

The book cover features a central image of a green printed circuit board (PCB) with various electronic components. This central image is framed by a decorative Art Nouveau border. The border consists of green, stylized floral and leaf motifs that curve around the edges. At the top, there is a row of small, light purple flowers. At the bottom, there is a decorative band with a repeating pattern of blue and yellow floral motifs. The title 'To Serve & Groove' is written in a white, elegant serif font, underlined, and centered over the PCB image. Below the title, the subtitle 'A Comprehensive Compendium of Numerically Disposed Mellifluous Servitude' is written in a smaller, white, serif font. At the bottom center, the author's name 'O.A. Masciarotte' is written in a white, serif font, with the word 'by' above it.

To Serve & Groove

A Comprehensive Compendium
of Numerically Disposed
Mellifluous Servitude

by

O.A. Masciarotte

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OLIVER MASCIAROTTE

TO SERVE & GROOVE

A Comprehensive Compendium
of Numerically Disposed
Mellifluous Servitude

or

How To Make Your Mac Into
A Real Fine Music Server

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Chapter 1 — Overview

INTRODUCTION

In the past few years, folks have started to realize that, in addition to providing typical business services and keeping your checking account in order, personal computers make pretty good entertainment sources. What started out as half baked attempts from Apple and Microsoft have matured into reasonably powerful and cost effective systems. For years now, music distribution has increasingly moved toward an on-line, downloadable distribution model, though higher fidelity music distribution has been slow to catch up to the breaking wave of CD and less-than-CD quality downloads.

In 2008, purpose-built software for high fidelity home music enjoyment arrived on the scene, and the hi-fi movement got a whole new niche. Music servers have taken off, thanks to convenience, easy upgrades and, the jukebox promise of seemingly infinite choice. If you think that computer-based hi-fi is a flash in the pan, consider that the traditional retail chain, Sears, now sells a range of respectable USB-equipped digital-to-analog audio converters!

This book is a beginner's guide to setting up that relatively new concept; a music server. Though that same server can easily deliver movies, 'net content and other forms of entertainment, I'm going to concentrate on providing a very high quality music experience. Why? Because I'm an audio fanatic, having worked on professional and consumer audio for well over 30 years. In the '80s, I worked as a recording engineer with a wide variety of talented acts, from Bob Seger, Roy Orbison and Rita Marley to Meatloaf and Julio Iglesias. I've also spent considerable time with some of the planet's best mastering engineers, the guys and gals that put the final polish on the music we all listen to.

What To Expect

This book is aimed at folks who are curious, have a bit of a tinkerer streak and, access to a small pile of mad money. This book isn't for those who already have a Windows or Linux server set up and running and are looking for tricks, tips and tweaks. Most of all, this book is for those of you who *love* music, so much so that to go without is like fasting.

If you've already dialed in your overall hi-fi rig and would like start down the path of computer-based audio in the quest for a very high fidelity digital source, then welcome aboard! You don't need to know Monsieurs Ohm or Watt but, it helps ease the journey.

Music Servers

“Music servers,” as file-based audio sources are called, vary widely in cost, operational complexity, and reliability. The cost begins at less than \$500 for a truly DIY assemblage of beige box host computer, open source software and home-assembled storage, and can go well past the \$10,000 mark for closed, bespoke appliances that are easy to use, look great and hopefully sound as good as you'd expect for the price. In between those two price points are a wide range of styles, features, form factors and performance.

I mentioned “open” source software and “closed,” turnkey systems... Those geek terms refer to who controls the intellectual property embodied in the product. “Open” systems or products, also know as FOSS,¹ are those where all documentation is public and the ability to muck about with and modify the product is explicitly allowed and generally encouraged. Open systems, whether hardware or software, are a tinkerer's dream but usually entail a steep learning curve and a compromised user experience. In the audio world, an example of open source software is The LAME Project, a “high quality MPEG Audio Layer III (MP3) encoder.” Nelson Pass, an electrical engineer known for his amplifiers, has created what many would consider to be open source hardware designs; audio amplifiers where the theory, design and realization are public knowledge and open to discussion and contribution by others. Many open systems have

1... For more on FOSS, see <http://j.mp/mF0EWk>

a lively community of adherents who publicly trade ideas and opinion, working cooperatively to improve the system or product.

“Closed” systems or products are those where some documentation may be public, such as the user manual, but usually, the underlying design and intellectual property is protected by copyright. Tinkering with or modify the product at best results in a voided warranty and, at worst, results in legal action. Public disclosure of trade secrets embodied in a closed system will surely precipitate often expensive legal hassle.

