F O R E W O R D

SAVE is an assembler designed to outlast the kind of programmer who tends to outgrow assemblers. There is a phenomenon in the world of programmers known as the Smart Guy, about whom the following axiom exists among programming system writers: given an automatic programming system there exists a programmer who wants to do something he could do in machine language but isn't permitted to do by the programming system.

In the domain of assembly programs the ideal is that which satisfies the Smart Guy and at the same time possesses all the customary advantages of assemblers which result in minimization of things to remember and worry about while coding. We have, of course, failed to achieve this ideal, but we are not dismayed, because we consider ours to be a rather interesting failure.

Case has at least its share of Smart Guys; most of them are undergraduate Mathematics majors or will end up that way before graduating. We gratefully endure their perversities and to them we dedicate our efforts. The first generation has come and gone but has left its mark: Donald Knuth, Bill Lynch, George Petznick, and Joe Speroni. Others have not yet left and still others seemingly never will: Fred Way III, our Associate Director, George Haynam, Bill Stieger, Jack Alanen, Richard Campbell, and Barry Fell. Each of these people influenced the development of the language, the assembler, or this manual. Special thanks to Richard Campbell, who coded the format band generator.

Our gratitude also goes to Brad MacKenzie, Alan Reade, and Jim Whitworth, all of Burroughs Corporation, who were very cooperative in providing debugging time before our 220 arrived.

A word about the name of the assembler. Here is another axiom of the automatic programming world: write a programming system and someone is going to expect that it have a name with a cleverly disguised meaning. "SAVE" has no cleverly disguised meaning; it has no meaning at all. It does have a certain practical value, though, due to the fact that people who tend to misplace things like call cards, keypunch program cards, and tapes mysteriously lose their disposition to do so when confronted with the name "SAVE" in bold letters.

In order to make reading easier we have divided the text of Section I of this report into three "depths" of reading difficulty. A number in parentheses in the right margin marks the beginning or a continuation of a passage of that depth. Number 1 is for light readings; it covers enough of the language so that SAVE looks like a typical simple assembler. Depth 2 covers most of the remainder of the language, and depth 3 is reserved for obscure digressions.

In anticipation of enlargements of the language we intend to refer in the future to the language and program described here as version 1 of SAVE.

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A B S T R A C T

SAVE is an assembler for the Burroughs 220 which runs on a 5000 word 220 with Cardatron and two tapes, although a third tape is sometimes desirable. Assembly may produce machine language on cards, paper tape, or magnetic tape, together with several listing options.

Features of the assembly language include program points, names, floating-point notation, alphabetic strings, very general symbolic arithmetic,a general FILL operation, partial-field loading, multiple name and literal tables, and general numeric and string literals.