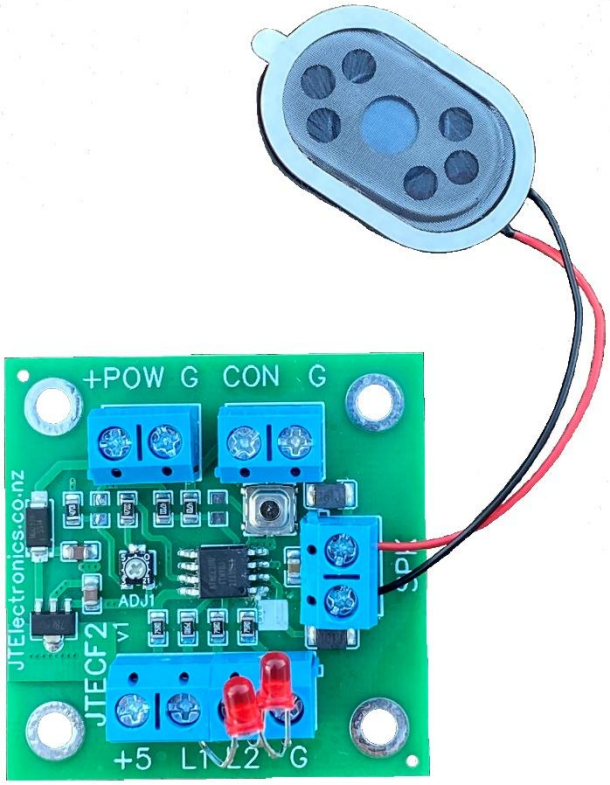
JTElectronics

Crossing LED Flasher Module With Sound

Model: JTECF2



The JTECF2 is an LED flasher and sound module which alternately flashes two LED's and also plays a configurable crossing bell sound as used on model railway grade crossing signals, or other uses for alternately flashing two LED's. The LED flash rate is approx. 0.5Hz very similar to real railway grade crossing signals. The JTECF2 module is CONtrolled (turned on) by applying a Ground/Negative signal to the "CON" control input screw terminal - you can connect the CON and G terminals together to activate it. The JTECF2 is a great companion to the JTEBD1 block detector, or maybe the JTEILD1 infra-red detector, or even reed switches, which can be used to trigger the JTECF2 crossing flasher module with sound as your train approaches a crossing.

Please note the sound is not "loud" and OK for home use but a bit quiet for exhibition halls etc. where there is a lot of background noise. Future designs (eg. JTECF3 and later) will have a much louder, and adjustable, sound volume.

The JTECF2 module can be powered from 7 to 20 volts DC. Do not supply from an AC power source.

The LED's can be connected in a common ground (common cathode) configuration **OR** common +5Volts (common anode) configuration and the JTECF2 is supplied with two 3mm red LED's and a small speaker as shown in the photo.

There is also a "delay" adjustment so the LED's will continue flashing and the sound will continue playing after the "CONtrol" signal is removed from the JTECF2 input, and this turn-off delay can be adjusted from 1 to 30 seconds.

The sound can be a mechanical bell, or an electronic bell, or a 1000Hz tone sound and the configured sound is selected by pressing the "CONFIGURATION" switch (for about ½ a second) while the JTECF2 module is activated (flashing and playing a

sound). Sequential presses of the configuration switch will move the configuration between sounds and you will hear the selected sound

Of course there are many more uses for the JTECF2 flasher module, for example:

- Select the 1000Hz tone sound and use as a person triggered door alarm
- Connect red and blue LED's and use as a "police flasher" on toys or bikes

WHAT YOU DON'T GET…

The JTECF2 module will be damaged by incorrectly connecting power to the wrong terminals. Make sure you connect your DC power supply to the POWER+ and GROUND terminals ONLY.

PLEASE REFER TO THE WIRING DIAGRAMS IN THIS DATASHEET FOR CORRECT WIRING INFORMATION

Like most electronic equipment the JTECF2 circuit board contains static sensitive devices and may be damaged by high voltages present during electrostatic discharge. Avoid electrostatic discharge by handling the JTECF2 module as little as possible. To prevent damage, we suggest you put the JTECF2 module into an enclosure or locate it somewhere protected from contact with random external objects...

