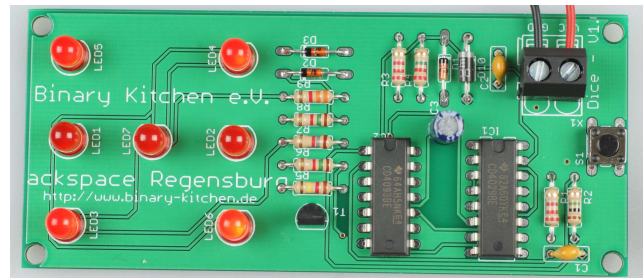


# Dice (DIP)



Quantity	Name	Description	Label/Color Code
2	C1, C2	Ceramic Capacitor 100 nF	104
1	C3	Capacitor 47 $\mu$ F	
3	D1, D2, D3	Diode BAW 76	
1	D10	Diode 1N4007	
1	IC1	CMOS-IC 4029	
1	IC2	CMOS-IC 4093	
7	LED1 – LED7	LED 5 mm	
2	R1, R3	Resistor 2.2 k $\Omega$	RE RE BK BR BR
1	R2	Resistor 1 M $\Omega$	BR BK BK YE BR
1	R4	Resistor 2.2 M $\Omega$	RE RE BK YE BR
1	R5	Resistor 120 k $\Omega$	BR RE BK OR BR
2	R6, R8	Resistor 1.5 k $\Omega$	BR GR BK BR BR
1	R7	Resistor 1.8 k $\Omega$	BR GR BK BR BR
1	R9	Resistor 3.3 k $\Omega$	OR OR BK BR BR
1	T1	Transistor BC547B	
1	S1	Push Button	
1	X1	Klemme 2-polig	
1	PCB		
1	IC-Socket 14-polig		
1	IC-Socket 16-polig		
1	Battery Clip für 9 V Block		
1	Battery 9 V Block		

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

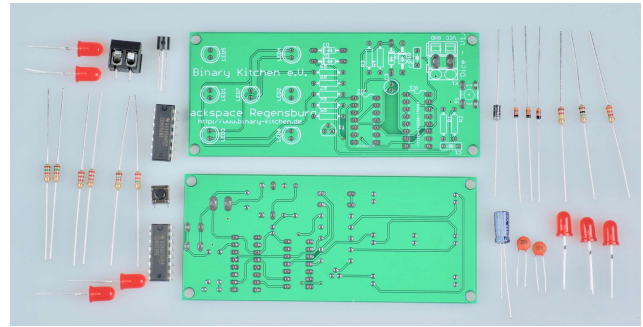
Manual v1.0a CC BY-SA 4.0 Binary Kitchen e.V.

PCB v1.0 CC BY-SA 4.0 Binary Kitchen e.V.

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

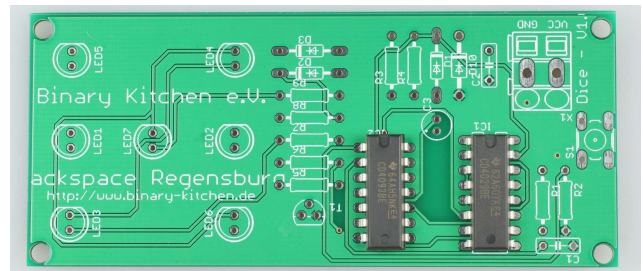
### Step 1

- Tips:
- Resistor value can be determined by color coding
- Alignment of the board so, that Binary Kitchen e.V. can be read normally (see picture)
- Alignment for resistors does not matter
- LEDs have a flat side and a shorter leg. Both indicate the negative side



