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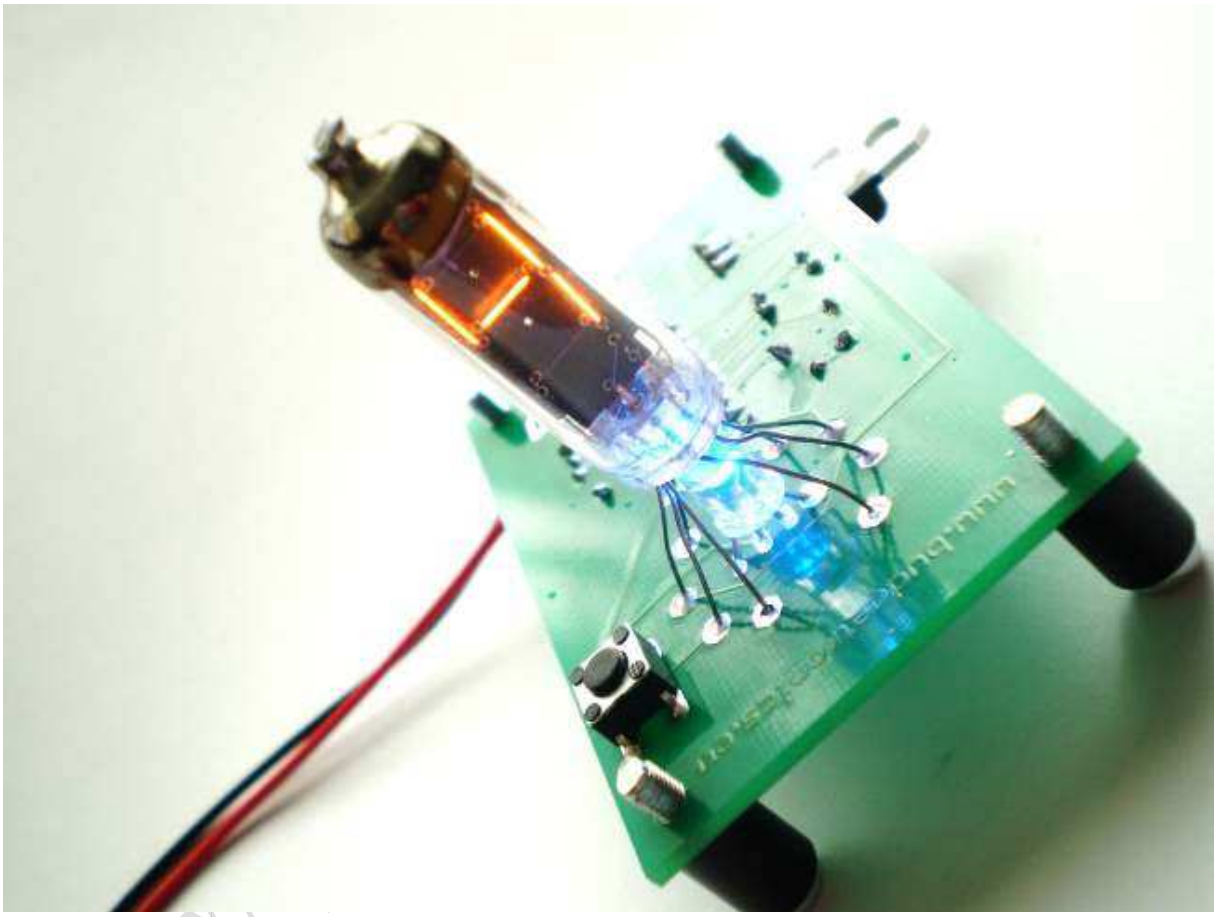
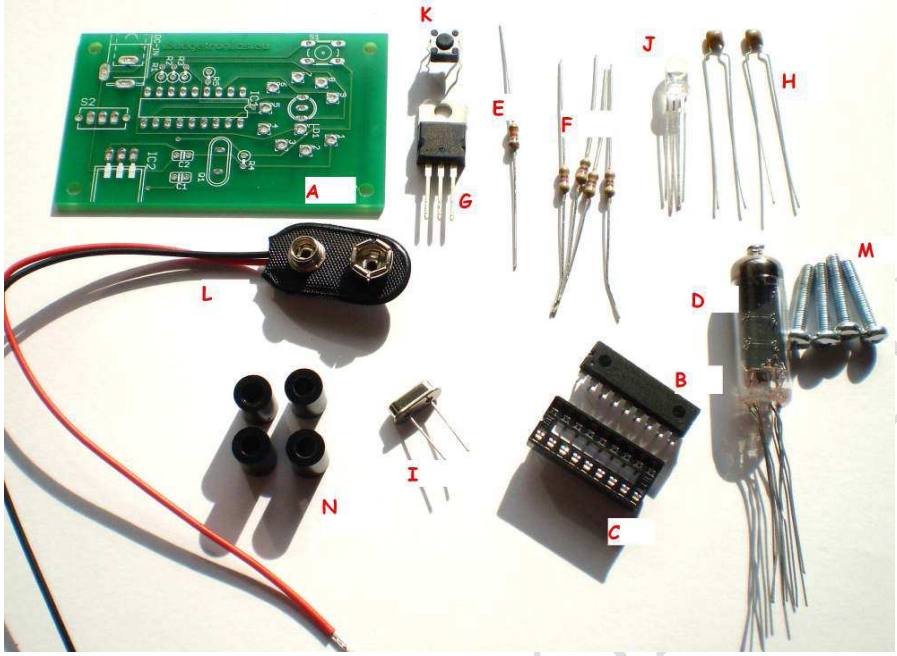
MAKE YOUR OWN ONE DIGIT NUMITRON CLOCK



