

# Handbook Of Reflector Antennas And Feed Systems Volume 1 Theory And Design Of Reflectors Artech House Antennas And Propagation Library

The book reviews developments in the following fields: circular microstrip antennas; microstrip patch antennas; circular polarisation and bandwidth; microstrip dipoles; multilayer and parasitic configurations; wideband flat dipole and short-circuit microstrip patch elements and arrays; numerical analysis; multiport network approach; transmission-line model; rectangular microstrip antennas; low-cost printed antennas; printed phased-array antennas; circularly polarised antenna arrays; microstrip antenna feeds; substrate technology; computer-aided design of microstrip and triplate circuits; resonant microstrip antenna elements and arrays for aerospace applications; mobile and satellite systems; conical conformal microstrip tracking antenna; and microstrip field diagnostics.

Best engineer's reference on antennas. Table of Contents: Introduction to Antennas; Fundamentals of Antennas; Arrays of Discrete Elements; Dipoles and Monopoles; Loop Antennas; Small Antennas; Microstrip Antennas; Slot Antennas; Slot-Antenna Arrays; Leaky-Wave Antennas; Long-Wire Antennas; Surface-Wave Antennas and Surface-Wave Excited Arrays; Helical Antennas; Frequency-Independent Antennas; Horn Antennas; Lens Antennas; Reflector Antennas; Feeds for Lenses and Reflectors; Electromechanical Scanning Antennas; Frequency-Scan Antennas; Phased Arrays; Conformal and Low-Profile Arrays; Adaptive Antennas; Methods of Polarization Synthesis; Low-Frequency Antennas; Medium-Frequency Broadcast Antennas; High-Frequency Antennas; VHF and UHF Communications Antennas; and more. Index. 800 illustrations.

Volume II covers antenna theory and design, describing a number of antenna types, including receiving, wire and loop, horn, frequency-independent, microstrip, reflector, and lens antennas. This section also includes arrays, providing array theory as well as exploring waveguide-fed slot arrays, periodic arrays, and aperiodic arrays.

The book reviews developments in the following fields: electromagnetic compatibility; EMC standards; EMC testing; radiated emission testing; antennas; radiated susceptibility testing; measurement equipment; electromagnetic transient testing; and uncertainty analysis

Good, No Highlights, No Markup, all pages are intact, Slight Shelfwear, may have the corners slightly dented, may have slight color changes/slightly damaged spine.

Handbook of Reflector Antennas and Feed Systems Volume II: Feed Systems Artech House

This book addresses a broad range of topics on antennas for space applications. First, it introduces the fundamental methodologies of space antenna design, modelling and analysis as well as the state-of-the-art and anticipated future technological developments. Each of the topics discussed are specialized and contextualized to the space sector. Furthermore, case studies are also provided to demonstrate the design and implementation of antennas in actual applications. Second, the authors present a detailed review of antenna designs for some popular applications such as satellite communications, space-borne synthetic aperture radar (SAR), Global Navigation

Satellite Systems (GNSS) receivers, science instruments, radio astronomy, small satellites, and deep-space applications. Finally it presents the reader with a comprehensive path from space antenna development basics to specific individual applications. Key Features: Presents a detailed review of antenna designs for applications such as satellite communications, space-borne SAR, GNSS receivers, science instruments, small satellites, radio astronomy, deep-space applications Addresses the space antenna development from different angles, including electromagnetic, thermal and mechanical design strategies required for space qualification Includes numerous case studies to demonstrate how to design and implement antennas in practical scenarios Offers both an introduction for students in the field and an in-depth reference for antenna engineers who develop space antennas This book serves as an excellent reference for researchers, professionals and graduate students in the fields of antennas and propagation, electromagnetics, RF/microwave/millimetrewave systems, satellite communications, radars, satellite remote sensing, satellite navigation and spacecraft system engineering, It also aids engineers technical managers and professionals working on antenna and RF designs. Marketing and business people in satellites, wireless, and electronics area who want to acquire a basic understanding of the technology will also find this book of interest. This monograph is devoted to the theory, design, performance and application of microwave horns and feeds for reflector antennas. It is a collaboration between the microwave antenna group at Queen Mary and Westfield College and the electromagnetic group at the University of Winnipeg, Canada.

