AUDIO PRODUCTION BASICS with

REASON SOFTWARE

ZAC CHANGNON

ONLINE MEDIA INCLUDED

Audio Production Basics with Reason Software

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with contributions by

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NextPoint Training, Inc.

Reason 11

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Contents

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Welcome to the World of Audio

Sounds are all around us. They make our world interesting, informative, and engaging. It's only natural to want to capture these auditory experiences—the sounds we like, the sounds we want to share, and the sounds we create. That is truly what audio production in Reason software is all about: creating, capturing, and sharing sound.

Reason Intro software provides a perfect springboard for learning the basics of audio production and improving the results of all your audio endeavors. This book has been written for readers using any edition of Reason software (Reason Intro, the full Reason software, or Reason Suite). Everything discussed in these pages applies equally to all editions of the software, unless otherwise noted. The included exercises are fully compatible with a basic Reason Intro setup. No additional hardware or software is required.

With this book, you're taking the first step toward discovering the power of Reason software and unlocking your audio creativity. Whether you've selected this book to use for self-study or have picked it up as the required text for instructor-led classroom training, you will find that it covers the principles of audio production from the ground up. It also gives you everything you need to know to fully understand the role of Reason in today's landscape of digital audio workstations (DAWs).

Getting Started in Audio Production

This book teaches the basics of recording, editing, mixing, and processing audio and MIDI using Reason software. It also provides plenty of power tips to take you beyond the basics and unleash the true power of using Reason as a creative tool. Additionally, the principles you learn in this book will apply equally to other commercial products used to create, record, edit, and process digital audio. This means you'll have a solid foundation, if you should upgrade your Reason software in the future, or switch to another digital audio workstation altogether, or even find yourself working in a full-fledged commercial studio down the line.

Who Should Read This Book

Although this book is written to support the entry-level Reason Intro software, the concepts apply equally to the full Reason edition and the expansive Reason Suite option. As such, this book serves as a resource for users of any edition of Reason software. Learners who are running full Reason or Reason Suite can use this book and complete the included exercises in a manner that is virtually identical to those running Reason Intro software.

To ensure that the topics covered in this book apply to all versions of Reason software, we have included additional details on the differences between platforms where they apply. This book is designed to help new and inexperienced users get started with little or no background knowledge. However, the scope is not limited to novice users who are experimenting with DAWs for the first time.

What Is Reason Intro?

Reason Intro is a low-cost, entry-level version of Reason software. It is available via download from reasonstudios.com for use by anyone who wishes to get started creating Reason projects on a limited budget. The Intro software is upwards-compatible with professional versions of Reason, allowing complete freedom to open Reason Intro projects on systems running full Reason or Reason Suite. However, Reason Intro is not able to open projects created with full Reason or Reason Suite.

Reason Intro runs on any compatible host computer. It does not require any additional hardware or software component add-ons. Reason Intro comes with various effects and instrument devices as well as a moderate collection of sounds and samples.

As you will learn, Reason Intro includes nearly all of the audio production features and capabilities found in full Reason software, limited primarily by a restricted track count and fewer included devices.

However, the depth of features that Reason Intro includes makes it an ideal learning environment and an excellent springboard for advanced Reason use.

About This Book

This book is designed for use in a formal course of study. The text and associated instructor-led course were developed by NextPoint Training, Inc. (NPT) as part of our Digital Media Production program and certification offerings. While this coursebook can be completed through self-study, we recommend the hands-on experience available through an instructor-led class with an NPT Certification Partner.

For more information on the classes offered through the NextPoint Training Digital Media Production program, please visit https://nxpt.us/DigitalMedia. For information on how your school can become an NPT Certification Partner, please visit https://nxpt.us/CertPartner.

Requirements and Prerequisites

This course does not require any specific background knowledge of computer systems, recording technology, or digital audio workstations. However, before starting to work with Reason software, it definitely helps to have at least a passing familiarity with computer concepts and recording gear. If you consider yourself a novice in these areas, pay special attention to the first four chapters of this book.

To try out the concepts and complete the exercises in this book, you will need to use a compatible computer and install Reason Intro software (or another edition of Reason software). Details on computer requirements are provided in Chapter 1, and installation details for Reason Intro are provided in Chapter 2.

