Meet **MIDI!**

By Plamen Pazov

A MIDI interface is little more than a baud range converter. Many consider it the best thing since sliced bread.

EVERYONE talks about MIDI, but no one does anything about it. You might not know what MIDI is. MIDI is the Musical Instruments Digital Interface standard. It means many different things to many different people. The majority of its users consider it the best thing since sliced bread.

In basic terms, MIDI is a standard that defines the hardware and software rules of exchanging musical information between instruments. In other words, it's the musician's equivalent of RS232.

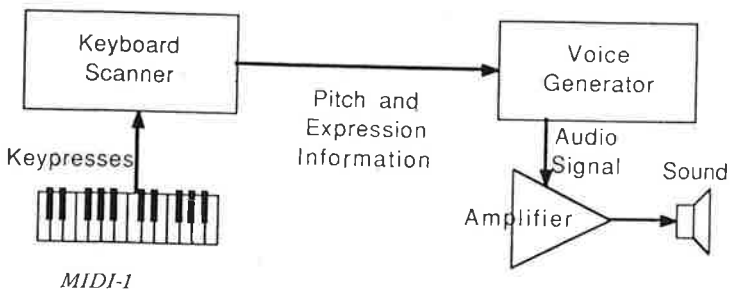
The birth of MIDI is a miracle in itself: a number of manufacturers getting together and agreeing on a standard. In 1981, Sequential Circuits Inc put forward a draft proposal for a "universal synthesiser interface". This was subsequently taken up by Roland, Korg, Yamaha and Kawai and, after suitable cogitations, accepted as the MIDI standard as we now know it.

MIDI is a modern concept and could not have co-existed with previous generations of musical instruments. Modern electronic musical instruments are designed in modular form, following a trend started by the earlier analogue synthesisers.

The keyboard is the first module, passing information of two kinds to the next module, the voice generator: (1) *pitch* (which key was pressed?) and (2) *expression* (how hard was it pressed?).

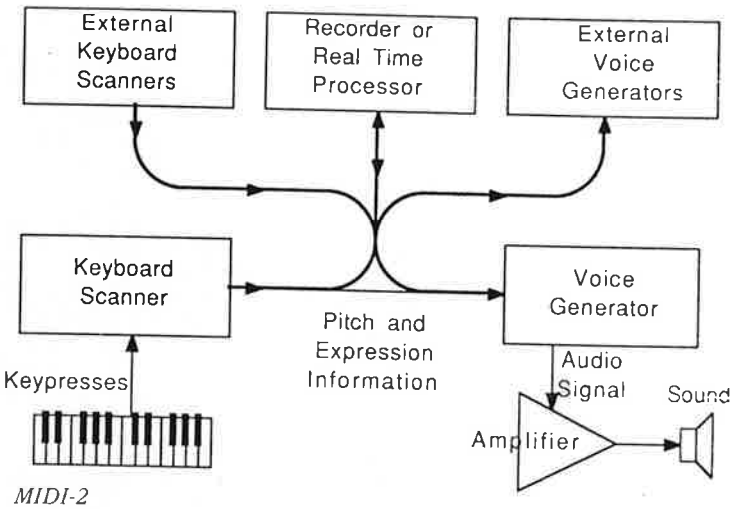
But since the keyboard is a separate function, its output signals obviously need not go directly to the sound generator; they could be redirected and further pre-processed by any number of devices. The information might even be stored in its raw form. Alternatively:

- External pitch and expression information could be fed to an existing voice generator either from another keyboard or, if previously recorded, from stored data.



MIDI-1

- The keyboard information could be processed in realtime for enhancement (loops, transposition, automatic chording, echo) and fed back into the system.



MIDI-2

The illustration shows an interchange of pitch and expression information between keyboard, voice generators and external devices.

As long as the information format is standardised, we can control any configuration of synthesisers from any mix of keyboards and recorded or realtime processed information. The controlling information could originate from a completely unexpected source, such as a guitar or a human voice.

