

REC'D — PALO ALTO

JUN 28 1970

SCIENTIFIC CENTER

IBM

Date: June 12, 1970

From (location

or U.S. mail address):

Dept. & Bldg:

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ASDD Mohansic Systems Laboratory
986
8-721-4001

Subject: A) Experimental Advanced Computer System
B) Faster Printing Terminal

Reference: 1) S. W. Dunwell's memos of May 22 and 28, 1970
2) R. L. Garwin's memo of May 18, 1970

To: IBM Fellows

I have read the referenced correspondence with some interest and wish to make the following observations:

- 1) Microprogramming APL for the NS-1 is a sensible suggestion. I have heard that Horace Flatt at the Palo Alto Scientific Center is engaged in a project of this sort.
- 2) The suggestion that someone should produce an LSI copy of the NS-1 in a similar manner to that in which the 7090 was produced as a transistorized copy of the 709 does not take into account some of the realities of LSI that we have encountered here in ASDD. The important benefits of LSI are not realized unless the partitioning of the design provides "hundreds" of circuits per module. The design iterations required to achieve this level of integration, while satisfying power dissipation, wireability and manufacturing tolerance limitations, usually result in dramatic changes of the physical architecture before satisfactory cost performance levels are reached.

Probably the best that can be done along the lines of building one system in another LSI technology is to begin with the desired instruction set and proceed to implement it in a manner that exploits the best features of the new technology. (The 709 to 7090 transition is not a good example because each of these was implemented in unit logic.)

- 3) The need for a high speed, no carbon printer as specified by Garwin and Dunwell is real and urgent. Again, cost/performance is a key factor. We are examining several technical approaches including ink jet, electrochemical, electro-optical and wet ink delivery by controlled capillary forces. Right now we are willing to settle for 60 to 100 character per second operation with up to a 128 character set.

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cc: CTC Staff