

suitable for determining the place of manufacture of paper made in Switzerland. In a study of the examination of inks, notes on their composition, which can be found in standard works, occupy seven pages; the ion migration method of age determination of ink is discussed. A paper of nearly 50 pages, entitled "Identification of a Typewriter by Defects of Stroke", considers the causes of defects in typed script; six pages are given to the comparison of typewritten documents; there are no references. An article on applications of gas chromatography devotes half the text to definitions and principles; the versatile nature of the equipment is emphasized rather than its value in problems which cannot be solved simply by other means. In a survey of the determination of blood groups of bloodstains, the treatment is historical and there is one page of text on new techniques; important papers which appeared before the middle of 1962 are omitted; there are no references to blood-grouping books in English.

This is an expensive and disappointing work which competes unsuccessfully with existing text-books and journals.

W. E. MONTGOMERY

ANALYSIS OF AMPLIFIER CIRCUITS

Magnetic Amplifier Analysis

By David L. Lafuze. Pp. ix+252. (New York and London: John Wiley and Sons, Inc., 1962.) 74s.

ORIGINAL publications on magnetic amplifiers are very extensive and much of this published material has been selected and edited into suitable book form by various authors. Four of these books are mentioned in the present author's bibliography, written by H. F. Storm, W. A. Goyger, E. H. Frost-Smith and G. M. Attura, in that chronological order, and are well known to most people interested in magnetic amplifier design. The most recent of these books was published in 1959. D. L. Lafuze's list of original works does not go beyond 1960, so that there is little published material used in this book which was not available to Attura. The appeal of the book, therefore, lies less in the new material used than in the approach adopted by Lafuze based on his own experience as an engineer in the Control Department of the General Electric Co. (U.S.A.)

Lafuze claims to have steered a middle course between works involving advanced mathematics and works based on design experience without full mathematical development. This is a fair claim, but the book is in no sense an elementary text-book and is likely to prove of most value to those who already have a working knowledge of magnetic amplifiers. Characteristics of these devices are built up piecemeal and the effects of rectifier imperfections, power supply and temperature variations are considered separately. This simplifies the mathematics considerably at the expense of some fragmentation of the treatment.

The half-wave amplifier, which is basically simpler in operation, is considered before the full-wave amplifier, but saturable reactors are not treated until later in the book. Transient and steady-state responses are considered in detail and many hybrid circuits are analysed. The sample calculations at the end of each chapter are very helpful. Lafuze discusses the effect of using different core materials, but in common with most American authors the main analysis is based on square-loop core materials.

Lafuze's style is conversational and this occasionally leads him into making statements lacking in mathematical rigour, as for example on p. 13, where he equates a voltage to a product of voltage and time. c.g.s. units are used throughout, which seems rather a pity, and it is not always easy to be certain whether root mean square or mean values are intended, since both are used.

The treatment is confined to the analysis of amplifier circuits and applications are not discussed. This makes it possible for the author to examine the finer points of amplifier performance in considerable detail while confining the size of the total work to 250 pages. The diagrams are clear and well placed in the text.

A. H. M. ARNOLD

RADAR DISPLAYS

Man and Radar Displays

By C. H. Baker. (AGARDograph 60.) Pp. viii+192. (Oxford, London, New York and Paris: Pergamon Press, 1962.) 70s.

MUCH has been written on the various facets of man/radar display optimization, and one must inevitably look with some interest at a book which aims to provide an informed appraisal of the work done in this field during the past one and a half decades. C. H. Baker, who is with the Defence Research Medical Laboratories, Toronto, has chosen to tackle the subject by making a systematic review of both the human and equipment parameters which affect the generation of output data from radar displays.

The first parameter studied is that of display brightness. Evidence showing the effect of cathode-ray tube bias, background noise and echo size is put forward and the treatment of this is comprehensive and reasonably sound. Surveying the chapter as a whole, one is left with the feeling that the somewhat interdependent parameters—video gain, signal limiting and cathode-ray tube bias—could have been treated in a more coherent manner, thus leaving the reader with a clearer view of the inter-relationships. For example, a statement attributed to Garner is repeated, without comment, implying that "signal limiting should be avoided since it increases the difficulty of differentiating between strong and weak signals". In fact, the dynamic range of signal returns, particularly from fan beam radars, dictates that limiting must be utilized, otherwise, in setting up the display for optimum weak signal visibility, strong signals will overdrive the cathode-ray tube and produce significant defocusing. Another statement, this time by Smith and Hunt, that "in general, the higher the video gain—and hence the noise level—the better is target visibility at all cathode-ray tube bias levels". This clearly is not so in the absolute sense and one suspects that this statement is made purely in relation to the range of video gain available on the AN-FPS3 radar.

In the next chapter, the effect of phosphor decay characteristic is examined and the argument here is put quite clearly. It is to be regretted that available reports lean so heavily towards investigation of the P7 phosphor, when the P19 (magnesium fluoride) phosphors are coming into more general use. What follows is a discussion of signal visibility as a function of pip dimensions, both pulse-length and beam-width being considered. It is a matter for speculation whether a better appreciation would have been gained from this chapter if additional information had been given on some of the parameters discussed; for example, in varying the beam-width, the number of pulses obtained and the expansion of the display were not given. Lack of this information makes it difficult for the discerning reader to obtain a balanced view of the conclusions. The question of ambient illumination has long been a thorny one and the author does fair justice to the work which has been done with adequate personal comment to link up the various stages. A significant omission from his review of high ambient illumination systems is the so-called 'White minus Amber' system applicable to P19 phosphors.

We now come to the effect of visual and perceptual factors. Of particular interest is the consideration of