MASSACHUSETTS INSTITUTE OF TECHNOLOGY

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Foreword

THE tremendous research and development effort that went into the development of radar and related techniques during World War II resulted not only in hundreds of radar sets for military (and some for possible peacetime) use but also in a great body of information and new techniques in the electronics and high-frequency fields. Because this basic material may be of great value to science and engineering, it seemed most important to publish it as soon as security permitted.

The Radiation Laboratory of MIT, which operated under the supervision of the National Defense Research Committee, undertook the great task of preparing these volumes. The work described herein, however, is the collective result of work done at many laboratories, Army, Navy, university, and industrial, both in this country and in England, Canada, and other Dominions.

The Radiation Laboratory, once its proposals were approved and finances provided by the Office of Scientific Research and Development, chose Louis N. Ridenour as Editor-in-Chief to lead and direct the entire project. An editorial staff was then selected of those best qualified for this type of task. Finally the authors for the various volumes or chapters or sections were chosen from among those experts who were intimately familiar with the various fields, and who were able and willing to write the summaries of them. This entire staff agreed to remain at work at MIT for six months or more after the work of the Radiation Laboratory was complete. These volumes stand as a monument to this group.

These volumes serve as a memorial to the unnamed hundreds and thousands of other scientists, engineers, and others who actually carried on the research, development, and engineering work the results of which are herein described. There were so many involved in this work and they worked so closely together even though often in widely separated laboratories that it is impossible to name or even to know those who contributed to a particular idea or development. Only certain ones who wrote reports or articles have even been mentioned. But to all those who contributed in any way to this great cooperative development enterprise, both in this country and in England, these volumes are dedicted.

L. A. DUBRIDGE.

Preface

WHEN the plan for this book was made the authors hoped that it would be possible to present a more or less complete account of the experiments and the theoretical ideas pertaining to the problem of the detectability of a signal in noise. However, because it became clear that the literature on the subject was so large and that we had no convenient access to the results of a great deal of work in progress at other institutions, it soon appeared that we would be unable to realize our original plan of giving a critical account of the whole subject. Accordingly we decided to limit ourselves to describing as completely as possible the work done at the Radiation Laboratory during the war, with sufficient introductory material to make the account intelligible. The authors regret that this decision has necessitated the omission of many interesting investigations and calculations.

Another aim of the authors was always to confront the theoretical ideas with the experimental investigations and in this way achieve some kind of unification of theory and experiment, which the authors felt was so often lacking in the existing literature. We feel that we have done so with some success, particularly in Chaps. 8 and 10, though elsewhere we may have fallen short of this aim.

This book is the result of the cooperative effort of many people. On the experimental side many of the investigations were performed by R. Meijer, S. G. Sydoriak, V. Josephson, and especially by R. H. Ashby, L. B. Linford, and A. M. Stone. The latter two have also helped considerably with the editing of the material in this book. On the theoretical side the authors wish to acknowledge the help given by H. Goldstein, A. J. F. Siegert, and Ming Chen Wang. The first two were responsible for most of the work described in Chap. 6 and helped with the writing of that chapter. The theory of the ideal observer described in Chap. 7 was initiated by Dr. Siegert. The authors are especially grateful to Dr. Ming Chen Wang who performed the work described in Chap. 13 and who also helped with the calculations and the writing of nearly all the other theoretical chapters.

Cambridge, Mass.
November, 1949

JAMES L. LAWSON
GEORGE E. UHLENBECK

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