If you will be using other connected audio or MIDI hardware, you may need to install device drivers for those components. Consult the documentation that came with your hardware or search the manufacturer's website for details.

Media Files

This book includes exercises at the end of each chapter that make use of various media files. The media files can be accessed by visiting www.halleonard.com/mylibrary and entering your access code, as printed on the opening page of this book. Instructions for downloading the media files are provided in Exercise 1.

The media files for the exercises in this book have been provided courtesy of The Pinder Brothers, Eric Kuehnl, and Fotograf.

Course Organization and Sequence

This course has been designed to teach you how to get the most out of your work with Reason software. The material is organized into 10 chapters, as follows:

- **Chapter 1. Computer Concepts**—What you need from a computer
- **Chapter 2. DAW Concepts**—What you need from your DAW
- **Chapter 3. Audio Recording Concepts**—What you need to record audio
- **Chapter 4. MIDI Recording Concepts**—What you need to record MIDI
- **Chapter 5. Reason Concepts, Part 1**—What you need to know to get started with Reason software
- **Chapter 6. Reason Concepts, Part 2**—What you need to know to work with Reason software
- **Chapter 7. Mixing Concepts**—What you need to know to mix a project
- **Chapter 8. Signal Processing**—What you can do to optimize your audio
- **Chapter 9. Finishing a Project**—What you need to do to create a stereo mixdown
- **Chapter 10. Beyond the Basics**—What to explore to become a power user

Users who have experience with computers and other DAWs may wish to skim the first four chapters, focusing mostly on the details that are specific to Reason software.

Conventions and Symbols Used in This Book

Following are some of the conventions and symbols we've used in this book. We try to use familiar conventions and symbols whose meanings are self-evident.

Keyboard Shortcuts and Modifiers

Menu choices and keyboard commands are typically capitalized and written in bold text. Hierarchy is shown using the greater than symbol (>), keystroke combinations use the plus sign (+), and mouse-click operations use hyphenated strings, where needed. Brackets ([ ]) indicate key presses on the numeric keypad.

Convention	Action
File > Save Session	Choose Save Session from the File menu.
Ctrl+N	Hold down the Ctrl key and press the N key.
Command-click (Mac)	Hold down the Command key and click the mouse button.
Right-click	Click with the right mouse button.
Press [1]	Press 1 on the numeric keypad.

Icons

The following icons are used in this book to call attention to tips, shortcuts, listening suggestions, warnings, and reference sources.

Tips provide helpful hints and suggestions, background information, or details on related operations or concepts.

Shortcuts provide useful keyboard, mouse, or modifier-based shortcuts that can help you work more efficiently.

Power Tips provide shortcuts and tips for power users that can dramatically speed up your work but that go beyond the scope of the current discussion.

Listening Suggestions refer you to audio examples that illustrate a concept or technique discussed in the text.

Warnings caution you against conditions that may affect audio playback, impact system performance, alter data files, or interrupt hardware connections.

Cross-References alert you to another section, book, or resource that provides additional information on the current topic.

Online References provide links to online resources and downloads related to the current topic.

Chapter 1

Computer Concepts

…What You Need from a Computer…

In this chapter, we introduce you to the basic components of a computer system and the minimum configuration required to run Reason software. We also discuss how to configure the hardware for your system and how to configure your computer's software settings for optimal results. Lastly, we take a brief look at how to work within your digital audio workstation, using Reason Intro as an example.

Learning Targets for This Chapter

- Understand how to select a computer for your digital audio workstation
- Understand how to navigate your computer's operating system for basic file management purposes
- Understand how to set preferences for your computer and your software
- Understand how to perform basic operations with your digital audio workstation

Key topics from this chapter are illustrated in the Reason Audio Production Basics Study Guide module available through the Elements|ED online learning platform. Sign up at ElementsED.com.

Selecting the right digital audio workstation (or DAW) involves many considerations: What features do you need? How big will your projects be? What kind of production work do you intend to do? What kind of system can you afford? And so on. Prior to making a purchase, you would be wise to check out a trial version or low-cost (feature-limited) edition of the product you are considering, if one is available.

