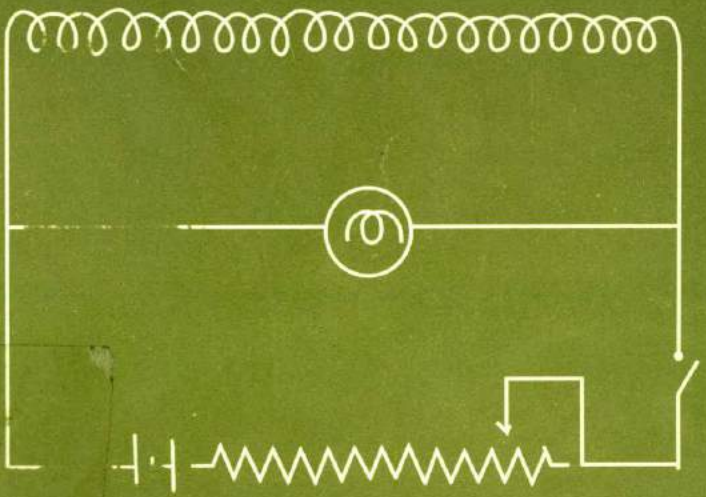
Alternating-Current Circuits

Fourth Edition



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Alternating-Current Circuits

4th edition

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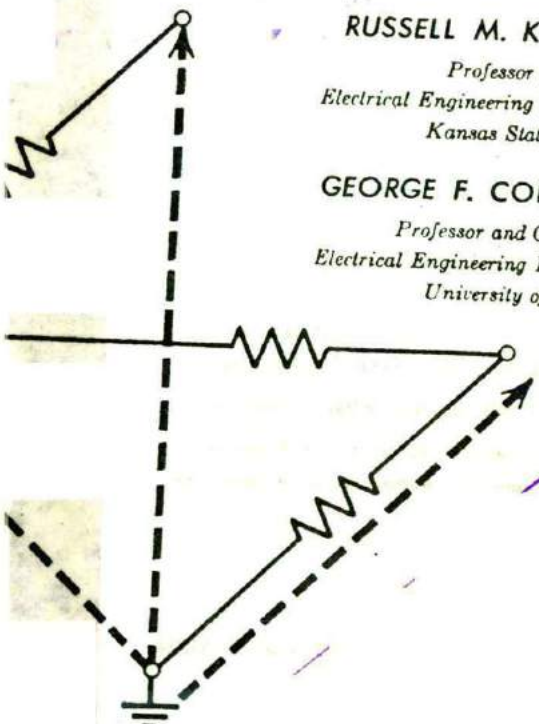

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Preface

The approach to alternating-current circuits which has been employed in previous editions has been found to be reasonably satisfactory in introducing the subject to students of electrical engineering and physics and has therefore been retained in this edition. Numerous additions and modifications have been made throughout the book where experience has shown the need for improvement. The changes have been made with a view toward making the book more understandable to the student. An introductory chapter on network concepts has been added in order to give the student a deeper insight into the general methods of network analysis. Network variables, topology, and duality are considered. For those students who have a knowledge of Kirchhoff's laws and some experience with solving networks employing direct currents it is possible to begin study of this edition with Chapter II. However most students will likely find Chapter I a good review and many will find in it a considerable amount of material which is new and of value in a study of more advanced network theory.

Because of the great advances in electronics and the consequent need for additional circuit theory, nearly all students now follow the first course in alternating-current-circuit theory with a rather intensive course in network theory and in many instances with some network synthesis. For courses of this kind some knowledge of complex frequency and poles and zeros is highly desirable. These subjects have been introduced in this edition, first in Chapter V where steady-state analysis is considered and again in Chapter XIV where the transient analysis of the *RLC* series circuit is treated.

In order not to interfere with the vector terminology of electromagnetic theory the term *phasor* has been adopted for a time-varying quantity which is handled by vector methods. The change from vector to phasor diagram is made in Chapter IV although as used in this book the distinction is unnecessary. To many electrical engineers a vector diagram will always be a vector diagram.

By certain reductions and eliminations, the book has been held to approximately the same size even though a considerable amount of

material has been added. Some new kinds of problems have also been included at the end of some of the chapters.

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June, 1960

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