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## Equivalent Circuit Transducer Model

5.4 Transducer Design Considerations 5.5 Transducer Pulses; 5.6 Equations for Piezoelectric Media; 5.7 Piezoelectric Materials; 5.8 Comparison of Piezoelectric Materials; 5.9 Transducer Advanced Topics; Bibliography; References; Chapter 6. BEAMFORMING; 6.1 What is Diffraction?; 6.2 Fresnel Approximation of Spatial Diffraction Integral; 6.3 Rectangular Aperture; 6.4 Apodization; 6.5 Circular Apertures; 6.6 Focusing; 6.7 Angular Spectrum of Waves; 6.8 Diffraction Loss; 6.9 Limited Diffraction Beams; Bibliography; References; Chapter 7. ARRAY BEAMFORMING; 7.1 Why Arrays? 7.2 Diffraction in the Time Domain 7.3 Circular Radiators in the Time Domain; 7.4 Arrays; 7.5 Pulse-Echo Beamforming; 7.6 Two-Dimensional Arrays; 7.7 Baffled; 7.8 General Approaches; 7.9 Nonideal Array Performance; Bibliography; References; Chapter 8. WAVE SCATTERING AND IMAGING; 8.1 Introduction; 8.2 Scattering of Objects; 8.3 Role of Transducer Diffraction and Focusing; 8.4 Role of Imaging; Bibliography; References; Chapter 9. SCATTERING FROM TISSUE AND TISSUE CHARACTERIZATION; 9.1 Introduction; 9.2 Scattering from Tissues; 9.3 Properties of and Propagation in Heterogeneous Tissue 9.4 Array Processing of Scattered Pulse-Echo Signals 9.5 Tissue Characterization Methods; 9.6 Applications of Tissue Characterization; 9.7 Elastography; 9.8 Aberration Correction; 9.9 Wave Equations for Tissue; Bibliography; References; Chapter 10. IMAGING SYSTEMS AND APPLICATIONS; 10.1 Introduction; 10.2 Trends in Imaging Systems; 10.3 Major Controls; 10.4 Block Diagram; 10.5 Major Modes; 10.6 Clinical Applications; 10.7 Transducers and Image Formats; 10.8 Front End; 10.9 Scanner; 10.10 Back End; 10.11 Advanced Signal Processing; 10.12 Alternate Imaging System Architectures; Bibliography References

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### Sommario/riassunto

Ultrasound, sound at a frequency we cannot hear, is a complex imaging method used by most medical professionals from cardiologists and pathologists to obstetricians and biomedical engineers. This text provides practicing engineers, scientists and physicians engaged in ultrasound research and applications with a well rounded and comprehensive reference for all major topics in medical ultrasound. From its antecedents to the modern day use and prospects for the future, this is the most up-to-date text on the subject. Based on the author's over thirty-five years of experience in

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