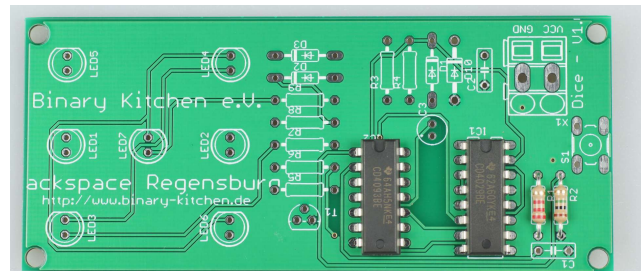
### Step 2

- Solder both IC sockets (Only the socket, not the actual IC device) with the nose up on the board
- Attention: Do not solder the IC but only the IC socket
- Note the pin count: IC1 with 14 pins left, IC2 with 16 pins right



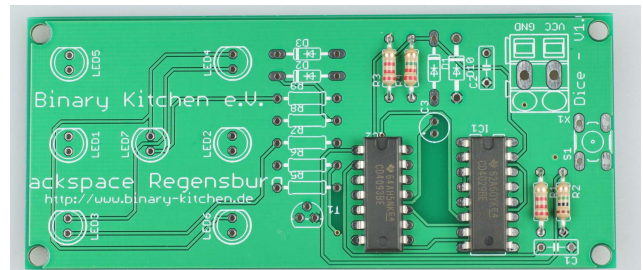
### Step 3

- Solder resistors R1 (2.2k $\Omega$ ) and R2 (1 M $\Omega$ )  
BR BK BK YE BR
- orientation does not matter



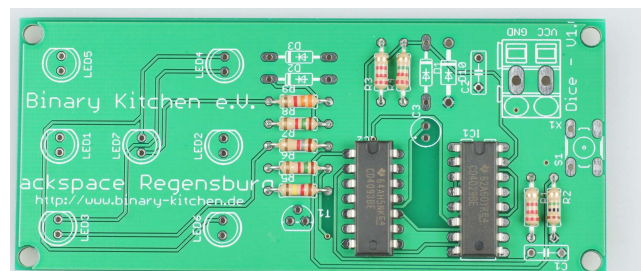
### Step 4

- Solder resistors R3 (2.2k $\Omega$ ) and R4 (2.2 M $\Omega$ )  
RE RE BK YE BR
- orientation does not matter.



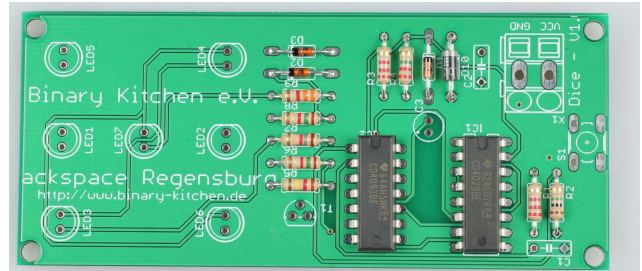
### Step 5

- Solder resistors R5 (120 k $\Omega$ ), R6 (1.5 k $\Omega$ ), R7 (1.8 k $\Omega$ ), R8 (1.5 k $\Omega$ ) and R9 (3.3 k $\Omega$ )  
BR RE BK OR BR (120 k $\Omega$ ),  
BR GR BK BR BR (1.8 k $\Omega$ ),  
OR OR BK BR BR (3.3 k $\Omega$ )
- orientation does not matter.



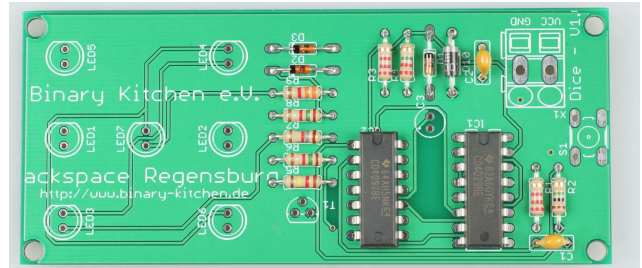
### Step 6

- a) Attention! Orientation of diodes is important
- b) solder diodes D1 to D3 (BAW76) with black side towards white mark on PCB
- c) solder diode D10 (1N4007) with white side towards white mark on PCB



