ELECTRICAL COMMUNICATION

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THIRD EDITION

John Wiley & Sons, Inc., New York
Chapman & Hall, Limited, London

THIRD EDITION

Second Printing, May, 1954

PRINTED IN THE UNITED STATES OF AMERICA

PREFACE TO THIRD EDITION

As was true of the preceding editions, the third edition covers the entire field of electrical communication, including the transmission of code, speech, and music by both wire and radio.

The third edition has been extensively revised. The basic subjects of acoustics, electroacoustic devices, networks, lines, cables, wave guides, and electronics have been grouped in the first part of the book. Telegraph, telephone, and radio systems have been placed in the last part. Both radio systems and dial telephone systems have received much greater emphasis than in previous editions.

Covering the entire field of modern electrical communication in a single book has necessitated a careful selection of material. It is regretted that more text material and more illustrations could not be included. However, the extensive lists of references will assist those interested in locating additional information.

An important feature of the third edition is the addition of review questions at chapter endings; also, the problems have been revised and increased in number. The standards of the electrical and radio professions have been followed closely.

The many courtesies of the American Telephone and Telegraph Company, Pacific Telephone and Telegraph Company, Bell Telephone Laboratories, and Western Electric Company have been greatly appreciated. Also courtesies extended by International Telephone and Telegraph Company, Western Union Company, Radio Corporation of America, Brush Development Company, General Radio Company, Racon Electric Company, and others are gratefully acknowledged.

Appreciation is expressed to the editors of *Electrical Engineering, Proceedings of the Institute of Radio Engineers, Bell System Technical Journal, Bell Laboratories Record, Electrical Communication, Electronics, Tele-Tech, Telephony,* and others, for permissions to use quotations, illustrations, and other material. Appreciation is also expressed to the authors of the many technical articles from which information was obtained.

The assistance of Mr. Dwight L. Jones, of the Pacific Telephone and Telegraph Company, who prepared most of the material on dial telephone systems, is acknowledged with gratitude.

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April, 1950

PREFACE TO FIRST EDITION

Although several excellent books treating specialized phases of electrical communication are available, there is a need for a book which considers these subjects as they are related to one another in modern communication systems. This book, accordingly, presents the various phases of transmitting intelligence electrically as they contribute to the end desired—that of providing the public with an adequate and economical communication service.

This book is designed primarily for use as a college textbook, and as a reference book for those in the communication industry who have had a college education or other technical training. However, those not having such training will find much of value included.

Although higher mathematics has been employed where advisable, the reader not prepared to follow these solutions will find, with few exceptions, that the text is easy to follow. In most chapters the use of mathematics has been limited; care has been taken, however, to insure that this has not been accomplished at a sacrifice of engineering exactness.

In preparing the manuscript the most recent communication standards have been rigidly followed. The material is thoroughly modern in every detail.

Engineering educators will recognize that a high percentage of the electrical engineering graduates now in the communication industry are engaged in engineering work which is broad and non-technical in nature. Relatively few graduates are engaged in such theoretical work as filter design or transmission studies. In selecting material for the manuscript, this fact has been considered. It has been the aim of this book, instead of merely presenting the electrical theories of communication, to include a discussion of the entire industry and thus provide a basic training upon which a successful career in communication engineering can more readily be built.

Those in the communication industry who are engaged in administrative, supervisory, or similar activities which are essentially non-technical in nature, but who desire a better understanding of the plant and engineering features of their industry, should find this book of great value.

The manuscript has been reviewed by many unbiased authorities on communication, and every care has been taken to insure its correctness. It is with the greatest appreciation that this assistance is acknowledged.

The writings of many authorities have been consulted during the preparation of the manuscript. Many of these articles are listed at the end of the chapters, and these have been freely referred to wherever it is felt that the reader would be benefited. These references are especially valuable to the reader who is not well acquainted with the subject. Many quotations are included, particularly where it seemed desirable that the original wording should be maintained. The contributions of these many writers are most gratefully acknowledged.

The courtesies of the Bell Telephone Laboratories, the American Telephone and Telegraph Company, the Radio Corporation of America, the Raytheon Production Corporation, and the American Institute of Electrical Engineers, in supplying descriptive material and in rendering other assistance, is greatly appreciated.

The assistance of the students and faculty of the school of engineering at Oregon State College has been invaluable. In particular, the interest and cooperation of H. S. Rogers, President of Brooklyn Polytechnic Institute and former Dean of Engineering at Oregon State, and of R. H. Dearborn, Professor and Head of the Department of Electrical Engineering and Acting Dean of the School of Engineering at this institution, have made this work possible.

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