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MADE IN EUROPE

10+

CE RoHS ✓

Return the device to a certified provider at the end of its useful life!

No. **79300**

4037373 793006

QR Codes

Parts list — Check and sort out parts

Qty.	Part	Value/Description	
1	Board	96300	
1	7 segment display (LED1)	Colour red	
1	LED 5 mm (LED2)	Colour green	
1	LED 5 mm (LED3)	Colour blue	
1	LED 5 mm (LED4)	Colour yellow	
1	LED 5 mm (LED5)	Colour red	
1	LED 1.8 mm (LED6)	Colour green	
1	LED 1.8 mm (LED7)	Colour blue	
1	LED 1.8 mm (LED8)	Colour yellow	
1	LED 1.8 mm (LED9)	Colour red	
10	Resistor (R1-R7/R10-R12)	330 Ohm	
2	Resistor (R8-R9)	1K Ohm	
2	Resistor (R13+R18)	180 Ohm	
1	Resistor (R14)	22K Ohm	
2	Resistor (R15+R17)	10K Ohm	
1	Resistor (R16)	47K Ohm	
1	Capacitor (C1)	100 nF/10V	
1	Diode (D1)	Z-3V3	
11	Pushbutton (T1-T11)	3301	
1	Processor (IC1)	ATTINY4313	
1	Wooden feet	self-adhesive	
1	Connecting cable	USB	

TrainYourBrain, Lötbausatz - Soldering kit - powered via power bank or USB port
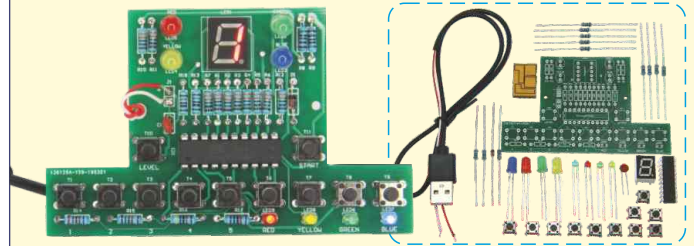
Recommendation for children and teenagers: Assembly and soldering should be supervised by an adult with soldering skills.

You will need: Soldering iron, solder, side cutters, tweezers, power bank (USB), possibly boards assistant

Resistor colour codes

330 Ohm	1K Ohm	180 Ohm
orange orange black black brown	brown black black brown brown	brown grey black black brown

22K Ohm	10K Ohm	47K Ohm
red red black red brown	brown black black red brown	yellow purple black red brown

Look at how to solder properly (QR):

IMPORTANT SAFETY NOTES!

- This kit is only intended to be powered by USB.
  Never connect the kit to 230 V mains voltage! Acute danger to life!
- Keep these instructions for future reference! They contain important information.
- The soldering iron, solder and even the parts being soldered become very hot when soldering. Be extremely careful!
- Always use a mat when soldering! This prevents parts and the board from slipping.
- We recommend using a soldering iron holder to set the soldering iron down safely during use.

The "TrainYourBrain" soldering kit

The "TYB" board kit is an excellent introduction to soldering, future electronics engineers and amateur technicians, and anybody who enjoys working with a soldering iron or a soldering station. Over 40 parts will be soldered onto the "TYP" board, including a preprogrammed microprocessor. Once the board is fully assembled, the "TrainYourBrain" program on the processor starts exciting games with various difficulties.

The 7 segment display shows numbers from 1 to 5, which the player must then enter correctly with the pushbuttons. If the entries were correct, you advance with the next round. Sounds simply, but just wait until the number sequence is longer or colours are added to the number and the output speed is faster: "TrainYourBrain". Improves memory and focus, and the best part is: it's fun!
The electronics kit is powered via power bank or directly via USB port. So you don't need an expensive battery.

ASSEMBLY INSTRUCTIONS

Laser-cut wooden bending fixture

To ensure resistors and diodes properly fit between the lands, the leads on the parts much be bent absolutely correct. To make this easier, we built this simple, yet functional bending fixture.

Simply place the parts into the respective opening (R = resistor /D = diode), then bend the leads down straight at the edge of the wood. The part now fits perfectly in between the lands. To make it easier, to bend all resistors and the diode now to prepare them for the next steps.

Resistor before bending	bent

Insert resistor

Bend one pin down...

