Colour also can display the time
Build a LED colour clock

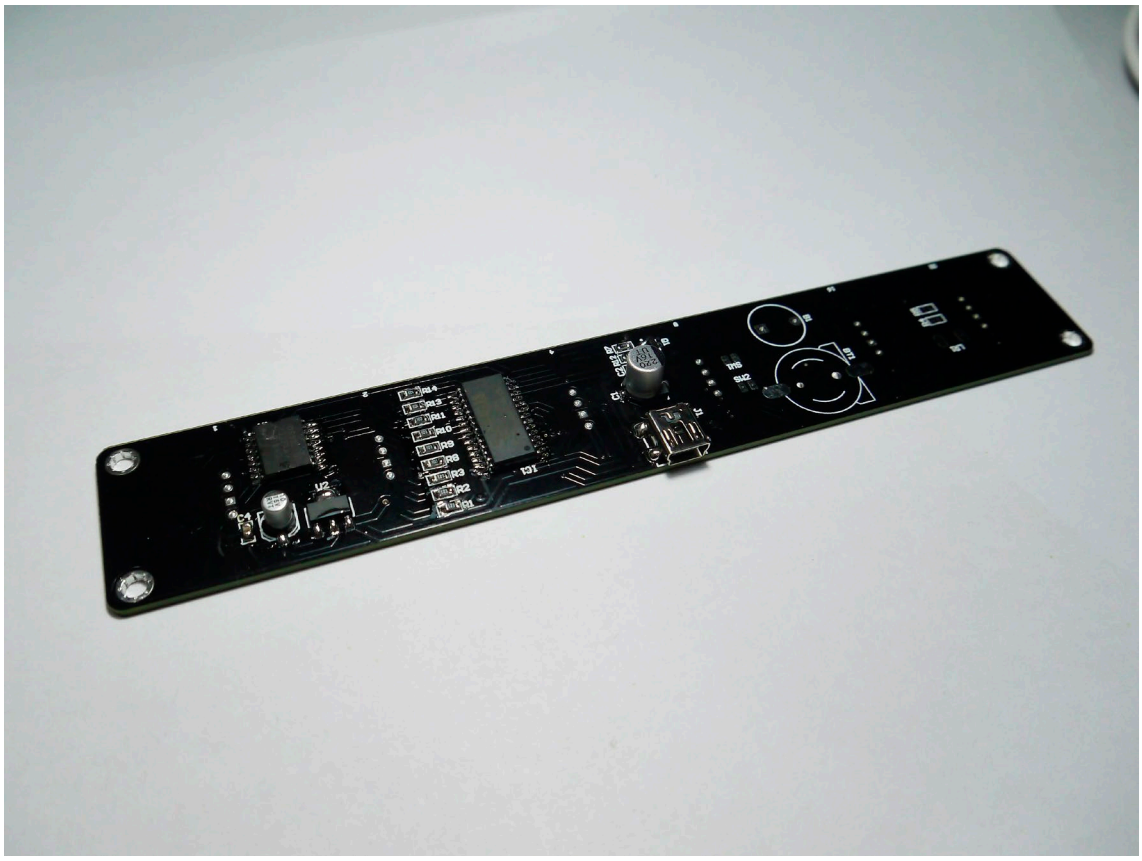
Not all clocks use digits to display the time. This neat little clock tells you the time by using different colours for each digit. The colours are based on the resistor colour code, so for most electronics DIYers it should be quite easy to read.

The colour clock is a relatively easy project, although it does include some surface mount components, so you will need a fine tipped, temperature controlled soldering iron and good eyes (or a good magnifier lamp).

