Hackerspace CogLight manual

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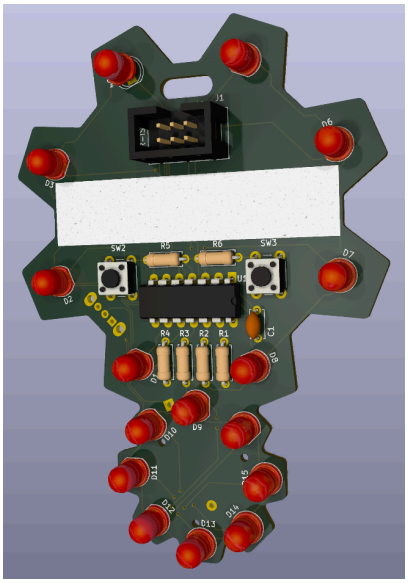
Building

Soldering

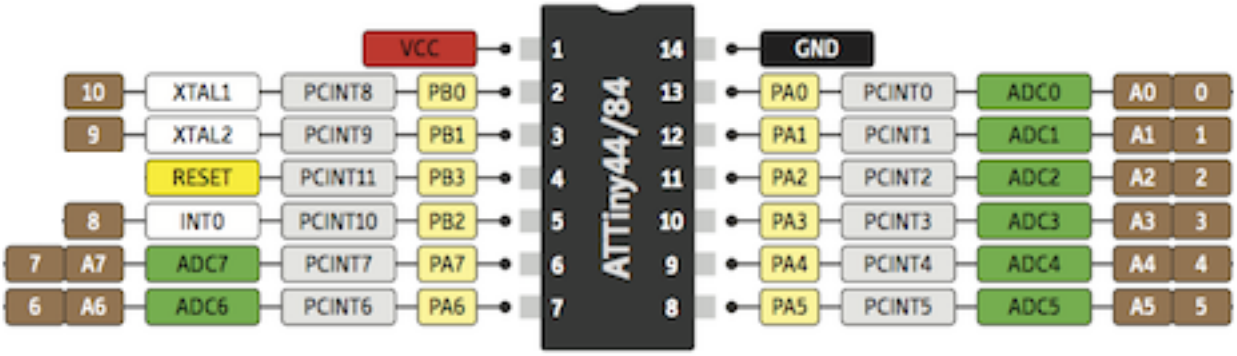
When building the hardware, solder the components in place as indicated on the silk screen of the PCBs. Make sure the LED diodes are placed in the correct orientation, that the resistors and capacitor are approximately the right values and that the microcontroller is oriented in the right direction.
When done, it should look something like the rendering.



