

Push-It (DIP)



Quantity	Name	Description	Label/Color Code
5	R1-R4, R6	Resistor 220 Ω	RE RE BR GO
1	R5	Resistor 1 k Ω	BR BK RE GO
1	R7	Resistor 10 k Ω	BR BK OR GO
7	S1-S7	Push Button	
1	SG1	Speaker	
1	JP1	Pinheader 3x1	
1	LED1	LED 10mm Yellow	
1	LED2	LED 10mm Red	
1	LED3	LED 10mm Green	
1	LED4	LED 10mm Blue	
1	LED7	7-segment display	
2	C1, C2	Ceramic Capacitor 100 nF	104
2	C3, C4	Ceramic Capacitor 22 pF	22
1	IC1	74HC 595	
1	IC2	Microcontroller Atmel Atmega 328P-PU	
1	Q1	16MHz Crystal	
1	POWER	terminal 2-pole	
1		IC-Socket 16-pole	
1		IC-Socket 28-pole	
1		PCB	
1		Battery Holder	
4		Batteries Mignon (AA)	

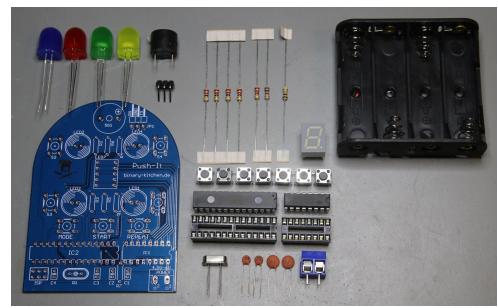
Difficulty: ●●○○○ Build Time: 1-2 hours

Manual v1.0a CC BY-SA 4.0 Binary Kitchen e.V.
 PCB v1.1 CC BY-SA Thomas Basler

Farblegende: SI = silber; GO = gold; BK = schwarz; BR = braun; RE = rot; OR = orange; YE = gelb; GR = grün; BL = blau;
 VI = violett; GR = grau; WH = weiß

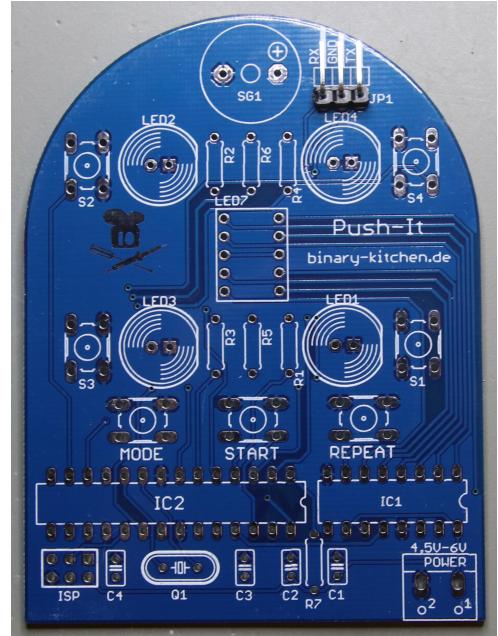
Step 1

- a) Hints:
- b) Resistor size can be determined by color coding
- c) Alignment of the PCB in such a way, that LED designation can be read normally (see picture)
- d) Alignment with resistors does not matter
- e) LEDs have a flat side and a shorter leg. Both indicate the negative side
- f) The orientation of capacitors doesn't matter, because ceramic capacitors are used