Produced and designed by Budgetronics

STEP 1

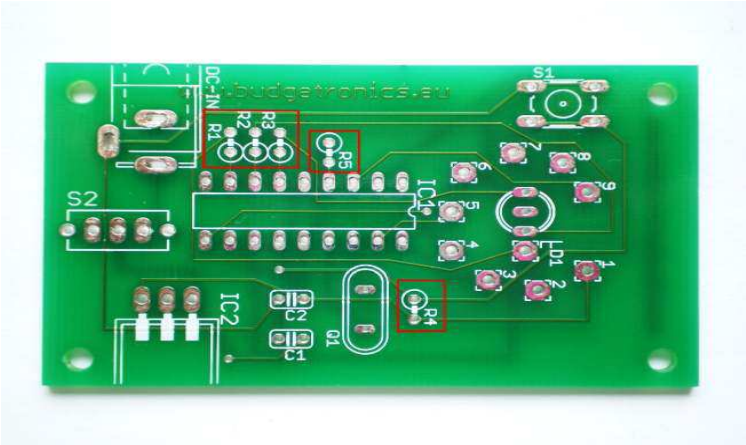
Check if you have received all the needed parts.



A) 1 x PCB
B) 1 x PIC16F84
C) 1 x IC socket for PIC
D) 1 x Numitron tube
E) 1 x resistor 1,5K ohm (color code brown green red)
F) 4 x resistors 470 ohm (color code yellow violet brown)
G) 1 x voltage regulator 7805
H) 2 x capacitors 100nf
I) 1x 4 mhz quartz
J) 1 x RGB LED
K) 1 x pushbutton
L) 1 x 9 volt battery clip
M) 4 x m3 screw
N) 4 x feet

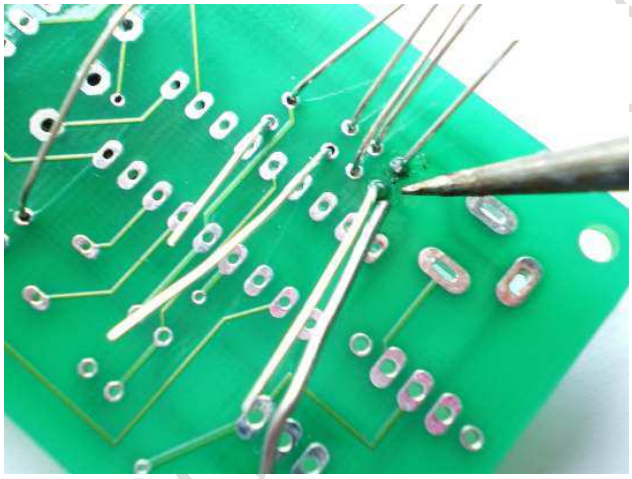
Step 2

Place all 5 resistors at the right spot. R1, R2,R3 and R4 are all 470 ohm. R5 is 1,5K. See the red lined areas in picture below.

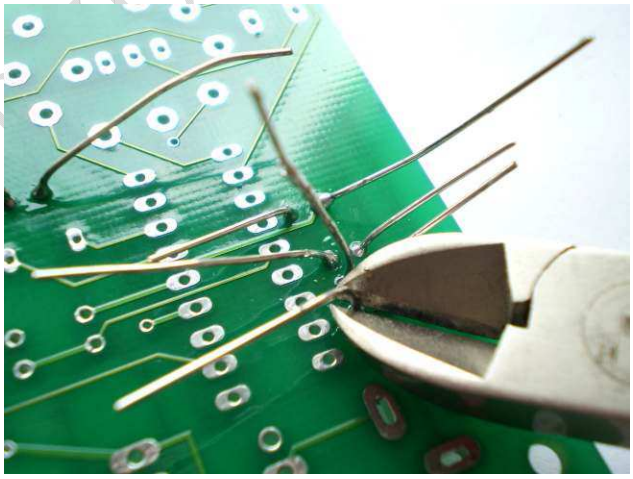


Bend the resistor leads like this:

Solder them in place:



Cut the remaining wires:



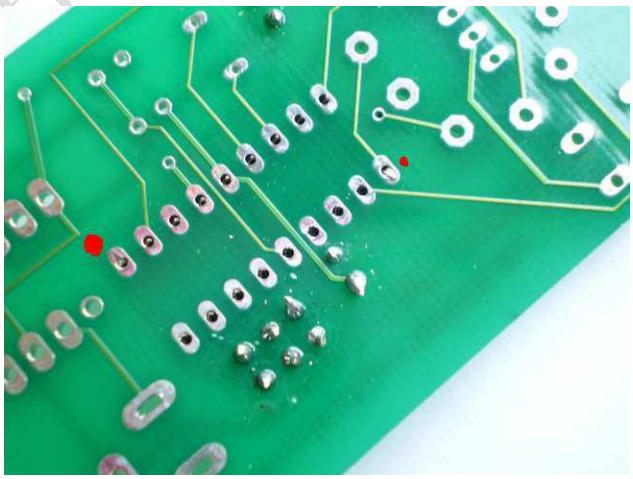
<u>Keep one cut wire, you will need it in step 8.</u>

Step 3

Place the empty IC socket and watch out that you place it correctly. Look at the red circle:

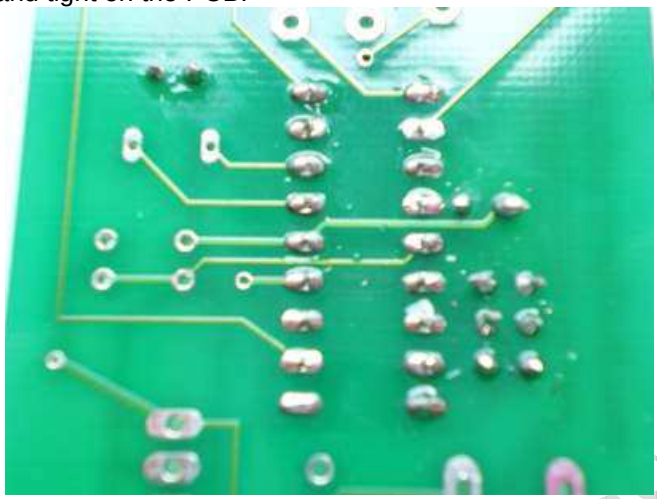
And place the socket on the PCB like this:

The red arrow indicates the side as shown in the picture above this one.