JTECF2 SPECIFICATIONS

LENGTH	43mm
WIDTH	43mm
HEIGHT	16mm

SUPPLY VOLTAGE	7 to 20 Volts DC
SUPPLY CURRENT (IDLE)	20mA
SUPPLY CURRENT (FLASHING & SOUND)	60 mA

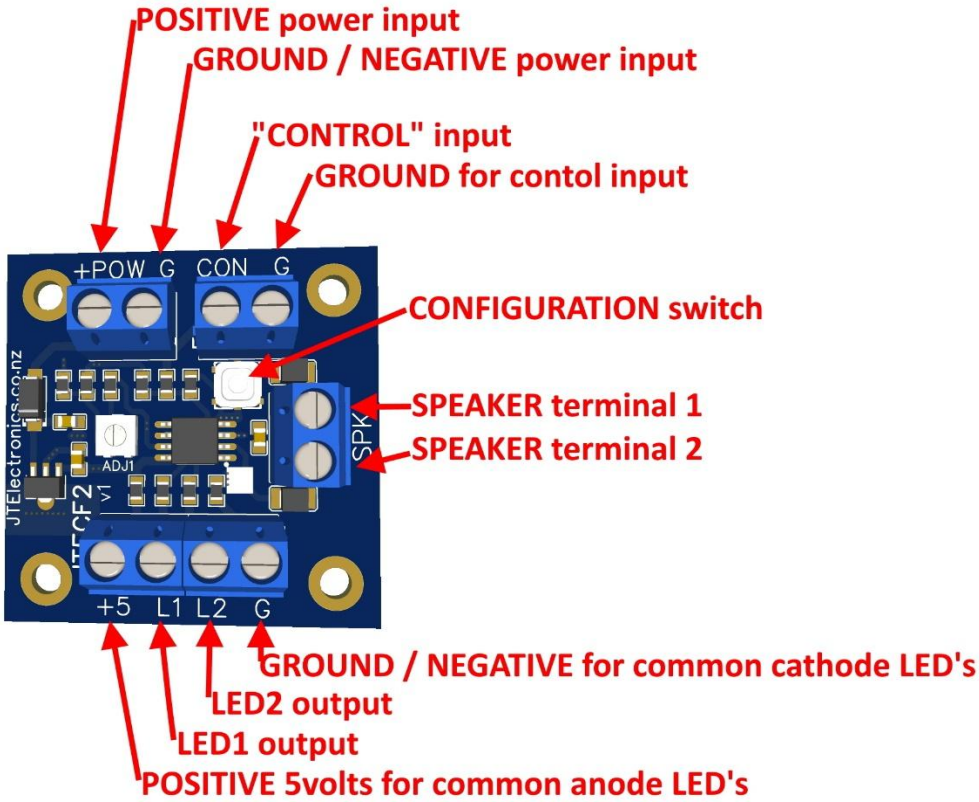
HOW TO CHANGE THE SOUND

You can change the sound between Mechanical bell, Electronic bell, or 1000Hz tone sound by performing the following procedure:

1. Activate the JTECF2 module so it is playing a sound
2. While it is still playing the sound, press the "CONFIGURATION" switch for about half a second
3. The sound will change, and this configuration will be stored

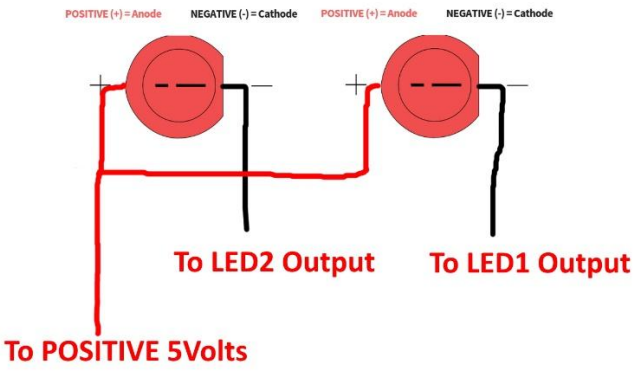
The sound will be louder if you attach the speaker to a solid surface like a thin piece of plastic, cardboard or wood etc. You can hold the speaker against the surface to hear the difference in sound, and when you are happy it works well you can remove the white adhesive protector ring from the front of the speaker and attach the speaker to the surface.