...bend the second pin down
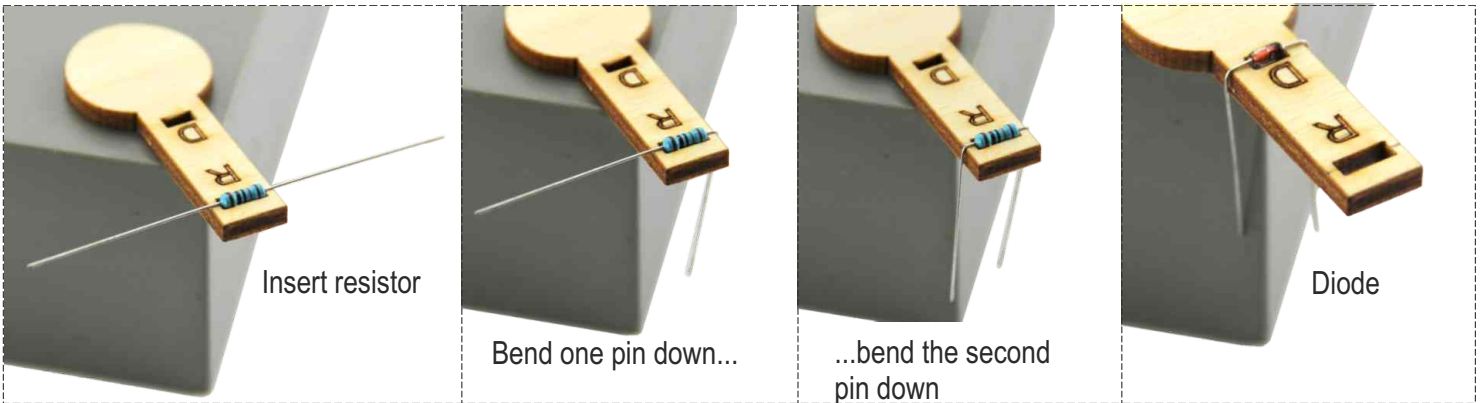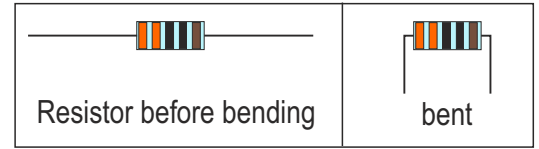
Diode

A **Solder diode in place.** Note the correct polarity (direction) - polarity shown on the board! Trim excess leads.
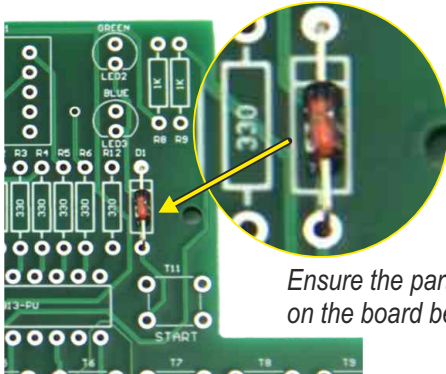
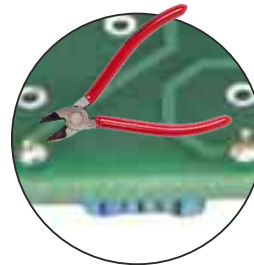*Ensure the part is positioned correctly on the board before soldering it!*

Required parts

1 x ▮3V3▮ **D1**

B **Trim excess leads.**

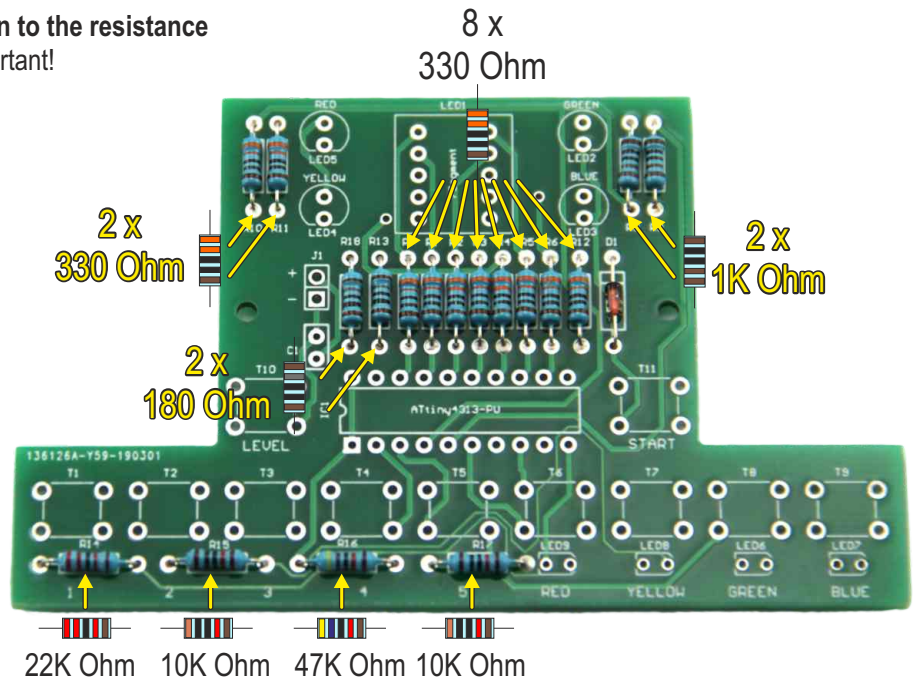When you are done soldering, use the side cutters to trim the excess leads in back to approx. 2 mm.