Fortunately, for those considering Reason as their DAW of choice, Reason Studios (formerly Propellerhead) offers Reason Intro software at a reduced price. Although Reason Intro does have certain limitations, it is remarkably full featured. Reason Intro provides the same powerful workflow as the full version of Reason but with a smaller set of built-in devices and sounds and a limited number of tracks, making it an ideal learning environment for new users.

Prior to purchasing any version of Reason, you can start working with Reason for free. Reason Studios offers a 30-day trial for Reason that provides the full set of features with no limitations. In addition, even without a paid Reason license or access to the trial period, Reason software can run in Demo Mode, which allows you to test out the features of the software with certain restrictions to its use.

See Chapter 2 for more information about using Reason software in Demo Mode.

Figure 1.1 Full version of Reason software with plug-in windows open

Before installing Reason (or other DAW software), you'll need to verify that your computer system meets the minimum requirements for the software. Once you've cleared that hurdle and installed the software on a suitable computer, you will want to configure your computer and the software application for optimal

performance. This chapter will help steer you in the right direction for these and other considerations to get a system up and running successfully.

Selecting a Computer

In this section, we will look at how to select a computer for use with Reason or another digital audio workstation of your choice. We will also look at options for optimizing your computer setup to get the most out of your work environment.

Mac Versus Windows Considerations

One of your first considerations is whether to run your DAW on a Mac-based computer or a Windows-based computer. This decision is primarily one of personal preference, but it may also be based on the kind of system you already own.

If you are purchasing a new system for your DAW, understanding some general characteristics of Macs and Windows machines may help you decide on one platform versus the other.

Mac-Based Computers

One of the big selling points for Macs is how well they interact with other Apple products: iPhones, iPads, Apple TVs, and the Apple Watch. If you have already bought into the Apple ecosystem, it may make sense to purchase a Mac for that reason alone. You will find the user experience on a Mac to be similar to that of other Apple products in many respects.

Interoperability aside, Mac systems have a reputation for being easy to use and simple to understand. Additionally, Macs are known for high-quality construction and attention to detail in their design.

The downside to purchasing a Mac is the higher price you will pay for those features and conveniences. You will likely spend more for a Mac system than you would for a similarly configured Windows system.

Windows-Based Computers

Windows-based computers are available from many different manufacturers, giving you an abundance of choices when selecting a system. The competition between manufacturers means it may be easier to find a system that meets your needs at a more affordable price.

In addition to competitive pricing, Windows computers may also have an advantage in terms of the applications they support. If you use certain Windows-only applications for personal or work-related purposes, you may find that issue to be a deciding factor in your choice of platform.

Whichever platform you choose—Mac or Windows—be sure to purchase a system with adequate random access memory (RAM), processing power, storage space, and connectivity options to support your needs.

The Importance of RAM

A computer's installed RAM determines how much data and information can be stored in the computer's memory at any given time. RAM is generally used for temporary storage while an application is running. The RAM allocation is typically measured in gigabytes (or GB).

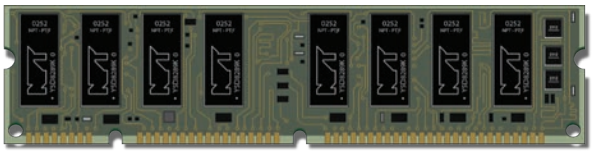

Figure 1.2 Illustration of a typical RAM module

Running Windows on a Mac

If you prefer to work on a Mac but need to run Windows for certain applications, several options are available. Modern Macs allow you to run a Windows operating system (OS) on your Mac hardware. You can configure a Mac to run Windows 10, for example, using either a separate disk partition or a virtualization software option.

To configure a separate disk partition for Windows 10, you can use the Boot Camp Assistant utility that comes with your Mac. This utility will partition your drive and guide you through the installation process for the Windows OS. If you use this option, you will need to restart your computer whenever you wish to switch between Mac OS and Windows OS.

To run Windows 10 with virtualization software instead, you can purchase and install software such as VMware Fusion or Parallels Desktop. These applications allow you to run a Windows OS on your Mac desktop without rebooting.

