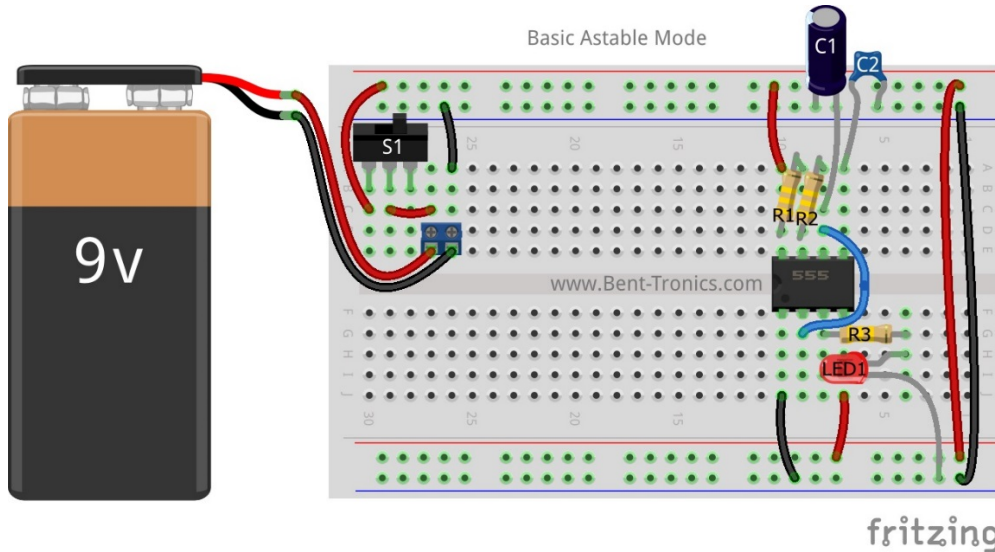


Parts Kit for the Ultimate Beginner's Guide to the 555 Timer Book
Jameco Part No.: 2244666



Experience Level: Beginner | Time Required: 15-30 Minutes

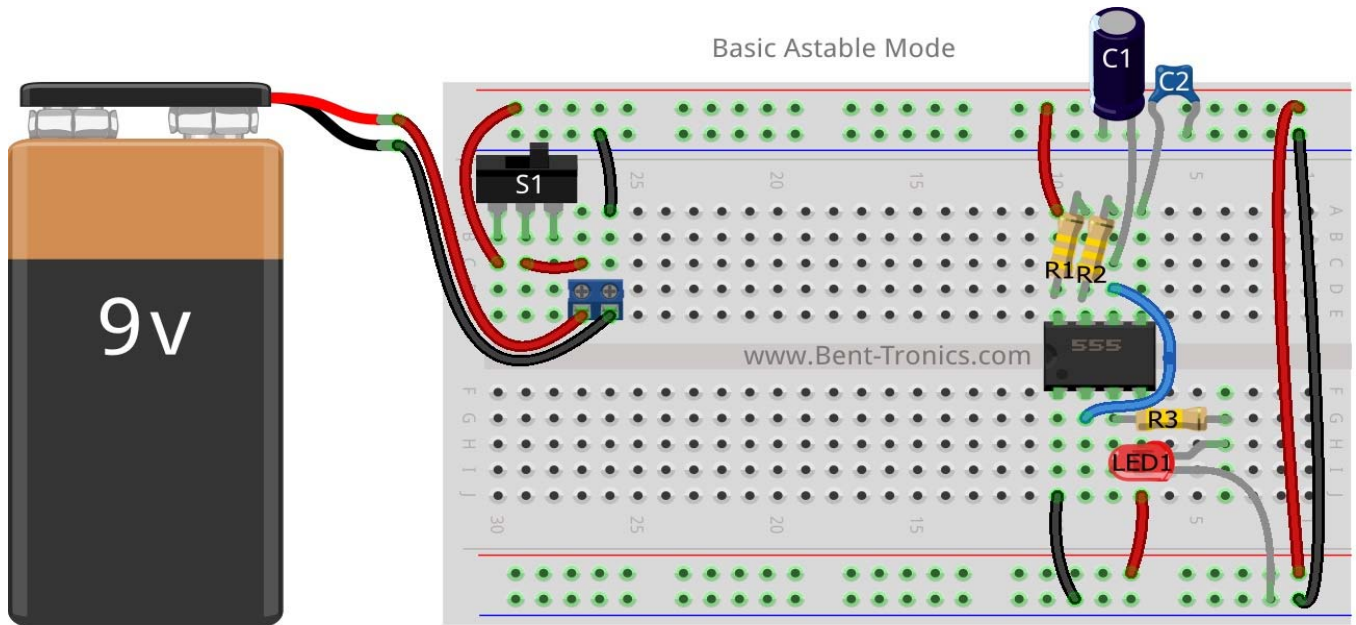
This kit is a companion parts kit for the book, "The Ultimate Beginner's Guide to the 555 Timer". The book is not included but is available on [amazon](#). This project is an abridged version of the first project in the book, which includes much more information and many more projects to utilize the parts in the Bill of Materials.

