

## books reviewed



### Fundamentals of Electron Devices

By Karl R. Spangenberg. Published (1957) by McGraw-Hill Book Co., Inc., 330 West 42 St., New York 36. 505 pp. including appendices, bibliography, and index. 6 by 9-in. Price \$10.00.

In this book, the development of the physics of electron tubes and semiconductor devices is presented as a unified structure which rests upon the common base of the theory of semiconduction action.

The extreme care which has obviously been taken in the selection of text material and wording indicates that the author spent many hours in its preparation. As a result, the material cannot easily be misinterpreted, although it must be carefully and

completely studied to achieve an understanding of the subject.

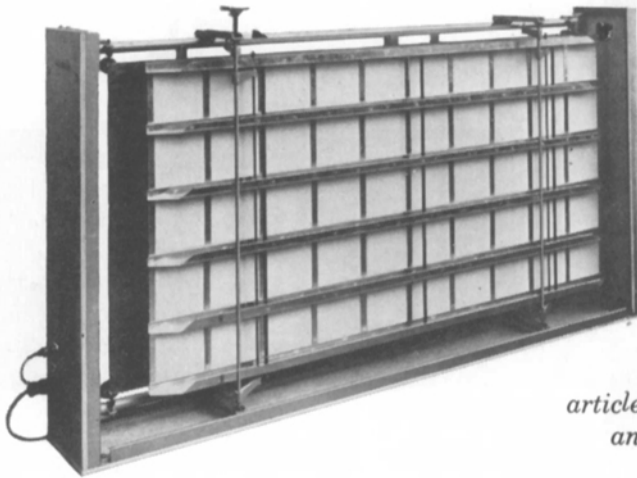
Approximately one-third of the book is devoted to the basic physical theory underlying both transistors and electron tubes, with emphasis on their similarities rather than their differences. Following this, about one-third of the book is used to present the devices and their characteristics, including electron tubes, semiconductor diodes, transistors and photoelectric devices. It should be noted that a number of the newest types of transistors such as the mesa and microalloy are not included, nor are the newest advances in electron tubes. This is not, however, a serious deficiency, since the same theory is applicable to these newer devices.

Following the discussion of the devices themselves, the author provides a detailed treatment of equivalent circuits and both small and large signal operation and characteristics, while the final few pages are devoted to a discussion of noise. It is this section which will be of the greatest interest to engineers concerned with the use of electron devices in new applications, and which must be studied rather than merely read to understand the derivations and analyses. The thirteen appendices contain detailed development and mathematical treatments of a number of relationships such as the Diffusion Equation and the Fermi Distribution Function which are used in the main part of the text. Engineers concerned primarily with the applications of the devices

can, without losing much, neglect these appendices.

Although intended as a textbook for a third or fourth year college course, the book will also prove valuable for those who have had engineering experience and wish to become familiar with the theory and concepts of semiconductors. Much of the present-day instrumentation equipment is being redesigned to take advantage of desirable transistor characteristics, and "transistorizing" of television and sound equipment is barely beginning. Recent advances in both high-power and high-frequency transistors should tend to accelerate this transformation, and the material contained in the book represents very nearly the minimum of knowledge for the development engineer. For the engineer who is, or will be, associated with electron devices, this book provides an excellent means of becoming familiar with the concepts, advantages and limitations of semiconductor devices and electron tubes. The emphasis on the similarities between these devices provides the link which should enable an engineer familiar with vacuum tubes to relate the two, although more examples illustrating the theory would have been desirable for a self-study program. In short, the book is a well-written, clear, and concise text which should be of value to many engineers—*Harvey W. Mertz*, Philco Corp., 23d and Lehigh Ave., Philadelphia 32.

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## Photographic Sketch Book of the Civil War

By Alexander Gardner. Published (1959) by Dover Publications, Inc., 180 Varick St., New York 14. 100 plates, text and index. 11 by 8½-in. Price \$6.00.

Among the spate of books already being published in anticipation of the centenary observances of the Civil War this Sketch Book should be of special interest to all those who, professionally or otherwise, are fascinated by the historical development of the photographic art. Originally published in 1866, this collection of photographs is one of the rarest of all Civil War photo-

graphic collections, probably less than ten copies being still in existence.

The pictures, made by Gardner while he was in the employ of Mathew Brady and later, after he had established his own organization, are accompanied by a descriptive text attributed to Gardner himself which effectively conveys the flavor of the period. For photographic historians, there is complete documentation on each photograph, including the maker of both the positive and negative plates, and an explanation of photographic processes in use at the time. Makers of documentary films dealing with Civil War subjects will find this a valuable source of pictorial material.

## Historical Costumes of England from the Eleventh to the Twentieth Century

New ed., with new illus., by Nancy Bradford; published by George C. Harrap, Great Britain, 1958, and Barnes & Noble, Inc., New York, 1959, 184 pp., \$6.00.