Why A Server

There are several reasons why you’d want a music server. For some, it’s a convenient way to organize a music collection. All your songs in a small physical footprint, making it desirable for people who live in smaller domiciles. These days, road warriors and real warriors both live with their laptops, being constantly on the go, and some of them appreciate having very high fidelity playback no matter where they’re billeted.

Obviously, music servers also have a whiff of modernity to them, being computer-based, which clearly appeals to neophiliacs. Inescapably, technology is more than a small part of embracing music servers. Several years ago, Stereophile editor John Atkinson started a blog posting¹ with the following thought...“Physical discs seem so 20th century!...” In our website poll of January 5, 2008, we asked, ‘Are you ready for an audiophile music server?’ The response to that question was the highest we have experienced: 32% of respondents already listen to music via their computer networks, many using home-brewed solutions, and 44% intend to.”

A third advantage is attractive to the pathologically organized. Imagine the OCD dream of simultaneously sorting by any of several categories, rather than only one or two, which is the case when you have physical media sitting on shelves.

For me, the most compelling reason to have a server is fidelity. A music server will play back very high resolution audio files which can provide much better fidelity than compact discs or, dare I say, vinyl. Even with,

1... See <http://j.mp/mPq3IK>

standard or low-fi lossy compressed formats like MP3, a server can sound better than what you're probably using now. Also, when set up carefully, a home grown music server can rival, fidelity-wise, equivalent products costing much, much more.

CD's were designed at a time when digital audio was still in its infancy. They're fine as a baseline reference but, as with all things tech, we can do better. I like vinyl for its strengths but dislike it for its many faults. With all its euphonious distortion and coloration, the phonograph is far from a linear, aka distortion-free, playback medium. I know too well the amount of limiting, low frequency mono folddown¹ and "equalization" that goes into copies of music destined for LPs since, as an audio production engineer, I used to prep mixes for duplication. As Glenn Meadows, an iconic mastering engineer, said when discussing² the myriad errors that accumulate through the transfer from analog tape to an LP on to your phono cartridge and reproduce electronics, "Bottom line, it's all a trade-off, as it will NEVER be quite as good as it sounds in the studio, especially going to vinyl." Well, that was before truly high resolution music was available to consumers as it is today.

That's not to say that analog tape or digital storage are perfect either but, once your music has been mastered, I like to think that I'm doing the least harm to the recording during playback. If you don't like what the engineer, producer and performer came up with timbrally, then you can use signal processing like tone controls, that equalization I mentioned earlier, to individually change the sound to suit your taste.

Don't be afraid to use "EQ." Just use good quality EQ, and don't use your playback chain to inherently color things up for you, as it becomes etched in stone so to speak. Coloration built into your system means you're always listening through a veil of distortion you can't bypass. So, we'll try to avoid needless distortion in our music server quest.

Another interesting potential of a laptop-based music server is complete mobility. With a bus or battery-powered DAC/headphone amplifier combo, a better than average set of "cans," and your trusty laptop, you

1... Summing the left and right channels into monaural or "mono."

2... 15 March 2010 posting to the private user list for Sonic Studio DAWs at <http://j.mp/rvYGGZg>

can rock out most anywhere with quality that will, excuse the expression, blow you away!

To deliver on that portable promise, the past year or so has seen the introduction of premium and super premium headphones retailing for upwards of \$1500. I think we can agree that's not pocket change but contrast that to what you have to spend on amplification and speakers to yield equivalent performance. There are some truly great headphones available for around \$200, making headphones a great gateway drug for aspiring audiophiles. Another advantage is that headphones remove your room from the equation so, there's a lot to like about a set of good quality cans. Chris Martens, editor for Playback magazine and AVguide said in his CES 2011 wrap-up,¹ "Most Important Trend: The emergence of high performance headphones (both full-size and in-ear) as a new generation's pathway of choice for entry into the world of high quality music reproduction. Think 'high-end audio,' but on a personalized scale."

In case you haven't noticed, computers are the gateway to a seemingly limitless supply of new music and emerging genres. If you're a seeker of new artists and material, then that's perhaps the most compelling reason to jump in to computer-based hi-fi. Granted, the majority of downloadable music is encoded in a lossy format, like MP3. Even with MP3's degraded quality however, a decent playback system will do any music file justice.

