

SYNTHIAM

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Using 123.circuits.io Schematics Pcb's & Breadboards

Circuits.io is an online, browser based schematic drawings, PCB design and breadboard simulation package by AutoDesk. It can be very useful for testing out circuits before you even get around to physically building them and even has a built in Arduino script simulator (which can be useful for testing out how switching of ports or ADC values can effect circuits).

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Step 1

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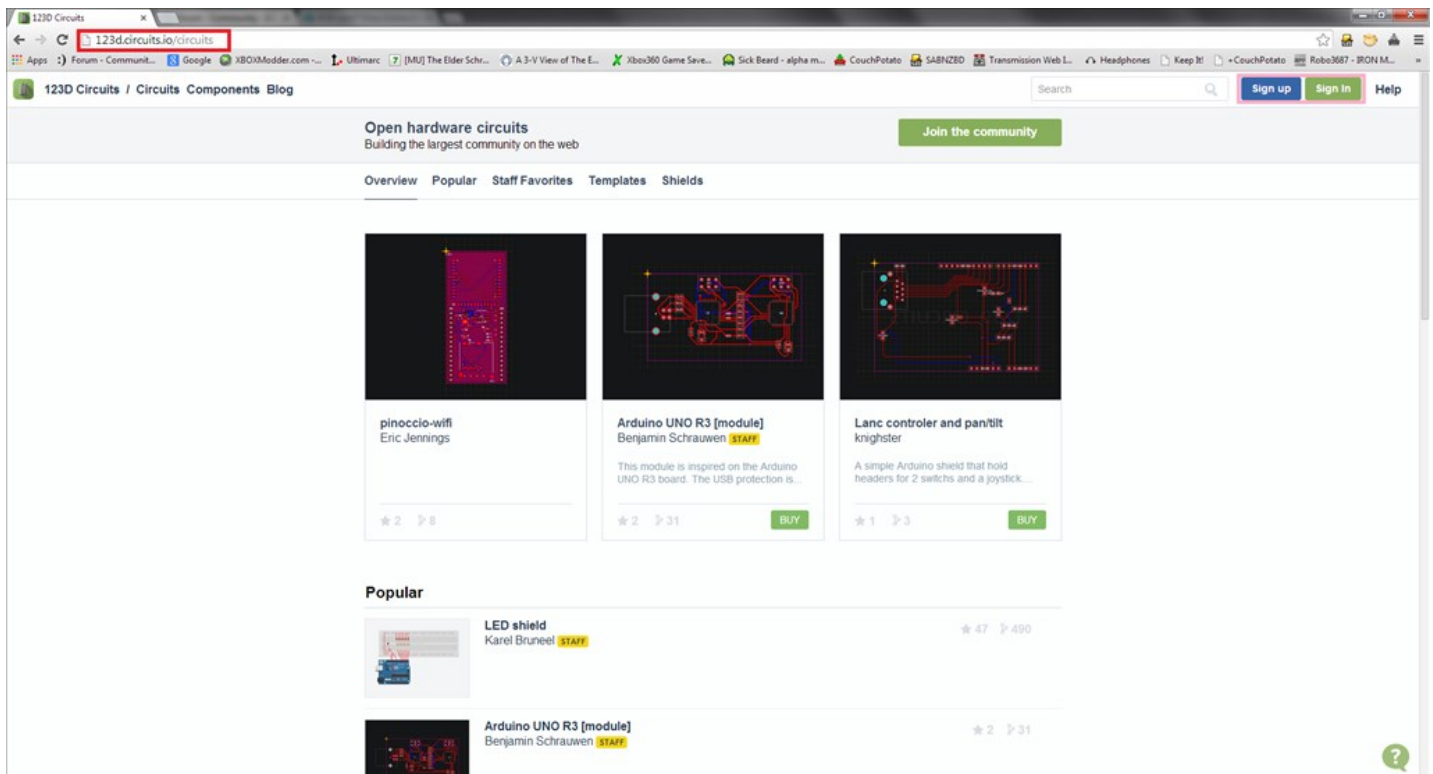
The software is pretty simple to use however I decided to write some tutorials on how to use each of the different parts of this software and have a step by step guide on building circuits.

Below are (or will be when I finish them all) tutorials for each part. This will be updated to eventually cover all parts however, for the time being I only have the schematic section completed (bear with me on the other two).

Circuits.io Schematic Tutorial

The first thing you need to do is make sure you have an account, so point your web browser to <http://123d.circuits.io/circuits>

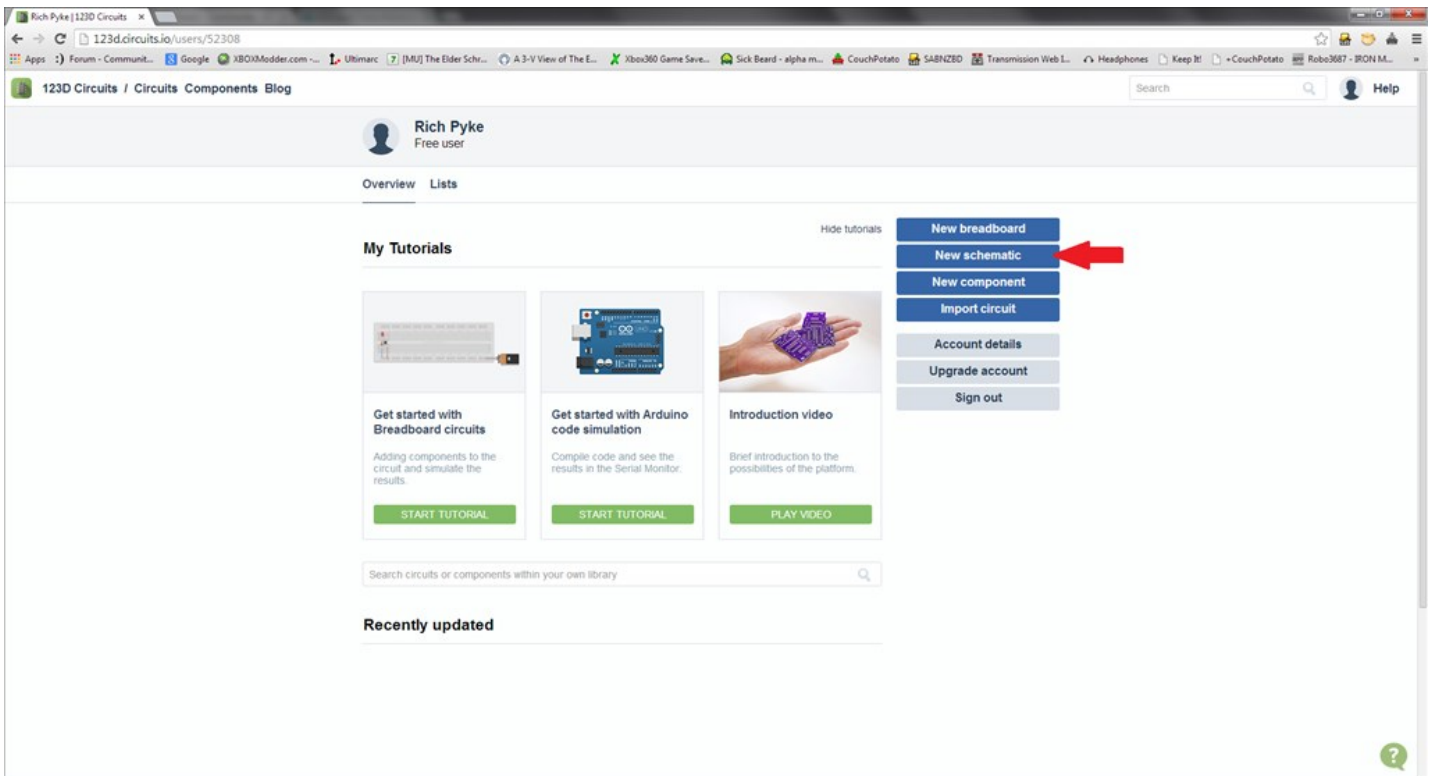
Then click on either Sign Up or Sign In depending if you have an account or not.



