

## books reviewed



### Photographic Systems for Engineers

Edited by F. M. Brown, H. J. Hall and J. Kosar. Published (1966) by Society of Photographic Scientists and Engineers, 1330 Massachusetts Ave., N.W., Washington, D.C. 20005. 215 + xi pp. Index. Illus. 5½ by 8½ in. Paper bound. Price \$5.00 (10% discount to SPSE members.)

The task undertaken by the editors of this work is to bring together information on photographic systems and to present it on a level such that it may be applied by engineering and technical personnel whose training has not included this field yet who find themselves requiring a working knowledge of the area of photographic systems — a situation which arises all too often as photography comes into its own as a scientific tool.

The purpose was to contain the information in a one-volume textbook and reference manual on photographic systems. This somewhat ambitious aim was feasible because the contents of the work are the contributions of many individuals from industry and the academic world, all of whom have some degree of recognition as experts in the area in which their contribution deals. Although this approach tends to decrease the overall unity of purpose and at times leads to unnecessary repetition of small points, these tendencies are not so pronounced as to decrease its value for its intended purpose.

Some of the areas covered are silver halide emulsions, sensitometry, lens systems, light sources, processing techniques, film handling and registration, information capacity, and tone reproduction. Some chapters deal in numbers, empirical formulas and rules-of-thumb; others give the reader a qualitative feel for such subjects as quantum yield, modulation transfer function and information theory.

This book will be found to be of greatest value by those looking for a very usable source of working knowledge in photographic systems as well as for a useful guide to more complete treatments of the included material.—*Lawton King*, Photographic Div., Naval Ordnance Laboratory, Silver Spring, Md.

### Microelectronic Design

Ed. Howard Bierman. Published (1966) by Hayden Book Co. 850 Third Ave., New York, N.Y. 312 pp. Illus. Diagrams. 8½ by 11 in. Price \$11.50.

*Microelectronic Design* is a valuable survey of the microelectronic field for electronic engineers without previous exposure to this

new electronic technology. The book is a compilation of over 80 articles published in *Electronic Design* between 1963 and 1966.

The first section of the book introduces and explains the various technologies involved in accomplishing microelectronic circuits. Individual articles review the semiconductor planar technology, MOS devices, and both thick film and thin film technologies.

A major part of the book is devoted to specific descriptions of the problems involved and the advantages achieved in designing microelectronic equipment. Some of the areas highlighted include high frequency design procedures, equipment packaging problems, and considerations involving thermal design and system reliability.

These articles are instructive but the microelectronic designer should be cautious about accepting all conclusions since the rapid evolution of improved technology may now make some previously rejected approaches practical.

A weakness of the book includes the relatively light treatment given to the testing of microelectronic circuits. This is one of the most complex problems facing the buyer of functional devices. The value of the book would be even greater if an overall topic index had been compiled, enabling the reader to locate rapidly different approaches to a given problem.

The book concludes with a survey of presently available microelectronic devices, typical data and a well-organized bibliog-



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raphy.—*I. H. Kalish*, Engineering Dept., RCA Electronic Components and Devices, Somerville, N.J. 08876.

### Transformers for Electronic Circuits

By Nathan R. Grossner. Published (1967) by McGraw-Hill Book Co., 330 W. 42 St., New York, N.Y. 10036. 321 + xiii pp. incl. Index. Diagrams. 6 by 9 in. Price \$14.00.

Circuit design engineers will find this book a comprehensive guide in their use of electronics transformers. Transformer design engineers will find it a valuable summary of the steps necessary for the design of electronics transformers. Throughout the book, basic principles are emphasized and complicated equations and masses of design data are avoided. The bibliographic references constitute one of the valuable features of this book and the references appear on the page where they are used or discussed. The author has made a good compromise between a handbook and a detailed text on transformers and it should make a valuable easy-to-read reference book in the library of an electronic circuit design engineer.

Those Society members who are interested in fidelity and distortion of transmitted signals will find the chapters on the Analysis and Synthesis of Wide-Band Frequency Range Transformers and Pulse Transformers and the section on Ferromagnetic Harmonic Distortion of special interest. In his treatment of the latter subject, he has dug into the many references and has provided the reader with a comparison of the

various points of view. The chapter on Temperature Rise and Thermal Design deserves special mention because of its comprehensiveness. Engineers engaged in thermal design would also find interesting an article by Mr. Grossner that was published in the June 1967 issue of the *Transactions of Parts, Materials, and Packaging of IEEE* entitled "Analysis of Transient Loading and Heating of the Electronic Transformer."

Mr. Grossner is Chairman of the IEEE Electronics Transformers Definitions and Nomenclature Subcommittee and a Member of the Electronics Transformers Technical Committee of the Group on Parts, Materials, and Packaging. He has been active for a number of years as a designer of transformers, magnetic amplifiers, and wave filters for electronic equipment. Since 1961, he has been a consulting engineer for a number of transformer companies.—*Andrew D. Halsey*, Ferroresonant Power Apparatus Dept., Bell Telephone Laboratories, Whippany, N.J. 07981.

