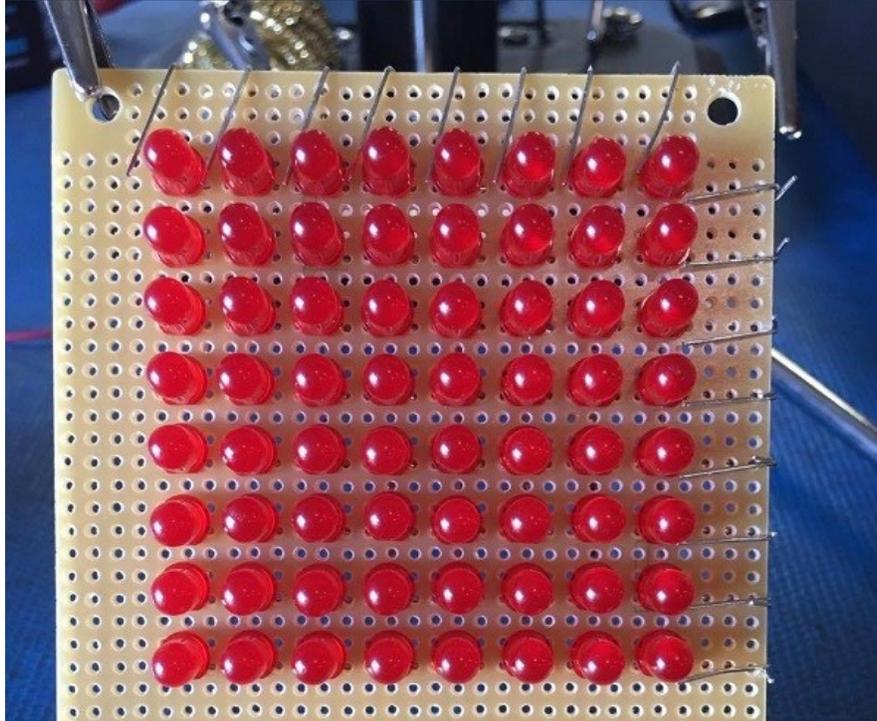
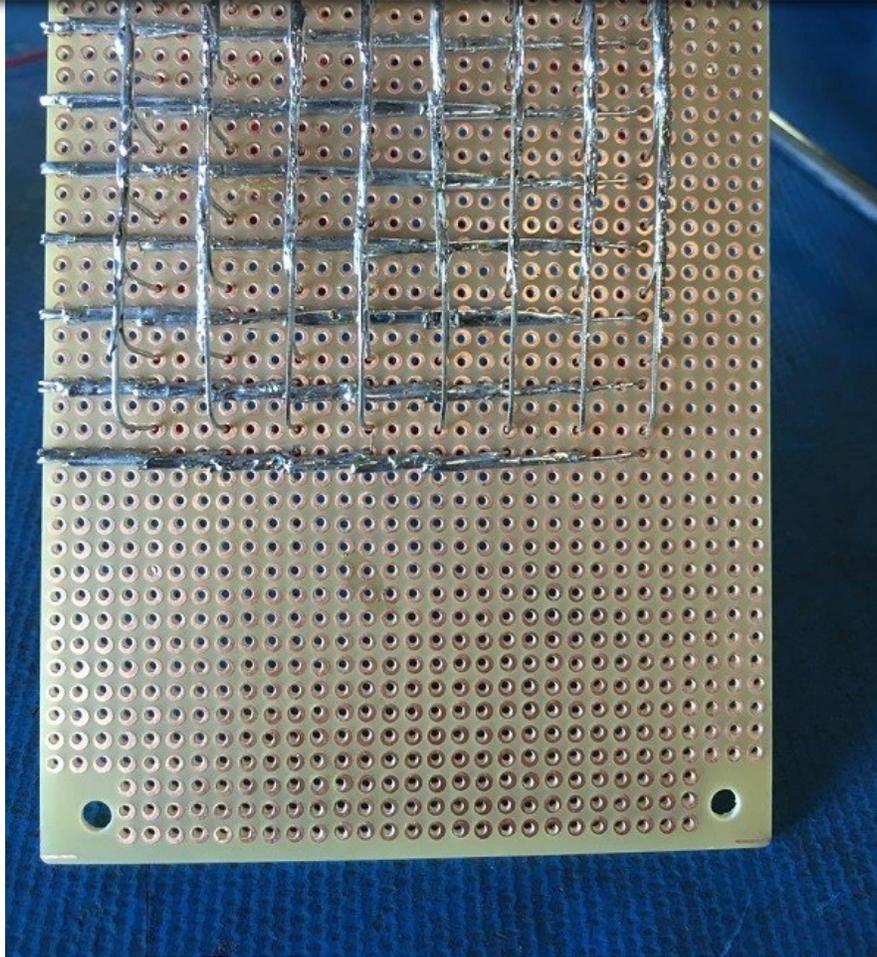
This is why [desoldering wire](#) and [rosin flux](#) are essential parts of your tool kit!



