

POUGHKEEPSIE

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Dept. 546 - Bldg. 702  
August 6, 1957

MEMO TO: Mr. J. C. Gibson

SUBJECT: Read and Roll and Write and Roll  
Instructions for Project 7000

REF: Your memo of July 8, 1957

The proposal in the referenced memo indicates a possible method of reducing the access time for the Ultra Fast Disc units, but the reduction is not as great as the memo implies. If we assume that each disc revolution requires 32 milliseconds, the maximum amount of time which can be saved by the proposed instructions will be 24 milliseconds. With the NRZ type of recording the reading or writing operation must start at the beginning of a block. The maximum saving in time can only occur when some integer multiple of 4 blocks is to be read or written. The table below shows that when all of the conditions are not satisfied, the saving will be smaller.

Blocks	Present Method			Proposed Method			Difference	
	Min.	Max.	Avg.	Min.	Max.	Avg.	Max.	Avg.
1	8	40	24	8	40	24	0	0
2	16	48	32	16	40	28	8	4
3	24	56	40	24	40	32	16	8
4	32	64	48	32	40	36	24	12
+4	+32	+32	+32	+32	+32	+32	+0	+0

The difference columns begin to repeat on a cyclic basis after the first 4 blocks; e.g., if 6 blocks were to be read, the maximum time difference would be 8 and the average time difference between the two methods would be only 4 milliseconds. Considering all of the possible word counts the average difference becomes only 6 milliseconds.

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Since this is not a guaranteed saving, the programmer must still make provision for the maximum cases. )|

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With the limitation that the grouping-distribution feature cannot be used with these instructions, their value appears to be marginal.

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