

Project

2nd Edition

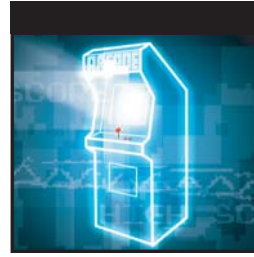
ARCADE

Build Your Own Arcade Machine



The
definitive
guide to
home arcade
machines

John St.Clair



Project Arcade

Build Your Own Arcade Machine

Second Edition

John St.Clair



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*This book is dedicated to my wife Kristi and my children Kayci, Isaac,
and Sebastian, without whom my life would not be complete.*

*I'd also like to dedicate this book to my parents, Ed and Liliane, and
brothers Don and Andy, who inspire me.*



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John St.Clair is a network engineer employed by a K-12 school district in a small county in Georgia. As network manager, John is responsible for the daily operation and stability of the networking infrastructure for the school system.

John has worked in the IT field since high school, approximately 25 years ago. He obtained a bachelor's degree in Computer Information Systems in 1995, and also holds MCSE and CNA networking certifications.

He started in the video gaming field like many children of the 80's, feeding most of his allowance into quarter-gobbling machines at the local arcade. His primary claim-to-fame in this subject matter is being the creator of the Build Your Own Arcade Controls (BYOAC) web site at www.arcadecontrols.com. This site has grown from a small hobbyist site to the de facto home of the hobby, with an average of 90,000 visitors monthly. Virtually every item of note in this hobby makes its way to the BYOAC web site, from product launch, to technique discussion, to presentation of yet another personal arcade cabinet project.

As if the above wasn't enough to occupy his time, John is also a martial artist, studying Jujitsu, Aikido, Hapkido, and Kyuki-Do.

John splits his personal time between being a web-master, tinkering with his arcade game collection, martial arts, and raising a family.



Acknowledgments

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I'd also like to thank my friends Mark and Michele for being rock solid friends in both the best and worst of times, and particularly Mark for his invaluable advice while building the cabinet. Thanks for being my "Dave Smallwood!"

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Special thanks go out to all the people who helped turn my Web site from a simple little one-page affair in late 1997 to the community it is today, which ultimately led to the book in your hands now. Jason "SirWoogie" Presnell in

particular for doing so much to help keep things running behind the scenes, and Jay “PlanetJay” Wilkinson who had the job before him. Thanks also to Arthur “SirPeale” Peale, Michael “JustMichael” Horton, Kevin “SirPoonga” Jonas, and Matt “Nivo” Nivison for helping run the message forums.

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I’d also like to give a shout out to all the chat room, wiki, and message board regulars, whose contributions are too numerous to mention and are found throughout this book. Also a big kudos and thanks to everyone who has documented the construction of their own *Project Arcade* machines. Thanks for being part of everything ladies and gents!

Yes, it’s a bit sappy, but I mean every word. Without everyone here, this book wouldn’t be nearly as good as I hope you’ll find it to be.



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Introduction

Gotcha! As soon as you picked up this book, you started a journey toward a game-player's paradise! You might be a classic arcade-loving child of the 1980s, or perhaps a fan 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 along 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 off the scale 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 thousands of unique games developed for the computer, there's a never-ending variety to suit everyone!

Sooner or later however, you'll realize that playing Pac-Man with the keyboard lacks something. It just isn't the same steering around the maze with the arrow keys as compared to using 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 with an awesome paintjob, with your favorite video 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 paradise!

Some of you may be veterans of the first Project Arcade book. This edition has plenty in store for you as well! I’ve kept all the good parts from the first book, and updated or added what’s new to the hobby. I’ll be showing you a new cabinet design this time around, but if you prefer the “classic” design you’ll find those plans and the original build chapters on the companion CD. There are also a bunch of new products to consider — the bar on adding “eye candy” to your cabinet has been raised considerably — and a greater emphasis on games you can play with your new machine. Welcome back — your second trip to paradise awaits!

About This Book

This book is a culmination of years of research into the subject of using genuine arcade controls with computer games. 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 pitfall of building your own arcade machine 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 made any progress 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 fun 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'd never built anything out of wood before starting in on this hobby), 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 Pentium-class machine can play a slew of great, albeit older, games. To play more recent games, you'll want a correspondingly recent computer to match. 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 into thousands of dollars! 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!

WARNING Will it fit in my basement? 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

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