C **Solder 18 resistors in place, paying attention to the resistance values.** The polarity of the resistors is not important! Trim excess leads after soldering.

Ensure the part is positioned correctly on the board before soldering it!
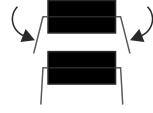
Required parts

10 x	330 Ohm	R1-R7/R10-R12
2 x	180 Ohm	R13 + R18
2 x	1K Ohm	R8-R9
1 x	22K Ohm	R14
2 x	10K Ohm	R15 + R17
1 x	47K Ohm	R16

8 x
330 Ohm

2 x
330 Ohm

2 x
180 Ohm

2 x
1K Ohm

22K Ohm   10K Ohm   47K Ohm   10K Ohm

D **Solder processor in place.** Pay attention to the polarity of the processor. It has a notch (cut-out), showing how it should be fitted. See red in the drawing! In this case the notch must face to the left! After soldering, trim excess leads.

After assembling the IC, look at the back to check if all feet were pushed through the lands!

Required parts

1 x ▬▬▬▬▬▬ IC1

TIP:

You can carefully bend the processor feet slightly inward. This will make it easier for the IC to fit into the holes!
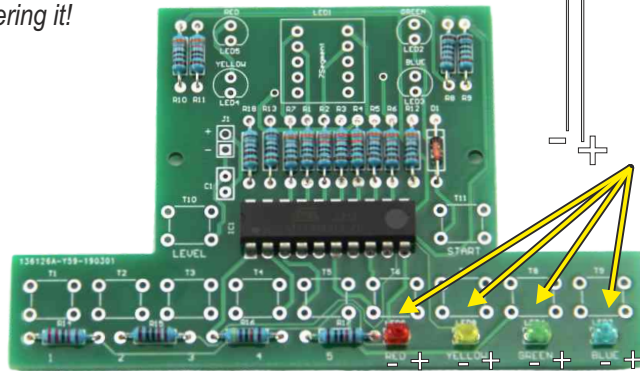
Notch (cut-out) here
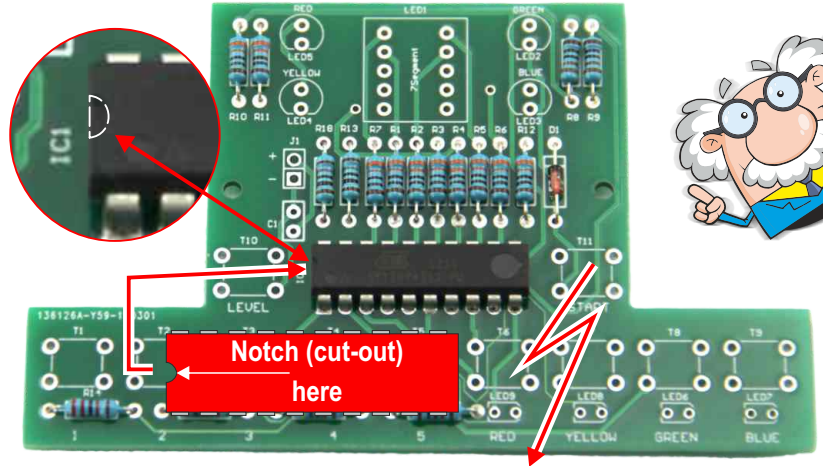
EXTREMELY IMPORTANT!