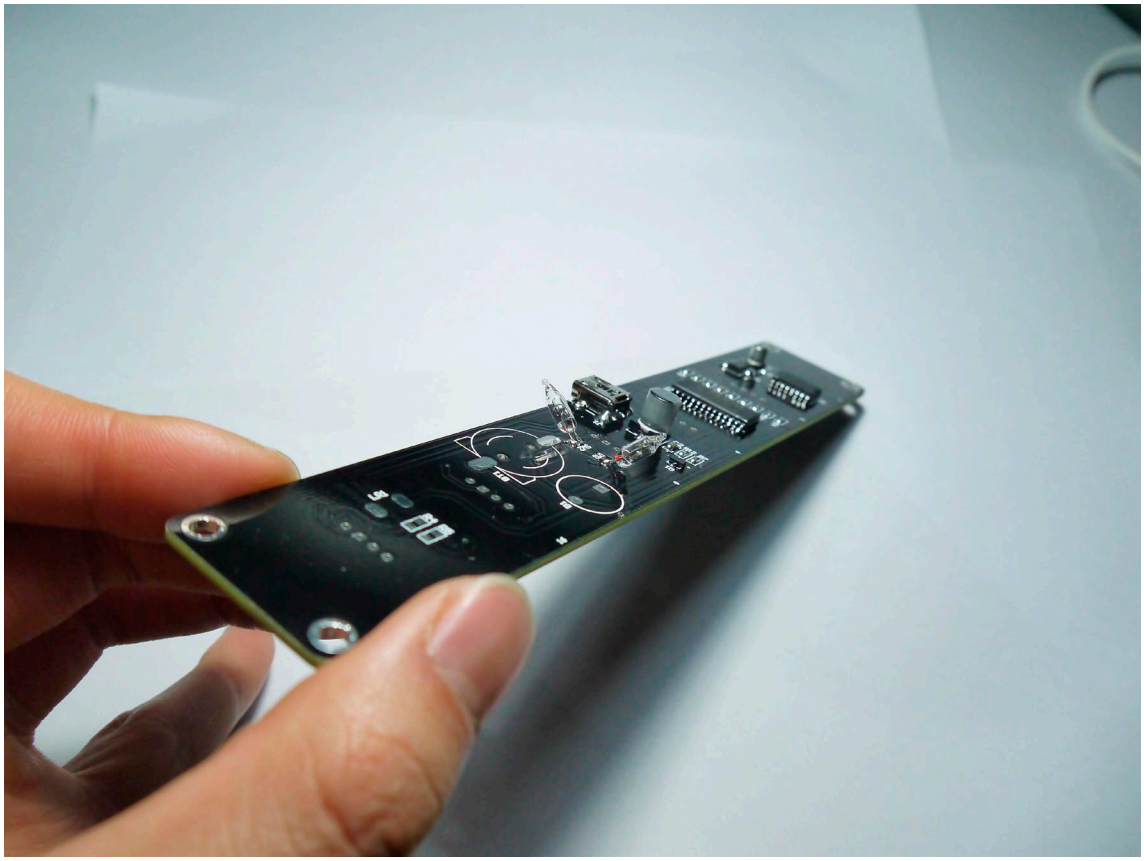
Please read these instructions carefully before you start assembly! Note that the LED package square pad corresponds to the longest lead on the RGB LEDs.

Components list

R1-R3, R12:	120 ohm (121)
R4-R5:	1M (105)
R7:	1k
R8-R11, R13-R14:	10k
C1:	220uf
C2:	104 chip capacitor
C3:	10uf
C4:	104 chip capacitor
L1, L2:	SMD LED
LR1:	photoresistor
Q1:	9012