Kit Includes:

Part No.	Qty.	Description
20601	1	400-Point Solderless Breadboard 3.3"L x 2.1"W
101470	1	9V Battery Snap Holder with 10 Inch Wires
2094485	1	Connector Terminal Blocks 2 Position 5mm
2127718	1	70-Piece Jumper Wire Kit - 22AWG 14 Lengths 10 Colors
2258831	1	3-Pin SPDT Slide Switch (S1)
149948	2	Tactile SPST Push Button Switch OFF-(ON)
2161422	2	3/8" Square Cermet Potentiometer 1MEG Ohms 1/2 Watt 1 Turn
2161414	2	3/8" Square Cermet Potentiometer 500K Ohms 1/2 Watt 1 Turn
2161393	1	3/8" Square Cermet Potentiometer 5k Ohm 1/2 Watt 1 Turn
904085	2	555 Timer 8-Pin Plastic DIP NE555
790225	10	LED Uni-Color Red 697nm 2-Pin T1-3/4
2099606	1	1.05" Round Speaker 8 Ohm 0.20 Watts 320-7500Hz 78dB
691104	10	Resistor Carbon Film 10k Ohm 1/4 Watt 5%
691260	10	Resistor Carbon Film 47k Ohm 1/4 Watt 5%
691382	10	Resistor Carbon Film 150k Ohm 1/4 Watt 5%
690865	10	Resistor Carbon Film 1k Ohm 1/4 Watt 5%
690785	10	Resistor Carbon Film 470 Ohm 1/4 Watt 5% (R3) for LED
691585	10	Resistor Carbon Film 1.0M Ohm 1/4 Watt 5% (R1, R2)*
1946367	10	10 uF 25 Volt Radial Electrolytic Capacitor 20% 85c 5x11x5mm
2261351	10	0.1uF 50 Volt Metallized Polyester Film Capacitor
25540	5	0.22uF 50V Monolithic Ceramic Capacitor 20%
31000	10	4.7uF 50 Volt Radial Electrolytic Capacitor 20%
25507	10	0.01uF 50V Monolithic Ceramic Capacitor 20% (C2)
545588	5	1uF 25 Volt Radial Tantalum Capacitor 10% (C1)*

