

## KED00201 Electronic Dice Kit



A easy to assemble electronic dice kit features: 2 die display with your choice of LED color, through-hole components, operates on 3 "AA" batteries, has auto power down to extend battery life, has a reset switch in case it misbehaves.

### **What's Included in the kit:**

- |  |                        |
|--|------------------------|
| 1 - Quality PC Board                         | 1 - Roller Ball Switch |
| 1 - Preprogrammed Atmel Controller IC        | 1 - Reset Switch       |
| 1 - 20 Pin IC Socket                         | 14 - LED's             |
| 6 - 1K ¼ Watt Resistors (brown, black, red)  | 1 - Battery Holder     |
| 2 - 1M ¼ Watt Resistor (brown, black, green) | 1 - Project Box        |

### **What you will need:**

1. Good quality soldering iron 25 – 40 watt
2. Solder tip cleaning sponge
3. Rosin core or no clean solder
4. Diagonal wire cutter
5. 3 “AA” batteries
6. Optional double sided tape, velcro or glue.

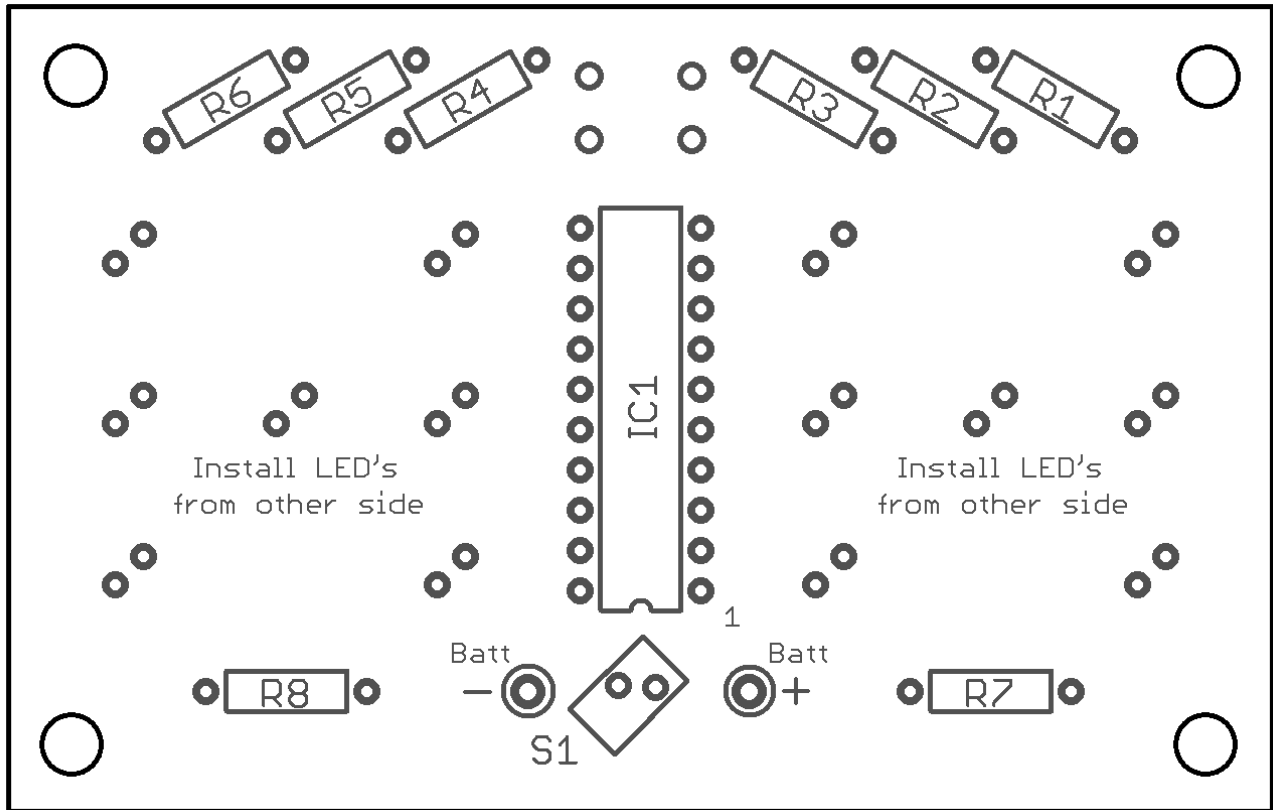
### **Basic instructions:**

**NOTE:** in this kit the parts are mounted on both sides of board, insert parts from the side that shows the part outline.

Parts should be fully inserted, most parts will touch PC board.  
If parts are polarity sensitive, double check your installation.  
On some parts you can bend the leads after inserting to help hold them in place.

