

# HackerBox Starter Workshop

## Version 4

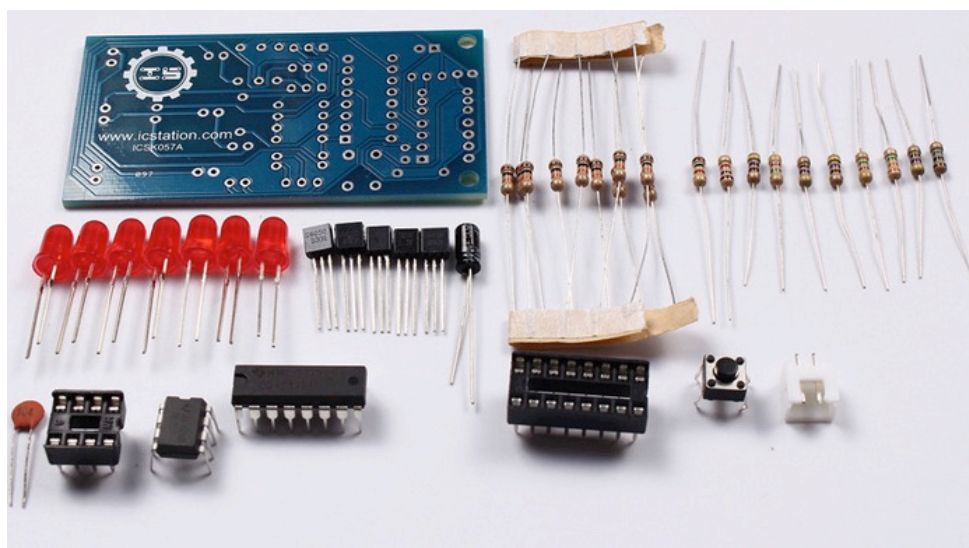
November 28, 2018 – April 2020

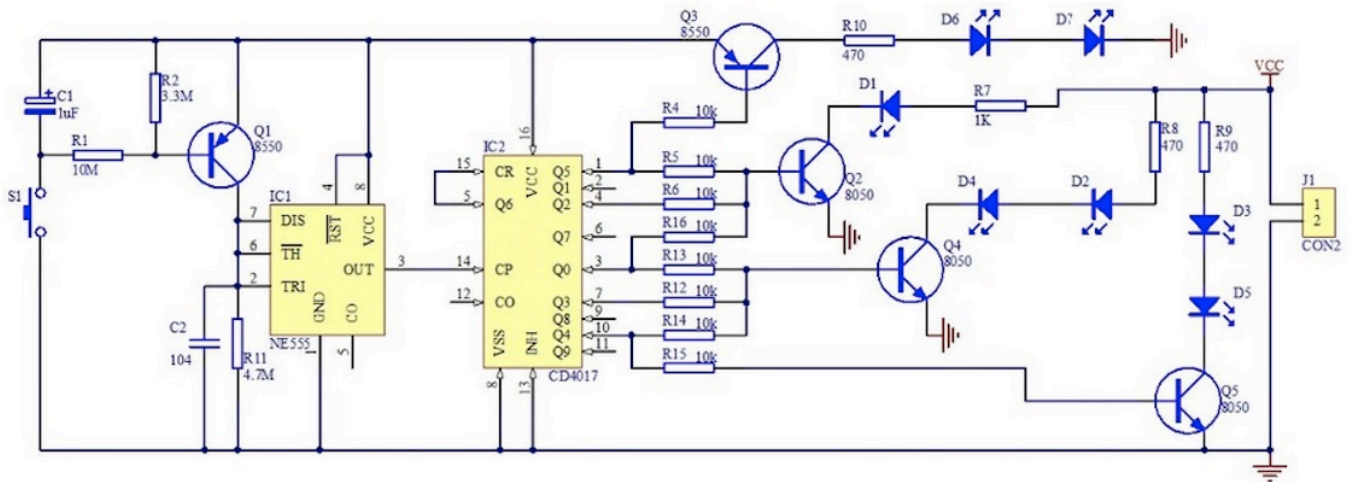
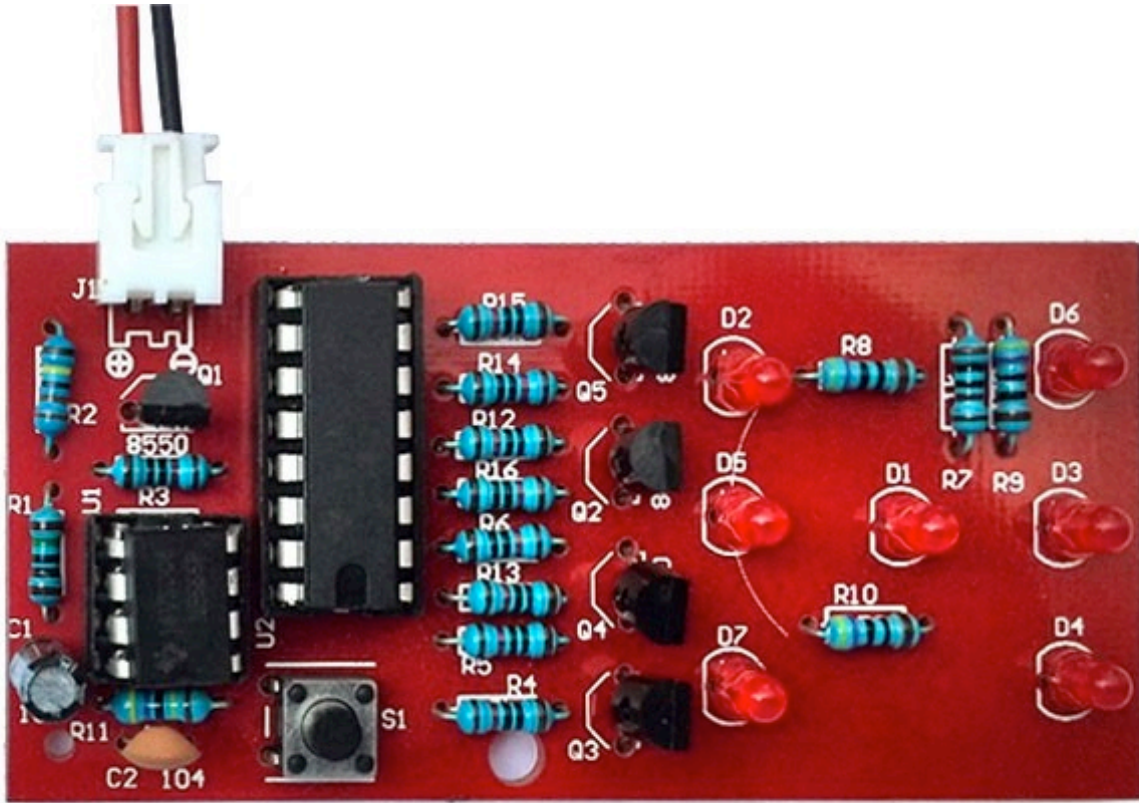
[www.hackerboxes.com](http://www.hackerboxes.com)

