Hack the Evening Retrofuture sideshow alley Project

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Hack the Evening Retrofuture sideshow alley Project

Blog post about the Project on the State Library Project

Pile of Resources on the State Library Website about the Ekka

List of projects

Heres a list of the different projects different people are working on. To get your project added talk to us at HtE or email appliedcreativity@slq.qld.gov.au

Title	People working on it	Description	Inspiration
“Wind Jammer” Chair ride	Dianne	Traditional swinging chair ride	
Carousel	Michelle	Traditional Carousel	
Shannons Hot Chips SpaceBus	Mick	Byrne Family Favourite Shannon's Chip was established in Crows Nest in 1948.	2016 CM story on Shannon's]Chips  Shonnon's FB
Shipping container filler	Luke		
Gravitron	Luke (taken over by Carolina		

Adding LEDS

hey just wanted to share the work i did the other day coming up with a led solution for the miniatures. We have a pile of 12 AC - DC adaptors bought out of flood money last year https://www.meanwellusa.com/upload/pdf/GST18B/GST18B-spec.pdf. I think there is about 20 of them. In alot of cases this will be better than using batteries. Batteries cost money and need to be replaced.

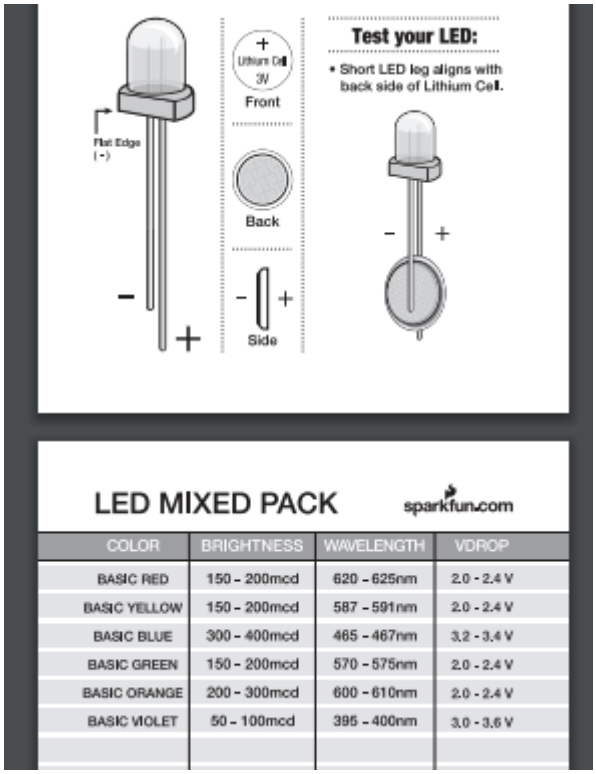
but how do you get an idea for a circuit diagram and what resistors do you need in the circuit so the LEDs don't burn out?

The answer is here. LED calculator . net lets look at an example of what Carolina has been working on and who I went about supporting her to prototype a solution.

Carolina wants to mount a total of 36 leds into her gravitron (4 leds on each of 9 panels)

That’s 36x standard colour LEDs powered by one of the 12 V power supply above.

Step 1 - Look up the info we need for the calculator



look up the data sheet for the LEDs. Heres the one for the Coloured LEDS we currently have in stock data sheet & SparkFun LED Tutorial and find the LED info for the LED calculator . The info sheet didn’t have much detail

but the tutorial had this handy table.

