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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 dedicated.

L. A. DUBRIDGE.

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Preface

THIS volume of the Radiation Laboratory Series is concerned with the theoretical and practical aspects of the design of duplexing circuits for use in microwave radar equipments, and of the gas-filled switching tubes (TR and ATR tubes) used in these duplexers. For a clearer picture of the equipment with which a duplexer must work the reader is referred to the following volumes of this series: Vol. 16 "Microwave Mixers," Vol. 9 "Microwave Transmission Circuits," Vol. 23 "Microwave Receivers," and Vol. 6 "Microwave Magnetrons."

The work upon which this book is based was done under the urgency of war commitments, and the main goal was always the production of a particular tube or duplexer circuit before a certain target date. As a result, many corners were cut and many intuitive steps were taken without clearly understood reasons, and there are today many gaps in our knowledge of the phenomena involved. This applies with particular emphasis to the problem of the high-frequency gas discharge. It is our belief that the material presented here fairly represents the present state of the art.

Besides the authors of the individual sections of this book, we wish to mention the following Radiation Laboratory personnel who actively participated in the design, study, and testing of the various tubes and duplexers discussed here. These people are: I. H. Dearnley, C. W. Jones, T. Kê, F. L. McMillan, Jr., H. Margenau, C. Y. Meng, C. S. Pearsall, J. Reed, F. Rosebury, and Norma Wolf.

Much work was done outside the Radiation Laboratory on these problems. The outstanding contributors were M. D. Fiske at the General Electric Research Laboratories, H. J. McCarthy of the Sylvania Electric Products Co., A. L. Samuel of the Bell Telephone Laboratories, and S. Krasik and D. Alpert of the Westinghouse Research Laboratories.

The editors wish to acknowledge the work of C. W. Jones in the collection of data and photographs and in the organization of Chapter 9. The preparation of the manuscript was greatly facilitated by the efforts of Gwenyth Johnson, Janet M. Jackson, and Anne Whalen. V. Josephson and his group produced all of the illustrations.

CAMBRIDGE, MASS.,
June 25, 1946.

THE AUTHORS.

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