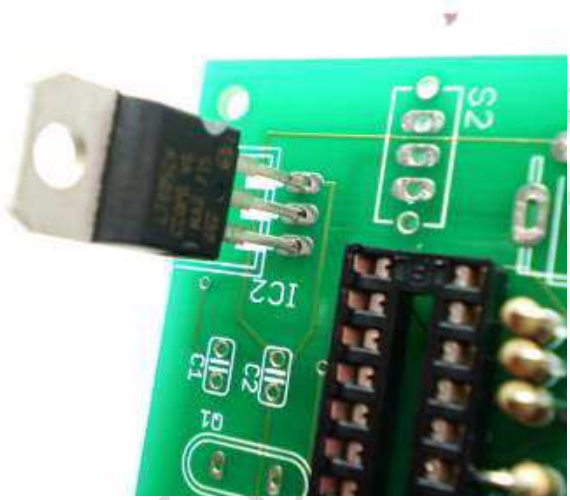
Bend two feet as seen on the picture at the red dots to keep the socket in place while soldering.

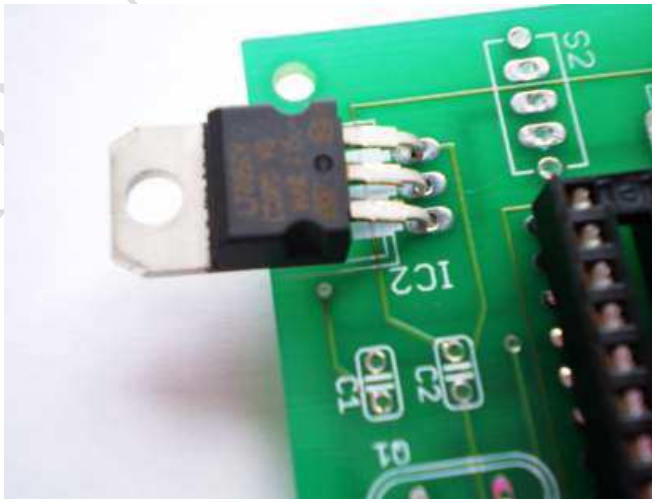
Solder the socket nice and tight on the PCB:



Step 4

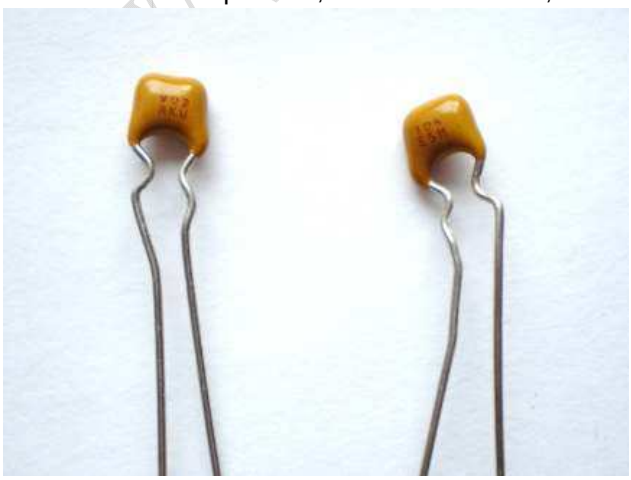
Place the power supply section:

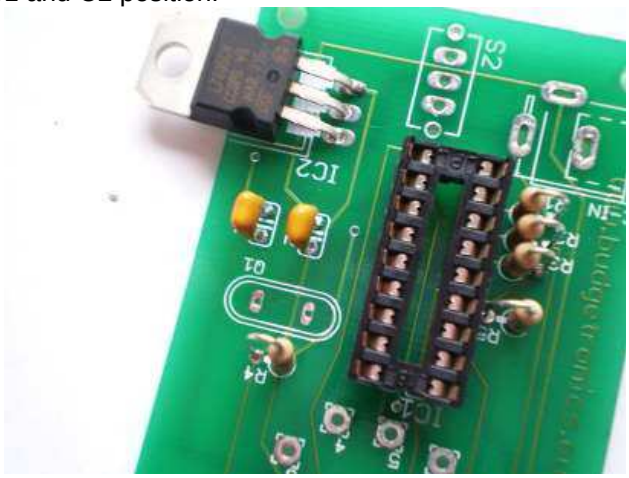




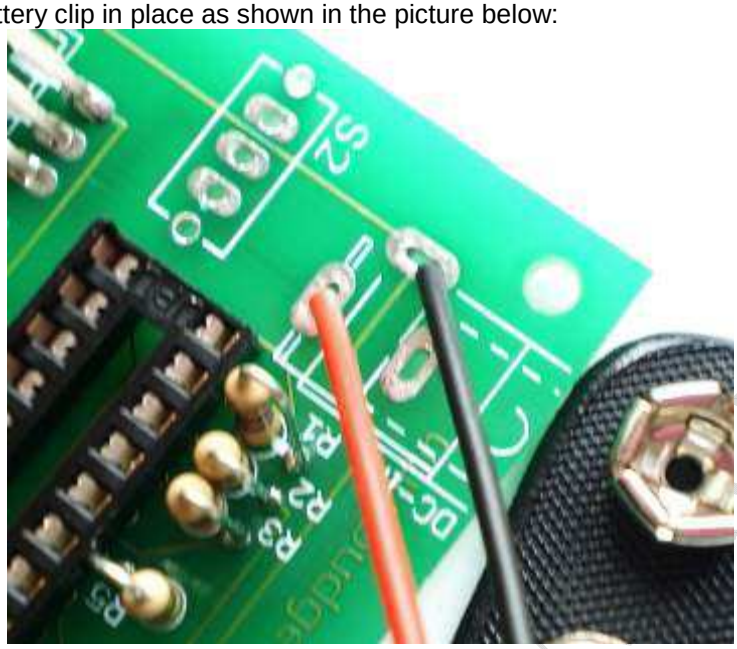
After placing the 7805 regulator bend it with care in a position as can be seen in, the above right, picture.