E **Solder 1.8 mm LEDs in place.** Pay attention to the polarity - polarity shown on the board! **The longer pin on the LED is always POSITIVE!**

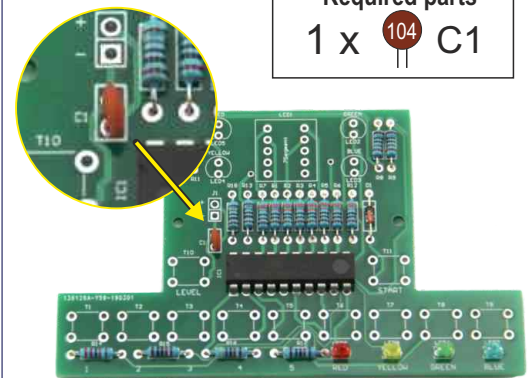*Ensure the part is positioned correctly on the board before soldering it!*

Required parts

1 x ● LED9

1 x ● LED8

1 x ● LED7

1 x ● LED6

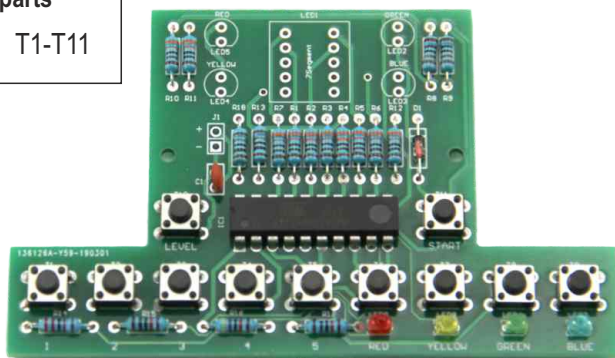**F** **Solder capacitor in place.** The polarity is not important. Trim excess leads.

Required parts

1 x (104) C1

G **Solder pushbuttons in place.** The polarity is not important. Trim excess leads.

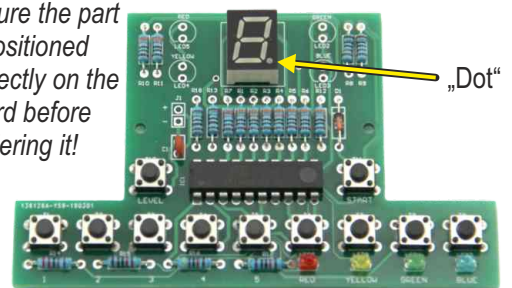*Ensure the part is positioned correctly on the board before soldering it!*

Required parts

11 x ▣ T1-T11

H **Solder 7 segment display in place.** Pay attention to the polarity. The "dot" must face in the direction of the pushbuttons. Trim excess leads and remove the protective film on the top.

Required parts

1 x ▤ 7-segment

Ensure the part is positioned correctly on the board before soldering it!

„Dot"

I **Solder 5 mm LEDs in place.** Pay attention to the polarity - polarity shown on the board! **The longer pin on the LED is always POSITIVE!** Trim excess leads.

Ensure the part is positioned correctly on the board before soldering it!

Required parts

1 x ● LED5

1 x ● LED4

1 x ● LED3

1 x ● LED2
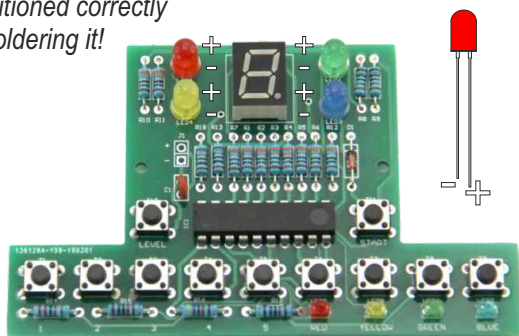
J **Solder USB cable in place**

Feed the cable through the hole from the backside of the board. Since the hole is very small, we recommend first inserting the white cable, then the red cable. Using tweezers makes this step a lot easier. Now make a knot approx. 3 cm from the end of the cable. This knot is a cable relief so the cable won't come off at the soldering point.

3 cm
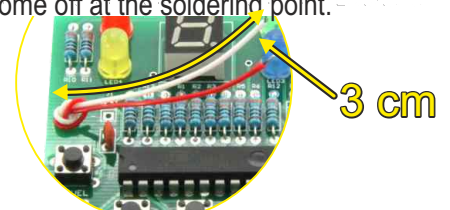
K Solder connecting cable in place.

Now feed the connecting cables through the landings at J1. Important: feed the red cable through "+" and the white cable through "-". Then solder in place at the back of the board. Trim excess leads.

Solder here!

