

## Satellite Communications 2nd Edition

Includes chapters on orbital mechanics, spacecraft construction, satellite-path radio wave propagation, modulation techniques, multiple access, and a detailed analysis of the communications link.

Fully updated edition of the comprehensive, single-source reference on satellite technology and its applications. Covering both the technology and its applications, *Satellite Technology* is a concise reference on satellites for commercial, scientific and military purposes. The book explains satellite technology fully, beginning by offering an introduction to the fundamentals, before covering orbits and trajectories, launch and in-orbit operations, hardware, communication techniques, multiple access techniques, and link design fundamentals. This new edition also includes comprehensive chapters on *Satellite Networks* and *Satellite Technology – Emerging Trends*. Providing a complete survey of applications, from remote sensing and military uses, to navigational and scientific applications, the authors also present an inclusive compendium on satellites and satellite launch vehicles. Filled with diagrams and illustrations, this book serves as an ideal introduction for those new to the topic, as well as a reference point for professionals. Fully updated edition of the comprehensive, single-source reference on satellite technology and its applications - remote sensing, weather, navigation, scientific,

and military - including new chapters on Satellite Networks and Satellite Technology □ Emerging Trends Covers the full range of satellite applications in remote sensing, meteorology, the military, navigation and science, and communications, including satellite-to-under sea communication, satellite cell-phones, and global Xpress system of INMARSAT The cross-disciplinary coverage makes the book an essential reference book for professionals, R&D scientists and students at post graduate level Companion website provides a complete compendium on satellites and satellite launch vehicles An ideal introduction for Professionals and R&D scientists in the field. Engineering Students. Cross disciplinary information for engineers and technical managers.

Satellite Communication is a special technology in the field of Electronic Communication Systems. A Graduate engineering students with Electronics and Communication Engineering will find this book useful to understand the concepts of satellite communication. This book deals with the technology and gives an adequate treatment of the subject. Analysis and design of satellite communication equipment is also treated to the extent required for the engineering graduates. It is very useful reference for the candidates preparing for higher studies and competitive examinations. Mathematical analysis is presented wherever required and concepts are well illustrated. It also deals with latest technological developments in the related fields

The revised and updated sixth edition of em style="mso-bidi-font-style: normal;"Satellite

Communications Systems contains information on the most recent advances related to satellite communications systems, technologies, network architectures and new requirements of services and applications. The authors – noted experts on the topic – cover the state-of-the-art satellite communication systems and technologies and examine the relevant topics concerning communication and network technologies, concepts, techniques and algorithms. New to this edition is information on internetworking with the broadband satellite systems, more intensive coverage of Ka band technologies, GEO high throughput satellite (HTS), LEO constellations and the potential to support the current new broadband Internet services as well as future developments for global information infrastructure. The authors offer details on digital communication systems and broadband networks in order to provide high-level researchers and professional engineers an authoritative reference. The companion website provides slides for instructors to teach and for students to learn. In addition, the book is designed in a user-friendly format.

Mobile Satellite Communications Handbook

SATELLITE COMMUNICATIONS, 2ND ED

Satellite Communication

Laser Satellite Communication

***The opening of space to exploration and use has had profound effects on society. Remote sensing by satellite has improved meteorology, land use and the***

***monitoring of the environment. Satellite television immediately informs us visually of events in formerly remote locations, as well as providing many entertainment channels. World telecommunication facilities have been revolutionised. Global positioning has improved transport. This book examines the varied elements of public law that lie behind and regulate the use of space. It also makes suggestions for the development and improvement of the law, particularly as private enterprise plays an increasing role in space. Discover a modern approach to the analysis, modeling and design of high sensitivity phased arrays. Network theory, numerical methods and computational electromagnetic simulation techniques are uniquely combined to enable full system analysis and design optimization. Beamforming and array signal processing theory are integrated into the treatment from the start. Digital signal processing methods such as polyphase filtering and RFI mitigation are described, along with technologies for real-time hardware implementation. Key concepts from interferometric imaging used in radio telescopes are also considered. A basic development of theory and modeling techniques is accompanied by problem sets that guide readers in developing modeling codes that retain the simplicity of the classical array factor method while incorporating mutual coupling effects and interactions between elements. Combining current research trends with pedagogical material suitable for a first-year graduate***