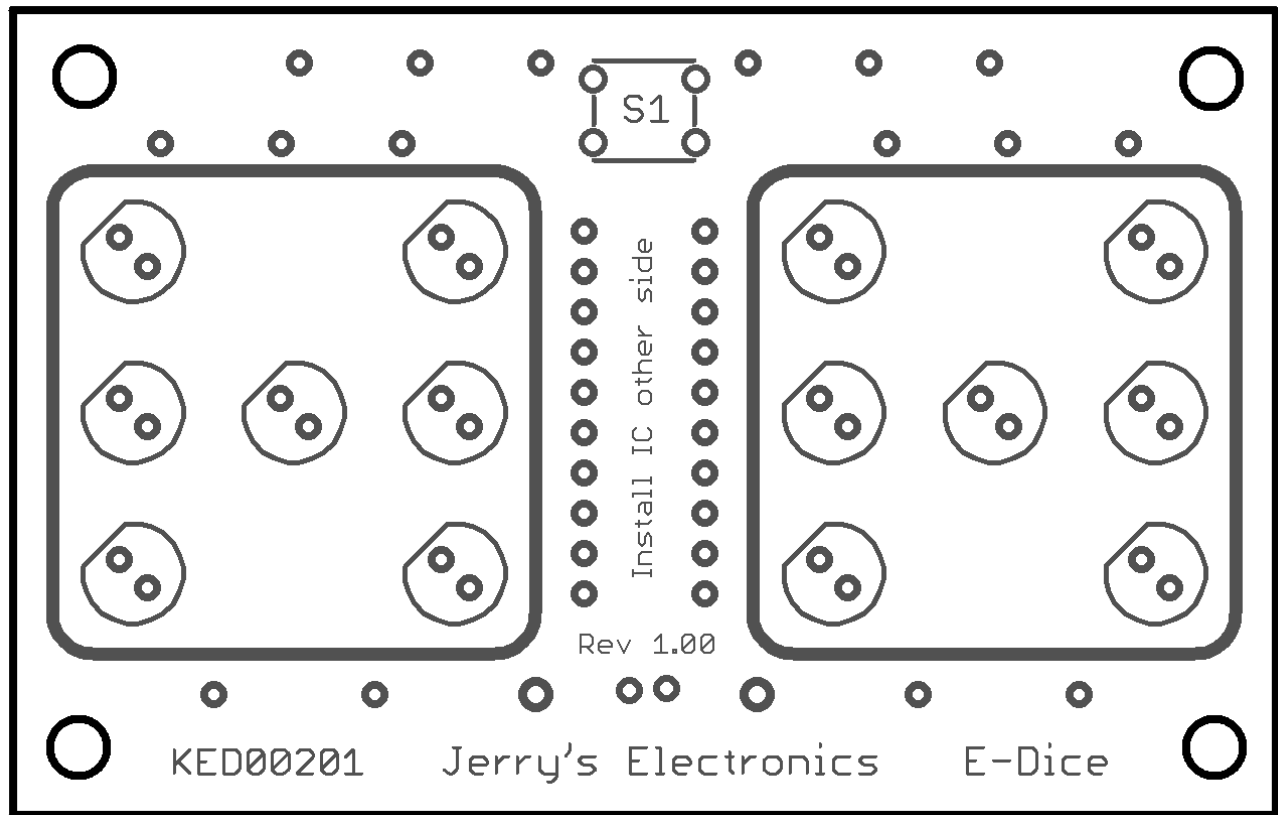
**Note:** the LED's are installed fully seated and resting against the pc board, use caution when soldering the LED's – they can melt quite easily, you must solder them quickly – under 2 seconds should be ok.

While soldering apply a small amount of solder to the solder tip to help with heat transfer. Touch the soldering tip to both the component lead and PC board. To improve your solder connection apply solder to part/PC board instead of solder tip. The solder should flow around the component lead and on the PC board. Avoid adding too much solder or too much heat. Your solder connection should be shiny and smooth, not balled or grainy looking. If your solder connection is grainy looking try adding some flux and reheat the joint. Cold solder connections are the most common beginner mistakes. Cold solder joints happen when the part lead and/or the PC board are not heated well. After soldering trim the component leads close to the solder joint.