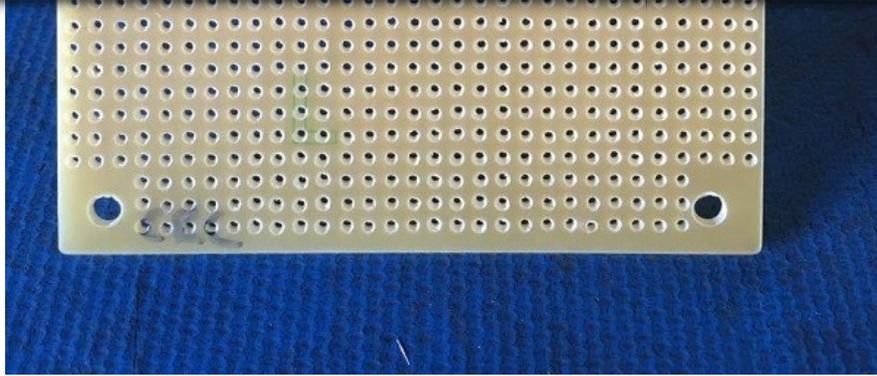
This is what it'll look like when your soldering is complete.



Orders over \$50 qualify for a free gift **Claim Yours Now**

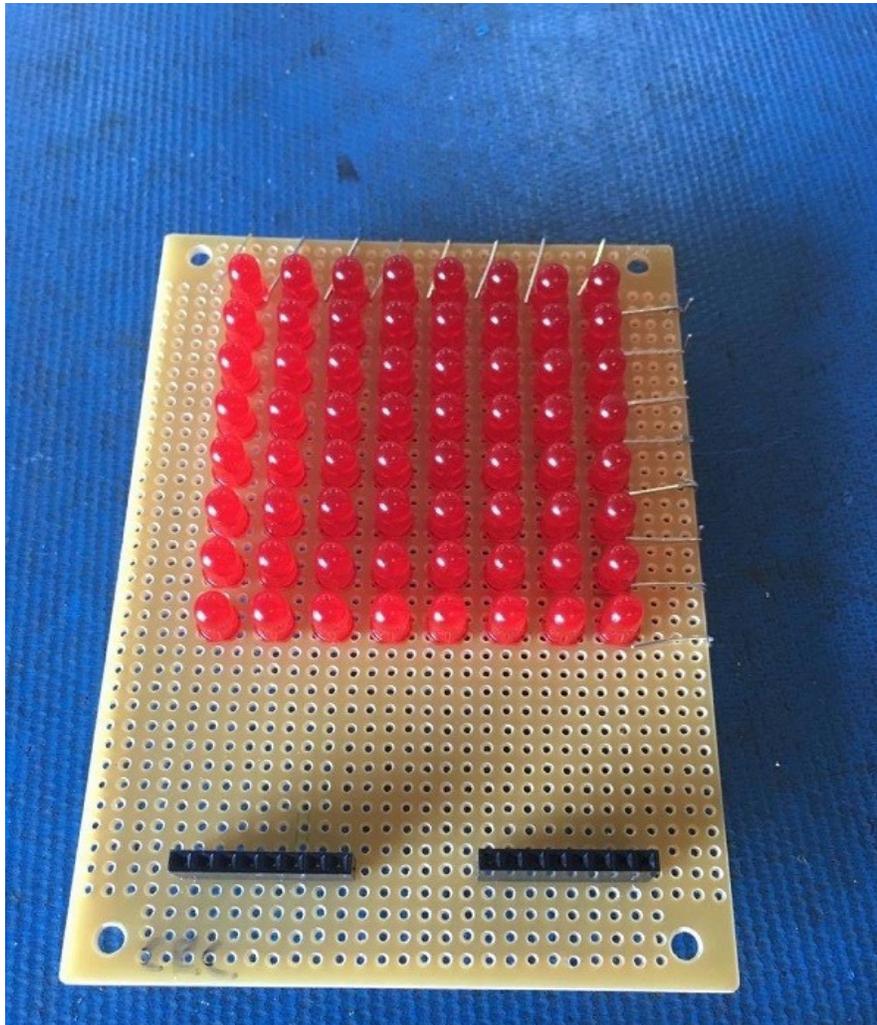


Orders over \$50 qualify for a free gift **Claim Yours Now**



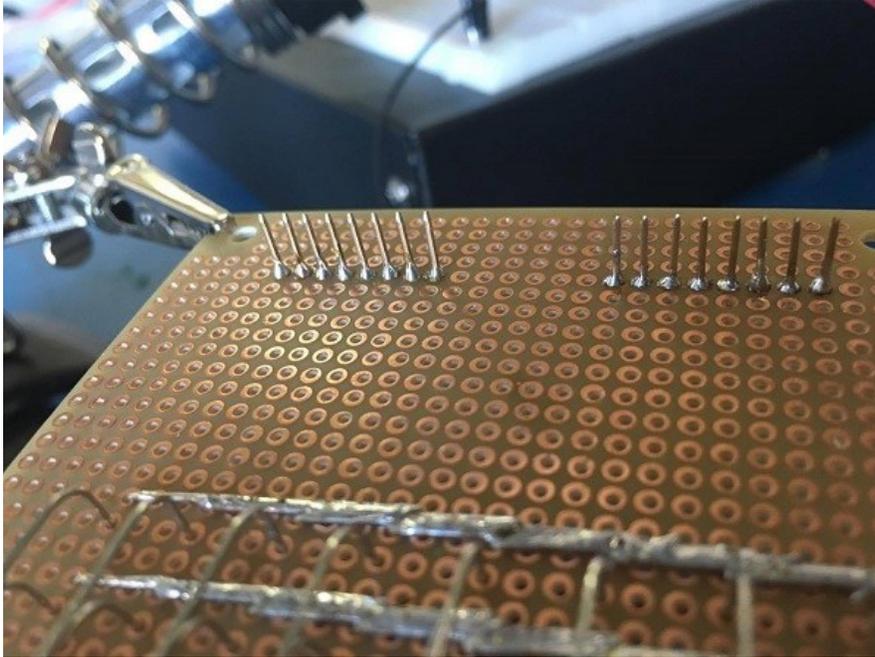
