

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 across the top of the central image, underlined. Below the title, the subtitle 'A Comprehensive Compendium of Numerically Disposed Mellifluous Servitude' is written in a smaller, white serif font. At the bottom of the cover, the author's name 'O.A. Masciarotte' is written in a white serif font, preceded by the word 'by' in a smaller font.

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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Table of Contents

Chapter 1 — Overview	11
Introduction.....	11
What To Expect.....	12
Music Servers.....	12
To Serve & Groove.....	16
What's To Come.....	18
Chapter 2 — Numbers & Music	19
Introduction.....	19
What Is Analog?.....	19
The Basics.....	19
Sound Is Analog.....	21
What's This About Voltage?.....	21
Storing Analog.....	22
On To Digital.....	24
Why Digital?.....	24
Sampling, Part One.....	25
Sampling Rates.....	33
Sampling, Part Deux.....	35
How Much Is Enough?.....	35
IM Me.....	38
Sampling Precision.....	39
AES3.....	43
Impedance.....	48
Jitterish, Part Deux.....	49
Even Digital Is Analog Is Digital.....	50
The Bottom Line.....	50
Digital.....	50
Sampling.....	50
Clocking.....	51
Hookups.....	51

Chapter 3 — More Gazintas & Gazoutas	53
Introduction.....	53
Bits & Bytes	53
The Process	53
The Brain.....	55
The DAC.....	56
DACs & Clocks.....	58
The Bottom Line	60
The Journey	61
The Choice.....	61
Chapter 4 — The Host	63
The Computer	63
Models.....	63
OS Versions	64
The Boot Disk.....	64
Disabling Services.....	65
Real Estate.....	69
Hardware Specifics	70
Memory Subsystems.....	72
DRAM.....	72
Power	73
Additional Software	75
Anti–Malware.....	75
Airbags	76
Windows.....	78
Housekeeping	79
The Bottom Line	79
Chapter 5 — The 'Ware	81
The Players	81
Some Common Features	83
Native File Handling.....	84
Bit–Perfect Output.....	84

SR Switching	87
Memory Playback.....	88
Memory–Resident Processing	90
Gapless Playback.....	90
Background Reading.....	90
Remote Control	90
Integer Mode.....	91
Overhead.....	93
Exclusive Mode	93
Format Support	93
Playlists	93
Conversion	93
Signal Processing.....	94
Commercial Players	103
Decibel	104
Fidelia.....	105
Pure Music	106
Amarra.....	107
Rippers & Encoders	108
Formats.....	109
Rippers.....	110
Additives & Fortifiers	117
How To Listen.....	117
Measurement	117
Conversion	118
Restoration.....	119
The Bottom Line	120
Chapter 6 — The DAC	123
The Philosophy Of Attachment.....	123
USB.....	124
FireWire.....	127
AES-EBU.....	127
The Dark Horses	128
Who’s Driving?	129
Daisy Chaining	130

Powering Your DAC.....	130
Wireless Weirdness.....	131
ADCs	131
Converters & Cans	132
DIY.....	132
The Bottom Line	133
Chapter 7 — The Content	135
Data Types	135
Lossy.....	135
Linear	136
DXD & DSD.....	136
Lossless	138
Downloads.....	139
Recording.....	140
Other Sources	142
The Bottom Line	145
Chapter 8 — Storing Your Files	147
Storage Basics	147
Drive Classes	147
The Philosophy Of Attachment, Part II	149
Go Direct.....	149
The Bottom Line	157
Chapter 9 — It’s A Wrap	159
Packages.....	159
The Toddler	159
The Social Climber.....	160
The One Upsman.....	160
The ÜberNerd.....	161
The Skinny	162
Appendix A — The OS	165
The Clique	165

The OS	166
The Choice	168

Appendix B — The Music 173

Appendix C — The Antecedents of Computer Audio 177

The Pioneers	177
--------------------	-----

The Dawn of DAWs	178
------------------------	-----

CD Prep & NoNOISE	179
-------------------------	-----

Index 181

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!

