geeekÜs

D.I.Y LED Flashing Wheel of Fortune Kit

Level: Beginner **GK-EK-180**

List of Components:

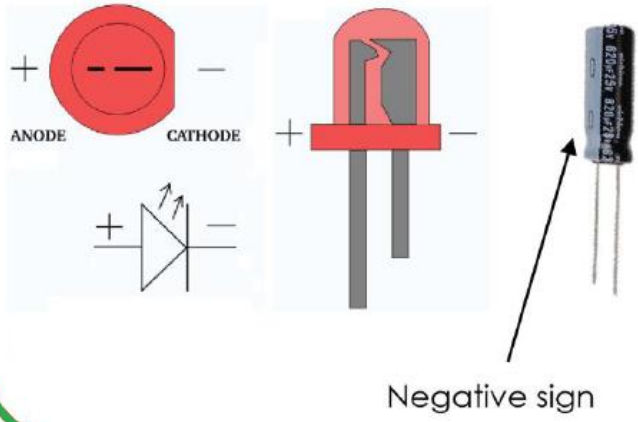
- 20x 5mm LEDs (D1 - D10)
- 4x ¼ W Resistors (R1: 470kΩ, R2:2.2kΩ, R3: 470kΩ, R4: 100Ω
- 2x Electrolytic Capacitors (C1: 1µF, C2: 47µF)
- 1x Ceramic Capacitor (C3: 10nF)
- 1x PN2222 NPN Transistor (Q1)
- 1x 555 Oscillator IC Chip (IC1)
- 1x CD4017BE Counter IC Chip (IC2)
- 1x Tactile Push Button (S1)
- 1x 3.5mm Screw Terminal
- 1x 2xAA Battery Holder

*R1 & R3: Yellow/Purple/Yellow/Gold
*R2: Red / Red / Red /Gold
*R4: Brown/Black/Brown/Gold

Component Polarity:

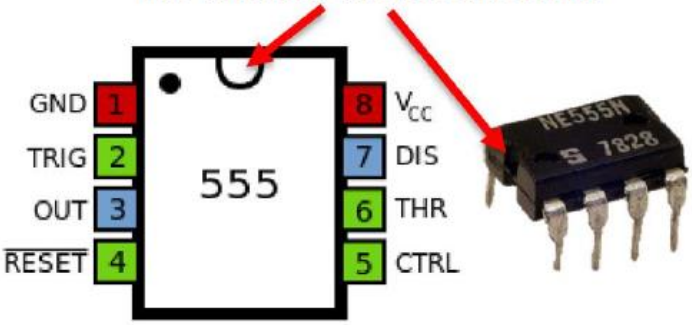
It is important to identify the polarity of specific components, such as the LEDs and electrolytic capacitors in this package, to ensure proper their proper functionalities.

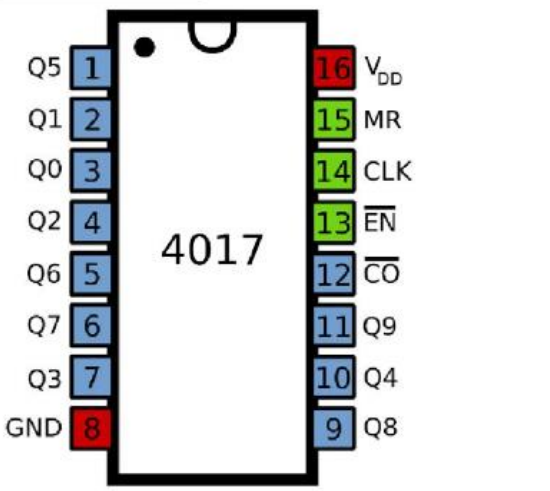
In most cases, flat cuts in the LEDs and the grey stripes in the electrolytic capacitors illustrate the side having a negative polarity, and the shorter pin also illustrates the negative polarity. Both instances will correspond to the same side:



Chip Pinout:

Use dent and dot as references.