### Step 5: Attaching the connectors

Now that our LEDs are arranged and we've tested each of the circuits, we will go ahead and attach the [8 pin headers](#) to the perf board.



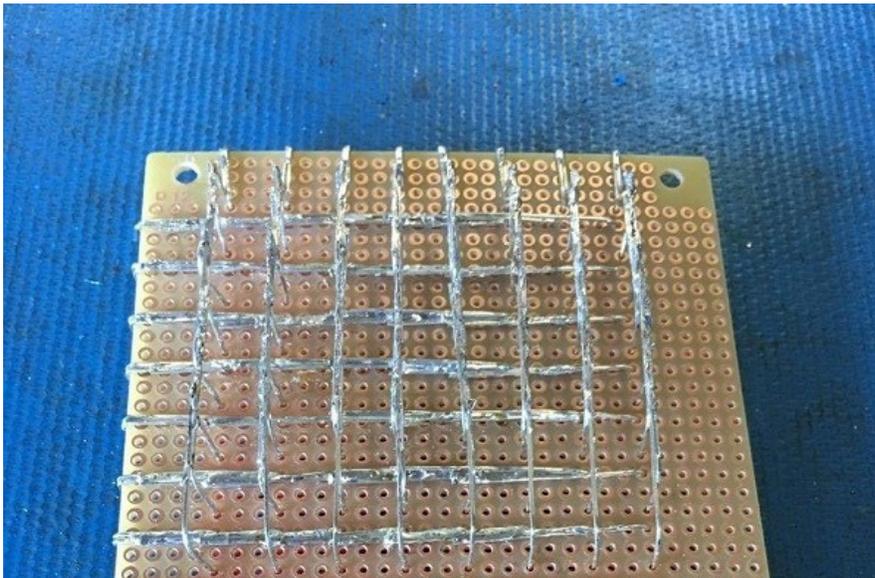
Orders over \$50 qualify for a free gift **Claim Yours Now**

Then we'll add some solder to keep the headers secure.

