

# A18: Use a Transistor to Control an LED

## 1001-act18 Introduction to Electronics

### Summary

In this activity you will build a circuit that makes use of a transistor to turn an LED on and off.

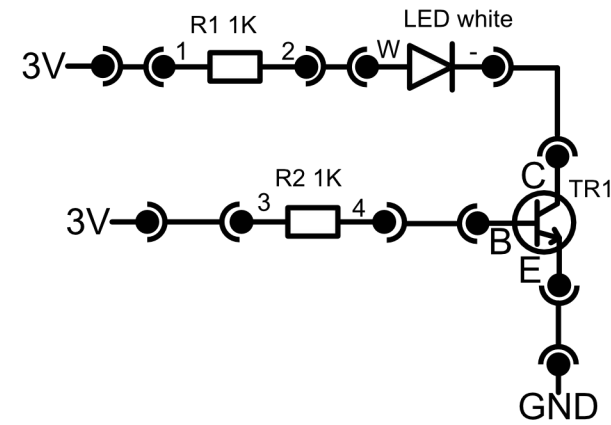
### What You Need

- JackBord
- JackBord TOP
- 10 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 TOP LED pin W. Instead of connecting the LED - pin straight to ground, connect it to pin C of TR1.
3. Connect another TOP 3V pin to 1K pin 3. Then from 1K pin 4, connect to the B pin of TR1.
4. From TR1 pin E, connect to ground.
5. When you turn the JackBord on, the LED will be on initially as there is a 3V current being fed into the base of the transistor. Considering that it takes a voltage of  $\sim 0.6V$  for the transistor to turn on, this is more than enough to turn the switch on.
6. Now pull out the 3V line connected to 1K pin 3. The LED will turn off despite having an untouched power line. This is because now the voltage going into the Base of the transistor is 0, which is less than  $0.6V$ , causing it to turn off.

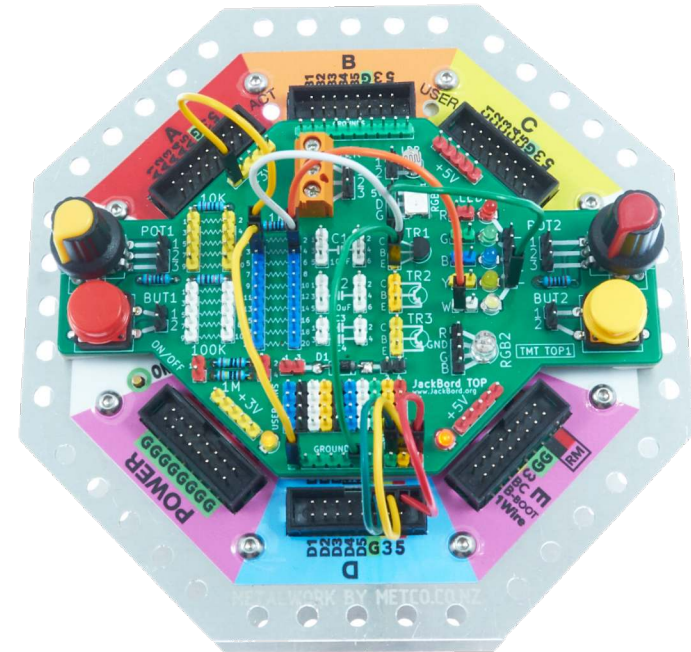
### Circuit Diagram



TOP 3V pin	1K pin 1
1K pin 2	TOP LED pin W
TOP LED pin -	TR1 pin C
TOP 3V pin	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 some more LEDs to the transistor switch