

# Contents

	Foreword . . . . .	xi
	About the Author . . . . .	xii
1	What is High-End Audio? . . . . .	1
2	Getting Started—Defining Your System . . . . .	7
3	How to Choose an Audio System . . . . .	13
	Defining Your Needs . . . . .	13
	Setting Your Budget . . . . .	14
	The Complete vs. the Incremental Purchase . . . . .	15
	<i>Value vs. Luxury Components</i> . . . . .	17
	Allocating Your Budget to Specific Components . . . . .	17
	Upgrading a Single Component . . . . .	20
	How to Read Magazine Reviews . . . . .	21
	System Matching . . . . .	23
	Do's and Don'ts of Selecting Components . . . . .	24
	Your Relationship with the Retailer . . . . .	25
	Used Equipment . . . . .	27
	Product Upgrades . . . . .	28
4	Becoming a Better Listener . . . . .	29
	Listening vs. Measurement . . . . .	29
	Introduction to Critical Listening . . . . .	30
	<i>Audiophile Values</i> . . . . .	30
	<i>Pitfalls of Becoming a Critical Listener</i> . . . . .	33
	Sonic Descriptions and their Meanings . . . . .	33
	<i>Tonal Balance</i> . . . . .	35
	<i>Overall Perspective</i> . . . . .	35
	<i>The Treble</i> . . . . .	36
	<i>The Midrange</i> . . . . .	37
	<i>The Bass</i> . . . . .	39
	<i>Soundstaging</i> . . . . .	41
	<i>Dynamics</i> . . . . .	43
	<i>Detail</i> . . . . .	44
	<i>Musicality</i> . . . . .	44

# Contents

<b>5</b>	<b>Digital Source Components . . . . .</b>	<b>45</b>
	Compact Disc . . . . .	45
	High-End CD Playback: Dedicated CD Players and Separate Transports and Processors . . . . .	46
	High-Definition Compatible Digital (HDCD) . . . . .	47
	Digital Connections . . . . .	47
	High-Resolution Digital Audio: SACD and DVD-Audio . . . . .	49
	<i>SACD</i> . . . . .	50
	<i>DVD-Audio</i> . . . . .	50
	<i>DualDisc</i> . . . . .	52
	<i>Universal Disc Players</i> . . . . .	52
	Multichannel Output on High-Resolution Players . . . . .	53
	Bass Management in SACD and DVD-A Players . . . . .	54
	The Future of High-Resolution Digital Audio . . . . .	55
	Music Servers . . . . .	56
	Computer-Based Digital Audio and File Formats . . . . .	57
	How to Choose a Digital Source . . . . .	58
	<i>What to Listen For</i> . . . . .	58
<b>6</b>	<b>Turntables, Tonearms, and Cartridges . . . . .</b>	<b>63</b>
	The Turntable . . . . .	65
	<i>The Base and Plinth</i> . . . . .	66
	<i>Sprung and Unsprung Turntables</i> . . . . .	66
	<i>The Platter and Bearing Assembly</i> . . . . .	67
	<i>Platter Mats and Record Clamps</i> . . . . .	68
	<i>The Drive System</i> . . . . .	69
	The Tonearm . . . . .	70
	The Phono Cartridge . . . . .	71
	<i>Moving-Magnet and Moving-Coil Cartridges</i> . . . . .	72
	<i>The Stylus and Cantilever</i> . . . . .	73
	How to Choose an LP Playback System . . . . .	74
	What to Listen For . . . . .	75
<b>7</b>	<b>Preamplifiers . . . . .</b>	<b>79</b>
	Types of Preamplifiers . . . . .	79
	How to Choose a Preamplifier . . . . .	80
	<i>Tubes vs. Transistors</i> . . . . .	81