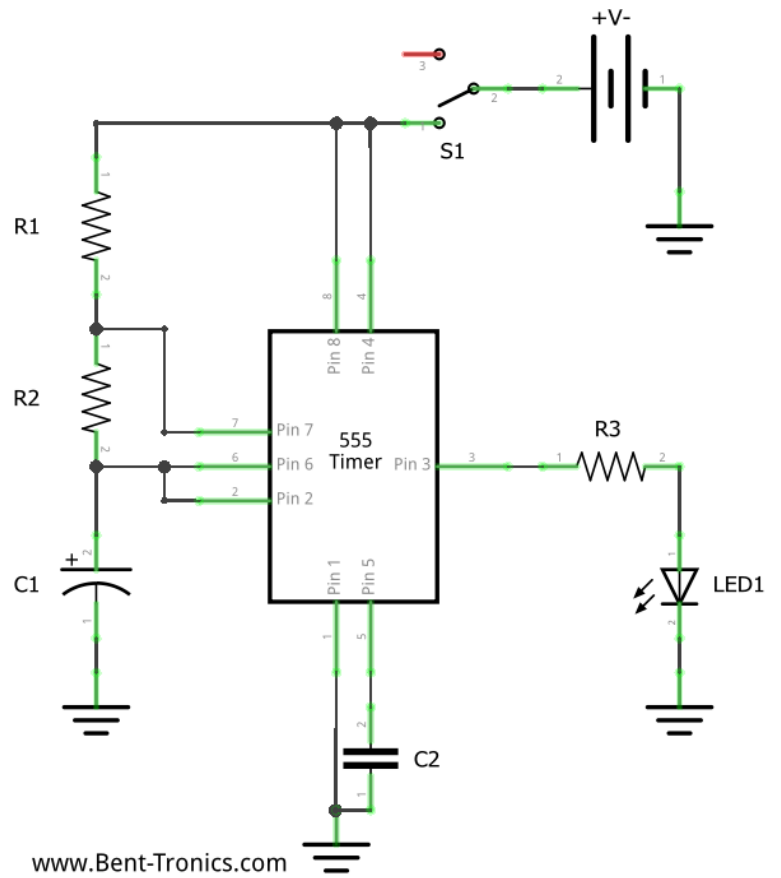
*Experimenting with these values will change the frequency/timing of the 555 - always switch the power off to the circuit before changing parts.

Step 1 - 555 Astable Mode



fritzing

555 Basic Astable Mode



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Blink an LED! While most books on the 555 start with the monostable (one-shot) mode, this one will start with astable (oscillator, or multivibrator) mode. Why? Because soon you'll have a circuit put together that blinks a light!

While using the 555 in the astable mode, there are only three components that have a direct effect on the timing cycle; R1, R2, and C1.

First connect all of the parts, except the battery, on the breadboard as shown in the diagram of the breadboard.

Some helpful tips:

Your parts may look different, or physically be a different size than the diagram, which may mean a slightly different layout on your breadboard.

Be sure to observe the polarity markings on your parts. Make sure all anodes (positive) go towards the most positive side of the circuit, and all cathodes (negative) towards the most negative (ground) side of the circuit.

Double check, even triple check that all of your connections are correct, and that any wires or legs of any components aren't touching other components or wires.

Once you are confident that your connections are correct, make sure S1 is in its "off" position, then connect the battery, making sure to observe the polarity is correct. Now is time for the "smoke test!" Slide S1 to the "on" position. What happens?

If everything is correct, you should see LED1 blinking on for about 1.3 seconds, and off for about .7 seconds. If so, congratulations! If not, slide S1 to the "off" position, disconnect the battery and re-check that all of your connections are correct and that the parts are the right values. Then try again.

Here is a brief and simplified explanation of how this circuit works. Current flows to C1 through R1 and R2. The amount of time C1 takes to charge up to $2/3 V_{cc}$ is both affected by the overall resistance of a formula of R1 and R2, and the size of C1, which determines the length of the on portion of the cycle. Once pin 6 senses that C1 has charged to $2/3 V_{cc}$; then C1 starts to discharge through R2 via pin 7, which determines the length of the off portion of the cycle. Since the off time is only affected by the size of C1 and R2, it will always be shorter than the on time (without other modifications to the circuit). Because a LOW voltage on pin 2 always starts the timing cycle, and since pin 2 connects to pin 6, when C1 discharges to $1/3 V_{cc}$ (LOW) it triggers pin 2, then the timing cycle starts over. Also, each time the circuit is powered up, the time C1 takes to charge is slightly longer than the rest of the cycles because it is charging from 0 volts instead of $1/3 V_{cc}$.

Much more information and many more projects are in my book, *The Ultimate Beginner's Guide to the 555 Timer!*