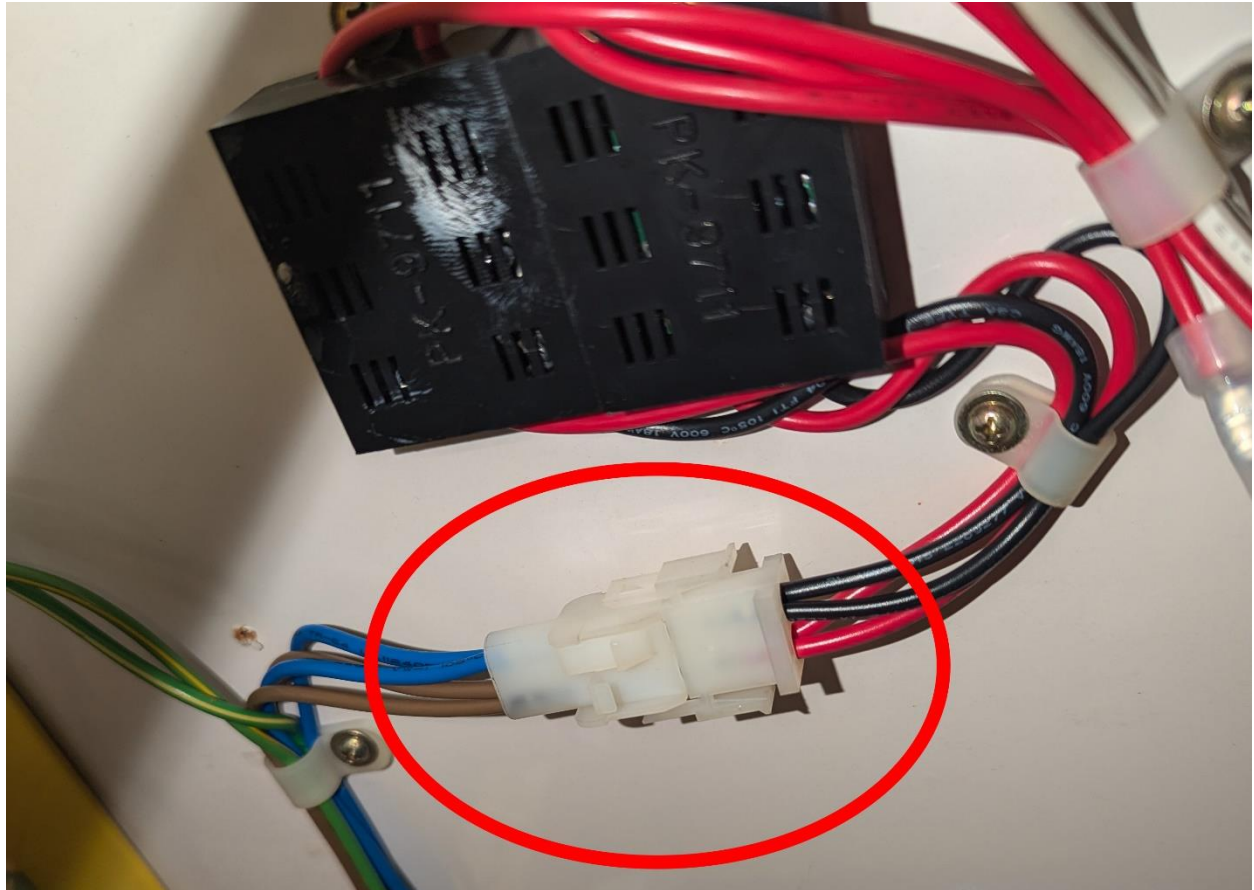


## Retrofitting LED lights into Toy Soldier Claw Machine with AC Rope Lights

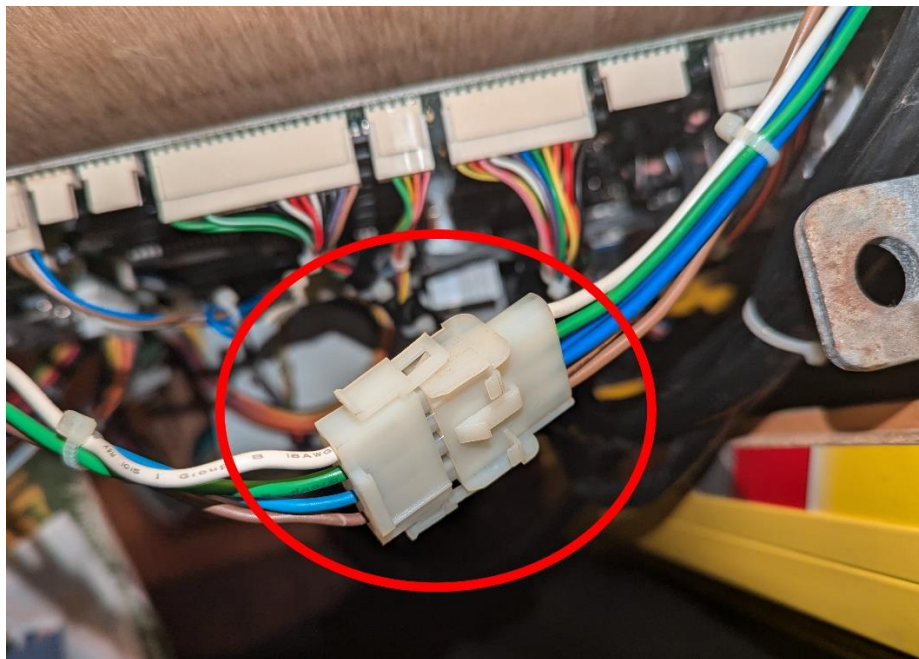
I Started this project after I noticed the rope lights used for the attract lights had mostly stopped working (sections of the lights had gone out). I had reached out to coastal amusements to talk about the rope lights and all they could tell me was that it was an older model (2004 from what I can tell) and they couldn't help past that, so I decided to take matters in my own hands.