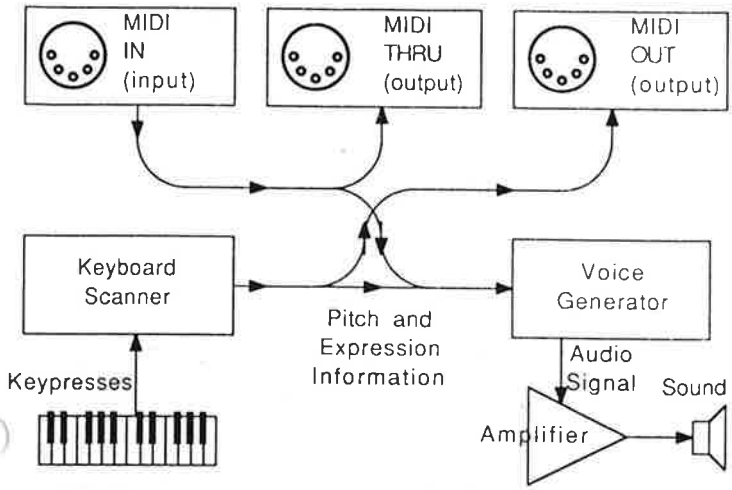
Now we can for the first time record a musician's actual playing, rather than the sound generated by his instrument. Unwieldy and expensive multitrack recordings become superfluous, and we may return to change a single flat note without a retake. A passage may be replayed with different settings or on a different instrument.

These opportunities will leave a recording engineer green with envy, yet they come free with the concept of MIDI recording. It can all be done on your Mac.

Physical interface

For this to be possible, your instruments must support the interface. A MIDI-equipped instrument has one to three 5-pin DIN sockets labelled MIDI IN, OUT or THRU. The THRU socket forwards only the signal received from

MIDI IN, so that several instruments could be daisychained.



MIDI-3

The signals flowing through these sockets are almost standard serial signals. *"Almost"* is the operative word. In their wisdom, the musical "gurus" chose the baud rate of 31.25 kHz (with 1 start bit, 8 data bits, 1 stop bit and no parity). This is smack in the middle of the two standard computer frequencies of 19.2 kHz and 38.4 kHz, and completely incompatible with most computers. Perhaps we cannot expect more than one miracle at a time.

Therefore, if you want to turn your Mac into a musician, you have to buy a MIDI interface, which is usually no more than a baud-rate converter.

Modes

When we look at the signals in detail, we see that the MIDI messages contain further information. The packets of MIDI information include a channel number — they can be sent to a particular unit in the daisychain programmed to respond to that number. The maximum number of channels is sixteen.

Poly Mode, as it's called, allows you to send different notes to different instruments in the same chain if your instruments support this mode of operation. In *Omni Mode* all instruments play the same notes in their own voices. More sophisticated instruments have a third mode of operation called *Mono Mode,* and can play a number of different voices simultaneously. Each voice is assigned a separate channel, and the different voices play independently as if they were separate instruments.

The last category of MIDI signals are system dependent, and transmit instrument settings, voice or sequence data and other utility information

Nothing in the above definitions stops us moving other than musical data on a MIDI network. Indeed, a number of recent releases of other equipment use MIDI as a communications medium for audio effects, mixing consoles, lighting consoles, PA and video control. Eventually we might control a whole studio under MIDI.

Long Live MIDI

As you probably have guessed, MIDI is a powerful tool in the hands of a competent user. Strangely enough, many of its proponents are non-musicians. The musical fraternity has been slow to explore is possibilities; many saw it as competition. With MIDI, a composer may, for the first time in history, craft a complete piece of music with more expressive power than a full orchestra, without the (good or bad) distorting effects of interpretation. At last we can hear precisely what the composer wrote.

A number of excellent pieces of software for the Mac would satisfy the most professional. Many of us lack a formal music education, but with MIDI we can still explore the possibilities of musical expression. Before us lies an incredible tool. Let us hope that it won't be idle.

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