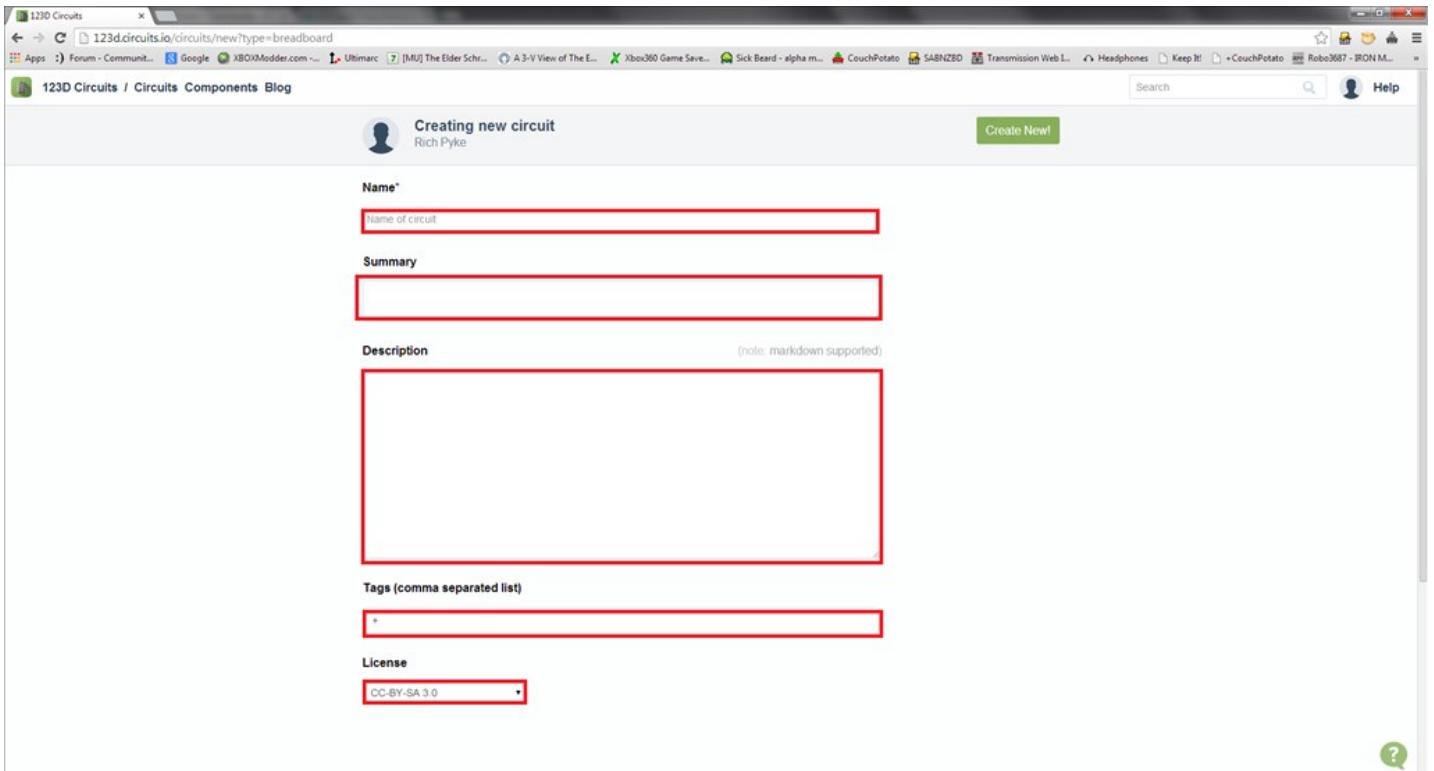
The screenshot shows the 123D Circuits website interface. At the top, there's a navigation bar with '123D Circuits / Circuits Components Blog', a search bar, and 'Sign up' and 'Sign in' buttons. Below the navigation, there's a header section with 'Open hardware circuits' and 'Building the largest community on the web', along with a 'Join the community' button. The main content area is divided into sections: 'Overview', 'Popular', 'Staff Favorites', 'Templates', and 'Shields'. The 'Popular' section is currently active, displaying a grid of circuit projects. Each project card includes a thumbnail image of the circuit, the project name, the creator's name, and a 'BUY' button. The projects shown are: 'pinoccio-wifi' by Eric Jennings, 'Arduino UNO R3 [module]' by Benjamin Schrauwen, 'Lanc controler and pan/tilt krightster' by Benjamin Schrauwen, 'LED shield' by Karel Bruneel, and another 'Arduino UNO R3 [module]' by Benjamin Schrauwen. A green question mark icon is visible in the bottom right corner of the screenshot.

If you don't have an account simply sign up for one. You can sign in using Facebook too to save you filling in any forms.

