Book Reviews

FET APPLICATIONS HANDBOOK, Jerome Eimbinder, Ed., TAB *Books, Blue Ridge Summit, Pa.*, 1967; 275 pages, *illus.*, $12.95.

This handbook is actually a collection of papers and manufacturers' application reports, which have been assembled into several sections. As such, it does contain a wealth of useful information, but also injects a number of extra errors in the processes of transference and modification. For instance, "Measuring FET Noise" by McIntyre and Prosser is derived from an appendix to Amelco's Technical Bulletin no. 7, but during rewriting, equation numbers have been misaligned (p. 104-105) so that the text refers to the wrong equations. Also, a section of the original which included definitions has been omitted, so that an undefined 'G' appears out of thin air in equation (6).

Even worse, equation (7) has been split between two pages so that a multiplying factor in an equation on p. 106 appears all alone on p. 107! And in this factor i_n^2 and e_n^2 appear as i_n^{-2} and e_n^{-2} !!

The current confusion regarding the 'correct' symbols for the representation of IGFETs is also reflected in the book, as is the arbitrary interchange of g_m and g_{fs}. These examples again highlight a lack of editorial coordination which does much to negate the utility of the volume.

It will nevertheless be a useful, albeit exasperating, reference book for the practising engineer: advice on the design of bias networks, low- and high-frequency amplifiers, oscillators, choppers and multiplexers abounds, and can be extracted from the 'noise' provided the reader is already reasonably familiar with FET circuit technology.

J. Watson

Joseph Watson received the B.Sc. degree from the University of Nottingham in 1954, M.S. degree from M.I.T. in 1955 and Ph.D. degree from the University of Nottingham in 1958, all in electrical engineering. From 1948 to 1950, he was with the Crompton-Parkinson, Ltd. He was a senior research engineer at Ericsson Telephone Ltd (England) from 1958 to 1960. During 1960-1961, he was with Hilger-Watts Ltd. (England). He was a member of the faculty of the Loughborough University of Technology, England, from 1961-1963. Since 1963, he has been on the faculty of electrical engineering at the University of Wales, Swansea (England). During the academic year 1967-68, he was a visiting associate professor at the University of California, Davis. Professor Watson is the author of Semiconductor Circuit Design (Hilger-Watts, 1966) and is a member of IEEE, IEE (London) and Sigma Xi.

ETUDE MATHEMATIQUE DES CIRCUITS DE L'EECTRONIQUE, J. Ortusi, *Masson et Cie Paris*, 1966, Vol. I (411 pages), Vol. II (544 pages), illus.

These two volumes, "Mathematical Study of the Circuits of Electronics", communicated through M.E. Van Valkenburg, are written in French at about the senior level and are "consecrated solely to the application of mathematics to electronics to exclusion of all experimental or concrete applications" (forward, p. viii, Vol. I). The first volume covers analysis while the second covers synthesis, while an attempt has been made in both to mix active and passive characterizations.

To give an idea of the material of the books the chapter titles can be roughly translated as follows:

Vol. I

1. Linearity in electronics
2. Applications of complex number calculus
3. Vector and matrix calculations
4. Classical methods of analysis
5. Active circuits
6. Modern methods of analysis
7. Classical theory of 2-ports
8. Wave theory for 2-ports
9. A study of particular 2-ports

Vol. II

1. Mathematical properties of transfer functions
2. Bode's laws and diagrams
3. Canonical synthesis forms
4. Modern theory of filters
5. Synthesis of modern filters
6. Frequency compensation of amplifiers
7. Hyperfrequency filters
8. Feedback in electronics

Because the books introduce synthesis concepts at an early level in the language, they have definite advantage for French students. However several things make them somewhat inappropriate as texts for American audiences. First, the format leads to more of a disjoint compilation of facts than a smooth flow of topics. Second, mathematical results are rarely justified (e.g., Vol. I, p. 180 states with no previous mention or justification that z_{ii} is a rational positive-real function) and when justified the justification is scarcely with any rigor (e.g., Vol. II, p. 41 demonstrates that z_{ii} is positive-real by stating that $W = \frac{1}{2}\mathrm{Re}[ei*]$ is necessarily positive from which $\mathrm{Re}\, z_{ii}(jw) \geq 0$ is obtained and extended to the right-half plane). Third, the emphasis away from practical devices, as mentioned above, attracts the student away from the more practical concepts, as sensitivity, active RC synthesis, and integrated circuits; in other words there is little motivation for undergraduate students in a field of considerable excitement for Americans.

Finally, there are rather disconcerting errors of concept (e.g., Vol. I, p. 180, "the fundamental theorem of passive networks is the reciprocity theorem" while we know that the passive gyrator violates reciprocity).

The main advantages of the books are a) their heavy reliance upon scattering techniques in the analysis of active circuits, b) the rewarding next-to-the-last chapter on microwave structures, and c) the mixture of active and passive components with the introduction of a synthesis emphasis into a French text. In these the author has definite success.

In summary, the author's stated purpose of bringing concepts taught in the United States into a French text with emphasis upon clarity in place of rigor (forward, pp. vii-viii, Vol. I) is well accomplished. Thus the texts have much to offer the community in France but little for an American audience. Perhaps their philosophy illustrates the differences between the two types of educational systems and somewhat the approaches of the societies.

"D'autre mes ne d'autre bevrage
Ne se quiert pestre n'avevrer."
(Chretien de Troyes)

R. W. Newcomb

R. W. Newcomb was born in Glendale, Calif., June 1933, received the BSEE from Purdue (1955), the MS from Stanford (1957) while a Research Intern at Stanford Research INstitute, and the PhD from the University of California (Berkeley) (1960) where he was also a Teaching Associate. Since 1960 he has been on the professorial staff at Stanford spending the academic year 1963-1964 as Visiting Professor at the University of New South Wales (Australia) and the first half of the academic year 1967-1968 as Professeur Invite at the Universite Catholique de Louvain (Belgium). He is the Network Series editor for Prentice-Hall, author of "Linear Multiport Synthesis", "Concepts of Linear Systems and Controls", "Active Integrated Circuit Synthesis", and "Network Theory: The State-Space Approach". Professor Newcomb's research concentrates in the areas of microsystems and generalized networks but incorporates related topics of interest to his co-workers and students.