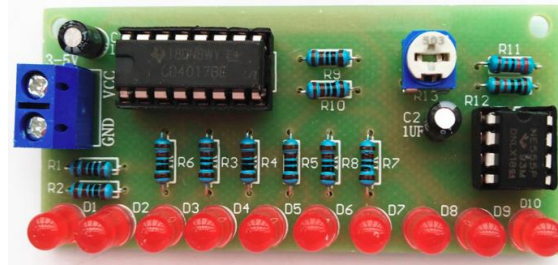


THE ELECTRONICS HOBBY KIT

STS-57 Night Rider 1

Operating voltage V_{in} : DC IN 3-5V



PCB Full Assembly

R1-R10= 1K, R11=2.2K,
R13=50K preset,
R12= 10 K
C1,C2=1uF

LED 5mm = D1-D10

J1=Terminal Block

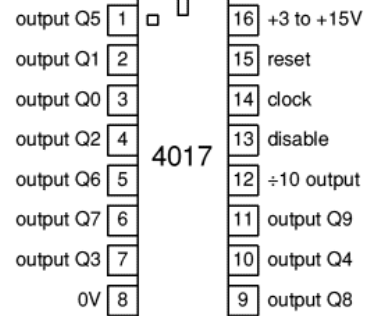
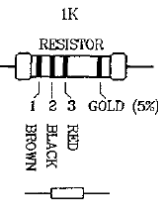
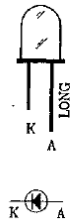
PCB

U1=NE555

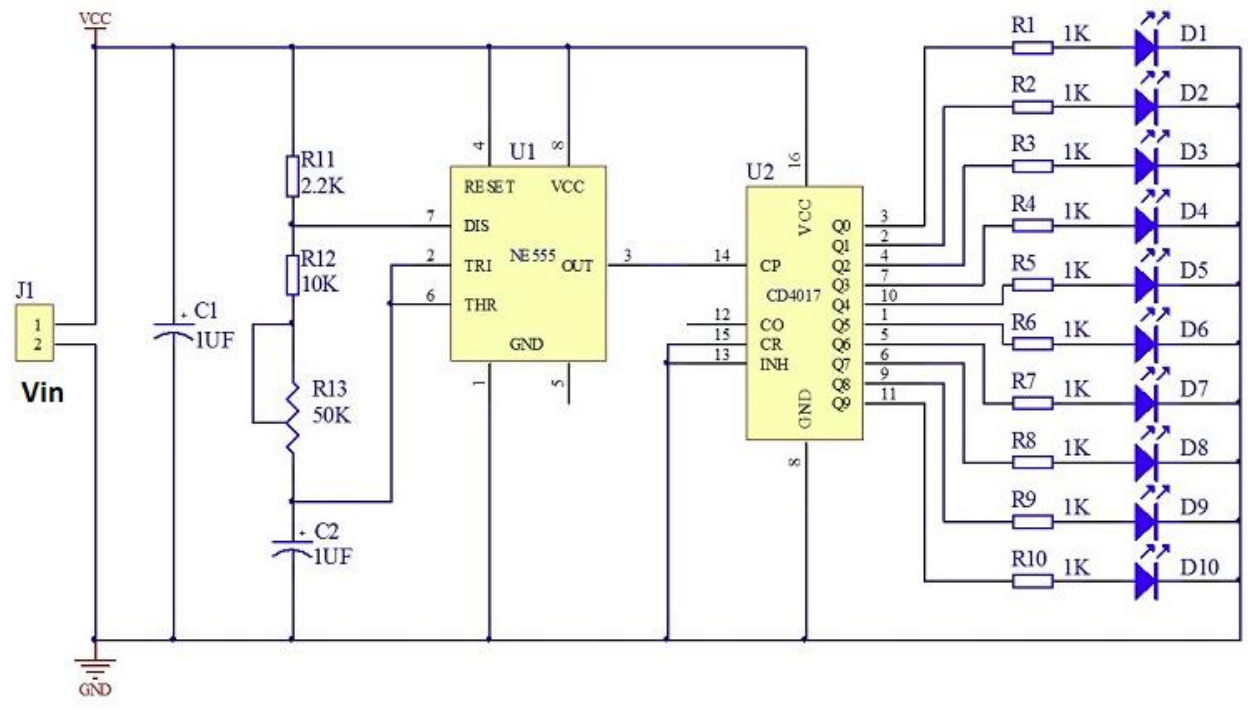
U2=CD4017

Power V_{in}

Battery Holder



Schematic Diagram





PCB COMPONENT LOCATION

THEORY OF OPERATION

This kit is mainly composed of a clock generation circuit and a decimal counter circuit. It is a self-excited multivibrator with NE555 as the core. C1 is the bias supply bypass capacitor. The power supply charges the capacitor C2 through R11, R12, and R13. When C2 just starts to charge, the 2 pin of NE555 is still in Low level, so the output pin 3 is high. When the power is charged to C2 through R11, R12, R13 to 2/3 of the power supply voltage, the level of the output pin 3 changes from high to low, and the internal discharge tube of NE555 is turned on. , Capacitor C2 is discharged through R13, R12, and pin 7 of NE555, until the voltage across C2 is lower than 1/3 of the power supply voltage, the level of pin 3 of NE555 changes from low to high again. C2 is charged again, This cycle forms an oscillation. The charging time is: $0.695(R11+R12+R13)C2$, and the discharging time is: $0.695(R13+R12)C2$. Adjusting R13 can control the output frequency of the oscillator. The clock oscillation signal of NE555 is continuously added to pin 14 of CD4017. 10 LEDs are connected to the 10 output terminals of the CD4017. When the 10 output terminals of the CD4017 generate high levels in turn under the action of the clock signal, D1--D10 will be lit in turn to form a water lamp effect. Adjust R13 to adjust the flow speed of LED lights.