Chapter 1

Introducing Digital Music

In This Chapter

- Joining the revolution in digital music
- Gearing up: What you need and what you'll want
- Composing your own music

In the early 1980s, a computer program was developed that caused a major shift in the music universe. The way people listen to music changed dramatically. (If you want the history behind this shift, check out the sidebar "A brief history of digital music" in this chapter.) The ways of making and selling music altered almost overnight, and the record companies are still struggling to catch up. Small, independent music composers and producers are creating new sounds and new beats. And the Web is altering forever how people acquire music.

To make the best music, you still need a good ear. Some musical education doesn't hurt, although you don't really need much — some basic knowledge of how the notes are written is all you need to get you started (check out Chapter 3 for more on that). But even *that* is changing — an ever-growing number of producers don't use scores or produce written music: They arrange beats and digital audio, and combine MIDI tracks (see "What Is Digital Music Anyway?" for more on MIDI) with vocalists into a unique sound and rhythm. You don't have to read music or have music theory training to make music today. You can make your own pro-quality sounds using the tools from any computer or music store.

In this chapter, I give you an overview of what digital music is, what kind of equipment you need to create it, and how you can get started creating your own music today.

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A brief history of digital music

In 1983, the musical earth shifted, and the seismic shockwave is still being felt today. No, it wasn't the release of Madonna's first album (although that did happen in 1983). It was the creation of the Musical Instrument Digital Interface (MIDI). MIDI was released into the wild, and the musical Tower of Babel fell.

MIDI meant that different electronic music machines, which in the past could only speak their own language, could now all talk to each other and share information. MIDI meant that people could build electronic musical gear in their garage that would work with any computer.

The shift was the end result of *multiple* technological advancements that were shaking the culture, all of which combined to create digital music. These technological advancements included:

- The invention of the transistor, which made small, portable electronic devices possible
- The invention of the personal computer
- The development of the Internet, originally begun as ARPANET, the U.S. Department of Defense's first information-sharing network

All these elements, along with cultural shifts in the United States, made the digital music revolution almost inevitable.

What Is Digital Music Anyway?

Because digital music doesn't necessarily sound "digital" (that is, all computery and technoid), you probably don't know how much of the music you hear every day has some connection to the digital revolution. In fact, almost every piece of music you hear has been "digitized" in some way:

- When you buy CDs or download MP3s, you're purchasing music that was encoded digitally, whether the music is of a string quartet or a techno-pop band.
- If you're watching TV or a movie, you're listening to a musical score that has at least *some* digital elements and was produced using digital music software and hardware.
- Most recording studios use digital hardware and software to record the musicians and singers, and use digital mix-down tools and plug-ins to finish the tracks.
- More and more commercial pop and R&B producers are using prepackaged *beats* (collections of ready-made rhythm section tracks) and then overdubbing them with a live singer or instrumentalists.
- A music student who uses Sibelius or Finale to create a score and then print the parts out for their school orchestra is using digital music creation tools.

Auto-Tune

You don't even need to have a sense of pitch to sing! Auto-Tune is an audio processor created by Antares Audio Technologies (www.antarestech.com). It's used to correct pitch in vocal and instrumental performances and to disguise inaccuracies and mistakes made by the vocalist. Auto-Tune is used as a software plug-in with popular digital audio workstations, such as Pro Tools. (For more on digital audio workstations, or DAWs, check out Chapter 6.)

And the list goes on and on.

And all this digital music is possible because of the Musical Instrument Digital Interface (MIDI), an industry-standard computer program that enables electronic musical instruments (such as synthesizers, computers, and other equipment) to communicate, control, and synchronize with each other. The term *MIDI* refers to both the type of cables and plugs used to connect the computers and instruments, and to the language those computers and instruments use to talk to each other. Almost every electronic musical instrument on the market today has MIDI connectors and can, therefore, be used with other MIDI instruments and with your computer's MIDI interface.

A piece of MIDI music can be transferred back and forth between different music-composing software programs made by different vendors and still work, because it's MIDI-compliant. The MIDI language conveys information and instructions, both from the computer to the instrument and from the instrument to the computer. For example, if you tell your computer that you want your MIDI keyboard to play a note, the computer sends a MIDI message telling the keyboard which note to play. When you tell your computer that you want the keyboard to stop playing that note, the computer sends another message that stops the note from playing. MIDI files contain all the MIDI messages and timing information that are needed to play a song.