JTECF2 MODULE – WIRING DIAGRAM

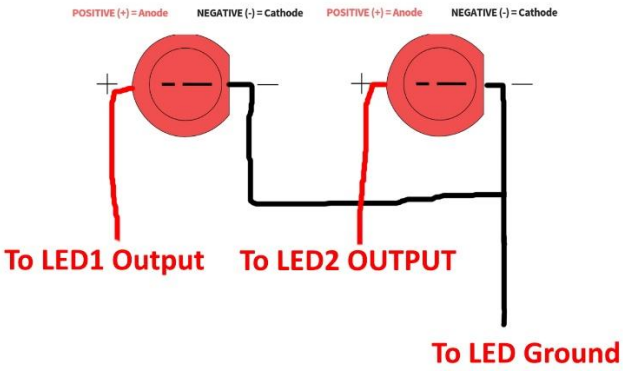


- Power input can be 7 to 20 volts DC, ideally about 12 volts DC, Do NOT use an AC power source
- “Power Ground”, “Control Ground” and “LED Ground” terminals are all connected internally
- A Negative/Ground signal on the “Control” input will activate the JTECF2 module (flasher and sound will start)
- The “Delay Adjustment” control increases the turn-off delay when turned clockwise
- LED’s can be connected in “Common Cathode” configuration OR “Common Anode” configuration. Either way will work fine and what LED wiring configuration you use will depend on how the LED’s are connected externally:
    - Common Cathode is when the LED1 Negative and LED2 Negative wires (the Cathodes) are externally connected together and wired together to the LED “GROUND” terminal. The LED1 Positive wire is then connected to the LED1 Output terminal. The LED2 Positive wire is then connected to the LED2 Output terminal
    - Common Anode is when the LED1 Positive and LED2 Positive wires (the Anodes) are externally connected together and wired together to the LED “POSITIVE 5volts” terminal. The LED1 Negative wire is then connected to the LED1 Output terminal. The LED2 Negative wire is then connected to the LED2 Output terminal
- DO NOT connect the LEDs to BOTH “POSITIVE 5Volts” and “GROUND” terminals or damage will occur

COMMON ANODE



COMMON CATHODE

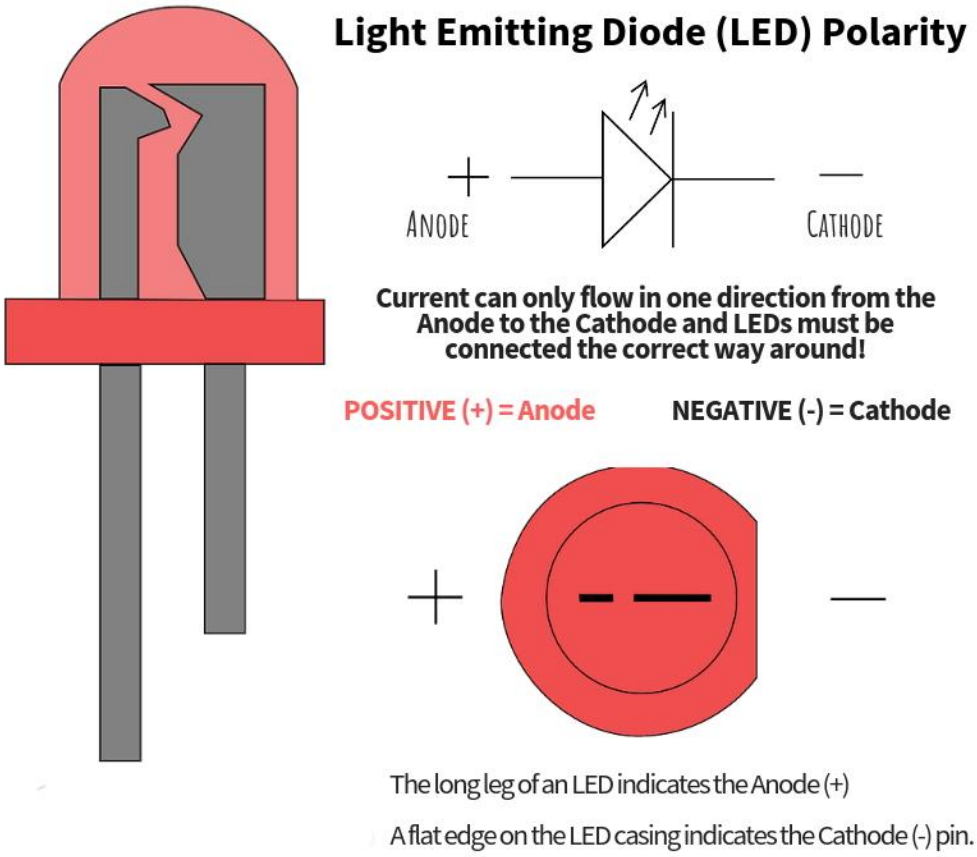


LED WIRING INFORMATION

The JTECF2 module has built-in current limiting resistors so you can connect the LED's directly to the L1 and L2 terminals without resistors.