The first idea that I had was to just unplug this wire at the top of the machine, plug in a micro-controller, maybe get a voltage adjuster if needed, and call it a day. Oh boy was that not going to work. After undoing the plug and testing the voltage, turns out that's just mains voltage. I should have just known that since the same wires are also driving the fluorescent lights in the top of the machine... also it says so in the provided "schematic" in the manual (should have looked there first). So, I went back to the drawing board.

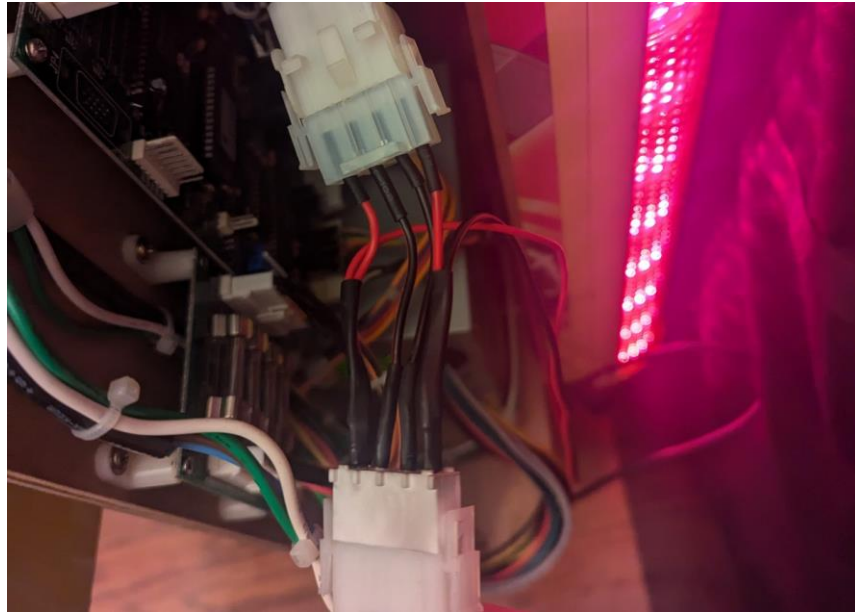


This is where I found out that in this power hub in the back of the tray that holds the electronics, the plug of the right of this image or the side closest to you when looking in the machine is just a regular power cable that goes to a connector then to the lights.



This connector is a MOLEX MLX 4POS ([Digikey links for sockets and pins at bottom](#)) so my next idea and the one that I went with is to make a small jumper type cable and split off the power to send to a different power supply, located in the larger opening in the back

(you can put it anywhere it fits), that would take the mains power in and output a nice 12 Volts DC.



The new connector that is built should look like this. It will have the neutral coming off the pin with the white wire coming off it and the live will come from the pin with the brown wire coming from it. Then the ground for the power supply just came from the ground rail next to where I put the power supply.

Then from the power supply I took the now 12 Volts DC and continued with my original idea, power a microcontroller to power ARBG or individually controllable white light strips, up to personal preference, in the channels where the rope lights once were. Since I went with 5V light strips I had to get a buck converter and step the 12v down to 5v, for this I got a relatively cheap car phone charger but there are cheap ones on places like eBay or Amazon that all you have to do is wire them directly into the circuit. Be careful with cheap buck converters as quality isn't always that great, I bought 2 but one of them fried itself the first time I gave it power since the chip was shorted from the factory.

The rest is simple, all that needs to be done is to install the lights of your choice, take the wires from the microcontroller that you chose, follow the old wires with your new wires, and connect the light strips. After that you should be all done.

### What I Chose

The lights that I chose to go with were the WS2812B strips with a density of 60 lights/meter, I used strips with a length of 106 lights on each side.

