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Chapter **1**

Understanding Home Recording

Audio recording is a fun and exciting activity. Being able to put down your musical ideas and craft them into an album is nearly every musician's dream. The only problem is the learning curve that comes with being able to record your music at home; most musicians would rather spend their time and energy making music.

In this chapter, I help you get a handle on the basics of home recording and show you what's involved in the process. You discover the basic components of a recording studio and find out what gear you need to buy first. In addition, you explore the multitracking process and find out what's involved in mixing your tracks. You move on to exploring mastering and finding ways to share your music with your listeners.

Examining the Anatomy of a Home Studio

Whether it's a free phone app or a million-dollar commercial facility, all audio recording studios contain the same basic components. Understanding these basic components is an area where many people get lost and one about which I receive the most email. As you glimpse the recording world, you'll inevitably think that

recording your own music will cost way too much and be way too complicated. Well, it can be. But it can also be pretty simple and cost-efficient. In the following sections, I present a list of audio-recording essentials and offer insight into cost-saving and efficient systems that you can find on the market.

Exploring the recording essentials

To take the mystery out of recording gear, here are the essentials that you need to know:

- » **Sound source:** The sound source is your voice, your guitar, your ukulele, or any other of the many sound makers in existence. As a musician, you probably have at least one of these at your disposal right now.
- » **Input device:** Input devices are what you use to convert your sound into an electrical impulse that can then be recorded. Here are the four basic types of input devices:
 - **Instruments:** Your electric guitar, bass, synthesizer, and drum machines are typical instruments you plug into the mixer. These instruments constitute most of the input devices that you use in your studio. The synthesizer and drum machine can plug directly into your mixer or recorder, whereas your electric guitar and bass need a direct box (or its equivalent, such as an instrument or Hi-Z input in your audio interface) to plug into first. A *direct box* is an intermediary device that allows you to plug your guitar directly into the mixer. Chapter 9 explores instruments and their connections to your system.
 - **Microphones:** A microphone (or mic) enables you to record the sound of a voice or an acoustic instrument that you can't plug directly into the recorder. A microphone converts sound waves into electrical energy that can be understood by the recorder. I detail several types of microphones in Chapter 6.
 - **Sound modules:** Sound modules are special kinds of synthesizers and/or drum machines. What makes a sound module different from a regular synthesizer or drum machine is that a sound module contains no triggers or keys that you can play. Instead, sound modules are controlled externally by another synthesizer's keyboard or by a Musical Instrument Digital Interface (MIDI) controller (a specialized box designed to control MIDI instruments). Sound modules have MIDI ports (MIDI jacks) that enable you to connect them to other equipment. Chapter 11 digs into the details about sound modules.
 - **Software synthesizers:** Software synthesizers (also known as *softsynths*) are software programs that don't need hardware MIDI connections because the sound modules are stored on your computer's hard drive.



REMEMBER

Depending on what your sound source is, it may also be an input device. For example, an electric guitar has pickups that allow you to plug it directly into a mixer input without having to use a microphone. On the other hand, your voice can't accept a cord, so you need to use a mic to turn your singing into an electrical impulse that can be picked up by your mixer or equivalent device. You can find out more about input devices in Chapter 9.

