NASA TECH BRIEF

NASA Tech Briefs are issued to summarize specific innovations derived from the U.S. space program, to encourage their commercial application. Copies are available to the public at 15 cents each from the Clearinghouse for Federal Scientific and Technical Information, Springfield, Virginia 22151.

Assembly Processor Program Converts Symbolic Programming Language to Machine Language

The problem:

To develop a computer program that will accept input cards written in a symbolic language and convert them to an appropriate machine instruction. This program should translate symbolic codes into computer understandable instructions, assign locations in storage for successive instructions, and computer locations from symbolic addresses.

The solution:

An assembly processor program that converts symbolic programming language to machine language.

How it's done:

The program operates on each language statement twice, once during each of two passes of those statements through the processor.

Pass 1 accepts the source language statements from either punched cards or a combination of an output listing from a previous assembly and punched change cards. The source statements are broken down into fields: locations, octal operation code, B-term, and variable field. Five statements are processed whereupon the five statements along with the fields are written on MT3. Also during Pass 1, each symbolic location term is equated to a relocatable octal address and the pair is stored in core tables.

Pass 2 reads the records on MT3 and processes the B-terms and the variable field (M-term). A listing tape is generated, an object deck is punched (if not suppressed), and images of the object deck are written on MT4 (if not suppressed).

Thus by selecting the jump and stop setting desired, any of the several octal machine language codes, their equivalent as shown in CDC or IBM (SHARE) reference manuals, can be input into the CDC 924A as symbolic language and this program converts each to appropriate machine instructions.

Notes:

1. The program uses any symbolic language shown in the CDC or IBM (SHARE) reference manual. It is for use in the CDC 924A computer.
2. Inquiries concerning this program may be directed to:

    COSMIC
    Computer Center
    University of Georgia
    Athens, Georgia 30601
    Reference: B67-10493

Patent status:

No patent action is contemplated by NASA.

Source: E. V. Pelto
of North American Aviation, Inc.
under contract to
Marshall Space Flight Center
(MFS-13262)