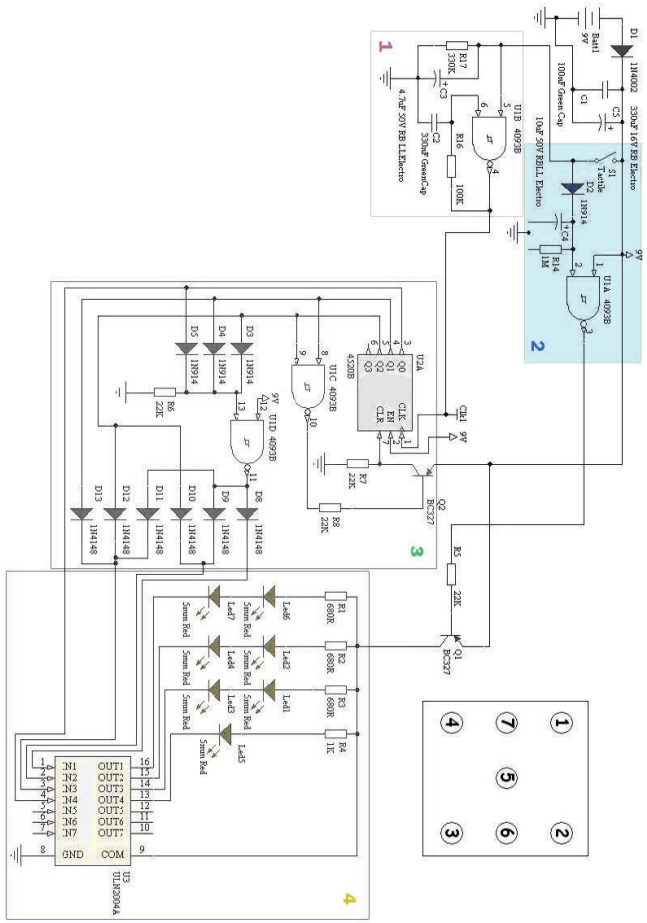
Schematic Diagram



HOW IT WORKS

The Circuit Diagram above Fig.5 has been divided into 4 different sections,
(1) oscillator, (2) LED on control,
(3) random number generator and (4) LED drive.

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HOW IT WORKS

When S1 is pushed it connects the 9V to both sections 1 & 2, this allows 2 things to happen at the same time in section 1. C3 is charged very quickly and the oscillator starts and runs until the voltage on Pin5 of U1B falls below its threshold voltage.
At this point the pulses that were being fed to clock input of U2A stop. In section 2, C4 is charged very quickly as well via D2, but because of D2 it's time is independent and this allows the Output of U1A to turn Q1 on and the LED's that are selected by the counter output will then light.
In the first timing period until C3 loses enough charge as stated before, the oscillator runs causing pulses to be fed to counter and the LED's will blink very fast. When C3's voltage falls below U1B's threshold voltage, pulses stop, the counter stops and the LED's display whatever the output counter stopped at.

U1A then continues to allow the LED's to be ON until C4 discharges and Pin2 drops below it's threshold voltage. Pin3 returns high and Q1 is turned OFF and the LED's go off.
The random number generator section uses a 4520 Binary Up Counter (U2) which with a series of signal diodes, U1C and U1D decode the output. This is a twofold event, as the output is decoded it drives the LED section mentioned below and also because of the way it is configured after the count of 6 it causes Pin7 (clear) to be set and the counter starts at 1 again. So it runs in loop 1 to 6 then reset, 1 to 6 again until U1B stops.
The LED drive U3 is a series of independent transistors which allow a particular LED to be connected to ground depending on how it is being driven by the decoded output of the binary up counter, U1D and diodes D3-D5, D8-D13.