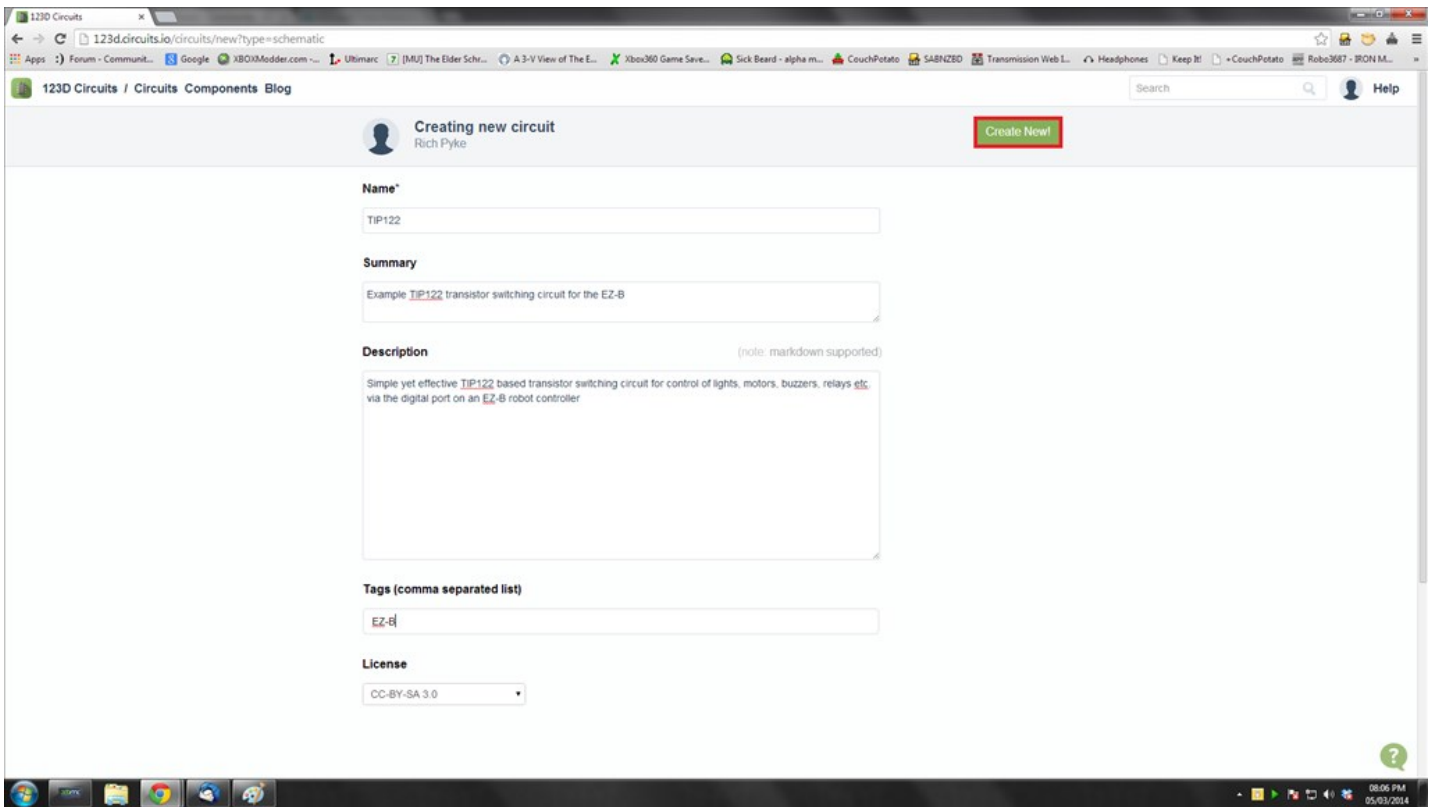
Once you have signed in you should be greeted with the main screen where you can see their tutorials, your previous projects or create a new one. We will want to create a new schematic so go ahead and click on the New Schematic button.



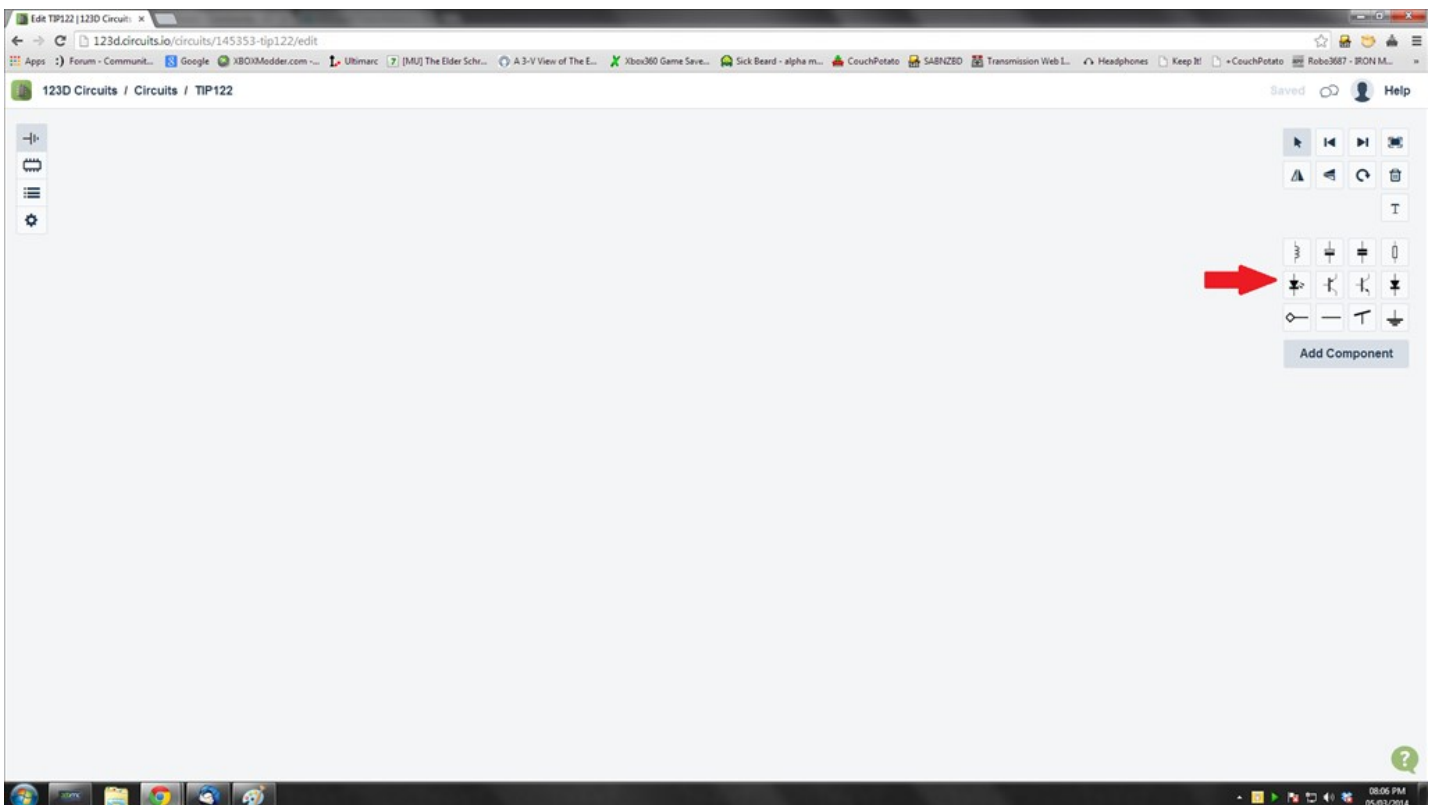
Now you need to fill in some details about the project such as the title, a summary, a description, some tags and finally the type of licence you grant.