The NAB Engineering Handbook provides detailed information on virtually every aspect of the broadcast chain, from news gathering, program production and postproduction through master control and distribution links to transmission, antennas, RF propagation, cable and satellite. Hot topics covered include HD Radio, HDTV, 2 GHz broadcast auxiliary services, EAS, workflow, metadata, digital asset management, advanced video and audio compression, audio and video over IP, and Internet broadcasting. A wide range of related topics that engineers and managers need to understand are also covered, including broadcast administration, FCC practices, technical standards, security, safety, disaster planning, facility planning, project management, and engineering management. Basic principles and the latest technologies and issues are all addressed by respected professionals with first-hand experience in the broadcast industry and manufacturing. This edition has been fully revised and updated, with 104 chapters and over 2000 pages. The Engineering Handbook provides the single most comprehensive and accessible resource available for engineers and others working in production, postproduction, networks, local stations, equipment manufacturing or any of the associated areas of radio and television.

A practical book written for engineers who design and use antennas The author has many years of hands on experience designing antennas that were used in such applications as the Venus and Mars missions of NASA The book covers all important topics of modern antenna design for communications Numerical methods will be included but only as much as are needed for practical applications

Antennas From Theory to Practice Comprehensive coverage of the fundamentals and latest developments in antennas and antenna design In the newly revised Second Edition of Antennas: From Theory to Practice, renowned researcher, engineer, and author Professor Yi Huang delivers comprehensive and timely coverage of issues in modern antenna design and theory. Practical and accessible, the book is written for engineers, researchers, and students who work with radio frequency/microwave engineering, radar, and radio communications. The

book details the basics of transmission lines, radiowaves and propagation, antenna theory, antenna analysis and design using industrial standard design software tools and the theory of characteristic modes, antenna measurement equipment, facilities, and techniques. It also covers the latest developments in special topics, like small and mobile antennas, wide- and multi-band antennas, automotive antennas, RFID, UWB, metamaterials, reconfigurable and MIMO antennas, and more. The new edition includes up to date information on a wide variety of newly relevant topics and trends, like adaptive impedance matching, the theory of characteristic modes, antenna materials and fabrication processes, and over-the-air (OTA) antenna system measurements. Many questions and examples are provided which enhances the learning experience. The book covers: An introduction to circuit concepts and transmission lines, including lumped and distributed element systems, transmission line theory, and the Smith Chart An exploration of field concepts and radiowaves, including wave equations and solutions and radiowave propagation mechanisms, characteristics, and models Discussions of antenna basics and popular antennas, including wire-type antennas, aperture-type antennas, and antenna arrays Information about antenna manufacturing and measurements, including antenna measurement facilities and methods The use of industrial standard simulation tools for antenna design and analysis Perfect for engineers and researchers who work in RF engineering or radar and radio communications, *Antennas: From Theory to Practice, Second Edition* will also earn a place on the bookshelves of university students seeking a concise and practical introduction to the basics of antennas and antenna design.

Presents an overview of CubeSat antennas designed at the Jet Propulsion Laboratory (JPL) CubeSats—nanosatellites built to standard dimensions of 10cm x 10 cm x cm—are making space-based Earth science observation and interplanetary space science affordable, accessible, and rapidly deployable for institutions such as universities and smaller space agencies around the world. *CubeSat Antenna Design* is an up-to-date overview of CubeSat antennas designed at NASA's Jet Propulsion Laboratory (JPL), covering the systems engineering knowledge required to design these antennas from a radio frequency and mechanical perspective. This authoritative volume features contributions by leading experts in the field, providing insights on mission-critical design requirements for state-of-the-art CubeSat antennas and discussing their development, capabilities, and applications. The text begins with a brief introduction to CubeSats, followed by a detailed survey of low-gain, medium-gain, and high-gain antennas. Subsequent chapters cover topics including the telecommunication subsystem of Mars Cube One (MarCO), the enabling technology of Radar in a CubeSat (RainCube), the development of a one-meter mesh reflector for telecommunication at X- and Ka-band for deep space missions, and the design of multiple metasurface antennas. Written to help antenna engineers to enable new CubeSat NASA missions, this volume: Describes the selection of high-gain CubeSat antennas to address specific mission requirements and constraints for instruments or telecommunication Helps readers learn how to develop antennas for future CubeSat missions Provides key information on the effect of space environment on antennas to inform design steps Covers patch and patch array antennas, deployable reflectarray antennas, deployable mesh reflector, inflatable antennas, and metasurface antennas *CubeSat Antenna Design* is an important resource for antenna/microwave engineers, aerospace systems engineers, and advanced graduate and postdoctoral students wanting to learn how to design and fabricate their own antennas to address clear mission requirements. These books present the fundamental background theory and analytical techniques of antenna design, dealing with a very wide range of antenna types, operating from very low frequencies to millimeter waves.

