PREFACE TO THE IEEE PRESS EDITION

We want to thank the IEEE PRESS for republishing this book, nearly thirty years after it first appeared, and to thank the IEEE Communication Society for being willing to serve as Sponsor. We are very pleased that the book will again be available; perhaps some students and engineers working on problems not formulated until years after the book was written will find it useful.

The book is being printed exactly as in the original edition with, of course, all the errors still there. However, an errata list has been provided to rectify those errors of which we are aware.

We point out to the reader that the modifier "realizable" as used in Chapter 11 means simply causal, or nonanticipative, in current systems theory language.

We also point out that the problems at the end of each chapter, except the first, are exercises for the serious reader and, as for the 1958 edition, no solutions manual is available.

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PREFACE

During the past decade there has been a rapidly growing realization amongst engineers of the power of the methods and concepts of mathematical statistics when applied to problems arising in the transmission and processing of information. The use of the statistical approach has resulted not only in a better understanding of the theory of communications but also in the practical development of new equipment. We have tried here to provide an *introduction* to the statistical *theory* underlying a study of signals and noises in communications systems; in particular, we have tried to emphasize techniques as well as results.

This book is an outgrowth of a set of lecture notes prepared by the first-named author in 1952 for a first-year graduate course on the statistical theory of noise and modulation given in the Department of Electrical Engineering at M.I.T. The material has recently been used in substantially its present form as a text for an informal course at the M.I.T. Lincoln Laboratory. With some expansion, it could form the basis of a two-semester, first-year graduate course. Alternatively, by cutting out some parts, say Arts. 6-4 and 9-5, all of Chap. 11, and parts of Chap. 14, the remaining material could probably be covered in a single semester. Prerequisites would include some electrical network theory and an advanced engineering calculus course containing Fourier series and integrals.

It would be impracticable to acknowledge all those who have contributed to this book. However, we do wish to mention David Middleton, with whom we have had many stimulating discussions, and our colleagues at M.I.T., who have made many valuable comments and criticisms. In particular, we wish to thank Morton Loewenthal for the time and effort he spent in making a critical review of the entire manuscript.

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