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SUBJECT: Recent Changes in The Comprehensive System Conversion Program

To: S&EC Staff and Programmers

From: J. M. Frankovich

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Abstract: Several changes have recently been made in the Comprehensive System Conversion Program. Most of these changes are of the nature of minor improvements in the coding vocabulary for CS. They are summarized here for the convenience of programmers using the system.

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1. New WHI Operations

The new WHI operation "sd", giving the partial sum of digits (See 6M-3716), is now converted by CS.

2. Floating Address Value Tables

(a) A table of floating address values is recorded at the end of buffer drum group two after every CS conversion (See DCL-76), thereby allowing the development of more sophisticated post mortem and error diagnosis techniques.

(b) The recording of a table of floating address values either on a delayed output magnetic tape unit or on the direct output typewriter can now be suppressed by setting up the proper numbers in the manual intervention registers before conversion. The time required to convert a flexo tape for which the flat table is known can thus be reduced. Operating details are given in memo DCL-22-Supplement #1

3. Output Requests

(a) In the past the convention was followed (See "Repeated Output Requests" in Chapter V of M-2539) that if the current address locations of two or more automatic output requests were identical, then only the last request was accepted by the conversion program and produced an output routine while all the other coincident requests were effectively ignored. This convention was valuable when programmers desired to correct or alter output requests by making modifications on the end of their program tapes, but it led to difficulties when such suppression was not actually desired, as, for instance, when the drum address locations of the current-address-coincident requests differed. This last example frequently arises when programmers store on the drum different pieces of a program which request automatic output and which will eventually occupy the same area of core memory.

The best solution to the problem thus raised is to ignore only those output request which are actually replaced by another, i.e., when both the current address and drum address location of two requests coincide. The alterations in CS to accomplish this would however have meant a major change in the logic of the system, so a compromise solution has been effected: the CS system now will not ignore any output requests at all. This convention will at worst lead to the presence of superfluous output routines in some programs. Any difficulties which might result because of this convention will be indicated by an automatic conversion postmortem, and the standard cure will be deletion of the undesired output requests in the program tape. Little difficulty is expected, however, for a survey of the tape room indicated that this practice of deleting modified output requests has been followed in the past, even though it was not necessary.

(b) A maximum of 31 automatic output requests were permitted in a program converted by CS, and a lower less precise limit existed which depended upon the number of Flexo characters appearing in all the requests. This second limit has not been altered, but the maximum number of requests which can now appear in a program has been raised to 63.

4. The Treatment of Flexowriter Characters

(a) In DCL-73 it is indicated that the backspace character is considered illegal by the CS conversion program. The backspace has actually been an ignored character until recently, and certain acceptable usages of the character in program typescripts have developed. To make allowances for these, the conversion program has been further modified so that the backspace character is now illegal except in tape titles ("fc"), subroutine titles ("LSR"), and comment words (" |"). In these three kinds of words the backspace is now ignored.

(b) It is stated in Chapter V of M-2539 that if a program typescript appears correct then the program tape is correct. Certain exceptions must of course be made to this statement, since, for example several spaces are not the equivalent, to CS, of a tab character. The other principal exceptions concern the backspace character (see above), and the carriage shift characters.

Superfluous, or ineffectual, shift to upper case or shift to lower case characters are ignored by CS, and in all but one situation no shift characters at all were required between two successive words when the first ended in upper case and the second began in upper case. The single exception concerns the tape title and the next word of a program. If this word were in upper case, then it had to be preceded by a shift to upper case character, whether the title ended in upper case or not. This requirement led to difficulties when such a character was accidentally omitted, as could easily be done.

The CS conversion program has been modified so that this requirement no longer exists, i.e., ineffectual shift characters need not occur between the tape title and the next word on the tape.