*Balanced and Unbalanced Connections* . . . . . 83

Audio/Video Controllers and  
 Multichannel Preamplifiers . . . . . 84

Phono Preamplifiers . . . . . 85

*RLAA Equalization* . . . . . 86

*Phono-Stage Gain* . . . . . 86

*Cartridge Loading* . . . . . 87

What to Listen For . . . . . 88

**8 Power and Integrated Amplifiers . . . . . 91**

A Survey of Amplifier Types . . . . . 92

*Monoblock, Stereo, Three-Channel, and Multichannel  
 Amplifiers* . . . . . 92

*Integrated Amplifiers* . . . . . 93

*Tubed Power Amplifiers* . . . . . 95

*Single-Ended Triode Amplifiers* . . . . . 96

*Single-Ended Solid-State Amplifiers* . . . . . 98

*Class-D (“Switching”) Amplifiers* . . . . . 99

How to Choose a Power Amplifier . . . . . 100

*Output-Power Specifications: Read the Fine Print* . . . . . 102

*Why Two “100W” Amplifiers Can Have Different  
 Output Powers* . . . . . 103

Other Power-Amplifier Considerations . . . . . 104

*Balanced Inputs* . . . . . 104

*Bridging* . . . . . 104

What to Listen For . . . . . 105

**9 Loudspeakers . . . . . 107**

How to Choose a Loudspeaker . . . . . 107

*Other Guidelines in Choosing Loudspeakers* . . . . . 111

Finding the Right Loudspeaker—Before You Buy . . . . . 113

What to Listen For . . . . . 114

Loudspeakers for Home Theater . . . . . 116

Loudspeaker Types and How They Work . . . . . 117

*The Dynamic Driver* . . . . . 117

*The Planar-Magnetic Transducer* . . . . . 119

*The Electrostatic Driver* . . . . . 122

# Contents

<i>The Dipolar Radiation Patterns of Ribbons and Electrostatics</i> . . . . .	124
<i>Horn Loudspeakers</i> . . . . .	125
Loudspeaker Enclosures . . . . .	126
<i>Enclosure Shapes</i> . . . . .	129
<i>Air-Suspension and Bass-Reflex Enclosures</i> . . . . .	129
<i>Passive Radiators</i> . . . . .	130
Powered and Servo-Driven Woofers . . . . .	130
Crossovers . . . . .	130
Digital Loudspeakers . . . . .	132
Subwoofers . . . . .	133

## 10 Audio for Home Theater

### **and Multichannel Music . . . . . 137**

Overview—Surround Sound . . . . .	137
Should You Choose a 5.1-Channel or a 7.1-Channel System? . . . . .	138
Overview—Audio/Video Receivers, Controllers, and Amplifiers . . . . .	139
Overview—Home-Theater Loudspeakers . . . . .	140
A/V Receivers . . . . .	141
How to Choose a Receiver . . . . .	142
<i>Inputs, Outputs, and Source Switching</i> . . . . .	142
<i>Digital Signal Processing (DSP) and         Surround-Decoding Formats</i> . . . . .	144
<i>6-Channel Analog Input</i> . . . . .	144
<i>Analog-Bypass Mode</i> . . . . .	144
<i>Automatic Calibration</i> . . . . .	145
<i>7.1-Channel Playback from 5.1-Channel Sources</i> . . . . .	145
<i>Multi-Room and Multi-Zone</i> . . . . .	145
<i>Power Output in AVRs</i> . . . . .	145
<i>Satellite Radio: XM and Sirius</i> . . . . .	146
<i>FM Tuner Performance</i> . . . . .	146
<i>THX Certification of AVRs and Controllers</i> . . . . .	147
Multichannel Power Amplifiers . . . . .	148
<i>How to Choose a Home-Theater Power Amplifier</i> . . . . .	148
Loudspeakers for Home Theater . . . . .	149

	<i>The Center-Channel Speaker</i> . . . . .	149
	<i>Adding a Center Speaker to Your System</i> . . . . .	150
	<i>Left and Right Speakers</i> . . . . .	151
	<i>Surround Speakers</i> . . . . .	152
	<i>Dipolar and Bipolar Surround Speakers</i> . . . . .	152
	<i>Surround-Back Speakers for 7.1-Channel Sources</i> . . . . .	154
	Subwoofers . . . . .	154
	Setting up a Home Theater . . . . .	154
	<i>Basic Setup</i> . . . . .	154
	<i>Acoustical Treatment</i> . . . . .	155
	<i>Speaker Placement</i> . . . . .	156
	<i>Surround-Speaker Placement</i> . . . . .	156
	<i>Surround-Back Speaker Placement for</i> <i>7.1-Channel Sources</i> . . . . .	156
	<i>Center-Speaker Placement</i> . . . . .	157
	<i>Left and Right Speaker Placement</i> . . . . .	157
	Subwoofer Placement and Connection . . . . .	158
	Calibrating a Home Theater . . . . .	159
	<i>Bass Management</i> . . . . .	159
	<i>Setting Individual Channel Levels</i> . . . . .	160
	Adding Home Theater Without Compromising Music Performance . . . . .	161
	Addendum: Surround-Sound Formats . . . . .	162
<b>11</b>	<b>Cables, Racks, and AC Conditioners . . . . .</b>	<b>165</b>
	How to Choose Cables and Interconnects . . . . .	166
	<i>How Much Should You Spend on Cables</i> <i>and Interconnects?</i> . . . . .	168
	<i>What to Listen For</i> . . . . .	168
	Binding Posts and Cable Terminations . . . . .	170
	Bi-Wired Loudspeaker Cables . . . . .	170
	Interconnects: Balanced and Unbalanced . . . . .	171
	Cable and Interconnect Construction . . . . .	172
	Equipment Racks . . . . .	173
	AC Power Conditioners . . . . .	175

# Contents

<b>12</b>	<b>How to Get the Best Sound From Your System . . . . .</b>	<b>177</b>
	Room Layout . . . . .	177
	Loudspeaker Placement . . . . .	178
	<i>Dipolar and Bipolar Loudspeaker Placement . . . . .</i>	<i>184</i>
	<i>Subwoofer Placement and Setup . . . . .</i>	<i>185</i>
	<i>Multichannel Loudspeaker Placement . . . . .</i>	<i>187</i>
	<i>Loudspeaker Placement Summary . . . . .</i>	<i>189</i>
	Optimizing Your Listening Room . . . . .	189
	<i>Common Room Problems and How to Treat Them . . . . .</i>	<i>190</i>
	Acoustical Do's and Don'ts . . . . .	194
	Digital Room Correction . . . . .	195
	Accessories and Cable Dressing . . . . .	197
	<b>Glossary . . . . .</b>	<b>199</b>
	<b>Index . . . . .</b>	<b>217</b>