A19: Use a Transistor to Control Multiple LEDs

1001-act19 Introduction to Electronics

Summary

In this activity you will build a circuit that expands on the previous one in act18. This time, the transistor will control 3 LEDs at a time.

What You Need

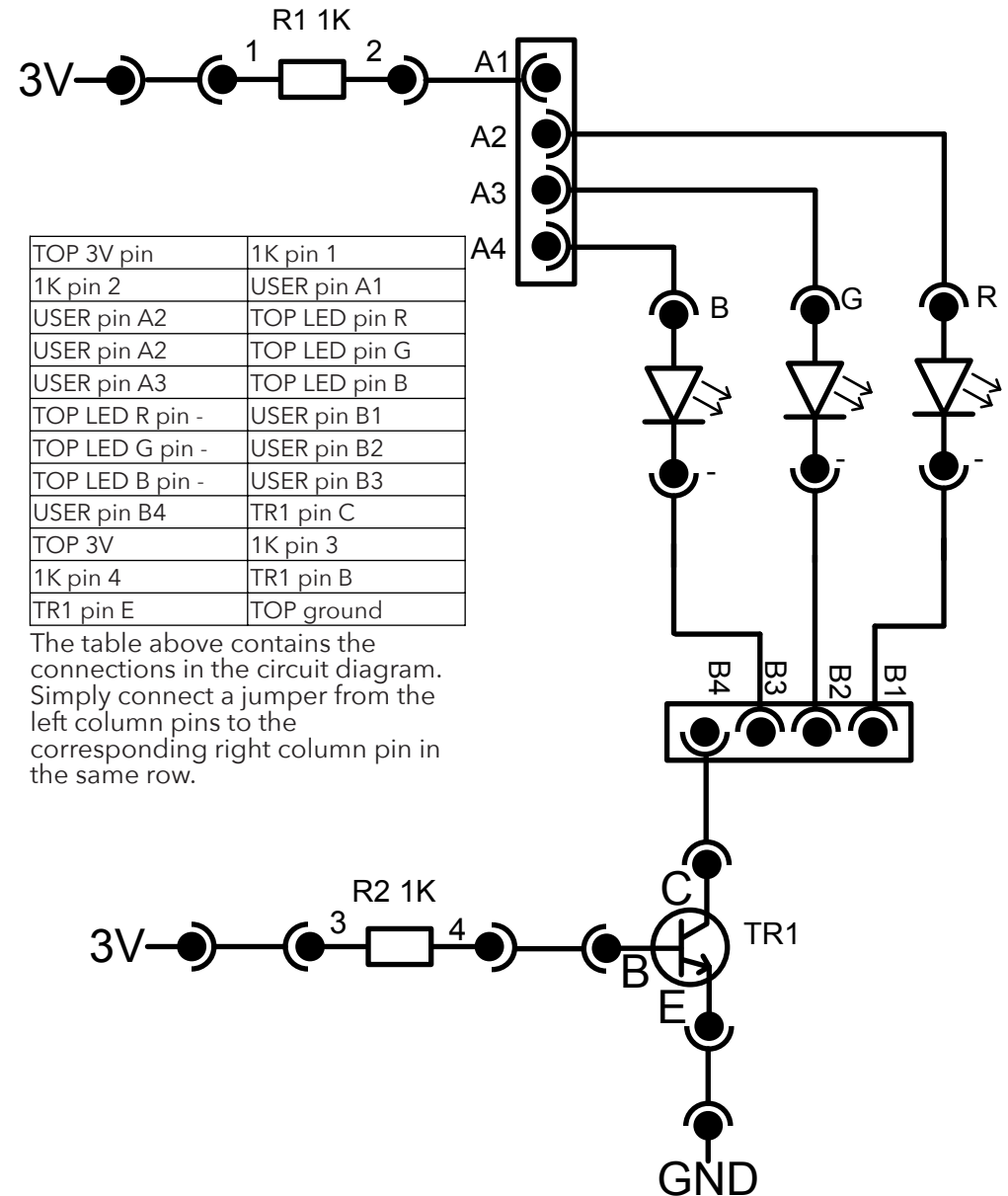- JackBord
- JackBord TOP
- 15 x 10cm Jumpers

Instructions

1. First, make sure that the JackBord TOP is already connected to the JackBord power pins and the two power LEDs are on (Check 1001-act5 if not). Turn off the JackBord.