***course, this is an invaluable resource for students, teachers, researchers, and practicing RF/microwave and antenna design engineers.***

***This updated and expanded second edition reflects the state of earth station design and ground segment architecture. From international telephone network gateways to direct broadcast home receivers, today's broad range of ground systems and devices require satellite communication engineers and business managers to have a broad and sound understanding of the design and operating principles of earth stations and ground control facilities. This book explores the delivery end of the satellite link and its relationship to delivery of services.***

***Authored by a leading authority in the field, the book provides engineers and managers with the knowledge they need to devise their own approach to implementing and managing earth stations and the overall ground segment.***

***Readers find practical guidance in an array of critical areas, including: preparing requirements, performing preliminary analyses, reviewing hardware designs, managing the introduction of the overall ground segment, and more.***

***A comprehensive, single-source reference on satellite technology and its applications, *Satellite Technology: Principles and Applications, Second Edition* includes the latest developments on the topic. Covering the features and facilities of satellites and satellite launch vehicles, with an emphasis on the fundamental principles and concepts, the authors provide readers with a***

***complete understanding of the technology. This book explains the past, present and future satellite missions, as well as non-communication related applications. Coverage ranges from remote sensing and navigational uses to meteorological and military areas. This second edition contains an additional chapter on earth station design and gives extensive focus to space based weapon systems, satellite interference and future trends in satellite technology. Extra information has also been provided on all of the first edition's topics to enhance the existing coverage. Fully updated new edition with latest technological developments Covers the full range of important applications such remote sensing, weather forecasting, navigational, scientific and military applications Amply illustrated with figures and photographs, this book also contains problems with solutions, which is of benefit students at undergraduate and graduate levels An indispensable book for professionals and students in the field of satellite technology Companion website provides a complete and updated compendium on satellites and satellite launch vehicles***

***Principles and Applications***

***Near-Earth Laser Communications, Second Edition***

***The Third Generation***

***Satellite Communication Engineering***

This book provides up to date coverage of the basics of ATM and internet protocols,

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and characteristics of satellite networks and internetworking between satellite and terrestrial networks Satellite Networking: Principles and Protocols, Second Edition provides up to date information of the original topics in satellite networking and protocols focusing on Internet Protocols (IP) over satellites, broadband over satellites, next generation IP (IPv6) over satellites, new generation of DVB-S/S2 and DVB-RCS next generations and new services and applications. It also includes some analytical techniques for evaluation of end to end IP performance and QoS over satellite, reflecting the recent convergence of telecommunication, Internet, broadcasting and mobile networks. Topics new to this edition: Internetworking with MANET, DVB-S/S2 and DVB-RCS/RCS2 (including TCP/IP over DVB-S/RCS), recent developments in broadband satellite systems, convergence of services and network technologies (including Internet, telecom, mobile, TV, etc.), radio resource management, PEP, I-PEP, SCPS, traffic modelling and engineering with analysis and examples, and future developments of satellite networking. Provides up to date coverage of the basics of ATM and internet protocols, and characteristics of satellite networks and internetworking between satellite and terrestrial networks (e.g. mobile ad hoc networks), including coverage of new services and applications (e.g. Internet, telecom, mobile and TV) Discusses the real-time protocols including RTP, RTCP and SIP for real-time applications such as VoIP and MMC, and explains TCP/IP over satellite and evolution of IPv6 over satellite and beyond

Extensive revision of the best-selling text on satellite communications — includes new chapters on cubesats, NGSO satellite systems, and Internet access by satellite There

