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Arithmetic Formulae and the Use of Subroutines in SAKO

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Summary—This paper describes the arithmetic formulae and methods of using subroutines in the SAKO automatic programming system. The form of permissible expressions and the basic ideas of how SAKO is translated into machine language are given.

1. Introduction

One aim of a scientific autocode is to assist the programmer to code some class of arithmetic operations. Naturally it is desirable that this class should be as large as possible. It is, however, limited by the 'translator' program.

Among well-known autocodes of this nature are: FORTRAN (1, 2), the Mercury Autocode system (3), and the Univac MATH-MATIC system (4). Each of these has its particular method of writing arithmetic formulae subject to certain limitations. One results from the generally accepted principles of mathematical notation; the second results from the way in which the autocode is used on an actual machine. While developing SAKO for use with arithmetic formulae, we endeavoured:

1. to retain the principles of the mathematical notation as far as possible; and
2. to reduce to a minimum any limitations due to the translator.

In this way it was possible significantly to shorten the time required to program arithmetic operations, and to reduce the possibility of mistakes.