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(TDMA) technology, was adopted in 1989. Immediately thereafter, in 1990, Qualcomm, Inc. a digital cellular system with dispersion spectrum based on code-division multiple-access (CDMA) technology, which in 1993 became the second North American digital cellular standard, known as the IS-95 system. This book is written for those interested in learning all about the technical basis of the design and operational principles of the IS-95 CDMA cellular system and of related personal communications services (PCS) systems, such as the one listed as the default JSTD-008. These CDMA communication systems are dispersing-spectrum systems and make use of most of the modern communication and information-theoretic technologies that have so far been discovered by so many scientists and engineers. The primary goal of this book is to explain in a tutorial way the technical parts of these remarkable wireless communication systems from ground level up. The book also provides in the beginning chapter all the tools, in the form of system analysis basics, for those who need them to understand the main flow of the text of the subsequent chapters. In this sense, the book is independent. We have generated many problems, each with a solution, to help the reader gain a clear and complete understanding of the topics presented. To keep the reader's attention focused on the main flow of discussion, where necessary, the mathematical derivations involved are inserted into an appendix in each chapter. This book is based on materials used for extensive technical courses conducted by the first author of this book in Korea and the United States since 1993, under variations on the generic title Elements of the Technical Foundation of CDMA Cellular System Design. In Korea only over 1100 hours of lectures on these topics were given at various organizations: the Electronics and Telecommunications Research Institute (ETRI); Central Research Centre of Korea Mobile Telecommunications Corporation (now SK Telecom); Shinsegi Telecommunications, Inc. (STI); Seoul Communications Technology Co. (SCT); Hyundai Electronics Industries Co., Ltd. (HEI); Hans01 PCS; and Korea Radio Tower, Inc. (KRT). A tutorial on this topic was also given at the 2nd CDMA Conference (CIC) held in Seoul in October 1997. The style and manner of presentation of the technical issues was xix xvii CDMA Systems Engineering Handbook Acknowledgments Authors are grateful for the support of their families during the process of writing this book. We are also pleased to recognize the contributions of William A. 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Immediately thereafter, in 1990, Qualcomm, Inc. a digital cellular system with dispersion spectrum based on code-division multiple-access (CDMA) technology, which in 1993 became the second North American digital cellular standard, known as the IS-95 system. This book is written for those interested in learning all about the technical basis of the design and operational principles of the IS-95 CDMA cellular system and of related personal communications services (PCS) systems, such as the one listed as the default JSTD-008. These CDMA communication systems are dispersing-spectrum systems and make use of most of the modern communication and information-theoretic technologies that have so far been discovered by so many scientists and engineers. The primary of this book is to explain in a tutorial way the technical elements of these remarkable wireless communication systems from ground level up. 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