

MIDI Audio Continued...

- Composing your own original score can be one of the most creative and rewarding aspects of building a multimedia project, and MIDI is the quickest, easiest, and most flexible tool for this task.
- Creating an original MIDI score is hard work. Knowing something about music, being able to play a keyboard, and having a lot of good ideas are just the prerequisites to building a good score; it takes time and musical skill to work with MIDI.
- The process of creating MIDI music is quite different from digitizing existing recorded audio.
- If you think of digitized audio as analogous to a bitmapped graphic image (both use sampling of the original analog medium to create a digital copy), then MIDI is analogous to structured or vector graphics (both involve instructions provided to software to be able to re-create the original on the fly).
- For digitized audio you simply play the audio through a computer or device that can digitally record the sound. To make MIDI scores, however, you will need **notation software, sequencer software** and a **sound synthesizer** (typically built into the software of multimedia players in most computers and many handheld devices).



Figure 4-5 Notation and composition software such as Sibelius provides a way for composers and musicians to create and arrange scores using MIDI instruments.

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Figure 4-6 Sequencer software such as Pro Tools allows you to record, edit, and save music generated from a MIDI keyboard or instruments and blend it with digital audio.

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A **MIDI keyboard** is also useful for simplifying the creation of musical scores.

- MIDI software creates data about each note as it is played on a MIDI keyboard (or another MIDI device)—which note it is, how much

pressure was used on the keyboard to play the note, how long it was sustained, and how long it takes for the note to decay or fade away.

- For example. This information, when played back through a MIDI device, allows the note to be reproduced exactly. Because the quality of the playback depends upon the end user's MIDI device rather than the recording.
- MIDI is **device dependent**. The sequencer software quantizes your score to adjust for timing inconsistencies (a great feature for those who can't keep the beat), and it may also print a neatly penned copy of your score to paper.
- An advantage of structured data such as MIDI is the ease with which you can edit the data.

Let's say you have a piece of music being played on a honky-tonk piano, but your client decides he wants the sound of a soprano saxophone instead. If you had the music in digitized audio, you would have to re-record and re-digitize the music.

- When it is in MIDI data, there is a value that designates the instrument to be used for playing back the music.
- To change instruments, you just change that value. Instruments that you can synthesize are identified by a **General MIDI** numbering system that ranges from 0 to 127 (see Table 4-3).

ID	Sound	ID	Sound
0	Acoustic grand piano	16	Hammond organ
1	Bright acoustic piano	17	Percussive organ
2	Electric grand piano	18	Rock organ
3	Honky-tonk piano	19	Church organ
4	Rhodes piano	20	Reed organ
5	Chorused piano	21	Accordion
6	Harpsichord	22	Harmonica
7	Clarinet	23	Tango accordion
8	Celesta	24	Acoustic guitar (nylon)
9	Glockenspiel	25	Acoustic guitar (steel)
10	Music box	26	Electric guitar (jazz)
11	Vibraphone	27	Electric guitar (clean)
12	Marimba	28	Electric guitar (muted)
13	Xylophone	29	Overdriven guitar
14	Tubular bells	30	Distortion guitar
15	Dulcimer	31	Guitar harmonics

- **Table 4-3** General MIDI Instrument Sounds
- Note : Until this system came along, there was always a risk that a MIDI file originally composed with, say, piano, electric guitar, and bass, might be played back with piccolo, tambourine, and glockenspiel if the ID numbers were not precisely mapped to match the original hardware setup. This was usually the case when you played a MIDI file on a MIDI configuration different from the one that recorded the file.

- *Making MIDI files is as complex as recording good sampled files; so it often pays to find someone already set up with the equipment and skills to create your score, rather than investing in the hardware, software, and the learning curve.*
 - *Once you have gathered your audio material, you will need to edit it to precisely fit your multimedia project. As you edit, you will continue to make creative decisions.*
 - *Because it is so easy to edit MIDI data, you can make many fine adjustments to your music as you go along.*
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- MIDI is device dependent and the quality of consumer MIDI playback hardware varies greatly so MIDI's true place in multimedia work may be as a production tool rather than a delivery medium.
 - MIDI is the best way to create original music, so use MIDI to get the flexibility and creative control you want. Then, once your music is completed and fits your project, lock it down for delivery by turning it into digital audio data.
 - In addition to describing the instrument and the note, MIDI data can also describe the **envelope** of the sound: the **attack** (how quickly a sound's volume increases), the **sustain** (how long the sound continues), and the **decay** (how quickly the sound fades away).
 - *Test your MIDI files thoroughly by playing them back on a variety of hardware devices or with different MIDI players before you incorporate them into your multimedia project. Windows Media Player and QuickTime will play MIDI on your computer.*

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