- » **Mixer:** You use a mixer to send the electrical signal of your input device into your recorder and to route signals in a variety of ways. Traditionally, a mixer serves the following purposes:
 - **Routing your signals into your recorder:** This allows you to set the proper level for each input device so that it's recorded with the best possible sound. Chapter 4 explores the different mixer-type devices for this purpose.
 - **Blending (mixing) your individual tracks into a *stereo pair* (the left and right tracks of your stereo mix) or surround sound channels:** This role of the mixer is where your vision as a music producer takes center stage and where you can turn raw tracks into a polished piece of music. Chapter 16 explores this use of a mixer.
- » **Recorder:** The recorder stores your audio data. For most home recordists, the recorder is digital. You can find out more about the different types of recorders in the next section of this chapter.
- » **Signal processors:** Most of the time, you have to tweak your recorded tracks. Signal processors give you the power to do this. Signal processors can be divided into the following basic categories:
 - **Equalizers:** Equalizers let you adjust the frequency balance of your tracks. This is important for making your instruments sound as clear as possible and for getting all your tracks to blend well.
 - **Dynamics processors:** Dynamics processors are used to control the balance between the softest and loudest parts of your tracks. They have many uses in the studio to help you make your tracks sit well together and to keep from overloading your system. Chapters 9, 19, and 22 explore ways to use dynamics processors in your music.
 - **Effects processors:** Effects processors allow you to change your tracks in a variety of ways, such as to create a more realistic sound or unusual effects. Typical effects processors include reverb, delay, chorus, and pitch shifting. You can find out more about these processors in Chapter 19.

- » **Monitors:** Monitors, such as quality headphones or speakers, enable you to hear the quality of your recording and mixing. Monitors come in three basic designs:
- **Headphones:** Headphones come in an astonishing variety. Some are good for listening to music, while others are good for recording and mixing music. Most home recordists start with headphones because they typically cost a lot less than speakers and serve the double duty of allowing you to hear yourself while you record and allowing you to hear the mix when all your tracks are done.
 - **Passive:** Passive monitors are like your stereo speakers in that you also need some sort of amplifier to run them. A ton of options are available with prices from around \$100. Just remember that if you go this route, you need to budget money for an amp, which can run a few hundred dollars or more.
 - **Active:** Active monitors have an integrated amplifier in each speaker cabinet. Having a built-in amp has its advantages, including just the right amount of power for the speakers and short runs of wire from the amp itself to the speakers (this is kind of a tweaky area that some people claim produces a better sound). You can find quite a few active monitors on the market starting at just a couple hundred dollars.

Checking out recording system types

With the long list of equipment that I present in the previous section, you may think that you need to spend a ton of money to get everything you need. Fortunately, home-recording systems are available that contain many of the components you need, so you don't have to buy everything separately. I go into detail about these systems in Chapter 2, but here's a basic overview:

- » **Studio-in-a-box (SIAB) systems:** These are all-in-one units that have everything in them except for the sound source, input device, and monitors. For very little money (starting well under \$500), you get almost everything you need to start recording. These types of systems are also easy for a beginner to use and are great for musicians who don't want to spend a ton of energy tweaking their setups.
- » **Computer-based systems:** These systems, often referred to as Digital Audio Workstations (DAWs) use the processing power of your computer to record, mix, and process your music. Computer-based systems, similar to the SIAB systems, perform many of the typical recording functions at once. When you have one of these systems, you only need your sound source, your input devices, and your monitors.

» **Ultra-portable systems:** Even though the rest of the systems I describe here can be portable, ultra-portable systems are designed so that you can record nearly anywhere with little fuss. These types of systems include smartphones, linear recorders, and tablet computers, which I introduce in Chapter 2. Like SIAB and computer-based systems, most of what you need is included, so all you have to worry about are your sound sources, input devices (or not — some come with mics already), and monitors (most often just a set of headphones).

Getting a Glimpse into the Recording Process

It's easy to focus on all the gear that's used in audio recording and think that the process must be pretty complicated. Well, it can be if you want it to, but it doesn't have to be. The heart of recording over the last 60 years or so has been an approach called *multitracking*. At its core, multitracking involves recording all the instruments on separate tracks so that you can mix them later almost any way you want. You can multitrack by recording everything — or at least most of the instruments — at one time, just like a live performance, or you can go to the other extreme and record each instrument separately. Either way, you need a bunch of tracks to be able to record to, and you need to understand how to blend all these separate pieces into something musical.