**To ease assembly install parts in the following order:**

1. R1,2,3,4,5,6 – 1K ohm Resistor (brown, black, red)
2. R7,8 – 1M ohm Resistor (brown, black, green)
3. 20 Pin IC Socket in IC1 location (observe orientation)
4. S1 – Roller Ball Switch  
 \*note – the outline for the switch is incorrect on the board,  
 just install it so it clears IC1



**To ease assembly install parts in the following order:**

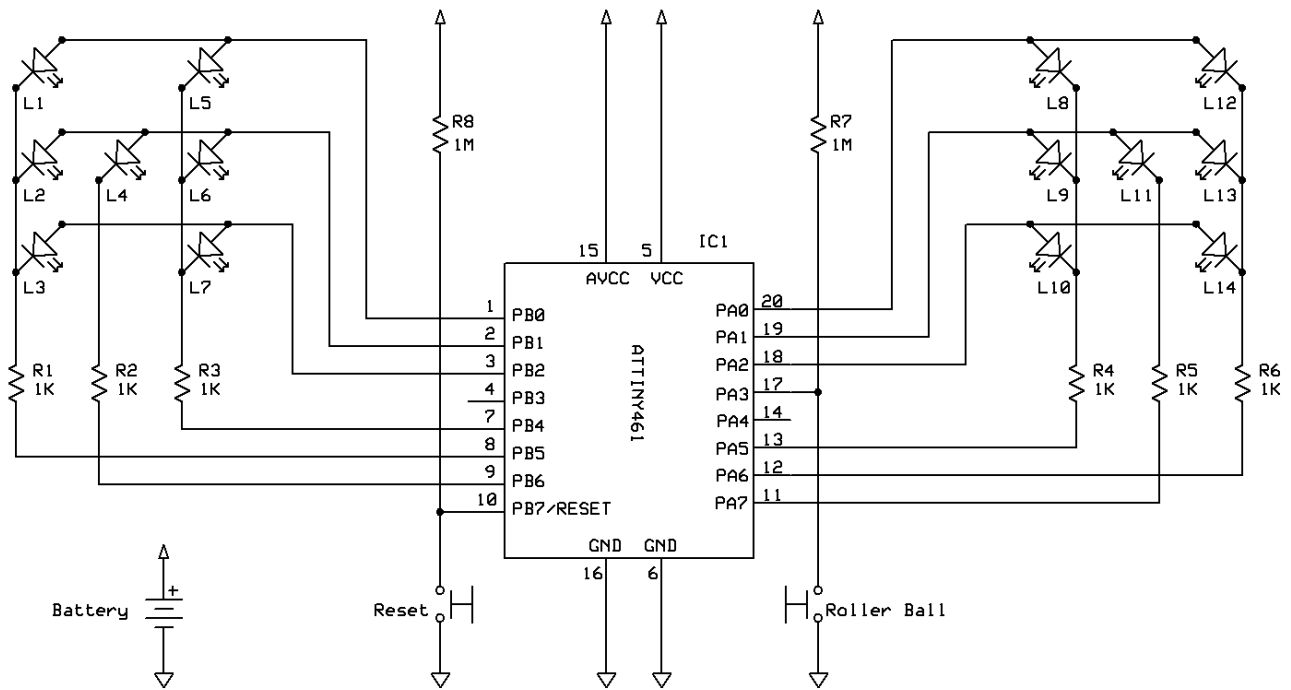
5. S1 – Reset Switch
6. The LED's – Observe orientation! The LED's must rest against the board, I recommend soldering one leg of the LED and checking that it is flush with the board and straight, you can reheat the solder joint while pressing on the LED to get it fully seated against the board, then solder the second leg. The LED's must be flush and straight for the cover to fit properly, test fit often. Also see note in the “Basic Instructions”
7. Connect the battery holder leads from the other side of the board, red wire to “Batt +”, black wire to “Batt -”
8. IC1 - ATTiny461A – observe orientation
9. If you want to secure the battery holder in the box, now is the time, use double sided tape, velcro, glue or just leave it loose in the box.

Lastly install the batteries.

### Assembly Tips:

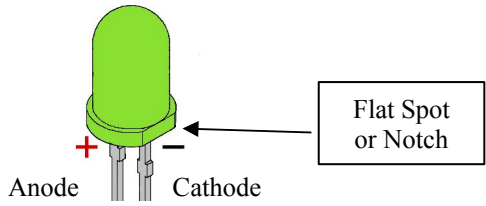
- For perfect solder connections clean solder tip with sponge before each connection – not after.
- Not everyone has a ESD Protected Area, here are some basic tips to follow:
  - a: Do not assemble kit on a carpeted work surface.
  - b: Do not assemble kit in low humidity environment (<40% RH = increased risk).
  - c: Avoid working/walking in carpeted areas.
  - d: Wear a short sleeve shirt.
- Insert components from component side of PC board then turn board over and lay it flat on your work surface to help hold the parts in place while soldering.

### Schematic:



**Parts Identification:**

LED's  
Flat side indicates Cathode  
or negative lead



ATTiny461A  
Top View