

Contents

PART I	THE SOUND OF MUSIC	1
1	The Physics of Music	3
	Musical Sound—The Systems Involved; The Way Ahead—An Overview.	
PART II	A PURE TONE—A CAPPELLA	9
2	The Origin of Musical Sound	11
	Periodic Motion; Simple Harmonic Motion; Damped and Forced Oscillations.	
3	The Transmission of Musical Sound	25
	Propagating Disturbances in Springy Matter; Sound Waves; Intensity of Sound Waves; Sound-Intensity Level	
4	The Perception of a Pure Tone	47
	The Role of Frequency: Pitch; The Role of Amplitude: Loudness; The Effect of Nonlinearity: Aural Harmonics.	
PART III	TWO PURE TONES TOGETHER	57
5	The Superposition of Vibrations	59
	Simple Harmonic Motion—A Brief Review; Comparing Two Periodic Motions: Phase; Simultaneous Vibrations—Superposition; Some Superposition Curves of Musical Interest; What is Pure about a Pure Tone?	
6	The Superposition of Waves	71
	Wave Superpositions of Particular Interest	

7	The Perception of Two Pure Tones	79
	Perceptual Features of Two Pure Tones; Combination Tones; Nonlinearity Revisited; Fundamental Tracking.	
PART IV	ARCHETYPAL INSTRUMENTS: THE TROMBA MARINA, THE FIFE, THE COACH HORN, AND THE DRUM	89
8	The Origin of Complex Tones: Strings, Tubes, and Membranes	93
	The Vibrational Modes of a Stretched String; The Vibrational Modes of an Air Column; The Vibrational Modes of a Stretched Membrane; Summary.	
9	The Transmission of Complex Tones from Strings, Tubes, and Membranes	117
	The Generation of Complex Vibrations on a String; The Generation of Complex Vibrations in an Air Column; The Generation of Complex Vibrations in a Membrane; Structural Influences on the Transmitted Sound.	
10	The Perception of Complex Tones	149
PART V	THE WHOLE ORCHESTRA	153
11	The Instruments of Musical Sound	155
	The Stringed Instruments; The Orchestral Woodwind Instruments; The Orchestral Brass Instruments; The Piano; The Singing Voice.	
12	The Musical Environment	205
	The Influence of the Environment; Acoustics—Art or Science?; Behavior of Sound—A Review and an Extension; Sound within an Enclosure; Quantitative Acoustical Parameters; Acousticians Interpretation of the Critics' Terminology; The Interdependence of Architecture and Music; Remedial Acoustics.	
13	Perception of Music	233
	Subjective Music and Objective Acoustics; Consonance and Dissonance; Musical Scales.	

PART VI	SOUND REPRODUCTION	255
14	Sound System Components	259
	The Transducer; The Phonograph Cartridge; High-Fidelity Program Sources; High-Fidelity Program Control and Amplification; High-Fidelity Playback; Car Stereo.	
15	Sound Systems and Their Environment	303
	Sound Systems; Home Systems; Component Placement in the Room Environment; Car Stereo.	
16	Toward a Consummation of the Listening Experience	313
	Questions Facing the Buyer; Suggestions for the Purchase Procedure.	
PART VII	ELECTRONIC MUSIC	323
17	Synthesized and Digital Sound	325
	Basic Components of an Electronic Synthesizer; Additive and Subtractive Synthesis; Putting the Components Together—Sample Patches; Digital Sound; Digital Disk: The CD; Postscript.	
	Answers to Selected Problems	347
	Index	349