

POUGHKEEPSIE

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Dept. 749, Bldg. 702
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MEMO TO: Mr. B. L. Sarahan

SUBJECT : The Status of Delta in the Stretch Program

As nearly as can be determined at this time the objectives of the Stretch program are these:

- 1. To create a calculator called Sigma whose primary application will be scientific computing, whose speed will be from 100 to 200 times the present 704, and whose characteristics will satisfy the requirements of the AEC contract.**
- 2. To create another machine called Delta which will be applicable to both scientific and commercial tasks, which will be able to communicate with Sigma and improve Sigma's overall performance by assuming editing and conversion tasks which Sigma will not perform efficiently. The speed of Delta will be about 10 times present 704 speed.**
- 3. To develop other units to operate with Sigma and Delta, primarily for input / output and auxiliary storage.**

There is no argument with objectives 1, and 3. The Company has a contract to fulfill in the development of Sigma and the higher speed devices of objective 3. are a necessary adjunct to the faster calculator. Further, it may be envisioned that a reasonable market exists for such a logical extension of the 701-704-709 line.

The real question is - why Delta? There are three possibilities. Sigma can not function without Delta. Sigma will be severely hampered without Delta. Sigma performance may be improved by Delta, but Delta's real justification for being is its market potential independent of Sigma.

The first two possibilities exist in greater or less degree only because of the characteristics of Sigma. Until Sigma is fully defined it will not be possible to state whether Sigma can function effectively lacking Delta. However, we know that the need for Delta does not have to be essential in Sigma, that Sigma can (and I believe should) be designed to function on its own. Whatever the degree of potential inefficiency or added cost in Sigma to overcome the lack of Delta, it cannot measure so large as to justify a wholly distinct computer to assume part of Sigma's burden.

The third possibility must in the end be the sole justification for the^{con}struction of Delta, that the Company desires to construct a wholly new computer in the

10x speed range which is aimed at a known market. In other words; unless Delta is to be a Research exercise, it must be built with its saleability in mind. To put it even more strongly, Delta must be designed in response to a recognition of market demand. Any other consideration, such as compatibility with Sigma should be secondary.

I question whether the present status of Delta, as an aspect of the Stretch program is a valid one. I feel that Delta should be treated as an independent undertaking, defined under a different set of rules, and the result compared with the senior 750 to ascertain which machine or whether both machines should represent the Company at that performance level.

There are ideas current in the advanced Planning group which may indicate the direction a machine planned for 1960 and beyond should take. A basic concept is that of real time, absolutely dependable, self-supervised operation. The computer is to be an integral part of the business accounting and decision-making system, running continuously on a variety of tasks taken up "on demand." Batch processing is less significant in this total scheme of things. The specifications of such a computing system may well reflect different underlying principles from those currently in vogue. If our 1960 and beyond commercial machine is to satisfy such requirements its design will have to be reconsidered from a fresh point of view, a point of view which may be inconsistent with stretch concepts.

As an alternative to the Stretch objectives enumerated above the following might be proposed:

1. To design Sigma as a self-sufficient, primarily scientific calculator, capable of operating independently or in communication with other Sigma machines. Speed and other characteristics to satisfy the AEC contract.
2. To develop other units for high speed and high volume input / output and auxiliary storage.
3. To develop a commercially-oriented computer, taking advantage of Sigma-inspired components and circuits, but built upon independent system concepts, such a project to be associated with, but not necessarily a part of Project Stretch.

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RG:mjc

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