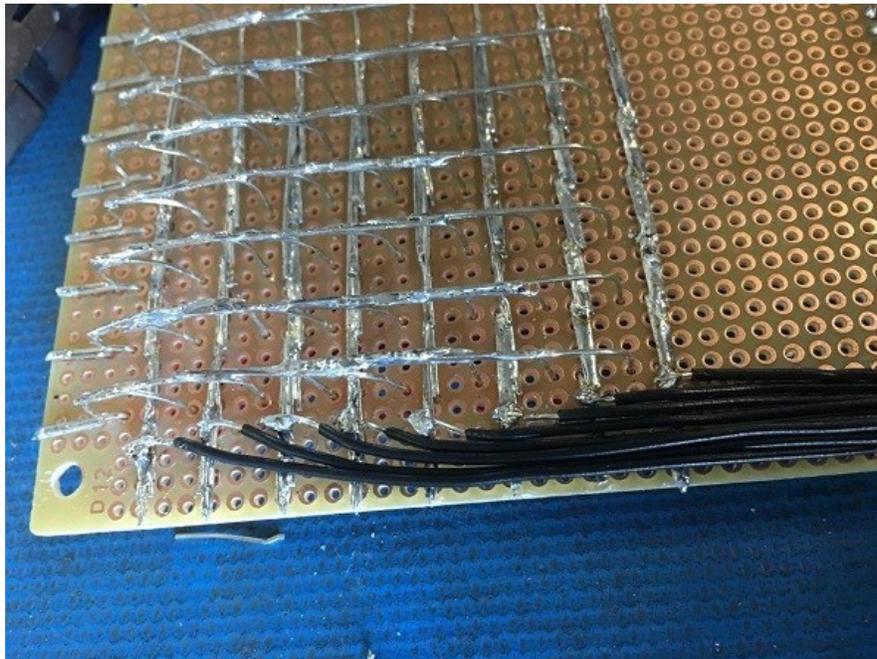
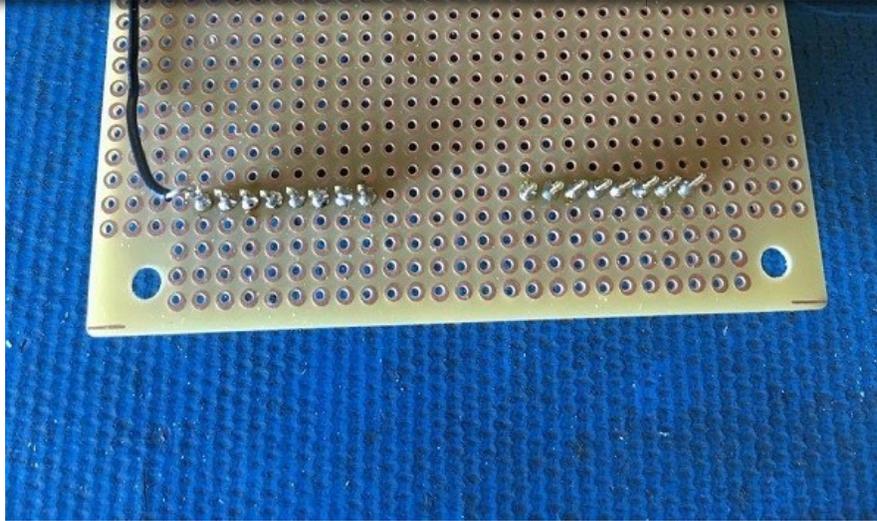


Now comes the (arguably) most difficult part of this build with regards to soldering skill.... connecting the pins to the rows and columns.

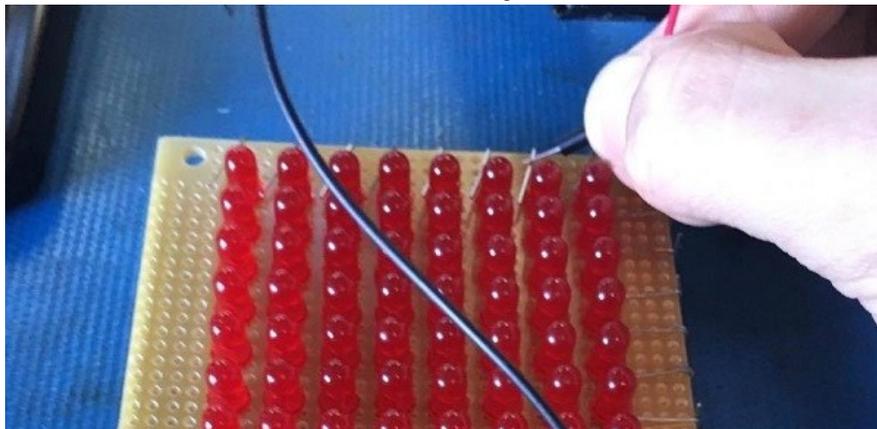
Keep in mind that the pins will be reversed when you flip the board over, so pay close attention to your work.