Setting up a song

The first step in recording your music is to set up your system to record. Because you're probably using a digital system, you need to configure your song. This usually involves setting the file type, bit depth, and sample rate. This process is one that you'll become very good at in no time. For the lowdown on setting up songs in various systems, check out Chapter 5.

Getting a great sound

Getting your sound source to sound great in your system is the most important aspect of recording quality music (well, aside from the song and the performances). This is also an area where you'll constantly be growing and learning. I've been recording professionally since 1985, but I still discover something new every time I set up a mic or plug in an electronic instrument. Any time you spend tweaking your mic placement or recording chain setup (configuration and levels)

is time well spent, and the reward is often added clarity or at least a more interesting sound. For an introduction to the intricacies of recording high-quality source sounds, check out Parts 2 and 3 of this book.

Recording

After you have everything set up, the actual process of recording your music properly is pretty straightforward: You enable your track and press the Record button. This is easier said than done when the clock is ticking and you know that every mistake you make is being documented. Luckily, digital recording makes it easy to redo a track without costing you anything in audio fidelity. (It will cost you time, but because you record at home, you may have more time to get your recording right.) Check out Chapter 10 for the specifics on recording using a variety of digital systems.

Overdubbing

With one track recorded, you're ready to dig into one of the most invigorating parts of the multitracking process: overdubbing. *Overdubbing* is the process of adding new tracks to your existing ones. This feature allows you to be the one-man band or to bring in other musicians to spice up your music. Overdubbing is easily done with digital multitrack recorders. To get you going quickly, I cover the details in Chapter 10.

Making Sense of Mixing

For most recordists, the process of mixing is what turns their mishmash of musical tracks into a song. Mixing involves the following steps:

- » Cleaning up your tracks by removing unwanted noise and performance glitches
- » Equalizing each track so that it blends well with all the others
- » Adding signal processing to enhance each track
- » Blending your tracks to tell the story you want to tell with your song
- » Embellishing your tracks with special effects or unique sounds

The following sections offer an overview of these steps.

Cleaning up tracks using editing

When you record, you want the best possible sound and performance for each instrument that you can get, but try as you might, sometimes you run into problems. These can include picking up unwanted sounds, such as chair squeaks, coughs, or other instruments, and can include (and often does) mistakes a musician makes that need to be cut out. In the olden days of tape recording, this editing process, which involved physically cutting out the bad parts of the tape with a razor blade, took time and skill. Today, you can do the necessary editing by using the editing functions in digital systems. This is nice, but it can also tempt you into editing your tracks more than is necessary and, as a result, can suck the life out of them. To help you understand what you can do with digital recording systems and to help keep you on track with your editing, check out Chapter 15.

Equalizing your tracks

When you start mixing a bunch of instruments, you often need to adjust the frequencies present in each instrument so that they all blend without creating mush (a highly technical term). By adjusting the frequencies of each instrument in the mix, you can make sure that each can be heard. This process is simple, but it can be time consuming. To make it easier for you, I cover equalization (EQ) in detail in Chapter 17.

Processing your signal

In the world of multitracking in small, acoustically untreated recording rooms (most home recordists use a spare bedroom or basement to record in and don't have a ton of money to make the room sound great), it's almost essential to process the sound with effects or dynamics processors. Doing so is usually intended to add the feel of a live concert to the recording, although many people also use signal processing to create interesting effects. Because the possibilities for processing your track using a digital system are almost limitless, this is an area where most beginners overdo it. The ability to alter your tracks can be used and abused — I cover the basics of processing in Chapter 19 to help you keep the abuse to a minimum.

Blending your tracks

This is also a process in which most new recordists run into problems. Properly mixing your tracks means keeping levels from getting out of hand, placing things where you want them in the sound field (left to right and front to back), adjusting EQ to blend all your instruments in a pleasing way, and using signal processors,

such as compression and reverb, to make the most of each track. This process is a circular one and takes skill and patience to get right. Cutting corners always results in an end product that falls short of its potential. To help you make this process easier, I cover mixing in detail in Chapters 20 and 21.