For either option, you will need to purchase Windows 10 separately. Factor this in when considering the total budget for your system. The virtualization software (if used) and the Windows OS may also impact the amount of RAM, storage space, and processing power required for the system.

How RAM Is Used

When you select a paragraph of text in a word processor and choose the **Edit > Copy** command, the text is stored temporarily in RAM. You can then move your cursor to a new location in the document and choose **Edit > Paste**. The text stored in RAM gets added to the document at the current cursor location.

Most applications also use RAM to keep track of the work you do in your open documents. As you work, a record of your changes and edits is saved in RAM. This allows you to use the **Edit > Undo** command, for example, to reverse any changes you've made.

The code required to run the application is also stored in RAM while the application is running. This allows the computer to work faster than it would if it had to run the application entirely from the hard drive.

Storing data in RAM allows the information to be retrieved and operated on very quickly.

However, once you quit an application or shut down your computer, the information stored in RAM is lost. That is why you must save your changes to permanent storage first.

Why More RAM Is Better

DAWs such as Reason rely on RAM to work efficiently. Like a word processor, a DAW uses RAM for edit operations. Your DAW will also use RAM to keep track of your changes and undoable actions.

The more RAM your computer system has installed, the more memory will be available to your DAW software for temporary storage. This means the application can run more efficiently, you can copy and paste larger amounts of data, and you can maintain a longer list of complex undoable actions.

Symptoms of insufficient RAM can include sluggish behavior, frequent error messages, long pauses (or hangs) when you perform certain actions, and sudden crashes.

DAW manufacturers typically publish minimum RAM specifications required to run the application. They may also suggest that you install more RAM for more efficient operation. For work on very large or complicated projects, you may want to exceed the manufacturer recommendations.

RAM Required for Reason Intro

The minimum RAM allocation to run Reason Intro on either a Mac or a Windows computer is 4 GB, with 8 GB or more recommended. If you plan to run Reason Intro at the same time as other applications (iTunes, a web browser, an email client, etc.), you would be wise to target the high side of these numbers.

Installing More RAM

Depending on the model of computer you buy, you may be able to add more RAM at a later time, as your needs grow. This can help keep the initial purchase price down. If this is your plan, make sure to do your homework before purchasing a computer. Certain models (especially "budget" options) have RAM chips soldered in place and cannot be upgraded later with more.

Also note that upgrading RAM often requires you to replace all RAM in the computer, rather than simply adding to the existing RAM. Most computers have an even number of memory slots, with RAM assigned in pairs across them.

For example, a laptop may have 4 GB of RAM allocated across two available memory slots. In such a case, each slot will have a 2 GB memory module installed. To upgrade to 8 GB of RAM, you would need to replace each module with a new 4 GB module. (RAM modules should be added in matching pairs.)

Processing Power

The processing power, or how fast a computer runs, is a function of the computer's central processing unit, or CPU. The CPU is responsible for performing all of the processing and calculations required by an application.

Figure 1.3 The computer's central processing unit determines how fast the computer can run.

Processing Speed. The speed of a CPU is based on its clock speed. Clock speeds for modern computers are measured in gigahertz (GHz), or billions of cycles per second. A 1 GHz processor, for example, can process up to one billion instructions per second. The faster the CPU, the more powerful the computer, and the faster your applications will run.

Processor Cores. Another consideration is the number of processing cores in the computer chip. Many computer chips today offer dual cores, quad cores, or more. This means that the CPU includes multiple processing units within a single chip. The benefit of multiple cores is that the computer can process multiple instructions at one time. This in turn allows modern applications to run faster and more efficiently.

Hyper-Threading

Many CPUs support hyper-threading as an alternative (or supplement) to multiple physical cores. Intel's hyper-threading technology allows a single physical core to perform as two virtual cores. This has the same benefit as adding physical cores, as it doubles the number of instruction threads that the CPU can process at once when running an application.

How Processing Power Affects Your DAW

A host-based DAW like Reason relies on the processing power of the host computer for all audio editing, mixing, and processing. A system with insufficient processing power may exhibit sluggish performance, unwanted audio artifacts, and frequent error messages. Projects involving large track counts and heavy use of audio devices will be more susceptible to issues.

