

FILE MEMO: Project 7000

July 24, 1957

SUBJECT: Processing 72 bit words in the Basic Exchange

For some reason the ECC Indicator bit has disappeared from the control-word format. Because it controls a valuable function of the Exchange, the bit and the function should be reinstated unless someone can provide an adequate reason for not doing so.

This function is defined on page 7 of Exchange Memo No. 15 as follows:

" When writing, the ECC Indicator signals the Exchange to send the 8 ECC bits contained in each data word to the output unit. If there is no ECC Indicator, the 8 ECC bits are discarded and only the 64 information bits in each data word are sent to the output unit. "

It is an accepted precept to include the 8 ECC bits with the 64 data bits of every word written by devices functioning as auxiliary storage units, i. e. by devices which record computer data for later re-entry into the computer. High speed tapes and disks are being planned to service 72 bit words. Such an important contribution to such a critical aspect of Project 7000 as effective reliability cannot be overlooked. Type 729 tape units also play the role of auxiliary storage; in fact, these may be the only auxiliary storage units in some Project 7000 installations. The Basic Exchange services Direct Access Disks as well as Type 729 tape units. These disks, serving no communication function, are used exclusively for auxiliary storage. The latest memo* on these calls for recording the ECC bits on disks.

Recent revisions in word formats have made it possible to include the ECC flag in the control-word. The Exchange upon observing the flag will assemble nine bytes (including one ECC byte) into a full 72 bit word. When the flag is down, 64 bit words will flow between the I/O unit and the Exchange, whereas when it is up these will be 72 bit words. The Exchange will always communicate with memory in 72 bit words. When a word arrives from memory the Hamming unit of the Exchange will test it and correct it. In sending a word to memory the Hamming unit will generate 8 ECC bits and send them with the word if the flag is down; under this circumstance but with the flag up, it will test and correct the incoming 72 bit word from the I/O unit and pass along its ECC bits to memory.

* Lippel, Berthold (Engineering Planning): DAD - Direct Access Disks; 4-23-57.

These statements in tabular form appear below. H denotes the Hamming unit.

Area	Between I/O and Exchange				Between Exchange and Memory			
	Reading		Writing		Reading		Writing	
Operation	Up	Down	Up	Down	Up	Down	Up	Down
Flag								
Bits/Word	72	64	72	64	72	72	72	72
Source of ECC	I/O	(none)	memory (dropped)		I/O	H	memory	memory
ECC Checked					H		H	H

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