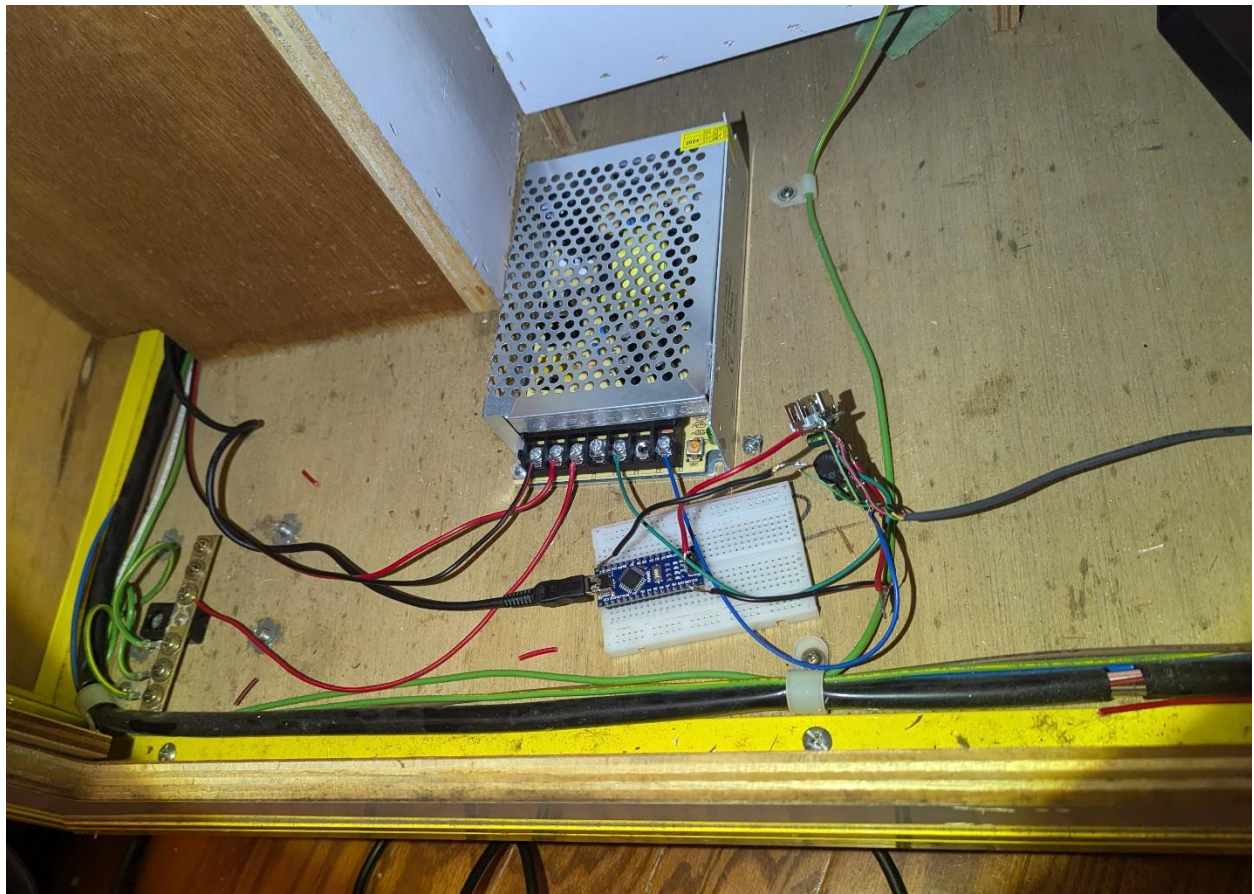


The micro-controllers that I chose to go with was Arduino Nano and I will host the code that I am running on GitHub. (Link Below or if you are already on GitHub, it's in this repository)

#### Notes about the code

- This is my first time truly “writing” an entire script
- All that I wrote was the set up and loop all of the animations came from <https://www.tweaking4all.com/hardware/arduino/arduino-all-ledstrip-effects-in-one/#DownloadLEDEffectSketches>
- Need the FastLED repository
- code `#include <Adafruit_NeoPixel.h>` and calls it on line 6 but never after that, can probably remove it but the script worked so I didn't feel comfortable removing it.

#### Final Setup



This is what the final install looked like for me, it could look a lot better, but I figured since we are the only people that will see it its fine how it is. The power is going AC to the power supply then DC 12v to the converter which is then split as DC 5v between the Arduino and the led strips.

#### Notes on the install

- The grey wire on the right has 3 solid core wires inside it and goes through the same channel as the wiring for the fluorescent lights. This goes to the top of the machine then spits off to either LED Strip
- The only purpose that the breadboard is serving is to keep the Arduino held down, nothing is plugged into it
- The USB cable plugged into the Arduino is run to the control compartment and is usually unplugged. The purpose of it is so that I can reprogram the board without having to move the machine out from the wall
- There is no visible voltage drop color change across all 212 LEDs that I can see

## Links

<https://github.com/nategr8nate/Toy-Soilder-Led-Attract/tree/main>

<https://www.digikey.com/en/products/detail/molex/0010845040/3068043>

<https://www.digikey.com/en/products/detail/molex/0050841040/134561>

<https://www.digikey.com/en/products/detail/molex/0002081001/1784871>