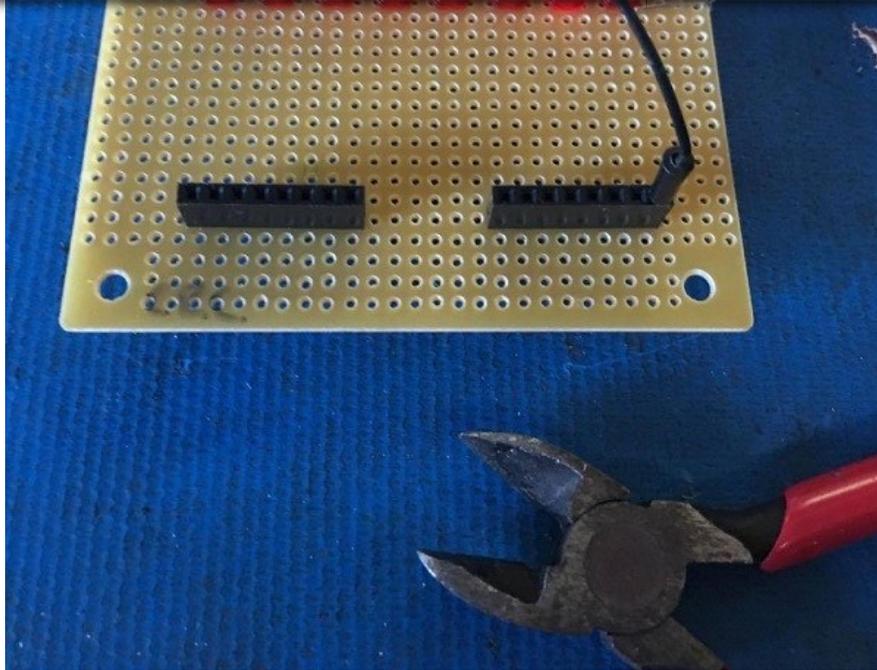
Orders over \$50 qualify for a free gift **Claim Yours Now**



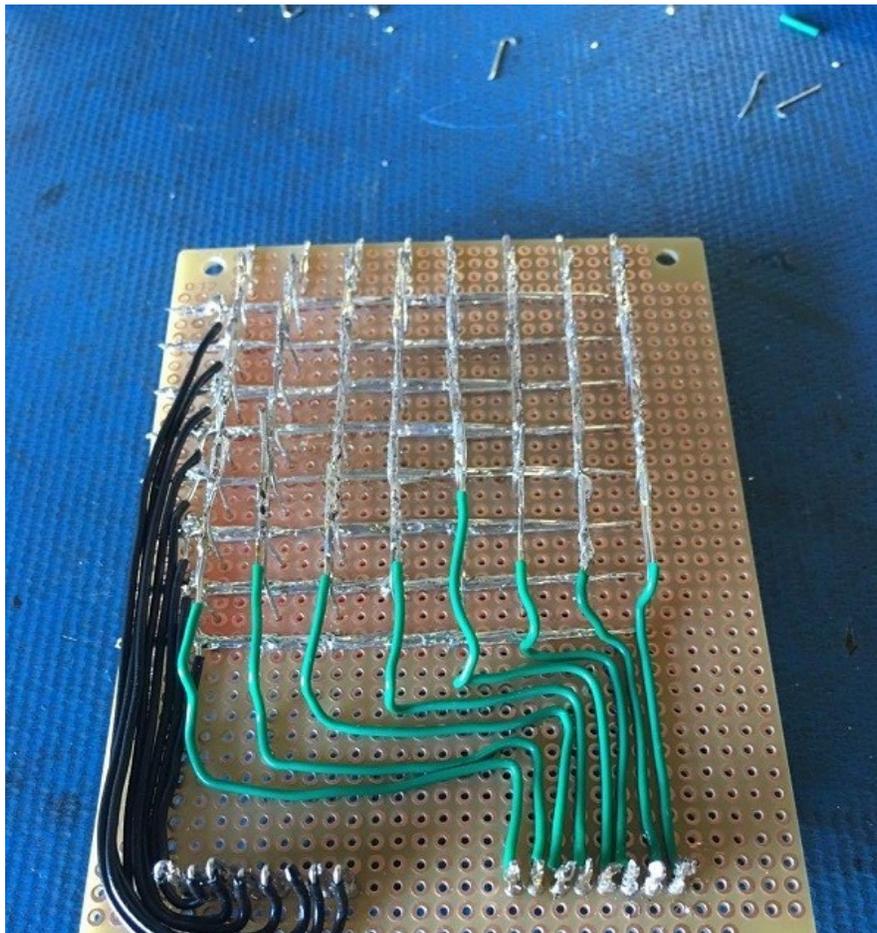
Now we'll test our connections one by one.