Enhance any display with these beautiful borders that feature full-color photographs of panoramic scenes. Eight 24" x 6" borders connect seamlessly for a total length of 16 feet. For use with Grades PreK–5.

This new resource covers the latest developments in computational electromagnetic methods, with emphasis on cutting-edge applications. This book is designed to extend existing literature to the latest development in computational electromagnetic methods, which are of interest to readers in both academic and industrial areas. The topics include advanced techniques in MoM, FEM and FDTD, spectral domain method, GPU and Phi hardware acceleration, metamaterials, frequency and time domain integral equations, and statistics methods in bio-electromagnetics.

The NAB Engineering Handbook is the definitive resource for broadcast engineers. It provides in-depth information about each aspect of the broadcast chain from audio and video contribution through an entire broadcast facility all the way to the antenna. New topics include Ultra High Definition Television, Internet Radio Interfacing and Streaming, ATSC 3.0, Digital Audio Compression Techniques, Digital Television Audio Loudness Management, and Video Format and Standards Conversion. Important updates have been made to incumbent topics such as AM, Shortwave, FM and Television Transmitting Systems, Studio Lighting, Cameras, and Principles of Acoustics. The big-picture, comprehensive nature of the NAB Engineering Handbook will appeal to all broadcast engineers—everyone from broadcast chief engineers, who need expanded knowledge of all the specialized areas they encounter in the field, to technologists in specialized fields like IT and RF who are interested in learning about unfamiliar topics. Chapters are written to be accessible and easy to understand by all levels of engineers and technicians. A wide range of related topics that engineers and technical managers need to understand are covered, including broadcast documentation, FCC practices, technical standards, security, safety, disaster planning, facility planning, project management, and engineering management.

The Handbook of Antenna Technologies aims to present the rapid development of antenna technologies, particularly in the past two decades, and also showcasing the newly developed technologies and the latest applications. The handbook will provide readers with the comprehensive updated reference information covering theory, modeling and optimization methods, design and measurement, new electromagnetic materials, and applications of antennas. The handbook will widely cover not only all key antenna design issues but also fundamentals, issues related to antennas (transmission, propagation, feeding structure, materials, fabrication, measurement, system, and unique design challenges in specific applications). This handbook will benefit the readers as a full and quick technical reference with a high-level historic review of technology, detailed technical descriptions and the latest practical applications.

The most up-to-date, comprehensive treatment of classical and modern antennas and their related technologies Modern Antenna Handbook represents the most current and complete thinking in the field of antennas. The handbook is edited by one of the most recognizable, prominent, and prolific authors, educators, and researchers on antennas and electromagnetics. Each chapter is authored by one or more leading international experts and includes cover-age of current and future antenna-related technology. The information is of a practical nature and is intended to be useful for researchers as well as practicing engineers. From the fundamental parameters of antennas to antennas for mobile wireless communications and medical applications, Modern Antenna Handbook covers everything professional engineers, consultants, researchers, and students need to know about the recent developments and the future direction of this fast-paced field. In addition to antenna topics, the handbook also covers modern technologies such as metamaterials, microelectromechanical systems (MEMS), frequency selective surfaces (FSS), and radar cross sections (RCS) and their applications to antennas, while five



chapters are devoted to advanced numerical/computational methods targeted primarily for the analysis and design of antennas.