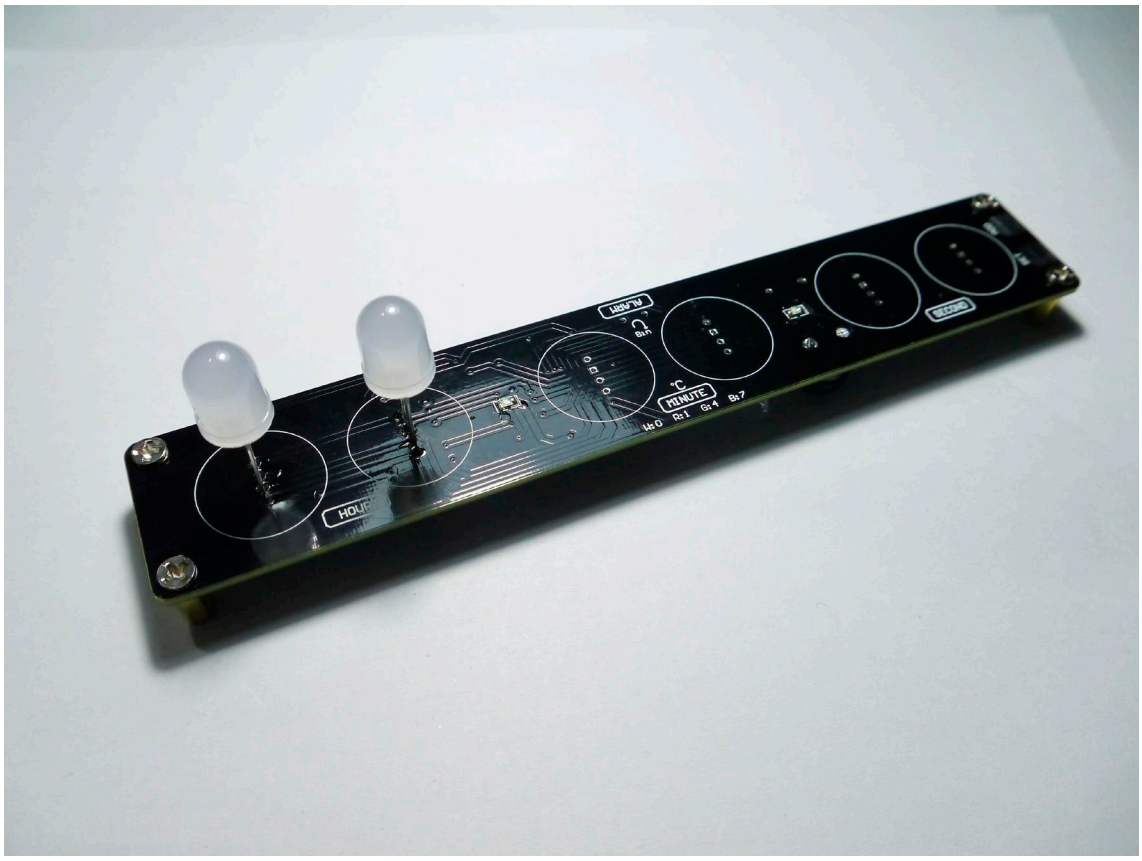


Starting from the USB socket, solder the components in place, paying attention to orientation of the polarised components (the resistors can go in either way around).



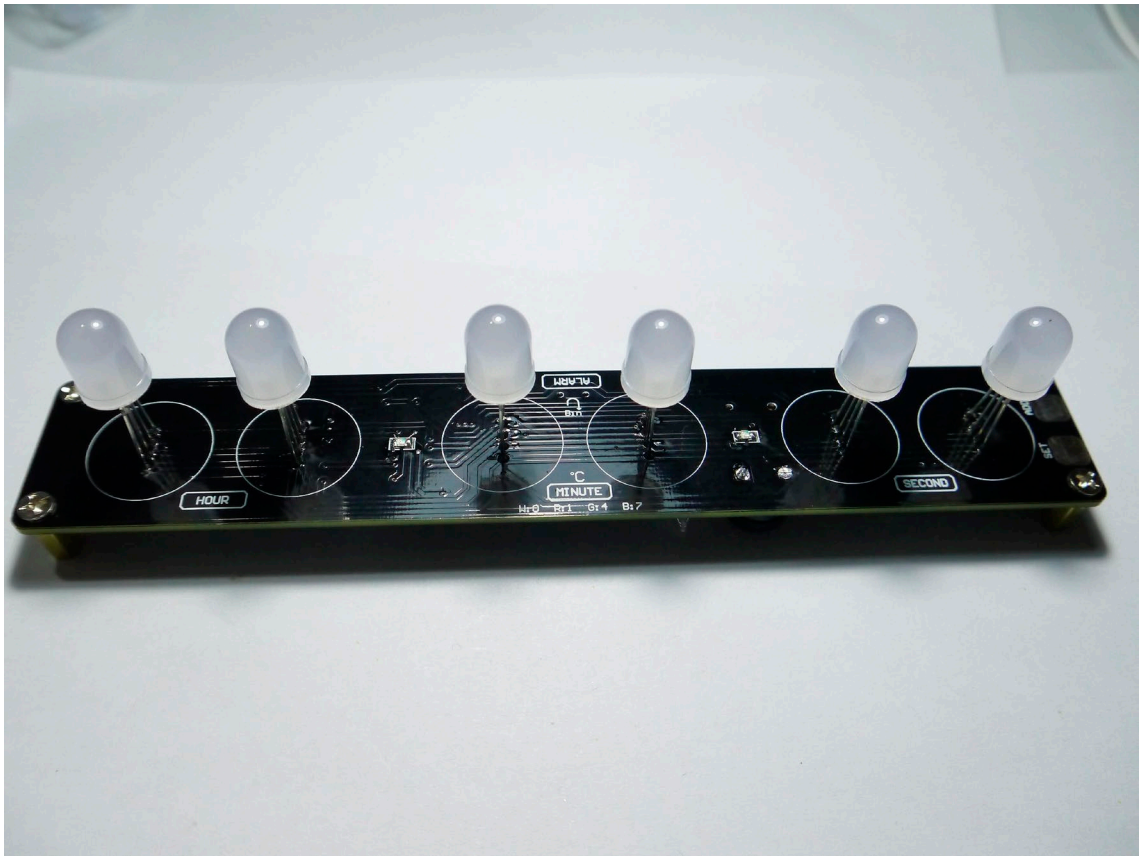
As shown above, the two mercury switches tilt outward at an angle of 45°. Be sure the two mercury switches are tilted outward or direction sensing function of the clock will not work. Next solder in the rest of the components on the bottom side of the PCB.

