KAPL

March 29, 1957

Memorandum to: Mr. D. W. Pendery

Subject: Call on Knolls Lab, G. E.
March 28, 1957

Present: Richard Ehrlich, KAPL
Henry Hunter, KAPL
Donald MacMillan, KAPL
C. Hibbert, KAPL
A. Dodge, Atomic Energy Commission
Douglas Baird, IBM Schenectady
Graham Jones, IBM Schenectady
Dura Sweeney, Product Planning
B. L. Sarahan, Product Planning
W. P. Heising, Product Planning

The largest problems KAPL anticipates solving four years hence are in reactor simulation, particularly the physics of neutron diffusion and transport. They currently run two dimensional problems on the 704 in about two hours. The mesh is 60X 60 with 9 words per mesh point. Some limited 3 dimensional simulations will be run on the 704: 20-30 hours are required per solution.

For Stretch, they are interested in 3 dimensional problems with 3,000-5,000 points in each of 100 planes. Each point requires upwards of 15 words. They need three and want five planes in memory at a time. This comes to a minimum memory of 135,000 words. "Trixy," the largest three-dimensional problems being considered for the 704 is definitely tape bound. Either 200X tape or a large drum would be important for Stretch. The drum would have to be 500,000 to 1,000,000 words in capacity.

For thermal transient computations, the 16,000 word 704 is satisfactory, and the greatest need is for higher computing speed.

704 word size is satisfactory, even for a 100X computer. Although they have some interest in Monte Carlo techniques, it appears that it will remain a specialized technique and should not influence word size.

80 to 85 per cent of their machine usage of the CPC, Univac and 704 was on problems which ran more than one hour. They predict similar usage of a Stretch type machine for their applications.

KAPL was very emphatic on the necessity for automatic operations. The aspects touched on were:

a. No automatic machine stops except by program control.

b. No external controls on the console except start button.

c. They demand a checked out automatic programming system delivered with Stretch.

d. A high-speed machine encourages closed shop operation for both high machine efficiency and accessibility. They felt the system should readily permit long runs to be interrupted for short runs.

Input/Output. On the 704 they do not require a card-to-tape device and they expect their off-line printer to be overloaded. For example, a 20 data card input to the 704 was typical. They cite a problem with a 120 data card input which uses 2 hours of 704 time and produces 10,000 lines of print.

Output plotting is important. The output is for internal use only - - film is acceptable. They predict Stretch output requirements 6-10 times that for their 704.

In the area of magnetic tapes, they recognize the need for faster tapes. They emphasized that they want tapes that work; speed is desirable, but reliability is essential.

They referred us to KAPL report 1531 for the inner loop of a typical problem. They want a machine clock on Stretch and 704 for logging purposes. (.01 hr.)

KAPL is anxious to learn about Stretch since they feel they must soon decide on placing a LARC order. Sperry Rand reviewed the LARC specifications with KAPL on March 27th. Mr. Hunter expressed dismay at the LARC programming complexity involved in multiplexing - - keeping the input-output computer and main computer busy.

W P Heising
W. P. Heising

B L Sarahan
B. L. Sarahan

D W Sweeney
D. W. Sweeney

WPH:pw

cc: Mr. A. E. Brand - Schenectady
Dr. C. R. DeCarlo
Mr. S. W. Dunwell - Pok.
Mr. J. E. Griffith - Pok.
Mr. W. W. Simmons