Introduction

Gotcha! As soon as you picked up this book, you started a journey toward absolute game-playing Nirvana! You might be a classic arcade-loving child of the 1980s, or perhaps an enthusiast of more recent, modern arcades. Remember playing *Pac-Man* at the local convenience store, or *Street Fighter* at the mall's arcade? Whatever caused this book to catch your eye, I'm betting that somewhere down the line the thought of owning one of these machines has crossed your mind. Wouldn't it be great to have your favorite arcade machine in your own den or recreation room? Imagine your friends' reactions when they encounter this treasure from their past in your home. This is definitely high on the "wow" factor! The problem is, though, that it's just one game. Sooner or later the thrill wears off, and it starts to gather dust.

No problem—as an arcade enthusiast, you're probably also a game player at home. If you haven't found them on your own yet, you'll discover through this book the joy of playing near-perfect replicas of your favorite games on your computer. The first time you play *Pac-Man* on your computer, the "wow" factor is back! Between commercial and shareware re-creations of classic and modern arcade games, and the thousands of unique games developed for the computer, there's a neverending variety to suit everyone. However, sooner or later you'll realize that playing *Pac-Man* with the keyboard lacks something. It just isn't the same as steering around the maze with a genuine ball-topped arcade joystick.

So—you can own your own arcade machine at home (this book will give you some pointers on that), and you can play thousands of games on your computer (we'll get you started on that, too), but both fall short of that perfect arcade experience. Wouldn't it be great if you could combine the two? Wouldn't it be great if you could . . . build your own arcade machine? Imagine an arcade machine with that perfect combination of joysticks, buttons, and trackballs running all your favorite games. Picture it painted to match your decor, with your favorite game characters decorating the sides and a lit marquee at the top saying "My Arcade!" Wouldn't that be awesome? This book will show you how. Congratulations—you've started down the road to game-playing Nirvana!

About This Book

This book is a culmination of five years of research into the subject of interfacing genuine arcade controls to computers. It is a polished and portable companion to the author's Web site, the Build Your Own Arcade Controls FAQ (BYOAC), located at `www.arcadecontrols.com/`. Most of the research and information for this book came from the Web, and I'll refer to various sites throughout. Access to the Internet is useful and recommended; however, it is *not* required. Everything you need to get started is right here.

This book is meant to be read from start to finish in order. I've kept the technical jargon and theory to a minimum, providing just enough background information to understand the direction we're heading when it comes time for the hands-on material. For those who are interested in a deeper understanding of the theory behind these projects, I've included pointers to more information where relevant.

This book will take you step by step through the process of designing and building your own arcade machine. You'll be able to begin immediately after the first chapter; you'll have the gratification of watching your design take shape as you proceed through the pages. In fact, one common trap is getting to the point where the machine is playable before it's totally finished and getting lost in the game play. One day you'll realize it's been weeks since you've actually worked on it because you've spent all your time playing, even though it's held together with string and chewing gum! That's not a problem though: The book will be waiting for you when you're ready to pick it up again.

We'll take a couple of side trips along the way. I discuss building a standalone desktop arcade control panel (arcade controls minus the cabinet) for those who want the experience but don't want to dedicate the space. I also cover hooking up game console controllers to your computer, such as the Nintendo 64 or Playstation game pads, for those who feel that they provide the best game-playing experience. Finally, for those who think the building part is beyond them (it's not, by the way), I'll point out and review some of the various commercial products you can buy. There is something in this book for everyone!

Assumptions

I'm assuming you have access to a computer. The majority of the computer-related material is PC-centric, but enough of it applies to Macintosh computers that Mac enthusiasts can successfully use this book to build an arcade machine as well. I'm not assuming you have any electronics or carpentry expertise. Depending on the path you take as you build your machine, you may gain those skills, but it's possible to build the entire thing with off-the-shelf parts. If you do decide to take the more advanced route (and I recommend it), I'm assuming you're willing to learn as you go. Most of all, I'm assuming you're ready to have fun!

Things You'll Need

- **Plans**: You'll need a set of plans to work from. Plans for upright arcade cabinets are included on the companion CD-ROM. You can use or modify them as suits you. I'll also show you where to find other plans on the Internet, and I'll give you suggestions should you choose to draw your own.
- **Computer:** A fairly modest computer will allow you a good classic arcade game experience. Depending on what you want to play, even an old 486 or Pentium-class machine can play a slew of great, albeit older, games. To play more recent games, you'll want at least a Pentium III– (or better) class machine. Specific requirements will depend on the software you want to play. Macintosh users will find that similar factors apply. Whatever

you have available for this project will work fine to start with. You can always upgrade later if you discover you can't run the games you want to play.