Certain audio processes are especially CPU-intensive. Some examples of common practices that may tax your CPU include the following:

- Retaining unused devices in a project or activating main mixer channel components (such as the EQ section) that are not needed
- Creating complex chains of effects devices, especially convolution reverbs and analog gear emulations

- Using many instrument devices or plug-ins in a project
- Connecting and routing devices in stereo when only a mono signal is needed
- Creating many instances of a certain effect, such as a reverb device, instead of sharing a single reverb device among multiple tracks as a send effect

To avoid running into processing limitations as your projects grow in complexity, look for a multicore CPU that runs at a reasonably high speed.

Processing Requirements for Reason Intro

Reason Studios does not specify a minimum CPU speed requirement for Reason Intro but instead simply indicates the need for a multicore Intel processor. Alternatively, a multicore AMD processor can be used with a Windows system. However, an Intel Core i7 dual-core processor running at 2.0 GHz or better (or a comparable AMD processor in a Windows system) is recommended.

Most computer systems available today meet the minimum CPU requirements to run Reason Intro.

Reason Intro supports multithreading, so you will get better performance out of a quad-core processor than you will out of a dual-core, for example.

Always Check Compatibility Before You Buy!

New versions of Reason often have more stringent compatibility requirements than previous versions. Prior to buying a system, be sure to check the compatibility requirements on the Reason Studios website.

Requirements for Reason 11 can be found at the following web address:

- https://help.reasonstudios.com/hc/en-us/articles/360002215674-What-are-the-minimum-system-requirements-for-Reason-11-

Storage Space

Another important consideration when buying a computer is the amount of storage space the computer provides. This is a function of the computer's installed hard disk drive (HDD) or solid state drive (SSD). The size of the storage drive determines how many applications you can install and how much space you will have for saving files on your system.

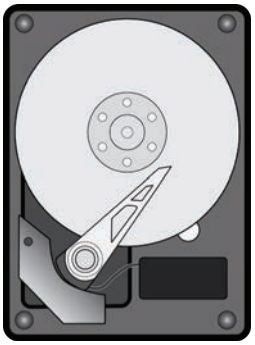

Figure 1.4 Illustration of a hard disk drive

Determining How Much Drive Space You Need

When determining storage requirements for your DAW, you will need to consider multiple factors:

- How much space is required to install the DAW software application itself
- How much space is required to install the plug-ins you intend to use with the DAW
- How much space you will need for the projects and media files that you create with the DAW
- How much space you will need for other media files that you may want to use with the DAW (such as sample libraries, loop libraries, and sound effects)

In addition, you may need to consider the impact of other files and applications that you want to use on your computer. For example, if you plan to store your digital photos and your personal music collection on the computer, you will need to allocate additional space for those purposes.

Likewise, if you will use the computer for work in programs such as Microsoft Word, PowerPoint, and Excel, you will need additional space to install each of those applications.

Installation Requirements for Reason Intro

To install Reason Intro software, you will need a minimum of 4 GB of storage space for the application. Reason Intro may also need up to 20 GB in *scratch* storage space. This is storage space used to temporarily hold recorded audio that has not yet been saved into a song project file, as well as audio data that is generated from operations such as time stretching.

The drive used to provide scratch storage space can be changed in Reason's preferences.

The full version of Reason requires an additional 8 GB to install included optional devices and sound library content, totaling 12 GB of required storage space. Reason Suite adds another 12 GB of optional devices and content, for a total of 24 GB required to fully install the software.

Storage Options

Many storage options are available for today's computer systems. A computer's internal system drive may be either an HDD or an SSD. The internal storage can be supplemented by any number of external drives and storage options. To allow your files to be accessed from anywhere, you can also consider cloud-based storage.

HDD Versus SSD Storage

HDD. Hard disk drives use spinning metal disks to store data. The more disks in the drive, the higher the data capacity. Storage sizes for modern HDDs typically range from around 1 to 4 terabytes (TB).

The data transfer speed for an HDD is based in part on the speed of the spinning disks, measured in revolutions per minute (RPM). Common options include 5400 RPM drives and 7200 RPM drives.