Index

Symbols

- 16 bit 31
- 1394 (FireWire) 57

A

- AAC 135
- AAC. 84
- AC 48
- AccurateRip 110
- AC Power 73
- Activity Monitor 88
- adaptive mode 58
- ADC 131, 140
 - Alpha Design Labs* 132
 - AMS/Neve* 133
 - dCS* 133
 - Furutech* 133
 - Lavry Engineering* 133
 - Metric Halo* 133
 - Parasound* 132
 - Prism* 133
 - Weiss* 133
- ADC (analog to digital converter) 25, 29, 30, 31, 32, 35, 53
- AES-3 128
- AES3 43, 45, 47, 56, 59
- AES3 connectors 51
- AES/EBU 49, 91
- AIFF 53, 84, 94, 109, 136
- AirPlay 131
- ALAC 34, 109, 139
- aliasing 35

- Alpha Design Labs 132
- Alternating Current 48
- Amarra 81, 87, 91, 107
- amplifier 12
- amplitude 22
- AMS/Neve 133
- analog 19
- analog audio 19
 - conversion to digital (see ADC) 25*
- analysis
 - SpectraFoo 117*
 - Spectre 117*
- anti-aliasing filters 37
- Apple 11
- arithmetic
 - fixed point 91*
 - floating point 91*
- ASRC (asynchronous SRC) 101
- asynchronous mode 58
- AU (Audio Units) 94
- audio
 - analog 19*
 - digital 19, 24*
 - frequency 23*
 - longevity 25*
 - storage 22*
- AudioEase 121
- AudioGate 102
- audio restoration 119
- AudioTest 118
- Audirvana 82, 91, 102
- auditory perception 85
- automatic SR switching 84
- AVB 129

B

- background loading 84, 90
- backup/disaster recovery 76
- battery PSUs 74
- BD 142
- Bell Labs 169
- Benchmark 133
- bit 31, 39
- bit-perfect operation 84, 86
- Blu-ray 142
 - Pure Audio* 142
- BNC connectors 45, 52
- Boot Camp 79
- Boxee 82
- buffer
 - overflow* 60
 - underflow* 60
- buffering 54
- buffering (memory) 60
- Burr Brown 123
- byte 55

C

- Cabrio 82
- capacitance 47
- CD 18
- Cdparanoia 110
- CDs 13, 31, 32, 33, 34, 35, 39
- clocking 20, 29, 33, 55, 58
 - adaptive mode* 58
 - asynchronous mode* 58
 - synchronous mode* 58
- Cloud storage 156
- Cocktail 79

- COG 82
- compact disc (see CD) 13
- compression
 - lossless* 18
 - lossy* 18
- computational overhead 93
- computer
 - host* 12, 63
- computers
 - personal computer* 11
- connector
 - F-05* 127
 - Mini Toslink* 127
 - RCA* 128
 - XLR* 128
- connectors
 - AES3* 51
 - BNC* 45, 52
 - RCA* 43, 52
 - ST optical* 46
 - TOSLINK* 43, 51
 - XLR* 43
- conversion
 - analog-to-digital (also see ADC)* 25, 30
 - digital-to-analog (also see DAC)* 30
- Core Audio 87, 92, 93
- CPU 55
- critical listening 17
- current 21
- cycles per second (Hertz) 32

D

- DAC 49, 123
 - Benchmark* 133
 - Burr Brown* 123
 - Eastern Electric* 132

- integer mode* 92
- M2TECH* 125
- MSB* 133
- MSB Technology* 125
- Music Hall* 132
- Nuforce* 132
- oversampling* 127
- Playback Designs* 125
- USB* 123
- Wadia* 133
- DAC (digital to analog converter) 29, 33, 37, 53, 56, 58, 72, 87
- Darwin 169
- DAS 149
- Dashboard 67
- DAT 144
- data
 - essence* 43
- data buffering 54
- DC 48
- DC offset 31
- dCS 133
- Decibel 91, 104
- de-emphasis
 - RIAA* 141
- digital audio 19, 24
 - AES3* 43
 - bit* 31
 - clocking* 20, 29
 - DSD* 32
 - fixed point vs floating point* 33
 - PCM* 32
 - sampling* 20
 - sampling rates* 33
 - serial vs parallel* 32
 - word length* 33

Digital Audio Tape (DAT) 144
Digital Rights Mangement 84
digital signal processing 132
digitization 140
Direct-Attached Storage
 DAS 149
Direct Current 48
disk usage 89
Disk Utility 78
Disk Warrior 80
distortion 85
DIY 12
double precision 92, 95
downsampling 100
DRAM 54, 56, 71, 72
driver 129
driver software 59
DRM 84
DSD 32, 127, 136
DSDConverter 102
DSD (Direct Stream Digital) 102
DSP 132
DSP (Digital Signal Processing) 94, 97
DVD-A Explorer 112
DVD-Audio 112
DVD Audio Extractor 115
DXD 127, 136
DXD. 50
dynamic range 42, 51

