July 8, 1957

FILE MEMORANDUM

SUBJECT: Project 7000, Ultra Fast Disks - New Instructions

It is proposed that two new instructions be provided to eliminate 30 ms delays encountered when a block addressed has just passed and a full revolution is required before it again is available. These instructions might be called READ AND ROLL and WRITE AND ROLL to imply that memory is addressed so that it seems to roll in synchronism with the disk. This feature has been proposed for LARK.

These instructions cannot be used simultaneously with the grouping – distribution feature. The programmer puts the data-word address (DWA) in the control-word address (CWA) part of the control-word and specifies a word count (W. C.) that is a multiple of 2^{10}. When the disk unit receives the READ AND ROLL instruction, it begins reading at the beginning of the next block and emits to the high speed part of the exchange the block number (0, 2^{10}, 2×2^{10}, 3×2^{10}) of the block it is reading. To assure sending each word to the proper location in memory, the exchange adds this emitted number to the CWA and stores the sum as the DWA prior to the processing of the first word.

The exchange then procedes as usual, adding 1 to the DWA and subtracting 1 from the W. C. as each word is processed. When the next block is encountered, its number is added to the CWA and this sum is stored, as before, as the DWA after which normal operation is again resumed. This continues until four blocks have been processed (one revolution). Then, if the W. C. is non-zero, 4×2^{10} is added to the CWA and the sum is stored back in the CWA part of the control-word. The process is repeated for another revolution, etc., until the W. C. reaches zero.

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