After this is done, plug in power via the USB cable and press the two touch buttons to test whether the device is functioning. If you hear the beeper buzz when you press the button, the clock is working normally.



Now fit the four PCB stand-offs as per the photo above. This lets you work on the clock without squashing the mercury switches down towards the PCB. Fit the SMD LEDs - the end with a green dot is negative.

Now fit the first RGB LED, dropping it in until the longest lead just touches the desktop, and, making sure it is in the right way around (longest lead goes in the hole with the square pad), solder the positive pin in place. Then solder the rest of the pins, making sure it is vertical and at right angles with the PCB in both directions.

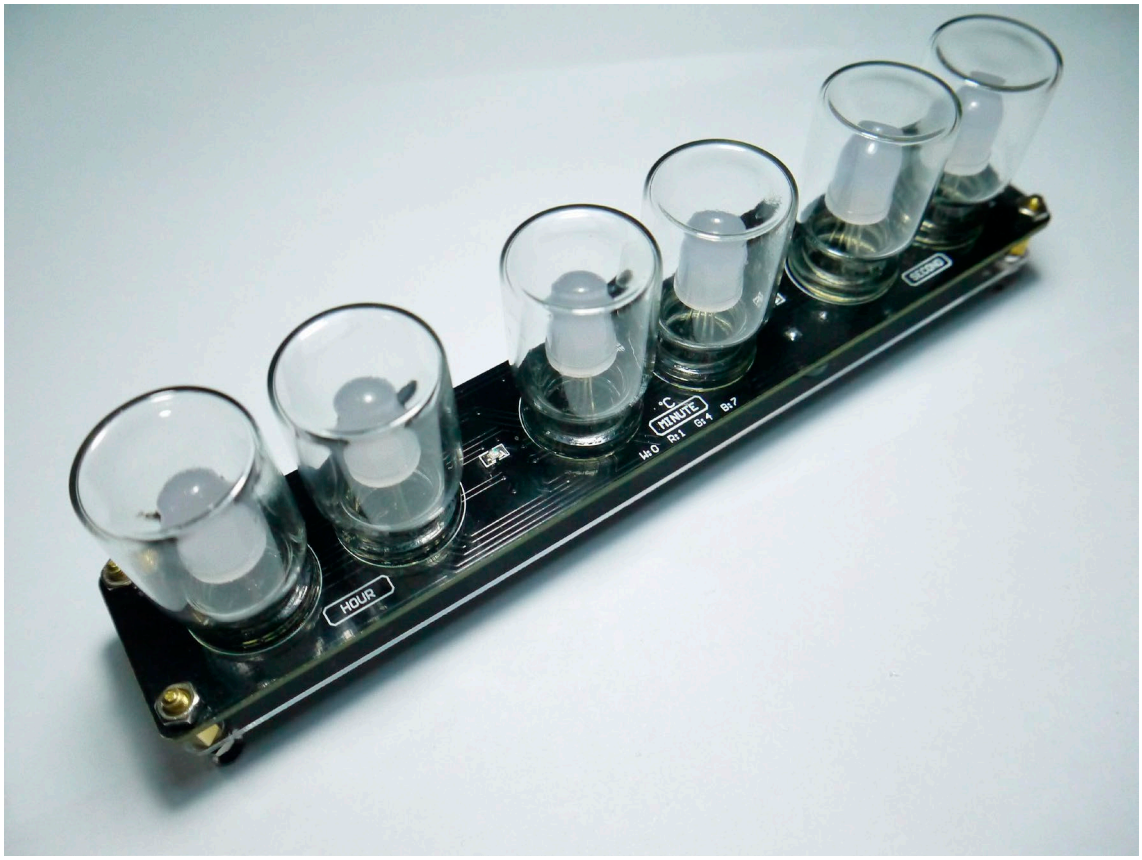


The rest of the LEDs can be fitted in the same way. They should all come out the same height if you use the desktop to align them.

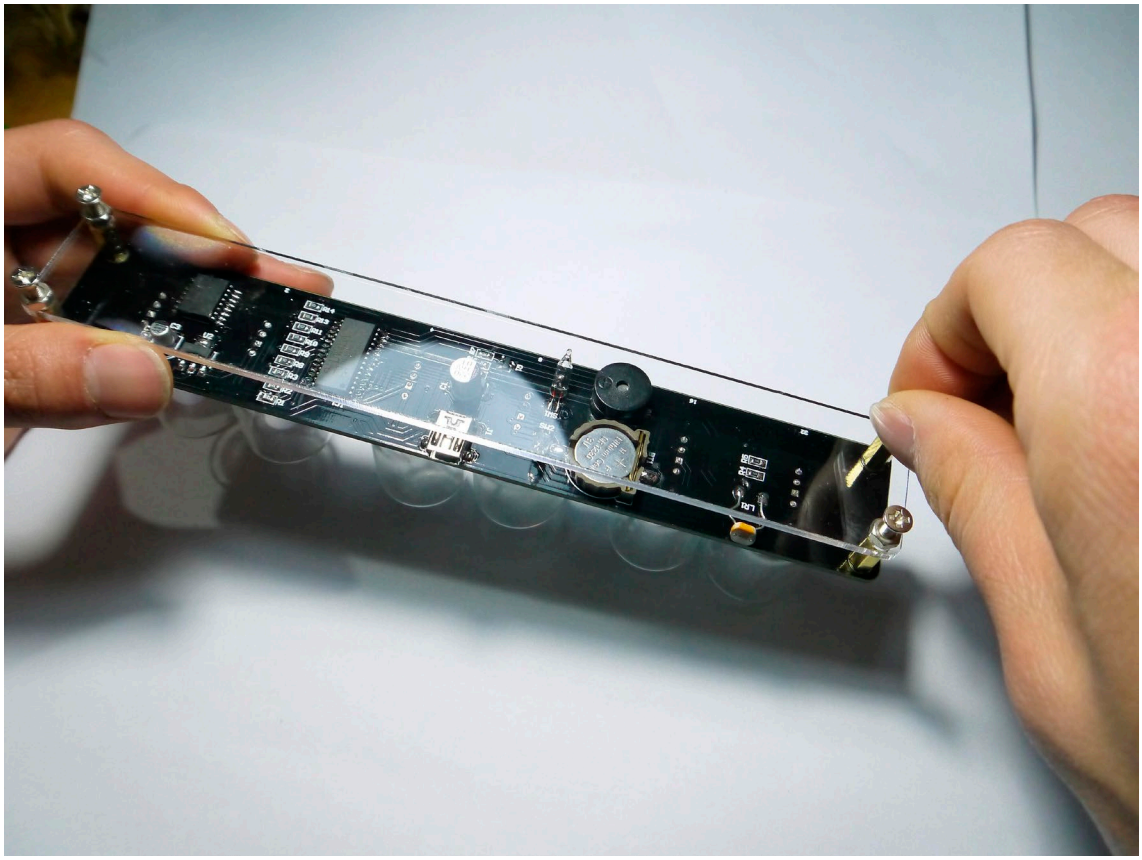
Once done you should be able to test the clock. Check the buzzer, LEDs and touch buttons. If all is well you can proceed to the next step.

