

MIDI

ByteNoise

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OK, I'd like to set the record straight about [MIDI](#). I've heard far too many geeks who are otherwise very knowledgeable about technology say things like "MIDI sounds terrible!" which, once you know what MIDI actually *is*, makes about as much sense as saying that sheet music sounds terrible.

MIDI stands for "musical instrument digital interface." It is a protocol that says when an instrument should start playing a note, how hard the key was pressed (known as the note's velocity), when it should stop playing the note, and various other information about what kind of sounds to play and when. It replaced CV (control voltage) as the standard in the mid eighties, and is here to stay for a while longer. Pretty much any synthesizer you can buy brand new will have "MIDI in," "MIDI out" and "MIDI through" sockets built into it so that you can use its keyboard or sequencer to control another instrument, control it with another keyboard or use a sequencer to keep track of every single detail of the music and play it back upon request. This is how pretty much all popular music is written these days.

MIDI is not limited to synthesizers, though. Yamaha have even made a range of acoustic pianos that use the MIDI protocol, the Disklavier series. This is basically the same technique used by old upright pianos that had punchcards with music stored on them, only using much more sophisticated technology. As MIDI can store subtle nuances that the old punchcards didn't, such as

assigning a seven bit number (between 0 and 127) for how hard each key is pressed, you'd find it hard to tell the difference between someone actually playing a piano and a recording of their movements instructing hardware to play it in exactly the same fashion.

In short, from the ubiquitous Roland TR-909 [drum machine](#) and the phenomenally popular Yamaha DX-7 synthesizer to acoustic pianos, many different instruments can talk via MIDI.

Then there's General MIDI, abbreviated as GM. This is the same as regular MIDI except it specifies 128 instruments (mainly classical, acoustic instruments) for the GM compatible instrument to emulate. This is where the problem lies: I have yet to hear a MIDI compatible xylophone or harpsichord. Instead, any GM instrument you are likely to own is probably going to be a synthesizer that doesn't sound very much like any of the general MIDI instruments it's supposed to emulate. While this may change with physical modelling, a technique that uses complex mathematics to generate realistic recreations of acoustic instruments, the current methods of synthesis ([subtractive synthesis](#), [FM synthesis](#) and PCM synthesis are the main three) do not sound very much like acoustic instruments. PCM synthesis, which uses actual recordings of real sounds (it's the same technology that CDs use), is probably the best candidate for the task, and even then, it won't convince anyone that they're listening to a full orchestra.

Then there's internal sound cards that play MIDI files on PCs. These are what give MIDI such a bad reputation. They attempt to recreate an orchestra or a set of rock instruments using FM synthesis. Without going into details of how FM synthesis works, it sounds great for synthetic sounds that can be used in dance music, but can't sound remotely like any acoustic

instrument. The best example of FM synthesis put to good use is probably Yuzo Koshiro's soundtrack to the Mega Drive game Streets of Rage. Many artists from [Brian Eno](#) to Type O Negative also make use of the DX-7, an FM synthesizer. Rick Smith of [Underworld](#) says of it "The DX-7 is my oldest and favourite synth. I have a set of sounds that I've programmed and that seem to work consistently." FM synthesis *does* sound good, it's just futile to try to emulate acoustic instruments with it.

So remember, although playing a MIDI file on a cheap sound card can sound less than euphoric, MIDI is still the industry standard for getting instruments to talk to one another. It doesn't sound bad because it doesn't dictate how music should sound, only which notes should be played and sometimes which instrument they should try to sound vaguely like. If it wasn't for MIDI, [Fatboy Slim](#) probably wouldn't still be writing songs on an Atari 1040ST.

The Rick Smith quote is from a Sound on Sound interview with Underworld, available at <http://www.soundonsound.com/sos/dec00/articles/underworld.asp>