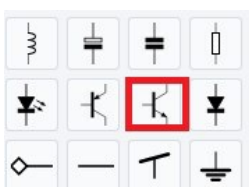
Go ahead and fill it all in.



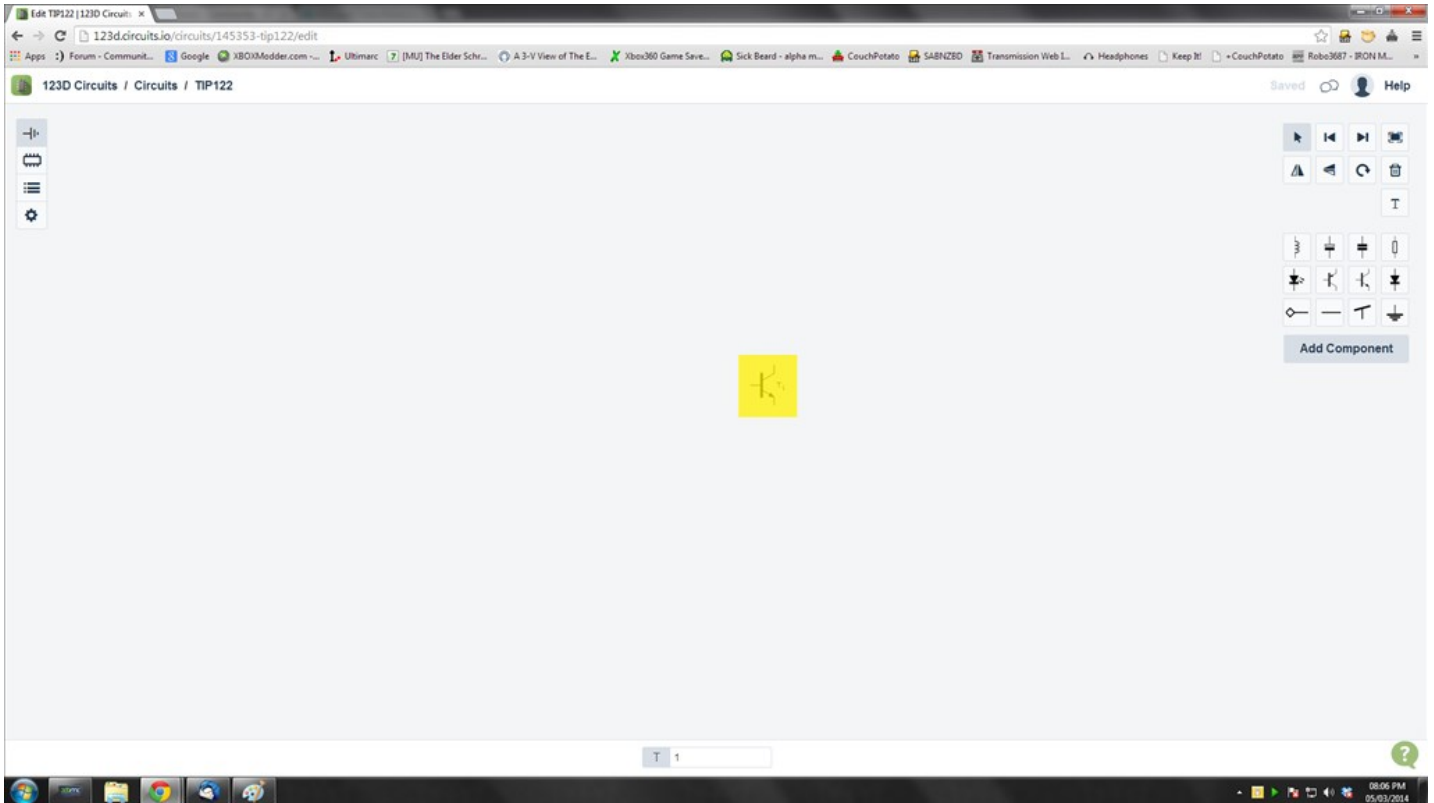
You should now be greeted with a nice blank canvas to play with and a pallet of tools and symbols to the right of the screen.



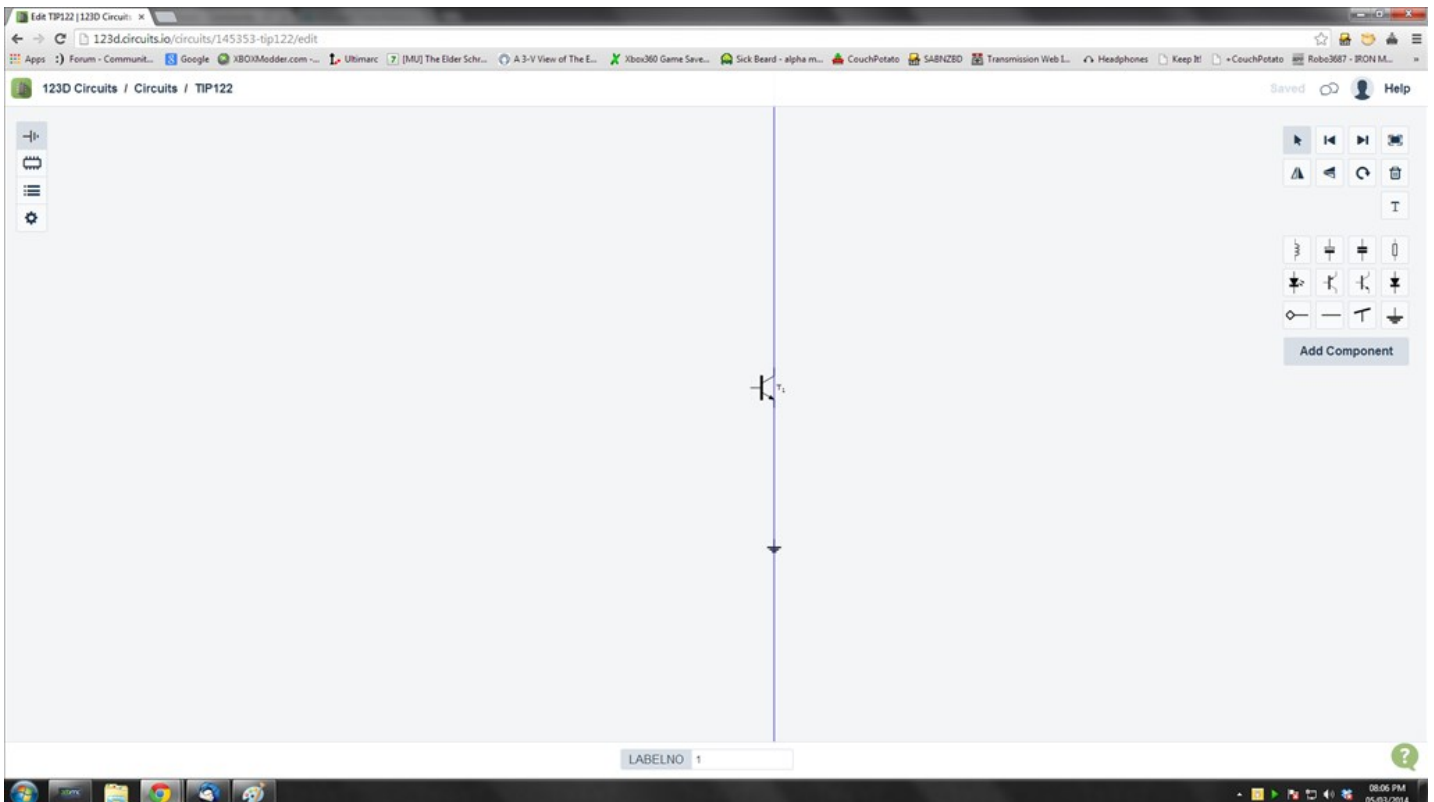
So, let's make a simple schematic for the trusty old TIP122 transistor switching circuit. The first thing we need is an NPN transistor so we click on the symbol for an NPN transistor