Scope of science and technology is expanding at an exponential rate and so is the need of skilled professionals i.e., Engineers. To stand out of the crowd amidst rising competition, many of the engineering graduates aim to crack GATE, IES and PSUs and pursue various post graduate Programmes. Handbook series as its name suggests is a set of Best-selling Multi-Purpose Quick Revision resource books, those are devised with anytime, anywhere approach. It's a compact, portable revision aid like none other. It contains almost all useful Formulae, Equations, Terms, Definitions and many more important aspects of these subjects. Electronics and Communication Engineering Handbook has been designed for aspirants of GATE, IES, PSUs and Other Competitive Exams. Each topic is summarized in the form of key points and notes for everyday work, problem solving or exam revision, in a unique format that displays concepts clearly. The book also displays formulae and circuit diagrams clearly, places them in context and crisply identities and describes all the variables involved. Diode, Transistor, Analog Electronics, Integrated Circuits, Industrial Device, Signals and systems, Communication Systems, Network Theory, Control Systems, Electromagnetic Field Theory, Antenna and Wave Propagation, Digital Electronics, Microprocessor, Material Science, Electronics Measurement and Instrumentation, Microwave Engineering

This is the first truly comprehensive and most up-to-date handbook available on modern reflector antennas and feed sources for diversified space and ground applications. There has never been such an all-encompassing reflector handbook in print, and no currently available title offers coverage of such recent research developments. The Handbook consists of three volumes. Volume II focuses on feed sources. Reflector antennas are extraordinary devices that combine high gain with geometrical simplicity, and can operate in broad frequency bands. Their performance, however, depends on the electrical characteristics of the feed system with which they operate. This comprehensive volume provides you with a solid understanding of feed system theory, design, and analysis. Featuring chapters authored by experts in each aspect of feed systems, this book takes you from fundamental mathematical techniques, electrically small and large dual reflectors, feed geometry and telemetry, tracking and command antennas, and more. Throughout the book numerous examples are provided to guide you in the practical aspects of feed design.

This comprehensive treatment of ultrawideband (UWB) antennas and time-domain microwave engineering serves as an invaluable practical reference for anyone involved in antenna and RF design work. This authoritative volume enables readers to select the proper UWB antennas for their applications, design and analyze UWB antennas, and integrate these antennas in an RF system. By applying time-domain thinking to problems of practical interest, the reader will not only learn how to build and analyze antennas, but also understand them at the most fundamental level. This second edition is updated and expanded throughout, providing readers with a history of antennas, numerous new problem sets and worked examples, along with new information on plotting time-domain field lines, time-domain reflectometry, matching techniques, and more. This book also addresses system issues like spectral control and antenna efficiency.

Techniques based on the method of modal expansions, the Rayleigh-Stevenson

expansion in inverse powers of the wavelength, and also the method of moments solution of integral equations are essentially restricted to the analysis of electromagnetic radiating structures which are small in terms of the wavelength. It therefore becomes necessary to employ approximations based on "high-frequency techniques" for performing an efficient analysis of electromagnetic radiating systems that are large in terms of the wavelength. One of the most versatile and useful high-frequency techniques is the geometrical theory of diffraction (GTD), which was developed around 1951 by J. B. Keller [1,2,3]. A class of diffracted rays are introduced systematically in the GTD via a generalization of the concepts of classical geometrical optics (GO). According to the GTD these diffracted rays exist in addition to the usual incident, reflected, and transmitted rays of GO. The diffracted rays in the GTD originate from certain "localized" regions on the surface of a radiating structure, such as at discontinuities in the geometrical and electrical properties of a surface, and at points of grazing incidence on a smooth convex surface as illustrated in Fig. 1. In particular, the diffracted rays can enter into the GO shadow as well as the lit regions. Consequently, the diffracted rays entirely account for the fields in the shadow region where the GO rays cannot exist.

This is the first truly comprehensive and most up-to-date handbook available on modern reflector antennas and feed sources for diversified space and ground applications. There has never been such an all-encompassing reflector handbook in print, and no currently available title offers coverage of such recent research developments. The Handbook consists of three volumes. Volume III focuses on the range of reflector antenna applications, including space, terrestrial, and radar. The intent of this book volume is to provide practical applications and design information on reflector antennas used for several communications systems. This book covers recent developments of reflector antennas used for satellite communications, terrestrial communications, and remote sensing applications. New subjects are introduced for the first time, including satellite antennas, Terahertz antennas, PIM, multipaction, corona, deployable mesh reflector antennas, and mechanical aspects of reflector antennas. In addition, this book contains a separate topic on integrated feed assembly for reflector antennas covering analysis, design, fabrication, and test.