- **Software:** The software that makes everything work comes from a variety of sources. Some of it can be had for free, and some of it has to be purchased. Where possible, the necessary software has been included on the companion CD. The software behind this hobby is updated frequently, however, and you should consider downloading updated versions of whichever software you choose to use. Links are of course provided. Software will be covered in great detail in Chapters 13 and 14.
- **Tools:** Odds are, you already have many of the necessary basic set of tools. Screwdrivers and a drill will meet the need for those of you who want to build a cabinet from off-the-shelf parts, while woodworking tools will be required if you want to build it all from scratch. I'll discuss tools more in Chapter 2 when I cover the anatomy of an arcade cabinet. Unless you're planning a lot of woodworking in your future, this is a good time to find a friend or relative with a workshop that you can borrow.
- **Budget:** Budget requirements will vary depending on what you're trying to accomplish. Desktop arcade control projects will average $200 to $300, while full-sized arcade cabinet projects can run $500 to $1,500 or more! The nice thing is that, with proper planning, you can start small and inexpensively and work your way up to bigger projects as your budget allows. For instance, you can start with a desktop arcade control panel that can later be incorporated into a full-sized arcade cabinet. Factors such as whether you need to purchase a computer and tools will obviously have a significant effect on your overall budget.
- **Space and Time:** No, this isn't a *Star Trek* reference. Space and time required for a project like this are often overlooked but are clearly worth some consideration. It *is* possible to complete a project like this in a weekend, but the more likely scenario is that you'll work on it in bits and pieces over the course of a couple of months. One truism is that a project like this is often never "finished"—there's always another tweak or upgrade to try. With this in mind, where you build your project becomes important. If you're going to tie up your garage for a month or two, you might want to check with your spouse first!

Don't fall into the trap that one unfortunate fellow did. He spent months building an absolutely gorgeous custom arcade cabinet, only to discover it was too wide to fit through the doorway of his basement once completed. I'm not certain how that was resolved, but there's definitely a lesson to be learned there!

How This Book Is Organized

In this book, you'll find chapters spread across five parts. Each part covers a different theme, and each chapter is broken down into sections covering the chapter's subject. The parts and chapters are laid out in a sequence designed to walk you through the process of building an arcade machine in a logical order. You'll probably be happiest browsing the contents of the entire book, and then diving in to Chapter 1.

Part I: Playing Your Games the Way They Are Meant to Be Played — with Arcade Controls

The two chapters in this part get you started on your project. You'll start by exploring the different kinds of projects you can build. In Chapter 2 you'll pick a design and come up with a plan, and then you'll jump right into the actual construction.

Part II: Designing and Building Your Dream Arcade Control Panel

Part II is where it starts to get really fun. Chapters 3 through 5 cover the different kinds of joysticks, buttons, trackballs, and other arcade controls you can include in your arcade machine. Chapter 6 covers designing the control panel and installing the controls you've chosen. It's starting to look like a real arcade machine now!

Part III: Hooking Things Up Under the Hood — Time to Trick the Computer

Part III is the most "techie" part of the book. These four chapters describe how to make the computer think a joystick and trackball are really a keyboard and mouse. Chapter 7 briefly covers some theory, and Chapters 8 and 9 cover using the keyboard port and mouse port, which is how the majority of these projects are done. The last chapter in this part, Chapter 10, discusses several other clever methods people have found to connect arcade controls to a computer, including the USB port for plug-and-play connections.

Part IV: Putting Together the Final Pieces

Part IV is the capstone of the project. Chapters 11 and 12 discuss sound systems and monitor options, respectively. Chapters 13 and 14 go over software, configuring your system for the ultimate game-playing experience, and installing the computer in the arcade cabinet. Finally, Chapter 15 covers the miscellaneous odds and ends that will enable you to turn your creation into your idea of the perfect arcade machine: artwork, the marquee, and so on.

Part V: Like the Concept but Not Sure You Have It in You?

This part covers subjects for those of you who aren't quite sure you can or want to build an arcade machine. Chapter 16 points out troubleshooting tips and where you can go to get help when stuck. Chapter 17 covers the various products you can purchase, from arcade cabinet kits to outright arcade cabinets, and it includes several reviews. Chapter 17 also briefly covers using game console controllers (such as the Nintendo 64 or Sony Playstation) on your computer, with do-it-yourself information included on the companion CD-ROM. Finally, Chapter 18 will introduce you to a few arcade cabinet and controller projects to inspire you and show you places to go online for more information.

Appendixes

Every ExtremeTech book has them, and this one is no exception! Handy information is gathered in this section, including where to find arcade parts for your project. There's also an interesting debate presented on whether to preserve or "MAME" an arcade machine. Feelings on this subject run deeper than you might think!

The book's companion CD-ROM winds up with a clickable glossary of terms you'll encounter as you read.

Conventions Used in This Book

Throughout the book, you'll find highlighted text where I point out cautions, cross-references, notes of interest, and helpful recommendations, as well as mention what's included on the book's companion CD-ROM. Specifically, five types of highlighted pointers appear:

These give you valuable information that will help you avoid disaster. Read all of these carefully!

These are pointers to other areas in the book or sites on the Internet where you can find more information on the subject at hand.

These are recommendations of best-practice methods and superior products or tools to use.

These pertain to items of interest related to the subject at hand. Although you can safely skip these, I recommend that you read them at your leisure. They'll help you to be a better arcade-machine builder!

These refer you to valuable information, links, software, illustrations, and more that is included on the companion CD-ROM to this book.