LED's must always be connected with the correct polarity for them to work. They have a positive wire (anode) and a negative wire (cathode) and there are two methods to clearly identify which wire is which - as shown in the diagrams below.

1. If the LED wires have not been cut, the Positive/Anode wire is 3 or 4 millimetres longer
2. When looking at the bottom of the LED, a flat side on the LED case will indicate the Negative/Cathode wire



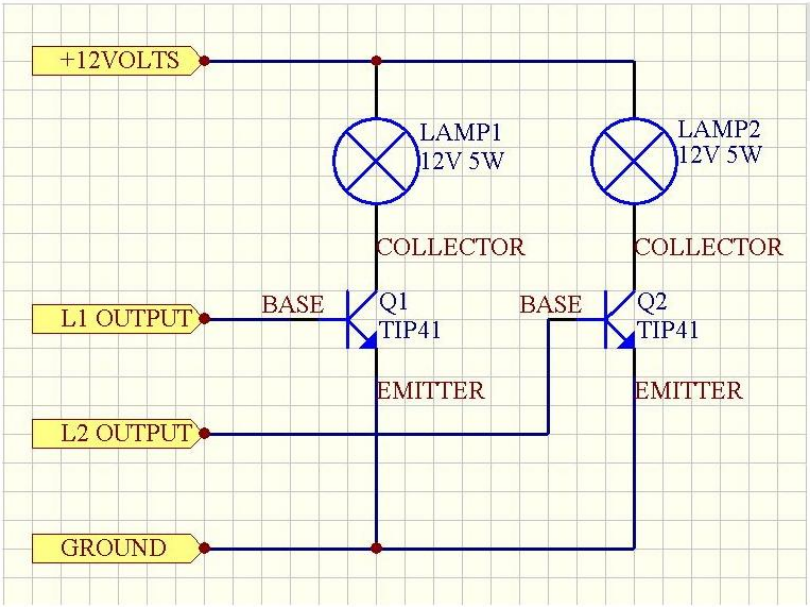
This document is updated from time to time as new information becomes available – usually due to people asking relevant questions regarding usage or configuration. The "Document Updated" date in the bottom-right corner of each page shows what document date you have. The latest version of this datasheet document can be downloaded from http://www.jtelectronics.co.nz/products/documents/ or Google "JTECF2"…