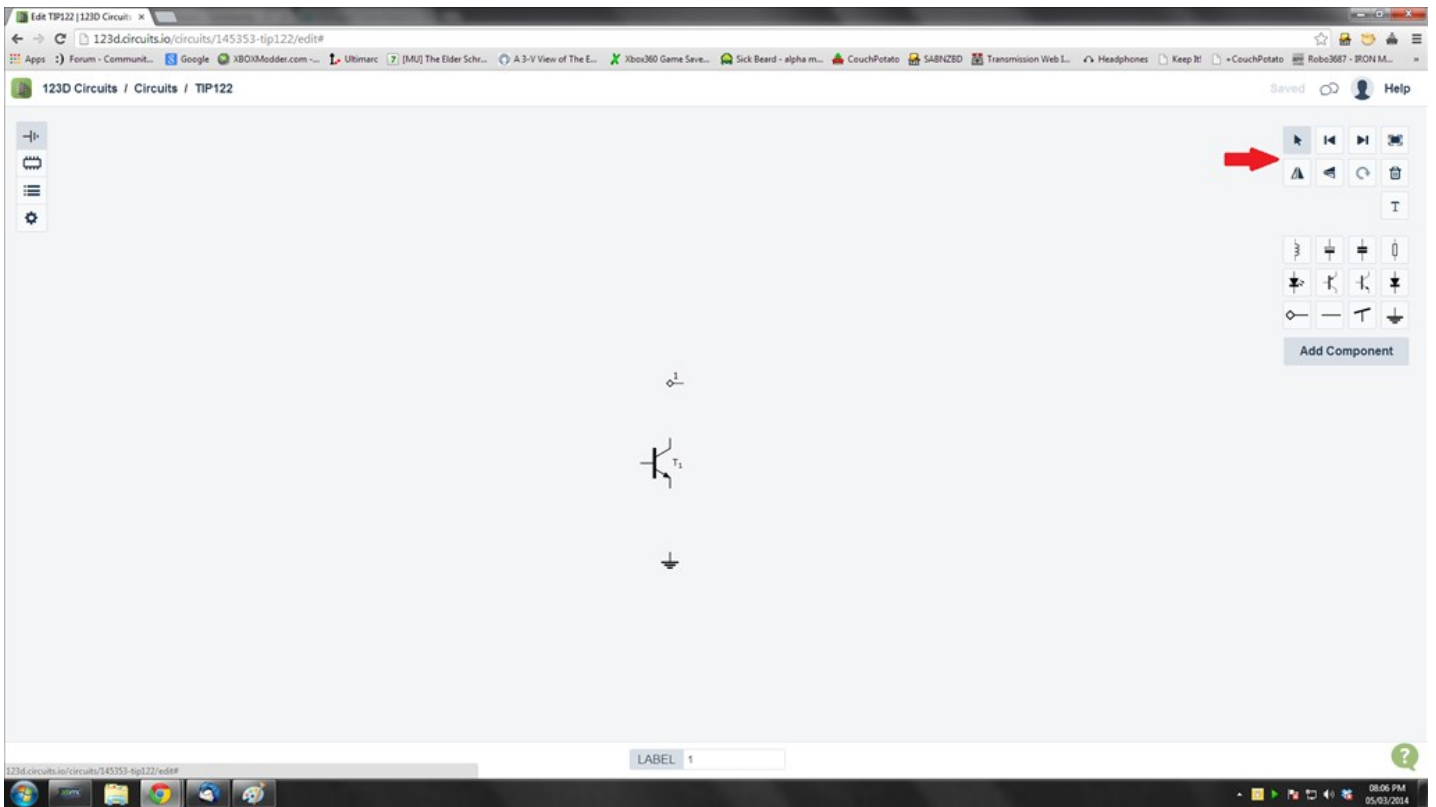
And we place it down on the canvas with a left click