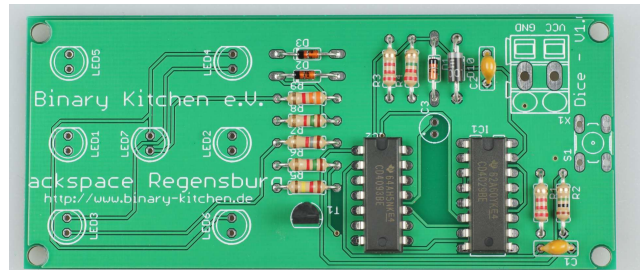
### Step 7

- a) Solder capacitors C1 (104) and C2 (104)
- b) orientation does not matter



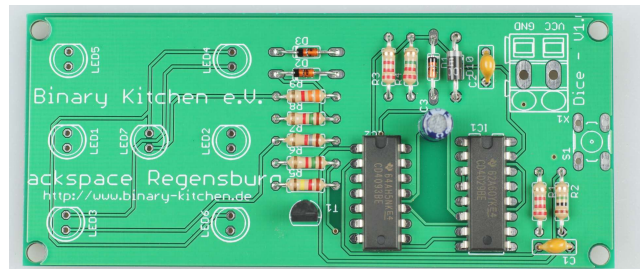
### Step 8

- a) Attention! Orientation of the transistor is important
- b) solder transistor T1 (BC547) according to the marking
- c) orientation: flat side downwards



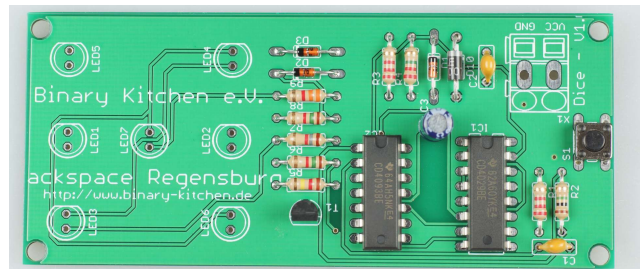
### Step 9

- a) Attention! Alignment of this capacitor is important
- b) Solder capacitor C3 (47  $\mu$ F) with long leg (+) downwards
- c) Hint: There is a plus sign printed on the board.



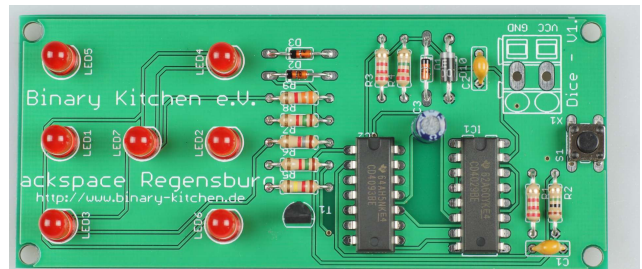
### Step 10

- a) Solder switch S1
- b) Hint: Legs have different distances. Nothing has to be bent. Switch fits exactly
- c) Some pressure may be necessary



### Step 11

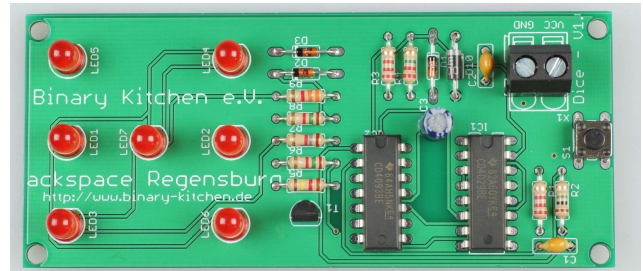
- a) Attention! Alignment of LED is crucial
- b) Solder LED 1-7. Alignment important! Short leg upwards





## Step 12

- Solder power connector X1 with opening upwards



## Step 13

- Connect battery holder (VCC red, GND black)
- Insert both ICs into the sockets (count the number of legs! There are differences here)
- Insert batteries
- Push button. Done
- Cube goes off again by itself