Knowing What Equipment to Get

You don't *need* much stuff to start composing digital music. But needs and wants are two very different things. In this section, I fill you in on the most basic of equipment you need to get started, and then let you know about some other cool things you'll probably want. I'll let you and your credit card work that out.

What you need

Even though you may have wanted to use me as your excuse for running out and buying a whole ton of new equipment ("But Russ says I need it, honey . . . "), I'm sorry to say I can't take the rap for that. The truth is, you don't need much to get started composing digital music. Here's the list:

- **A computer:** Any fairly new, off-the-shelf Windows PC or Mac will do the job. Your computer should have a CD-ROM drive so you can use the templates and hear the audio examples on the CD that comes with this book. (The odds of your having a computer that didn't come with a CD-ROM drive and that still works today are slimmer than the odds of all four Beatles reuniting.)
- **Headphones or speakers:** Your computer's built-in speaker is not designed to play high-quality audio, so having a set of speakers or headphones is important if you want to hear your music played back to full effect. You can get a basic pair of headphones for $49 and a basic set of speakers for $29. Try to stay away from ear pods — they don't usually have the full-frequency response you want.
- **Music composing software:** Two types of software programs are used to input digital music into your computer and compose digitally:
  - **Musical notation software:** Musical notation software is software that lets you enter notes into your computer, using digital score paper. Sibelius (on this book's CD) and Finale (shown in Figure 1-1) are two of the most popular programs.
  - **Sequencing and/or digital audio workstation (DAW) software:** Originally hardware, digital audio workstation software records and manipulates audio digitally. Most current DAW software has MIDI sequencing features, and all the DAW software I use in this book has sequencing features. (For more information on sequencing, check out Chapter 6.) DAWs have a big advantage over notation programs: You don't have to know how to read music to use them. Programs such as Ableton, ACID, Cubase, Digital Performer, Logic, Pro Tools, Reason (shown in Figure 1-2), and SONAR are very popular programs. And if you have a Mac, you don't have to spend a dime: GarageBand is included with every new Mac.

  I give you a full rundown of what your software choices are (and how much they'll set you back in terms of cost) in Chapter 6.
- **An Internet connection:** You can download demo or trial versions of most of the software I describe in this book on the companies' Web sites. Using free demos or trial versions is a great way to familiarize yourself with the look and feel of the software and decide whether you like it enough to buy it.

- **A printer:** If you're going to print out your score or parts from the notation software, a printer is a necessary piece of equipment. You don't have to buy an expensive laser printer — you can get a good inkjet printer for around $100.

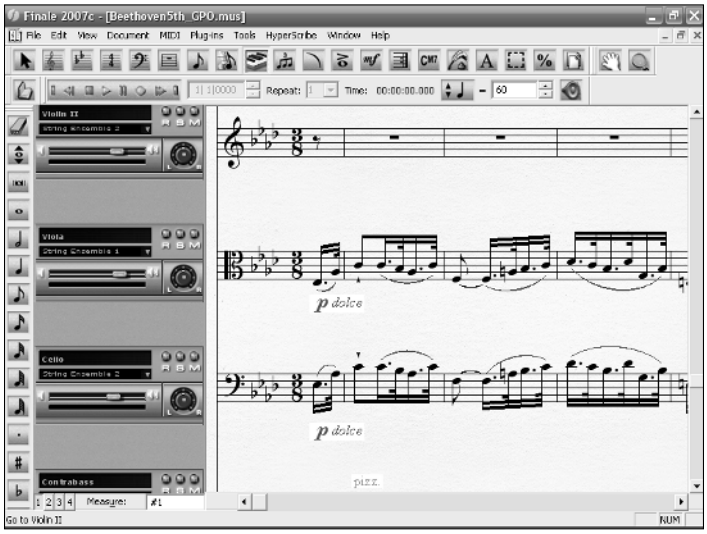

Figure 1-1: Finale 2007 music notation software.

Figure 1-2: The Reason 3 music sequencing rack.

What you'll want

As your musical ideas grow, you'll want a better audio system than the stock computer setup offers you. Here are just some of the things you'll find yourself adding to your wish list:

- **An external audio box:** External audio boxes attach to your computer and let you connect various MIDI devices and speaker systems, and provide a much higher quality sound. (I describe these in more detail in Chapter 4.)
- **More random access memory (RAM):** Memory is pretty cheap these days, and the more you have, the better.