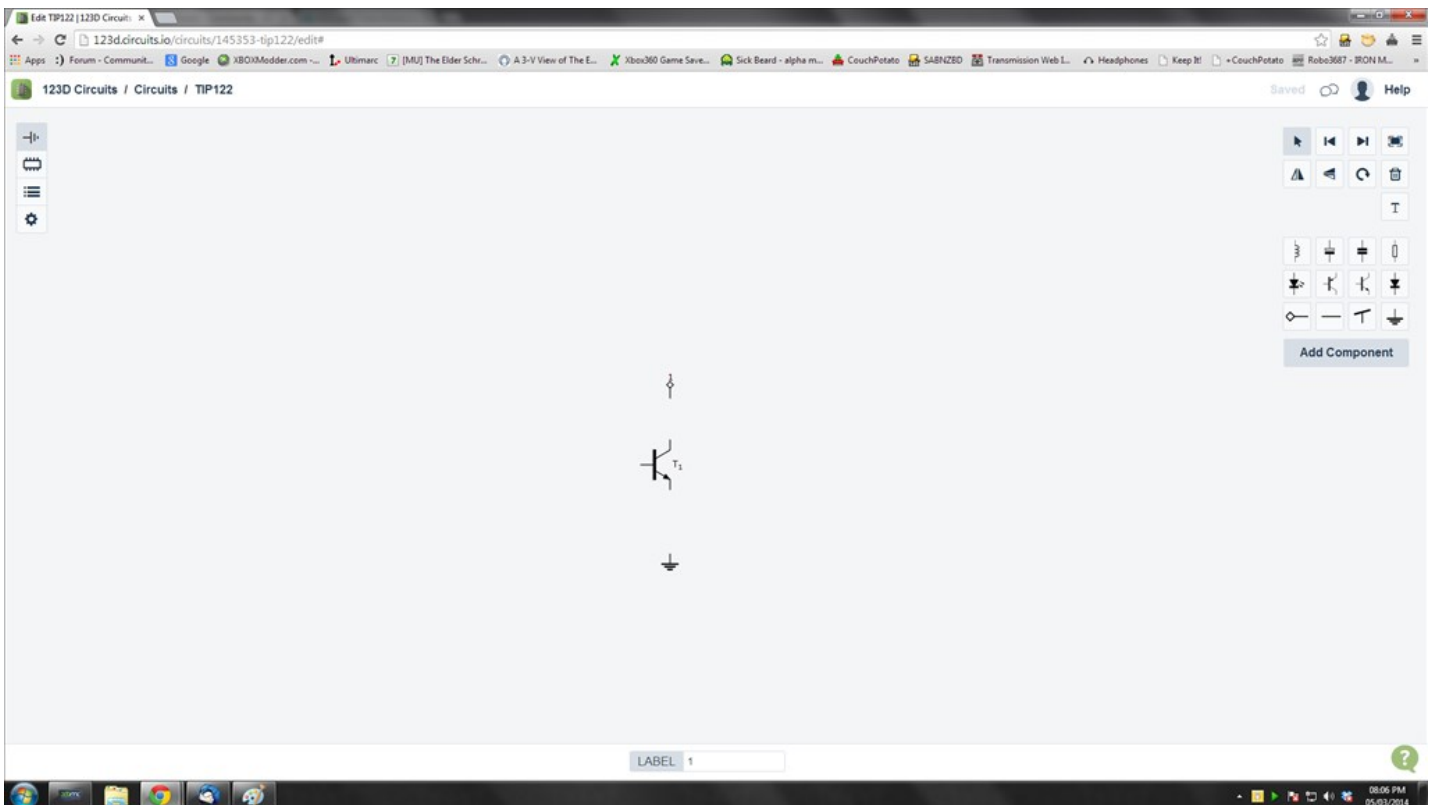
Next we want our ground so we select the ground and place it on the canvas too, notice at this point we get a blue line to aid in aligning with the other parts already on the schematic.



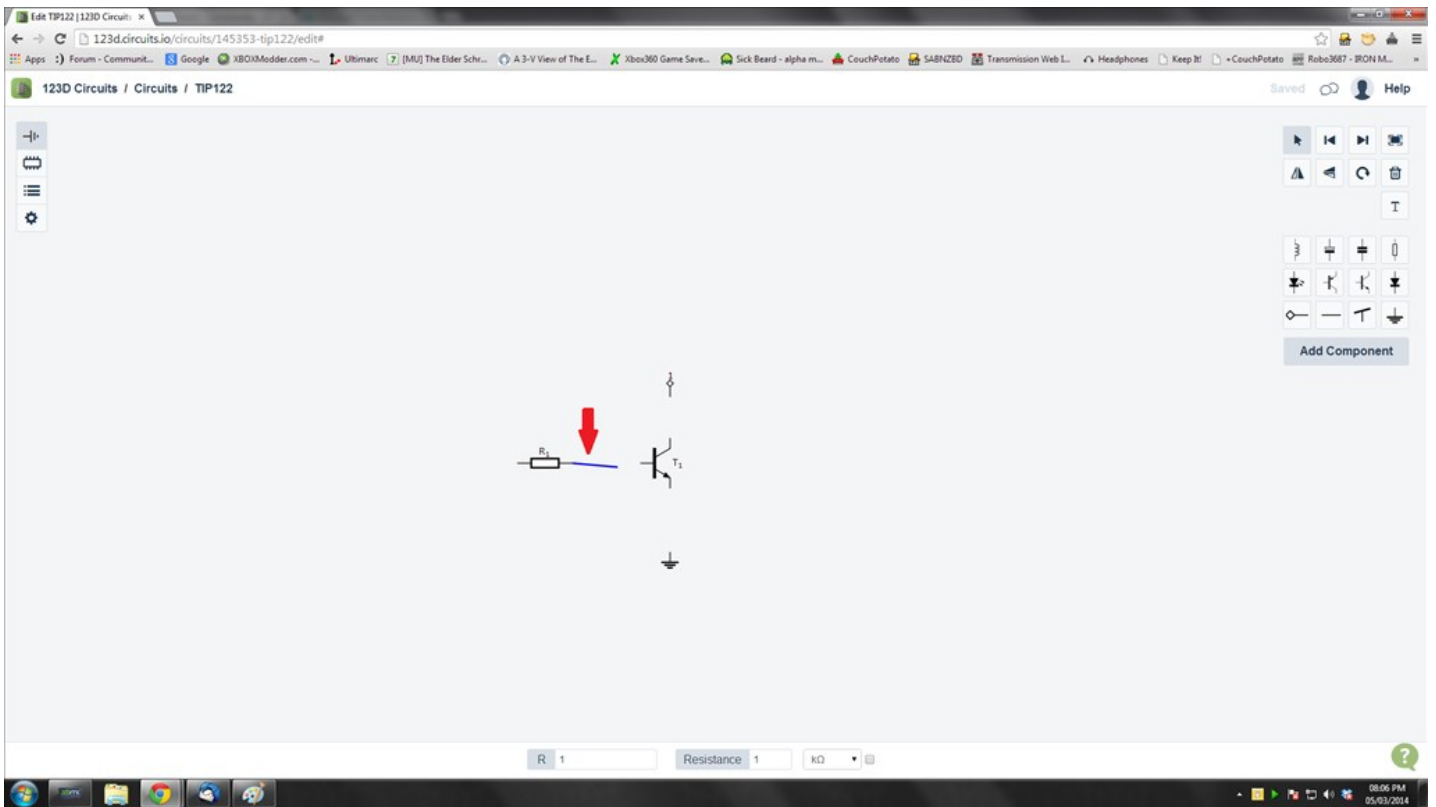
Next we add a node, which will be going to the item the transistor is switching, be it an LED, lamp, buzzer, motor or whatever, so select the node and place it down. The node will be at the wrong rotation so once it's placed down click on it to highlight it and select the rotate button from the pallet of tools.