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have been many changes in the thirty three years since the first edition of Satellite Communications was published. There has been a complete transition from analog to digital communication systems, with analog techniques replaced by digital modulation and digital signal processing. While distribution of television programming remains the largest sector of commercial satellite communications, low earth orbit constellations of satellites for Internet access are set to challenge that dominance. In the third edition, chapters one through three cover topics that are specific to satellites, including orbits, launchers, and spacecraft. Chapters four through seven cover the principles of digital communication systems, radio frequency communications, digital modulation and multiple access techniques, and propagation in the earth's atmosphere, topics that are common to all radio communication systems. Chapters eight through twelve cover applications that include non-geostationary satellite systems, low throughput systems, direct broadcast satellite television, Internet access by satellite, and global navigation satellite systems. The chapter on Internet access by satellite is new to the third edition, and each of the chapters has been extensively revised to include the many changes in the field since the publication of the second edition in 2003. Two appendices have been added that cover digital transmission of analog signals, and antennas. An invaluable resource for students and professionals alike, this book:

- Focuses on the fundamental theory of satellite communications
- Explains the underlying principles and essential mathematics required to understand the physics and engineering of satellite communications
- Discusses the expansion of satellite communication systems in areas such as direct-broadcast satellite TV, GPS, and internet access
- Introduces the rapidly

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advancing field of small satellites, referred to as SmallSats or CubeSats Provides relevant practice problems based on real-world satellite systems Satellite Communications is required reading for undergraduate and postgraduate students in satellite communications courses and an authoritative reference for engineers working in communications, systems and networks, and satellite operations and management. For those seeking a thorough grounding in modern communication engineering principles delivered with unrivaled clarity using an engineering-first approach Communication Engineering Principles: 2nd Edition provides readers with comprehensive background information and instruction in the rapidly expanding and growing field of communication engineering. This book is well-suited as a textbook in any of the following courses of study: Telecommunication Mobile Communication Satellite Communication Optical Communication Electronics Computer Systems Primarily designed as a textbook for undergraduate programs, Communication Engineering Principles: 2nd Edition can also be highly valuable in a variety of MSc programs. Communication Engineering Principles grounds its readers in the core concepts and theory required for an in-depth understanding of the subject. It also covers many of the modern, practical techniques used in the field. Along with an overview of communication systems, the book covers topics like time and frequency domains analysis of signals and systems, transmission media, noise in communication systems, analogue and digital modulation, pulse shaping and detection, and many others.

The only work to present a unified treatment of all the basic aspects of satellite

## Read Book Satellite Communications 2nd Edition

communications and to give practical examples from real systems. Whereas most texts in the field concentrate on a mathematical description of the communications link, Satellite Communications gives the reader a thorough knowledge of the subject by going on to cover orbits, propagation, and the equipment that comprises a working system. Pratt and Bostian go beyond the standard treatment of ideal channels (which ignores some very real practical limitations) to deal with the problems associated with transmitting digitally modulated signals through real satellites and earth stations. Included are chapters on orbital mechanics, spacecraft construction, satellite-path radio wave propagation, modulation techniques, multiple access, and a detailed analysis of the communications link. Contains worked examples and homework problems based on current industrial practice.

### SATELLITE COMMUNICATION

A Technical Tutorial and Overview of a US\$ 100 Billion a Year Industry

Satellite Communications Systems Engineering

The Satellite Technology Guide for the 21st Century, 2nd. Edition

Highlighting satellite and earth station design, links and communication systems, error detection and correction, and regulations and procedures for system modeling, integrations, testing, and evaluation, Satellite Communication

Engineering provides a simple and concise overview of the fundamental principles common to information communications. It

VSAT Networks: Second Edition covers all the important issues involved with the

installation of VSAT systems. Since the first edition was published, the VSAT market has continued to expand steadily. VSAT technologies have advanced, prompting an increase in the take-up of VSAT services. Offering a comprehensive introduction to the topic followed by a detailed exploration of multiple access protocols, delay analysis and system dimensioning, this edition is a highly relevant update of VSAT Networks. Written by a well respected and established member of the satellite community, it will be welcomed by academics and engineers alike. Covers important issues of services, economics and regulatory aspects Provides a detailed technical insight on networking and radio frequency link aspects, therefore addressing the specific features of VSAT networks at the three lower layers of the OSI Reference Layer Model for data communications This timely second edition is fully updated with new figures, improvements and revised chapter on future developments This book will appeal to students of telecommunications, electronics and computer science. Practising telecommunications engineers and technical managers involved in the planning, design and operation of VSAT networks and systems will also find this book a valuable reference source. This textbook takes a unified view of the fundamentals of wireless communication and explains cutting-edge concepts in a simple and intuitive way. An abundant supply of exercises make it ideal for graduate courses in electrical and computer