ITEMS	Symbol	Absolute Maximum Rating	Unit
Forward Current	I_F	20	mA
Peak Forward Current	I_{FP}	30	mA
Suggestion Using Current	I_{su}	16-18	mA
Reverse Voltage (V_R=5V)	I_R	10	uA
Power Dissipation	P_D	105	mW
Operation Temperature	T_{OPR}	-40 ~ 85	℃
Storage Temperature	T_{STG}	-40 ~ 100	℃
Lead Soldering Temperature	T_{SOL}	Max. 260℃ for 3 Sec. Max. (3mm from the base of the expoxy bulb)	

So between these two we have the info we need

Step 2 - Enter this info into the calculator

Plug the relevant into the the LED calculator website

Power supply voltage (V):

12

LED voltage drop (V):

1.8

LED current rating (mA):

20

Number of LEDs:

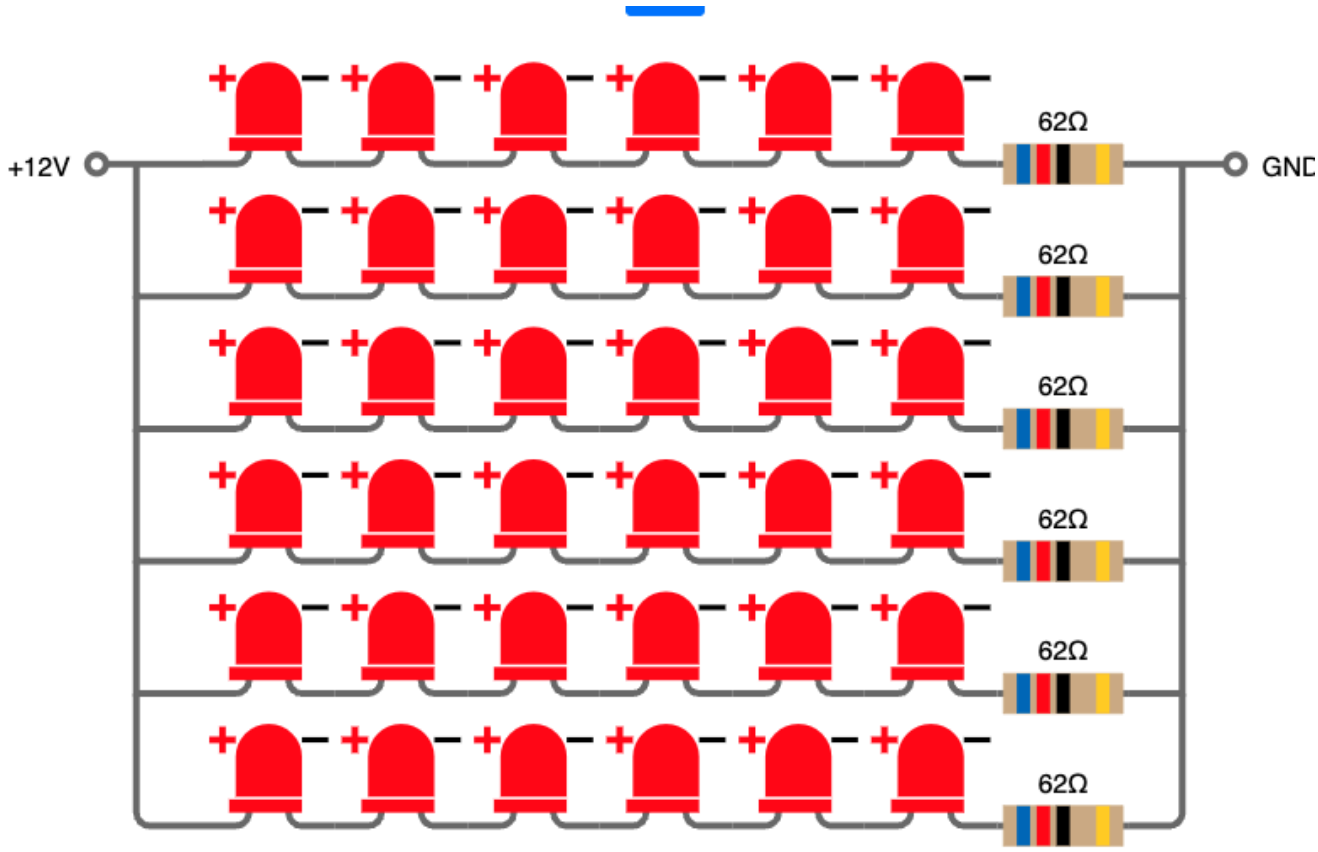
36

Output:

- (•) Wiring Diagram
- ( ) Schematic

Design Circuit

Step 3 - Gather the components

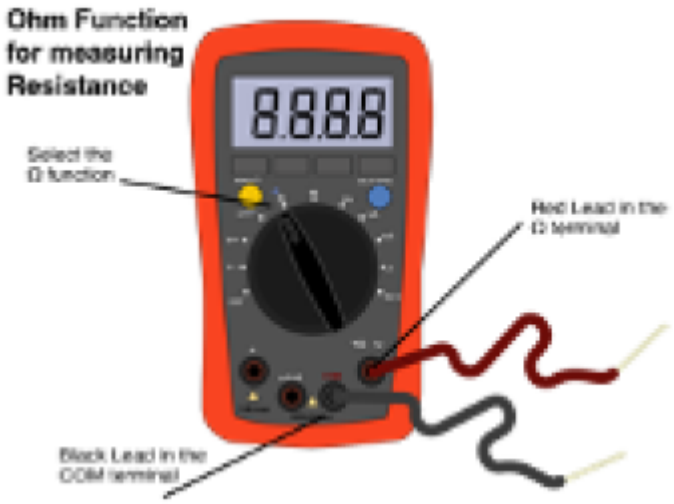


- You will need 6 x 62 ohm 1/8 watt resistors.
- The 62 ohm resistor is color coded: Blue, Red, Black, Gold.
- Each 62 ohm resistor consumes 24.8 milliwatt.
- Total power consumed by the resistors is 148.8 milliwatt.
- Total power consumed by the LEDs is 1296 milliwatt.
- Total power consumed by the circuit is 1444.8 milliwatt.
- Total current drawn by the circuit is 120 milliampere.
- The resistor values are calculated based on the common ±5% tolerance resistors.
- Make sure to wire the LEDs in the correct direction as shown below.
- Always leave some space for the resistors to breathe. They might get hot.

We grabbed the 36 LEDs • 6x 47Ohm resitors (close enough, our packs didn’t come with 62 Ohm resistors) • 7 x breadboards • Jumperwires • 1x 12v power supply

Step 4 - Check we understand how a breadboard works

use the multimeter on the Continuity setting to demo how the bread boards work



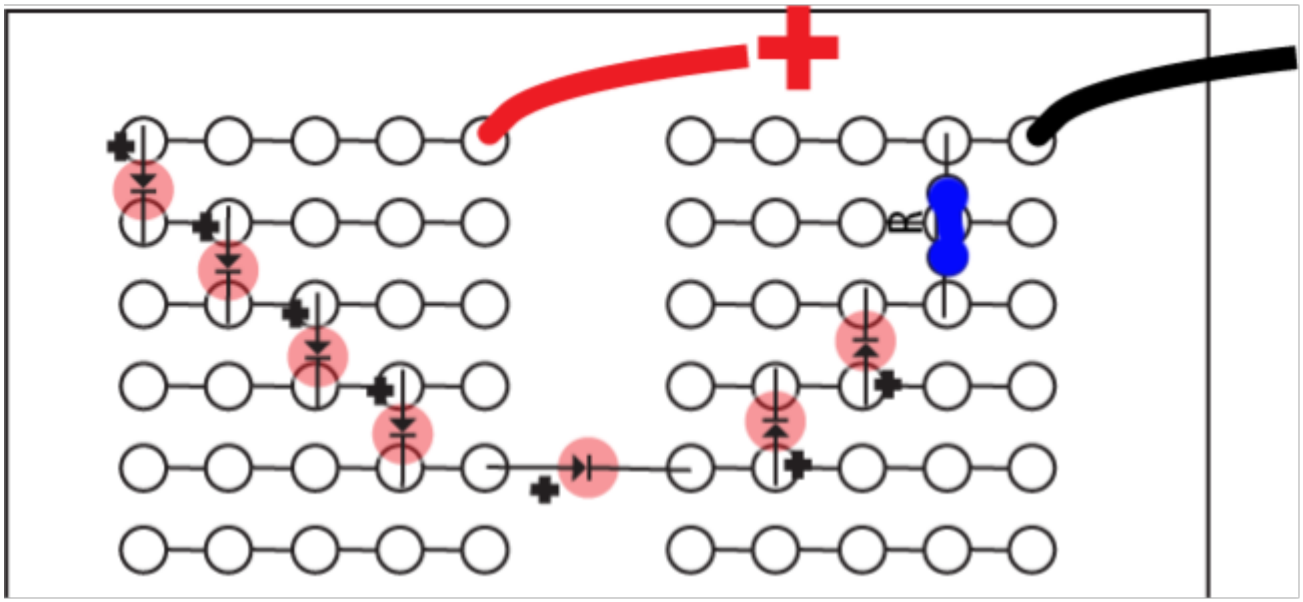
Select the continuety setting by • selecting Ohm on the Dial Ω • And use the blue button in the image above to select the continuity setting