This completely revised third edition of an Artech House classic, Phased Array Antenna Handbook, Second Edition, offers an up-to-date and comprehensive treatment of array antennas and systems. This edition provides a wealth of new material, including expanded coverage of phased array and multiple beam antennas. New modern machine learning techniques used for analysis are included. Additional material on wideband antennas and wideband coverage in array antennas are incorporated in this book, including new methods, devices, and technologies that have developed since the second edition. A detailed treatment of antenna system noise, sections on antenna pattern synthesis, developments in subarray technology, and in-depth coverage of array architecture and components are additional new features of this book. The book explores design elements that demonstrate how to size an array system with speed and confidence. Moreover, this resource provides expanded coverage of systems aspects of arrays for radar and communications. Supported with numerous equations and illustrations, this practical book helps evaluate basic antenna parameters such as gain, sidelobe levels, and noise. Readers learn how to compute antenna system noise,

design subarray geometries for given bandwidth, scan and sidelobe constraints, and choose array illumination tapers for given sidelobe levels.

This book provides engineers with a comprehensive review of the state-of-the-art in reflectarray antenna research and development. The authors describe, in detail, design procedures for a wide range of applications, including broadband, multi-band, multi-beam, contour-beam, beam-scanning, and conformal reflectarray antennas. They provide sufficient coverage of basic reflectarray theory to fully understand reflectarray antenna design and analysis such that the readers can pursue reflectarray research on their own. Throughout the book numerous illustrative design examples including numerical and experimental results are provided. Featuring in-depth theoretical analysis along with practical design examples, *Reflectarray Antennas* is an excellent text/reference for engineering graduate students, researchers, and engineers in the field of antennas. It belongs on the bookshelves of university libraries, research institutes, and industrial labs and research facilities.

Written by one of the world's leading experts in the field, this book is intended as an advanced text for courses in antennas, with a focus on the mature but vital background field of aperture antennas. It is aimed at final year, MSc, PhD and post-doctoral students, as well as readers who are moving from academia into industry, beginning careers as wireless engineers, system designers, in R&D, or for practising engineers. It assumes the reader has undertaken an earlier course of study on Maxwell's equations, fields and waves. Some of these topics are summarized in the early few chapters in order to provide continuity and background for the remaining chapters. The aperture antennas covered include the main types of horns, reflectors and arrays as well as microstrip patches, reflectarrays and lenses. To provide more than a superficial treatment of arrays, the topic of mutual coupling is covered in greater detail compared to most similar books in this area. Also included is an introduction to arrays on non-planar surfaces, which are important in applications that involve curved surfaces such as in aerodynamics or for making aperture antennas unobtrusive. A chapter is included on some modern aperture antennas to illustrate design techniques beyond the most common types of aperture antennas described in the early chapters. This is to show where advances have recently been made and where they could be improved in the future. Also included are selective topics that are practical in nature for aperture antennas, namely fabrication and measurement.

This book is devoted to describing the theory, design, performance and application of microwave horns and feeds for reflector. The first general treatment of feeds for reflector antennas, it describes design principles and methods of analysis.

The Latest Resource for the Study of Antenna Theory! In a discipline that has experienced vast technological changes, this text offers the most recent look at all the necessary topics.

Highlights include: \* New coverage of microstrip antennas provides information essential to a wide variety of practical designs of rectangular and circular patches, including computer programs. \* Applications of Fourier transform (spectral) method to antenna radiation. \* Updated material on moment methods, radar cross section, mutual impedances, aperture and horn antennas, compact range designs, and antenna measurements. A New Emphasis on Design! Balanis features a tremendous increase in design procedures and equations. This presents a solid solution to the challenge of meeting real-life situations faced by engineers.

Computer programs contained in the book-and accompanying software-have been developed to help engineers analyze, design, and visualize the radiation characteristics of antennas. This is the first truly comprehensive and most up-to-date handbook available on modern reflector antennas and feed sources for diversified space and ground applications. There has never been such an all-encompassing reflector handbook in print, and no currently available title offers coverage of such recent research developments. The Handbook consists of three

volumes. Volume II focuses on feed sources. Reflector antennas are extraordinary devices that combine high gain with geometrical simplicity, and can operate in broad frequency bands. Their performance, however, depends on the electrical.

