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Treatment) -- 4.1. Cold-Cavity Approximation -- 4.2. Self-Consistent Approach -- 4.3. Effect of Velocity Spread -- 4.4. Space-Charge Effects -- 4.5. Trade-Offs in the Gyrotron Design -- 4.6. Problems and Solutions -- Chapter 5 Mode Interaction in the Gyromonotron -- 5.1. Preliminary Remarks -- 5.2. Main Effects in the Mode Interaction -- 5.3. Start-up Scenario -- 5.4. Phase Locking in Multimode Gyrotrons -- 5.5. Problems and Solutions -- Chapter 6 Linear Theory of the Gyro-TWT -- 6.1. Introduction: Instability in Magnetoactive Plasma -- 6.2. Derivation of the Dispersion Equation for the Gyro-TWT -- 6.3. Small-Signal Gain in Single-Stage and !Vlultistage Devices -- 6.4. Bandwidth. 6.5. Stability -- Chapter 7 Nonlinear Theory of the Gyro-TWT -- 7.1. Self-Consistent Set of Equations. Energy Conservation Law. Low-Current Limit -- 7.2. Beam-Wave Interaction -- 7.3. Gain and Bandvvidth -- 7.4. Concluding Remarks -- 7.5. Problems and Solutions -- Chapter 8 Theory of Gyroklystrons -- 8.1. Introductory Remarks -- 8.2. General Formalism. Point-Gap Model -- 8.3. Gain, Bandwidth, and Efficiency -- 8.4. Two-Cavity Gyroklystron -- 8.5. Problems and Solutions -- Chapter 9 Fluctuations: Intrinsic and Extrinsic Noise -- 9.1. Radiation Linewidth, Sources of Noise -- 9.2. General Formalism -- 9.3. Intrinsic Noise Sources. Shot Noise -- 9.4. Extrinsic Noise -- 9.5. Phase Stability of Gyroamplifiers -- 9.6. Problems and Solutions -- PART III THE DEVELOPMENT OF GVRODEVICES -- Chapter 10 Gyrotron Oscillators for Controlled Fusion Experiments -- 10.1. Historical Introduction -- 10.2. Quasi-Optical Mode Converters -- 10.3. Output Windows -- 10.4. Depressed Collectors -- 10.5. Experimental Results -- Chapter 11 Gyroklystrons -- 11.1. Historical Introduction -- 11.2. Gyroklystrons for Radar Applications -- 11.3. Gyroklystrons for Charged Particle Accelerators -- Chapter 12 Gyro-Traveling-Wave Tubes -- 12.1. Historical Introduction -- 12.2. Large-Bandwidth Gyro-TWTs -- 12.3. High-Gain Gyro-TWTs -- Chapter 13 Other Types of Gyrodevices -- 13.1. Gyro-Backward-Wave Oscillator -- 13.2. Gyrotwystron -- 13.3. Quasi-Optical Gyrotron -- 13.4. Cyclotron Auto-Resonance Maser (CARM) -- 13.5. Cyclotron Maser Based on the Anomalous Doppler Effect -- 13.6. Large-Orbit Gyrotron -- 13.7. Peniotron, Gyropeniotron, and Autoresonant Peniotron -- 13.8. Problems and Solutions -- Summary -- Appendix 1: Derivation of Gyro-Averaged Equations -- Appendix 2: Wave Excitation by Electron Beams in Waveguides.
Appendix 3: Derivation of the Self-Consistent Set of Equations for the Gyro-TWT -- References -- Index.

Sommario/riassunto

As unique sources of coherent high-power, microwave, and millimeter-wave radiation, gyrotrons are an essential part of the hunt for controlled fusion. Presently, gyrotrons are actively used for electron cyclotron resonance plasma heating and current drive in various controlled fusion reactors. These sources have been under development in many countries for more than forty years. In spite of their widespread use, however, there is as yet no single book to introduce non-specialists to this vital field.Now Gregory S. Nusinovich, an early pioneer of the gyrotron and widely regarded today as the world's leading authority on the subject, explains the fundamental physical principles upon which gyrotrons and related devices operate. Nusinovich first sets forth some "rules of thumb" that allow readers to understand gyrotron operation in simple terms. He then explores the fundamentals of the general theory of gyrotrons and offers an overview of the various types of gyro-devices, including gyromonotrons, gyroklystrons, gyro-traveling-wave tubes, and gyrotwystrons. He explains not only the theory, linear and nonlinear, but also the practical challenges that users of such devices face. This book will be of interest

to undergraduate and graduate students as well as to those who develop gyrotrons or who use them in various applications. It should also appeal to plasma physicists interested in charged-particle dynamics, as well as to applied physicists needing to know more about micro- and millimeter-wave technologies.