32[Z].—PHILIP M. SHERMAN, *Programming and Coding the IBM 709-7090-7094 Computers*, John Wiley & Sons, Inc., New York, 1963, xiv + 137 p., 24 cm. Price $1.95.

This is a small booklet to be used as a "workplan" in learning the material in the author's book *Programming and Coding Digital Computers*, and relating it to the IBM 709-7090-7094 computers. Chapter headings are as follows: Basic Operations, Symbolic Coding, Program Loops, Index Registers, Sequencing in Memory Subroutines, Input-Output Operations, Numerical Problems, Algebraic Languages, Non-numerical Problems, Data Processing Macro-instructions, Interpreters and Simulation, Program Debugging and Testing.

E. K. BLUM

33[Z].—MARVIN L. STEIN & WILLIAM D. MUNRO, *Computer Programming: A Mixed Language Approach*, Academic Press, New York, 1964, xiv + 459 p., 24 cm. Price $11.50.

With the market so richly supplied with books on computer programming, each new entry in this field must, first, display a unique or arresting feature in order to capture attention and, second, meet exacting standards of excellence in order to gain acceptance. The book under consideration successfully negotiates the first hurdle and, in the opinion of the reviewer, possesses the necessary merit to surmount the second.

The feature that sets Stein and Munro's *Computer Programming* apart is its use of the Control Data 1604 as the model in terms of which machine language is discussed. It takes courage to eschew the easier path of inventing a fictitious machine on which to carry out the indispensable process of illustration. The authors have elected to meet the problem head on by going to a machine actually in use, thereby limiting their appeal to a highly selective market and also risking obsolescence of the book as the computer is inevitably superseded. These built-in obstacles to widespread circulation are partially offset by the obvious care that has gone into all phases of the production of the book.

The first two chapters, together about 70 pages in length, deal with number systems and the organization of a computer. The treatment of number systems, in particular, is exceptionally thorough and lucid. Programming proper, using the "mixed-language approach," begins in Chapter III. As suggested by the authors' determination to base their exposition on a flesh-and-blood machine, their point of view places them in the camp of those who believe that an initial grounding in machine code is essential for the student of computer programming, whether he is destined to be a professional or only a casual user. The progression is from machine code through symbolic machine code to FORTRAN. The step-by-step unfolding of programming, both as an attitude toward problem solving and as a corpus of techniques, occupies the remainder of the book. There are many carefully worked-out examples, some extending over several sections in episodal form. Numerous exercises, mostly drills for solidifying technical skill, are found at the end of each chapter. Special mention should be made of the end-papers, which contain a most convenient listing of the 1604 instruction repertoire.

The book was written to become a text at the upper-division level. One may assume that the dozen or so universities that have 1604's have already been made aware of its potential usefulness in this role. It can be recommended also for the library of any non-academic computing center that has this machine. The big question is, of course, whether it would be suitable as a textbook at those institutions that do not have a 1604. The authors have attempted to some extent to make an affirmative answer possible by separating material that can be treated in general terms from that which is heavily 1604-dependent. However, its value would seem to be greatest as a supplementary reference rather than a text if a 1604 is not available.

R. N. Goss

Navy Electronics Laboratory
San Diego, California

34[Z].—R. WOOLDRIDGE & J. F. RACTLIFFE, *An Introduction to ALGOL Programming,* Van Nostrand Company, Inc., Princeton, N. J., 1964, x + 131 p., 21 cm. Price $4.20.

This book is an addition to the rapidly growing list of introductory and tutorial texts on ALGOL programming. At the beginning, the reader is made familiar with a simple paper-tape oriented computer system and some basic notions relating to it; such as program, memory, input and output. In the following chapter, ALGOL is introduced by means of a short sample program. The sequel proceeds through the explanations of numbers, identifiers, expressions, arrays, and loops. A special chapter is inserted on input and output. The last chapters are devoted to the ALGOL block-structure and to procedures. A summary of the "main features of ALGOL" concludes the text.

The book is heavily oriented towards the ALGOL system implemented on the Elliott computers. This allows for the addition of a chapter on input-output, which discusses in detail the *read* and *print* operators of the Elliott-ALGOL system. The book is therefore particularly valuable to users of Elliott computers. For the reader interested in ALGOL 60, or implementations of ALGOL on other machines, this strong orientation is of questionable value, although the authors promise to annotate any "deviation of ALGOL 60" from Elliott ALGOL. For example, in the reviewer's opinion, the mandatory occurrence of *switch* declarations with the purpose of acting as label declarations ought to have been mentioned as a peculiarity of the Elliott system, and not as the general rule, which ALGOL 60 allows to be disregarded.

Also, example 7 does not seem to yield the expected results.

N. WIRTH

Stanford University
Stanford, California