E

Eastern Electric 132
editing 42

- electricity
 - current* 21
 - voltage* 21
- Electro–magnetic Interference 85
- electromotive force 48
- EMF 48
- EMI 85
- Empirical Audio 128
- Energy Saver Preferences 66
- EQ 85, 94
- EQ (equalization) 99
- essence 43
- ethernet 156
- exclusive mode 93

F

- F-05 connector 127
- Fear Uncertainty & Doubt
 - FUD* 168
- Fidelia 91, 94, 105
- file format conversion 93
- file formats
 - AAC* 84
 - AIFF* 84, 109, 136
 - ALAC* 109
 - DSD* 136
 - DXD* 136
 - FLAC* 84, 109
 - linear PCM* 84
 - M4P* 84
 - MP3* 84
 - WAV* 84, 109, 136
- file systems
 - fragmentation* 78
 - journaled* 64, 77

FileVault 76
filters
 anti-aliasing 37
FireWire 56, 57, 124, 127
Firewire-to-AES
 Weiss Engineering 128
fixed point 92
fixed point vs floating point 33
fixed to floats conversion 92
FLAC 34, 53, 84, 93, 94, 109, 139
flash RAM 148
floating point 91, 92
floating vs fixed point 91
Flux 120
FOSS 12, 140, 168, 170
 LAME Project 12
 Linux 16
 open source software 12
frequency 23
FUD 168
Furutech 133
FuzzMeasure Pro 118

G

gain 85
gapless playback 84, 90
grounding 85
group delay 36

H

HD AAC 135
HDMI 47, 58, 72, 74, 129
hog mode 93
host computer 12, 63

How to Listen 117

I

I2S 46

iChat 91

impedance 47

Impedance 48

integer mode 91, 92

intermodulation 38

iOS 90

iTap VNC 91

iTunes 53, 65, 82, 87, 90, 93

J

Jamendo 82

jitter 28, 30, 46, 49, 85, 86

L

LAME Project 12

Lavry Engineering 133

Lexicon 121

linear PCM 84

linear PSUs 73

Linkwitz, Siegfried 99

Linux 16

lossless 135, 138

ALAC 139

FLAC 139

HD AAC 135

Monkey Audio 135

Ogg 135

lossless audio

ALAC 34

FLAC 34

Monkey's Audio 34

- lossless compression 18
- lossy
 - AAC* 135
 - M4A* 135
 - MP3* 135
- lossy compression 18
- lossy vs lossless 135
- loudness 22
- low pass filter 35
- Lynx 123

M

- M2TECH 125, 128
- M4A 135
- M4P 84
- MAC M4P Converter 84
- Mac OS 63, 64, 165
 - Darwin* 169
 - Dashboard* 67
 - Disk Utility* 78
 - Energy Preferences* 66
 - FileVault* 76
 - iTunes* 65
 - journaling* 64
 - Spaces* 69
 - Spotlight* 66
 - Time Machine* 65, 76
 - updates* 68
- MADI 56
- Malware 75
- managing plug-ins 96
- mastering 11
- mastering engineers 11
- Max 110
- MBIT+ 99, 105

McDSP (McDowell Signal Processing) 120
mean time between failure
 MTBF 147
Memory
 DRAM 54
memory–resident playback 84
Memory (see DRAM) 72
memory usage 89
metadata 16, 43
Metric Halo 133
Microsoft 11
Mini Toslink 127
Mint Audio 82
MLC 64, 148
MLP (Meridian Lossless Packing) 113
monitoring
 disk usage 89
 memory usage 89
Monkey Audio 135
Monkey's Audio 34
MP3 34, 84, 135
MSB 133
MSB Technology 125
MTBF 147
Music Hall 132
music reads
 background 84
music server 11, 12, 16, 17, 18
music servers 171

N

NAS 155
Nelson Pass 12
Network-Attached Storage

NAS 155
network services 67
 Bluetooth 68
NoNOISE II 120
Nuforce 132
Nyquist Frequency 35

O

offset
 DC 31
Ogg 135
Ogg Vorbis 110
Onadime 82
open source software 12
operating systems 166
optical fibre 46
OS
 operating system 166
oversampling 127
Oxford Dynamics 121

P

Panorama 121
Parallel ATA
 PATA 151
Parallels 78
Parasound 132
PATA 151
 EIDE 151
PCI 123
PCM 32, 33, 34, 43
perception
 auditory 85
peripherals 56