Orders over \$50 qualify for a free gift **Claim Yours Now**



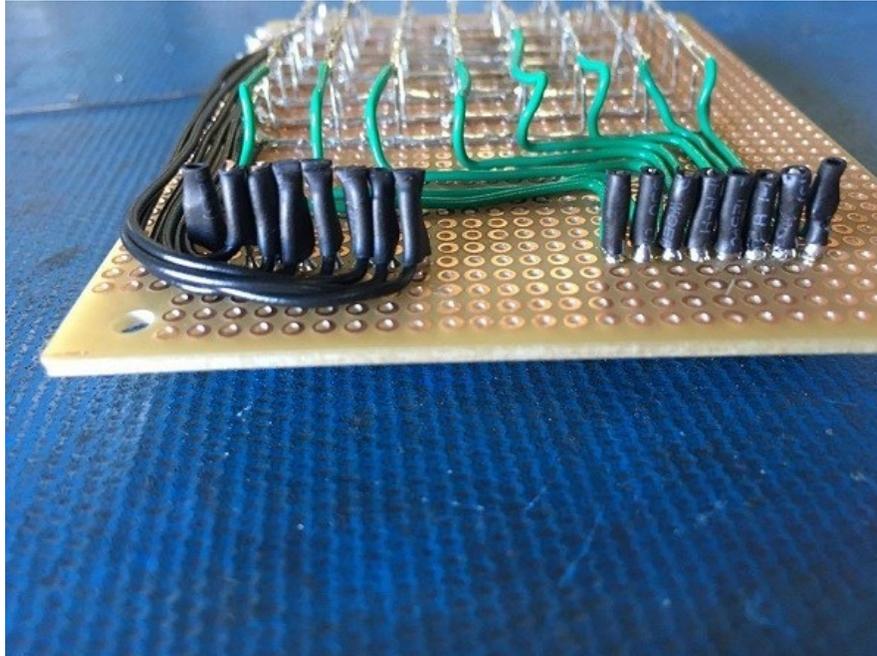
Then, we move on to the anode side.



Orders over \$50 qualify for a free gift **Claim Yours Now**

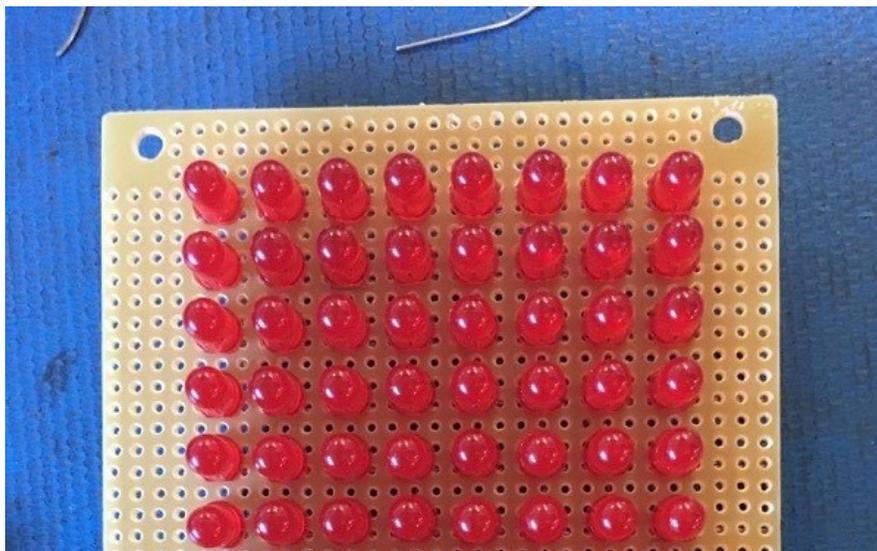


Then a little heat shrink to keep everything neat.