engineering and it will also be of great interest to practising engineers. This groundbreaking resource is the first book to offer you a thorough, practical treatment of laser space communications. The book focuses on the feasibility of laser space communication links between satellites, satellites and airborne platforms, and satellites and ground based stations to achieve worldwide connectivity. You get expert guidance on weather avoidance approaches and adaptive antenna subsystems that help mitigate the effects of turbulence. The book presents simplified, yet highly accurate, engineering expressions of complex mathematics of turbulence that provide you with numerical values in the links' signal power budget. Moreover, you find an entire chapter devoted to noise photons and their effect on the bit error rate. This comprehensive volume covers a wide range of critical topics you need to understand for your work in the field, from a discussion on laser vs. RF communications in space, basic design features of a laser transceiver, and configuration of inter-satellite communication links, to selection of ground station locations, 5th Generation Internet (5-GENIN), and signal modulation schemes. The book is supported with over 70 illustrations and more than 100 equations.

Phased Arrays for Radio Astronomy, Remote Sensing, and Satellite Communications

### Doppler Applications in LEO Satellite Communication Systems The Satellite Communication Ground Segment and Earth Station Handbook, Second Edition

Master the fundamentals of satellite communications Highly regarded for more than a decade as both a teaching text and professional tutorial, this classic guide to satellite communications has been revised, updated, and expanded to cover global wireless applications, digital television, and Internet access via satellite. In-depth, textbook-style coverage combined with an intuitive, low-math approach makes this book particularly appealing to the wireless and networking markets New to this edition: Global wireless services, including 3G; Antenna Options, Error Coding

Market\_Desc: · Students and Instructors in Electrical Engineering Special Features: · Includes chapters on orbital mechanics, spacecraft construction, satellite-path radio wave propagation, modulation techniques, multiple access and a detailed analysis of the communications link About The Book: Satellite Communications gives the reader a thorough knowledge of the subject by going on to cover orbits, propagation, and the equipment that comprises a working system. The authors go beyond the standard treatment of ideal channels to deal with the problems associated with transmitting digitally modulated signals through real satellites and earth stations.

This new edition, an up-to-date and comprehensive title on the rapidly expanding field of satellite communication, is aimed at giving important aspects of space and satellite communication. It starts from fundamental concepts and helps reader to design satellite links. The book provides a smooth flow from satellite launch to various applications of satellite. It contains satellite systems, important parameter calculations and design concepts. The emphasis is on geostationary satellites. The text is organized in such a manner that the reader starts with orbiting parameters and ends at designing a complete multiple access links. With all of the latest information incorporated and several key pedagogical attributes included, this textbook is an invaluable learning tool for the engineering students of electronics and communication. New to This Edition • Important design equations have been listed separately. • Three new chapters—Reliability requirements in satellites, Remote sensing satellites and Error control coding—have been included. • New Sections are added in Chapters 1, 2 and 3. • A brief discussion on digitized video transmission is included in Chapter 4.

This second edition of Satellite Communications is a revised, updated, and improved version of the first edition (Van Nostrand, 1984) and has been extended to include many newer topics that are rapidly becoming important in modern and next-generation satellite systems. The first half of the book again covers the basics of satellite links, but has been updated to include additional areas such as Global Positioning and deep space satellites,

dual polarization, multiple beaming, advanced satellite electronics, frequency synthesizers, and digital frequency generators. The second half of the book is all new, covering frequency and beam hopping, on-board processing, EHF and optical cross links, and mobile satellites and VSAT systems. All of these latter topics figure to be important aspects of satellite systems and space platforms of the twenty-first century. As in the first edition, the objective of the new edition is to present a unified approach to satellite communications, helping the reader to become familiar with the terminology, models, analysis procedures, and evolving design directions for modem and future satellites. The presentation stresses overall system analysis and block diagram design, as opposed to complicated mathematical or physics descriptions. (Backup mathematics is relegated to the appendices where a reader can digest the detail at his own pace. ) The discussion begins with the simplest satellite systems and builds to the more complex payloads presently being used.