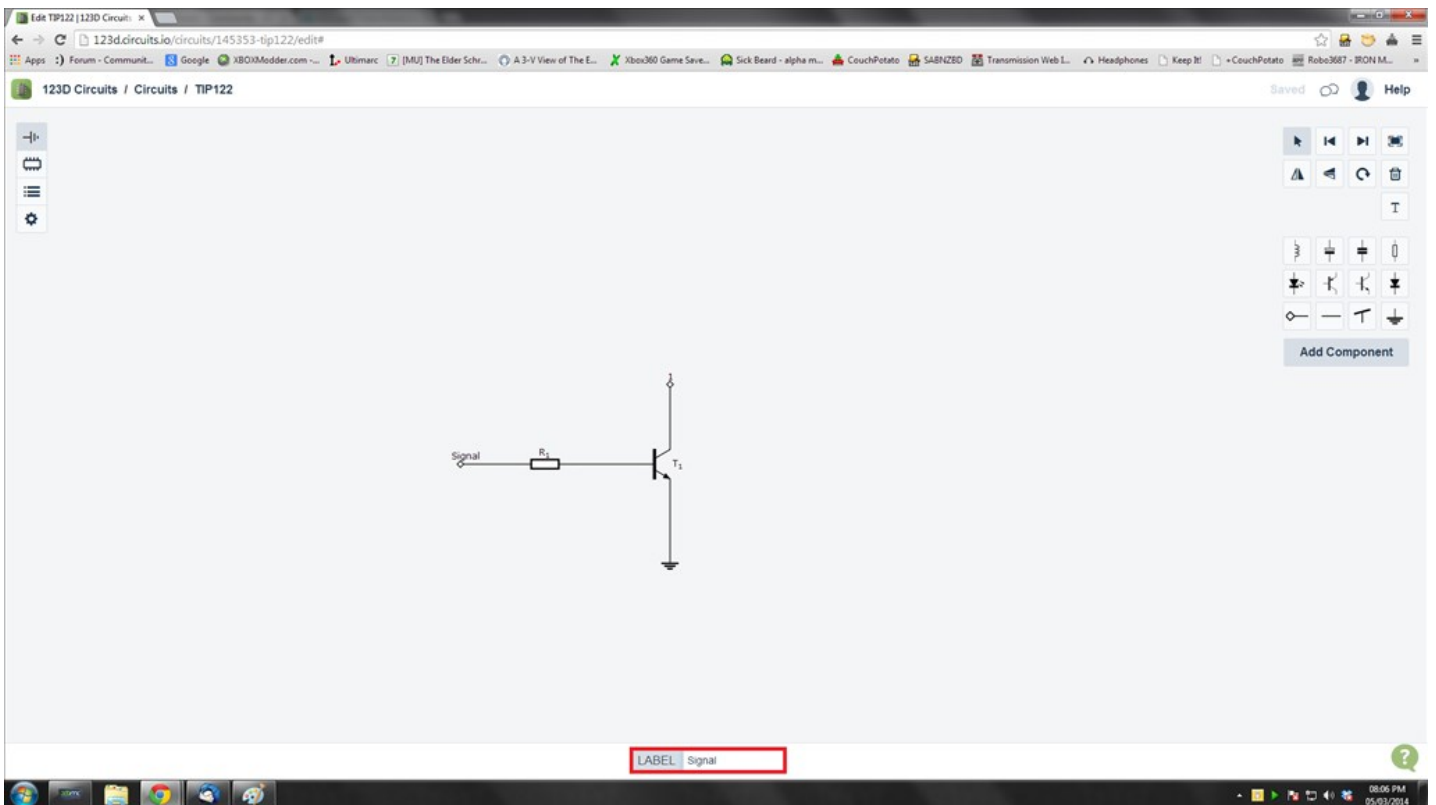
Next we need to add a resistor, so select the resistor and place it down



And now it's time to join it all up with circuit lines. To add these simply click on the end points of any of the components, a blue line will now be joined to the component and your pointer, then click where it needs to go to and the circuit line is added.