An important historical look at the space program's evolving telecommunications systems Large Antennas of the Deep Space Network traces the development of the antennas of NASA's Deep Space Network (DSN) from the network's inception in 1958 to the present. It details the evolution of the large parabolic dish antennas, from the initial 26-m operation at L-band (960 MHz) through the current Ka-band (32 GHz) systems. Primarily used for telecommunications, these antennas also support radar and radio astronomy observations in the exploration of the solar system and the universe. In addition, the author also offers thorough treatment of the analytical and measurement techniques used in design and performance assessment. Large Antennas of the Deep Space Network represents a vital addition to the literature in that it includes NASA-funded research that significantly impacts on deep space telecommunications. Part of the prestigious JPL Deep Space Communications and Navigation Series, it captures fundamental principles and practices developed during decades of deep space exploration, providing information that will enable antenna professionals to replicate radio frequencies and optics designs. Designed as an introduction for students in the field as well as a reference for advanced practitioners, the text assumes a basic familiarity with engineering and mathematical concepts and technical terms. The Deep Space Communications and Navigation Series is authored by scientists and engineers with extensive experience in astronautics, communications, and related fields. It lays the foundation for innovation in the areas of deep space navigation and communications by disseminating state-of-the-art knowledge in key technologies.

This completely revised and expanded edition of an Artech House classic Polarization in Electromagnetic Systems presents the principles of polarization as applied to electromagnetic systems. This edition emphasizes the concepts needed for functional aspects of systems calculations and device evaluation. Readers find up-to-date coverage of applications in wireless communications. The fundamentals of polarization are explained, including the principles of wave polarization along with their mathematical representations. This book explores polarized, partially polarized waves, and unpolarized waves. The second part of the book addresses applications of polarization to practical systems. Antenna polarization is covered in detail, including omnidirectional, directional, and broadband antennas with emphasis on antennas for generating linear and circular polarization for each antenna type. This book provides detailed coverage of wave interaction with an antenna and dual-polarized systems. Additional topics covered in this edition include propagation through depolarizing media, polarization in wireless communication systems, including polarization diversity and polarization measurements. This hands-on resource provides a clear exposition on the understanding of polarization principles and evaluation of the performance of electromagnetic systems.

The gold-standard reference on the design and application of classic and modern antennas—fully updated to reflect the latest advances and technologies This new edition of the “bible of antenna engineering” has been updated to provide start-to-finish coverage of the latest innovations in antenna design and application. You will find in-depth discussion of antennas used in modern communication systems, mobile and personal wireless technologies, satellites, radar deployments, flexible electronics, and other emerging technologies, including 5G, terahertz, and wearable electronics. Antenna Engineering Handbook, Fifth Edition, is bolstered by real-world examples, hundreds of illustrations, and an emphasis on the practical aspects of antennas. Featuring 60 chapters and contributions from more than 80 renowned experts, this acclaimed resource is edited by one of the world's leading antenna authorities. This edition features all of the classic antenna types, plus new and emerging designs, with 13



all-new chapters and important updates to nearly all chapters from past editions. Antenna Engineering Handbook, Fifth Edition, clearly explains cutting-edge applications in WLANs, automotive systems, PDAs, and handheld devices, making it an indispensable companion for today's antenna practitioners and developers. Coverage includes:

- Antenna basics and classic antennas
- Design approaches for antennas and arrays
- Wideband and multiband antennas
- Antennas for mobile devices and PDAs, automotive applications, and aircraft
- Base station and smart antennas
- Beamforming and 5G antennas
- Millimeter-wave and terahertz antennas
- Flexible, wearable, thin film, origami, dielectric, and on-chip antennas
- MIMO antennas and phased arrays
- Direction-finding and GPS antennas
- Active antennas
- Low-profile wideband antennas
- Nanoantennas
- Reflectors and other satellite and radio-telescope antennas
- Low-frequency, HF, VHF, UHF, ECM, and ESM antennas
- Impedance-matching techniques and material characteristics
- Metastructured and frequency selective surfaces
- Propagation and guided structures
- Computational techniques and toolsets
- Indoor and outdoor measurements