Hard disk drives provide greater storage capacity at a lower price than their solid state counterparts.

SSD. Solid state drives, by comparison, use flash memory instead of spinning metal disks for storage. The storage capacity of an SSD is based on the number and size of memory chips it has. Storage sizes for SSDs typically range from 256 GB to 1 TB.

Solid state drives provide faster access speeds than HDDs, meaning they provide better read/write performance for the computer's functions. This is noticeable in faster startup times for the computer, faster launch times for applications, and faster file transfers among systems and drives.

Solid state drives also require less power than HDDs. This gives them an advantage for laptop computers and mobile devices. Additionally, SSDs have no moving parts, so they operate silently and are less prone to mechanical failure. These advantages come at the expense of higher cost and lower overall storage capacity.

External Drive Storage

A popular option for supplementing a computer's storage is to use an additional external drive. External drives are readily available, offering a variety of connection types to match the available ports on your computer. Some common connection types include the following:

- FireWire 400 or 800
- USB 2.0 or 3.0

- USB-C
- eSATA
- Thunderbolt 1, 2, or 3

If you plan to store media files on an external drive for use with your DAW, look for a high-performance drive with a high-speed data connection to your computer. Good drive options would include a 7200 RPM HDD or an SSD. Good data connections would include USB 3.0, USB-C, eSATA, Thunderbolt 2, or Thunderbolt 3. Be sure to match the capabilities of your computer when selecting the connection type.

Cloud Storage

Both the internal system drive of your computer and any connected external drives are considered local storage. Your local storage can be complemented by any number of cloud-based storage options.

Cloud storage utilizes large-capacity storage servers and data centers that you connect to via the Internet. Cloud storage options generally require a subscription. To allow for quick access to your cloud-based content, cloud storage services usually allow you to sync your cloud content to your local storage.

The advantages of using cloud storage are many. For example, cloud storage enables you to keep your files in sync across multiple devices, to easily share files with anyone who has an Internet connection, and to retrieve your files from any computer, anywhere in the world.

Some popular cloud-based storage services include Dropbox, iCloud Drive, and Google Drive.

Onboard Sound Options (Audio In and Out)

Another aspect to consider when selecting a computer is the onboard sound options that the model offers. Many DAWs, including Reason Intro, can utilize the computer's built-in sound options for recording and playback. This allows you to use any built-in microphone inputs on the computer for recording to your project and to use the built-in computer speakers for playing back your project.

While you may not want to use the computer's microphones for any meaningful recording project, having onboard audio will allow you to run your DAW without requiring a connected audio interface. This can save you some money at the outset. It also provides the flexibility to work on the go, especially when using a laptop, without needing to bring along additional hardware.

Although audio inputs are not required, audio outputs are critical. Look for a computer that has built-in speakers and/or a stereo headphone jack for monitoring playback from your DAW.

Other Options to Consider

Aside from the computer hardware itself, you may also want to consider options for peripheral devices. With the right accessories, you can customize your setup for efficiency and/or personal preference.

Mice and Trackballs

Many computer users find the mouse that comes with their computer to be less than ideal for long-term use. Numerous alternatives are available, offering features such as multiple buttons, scroll wheels, trackballs, gesture/touch input, and wireless connection to the computer. Mouse upgrades can range from around $20 to upwards of $100. Be sure to try out any options you are considering while running your DAW (or a similar application) to determine what works best for you.

Trackpads and Touchpads

As an alternative or supplement to a traditional mouse, Apple offers several trackpad options (such as the Magic Trackpad and Magic Trackpad 2). These devices provide touch-based gesture input, similar to that found on many modern laptops. Logitech, Dell, and others offer similar touchpad devices for Windows computers.

Extended Keyboards and Keypad Options

An upgrade option that can be valuable is an extended keyboard. The extended keyboard provides access to numeric keypad keys on the righthand side, which adds an easy way to access several commands in Reason.

Figure 1.5 Standard Mac keyboard (top) and extended Mac keyboard (bottom)

Benefits of an Audio Interface

Many audio interfaces are available that are compatible with Reason Intro. Any audio interface that is Core Audio–compliant (Mac) or ASIO-compliant (Windows) will work with Reason Intro.

