Preface

Wireless personal mobile and cellular communications are expected to be one of the hottest growth areas of the 2000s and beyond. They have enjoyed the fastest growth rate in the telecommunications industry—adding customers at a rate of 20–30% a year. Presently, at least six satellite systems are being developed so that wireless personal voice and data communications can be transmitted from any part of the earth to another using a simple, hand-held device. These future systems will provide data and voice communications to anywhere in the world, using a combination of wireless telephones, wireless modems, terrestrial cellular telephones and satellites. The use of wireless remote sensing, remote identification, direct broadcast, global navigation, and compact sensors has also gained popularity in the past decade. Wireless communications and sensors have become a part of a consumer's daily life. All of these wireless systems consist of a radio frequency (RF) or microwave front end.

Although many new wireless courses have been offered at universities and in industry, there is yet to be a textbook written on RF and microwave wireless systems. The purpose of this book is to introduce students and beginners to the general hardware components, system parameters, and architectures of RF and microwave wireless systems. Practical examples of components and system configurations are emphasized. Both communication and radar/sensor systems are covered. Many other systems, such as, the global positioning system (GPS), RF identification (RFID), direct broadcast system (DBS), surveillance, smart highways, and smart automobiles are introduced. It is hoped that this book will bridge the gap between RF/microwave engineers and communication system engineers.

The materials covered in this book have been taught successfully at Texas A&M University to a senior class for the past few years. Half of the students are from RF and microwave areas, and half are from communications, signal processing, solid-state, optics, or other areas. The book is intended to be taught for one semester to an undergraduate senior class or first-year graduate class with some sections assigned to

students for self-study. The end-of-chapter problems will strengthen the reader's knowledge of the subject. The reference sections list the principal references for further reading.

Although this book was written as a textbook, it can also be used as a reference book for practical engineers and technicians. Throughout the book, the emphasis is on the basic operating principles. Many practical examples and design information have been included.

I would like to thank all of my former students who used my notes in class for their useful comments and suggestions. I would also like to thank Mingyi Li, Paola Zepeda, Chris Rodenbeck, Matt Coutant and James McSpadden for critical review of the manuscript. Michelle Rubin has done an excellent job in editing and preparing the manuscript. Taehan Bae has helped to prepared some of the art work. Finally, I wish to express my deep appreciation to my wife, Suh-jan, and my children, Peter and Nancy, for their patience and support.

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February 2000