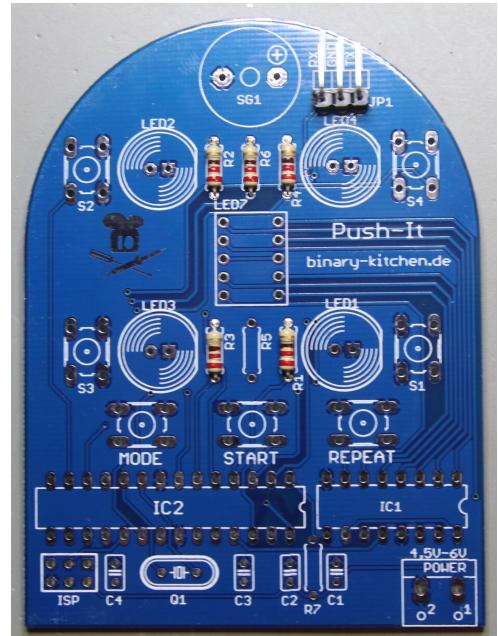
Step 2

- a) Soldering the pin header JP1



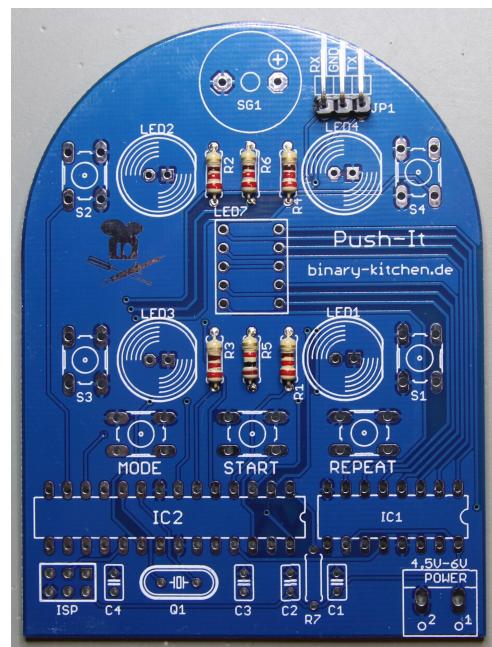
Step 3

- a) Solder resistors R1 - R4 and R6 (220 Ω)
- b) The orientation doesn't matter



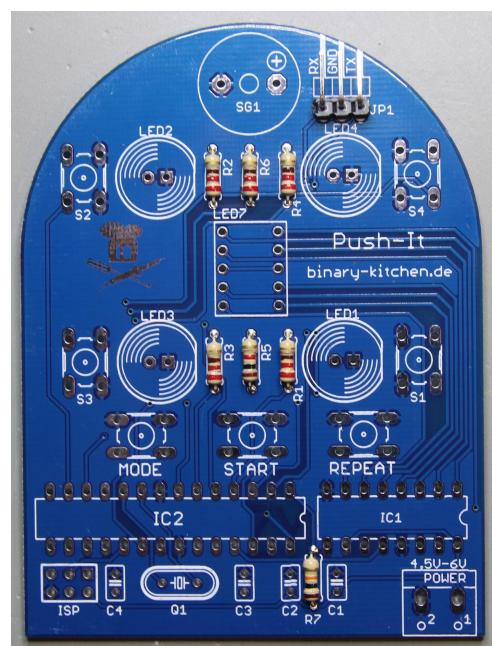
Step 4

- a) Solder resistors R5 ($1\text{ k}\Omega$)
- b) orientation does not matter



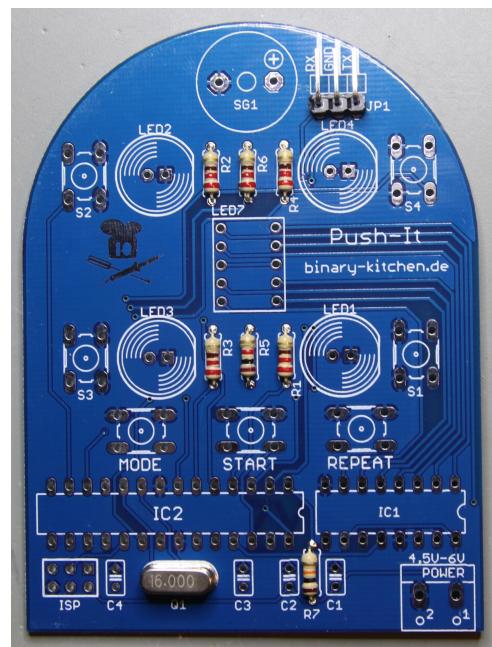