Place the two capacitors, as seen below left, at the C1 and C2 position.



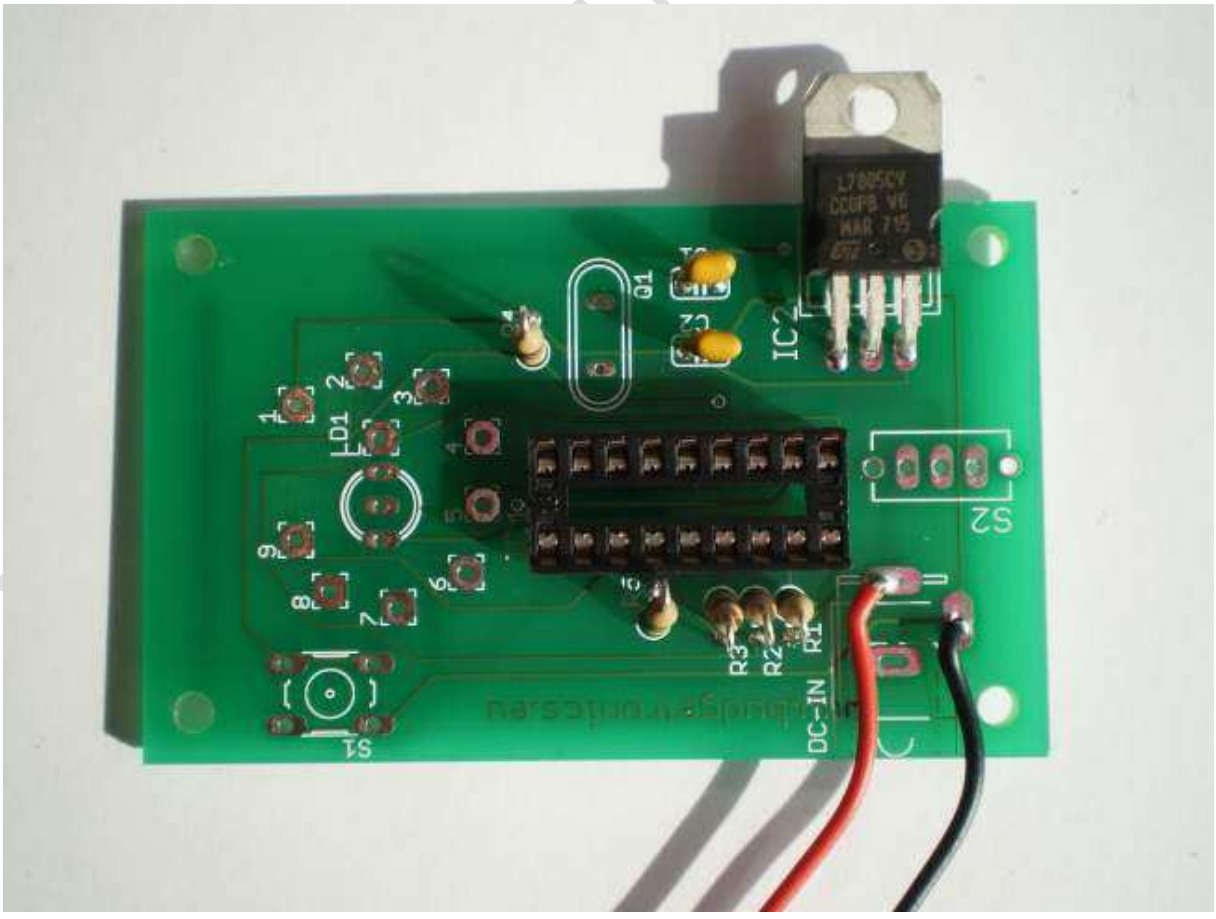


Solder the 9 volt battery clip in place as shown in the picture below:



