

# SYNTH HACKS #12

## SPIN CONTROL

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**NAMM, 2018:** I'm in a windowless briefing room, deep in the catacombs behind the Anaheim Arena. A major chip manufacturer is wrapping up a sneak preview of its new "A2B" audio technology, a string of networked DSP boards they've configured as synths and effects. It's impressive: with just two wires, they can transmit thirty-two channels of digital audio plus MIDI, clock, and power. But it's the end of a long trade show day, and the engineers are slumped against the walls. Then the PR guy says, "Hey David, you have something to show us, too?"

Slyly, I tease out a fidget spinner, built to showcase my company's own technology. Walnut sides, laser-cut acrylic core, tungsten weights, and a magnetically triggered microprocessor that generates sophisticated lighting effects from a single LED. The weary engineers spring forward to see better. Fidget spinners are irresistible.

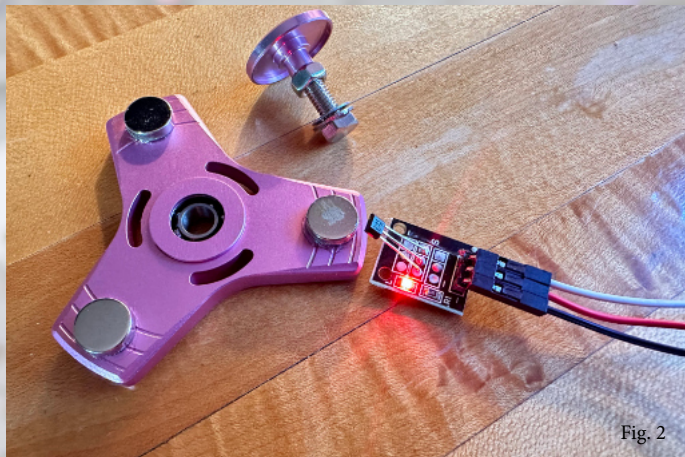


Fig. 2

This Hall effect sensor board sends a 5V pulse and flashes an LED when a magnet passes by. I superglued magnets to the arms to trigger it.

Spinners make fun synth controllers, too. One popular hack is to bolt one over a guitar pickup (see Figure 1). Twirling it produces an LFO effect that slows down organically. By amplifying the signal, you can produce drones or a unique control voltage (CV). DeftAudio sells a \$29 kit to make a Eurorack module (blog.tindie.com/2023/05/fidget-spinner-lfo). In the demo video, the spinner modulates the frequency of a sine wave, creating effects that morph between a moist splatter and a spacey warble. NoodleVolt offers a more advanced module with a preamp and CV-controllable attenuator (\$120; reverb.com/brand/noodlevolt). Their demo shows the dynamic sounds you can get by "spinning" pulse width and filter cutoff. My favorite example comes from Kale of Musical Miscellany. He mounts two spinners in a cigar box and spins them in opposite directions, and then modulates a granularizer and a wavefolder (youtu.be/q\_vbMulQyAc). Another approach is to use a photoresistor



Fig. 1

Twirling a fidget spinner over a guitar pickup produces a warbling voltage you can use to modulate a synth, as demonstrated by Sam Battle aka Look Mum No Computer. —photo by Sam Battle

(etsy.com/shop/Kowabungus), attenuating a signal instead of generating one.

I did something different. I glued magnets to the spinner's arms and mounted it over a Hall effect sensor, which detects changes in magnetic fields (see Figure 2). Hall sensors come in two main types: analog (aka linear) versions generate a voltage proportional to the field strength; digital (aka switched) ones, the kind in my NAMM spinner, generate a pulse. The digital board I used was only a dollar and includes handy mounting holes and an LED to confirm triggering. I patched the output to the sync input of my Korg Volca Sample, clocking the tempo of its drum patterns (see Figure 3). I also used my spinner to drive arpeggios in my Cre8audio West Pest and to stutter individual notes.

Because Hall sensors detect polarity, I glued two of the magnets upside-down so the spinner would stay balanced yet trigger only once per rotation. Then I discovered that if I flipped the sensor over, it would trigger twice per rotation in a swinging On-On-Off pattern. Is this how Roger Linn felt when he discovered shuffle and put it in the legendary LM-1? Fidget spinners really are irresistible!



Fig. 3

Bolted to a creepy Takada Facebank, my magnetized fidget spinner flashes the purple eyes and sends a 5V pulse proportional to the speed of the spin. See it in action at batmosphere.com/fidget.