Memo 10

March 10, 1959

PROJECT 7000

FILE MEMORANDUM

SUBJECT: Percentage Effects of Certain Component Variations on SIGMA Internal Computing Speed

In the following graphs, I have redrawn certain variations of SIGMA internal computing speed as obtained from Timing Simulator runs made last year. The graphs are all plotted in percentages to facilitate inter-comparison. It should be kept in mind that one 704's capability is between 1% and 2% on this scale.

1. Effect of Number of Look-Ahead Levels

The first graph shows how the speed varies as the number of look-ahead levels are changed. The real purpose of the Look-Ahead device is to permit the computer to use the overlapping organization built into it. In this case the 4th level buys 2.5% in performance, the 34d and 4th buy 7%.

2. Effect of the Number of Memory Units

The second graph indicates that there is a considerable change in performance depending on whether data and instructions are separated or not. The slow-down when they are mixed is due mainly to instruction-fetch delays caused by the boxes being busy with data traffic. Nevertheless, it is expected that the mixed mode of operation will be commonly used for "load and go" type programs. In this case the difference between 4 and 6 boxes is about 5% in performance

3. Effect of Half Microsecond Memory

The third graph is a duplicate of one given in my File Memo dated August 29, 1958, concerning the half-microsecond memory. Some problems are more sensitive to the instruction memory configuration than others due mainly to the relative percentages of logic and arithmetic in their makeup.

In all the problems listed, the size of memory was not a factor, only the number of separate units.

