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Drawdio Musical Pencil



Drawdio (Figure 1) is a simple electronic sound synthesizer built on a pencil. The Drawdio circuit plays a musical tone with a frequency that varies based on the resistance between two points. When you hold Drawdio in your hand, your body becomes part of the resistive loop. To see the Drawdio in action, click on this link for a short video: https://www.youtube.com/watch?v=t_Q4BQ7_Cc0

Figure 1: Drawdio Musical Pencil

The Drawdio circuit uses the TLC555 timer chip (see Figure 2). This chip operates on 3 Volts. The chip sends a continuous output stream of pulses from pin three, labelled as output in the circuit diagram. The frequency of those pulses can be controlled by changing the values of the resistors and capacitors connected pins two (trigger) and seven (discharge). Because a person's body is used as the resistor between these pins, that person's natural resistance is what will vary



Figure 2: Circuit Diagram

the frequency output of the TLC555. The PNP transistor amplifies those pulses out to the mini speaker which creates an audible sound. For a view of the completed circuitry, see figure three.

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Figure 3: Close-up photo of circuitry.

With a little creativity and a lot of experimenting, this pencil can do all sorts of fun things. For example, it can play a little tune. After installing two AAA batteries, wait for a minute or two for Drawdio to warm up. Draw a line on your paper, then lightly wet a

finger on your non-writing hand and place it on one

end of that line. Place the sharpened point of your Drawdio pencil on the other side of that line and you should hear a tone emerge from the small speaker on your pencil. By moving the pencil or your damp finger to different locations on the line, you can either lower or raise the frequency of the tone.

The Drawdio musical pencil is a fun little weekend project. This is a great musical synthesizer that uses the conductive properties of a graphite pencil to create different sounds. The gratification of making your own little circuit and getting to play with toys makes this engineering circuits project a fun little item to build.