### Circuit Design for Audio, AM/FM and TV

By Engineering Staff of Texas Instruments Inc., Dallas. Published (1967) by McGraw-Hill Book Co., 330 W. 42 St., New York, N.Y. 10036. 352 pp. incl. Index. Illus. Diagrams. 10 by 7 in. Price \$14.50.

This reference book deals with the practical design of audio, radio and television circuits using equations developed in the text.

The audio section is most thorough in dealing with the design of the various output configurations in a step-by-step fashion with a careful explanation of each step. Examples are also given in the same detail. It is helpful that each section is complete by itself with little or no reference to the previous sections.

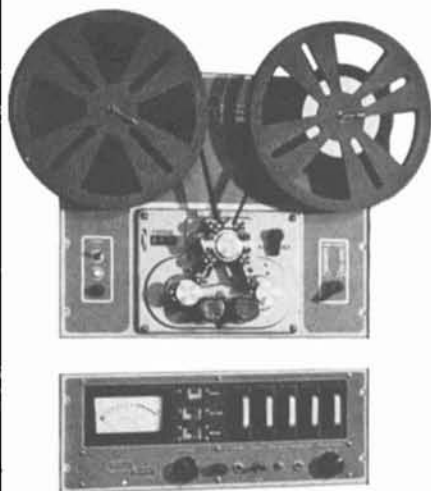
The AM and FM design section discusses FM RF amplifier and converter design considerations. IF system design is presented with detailed treatment of the design leading to completed printed circuit layouts. Considerable emphasis is placed on the attenuation and phase response of multistage FM IF transformers, so necessary for good stereo performance. A computer-tabulated table of phase and attenuation with various coupling coefficients is included in this section to aid in designing IF amplifiers with up to four stages.

The third section, which deals with TV design, first goes into the state-of-the-art for UHF tuners, then proceeds to the design considerations and compromises for VHF tuners. A VHF tuner design is worked out using the given equations. Video IF amplifier design is analyzed from the first to the troublesome last IF stage. Video detectors, video amplifiers and AGC systems are discussed. A chapter on the 4.5 MHz sound IF amplifier and detector is included. TV sync separators are discussed in another short chapter that gives one an insight into the problems involved in this area of the TV receiver. The last three chapters deal with the vertical deflection system, horizontal synchronization and AFC systems,

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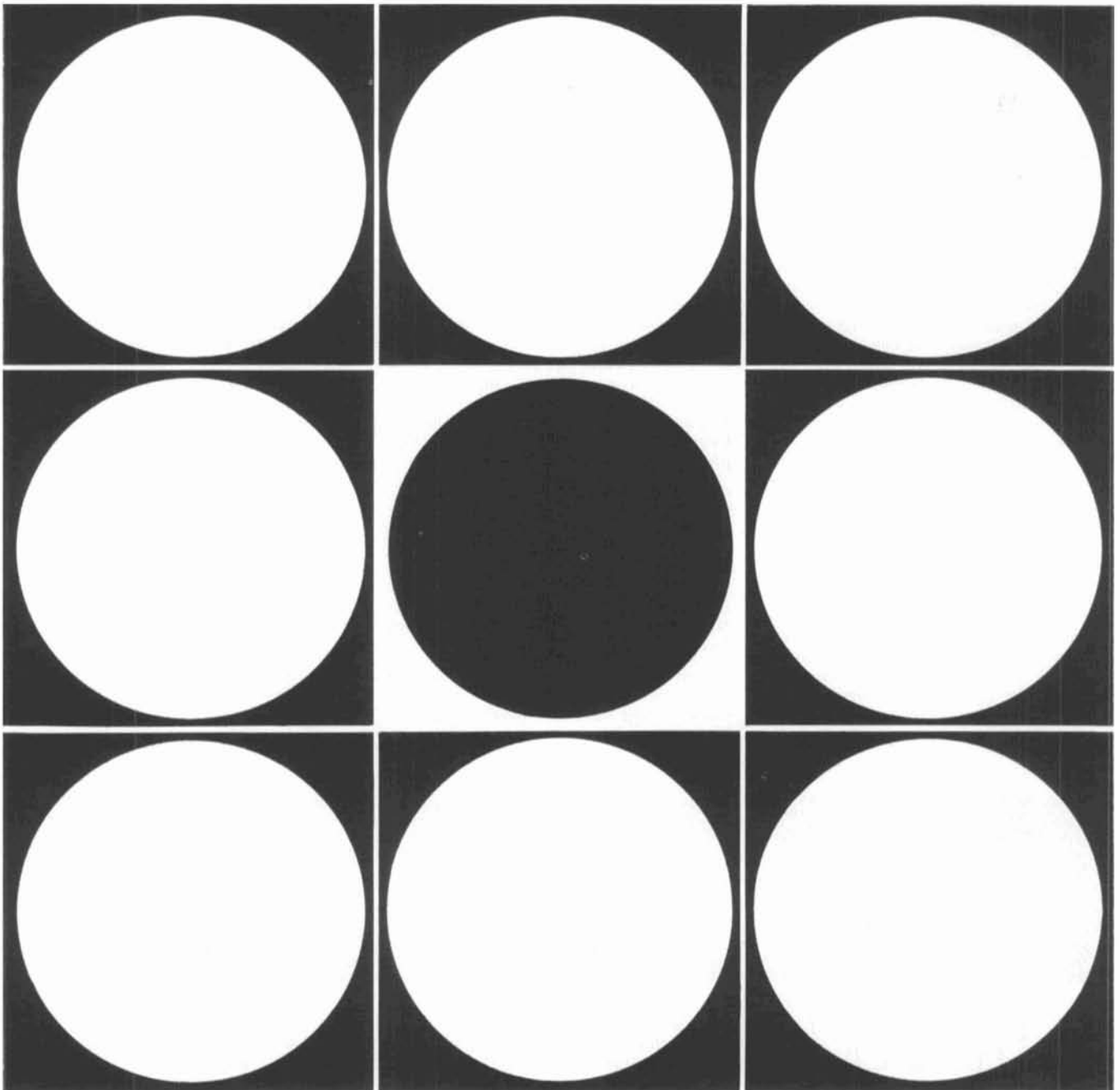
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and problems associated with the horizontal output stage.