 <p>Soldering Iron</p>	 <p>Stand / Cleaner</p>	 <p>Solder</p>	 <p>Solder Wick</p>	 <p>Flush Cutters</p>	 <p>Digital Meter</p>
 <p>Arduino Nano</p>	 <p>MicroUSB Cable</p>	 <p>Power Supply</p>	 <p>Breadboard</p>	 <p>Jumper Wires</p>	 <p>Clip Leads</p>
 <p>Micro Servo</p>	 <p>RGB LED Array</p>	 <p>Photo Resistors</p>	 <p>Solder Kit LED Dice</p>	 <p>Female - Female Jumper Wires</p>	 <p>OLED Display</p>
 <p>Push Buttons</p>	 <p>LEDs</p>	 <p>Potentiometers</p>	 <p>RGB LED</p>	 <p>Alligator Clips</p>	 <p>Temperature Sensor</p>
 <p>Buzzer</p>	 <p>Ultrasonic Range Sensor</p>	 <p>Resistors</p>	 <p>IR Motion Sensor</p>	 <p>RFID Kit</p>	 <p>Joystick Module</p>

The “Learn to Solder Kit” in Version 1-4 of the HackerBoxes Starter Workshop was an LED Dice Kit, which was replaced in Version 5 with the HackerBoxes Badge Buddy Kit.

## LED Dice – Soldering Kit





The LED Dice kit is a great chance to practice some through-hole soldering techniques. Hopefully, in the end, you will have a cool random dice thrown toy to play with, but don't put too much pressure on yourself if you are new to soldering.

You can take a look at the schematic and the silkscreen legends on the PCB to guide you in placing the correct components into the correct vias.

- Start with the resistors. There are different values of resistors, so make sure the correct values go into the appropriate positions. You can read the color bands and use the included color code card. We also recommend double checking the values with a meter. Resistors are not polarized and may be inserted in either direction.
- Next, there are two capacitors. C1 is an electrolytic can-style capacitor. It is polarized so makes sure the plus and minus leads end up in the correct holes. C2 is a little brownish ceramic capacitor. The leads of C2 are not polarized and may be inserted in either orientation.
- The LEDs are polarized and will not light up if connected in reverse. Check the flat portion of the circle on the silkscreen against the base of the plastic LED diffuser lens. Also, the longer lead of the LED is positive.
- With the transistors, note that there are two different kinds. They are not interchangeable even though they look almost identical. Their pins are also polarized. Again, check the flat portion of the circle on the silkscreen against the flat face of the transistor body.
- DIP (dual in-line package) chips and chip sockets are oriented by a small half-circle on end. Make sure these line up with the similar marking on the PCB silkscreen. If your kit includes chip sockets, solder those to the board and then let them cool for a 20 seconds before inserting the chips in the correct orientation. If you are not using sockets, be VERY careful to not overheat the chip leads. Heat then very quickly and just enough to melt solder.
- The push button should only fit in one way. It operates the same if rotated 180 degrees, so that is no worry.
- Note that the power jack and power lead have a positive wire and minus wire. The power supply requirement is 4.5-6 volts DC, so the 5V output from the UNO, the YwRobot supply, or any other 5V DC supply may be used.