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MEETING OR CONTACT REPORT

Date of Report: November 12, 1958

Organization & Location: 7090 Planning, IBM Poughkeepsie	Date: November 10, 1958 Reported By: G. A. Blaauw
Project: 7000 X Committee--Investigation of 7090 and its possible improvement	Department: 539 Follow-up Date:

PERSONNEL PARTICIPATING:
(Place asterisk next to those on distribution list. Other distribution show at end of report)

G. A. Blaauw*
S. G. Campbell*
H. G. Jones*
K. W. Kaeli*
H. G. Kolsky*

The subject of the meeting was the current 7090 planning effort. The 7090 model which is under development is almost compatible with the 709 and makes use of Stretch technology both in switching circuits and memory. The 709 can be made nearly compatible with the 704 by means of a trapping mode for instructions such as "copy" and "locate drum addresses" and a program subroutine. It is understood that the 7090 is not exactly compatible with the 709 and hence with the 704 in these instructions

The current planning effort is mainly concerned with the performance improvement which can be achieved by:

a. Improved Stretch circuit technology

A 2.4 usec memory cycle is assumed. This memory cycle requires a cycle time of 200 m usec. Circuits are designed for 167 m usec cycle time in order that a 2 usec memory cycle can be used. Furthermore, the use of double density cards and three level logic as incorporated in Sigma is considered.

b. Stretch arithmetic logic

An added improvement of about a factor of two can be achieved in "multiply" by skipping zeros and ones and making the addition cycle less synchronous. Similarly "floating add" may be improved by a factor of two. Present design is for 7 memory cycles which permit a 10 position pre-shift and a 4 position post-shift giving an average of 7.1 memory cycles. A possible objective may be 3 cycles memory which permit a 4 position pre-shift and a 1 position post-shift giving an average of 3.5 memory cycles. In addition, operations like "transfer" may be reduced from 2 to 1 memory cycle.

A second area of planning effort is that of input-output attachments to the 7090. Equipment to be studied is:

a. Stretch high speed disk file or a large capacity drum.
b. Advanced serial disk file
c. Swift tapes
d. Console type serial reader and printer
e. On-line Stro mberg-Carlson printer
f. Chain printer
g. High speed card reader (2000 cpm)
h. High speed punch
i. Real time unit
j. Paper tape

The possibility of a 7000-X program compatible with 7090 was discussed and ruled out by all present. Main areas which make 7090 compatability unsuitable are:

a. Word size should be at least 48 bits
b. The computer should be better suited for commercial problems and should permit:
   b.a. binary and decimal arithmetic
   b.b. more checking
   b.c. variable field length
   b.d. better control word philosophy

c. The computer should be more geared for integrated data processing and have as facilities:
   c.a. interrupt system with priority control
   c.b. multiprogramming features - fast register dump - good memory protection
   c.c. relative addressing
   c.d. multiple C.P.U. operation

d. Greater logical ability - e.g., all 16 binary connectives
e. Improved indexing facilities
   e.a. more index registers
   e.b. better indexing adaptability

f. More flexible input-output control-exchange type operation.

GAB/jcv

cc: Mr. D. W. Pendery
Mr. D. W. Sweeney
Mr. S. W. Dunwell
Mr. H. T. Marcy
Mr. R. L. Palmer
Dr. W. Buchholz