Major emphasis is placed on audio and IF systems while the other systems are not covered quite so thoroughly. The basics are presented with references and examples that will aid those recently entering the field, and serve as a reference for more experienced readers.—*H. A. Wittlinger*, 14 Moores Mill-Mt. Rose Rd., Pennington, N.J. 08534.

### Crystal Physics of Interaction Processes

By Warren P. Mason. Published (1966) by Academic Press, 111 Fifth Ave., New York, N.Y. 10003. 354 pp. incl. Indexes. Illus. 9 by 6 in. Price \$14.95.

The increasing scientific and technological importance of crystalline solids with anisotropic physical properties demands that both the contemporary solid state physicist and the engineer have a knowledge of the tensorial formulation of these properties. In this book, there is, for the first time, an excellent and consistent tensor treatment of a broad spectrum of physical processes and properties in solids. These range from elasticity, piezoelectricity, and crystal optics to Faraday rotation, electro-optics, piezoresistivity, and both galvano-

magnetic and thermoelectric effects. The presentation emphasizes the unifying restrictions placed on apparently diverse processes by crystalline symmetries and thermodynamics. Little is said about the microscopic physical processes which determine the relative magnitudes of the effects in various materials, and this adds immeasurably to the clarity of the presentation. The inclusion of descriptions of various devices which exploit the anisotropy of various physical processes gives the reader a feeling for the importance of developing a familiarity with the tensor description of processes in solids. Striking features of this book are the consistency of the notation, the clarity of the definitions, and the extensive tables of physical properties of a wide variety of solids of contemporary interest.—*D. C. Hoestery*, Eastman Kodak Co., Research Labs., Kodak Park, Rochester, N.Y. 14650.

### Theory of Crystal Defects:

#### Proceedings of the Summer School Held in Hrazany in September 1964

Sci. Ed. Boris Gruber. Published (1966) by Academic Press, 111 Fifth Ave., New York, N.Y. 10003. 416 pp. inc. Indexes. Illus. 9½ by 6½ in. Price \$15.

This book contains the texts of a dozen of

the lectures which constituted a major part of a summer school on the Theory of Crystal Defects held in 1964 at Hrazany, near Prague. The stated aim of the school was "to close as much as possible the gap existing between the basic literature in the field of the theory of crystal defects . . . and the present-day specialized scientific papers and monographs." The school was directed at the postgraduate level, and on the whole the *Proceedings* are of value only to specialists in this branch of theoretical solid state physics. Some of the lecturers have taken pains to show how a particular approach fits into the broader picture of understanding the mechanical properties of solids, and references to the more practical aspects of materials technology are surprisingly frequent. Therefore, one gains some sense of the direction of current and future theoretical efforts in this field from the reading of these lectures. However, it is definitely not to be recommended to one with a casual or fledgling interest in the subject.

The topics treated cover broad aspects of crystal imperfections, including point defects, dislocations and dislocation loops, stacking faults, thermal vibrations, and radiation damage, and interactions between many of these.—*J. F. Hamilton*, Eastman Kodak Co., Research Labs., Kodak Park, Rochester, N.Y. 14650.



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