

Mod wheel

## ByteNoise

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The first all-in-one, hardwired synthesiser with a built-in keyboard was the Minimoog, designed by Bill Hemsath and Robert Moog and released by Moog Music in 1971. It's hard to say how much of its design was carefully considered, and how much was arbitrary. Regardless, other companies -- including the Japanese trio Yamaha, Korg and [Roland](#) -- soon started to imitate the Minimoog's placing of elements as well as its sonic features. Ever since, almost every synthesiser produced has taken the form of an all-in-one product that has a prominent keyboard at the front, with two partially visible wheels to its left, and an array of knobs or sliders behind it that seems designed to intimidate the newcomer to the world of synthesis.

While the knobs or sliders can be used to intricately craft subtle nuances of the synthesiser's [sound](#) in painstaking ways, the two wheels to the immediate left of the keyboard are kept close to the musician's hands, and with good reason: unlike the array of esoteric dials, they're designed to be used during an actual performance of the instrument. They aren't part of the sound design process, but instead are used to make the performance more expressive. Those two wheels are the pitch bend and the mod wheel.

As its name suggests, the pitch bend is used to make the note or notes played move up or down in pitch, like a guitarist physically bending the guitar's strings to change their length.

When you let go of it, it always snaps back to its centred position, leaving subsequent notes unaffected.

Much more interesting than the pitch bend is its neighbour, the mod wheel. Unlike pitch bend, when you let go of the mod wheel, it stays put in whichever position you left it. It's used to modulate, which is a pretty vague term, hinting at its open ended possibilities.

If you're used to acoustic instruments, you may be wondering specifically what the mod wheel is actually used for at this point. On the Minimoog, the mod wheel is used to alter the intensity with which the third oscillator and the noise generator modulate the main two oscillators and the [envelopes](#).

The lure of the synthesiser lies in its flexibility, however. It doesn't have one set sound or one set way of being played. On a suitably versatile synthesiser, you can use the mod wheel to control whichever parameter of the sound you choose.

There are two particularly noteworthy uses of the mod wheel. One involves using it to control the level of vibrato, with the mod wheel all the way down doing nothing, and all the way up inducing quite a strong level of vibrato. This way, restrained applications of the mod wheel can add subtle nuances to the musician's performance.

Another good use of the mod wheel is to control the cutoff point of a lowpass filter. This gives the synthesiser much the same effect as a harmonica player's hand cupping the instrument, or a saxophonist's force of breath affecting its timbre: it is used to brighten or dull the sound as appropriate.

When Dave Smith designed the [MIDI](#) protocol in 1982, he saw

how useful controllers such as the mod wheel and pitch bend were to expressive performance of the synthesiser, and dutifully included support for them in the specification. As a result, a good MIDI compatible synthesiser can send and receive the position of its mod wheel. Given how expressive the mod wheel can make a performance, this is good news indeed.

Having come all the way from the original Minimoog, to MIDI compatible synthesisers, and now to virtual synthesisers that exist only as software, it's reassuring to know that I can still hook up my relatively cheap controller keyboard to my computer and use its real, tangible mod wheel to control the virtual mod wheel on my computer's screen, which in turn can be used to control pretty much anything.

All these improvements in technology give me, as a musician, countless advantages over [Wendy Carlos](#) and Vangelis in their respective heydays, such as total recall and astounding levels of polyphony and timbrality. Through it all I can still use the venerable mod wheel to ensure that my performances are as expressive as my admittedly lacking sense of musicianship allows for. This is a luxury I would be foolish to overlook.