Presents recent progress in low-profile natural and metamaterial antennas This book presents the full range of low-profile antennas that use novel elements and take advantage of new concepts in antenna implementation, including metamaterials. Typically formed by constructing lattices of simple elements, metamaterials possess electromagnetic properties not found in naturally occurring materials, and show great promise in a number of low-profile antenna implementations. Introductory chapters define various natural and metamaterial-based antennas and provide the fundamentals of writing computer programs based on the method of moments (MoM) and the finite-difference time-domain method (FDTD). Chapters then discuss low-profile natural antennas classified into base station antennas, mobile card antennas, beam-forming antennas, and satellite-satellite and earth-satellite communications antennas. Final chapters look at various properties of low-profile metamaterial-based antennas, revealing the strengths and limitations of the metamaterial-based straight line antenna (metaline antenna), metamaterial-based loop antenna (metaloop), open metaloop antenna, the effects of counter dual-band CP radiation, and more. Offers comprehensive coverage of both metamaterials and natural materials for low-profile antennas Written by an internationally-recognized expert in the field of low-profile antennas Depicts actual high-performance low-profile antennas for the antenna engineer Draws on classroom-tested material in graduate courses and short courses over the past 20 years Low-Profile Natural and Metamaterial Antennas is a must-have reference book for advanced undergraduate and graduate level students as well as antenna engineers interested in low-profile antenna design theory.

This edition is the most comprehensive and informative available on radar systems and technology. Thoroughly revised and updated to reflect the advances made in radar over the past two decades. Charts/graphs.

Written by a leading expert in the field, this practical new resource presents the fundamentals of electromagnetics and antenna technology. This book covers the design, electromagnetic simulation, fabrication, and measurements for various types of antennas, including impedance matching techniques and beamforming for ultrawideband dipoles, monopoles, loops, vector sensors for direction finding, HF curtain arrays, 3D printed nonplanar patch antenna arrays, waveguides for portable radar, reflector antennas, and other antennas. It explores the essentials of phased array antennas and includes detailed derivations of important field equations, and a detailed formulation of the method of moments. This resource exhibits essential derivations of equations, providing readers with a strong foundation of the underpinnings of electromagnetics and antennas. It includes a complete chapter on the details of antenna and electromagnetic test and measurement. This book explores details on 3D printed non-planar circular patch array antenna technology and the design and analysis of a

planar array-fed axisymmetric gregorian reflector. The lumped-element impedance matched antennas are examined and include a look at an analytic impedance matching solution with a parallel LC network. This book provides key insight into many aspects of antenna technology that have broad applications in radar and communications.

The move toward worldwide wireless communications continues at a remarkable pace, and the antenna element of the technology is crucial to its success. With contributions from more than 30 international experts, the Handbook of Antennas in Wireless Communications brings together all of the latest research and results to provide engineering professionals and students with a one-stop reference on the theory, technologies, and applications for indoor, hand-held, mobile, and satellite systems. Beginning with an introduction to wireless communications systems, it offers an in-depth treatment of propagation prediction and fading channels. It then explores antenna technology with discussion of antenna design methods and the various antennas in current use or development for base stations, hand held devices, satellite communications, and shaping beams. The discussions then move to smart antennas and phased array technology, including details on array theory and beamforming techniques. Space diversity, direction-of-arrival estimation, source tracking, and blind source separation methods are addressed, as are the implementation of smart antennas and the results of field trials of systems using smart antennas implemented. Finally, the hot media topic of the safety of mobile phones receives due attention, including details of how the human body interacts with the electromagnetic fields of these devices. Its logical development and extensive range of diagrams, figures, and photographs make this handbook easy to follow and provide a clear understanding of design techniques and the performance of finished products. Its unique, comprehensive coverage written by top experts in their fields promises to make the Handbook of Antennas in Wireless Communications the standard reference for the field.

This is the first truly comprehensive and most up-to-date handbook available on modern reflector antennas and feed sources for diversified space and ground applications. There has never been such an all-encompassing reflector handbook in print, and no currently available title offers coverage of such recent research developments. The Handbook consists of three volumes. Volume I provides a unique combination of theoretical underpinnings with design considerations and techniques. The need for knowledge in reflector antennas has grown steadily over the last two decades due to increased use in space and ground applications, as well as their high gain and wide bandwidth capabilities at relatively low cost. This volume brings you to the leading edge of developments in the field related to numerical techniques, classical reflector geometries, adaptive reflector antennas, shaped reflectors, bifocal and bicollimated dual reflectors, advanced reflectors, and reflect arrays. A must-have reference for both practicing engineers as well as academic researchers.

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