Guide:

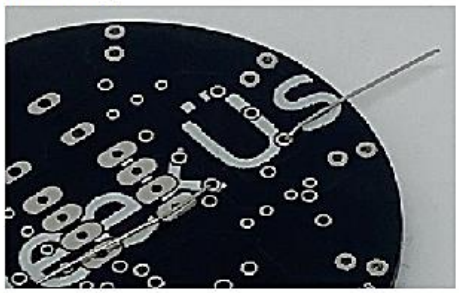
1) Turn on iron to 285°C (545°F) temperature (the solder used for this kit 60 tin/40 lead).

2) Place components face up (silkscreen side) in designated areas and proceed to solder:

2.1) First, place the resistors and be sure their values match with their names (refer Components List).
Tip: Bend the leads of the resistor outwards after placing it in the board to allow minimal mechanical grip. Ensure the angle formed by the bend is no less than 45 degrees.

2.2) Solder the leads of the resistors to the pads, then cut them off using the flush cutter.

2.3) Place the capacitors and ensure their values match with their names (refer Components List and capacitor). Ceramic capacitors are not polarized, but be vigilant about the polarities of electrolytic capacitors (refer Component Polarity).

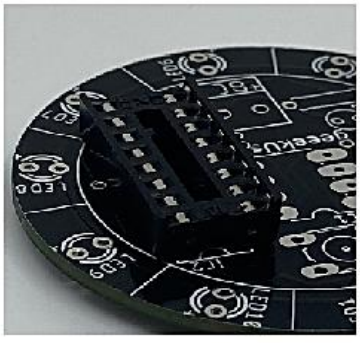


2.7) Now, place the tactile button. The button's positioning is determined by the holes closest to each other corresponding with the leads'.

2.8) Solder the leads of the button and cut.

2.9) Next, place the sockets belonging to the chips. Starting with the DIP8, make sure the dents on the socket correspond with the dent on the silkscreen (refer to Chip Pinout).

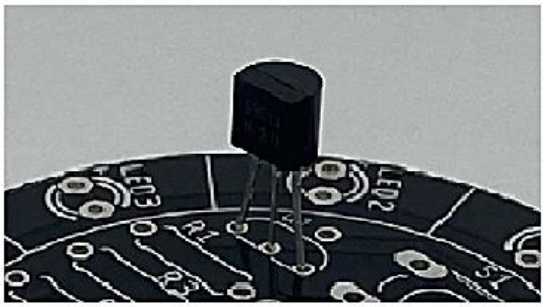
2.10) Solder the socket and cut the leads.



2.4) Solder the leads of the capacitors and cut when finished.

2.5) Place the transistor (Q1). Refer to the flat side of its silkscreen when placing it to ensure it is placed correctly. The physical component's flat side must be facing the same direction as the silkscreen's.

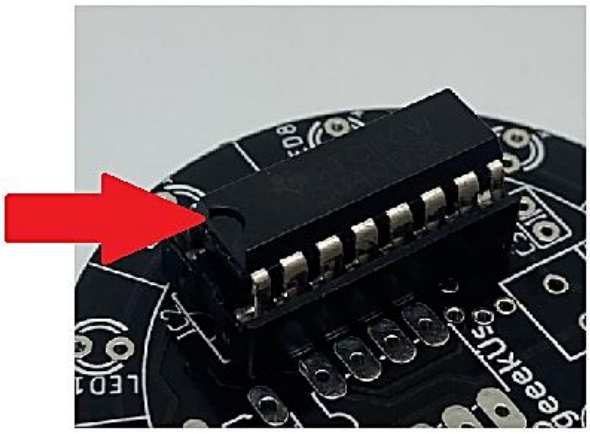
2.6) Solder the leads of the transistor and cut when finished.



2.11) Place the DIP16 socket for the other chip (IC2). Pay attention to the dent once more the same way with this chip.