2. Connect a TOP 3V pin to 1K pin 1. Then from 1K pin 2, connect to USER pin A1.

3. From USER pins A2, A3, and A4, connect to TOP LED pins R, G, and B respectively. Connect the - pins of the aforementioned LEDs to USER pins B1, B2, and B3 respectively. Connect USER pin B4 to TR1 pin C.

4. Connect another TOP 3V pin to 1K pin 3. From 1K pin 4, connect to TR1 pin B.

5. Connect TR1 pin E to TOP ground.

6. Now when you turn on the JackBord and connect and disconnect the TR1 pin B power line, all 3 LEDs should turn on and off correspondingly.

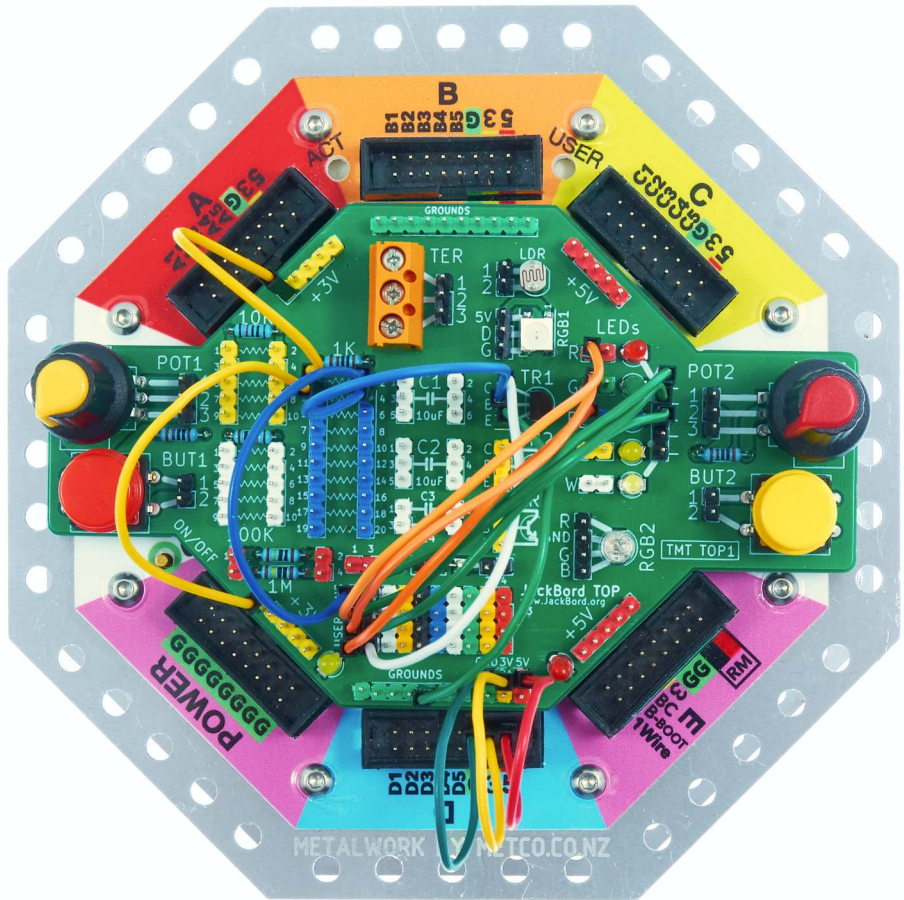7. If not all the LEDs turn on, change the 1K pin 1 power line to 5V.

NOTE

USER pins refer to the pins on the bottom half of the top. They are connected in columns of 4, but unconnected horizontally.
They are referred to by grid reference.
I.e. USER pin E2 refers to the second pin down in the E column.

A B C D E F G H I J
1
2
3
4
USER PIN BLOCK

Circuit Diagram

TOP 3V pin	1K pin 1
1K pin 2	USER pin A1
USER pin A2	TOP LED pin R
USER pin A2	TOP LED pin G
USER pin A3	TOP LED pin B
TOP LED R pin -	USER pin B1
TOP LED G pin -	USER pin B2
TOP LED B pin -	USER pin B3
USER pin B4	TR1 pin C
TOP 3V	1K pin 3
1K pin 4	TR1 pin B
TR1 pin E	TOP ground

The table above contains the connections in the circuit diagram. Simply connect a jumper from the left column pins to the corresponding right column pin in the same row.

Completed Circuit

Extension

- Try adding a button to the circuit, so pressing the button turns on the transistor.

- Try different values of the base resistor R2, and see if there is any effect on the operation of the LEDs.

- Try increasing the value of resistor R1 to say 10k and then 100k. What happens to the LEDs? They should get dimmer as the increased resistance reduces the amount of current for the LEDs.