VSAT Networks

The Satellite Communication Applications Handbook

Principles and Protocols

Laser Space Communications

The Satellite Communications Technology Guide for the 21st Century clearly explains in non-technical terms the basics of satellite communications

technology and how it works. This book also provides a historical background of the industry, its current status, market prospects, trends and the future of satellite communications. Fully illustrated with graphs and tables, the book contains appendices including a glossary of terms and a list of industry resources.

Doppler Applications in LEO Satellite Communication Systems develops and presents an important class of techniques useful in the construction of little Low Earth Orbit (LEO) satellite communication systems. It centers on the very significant Doppler shift that attends communications through a LEO satellite and shows how this phenomenon can be exploited for an unexpected benefit. The techniques taught in the book are expected to be particularly attractive to system engineers because ground-based transceivers must generally compensate for the large Doppler component and therefore the necessary receiver processing loops are often already in place and expensed. This volume starts with a recounting of the characteristics of a LEO satellite and its orbit. The 2nd chapter addresses the LEO orbital geometry and reviews the Doppler effect attending LEO communications. Chapter three is focused on the important task of estimating the Doppler at a ground terminal. Appropriate signal processing algorithms are reviewed. Chapter four is

concerned with predicting LEO satellite visibility. Chapters five and six are, respectively, devoted to the use of the significant LEO Doppler as an aid in a new traffic flow control protocol and as an aid for effecting communications power control. The last chapter describes MATLAB® based analysis. Doppler Applications in LEO Satellite Communication Systems provides a thorough review of the LEO Doppler phenomenon.

Introduces the next generation of telecommunications--laser satellite communications--and discusses opportunities and business strategies available with the new technology.

Market\_Desc: Primary: Undergraduate and graduate level students of Electronics and Telecommunications, IT professionals, people interested in book on DVB technology. Secondary: Postgraduate students on digital communications technology courses Special Features: · Provides a comprehensive, single-source reference on satellite communication and its applications. · Discusses satellite orbits and trajectories, launch and in-orbit operations, hardware, communication techniques, multiple access techniques, and link design fundamentals. · Covers the full range of satellite applications in remote sensing, meteorology, the military, navigation and science, as well as in communications. · Covers the subject of satellite communication in

entirety.· Highly accurate, complete and comprehensive coverage of the subject with all latest information incorporated.· Emphasis on fundamental principles and concepts.· Lucid and reader-friendly language.· Ideal test book for engineering students of electronics and communication and indispensable reference for professionals.· Excellent pedagogy that includes:· More than 80 solved problems.· More than 200 multiple-choice questions, review questions and practice problems.· Beautifully illustrated book with more than 400 photographs and figures.· Optimum balance of qualitative and quantitative problem set. About The Book: The text is an up-to-date and comprehensive title in the field of satellite communication technology and applications. It offers full coverage of the theoretical and practical concepts of the communication satellites and also briefly talks about the other applications including remote sensing, weather forecasting, navigation, scientific and military. The essentials of satellite technology are explained by giving an introduction to the fundamental topics such as orbits and trajectories, launch and in-orbit operations before going on to describe satellite hardware. Communication-related topics like modulation and multiplexing techniques, multiple access techniques, link design, satellite access, earth station design and applications of communication satellites are covered in great depth.

Other applications of satellites are also explained in the book which makes this book an essential buy for professionals and students alike.