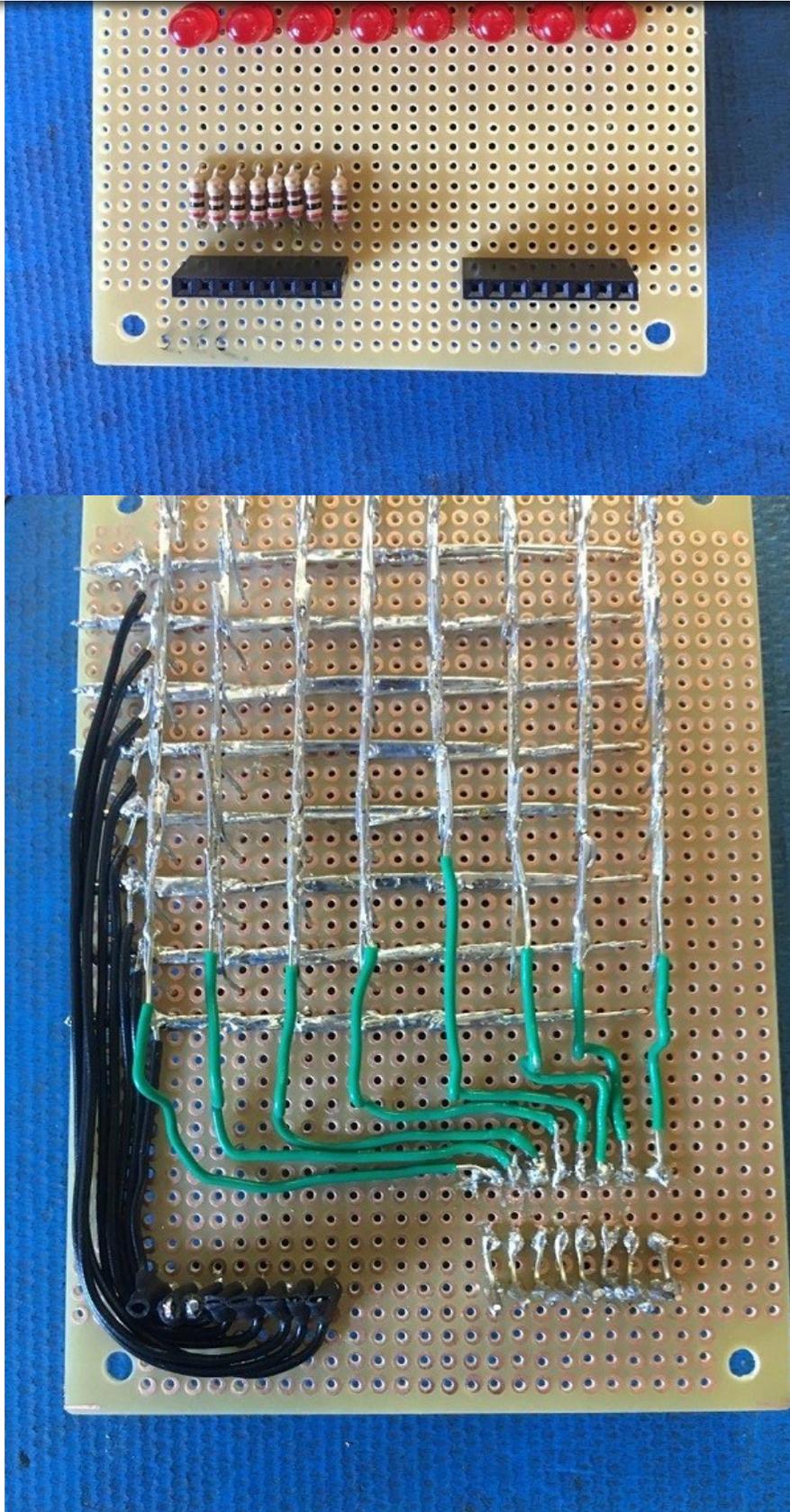


As you probably noticed, I initially forgot something very important.... THE RESISTORS!!

Try to avoid this, and get them in the power lines from the start.