H. G. Kolsky

HGK:jcj
Enclosures: 3 Graphs

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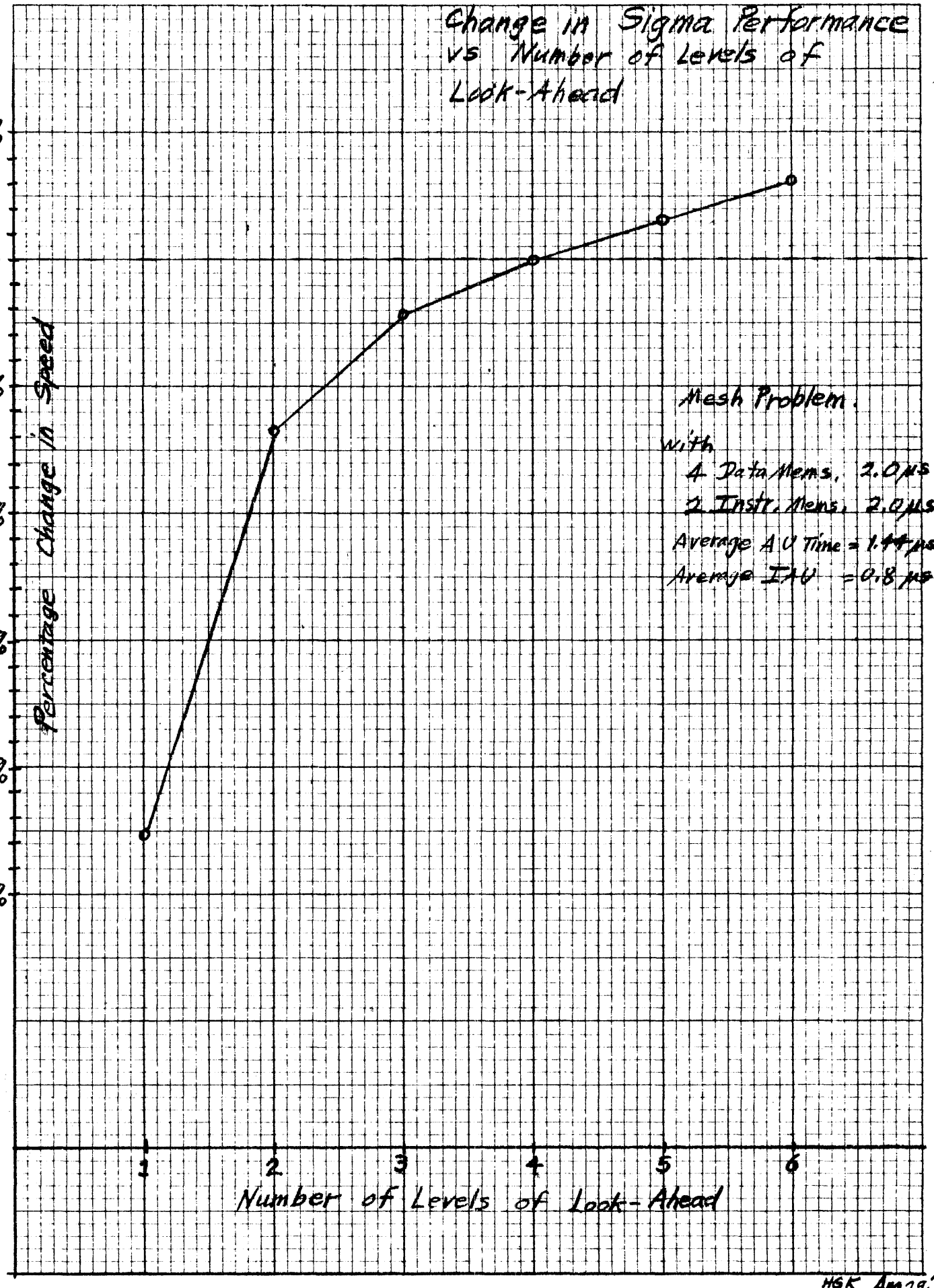