Adding the Final Touches

After your songs are recorded and mixed, all that's left to do is add the finishing touches. These include mastering your songs, putting them all on CD, and getting them out into the world through promotion.

Mastering your mixes

Mastering is an often-misunderstood (and even unknown to many) part of the music production process that can make or break a CD (well, not literally). Mastering consists of several important steps that are intended to polish your songs so that they make up a complete collection on a CD, commonly referred to as an album. Here are the steps for mastering your songs:

1. Optimize the dynamics.

The goal here is to get the dynamic levels within and between each song to their best. It also means making your music *smooth* (no sharp edge to the music) or *punchy* (a pronounced attack) — or something in between. Unfortunately, most people are concerned only with getting their CDs as loud as possible when performing this part of mastering. This isn't a good idea, as you find out in Chapter 22.

2. Adjust the overall tonal balance.

The point of this part of the mastering process is to create tonal continuity among all the songs on your CD. Because you probably recorded and mixed all your tunes over a period of months, each song may have slightly different tonal characteristics. This part of mastering is where you make all your songs consistent so that they sound like part of an album and not a bunch of disjointed tunes thrown together haphazardly.

3. Match the song-to-song volume.

When your listeners play your CD, you don't want them to have to adjust the volume of each song as it plays (unless they absolutely love a particular tune and want to turn it up, of course). The goal with this part of mastering is to get the volume of all the songs on a CD at pretty much the same level. This keeps one song from barely being heard while another threatens to blow the speakers.

4. Set the song sequence.

How your songs are arranged on your CD helps tell your story. Think about how the order of each song on your album can make the most compelling musical statement. This part of the mastering process involves not only deciding what order everything should be in but also the steps you take to make it happen.

Putting your music out into the world

Formatting your finished and mastered songs for distribution and sales is one of the most exciting parts of the recording process. At last, you have a product, a complete musical statement that you can share with (or sell to) others. Like a lot of audio recording and production, the act of making distributable and saleable music is more involved than simply clicking the Burn button in your CD-recording program (at least if you want to make more than one copy) or uploading your music to a website.

In today's largely digital world you have two basic distribution methods: streaming/downloadable music and physical CDs. As a throwback, more and more people are releasing music on vinyl records today.

Dealing with digital distribution

All music is now delivered, first and foremost, as a digital file. MP3 and AAC are the most popular formats. Depending on where your music goes, such as Spotify, Apple Music, or any of a myriad of other Internet music sites, you need to encode your music to meet the site's requirements. It's a pretty simple process, but one that's closely tied to an area most musicians would rather not have to deal with: promotion. I cover this topic in Chapter 25.

Creating CD copies

For CD copying, you can either duplicate or replicate your CDs to make copies to give or sell to your fans. Here's a quick rundown on the differences between these two approaches (Chapter 23 explains them in detail):

- » **Duplication:** Duplication consists of burning multiple CD-Rs from an audio file. Duplication requires very little setup, so it doesn't cost much to make smaller quantities, such as 50 to 500 CDs.
- » **Replication:** The replication process starts with producing a glass master from your finished CD-R. This master CD is then used to create CDs using special CD presses, just like the major-label releases. Replication costs a bit more for setup, but the cost to create larger quantities of CDs is lower than that for duplication. This is a good choice for quantities of 500 or more.

Embracing vinyl

Many indie musicians are also embracing vinyl as a medium for their music. There are several reasons, many of which relate to creating a more compelling product. It's also worth mentioning that vinyl is much harder to pirate than a downloadable digital file. This is adding to appeal of vinyl records as a cost worth considering. I cover the details of making vinyl records in Chapter 23.

Promoting your music

The final and most grueling step of recording and putting out a CD is the promotion process. This is where you either make it or break it as an independent artist. To help you along, I offer ideas and insights in Chapter 25.