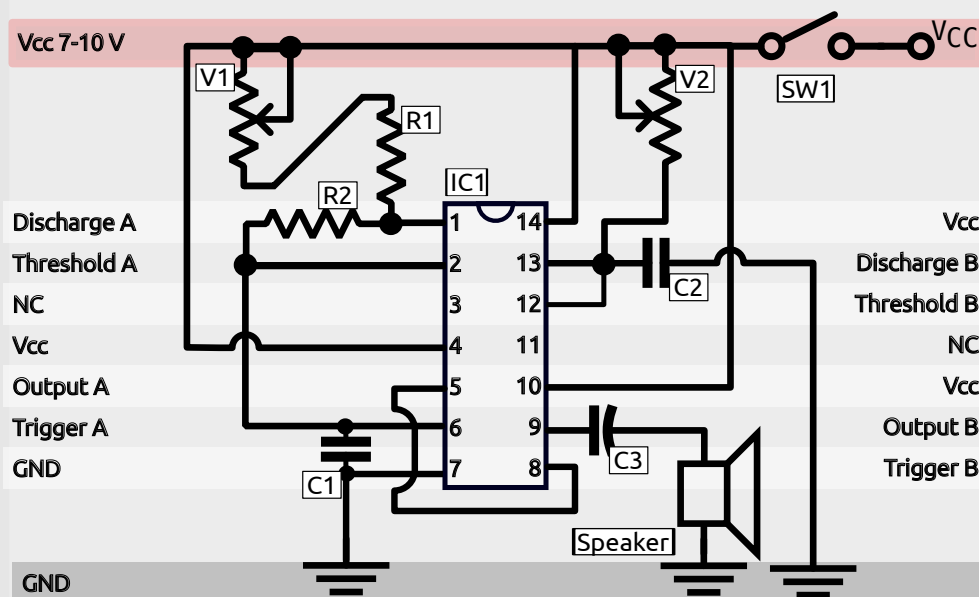


Puzzle 4

Use Two Timers for a Stepped Tone Generator



IC1	NE556N
R1	10kΩ
R2	1kΩ
C1	330nF
C2	330nF
C3	47uF
V1	100kΩ
V2	100kΩ
SW1	Button

By constructing the resistor-capacitor timer on both sides of this chip, many kinds of sounds can be generated when the output of side A is used as an input to side B.

For this circuit, we put a button between the voltage source and all of the components that take power directly:

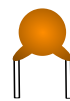
Varistors 1 & 2 and pins 4, 10, and 14 are all connected.

Pins 5 and 8 are connected directly, as are 2/6, and 12/13.

A 330nF capacitor sits between pins 6 and 7 (7 is GND for the chip)

A 330NF capacitor connects the pins 12/13 to GND.

Nonpolarized Capacitor



Parts with a few pF or nF of capacitance are generally non-polarized and can be placed in either orientation.

Polarized Capacitor

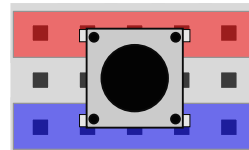
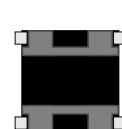


A curved icon indicates the negative side of a polarized cap.

These are usually the larger, uF values.

The negative side of the part itself is indicated by a stripe.

Momentary Switch



Make sure your button is lined up correctly!

The gap on the bottom of the button should be horizontal – in-line with the rows of the breadboard / protoboard.

You can also test each pair of legs with a multimeter, you'll find that the legs that line up in the row are connected whether or not the button is pushed.

The pairs only make a complete circuit between them when the button is pushed.

Resistance Values

$$10 \times 100 = 1k\Omega$$

$$10 \times 1000 = 10k\Omega$$