L Attach self-adhesive feet
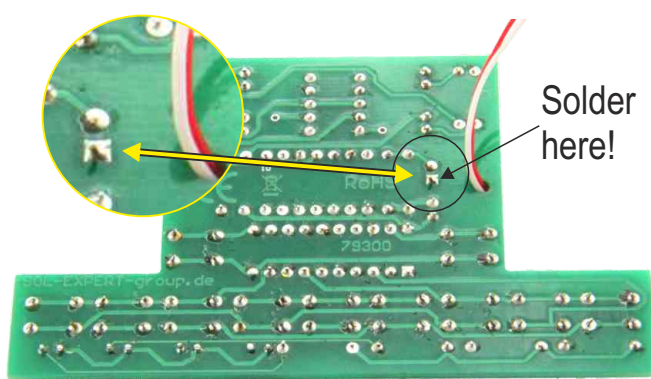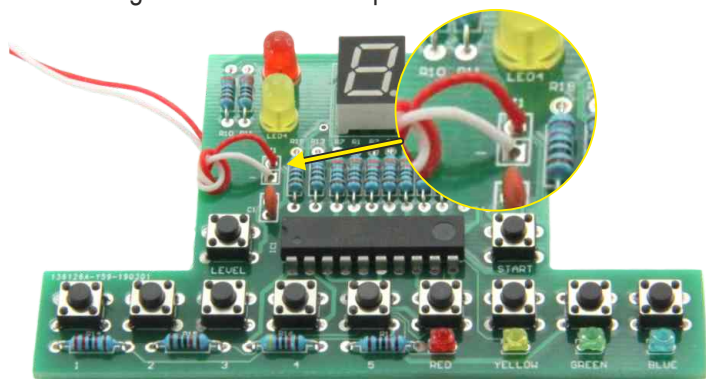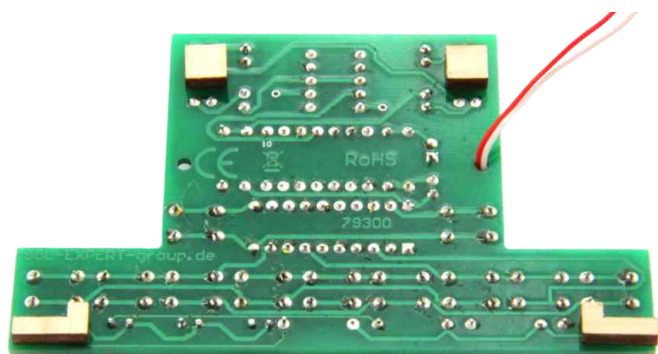
Attach the self-adhesive feet as shown. These prevent scratches in the table from the soldering points and the ends of the leads.

M VISUAL INSPECTION:

Now lean back and take a little mental break. Once you are relaxed, look over the assembly instructions from the beginning again, checking if you followed all steps correctly. Carefully check for short-circuits and verify the values of the resistors, etc. are correct.

Everything's good?

GREAT JOB!!

Now enjoy playing!

GAME INSTRUCTIONS

Connect the TrainYourBrain board to a power bank or your mobile phone charger. You may need to press the start button on the power bank to activate it. The small LED will now light up and stay on. These merely show which pushbutton is for which LED colour. The 5 mm LEDs will light up briefly and the 7 segment display will read "L" for "level", followed by the number 1. This number indicates the level. You can now select a level to play. The level will go up each time you press the "LEVEL" pushbutton. Choose from 7 different levels. The higher the level, the more difficult the game.

Once you have selected your level, press the "Start" button to start the game. The display will now read "H", showing the game will be starting. After that the actual "sign and/or colour combination" will appear. Once the sequence is complete, the display goes out and the 5 mm LED, and you can start entering the combination you memorised.
Enter it with the keys. Below the keys you will see which button is assigned to which number or colour.
If your entry is correct, the green LED lights up; if the entry is incorrect, the red LED lights up. Then the display will read "H" again and the next round starts. Once you have correctly entered all rounds of a level, the game of course advances to the next level.

To change the level whilst playing, wait for a sequence to appear, then press the "Start" button.
The display will read "L" and you can use the level button to make your selection.

Levels:

Level	Mode	Rounds	Outputs	Pause in ms
1	Numbers	10	6	600
2	LEDs	10	5	600
3	Numbers/LEDs	20	6	600
4	Numbers/LEDs	20	6	400
5	Numbers/LEDs	20	6	240
6	Numbers/LEDs	10	7	500
7	Numbers/LEDs	255	8	600

TROUBLESHOOTING:

No response:
- Check all processor soldering points for short-circuits
- USB cable soldered in place with the wrong polarity
- Power bank fully charged?

Specific LED doesn't light up:
- Check the soldering points of the LED
- Is the LED installed the correct way around?

Specific button doesn't respond:
- Check the soldering points of the button