Atmospheric Effects, Satellite Link Design and System Performance

Satellite Communications, Fourth Edition

Systems, Techniques and Technology

Satellite Networking

*The first edition of Satellite Communications Systems Engineering (Wiley 2008) was written for those concerned with the design and performance of satellite communications systems employed in fixed point to point, broadcasting, mobile, radio navigation, data relay, computer communications, and related satellite based applications. This welcome Second Edition continues the basic premise and enhances the publication with the latest updated information and new technologies developed since the publication of the first edition. The book is based on graduate level satellite communications course material and has served as the primary text for electrical engineering Masters and Doctoral level courses in satellite communications and related areas. Introductory to advanced engineering level students in electrical, communications and wireless network courses, and electrical engineers, communications engineers, systems engineers, and wireless network engineers looking for a refresher will find this essential text invaluable.*

*Since the publication of the best-selling first edition of The Satellite*

*Communication Applications Handbook, the satellite communications industry has experienced explosive growth. Satellite radio, direct-to-home satellite television, satellite telephones, and satellite guidance for automobiles are now common and popular consumer products. Similarly, business, government, and defense organizations now rely on satellite communications for day-to-day operations. This second edition covers all the latest advances in satellite technology and applications including direct-to-home broadcasting, digital audio and video, and VSAT networks. Engineers get the latest technical insights into operations, architectures, and systems components.*

*With a Preface by noted satellite scientist Dr. Ahmad Ghais, the Second Edition reflects the expanded user base for this technology by updating information on historic, current, and planned commercial and military satellite systems and by expanding sections that explain the technology for non-technical professionals. The book begins with an introduction to satellite communications and goes on to provide an overview of the technologies involved in mobile satellite communications, providing basic introductions to RF Issues, power Issues, link issues and system issues. It describes early commercial mobile satellite communications systems, such as Marisat and Marecs and their military counterparts. The book then discusses the full range of Inmarsat and other current and planned geostationary, low earth orbiting and hybrid mobile satellite systems from over a dozen countries and companies. It is an essential guide for anyone seeking a comprehensive understanding of this industry and military tool.*

• *Revised edition will serve both technical and non-technical professionals who rely every day on mobile satellite communications* • *Describes and explains historic, current, and planned civil, commercial, and military mobile satellite communication systems.* • *First Edition charts and tables updated and expanded with current material for today's mobile satellite technology.*

*Despite the proliferation of new communications technologies, the decades-old satellite industry is shifting with the times. Now in its second edition, this guide addresses the myriad aspects of the technology in its current form and explores the paths it is expected to take in the future.*

*The Basics of Satellite Communications, Second Edition*

*The Satellite Communication Applications Handbook, Second Edition*

*The Future Of Satellite Communications*

*Satellite Communications*

*This reference provides an overview of near-Earth laser communication theory developments including component and subsystem technologies, fundamental limitations, and approaches to reach those limits. It covers basic concepts and state-of-the-art technologies, emphasizing device technology, implementation techniques, and system trades. The authors discuss hardware technologies and their applications, and also explore ongoing research activities and those planned for the near future. This new edition includes*

*major to minor revisions with technology updates on nearly all chapters. An undeniably rich and thorough guide to satellite communication engineering, Satellite Communication Engineering, Second Edition presents the fundamentals of information communications systems in a simple and succinct way. This book considers both the engineering aspects of satellite systems as well as the practical issues in the broad field of information transmission. Implementing concepts developed on an intuitive, physical basis and utilizing a combination of applications and performance curves, this book starts off with a progressive foundation in satellite technology, and then moves on to more complex concepts with ease. What's New in the Second Edition: The second edition covers satellite and Earth station design; global positioning systems; antenna tracking; links and communications systems; error detection and correction; data security; regulations and procedures for system modeling; integration; testing; and reliability and performance evaluation. Provides readers with the systems building blocks of satellite transponders and Earth stations, as well as the systems engineering design procedure Includes the tools needed to calculate basic orbit characteristics such as period, dwell time, coverage area, propagation losses; antenna system features such as size, beamwidth, aperture-frequency product, gain, tracking*

*control; and system requirements such as power, availability, reliability, and performance Presents problem sets and starred sections containing basic mathematical development Details recent developments enabling digital information transmission and delivery via satellite Satellite Communication Engineering, Second Edition serves as a textbook for students and a resource for space agencies and relevant industries.*

*This book emphasizes U.S. policy considerations in as much as the U.S. has been at the forefront of satellite technology and its application. It addresses the impact of the earlier U.S. policy of global monopoly on the development of international satellite systems.*