On this setting the multimeter beeps when there is continuity between (electrical connection) between the 2 probes

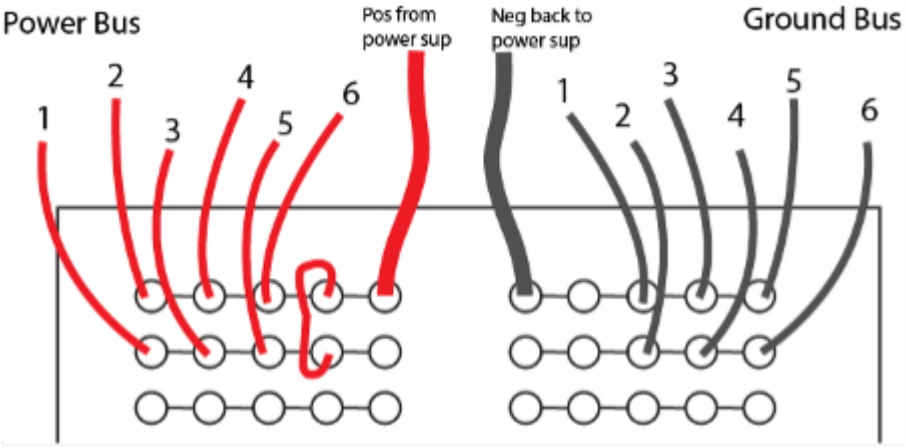
Step 5

Then we populate all these components in the circuit onto a breadboard using the Circuit Diagram the calculator produces.

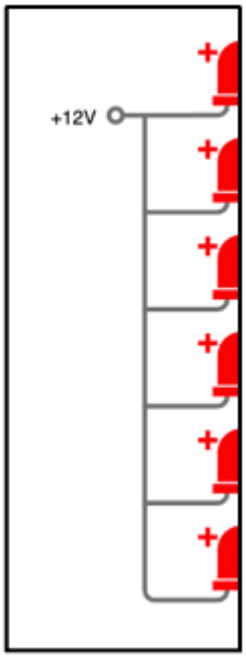
We made 6x of these



On the 7th Breadboad we made a



common 12v+/ (positive (+) terminal.



And a common Ground /(-) terminal

Step 6

Apply power to it from the 12v Power Supply. Chances are you've made mistakes (especially with the polatirty of the LEDs) but there's a good chance that you have at least some of the LED gangs right and these should work. No set about fixing the parts of the circuit you didn't get right.

Check for the following

• Dead LEDs Test the LEDs that don't work on a calculator battery you know is working • Polarity is wrong on LEDs

Once you have this all sorted (as a prototype on breadboards) you can work out how your are going to run your wires in your actual miniature.