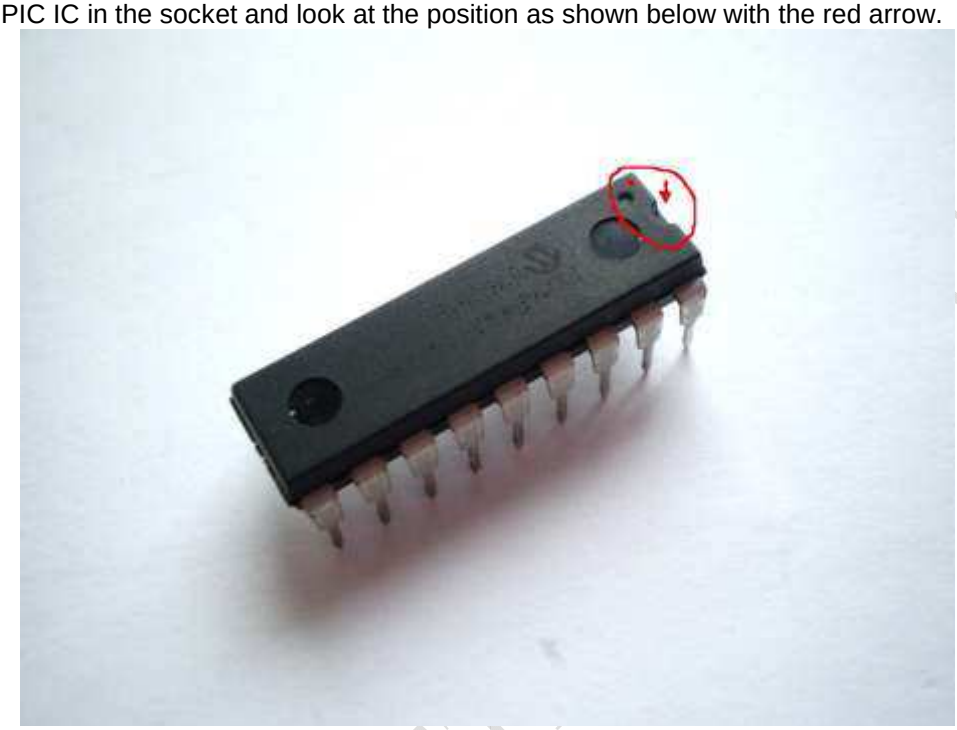
Don’t switch the black and red wires! Solder the right color wire to the PCB exactly as shown in the picture! Otherwise your Numitron Clock will not work or gets defect!

Your PCB should look like this now:

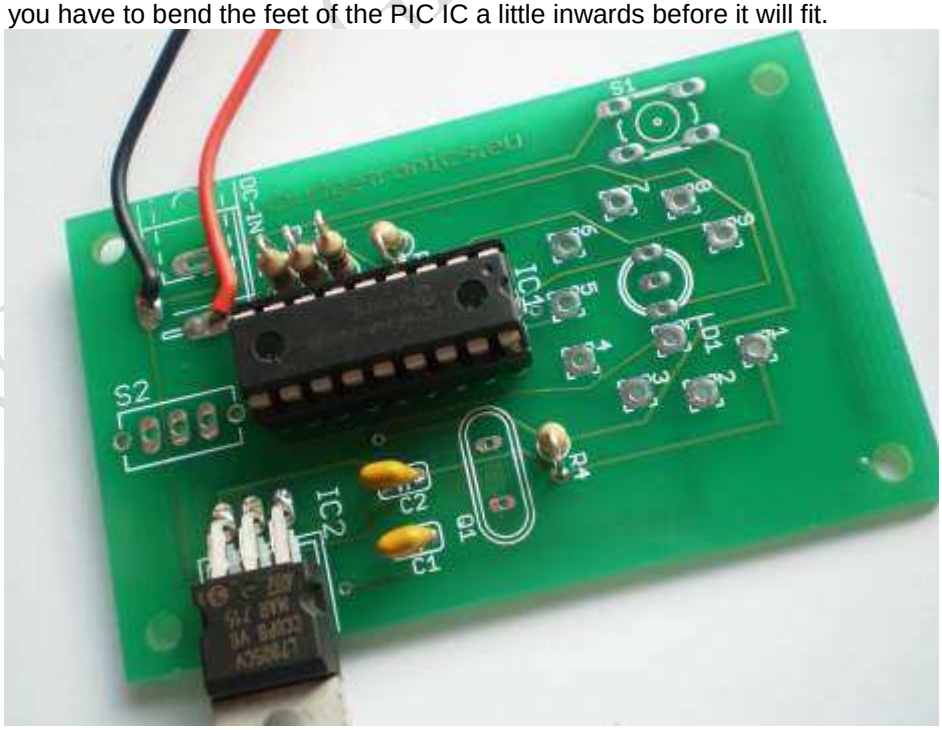


Step 5

Place the PIC IC in the socket and look at the position as shown below with the red arrow.

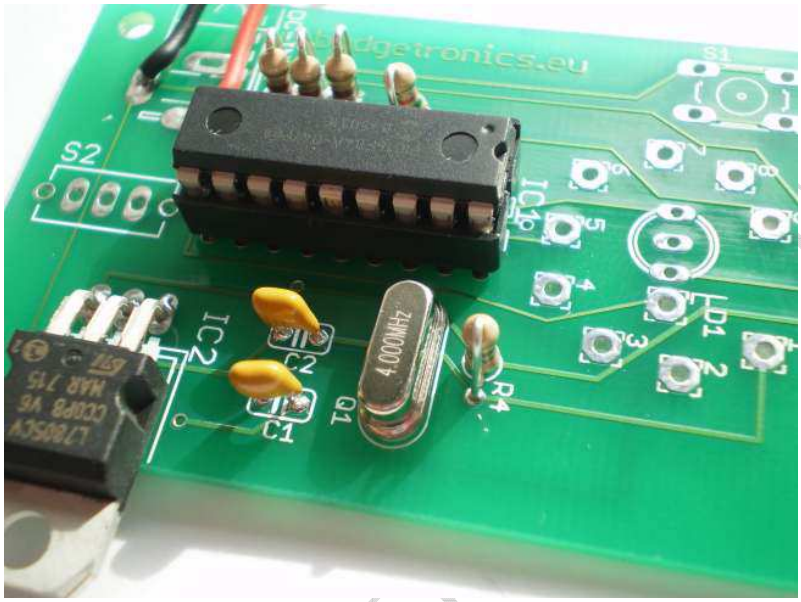


Keep the side indicated, in the picture above, by the red arrow to the right and place the PIC IC gently in its socket by pushing lightly while watching carefully if all feet go in the right place without bending. Sometimes you have to bend the feet of the PIC IC a little inwards before it will fit.