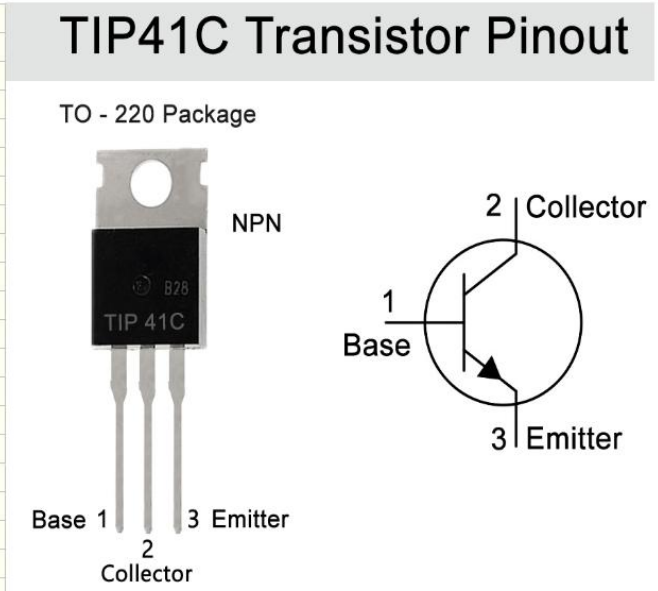
INCREASING THE OUTPUT CAPABILITY

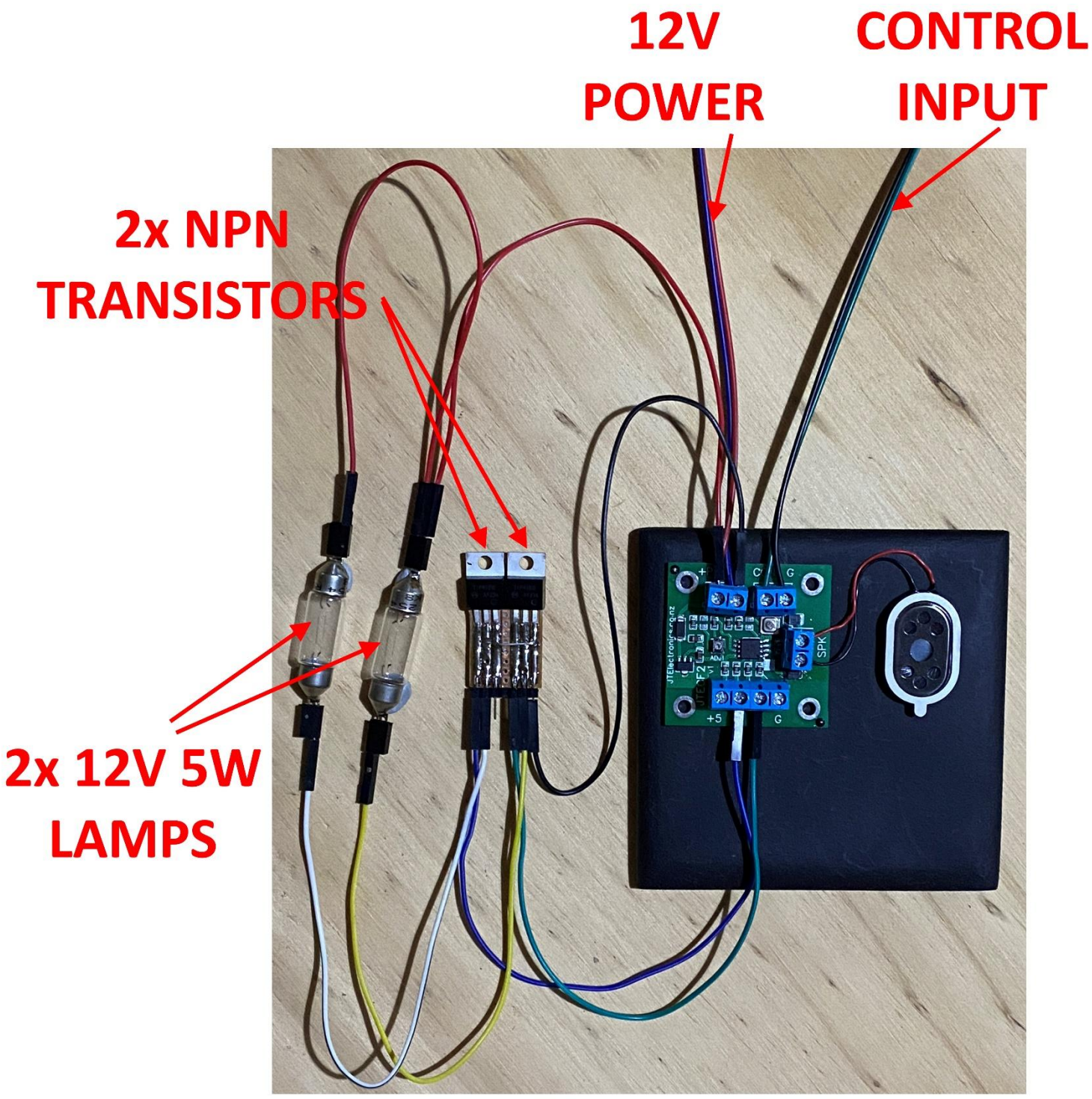
The JTECF2 module can only power one LED on each of the L1 and L2 outputs, at about 20 milliamps. To increase the output capability, you could connect a relay board (eg. Jaycar XC4440) or use two NPN transistors to switch more power. We prefer the NPN transistor option as it's cheaper than relay boards and the transistors don't make an annoying click/clack/click/clack noise as they operate like relays will do. The transistors will switch the "ground" power supply connection so LED's must be wired in "Common Anode" configuration which is connected to the positive power supply connection. In either case, you must ensure there is a current limiting resistor in series with the LED's to limit the current. The resistor value will depend on the supply voltage and how many LED's are connected in series. There are many online LED resistor calculators – this one also shows series and parallel LED connection calculations:
https://www.hebeiltd.com.cn/?p=zz.led.resistor.calculator