The last advantage to a server that I'll mention is shared by all digital content. Because servers are software-based, they are, to some extent, future proof. With proper care and forethought, your music files are theoretically immortal, which can't be said for any other audio format. I know, the real world is a whole 'nother matter but, we really can come close to that ideal.

Shiny new technology makes some traditionalists cringe. This whole "Argh, there's a computer in my music, and I don't like it!" thing seems to be largely generational, though I know many open minded Boomers and older listeners who have embraced digital audio. In a recent interview, Angelina Mondavi, a young member of the renowned winemaking family,

1... See <http://j.mp/kLKc24>

was discussing her grandad and wine,¹ but she could just as well have been talking about audiophilia. . .“My grandfather is old-school, but, importantly, he isn’t resistant to change. We know that change is what keeps wineries going, and we must be open to it.”

Both music and change are eternal. I’ve beaten that subject to death, and I’m probably preaching to the choir if you’re reading this book so, let’s dive into specifics. . .

What Makes A Server?

Basically, a music server is a computer designed to organize and play music files. As I mentioned earlier, commercially available servers vary widely in cost, finish and functionality. Starting from a few thousand dollars, you can purchase a turnkey server appliance from any number of companies, from unknowns with no street cred to audio heavyweights like Bryston, Linn, Meridian, MSB Technology, and Olive. Many have slick graphical interfaces that display file information, such as metadata² embedded in the music file, while others are a “black box” with no display whatsoever.

Some tout their use of open source software, such as Auraliti’s use of the Linux operating system and the zero-config network protocols, while most manufacturers hide the inner workings from the owner. Some can handle very high quality music files, while others are content with middling “CD quality” or slightly better. By the way, I’ll discuss audio metadata in an upcoming chapter.

TO SERVE & GROOVE

In this book, I’m going to walk the line between open and closed, costly and cheap, slick and bare bones. For those of you who find that \$1000 for a reference-grade source component is out of your price range, then you’ve come to the wrong place, er, book. Conversely, for those of you who want a shiny, multi-zone, post-modern design statement for your modernista living room, you’ve steered wrong as well. I’m going to

1... See <http://j.mp/qkKRmE>

2... Metadata is “data about the data,” such as the artist’s name, the song title, and cover art.

discuss a very high quality music server, based on Mac OS, that you can assemble yourself for a price that's about what you'd pay for your other stereo components. It requires little maintenance, is easy to use and infinitely extensible. Depending on what you hang off of it "downstream" in the signal chain, it can provide audio quality equivalent to sources costing five times more. If you're new to computers, you probably don't care one way or another but, if you've already spent hundreds of hours and tons of money on a Windows PC, then this book also isn't for you as your arteries probably couldn't stand the strain.

Now, two major points I must emphasize...One: this book focuses on computer-based audio reproduction. If the very thought of computers and audio together in the same living room makes your blood boil, then I'm afraid you won't enjoy the rest of this discussion. If, however, you've got some spare time, are open minded and look forward to experimenting, have some disposable income and would like to improve your listening experience, then this book's for you. I've had quite a bit of experience walking technology neophytes through the sometimes anxious waters of computer-based audio so, don't worry. You don't need to be a techno-Yoda to explore this hobby. You just need some curiosity, some dough and, a desire to modernize your hi-fi rig.

The second subject I must broach is hearing versus listening: most of us have reasonable hearing but listening is a whole 'nother kettle o' fish. You see, listening is a synergetic blend of physiology and psychology, a blending of your ears, the transducers, and your brain, the signal processor. Listening is a purely mental process that can be improved and refined with careful exercise. What's called "critical listening" is a learned ability, like wine appreciation, that springs from guided and repeated training.¹

The ability to recognize the concrete and subjective aural differences between a 192 k MP3 and the 176.4 master from whence it came is something you can learn. You're not born with the ability, and it takes a good bit of time with a quality playback environment to understand those differences. As my friend, mastering engineer Michael Romanowski

1... Sound On Sound, a magazine for pro audio engineers, has a section called "The Mix Review" that offers guided listening tips for "commercial productions." See <http://j.mp/pVZGmd>

recently said, “...learning to listen carefully is a lengthy task that needs considerable personal investment.” Amen, bro.

WHAT'S TO COME

In this chapter, I've provided the 10,000 foot view of music servers. In the next chapter, we'll look at the basics of digital audio, including the differences between lossy and lossless compression, CD versus vinyl and archival quality, and what all that has to do with subjective fidelity. So, hold on to your discs, we're goin' in!

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