Some good options include the Focusrite Scarlett series or Focusrite iTrack Solo. Many Focusrite interfaces are also available in Studio editions, with microphone and headphones included.

The benefits of using an audio interface can include better sound quality, a greater number of available inputs and outputs (I/O), and access to digital I/O options. For many beginning users, the number of inputs may be the most significant issue.

Reason supports a maximum of 64 audio input channels with compatible hardware, although Reason Intro supports only 16 total tracks. Any number of available audio tracks can be record-enabled simultaneously, but the processor and storage performance of your computer will limit the number of tracks you can simultaneously record in practice. Without an audio interface, you are limited to the input options available on your computer.

Working with Your Computer

Once you have selected an appropriate computer to host the DAW of your choice, you should spend some time to get familiar with basic operations on the system. If you already have experience with computers and the operating system you will be using, you may want to skip or skim this section. The information in this section focuses on navigating among the files, folders, and applications on your computer.

In this section, we cover basic operations such as locating, moving, organizing, and saving files, creating folders, and launching applications.

File Management

Perhaps the most important thing you should know about your computer is how to navigate among the files and folders using the computer's operating system. On the Mac, you will use the Mac Finder for this purpose. On a Windows computer, you will use File Explorer windows.

Using the Finder (Mac-Based OS)

The desktop experience in a Mac-based operating system is defined by the Finder application. The Finder is the first thing you see after you start up a Mac, before you launch any applications or open any files or folders.

Figure 1.6 The Finder icon on a Mac

The Finder includes a menu bar at the top of the screen, the desktop display in the center (a background image along with any desktop icons and open Finder windows), and the Dock at the bottom of the screen.

Figure 1.7 The desktop in the Mac Finder (macOS 10.14 Mojave)

The Finder Versus the Desktop

Although the terms are sometimes used interchangeably, the Finder and the desktop are two different things. The Finder is an application on the Mac that is always running. You can switch to the Finder application at any time, the same way you switch between other running applications.

The desktop is the default location displayed by the Finder. You can think of the desktop as the background canvas upon which your open folders and applications are displayed. The desktop also provides a location to store folders and files.

The items stored on the desktop are visible from the Finder. They can also be displayed in a Finder window, by opening the Desktop folder.

From the Finder, you can:

- Navigate through the file system on your storage drive(s)
- Open folder locations
- Manage files within open folders

To open a new Finder window, choose **File > New Finder Window** from the menu bar at the top of the screen (or double-click on a folder on the desktop). You can navigate within an open Finder window by clicking on a location in the sidebar or by double-clicking on a displayed folder in the file list to open it.

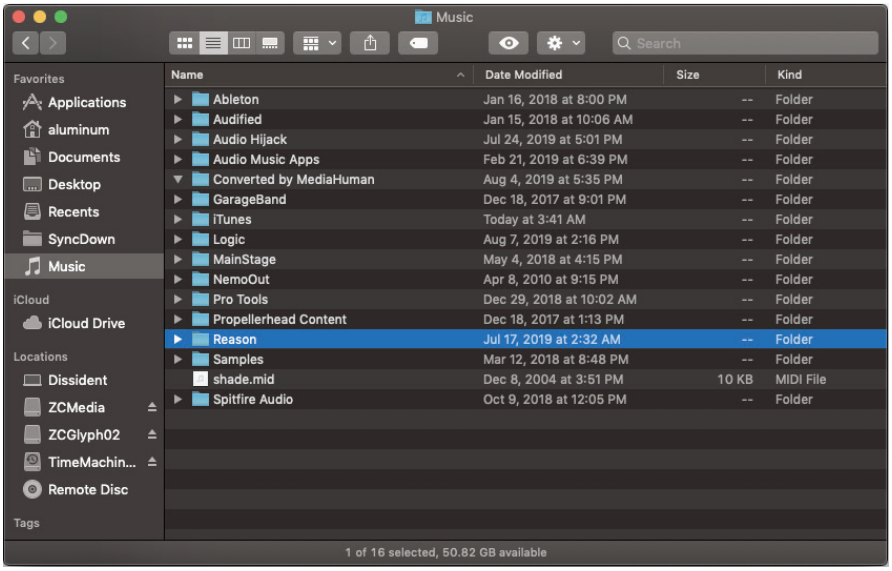

Figure 1.8 An open Finder window (macOS)

Using File Explorer (Windows-Based OS)

Windows computers also provide a desktop view (similar to the Mac Finder). However, the desktop might not be the first thing you see upon startup, depending on the operating system you are using. (Windows 8 and Windows 8.1 use the Metro UI tile view by default, similar to that on a Windows Phone.)