Below are pictures of the schematic wiring diagram and a test setup using two NPN transistors to turn on two 12 volt 5 watt lamps, which is about 400 milliamps current. The "base" connection of the transistors is connected to the L1 and L2 outputs of the JTECF2 flasher unit. The "emitter" connection of both transistors is connected to the power supply "ground" connection. The "collector" connection of the transistors is connected to a lamp. The other lamp connection is connected to common 12V power.

The transistors can be any general purpose NPN transistors rated at 20 volts or greater, and 1 amp or greater. In my test setup I have used transistor type TIP41 (eg. Jaycar ZT2291).



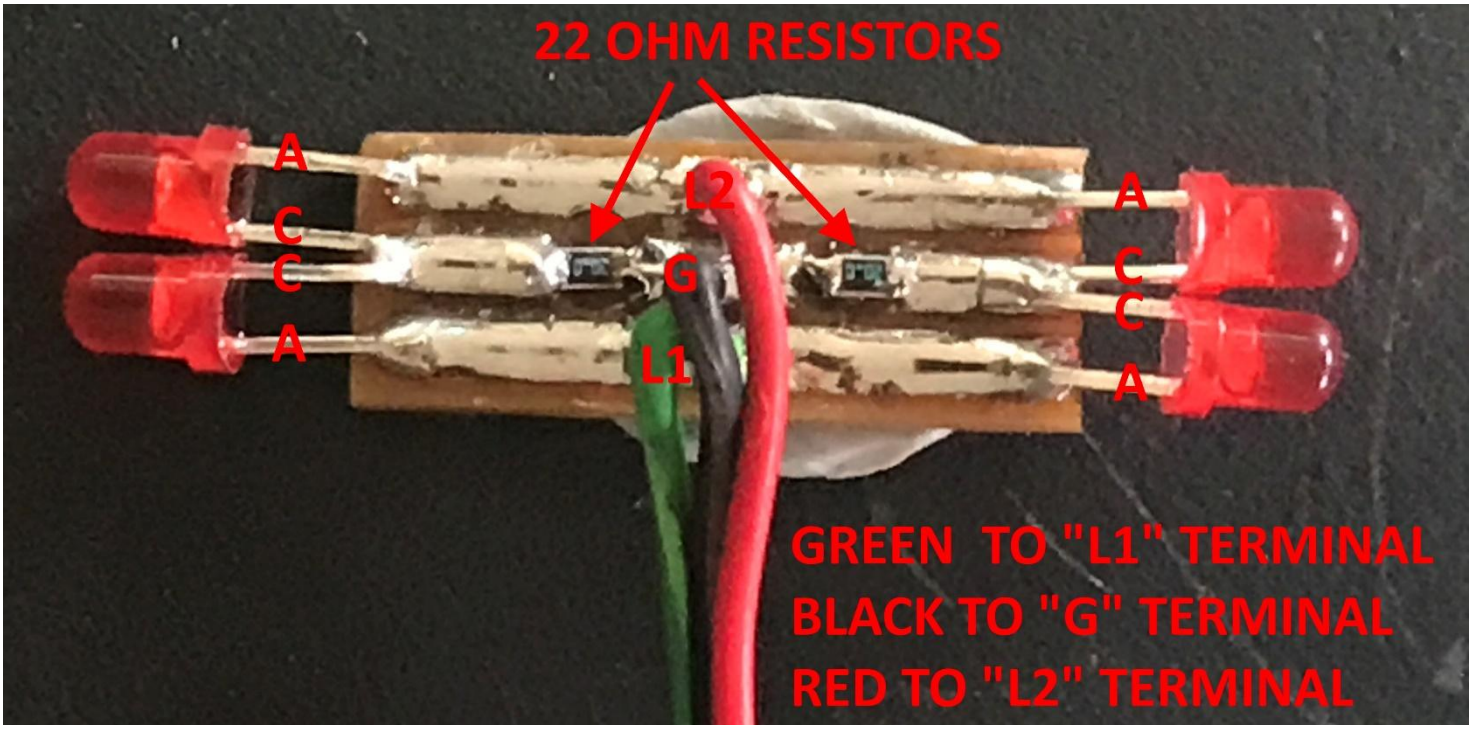


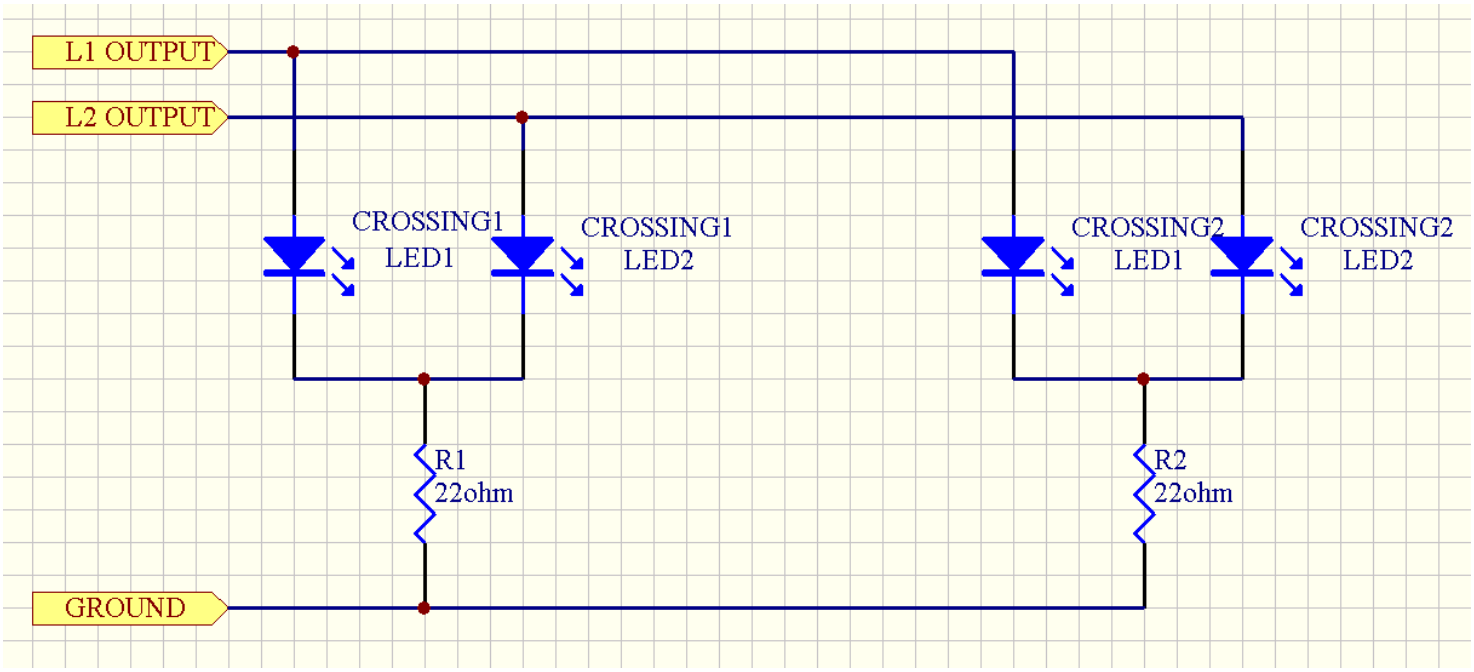

12V
POWER
CONTROL
INPUT