For the technical man who may become involved, however unexpectedly, with theatrical production, this book could be a mighty handy tool. Tersely written, it is practically encyclopedic in details. Colors and textures are specified, pen-and-ink drawings tell the design story directly and easily. A table of contents listing the 36 royal reigns spanned by ten centuries affords quick reference, and marginal headings help locate particular details. Although the costumes are specifically English, generalities can be applied to American and European costumes contemporary with any given period.

## Progress in Photography 1955-1958

D. A. Spencer, Editor-in-Chief. Published (1959) by Focal Press Ltd., 31 Fitzroy Sq., London W. 1; in U.S.A., by The Macmillan Co., 60 Fifth Ave., New York 11. 167 pp. incl. illus. & index + 7 tip-in illus. 7 by 9½-in. Price \$10.00.

This is the third, and last, volume of the series whose objective has been to bridge the gap of over ten years in which records of progress in different countries have not been readily available. Listing the contents of the six sections of the present volume proves the format.

Section One, Practice and New Techniques, has four chapters: Zerography; Image Transfer Processes; Thermo-Fax; Amateur Colour Print Processes. Section Two, Photographic Theory and Materials, has these four chapters: Photographic Sensitivity and Latent Image Formation; Mechanism of Development; Russian Work on the Theory of Photographic Emulsions (by K. V. Chibisov); New Film Supports.

Section Three, Business, contains statistics on the industry in Belgium, France, West Germany, Great Britain, Italy, Japan and U.S.A. Section Four, Literature, has brief chapters on Photographic Libraries and Archives and on Historiography of Photography (by Beaumont Newhall), and 20 pp. on Russian Literature on the Photographic Process (by V. I. Sheberstov).

Section Five, Applications, contains a concise chapter on New Methods of Motion Picture Presentation (by Gordon A. Chambers), and chapters on Photographic Photometry and on Photomechanical Resists. A list of Periodicals Cited in Literature References and the Index complete the volume.

The volume will obviously have great value for a variety of researchers, marketers and some students; but, true to its announced purpose, it does not provide more than a catching up in the areas noted. The publishers announce in the Introduction to the volume their plans for succeeding publications which are to be two.

A quarterly, called *Perspective*, will contain articles in the various fields of photog-



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raphy, cinematography and other methods of image and sound recording. Each article is to provide a general account of its area and list references for those who would pursue the matter further. *Perspective* will also publish digest or extracts from the current literature.

Independent of the quarterly but allied and complementary in aim, the publishers plan a series of monographs called *The Progress Library of the Science and Applications of Photography*, to be written by specialists for specialists.

**British Broadcasting: A Bibliography (1958)** published by the British Broadcasting Corp., Broadcasting House, London W.1. replaces *Books About Broadcasting*, published in 1948. The 49-page bibliography lists books published in Great Britain on television, with the exception of those on engineering. The bibliography also lists selected articles, Parliamentary debates and government and official publications relating to B.B.C. Subject categories include: Monopoly and Commercial Broadcasting; Art and Technique of Broadcasting; Biography; and Finance. The bibliography is priced at 5 shillings.

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## Translated Abstracts From Foreign Journals

The *Journal* is scheduled to publish from time to time lots of abstracts such as these, chiefly from U.S.S.R., from the *Kodak Monthly Abstract Bulletin*.

### Electronic Image-Intensification

Electronic image-converters based on photoelectric emission are used to intensify images, and on the score of definition and contrast, they satisfy the highest requirements of cinematography. The low threshold illumination and great intensification obtainable with cascade converters allow one to count on a lowering of the illumination necessary for exposure by a factor of 1000 or more. This makes it possible to film under practically any circumstances of lighting. The time has come to turn to the practical consideration of this problem. The use of electronic image-converters and TV techniques opens up new technical possibilities in film-making. (Translation of Author's Abstract, S. C. G.)—A. M. Khalifin, *Tekh. Kino i Televideniya*, pp. 10-19, Sept. 1958.

### Machines for Coating Ferromagnetic Suspensions on Motion-Picture Film

Two machines have been built in the Moscow Constructional Bureau for Motion-Picture Apparatus for coating magnetic suspensions of 35mm, 16mm and 32mm

film. They are claimed to be better than the foreign machines known, in quality of construction and the high level of automatization. The constructional details of the 16mm machine and its control system are given. The 35mm machine is not essentially different, and so is not described in detail. (S. C. G.)—K. Kh. Sutyushev and M. B. Khalameizer, *Tekh. Kino i Televideniya*, pp. 57-63, Sept. 1958.

### New Methods and Apparatus for Testing Cine Cameras

The apparatus described is an autocollimator into which are inserted, in turn, three transparent test objects, with appropriate illumination. The camera is aligned and exposures are made. The first test object is intended to determine frame stability, the second to test the accuracy of setting of the distance scales on the objectives, and the third to check the correspondence between the framing of the viewer and the framing of the film. The overall length of the apparatus does not exceed 600 mm and the test objects are 220 and 160 mm in size. A design for a general-purpose autocollimator is given. (S. C. G.)—O. I. Reznikov, *Tekh. Kino i Televideniya*, pp. 62-65, Nov. 1958.

### The Relation Between the Resolution of Fine Detail after Multiple Copying and the Character of the Light-Beam Used

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