Step 5

- a) Solder resistor R7 ($10\text{ k}\Omega$)
- b) orientation does not matter



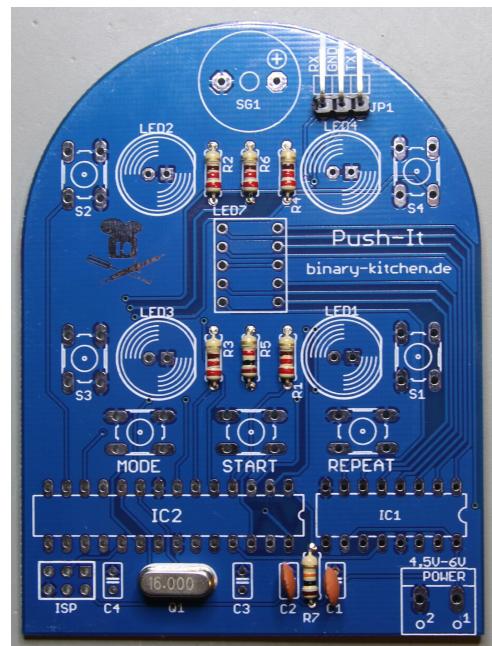
Step 6

- a) Solder crystal Q1
- b) orientation doesn't matter



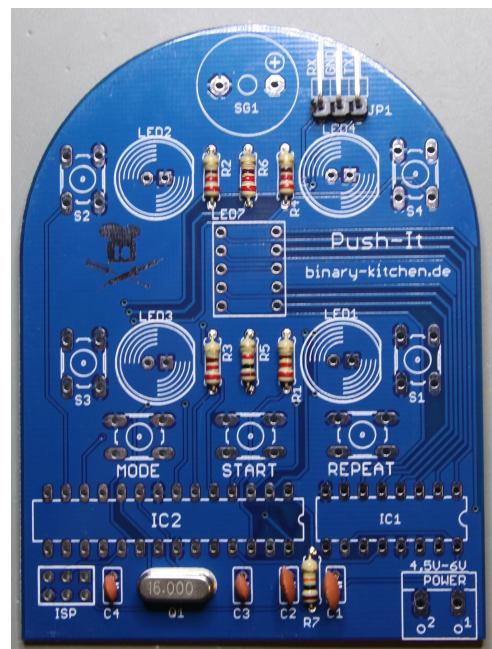
Step 7

- a) Solder capacitors C1 and C2 (104)
- b) orientation doesn't matter



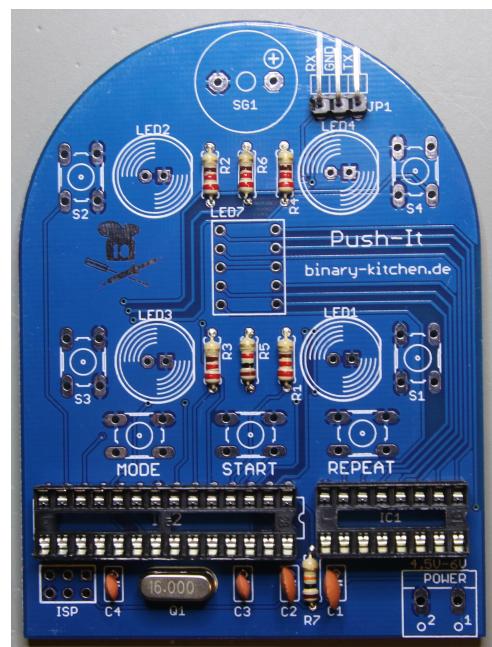
Step 8

