

two-, and single-address instruction systems; it also discusses such topics as indirect and relative addressing. Chapter 4 is entitled *Programming for Special-Purpose Digital Computers*. This is one of the topics usually not covered in textbooks of this type. The chapter contains some general discussion of digital differential analyzers, real-time control computers, information retrieval computers, and other similar topics.

With Chapter 5 we enter into Part 2 of the book. This chapter introduces various topics of automatic programming such as interpretive routines, including even a brief discussion of threaded-lists, and an introduction to algebraic compiling routines and the associated translation problems. Chapter 6 is an introduction to ALGOL; the Backus normal notation is used to define the language. This chapter appears to be quite condensed and, as a result, seems to lack the instructional value of, for example, H. Bottenbruch's "primer" on ALGOL 60. (See *Journal of the ACM*, v. 9, 1962, p. 161–221.) Chapter 7 presents an introduction to the essential concepts of COBOL 1961. Chapter 8, entitled *Programming to Achieve Intelligence*, is a quite ambitious chapter, as a list of subtitles will indicate: list processing, automatic programming-language translation and examples of translating ALGOL codes, mathematical optimization including dynamic programming, programming for medical diagnosis, proving geometric theorems and trigonometric identities, and abstraction and creativity.

Part 3 begins with Chapter 9, which gives a brief introduction to the fundamentals of numerical analysis, ranging, nevertheless, from simultaneous linear equations to the solution of Laplace's equation by difference techniques. Chapter 10 gives an equally condensed introduction to Boolean algebra. The last chapter, Chapter 11, discusses search and sorting techniques as well as some problems of codifying information.

As can be seen from this partial enumeration of topics, the author certainly introduces a wide variety of subjects. He definitely does this in a very lucid way and his selection of topics is up-to-date. However, one might perhaps wish that the author had gone into greater detail in certain sections of the book, compensating for this by leaving other sections out. As it stands, many sections are so short that they appear to be superficial, even though the author has tried to overcome this by giving extensive lists of relevant references. Nevertheless, the emphasis on automatic programming techniques and the discussion of modern problems in the computer sciences make this a very attractive book, which probably will find widespread use in introductory computer courses.

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64[Z].—DANIEL D. McCracken, *A Guide to ALGOL Programming*, John Wiley & Sons, Inc., New York, 1962, viii + 106 p., 27 cm. Price \$3.95.

This is not a reference work on the syntax and semantics of ALGOL, but a highly practical text suitable for a beginner. It assumes no prior knowledge of computers or programming nor any mathematical sophistication.

Eight Chapters are contained within 93 pages. New concepts are introduced gradually. The if-statement appears in Chapter 3, the for-statement in Chapter 4, and procedures in chapter 7. Each chapter is followed by a set of exercises, the answers to some of which are given in the back of the book. Flow charts are used

effectively to help illustrate the algorithms. Several chapters are concluded with case studies: examples of programs which can occur in practice. The final chapter deals with an input-output scheme which the author admits is not ALGOL, and the reviewer hopes will never be.

This text is on the other end of the scale from that of Naur, which was evidently written for the experienced programmer. It is probably more suitable for the beginner than those of Bottenbruch or Dijkstra. However, the reader is not warned that ALGOL has imperfections, nor is he given an indication of the precise manner in which the syntax is defined. The author gets into trouble by not making clear the distinction between procedure-identifier and function-designator. Thus the statement (on page 76) that a function name "must never appear anywhere but on the left-hand side of an assignment statement", will probably convince many readers falsely that the recursive factorial procedure on page 79 is incorrect.

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65[Z].—JAMES A. SAXON & WILLIAM S. PLETTE, *Programming the IBM 1401: A Self-Instructional Programmed Manual*, Prentice-Hall, Inc., New Jersey, 1962, xv + 208 p., 23 cm. Price \$9.00.

The sub-title of this book; namely, *A Self-Instructional Programmed Manual*, describes the special feature of its design. It is a text on the 1401 designed for study without the aid of a teacher. In order to accomplish this purpose, frequent problems are provided, with the answers given on the immediately succeeding pages. The answers are accompanied by comments which help to clarify any errors that may have been made by the student.

This general technique seems very useful, and can certainly assist in the initial training of 1401 programmers, with a reduction in the time required by an instructor.

Considering the space demands of this special method of presentation, the text provides a good coverage of the fundamentals of programming. Machine language, flow charting, symbolic coding, assembly programs, input and output, editing features, and subroutines are only briefly mentioned.

With the completion of this text, the student has acquired a good start in 1401 programming.

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66[Z].—RAJKO TOMOVIC & WALTER J. KARPLUS, *High-Speed Analog Computers*, John Wiley and Sons, Inc., New York, 1962, xi + 255 p., 22 cm. Price \$9.95.

This book presents the material on electronic devices and circuits which combine to constitute the repetitive type of analog computers (where a solution can be displayed on a cathode ray tube) and on applications of such computers to engineering problems. Professor Tomovic is associated with the University of Belgrade, Yugoslavia. He has written a book (entitled *Calculateurs Analogiques Répétitifs*, published in Paris in 1958) from which the present volume was derived. The co-author, Professor Karplus of the University of California, author of other books on analog com-