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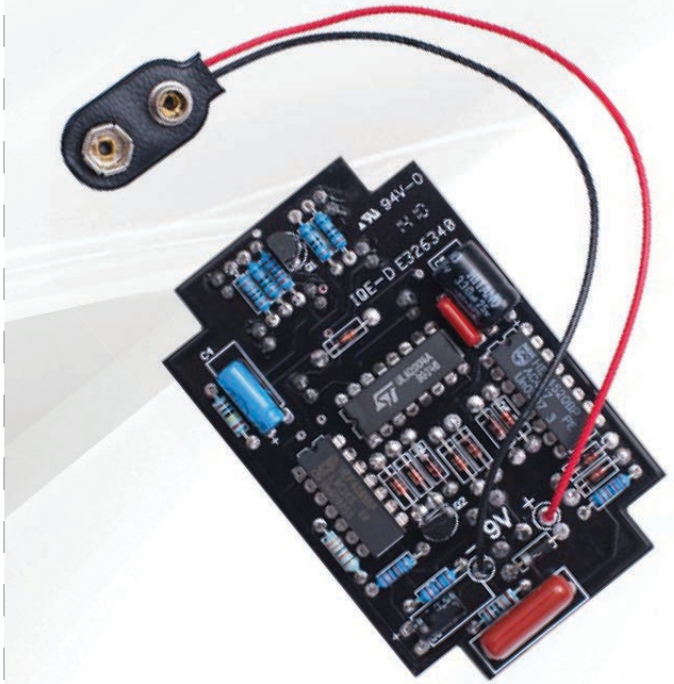
Electronic Dice Kit

Tekky Kit



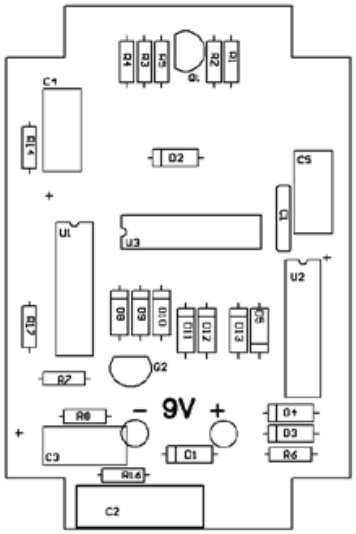
Component List

Designator	Part Description	Part No.
R1, R2, R3	680R 0.25W Resistor (Blue, Grey, Brown)	RS1465
R4	1K 0.25W Resistor (Brown, Black, Red)	RS1485
R5, R6, R7 R8	22K 0.25W Resistor (Red, Red, Orange)	RS1645
R16	100K 0.25W Resistor (Brown, Black, Yellow)	RS1725
R17	330K 0.25W Resistor (Orange, Orange, Yellow)	RS1785
R14	1M 0.25W Resistor (Brown, Black, Green)	RS1845
D1	D0-41 1A Rectifier Diode	1N4004
D2-D5, D8-D13	D0-35 Signal Diode	1N4148
C1	100nF GreenCap Capacitor	CC2061
C2	330nF GreenCap Capacitor	CC2167
C3	4.7uF 50V RB Electrolytic	CC1412
C4	10uF 35V RB Electrolytic	CC1417
C5	330uF 25V RB Electrolytic	CC1457
LED 1-7	Red LED 5mm	LED-5MM/R
Q1, Q2	TO-92 NPN Transistor	BC327
SW1	Tactile 6mm Switch 7mm HI	SW1808
U1	Quad NAND Scmitt Trigger	4093B
U2	Dual Binary Up-Counter	4520B
U3	Transistor Darlington Array	ULN2004A
BH1	9V Battery Snap	BA9000

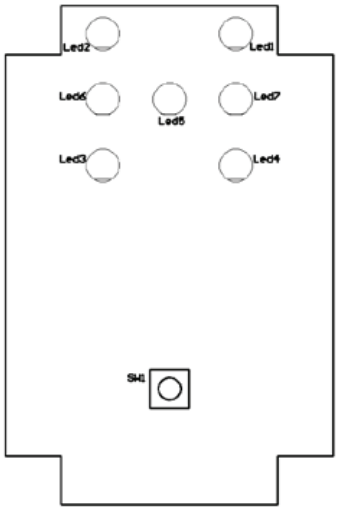
Circuit Description

This kit is an electronic simulation of a traditional die. The 7 LED's are arranged on a PCB which simulates the roll of a die.
Push the switch and all LED's will flash rapidly then stop with a pattern of LED's displaying a random number from 1 to 6.
The randomly chosen number remains visible for about 6 seconds then turns off to maximize the life of the 9V battery.
When not in use it is recommended to remove the battery.

PCB Component Overlay



Component Side



LED Side

Check your kit of parts using Fig.3 components list. Go through the list, identify and check off each component.
Be careful with the 2 CMOS IC's (U1 & U2) they are both static sensitive, they should be inserted and soldered last.
Using Fig.2 overlay insert and solder in the smallest components first i.e. resistors and diodes, then the larger parts can be assembled onto the circuit board in any order.
Note: Most components are polarized!
Make sure they are fitted correctly matching the positive and negative symbols printed on the PCB.

Assembled PCB