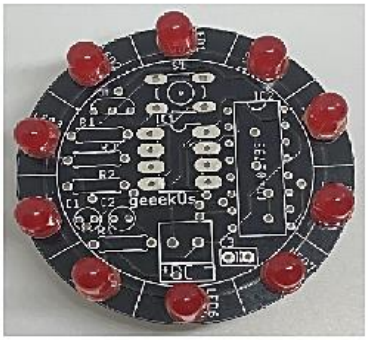
2.12) Solder the socket and cut the leads.

2.13) The chips may be placed in their respective sockets. The dent in the chips should be aligning with the dent in the socket when placed. Did you know: The reason the sockets are soldered in the area for the chip is because they allow it to be removed to either get replaced or be used for another PCB.



2.14) Start placing the LEDs. As always, be aware of the polarities. Refer to Components Polarity if unsure. On silkscreen, the plus indicates the anode of the LED. Tip: Place and solder the LEDs sequentially rather than placing down all ten and then soldering. Doing the latter has the many leads on the board create unnecessary difficulties when soldering.

2.15) Solder and cut the leads.

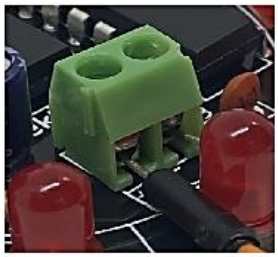


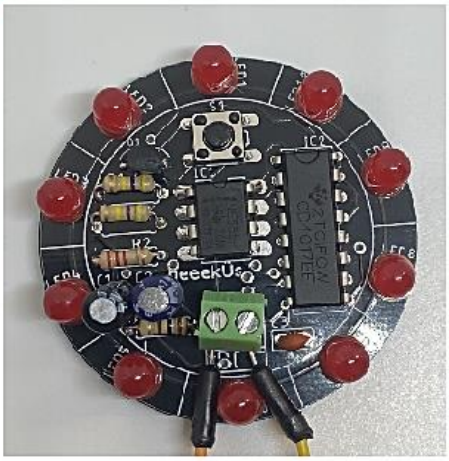
2.16) Place the screw terminal in the designated area. It is preferred to place it with its two holes facing LED6 because that's the area with the least components and obstacles in the way of the wires.

2.17) Solder and cut the leads.

3) Now that the board has successfully been soldered, it is time to pick up the battery holder and plug its wires into the screw terminal. Watch for the plus and minus signs on its silkscreen to identify which type of wire must go in and where. Plus means the power wire, and minus means the ground wire. With a screwdriver, screw both wires in place in the terminal.

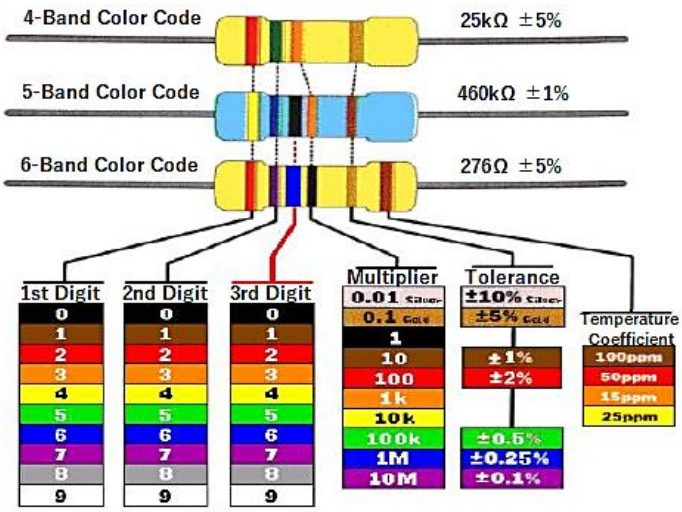
4) Batteries may now be placed inside the holder to power the board and accomplish the assembly of The Flashing Wheel of Fortune.





Top View

Bottom View



Utilise this chart to identify resistor values. Note that the number of bands drawn on the resistor dictate how to calculate your values.