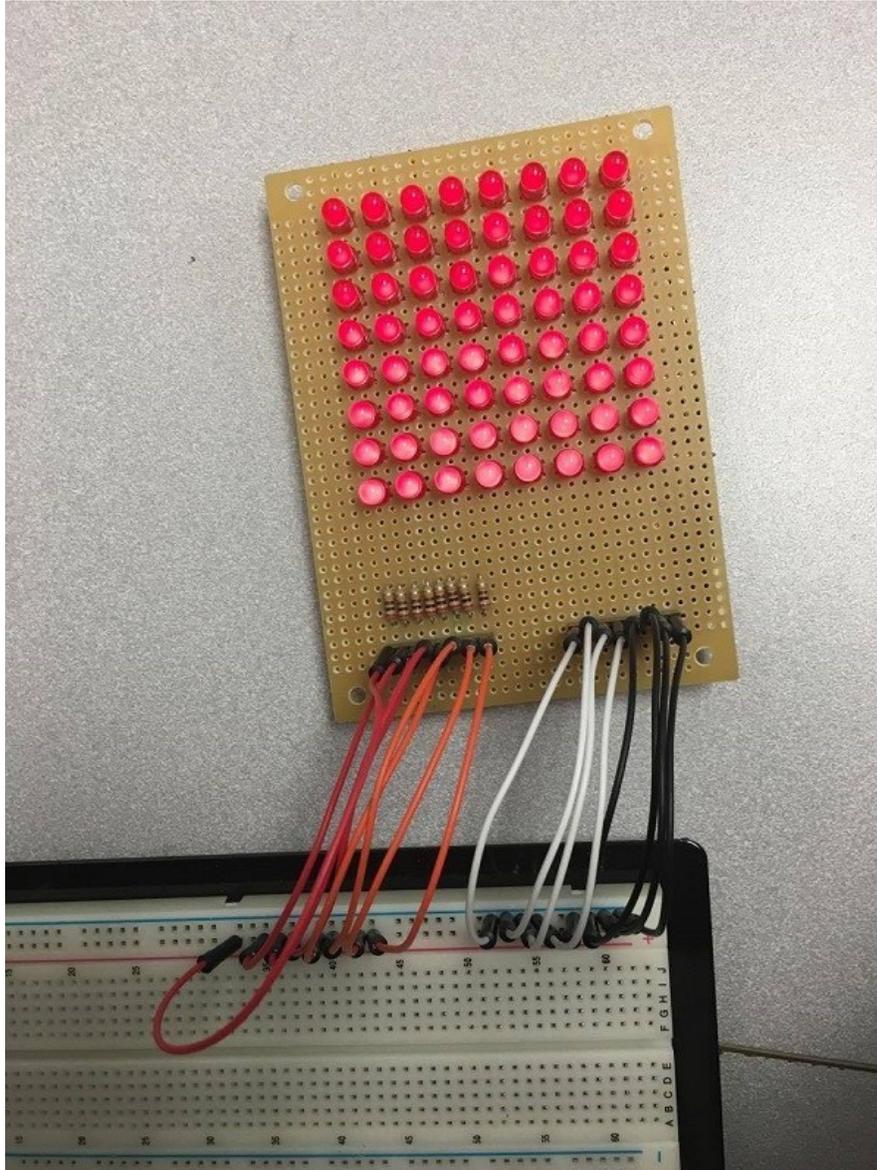


Orders over \$50 qualify for a free gift **Claim Yours Now**



Orders over \$50 qualify for a free gift **Claim Yours Now**

Okay, much better... now we can power up the unit!



Looks great! Now we can start learning how to program the matrix using the [OSEPP Uno R3 - Arduino compatible board!](#)

We will begin this lesson next week. Make sure you subscribe to keep updated!

**Update: [8x8 LED MATRIX - BEATING HEART TUTORIAL](#)**

Orders over \$50 qualify for a free gift **Claim Yours Now**

[← Introducing the Particle Photon – Compact IoT Device](#)

[DIY: Smartphone Garage Opener w/ Status Updates →](#)

## You May Also Like

SOLDERING  
101 – The  
Basics

📅 December 11,

2013  0

Introduction to  
Linear &  
Switching  
Power  
Supplies

📅 April 22, 2014  0



DIY:  
Smartphone  
Garage  
Opener w/  
Status Updates

📅 February 15, 2016

 1

## 2 thoughts on “How To Make An 8×8 LED Matrix”



 alkah@hotmail.com

📅 May 22, 2017 at 1:11 pm

 [Permalink](#)

So how are the diodes connected.



 pierson7

Orders over \$50 qualify for a free gift **Claim Yours Now**

 [Permalink](#)

I absolutely love this tutorial, it is very clear. I was wondering if you could do another one but with common anode RGB Led?

## Leave a Reply

You must be [logged in](#) to post a comment.

Copyright © 2019 [Simply Smarter Circuitry Blog](#). All rights reserved.  
Theme: ColorMag by [ThemeGrill](#). Powered by [WordPress](#).