In order to protect the RGB LEDs from damage and to give the clock a more interesting look, six small vials or bottle are included in the kit. One vial is fitted over each LED and glued in place, but make sure everything is working correctly before you do this.

You can use hot melt glue or another strong glue such as epoxy or 2-part acrylic, but don’t use superglue as it will cloud the vials.

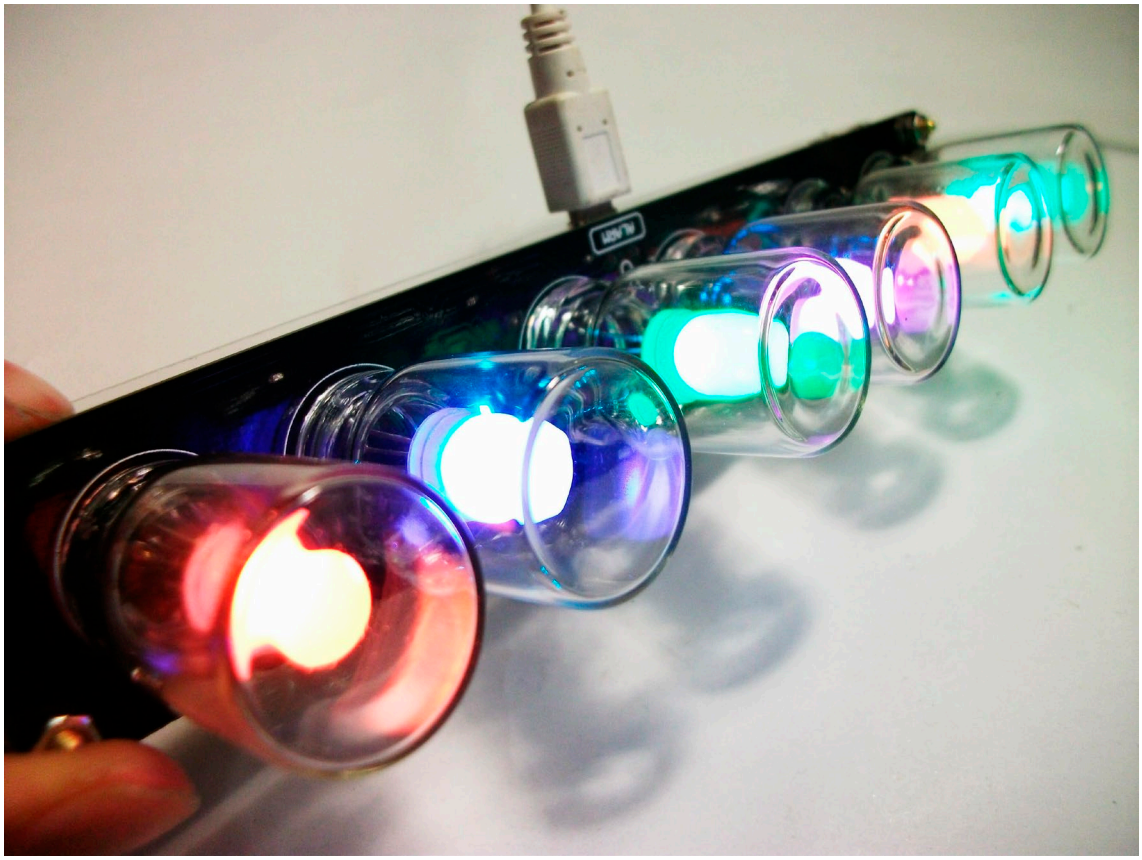


Make sure all vials are aligned nicely, you don’t want a wonky clock!



To finish the clock, turn it over and insert the backup battery, then fit the bottom acrylic cover and fix in place with the 4 long screws. Screw each screw into place several turns and then tighten the nut down onto the acrylic. This holds the cover in place and provides 4 adjustable feet for the clock. Make sure to remove the protective film from the acrylic.

No power up the clock via the USB cable and you should see the colours start to change. When setting the alarm, the two middle blue LEDs will light up to show the alarm is on.



Tilt the clock forward as shown to set the time using the touch buttons. To set the alarm simply tilt the clock backwards and set it in the same way.

Night effect.