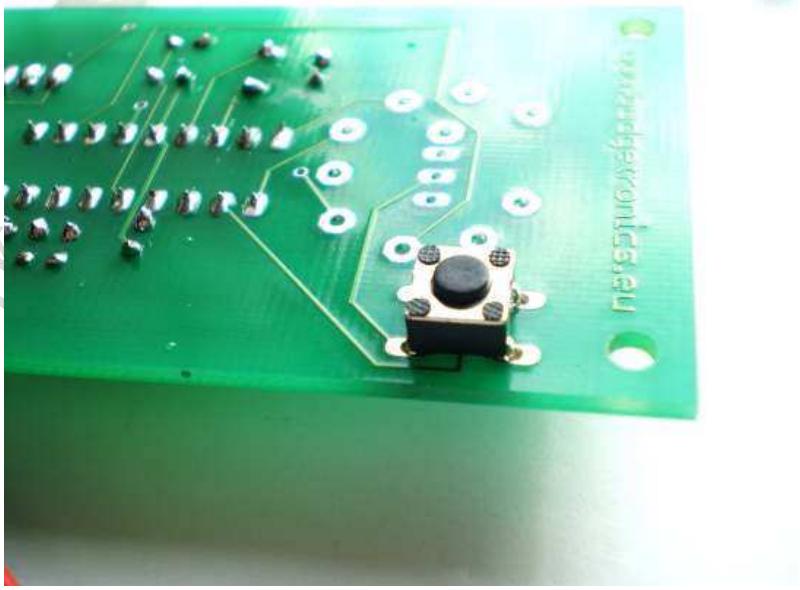
Step 6

Placing the crystal at its position as seen on the picture below and solder it. Don't forget to cut of the long leads at the other side.

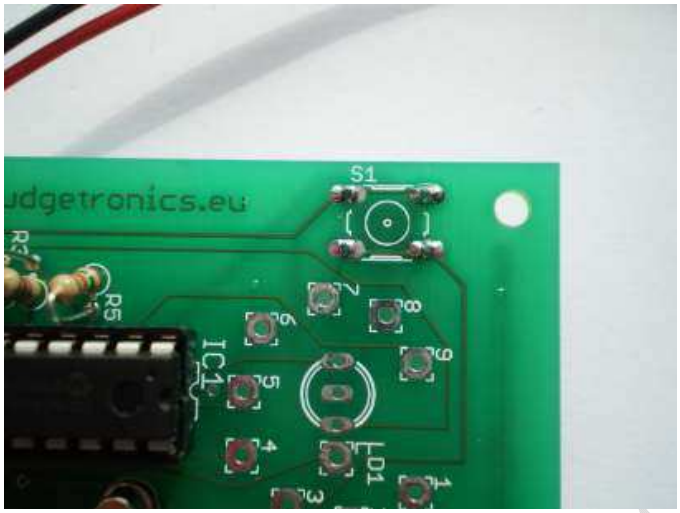


Step 7

Place the pushbutton **AT THE BACK OF THE PCB!!!: Look at the picture carefully!**

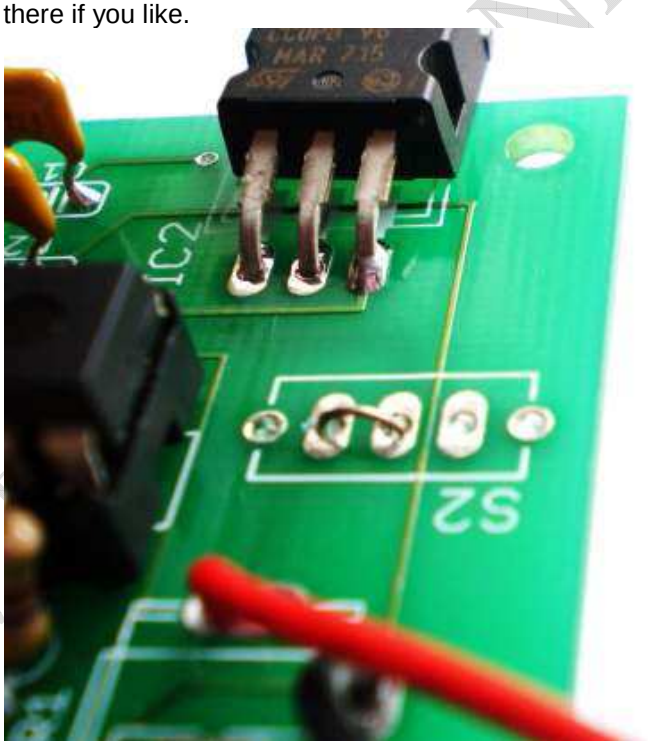


And solder it in place at the side with the PIC IC so the button is on the backside:



Step 8

At step you kept a cut wire. Use this now to solder it at S2 as seen in the picture below. In the future you can place a switch there if you like.

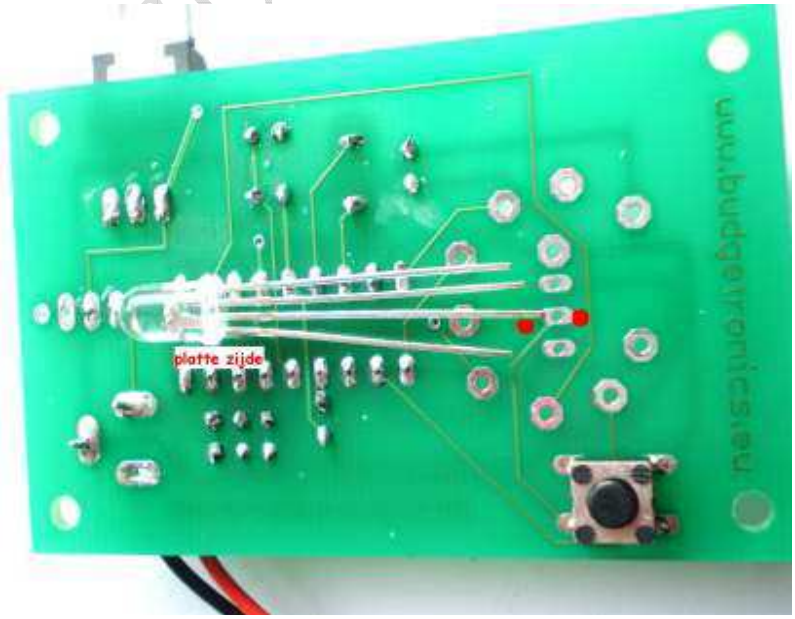


STEP 9

Placing the RGB LED in the right way.