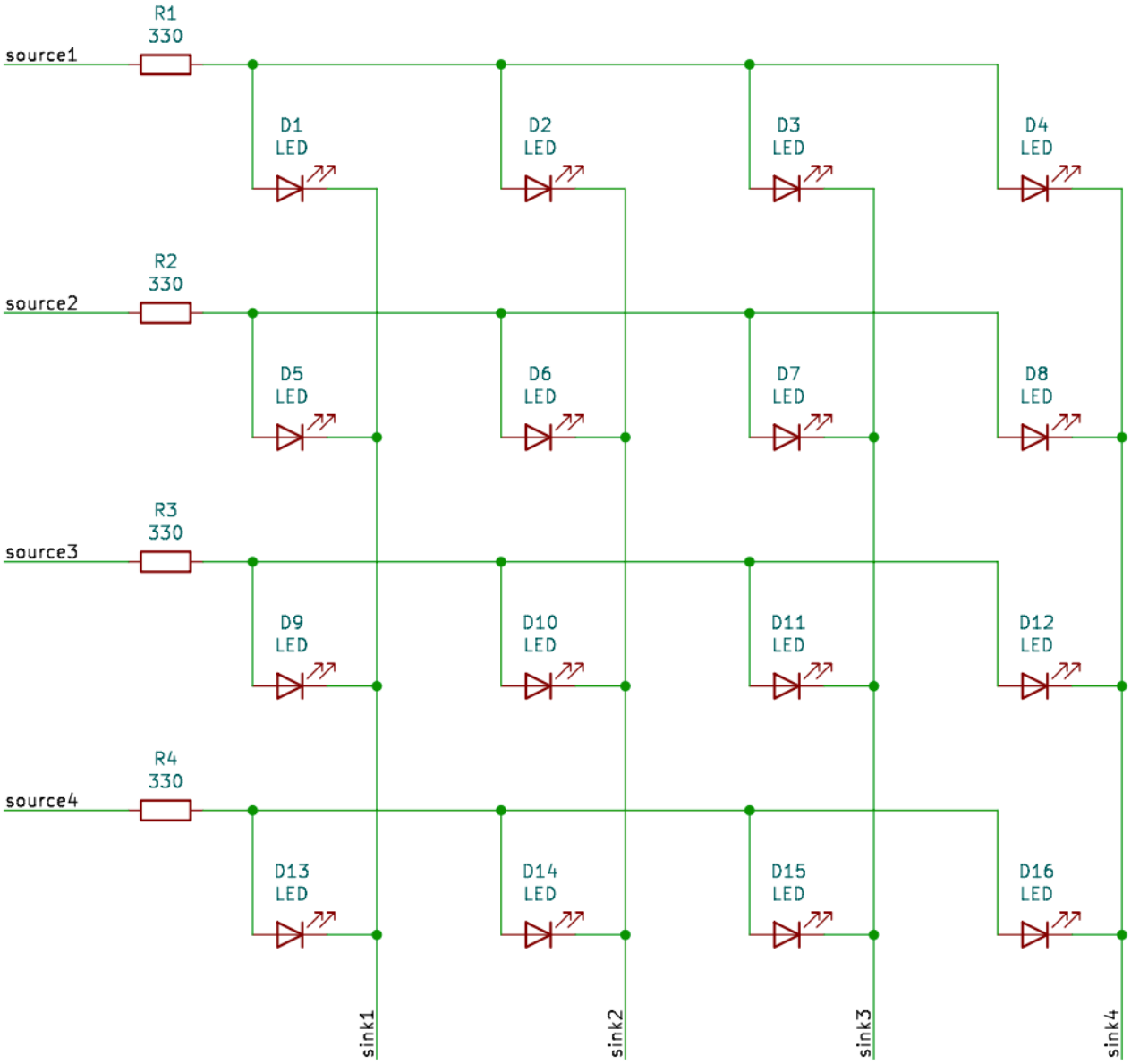
Programming

The board can either be programmed as an AVR chip or as an Arduino board.
If the latter is chosen, remember to set the board and programmer correctly in the Arduino IDE and burn a bootloader to the chip before uploading the program itself.
No matter which method is chosen, the Atmel ICE at Hackerspace can be used together with the 6-pin header on top of the badge.

When using the Arduino system, the pinout between the schematics and Arduino pin names are as shown below.



The LEDs are configured in a 4x4 matrix as shown below.



The pins line up as follows:

Matrix pin	ATTiny pin	Arduino pin
Source 1	13	0
Source 2	12	1
Source 3	11	2
Source 4	10	3
Sink 1	9	4
Sink 2	8	5
Sing 3	7	6
Sing 4	6	7

A LED in the matrix will be turned on when its source is high and its sink low.

Troubleshooting

There are many reasons why the badge might not work, here are some of the most common.

- The resistors R1-R4 might be too high
- The capacitor might be missing
- The microcontroller can be mounted the wrong way
- The battery might be flat
- The software might use the wrong pin definitions

Ordering

When ordering, use the exported gerber files and a supplier such as jlcpcb. Note that the current design requires through-hole plating, this may be optional on the cheapest production lines.

Note that the battery holder is not readily available at other workshops, and must be ordered.

It is up to those who make the kits if the microcontrollers should come pre-flashed or not. They can always be reprogrammed through the header pinns on the badge at a later point.