

1: - Fundamentals of Physical Acoustics by David T Blackstock

Fundamentals of Physical Acoustics is intended for atwo-semester, first-year graduate course, but is also suitable foradvanced undergraduates. Emphasis on plane waves.

Includes bibliographical references and index. What Is a Wave? Some Basic Solutions 3 -- 1. General Solution of the Wave Equation 4 -- 2. Free Waves 10 -- 3. Forced Waves 14 -- 4. Relation between Derivatives for a Progressive Wave 16 -- C. Derivation of Wave Equations. Impedance 18 -- 1. Electrical Transmission Line 18 -- 2. Waves on a String 22 -- 3. Sound Waves 27 -- D. Three-Dimensional Wave Equation 40 -- 2. Solutions for One-Dimensional Waves 41 -- 3. Sound from a Pulsating Sphere 42 -- E. Signals, Impedance, Intensity and Power, and Levels 44 -- 1. Time and Frequency Domains 44 -- 2. Impedance 46 -- 3. Intensity and Sound Power 48 -- 4. Conservation Equations and Constitutive Relation 65 -- 1. Equation of Continuity 65 -- 2. Momentum Equation 69 -- 3. Energy Equation 77 -- 4. Equation of State Constitutive Relation 80 -- 5. Entropy Equation 82 -- B. Nonlinear Wave Equation 84 -- 2. Plane Progressive Waves of Finite Amplitude 86 -- 3. Second-Harmonic Distortion 89 -- 4. Small-Signal Wave Equation 91 -- 1. Lossless Medium at Rest 91 -- 2. Lossless Medium Moving with Constant Velocity 93 -- 3. Lossless Medium in a Gravitational Field 95 -- 4. Viscous Fluid 96 -- 5. Viscous, Thermally Conducting Fluid 97 -- 6. Pressure Signals -- 2. Sound Power -- 3. Transmission Loss -- B. Special Cases -- 1. Rigid Wall -- 2. Pressure Release Surface -- 3. Matched Impedance Interface -- C. Change in Cross-Sectional Area -- 1. Shock Tube -- 3. Steady-State Analysis -- B. Single Impedance Termination -- 1. General Resistive Termination -- 4. General Impedance Termination -- 5. Change in Cross-Sectional Area -- C. Lumped-Element Approximation -- 1. Electrical Analogs -- 2. Short Closed Cavity -- 3. End Correction for an Open Tube -- 4. Short Open Cavity -- 5. Helmholtz Resonator -- 6. Orifice -- 1. Side Branches, Filters -- 2. Probe Tube Microphone -- E. Three-Medium Problems -- 1. Cross Sections Different for the Three Media -- 3. Oblique Incidence -- A. Plane Interface Separating Two Fluids -- 1. Special Cases -- C. Transmission through Panels at Oblique Incidence -- 1. Transmission Dominated by Panel Mass: The Mass Law -- 2. The Coincidence Effect -- D. String with Fixed Ends -- 2. Other Boundary Conditions -- 3. Struck String -- B. Vibrating Membrane -- C. Sound in a Rectangular Enclosure -- D. Rectangular Waveguide -- 1. Membrane Waveguide -- 2. Physical Interpretation -- 4. Source Conditions -- Chapter 7 Horns -- A. Webster Horn Equation -- 1. Continuity Equation -- 2. Momentum Equation -- 3. Webster Horn Equation -- B. Exponential Horn -- 1. Exponential Horn Equation and Solution -- 2. Amplitude Decay and Phase Velocity -- C. Impedance, Power Transmitted, and Transmission Factor -- 1. Impedance and Power -- 2. Conical Horn -- 3. Transmission Factor -- D. WKB Method -- 1. Application to the Horn Equation: Direct Approach -- 2. Modified Approach -- 3. Impedance and Transmission Factor -- E. Static Properties of the Atmosphere and the Ocean -- 1. Atmosphere -- 2. Ocean -- B. Vertical Propagation of Plane Waves -- 1. One-Dimensional Wave Equation -- 2. Vertical Propagation through an Isothermal Atmosphere -- 3. Ray Theory -- 1. Ray Paths -- 2.

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3: ISBN - Fundamentals of Physical Acoustics Direct Textbook

DAVID T. BLACKSTOCK is a professor in the Department of Mechanical Engineering at the University of Texas at Austin. He is a past president of the Acoustical Society of America and has been awarded its Gold Medal.

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