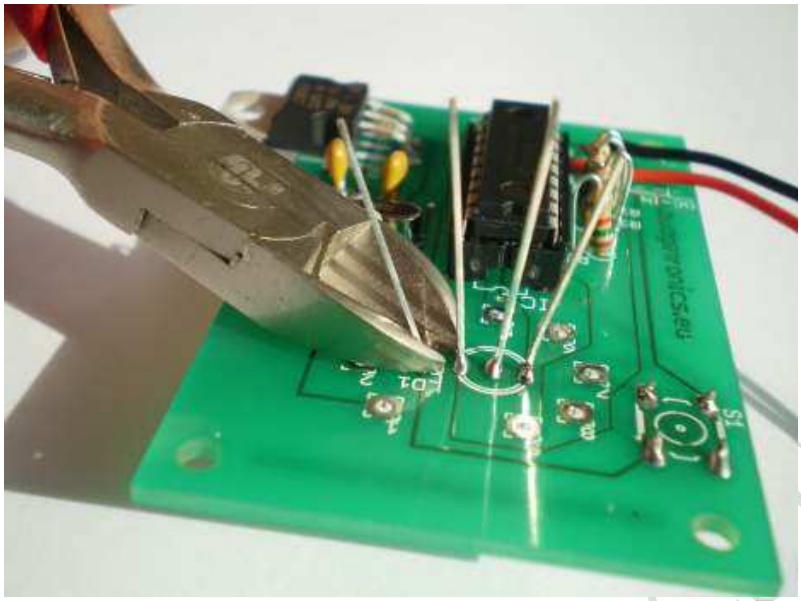
Look at the longest lead as indicated with the red arrow. The arrow at the LED housing indicates the flat side of the LED.

Place the LED **at the BACK of the PCB** just like you did with the pushbutton. Watch the picture carefully before you solder the LED. Be sure you connect it in the right way otherwise it will NOT work.



The longest wire is indicated by the two red dots. “platte zijde” means the flat side of the LED.

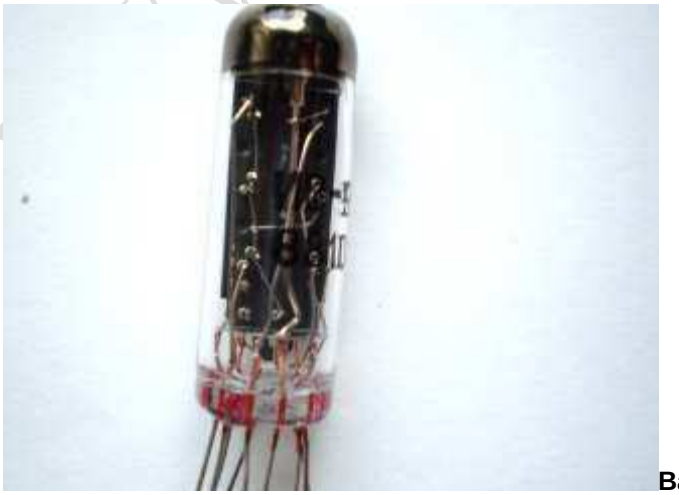
Solder the LED in place and cut of the wires.



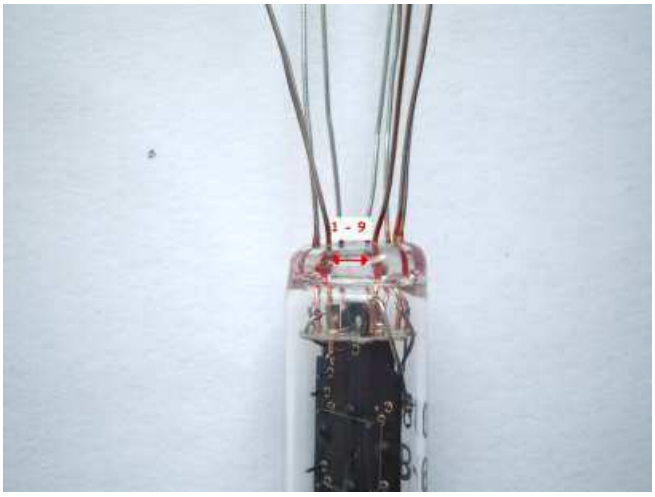
Step 10

Connecting of the Numitron tube is also done at the back of the PCB. The Tube will sit on top of the RGB LED to make nice light effects possible. First look carefully at the tube:

Front of tube

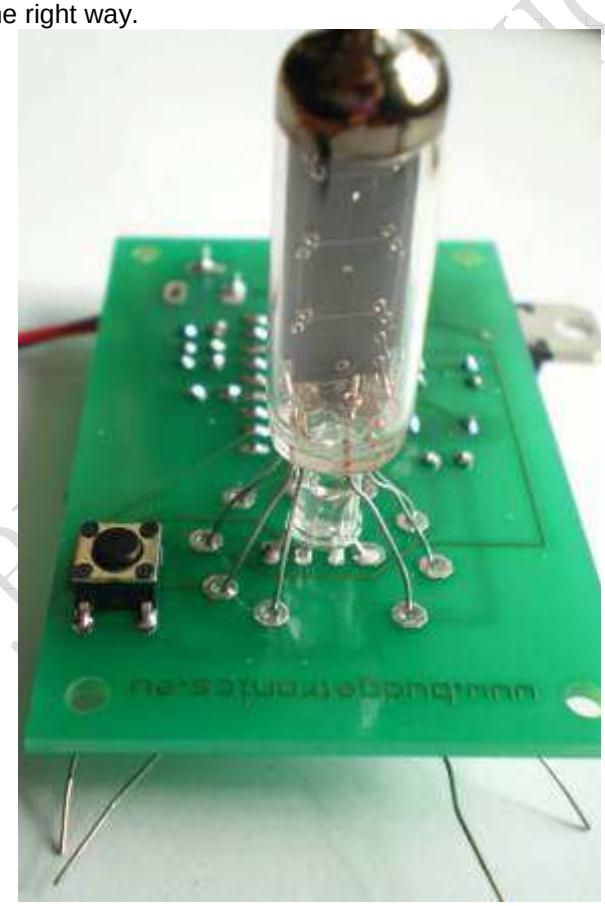


Back of tube

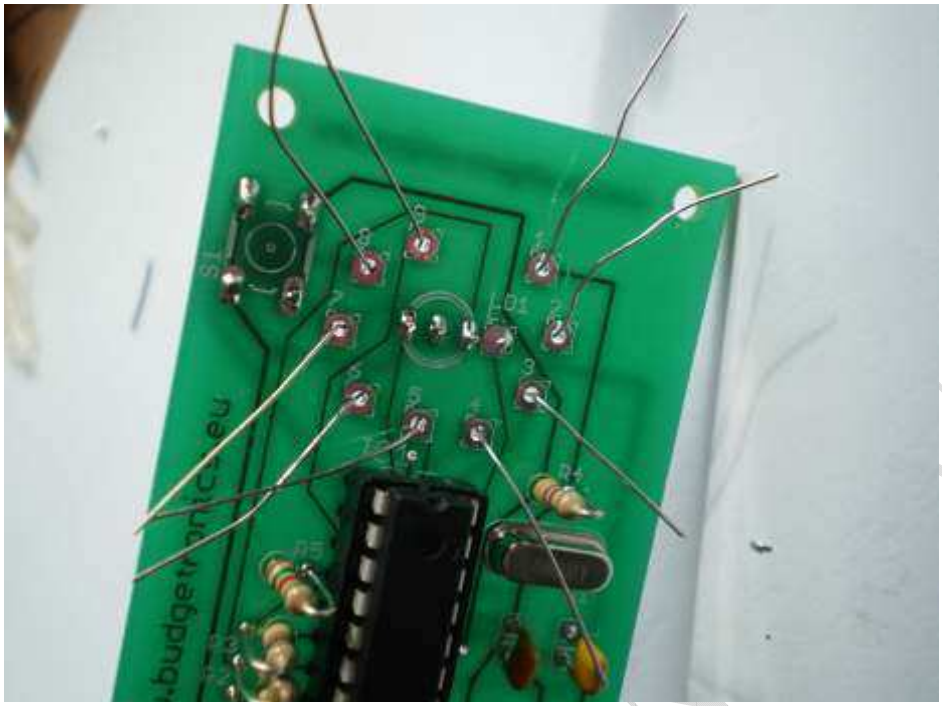


Find the little gap between the wires and see that the left wire is pin 1 and the right wire pin 9.

Place the tube over the LED on the PCB and see that pin 1 goes to hole 1 and pin 9 in hole 9 and so on. Take care that the tubes wires are tight and not touching each other. It takes a bit of fiddling to position all the wires in the right way.

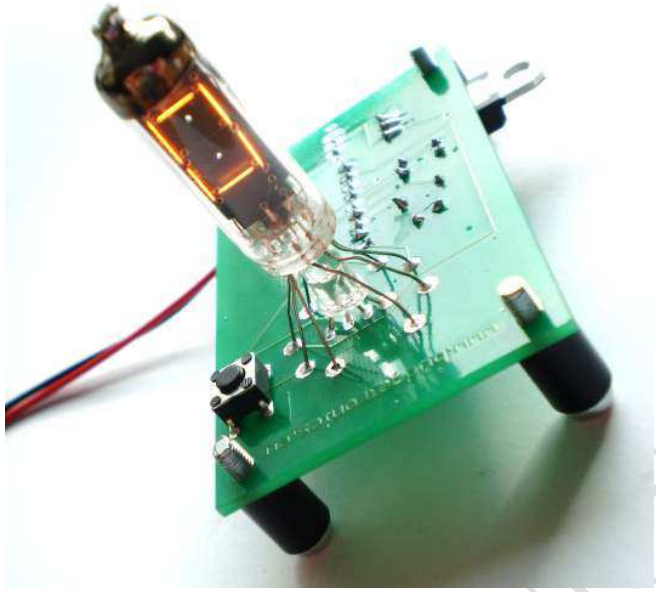


If it looks like this, you can solder the tube in place and cut the wires.



To finish this project place the 4 small feet:

Your Numitron clock must look like this now:



Connect a 9 volts battery and see if the kit starts up with a sequence and showing the number 1, 2, 0 and 0 in succession (time 12:00)The LED will light up with 3 numbers. Number 2, 0 and 0. It will stay out at the first digit. Is this not the case? Disconnect the battery immediately and go back and look at all the steps carefully and find out where you made a mistake.

Does it work? Congratulations your numitron clock is working. To set the time press the pushbutton when a number is shown which you want to set. Press it until the right number is set. After this wait for the sequence to start again and press the button again when a number is shown you want to change.

The LED colour tells you what position is shown:

Led off = first digit hours
Led blue = second digit hours
Led green = first digit minutes
Led red = second digit minutes

After the sequence the seconds there is a few seconds delay before it all starts again.

Have fun with this unique timepiece!