

which stepped up to the exceptionally high impedance of 300k Ω , is shunted by a 300k Ω resistor, thus sacrificing, in simple theory, 3dB of potentially-available signal-to-noise ratio. This point does not appear to have been appreciated at the time.)

Figures 16-19 show four practical amplifiers which use a combination of feedback and passive gain control. The McWhorter design⁴ of Fig. 19 employs the basic circuit of Fig. 12, which has also re-surfaced recently in a Philips tape recorder⁸.

My own circuit³ of Fig. 18 is the same in broad principle, but unlike Fig. 12 has the negative feedback and the signal output taken from different electrodes of the output stage. This permits injection of the feedback voltage in series with the transformer secondary, thus obviating the introduction of local emitter feedback in the input stage. Though this circuit was in regular and very successful use for some years, a weak point in its design ultimately became evident, but only after hard service had caused the pot. slider to make erratic contact with the track. Unfortunately, if the slider fails to earth the track, there is a signal path straight through the track from the output collector to the input base. This is positive feedback and is of greater magnitude than the negative feedback from the output emitter. Violent oscillation therefore occurs during moments of poor slider contact, with accompanying very loud noises from the loudspeaker! The other circuits described do not have this weakness — a point worth bearing in mind.

To be continued

References

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2. Berry, S. D., "New Equipment for Outside Broadcasts", *The BBC Quarterly*, Vol. VII, No. 2, pp. 120-128. (Summer 1952).
3. Baxandall, P. J., "Low Distortion Amplifiers — Part 2", *B.S.R.A. Journal*, Vol. 6, No. 11, pp. 246-256. (Nov. 1961).
4. McWhorter, M. M. and Warner, G. S., "A Low-Noise Transistor Microphone Amplifier", *IEEE Trans. on Audio & Electroacoustics*, Vol. AU-14, No. 1, pp. 27-31. (March 1966).

A Users Guide to Copyright, by Michael F. Flint, is intended to make clearer the subject of copyright "to enable people whose jobs — or even hobbies — cover any copyright field, to acquire a general understanding". It is, however, only a reference book, and does not cover all the more complex legal aspects which may arise when dealing with this intricate subject. The book is laid out in a manner which will enable its reader to obtain the relevant piece of information quickly, and each chapter is sub-divided into well defined sections, each with a reference number and a bold sub-heading. Part 1, the first 14 chapters, is a general explanation of the copyright law, whilst the second part gives a more specified description of copyright in practice, with chapters directed at publishers and printers, advertising agencies, the music industry etc. The book is published by Butterworth Law Publishers Ltd, 88 Kingsway, London WC2B 6AB, and its price is £8.50 in limpback form.

Microcomputers are responsible for a great number of paperbacks, mainly from the USA, and the pace of publication does not appear to be slackening. Three such books have reached this office recently, among others too numerous to mention, each slanted in a different way.

The first is by a British author, Robin Bradbeer, and is entitled **The Personal Computer Book**, published by Input Two-Nine at £5.25 and distributed by MCB Publication, 198/200 Keighley Road, Bradford, West Yorks. BD9 4JQ. This one assumes no knowledge of computers — not even enough to know what computers will do — and, accordingly, the first two chapters are extremely basic. The rest of the book is an attractively written explanation of the more important aspects of computing techniques and of computers, a very useful feature being a survey of equipment currently on the market. Several appendices provide information which is quite difficult to find elsewhere in one place, such as bus standards, addresses of clubs, manufacturers and publications.

The second book, by E. A. Parr, is published by Bernard Babani (Publishing) Ltd., The Grampians, Shepherds Bush Road, London, W6 7NF at £1.75. This one is entitled **A Microprocessor Primer**, and approaches the subject by way of a hypothetical device, the DIM-1, so that the author can explain general features of microprocessors without being constrained by any particular design. Having gone through this process, he then sets out to study the Z-80. This is a small book (75 pages) but within its scope achieves its purpose.

Thirdly, there is **Introduction to Microcomputers for the Ham Shack**, by Harry L. Helms, Jr., published by Howard Sams and distributed by Prentice-Hall International, 66 Wood Lane End, Hemel Hempstead, Herts HP2 4RG at £3.20. Also a small book, this is concerned with the application of micros to amateur radio. Three chapters are allocated

to the basics of micro operation and programming, after which two chapters describe present and future operations using micros to send and receive Morse, to convert slow-scan tv to fast-scan for ordinary viewing, to store frequencies, in digital modulation, and in several other roles.

Early Radio Wave Detectors, by V. J. Phillips, gives a comprehensive account of various radio wave detectors used before the advent of the crystal and thermionic valve. Among the types described are spark-gap, electrolytic, magnetic, thin-film and capillary detectors, as well as tickers, tone wheels, heterodynes and coherers, the type of detector which makes use of "a phenomenon which occurs in a poor electrical contact, the sort of contact which the engineers of today would call a 'dry joint'".

Among the items described under the heading "Miscellaneous detectors," are the 'physiological' receiver, which made use of the electrical sensitivity of a frog's leg to displace a pointer on the smoked surface of a rotating drum, and the use of a human brain as a coherer, the description of which is supplemented by a photograph for which an advisory note is given for the benefit of "readers of delicate sensibilities". Be forewarned, however, the note appears at the bottom of the page, and the photo at the top!

The last chapter, entitled "And so to the modern era," covers the early crystal and thermionic valve type detectors and how they were used — an appropriate finale to an interesting and well-illustrated book. The publishers are Peter Peregrinus Ltd, Marketing Dept, Station House, Hitchin, Hertfordshire SG5 1RJ, and the price of the book in hardback form is £16.

Digital Techniques and Systems, by D. G. Green, is intended as a first course book for students with a basic knowledge of electronics and telecommunication transmission techniques, but the combined coverage of basic techniques used in modern digital circuits, and elementary principles of data communication, laid out in a logical sequence, make it useful for anyone wishing to gain insight into this field.

Chapter 1 gives a concise introductory description of a few of the uses of modern digital applications to which he may put the knowledge that he is about to learn. The second and third chapters cover the operation of electronic gates of all kinds and the remainder of the book, which includes chapters on digital modulation, data-links and pulse code modulation, is devoted to the subject of data transmission over telephone lines.

Worked examples are included in the text, and each chapter concludes with exercises, some of the questions of which have been taken from past C and G examination papers. Multiple-choice questions are also provided at the end of the book, which is priced at £4.95 and published by Pitman Books Ltd, 39 Parker St, London WC2B 5PB.

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