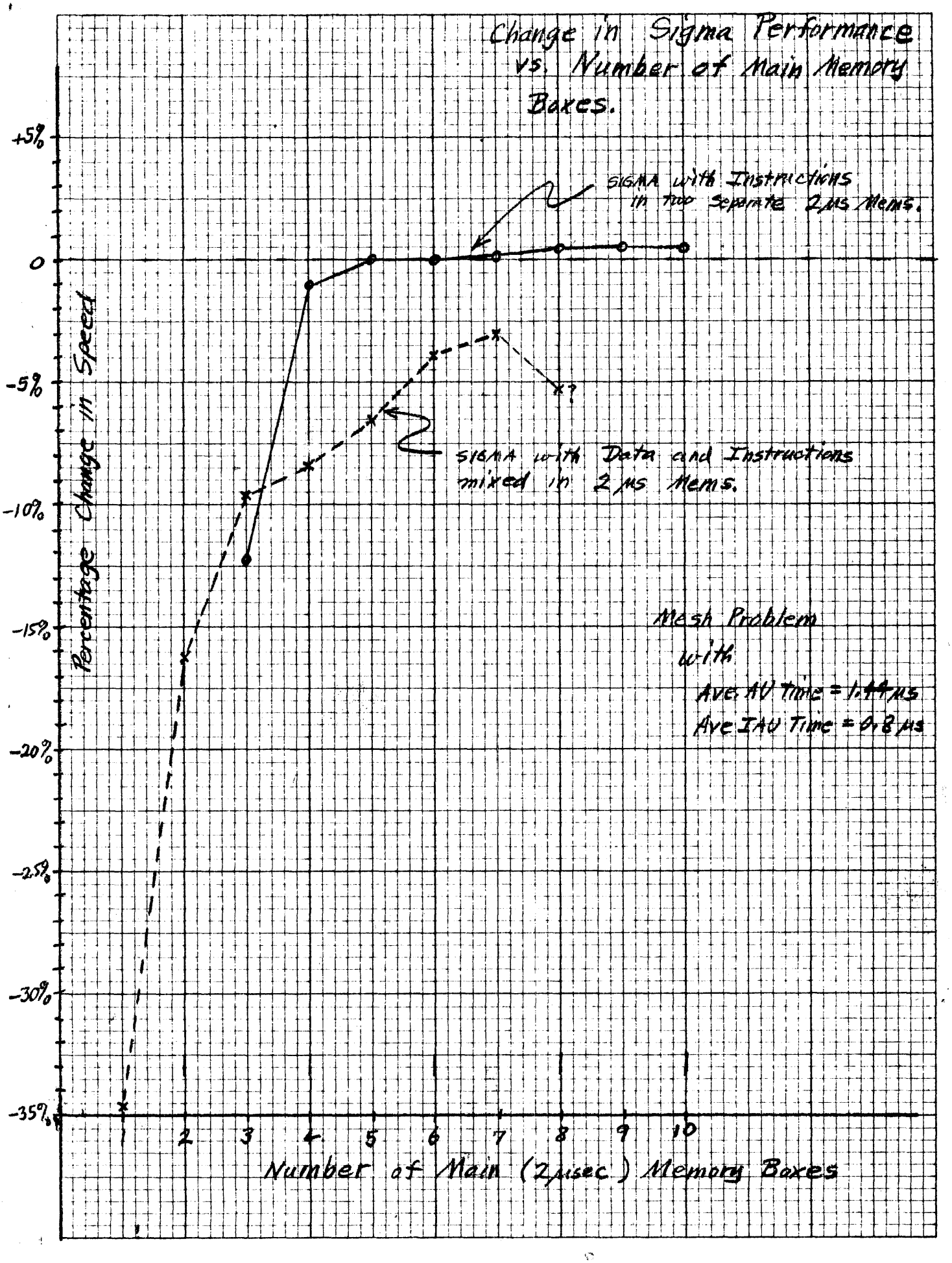
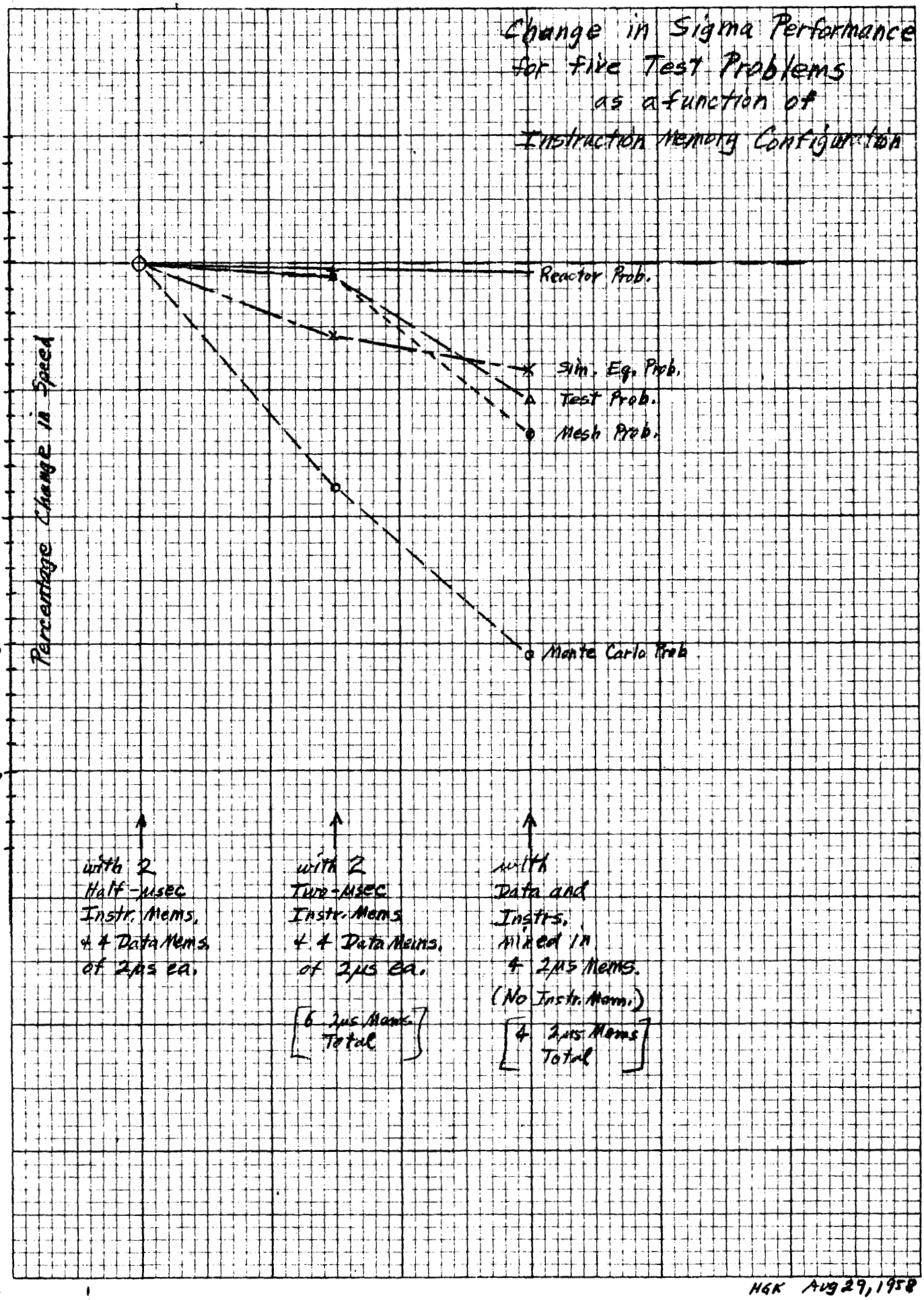



HGK Aug 29, '58






HGK Aug 11, 58




HGK Aug 29, 1958