- a) Solder capacitors C3 and C4 (22)
- b) orientation doesn't matter



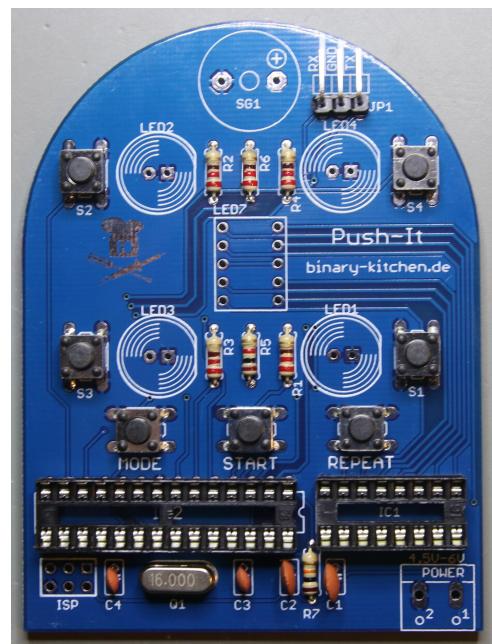
Step 9

- a) Solder IC1 socket as well as IC2 socket with the nose to the right onto the PCB



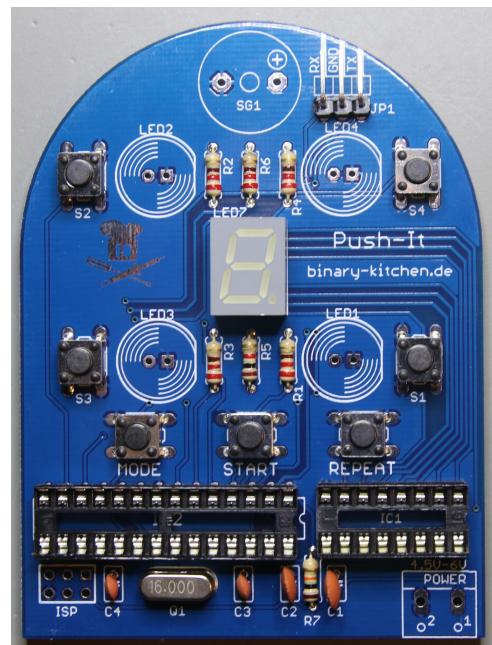
Step 10

- Solder switches S1 to S4 as well as MODE, START and REPEAT
- Hint: Legs have different distances. Nothing has to be bent.
Switch fits exactly



