

SYNTH HACKS #14

THE SOUND OF ONE BUTTON TAPPING

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What can you possibly do with a one-button synthesizer? It's a Moffenzeef Shtick, quite a lot. This "harsh noise synth" (moffenzeefmodular.com; \$25) is a gem of conciseness. Its pinky-size body has a USB plug for power on one end, a 3.5mm mono output on the other, and a single button in between. (See Figure 1.) Add power and it plays a random sustaining sound at a random pitch. Tap the button and a new sound begins. That's it! The Shtick is essentially an oscillator of surprise. You might hear a rasping car alarm, a yodeling square wave, a supersaw, or endless other edgy tones.

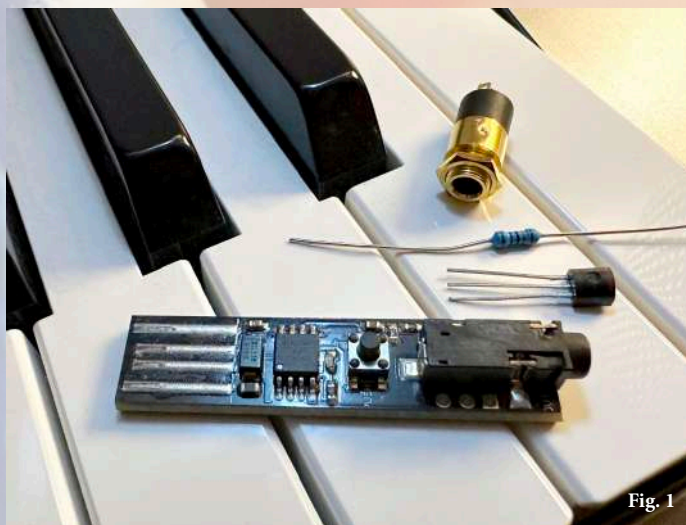


Fig. 1

Powered by USB, the \$25 Moffenzeef Shtick makes a unique new sound each time you tap the button. Adding a few pennies worth of parts lets you trigger it with CV.

The musician AA Battery (aabattery.de) discovered he could solder a larger button to the side of the Shtick to trigger new sounds remotely. Then he swapped in a light-sensitive resistor and triggered sounds by pointing it at the flashing LEDs on a Teenage Engineering PO-133 drum machine. Synchronizing drums and random sounds made a fantastic groove, as you can hear in his video at tinyURL.com/AAShtick. A link in the description gives you a free pack of 73 Shtick samples so you can hear the instrument's range.

I was curious if I could change Shtick sounds with a 5-volt pulse from a keyboard or sequencer, so I asked Mr. Moffenzeef himself, Ross Fish, and he said I could wire a voltage-to-switch trigger converter in parallel with the button, and kindly sent me the classic circuit diagram for triggering vintage Moog synths. After watching a quick triggering tutorial (tinyurl.com/V2Strig),

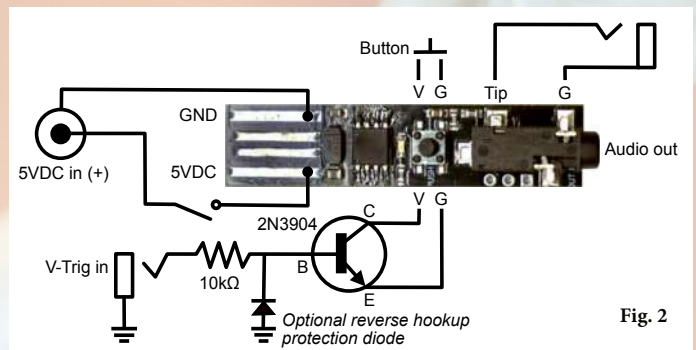


Fig. 2

The classic V-trig to S-trig circuit (bottom) converts a 5V trigger signal to a virtual button push. I added a second physical button and extended the audio output to a remote jack.

I came up with the version in Figure 2. It sends the 5V pulse (V-trig, or voltage trigger) through a resistor to the base (B) of an NPN transistor, causing the transistor to connect its collector (C) and emitter (E) terminals. In other words, the transistor shorts the button to ground, producing a switch trigger (S-trig). The resistor protects the transistor by limiting the amount of current.

Because my shtick is embedding audio electronics into Japanese monster toys, I popped open a Bandai M1, Ultraman's giant apelike enemy, and added the modified Shtick, another output jack, and a power switch. A round red button, wired in parallel with the one on the board, adorns M1's head like a monkey's fez. With the gate output of my Arturia KeyStep connected to M1's trigger input, I can advance Shtick sounds by playing keys or running the arpeggiator (pretty cool with swing!). Connecting the KeyStep's modulation output instead changes the timbre when I tap the top of the mod ribbon.

Of course, Shtick randomizes the pitch of each new sound as well, so to make the pitch follow the keyboard, I ran M1's output through the granular oscillators on my 1010music Lemondrop (Figure 3). The Lemondrop shifts the pitch to match the note you're playing and—magically—creates new pitches as you hold additional notes, producing up to four-voice polyphony.



Fig. 3

I embedded the Shtick in a rubber monkey monster and granularized the audio with a 1010music Lemondrop, producing four-note polyphony. Each keypress can also change the sound.