  You don't have to go out and buy a brand-new computer to get more RAM; you can have a computer geek install more RAM for you at any of the major computer stores.
- **A bigger hard drive space:** Eventually, you'll need more hard drive storage to hold the rapidly increasing amount of tunes you've written. External drives, such as ones you can connect to your computer's USB port, are cheap and easy to use.
- **A MIDI controller:** The term *MIDI controller* may sound ominous, but it's really just another instrument, like a piano's keyboard. It's a way to compose your digital music in a more musician-friendly manner, by attaching a piano-like keyboard to your computer and playing the notes right into your software. (In Chapter 12, I show you how to play your notes right into the written music.)

Getting Started with a Composition

You may think that composing digital music is hard, but it's really not so difficult. Composing good music that stands the test of time will always be hard, but learning the tools to create something that's fun to listen to is easy. I provide dozens of templates and even demo software on the CD, to help you get started. After you've installed the software, you can open a template and start to build your first tune.

With digital music tools, trying out lots of different sounds and instruments is easy. You can add guitars and drums, and just copy and paste parts from one template into your digital score on the screen. You can experiment with different notes and tempos, and always go back to the way it was originally.

Digital music can be composed a bunch of ways, even if you don't read and write music. If you have a little experience with written music, notation software, like Finale or Sibelius, is a quick and simple way to write music for many different types of music groups, from small bands to orchestras.

Digital audio workstation (DAW) software, with MIDI sequencing ability, allows you to combine instruments and sounds anyway you can think of. And because it's all digital, you can just back up and undo, or erase a track and start over. You can even import samples and beats from the Web, and build your tune in new and unusual ways.

Burning your tunes

After you've created your masterpiece, you want to share it with others. You can burn it on a CD, send it to your cellphone as a ringtone, export it as an MP3 file from the Internet, or print out parts for your school band to play.

Because most music software interacts with other music software, you can create a tune using one piece of software, and then use another program to edit it into a final product, and save in different digital music formats. For example, if you used notation software (such as Finale or Sibelius) to build your piece of music, you can export it to other MIDI software, like Logic, SONAR, ACID Pro, or other programs. These programs let you change the sound of the piece dramatically (for example, by adding special effects, synthesizer sounds, and even vocal samples).

Using notation software to print out parts for other musicians to play is probably the greatest boon to composers since the invention of the eraser. Now, instead of laboriously writing out each part by hand for every instrument (called *copying* in the music biz), you can just push a button, and every part will be printed out by your desktop printer, and in the right key for each instrument!

Publishing your stuff

Besides burning CDs and emailing MP3s, you have other ways to share your original music. Internet publishing may work for you. Web sites let you share your tunes and help you reach a wide audience. And independent (indie) music distributors give the new artist a bigger financial share of his music than traditional record companies did.

If you compose music using Sibelius, you can post, sell, and share your music on the Web at its online sheet music store, SibeliusMusic (`www.sibeliusmusic.com`). Then anyone using Sibelius's free Web browser plug-in, Scorch, can read, play back, and print your music right from the site.

Indie music publishers offer many options for a new composer. Less rigid than the traditional record companies, they offer your fans CDs and downloads, and give the new artist on the scene greater product control.

But every creative composer needs to be aware of copyright pros and cons. You have to protect your music. Even if you're feeling generous and decide to distribute it to your fans via the Web, you still need to make sure your original work is copyrighted and you're not using someone else's copyrighted material.

The U.S. Copyright Office (`www.copyright.gov`) is where you register sound recordings or printed music for copyright protection. Other organizations that help protect the rights of authors, musicians, and digital artists include the Authors Guild (`www.authorsguild.org`) and the Electronic Frontier Foundation (`www.eff.org`). You should also check out Creative Commons (`www.creativecommons.org`); they provide tools that let you specify the terms of use for your work.

TIP

If you use *samples* (pieces of other people's compositions) in your work, you need to be sure you have permission from the composers, unless the samples you're using are from the *public domain* (music with a copyright that has expired).

Look, Ma — No Hands! Composing from Scratch

Of course, using the templates is really only one way to compose. When you get your composing sea legs, you'll want to stretch out and try your hand at composing from scratch. But you can't start building your opus immediately — you have some decisions to make.

One decision is what the score paper should look like. The term *score paper* is a throwback to the old days of composing, when orchestral compositions were written on manuscript paper. Digital music notation software still uses the term *score paper,* but now it refers to the format you use to build your tune.

What type of score paper you should use depends on what kind of musical group you're writing for: choir, pop band with a vocalist, jazz big band, school marching band. Every type of band uses a different type of score paper.