*Revisions to 5th Edition by: Zhili Sun, University of Surrey, UK New and updated edition of this authoritative and comprehensive reference to the field of satellite communications engineering Building on the success of previous editions, Satellite Communications Systems, Fifth Edition covers the entire field of satellite communications engineering from orbital mechanics to satellite design and launch, configuration and installation of earth stations, including the implementation of communications links and the set-up of the satellite network. This book provides a comprehensive treatment of satellite communications systems engineering and discusses the technological*

*applications. It demonstrates how system components interact and details the relationship between the system and its environment. The authors discuss the systems aspects such as techniques enabling equipment and system dimensioning and state of the art technology for satellite platforms, payloads and earth stations. New features and updates for the fifth edition include: More information on techniques allowing service provision of multimedia content Extra material on techniques for broadcasting, including recent standards DVB-RCS and DVB-S2 (Digital Video Broadcasting -Return Channel Satellite and -Satellite Version 2) Updates on onboard processing By offering a detailed and practical overview, Satellite Communications Systems continues to be an authoritative text for advanced students, engineers and designers throughout the field of satellite communications and engineering. Satellite Communications Payload and System*

*Satellite Technology*

*CONCEPTS AND APPLICATIONS*

*Communication Engineering Principles*

Since the publication of the best-selling first edition of the Satellite Communication Applications Handbook, the satellite industry has experienced explosive growth thanks to a flood of innovations in consumer electronics, broadcasting, the Internet,

transportation, and broadband telecommunications. This second edition covers all the latest advances in satellite technology and applications and features new chapters on mobile digital audio radio and VSAT networks. It updates and expands upon the engineering and management topics that made the first edition a must-have for every satellite communications professional as well as network architects. Engineers get the latest technical details into operations, architectures, and systems components. Managers are brought up to date with the latest business applications as well as regulatory and legal decisions affecting domestic and international markets. The treatment is also of value to marketing, legal, regulatory, and financial and operations professionals who must gain a clear understanding of the capabilities and issues associated with satellite space and ground facilities and services.

The book covers all the fundamentals of satellites, ground control systems, and earth stations, considering the design and operation of each major segment. You gain a practical understanding of the basic construction and usage of commercial satellite networks. How parts of a satellite system function, how various components interact, which role each component plays, and which factors are the most critical to success." This is the first book primarily about the satellite payload of satellite communications systems. It represents a unique combination of practical systems engineering and communications theory. It tells about the satellites in geostationary and low-earth orbits today, both the so-called bent-pipe payloads and the processing payloads. The on-orbit

environment, mitigated by the spacecraft bus, is described. The payload units (e.g. antennas and amplifiers), as well as payload-integration elements (e.g. waveguide and switches) are discussed in regard to how they work, what they do to the signal, their technology, environment sensitivity, and specifications. At a higher level are discussions on the payload as an entity: architecture including redundancy; specifications--what they mean, how they relate to unit specifications, and how to verify; and specification-compliance analysis ("budgets") with uncertainty. Aspects of probability theory handy for calculating and using uncertainty and variation are presented. The highest-level discussions, on the end-to-end communications system, start with a practical introduction to physical-layer communications theory. Atmospheric effects and interference on the communications link are described. A chapter gives an example of optimizing a multibeam payload via probabilistic analysis. Finally, practical tips on system simulation and emulation are provided. The carrier frequencies treated are 1 GHz and above. Familiarity with Fourier analysis will enhance understanding of some topics. References are provided throughout the book for readers who want to dig deeper. Payload systems engineers, payload proposal writers, satellite-communications systems designers and analysts, and satellite customers will find that the book cuts their learning time. Spacecraft-bus systems engineers, payload unit engineers, and spacecraft operators will gain insight into the overall system. Students in systems engineering, microwave engineering, communications theory, probability theory, and

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communications simulation and modelling will find examples to supplement theoretical texts.

Fundamentals of Wireless Communication

Satellite Communications Systems

The Basics of Satellite Communications

Satellite Communication Systems 2ed