To open a new File Explorer window, do one of the following:

- In Windows 7 or Windows 10, click on the yellow **File Explorer** icon in the taskbar at the bottom of the desktop screen (or double-click any folder on the desktop).

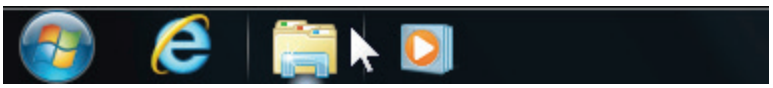

Figure 1.9 Mouse cursor next to the File Explorer icon in the taskbar (Windows 7 shown)

- In Windows 8 or Windows 8.1, first click the **DESKTOP** tile from the tiled Start screen; then, from the desktop, click the **FILE EXPLORER** icon in the taskbar (or double-click any folder on the desktop).

In Windows 8.1, you can also access the File Explorer directly from the tiled Start screen by typing *file explorer* and clicking on the File Explorer icon that appears.

As in the Mac Finder, you can navigate within an open File Explorer window by clicking on a location in the Navigation pane on the left or by double-clicking on a displayed folder in the file list to open it.

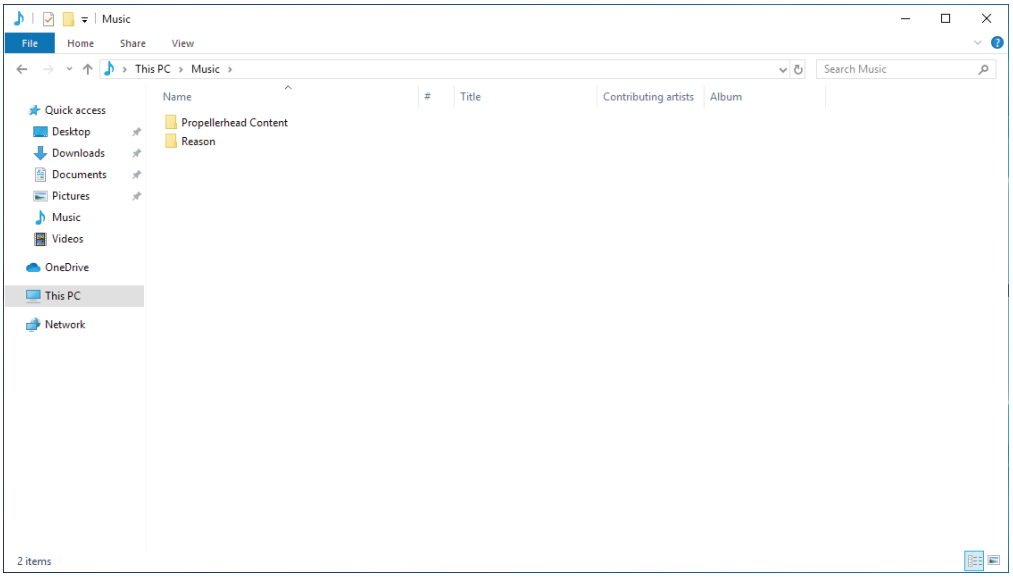

Figure 1.10 The File Explorer window (Windows 10)

Locating, Moving, and Opening Files

Using the locations in the sidebar of a Mac Finder window (or the Navigation pane in File Explorer), you can navigate to different folder locations on your computer. For example, clicking on the **DOWNLOADS** location will take you to the Downloads folder on your system (for any files you've downloaded from the Internet). Clicking on the **DOCUMENTS** location will take you to your Documents folder.

You can access the files within a folder at a given location by double-clicking on the folder to open it. On a Mac, you can also click on the triangle next to a folder to expand it and display its contents.