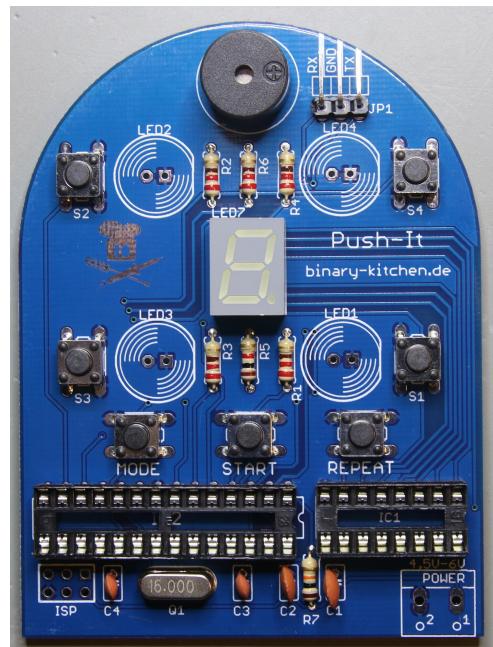
Step 11

- solder 7-segment display LED7
- The dot must be in the lower right corner



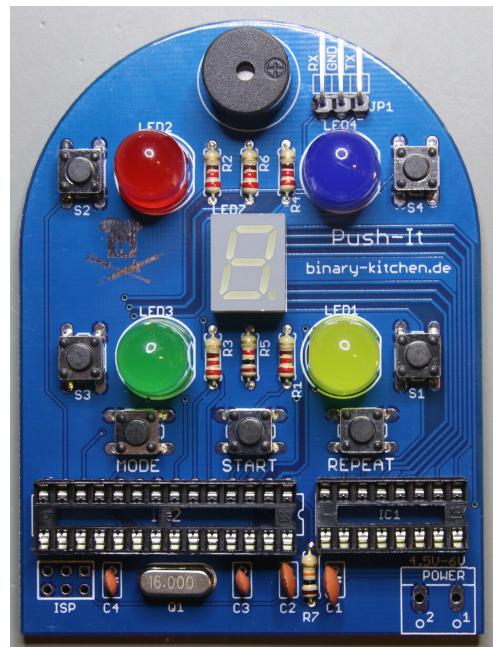
Step 12

- a) Solder loudspeaker SG1
- b) Attention! Alignment is important
- c) The printed plus sign must be in line with the PCB
- d) Remove the protective sticker if present



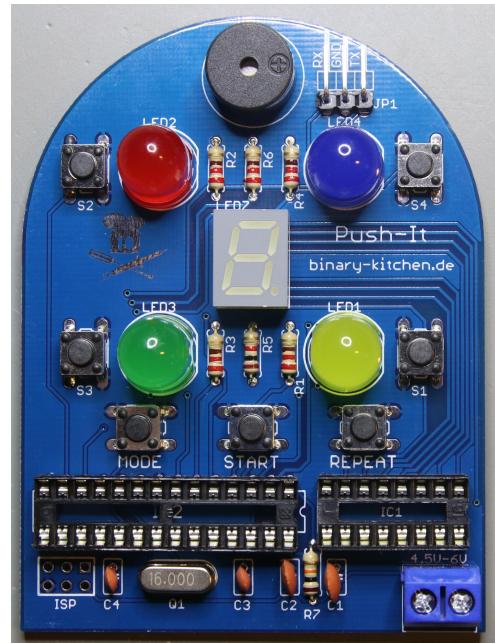
Step 13

- a) Solder LED1 to LED4. Note colors according to picture
- b) Attention! Alignment is important
- c) LEDs have a flat side and a shorter leg. Both indicate the negative side
- d) On the PCB the negative side is represented by a flat area.



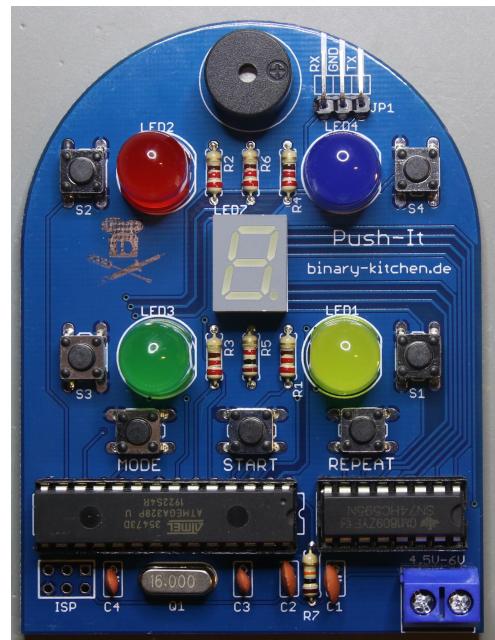
Step 14

- Solder POWER connector with the opening downwards



Step 15

- Insert IC1 and IC2 with the nose to the right into the socket
- Tip: The legs of the ICs must be bent slightly, to fit into the socket
- Possibly remove and tin the insulation at the tips of the connecting cables of the battery
- Screw on the battery (+ red, - black)



Step 16

- Fix the battery compartment with double-sided tape to the back-side of the board
- Cover the two ICs with some tape (protection against touch and moisture while playing)
- Insert the batteries
- Done!