Other decisions a composer makes is what kind of instruments will play the tune, the tempo of the piece, the rhythmic feel and style, the chord progression, and probably the most obvious element, the notes.

You can enter notes into your computer in a variety of ways:

- Enter each note, one at a time, using either a MIDI controller or your mouse and keyboard.
- Connect your MIDI keyboard to your computer and record your playing right into the software as the tune plays.
- Import your music from other software programs, using different digital file formats, such as MIDI, and change it to your liking.
- Scan printed sheet music right into your computer.

If your tune is for a pop group, a rock band, or a hip-hop loop, the drum track will be very important. Your drum part can be created a lot of different ways, such as recording a live drum set or playing a MIDI controller programmed with drum sounds. You can also import prerecorded samples, loops, and beats.

TIP

Most MIDI compositions use more than one track for the drum part. This lets the composer import a sample or manipulate MIDI data for just one piece of the drum set (called the *kit*) without affecting the other piece. A digital tune commonly has separate tracks for the bass (kick) drum, the snare drum, the hi-hat, the ride cymbal, and other elements (like Latin percussion) that the composer wants to use. You can then add effects, like reverb, or adjust the volume of each part independently.

Taking Your Music to the Next Level

If you want to kick up your music and run with the big dogs, you need to know how to write chord progressions, countermelodies, intros, and outros.

The chord progression is a fundamental part of pop, jazz, country, rock, and lots of other types of music. A *chord progression* is the framework of chords that are used in your tune. *Chord symbols* are written to specify which chord should be played and when. A songwriter may create the chord progression at different stages of composing, either after he's made up the melody or, first, before he thinks of a melody to go with his lyrics.

In professional music situations, like a jazz combo performance, the chord progression is called the *changes,* and the pros are expected to know the changes to a lot of music, both popular and not so popular (like jazz standards).

Many guitarists don't read the dots and squiggles that make up music notation. This is why most music also writes the guitar part in *tablature* format, in addition to the regular note format. Tab (as it's called) lets the guitarist know exactly where to place his fingers.

Lyrics are important to have in a score, if there's going to be some vocalizing. All notation software lets you add lyrics, so when you print out the parts, the singer gets a part, too.

You also want to add finishing touches to your music, by composing countermelodies, and introductions and endings for the tunes. A countermelody is a series of notes that isn't the main melody, but may be played at the same time as the melody.

When you really get into composing and want to take your music to the next level, your first step may be to build your own basic home studio, like the one shown in Figure 1-3. In this simple studio setup, your MIDI keyboard controller goes into your computer using a USB connection, and the output audio goes to an external receiver with speakers, or directly from the speaker outputs on your computer's audio card.

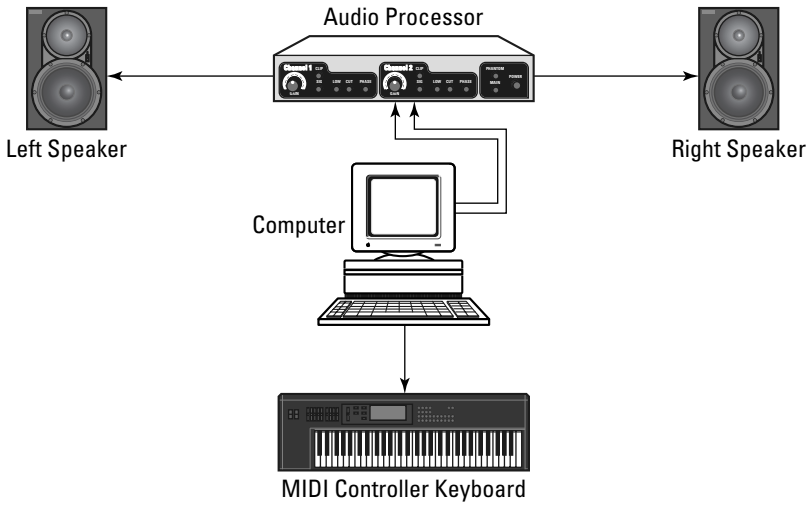

Figure 1-3: A simple home studio setup.

However you follow your musical muse, digital music will be there for you to use as creatively as you'd like. As Meshell Ndegeocello told me: "I believe these advancements in technology create an environment of seekers and followers, mediocrity and genius. . . . For a moment I'm transported to when I was a teen and got my first multi-track recorder, electronic drum machine, and MIDI sequencer. I'm still the same as I was then. I just want to make some groovy sounds."