- personal computer 11
- Philips 103
- Play 82, 104
- playback
 - bit-perfect* 84
 - gapless* 84, 90
 - memory-resident* 84
- player software 81
- playlists 93
- plug-ins 94, 95
 - AU* 94
 - AudioEase* 121
 - Flux* 120
 - Lexicon* 121
 - managing* 96
 - McDSP (McDowell Signal Processing)* 120
 - Oxford Dynamics* 121
 - Panorama* 121
 - PSPAudioware* 120
 - Trio* 121
 - VST* 94
- power supplies
 - battery* 74
 - linear* 73
 - switched-mode* 73
- POW-r 98
- preamplification 140
- Prism 133
- processing
 - memory-resident* 84
- PSPAudioware 120
- Pure Audio Blu-ray 142
- Pure Music 94, 102, 106

Q

quantizing errors 31

R

RAID 152

controller 152

Levels 153

rebuilding 154

RAID controller 152

RAID Levels 153

RAM 88

flash 148

RCA 128

RCA connectors 43, 52

R-DAT 144

redithering 97, 98

MBIT+ 99, 105

POW-r 98

RPDF 98

SBM II 98

shaped 98

TPDF 98

UV-22 98

Redundant Array of Inexpensive Disks

RAID 152

remote control 90, 91

Rowmote 91

restoration, audio 119

NoNOISE II 120

RX 119

RFI (Radio Frequency Interference) 46, 47, 74, 86

RIAA 141

rippers

DVD-A Explorer 112

DVD Audio Extractor 115

Max 110

XLD 110

ripping 53, 108
 AccurateRip 110
 Cdparanoia 110
RME 123
Rowmote 91
RX 119

S

SACD 143
SACDs 32, 136
sample clock 26
sample rate 42
 automatic switching 84, 87
sampling 20, 25, 35
 aliasing 35
 distortion 31
 jitter 28, 30
 motion pictures 25
 precision (see word length) 39
 sample clock 26
 sample rate 42
 word length 39
sampling precision
 16 bit 31
sampling rates 33, 35
SAN 156
SAS
 Serial-Attached SCSI 147
SATA 148, 151
 eSATA 151
SBM II (Super Bit Mapping) 98
Screens 91
screensharing 91
SCSI 149
S-DAT 144

seek time 55

Serial ATA
SATA 148

Serial-Attached SCSI 147

server 11, 16, 17, 18, 53
music server 11

Siegfried Linkwitz 99

signal generators
AudioTest 118
FuzzMeasure Pro 118

sine waves 20

SLC 64, 148

slew rate 31

Small Computer Systems Interface
SCSI 149

software
driver 129
drivers 59
player 81

Software Players (partial list) 82

solid state drive
SSD 148

Songbird 82, 91

sound quality 81

Spaces 69

S/PDIF 59

SpectraFoo 117

Spectre 117

Splashtop 91

Spotlight 66

SRC 100

SRC (sample rate conversion) 94

SSD 53, 56, 64, 148
MLC 64, 148

SLC 64, 148
ST optical connectors 46
Storage Area Network
 SAN 156
storing audio 22
Super Audio CD (SACD) 136
Super Audio CD (see SACDs) 32
SuperDuper 80
switched-mode 73
synchronous mode 58

T

Tag 104
The Cloud 156
Thunderbolt 57, 124, 128
timbre 38
time base 30
timebase 51
Time Machine 65, 76
TOSLINK connectors 43, 51
transcoding 108, 119, 136
transducers 22
transfer rate 148
Trio 121
tubes 148
Tune4Mac M4P Converter 84

U

ultrasonics 36, 38
Universal Serial Bus
 USB 149
Unix 165
upsampling 101
USB 11, 56, 57, 72, 124, 149

Audio Class 1 125
Audio Class 2 125
Class 2 Audio 170
driveless 125
hubs 151
USB Class 2 Audio 170
USB DACs 123
USB -to-AES
 M2TECH 128
USB-to-AES
 Empirical Audio 128
User Experience
 UX 168
utilities
 Cocktail 79
 Disk Utility 78
 Disk Warrior 80
 SuperDuper 80
UV-22 98
UX 168

V

valves 148
vinyl 13
virtualization
 Fusion 79
 Parallels 78
VLC 82
VNC Viewer 91
VNC (Virtual Network Computing) 91
voltage 21
Volume control 22
Vox 82
VST (Virtual Studio Instruments) 94

W

Wadia 133

WAV 53, 84, 109, 136

Weiss 133

Weiss Engineering 128

WiFi 131

Windows 78, 165

virtualized 79

word length 33, 39, 42, 51

X

XBMC 82

XLD (X Lossless Decoder) 110

XLR 128

XLR connectors 43

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