2x NPN
TRANSISTORS
2x 12V 5W
LAMPS
+
C
G
SPK
ADJ
+5
G

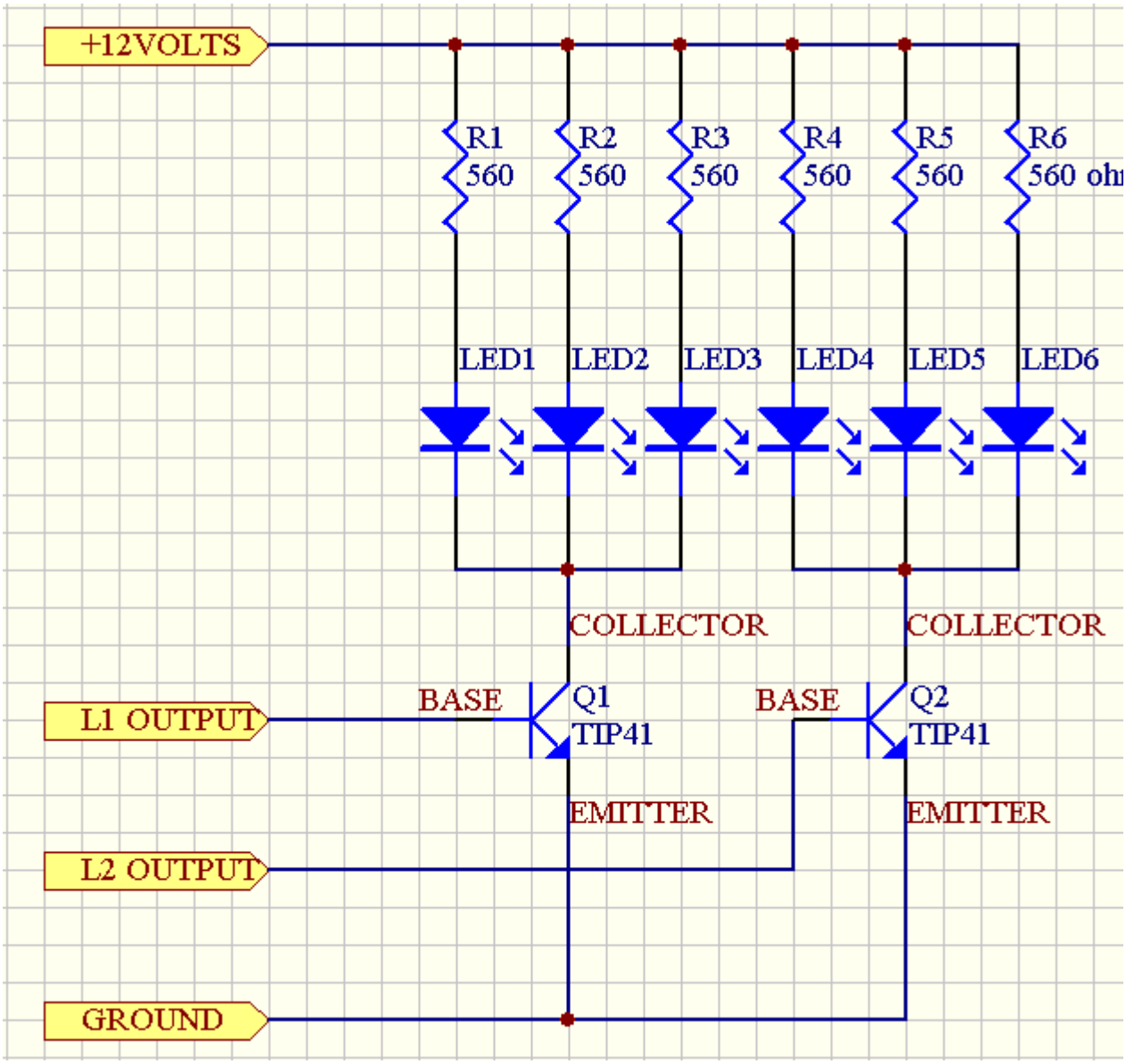
TWO LEDs PER OUTPUT OUTPUT CAPABILITY

The JTECF2 module can only provide about 20 milliamps to the LED output terminals but will successfully power “dual” crossing signals, like for a set of signals on either side of the track at a crossing.

The pictures below show a test wiring setup where the LEDs will be turned on in pairs – either the top two or the bottom two LEDs lit up alternately. The pairs of LEDs each on the left and right hand side of this test board are wired in “Common Cathode” configuration and importantly the common cathode “Ground” connection fed to each pair has its own 22 ohm resistor so the LEDs behave nicely and share the available current from the JTECF2 module. If you wire the LEDs in “Common Anode” configuration, just put the resistors in the Anode connection to each pair of LEDs.





MULTIPLE LED OUTPUT CAPABILITY

The JTECF2 module can only provide about 20 milliamps to the LED output terminals. To greatly increase the output current capability, you could connect a relay board (eg. Jaycar XC4440) or use two NPN transistors to switch more current. The circuit below shows three LED's connected to each output with about 20milliamps current through each LED and you could easily increase this to 10 or 20 LED's per output (each with their own current limiting resistor) so long as your 12volt power source can provide the required current of 20milliamps per LED. A 12volt 500milliamp power supply will be sufficient for connecting up to 25 LEDs per output…