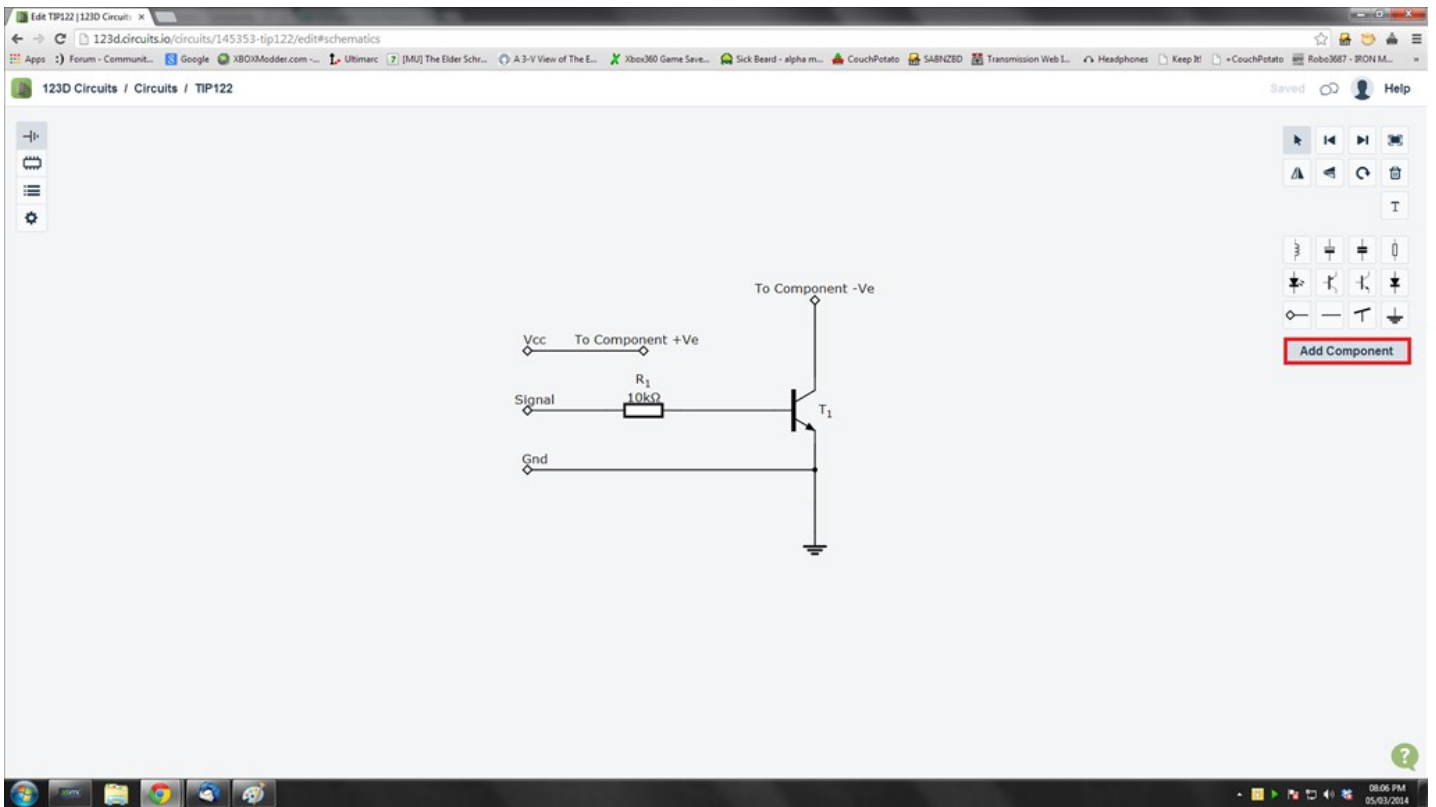


Add in the other components, nodes and circuit lines to complete the circuit. Then add in the labels for the nodes. To add the labels, or to change the values and part numbers of the components click on them, at the bottom of the screen the information will pop up, simply click in the box and adjust the text to suit.



And we have our circuit.

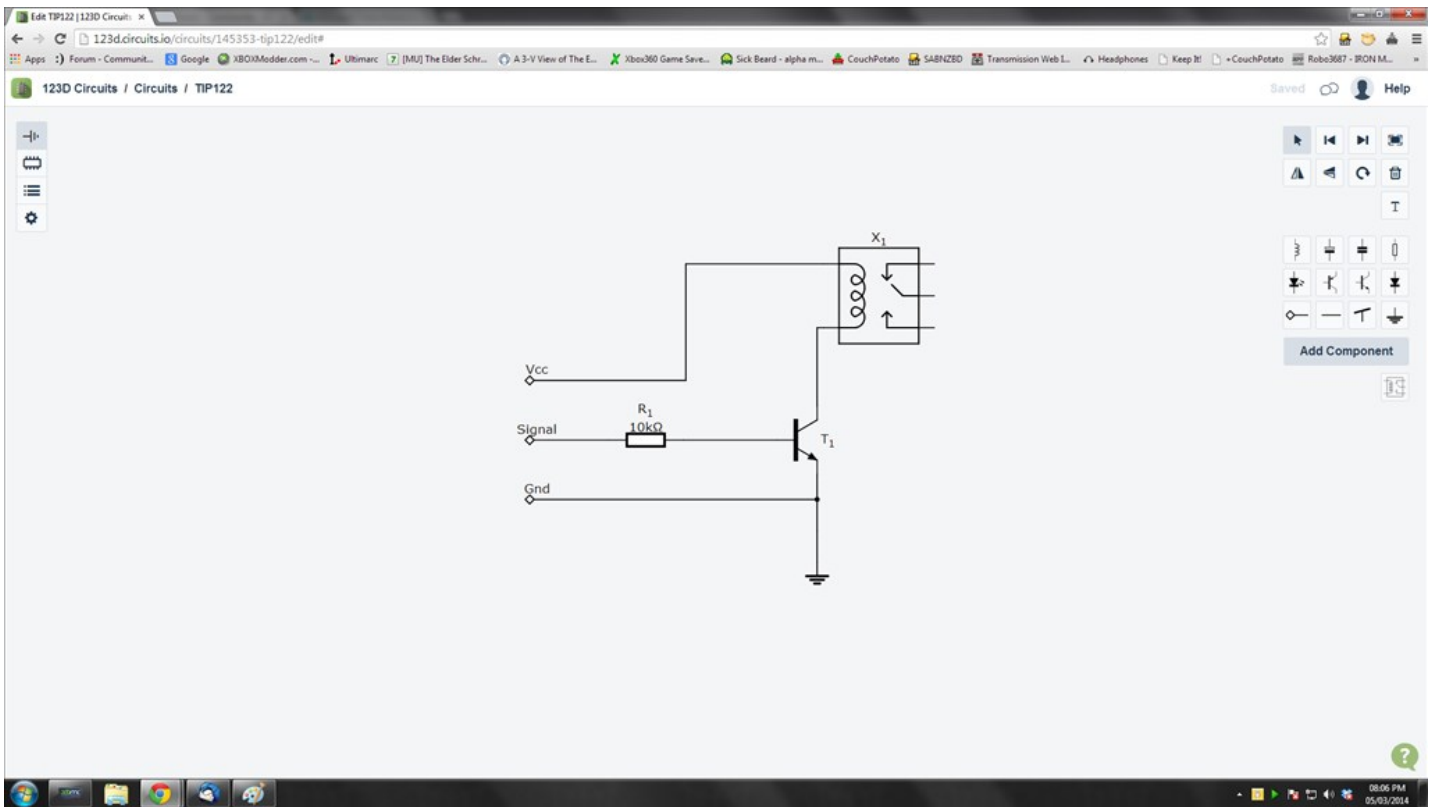
If the component symbol you need isn't in the pallet, for instance a relay, the option to add a component is also there, just click on it



Up pops a dialogue with a whole range of new components. Use the search box to narrow down the search. Click on Add to add it to the pallet.

Component Name	Description	Footprint	Action
LM380		SOT-23-8 (forked)	Add
New Temp tmp36 GZ		The Unnamed Footprint	Add
Jav-1234	Just testing	PDIP 8 (forked) (forked)	Add
FIDUCIAL		FIDUCIAL_1MM	Add
Switch	ON-OFF Switch	header(1x2)	Add
relay		no footprint	Add
4-PIN Header Straight Single Row	4-PIN 1" (2.54 mm) Straight Single Row Pin Header	4_Pin Header (forked) (forked) (forked)	Add
3-Pin header	3-Pin header 1" (2.54 mm) Straight Single Row.	3-PIN Break away Male Head	Add
AD-121F2	Single Digit 7-segment RGB LED Display	AD-121F2	Add
Resistor	Carbon film THM	R 0.25W THM 400mis pads	Add
2 X Male board connector	Regular 0.1" pins	2 X Male board connector	Add
XBee S6B	The XBee® Wi-Fi RF module provides wireless connectivity to end-point devices in 802.11 bgn networks. Using the 802.11 feature set, these modules are interoperable with other 802.11 bgn devices, including devices from other vendors. With XBee, users can have their 802.11 bgn network up and running in a matter of minutes.	XBee S6B	Add

Then add it to the circuit like we did with the other components, click on the icon in the pallet and place it on the canvas. Connect it up with circuit lines and viola.



The circuit will automatically save throughout drawing it so next time you go to the main screen the circuit will be under your circuits.

And that's it, you have just drawn a circuit schematic. You can print this, share this or edit this all from the main menu. Just click on the circuit picture or title and it will load up all of the information you need.

PCB Tutorial Coming soon

Breadboard Tutorial Coming soon