

# MEETING OR CONTACT REPORT

LASL Los Alamos, New Mexico	Date of Report: September 19-20, 1957
Organization & Location:	Date: October 3, 1957
7000 Mathematical Planning Committee	Reported By: J. C. Gibson
Project: Meeting #9.	Department: 749
	Follow-up Date:

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

## LASL

B. Carlson\*  
G. L. Carter  
R. Frank  
R. Lazarus  
E. Voorhees  
M. B. Wells  
D. Wood  
W. J. Worlton

## IBM

W. Buchholz\*  
F. P. Brooks\*  
J. C. Gibson \*  
F. E. Johnson\*  
D. W. Sweeney\*

Los Alamos requested that they be provided block diagrams as well as written descriptions of the various computer operations. IBM replied that some diagrams are available but obsolete; otherwise none exist that are up-to-date, because changes are too frequent. As soon as new ones are drawn they will be forwarded to Los Alamos. IBM will at any event provide diagrams at least a month prior to freezing specifications. This is satisfactory to Los Alamos if IBM will not freeze specifications without consulting them.

Los Alamos asked to be informed as to what disposition is made on both past and future proposals and suggestions they submit to IBM. IBM agreed to do so on future proposals and stated that all past proposals have been carefully considered and evaluated and that many have been adopted without expressly having indicated so. Los Alamos replied that this is satisfactory.

IBM stated that, because the freeze point is close, better communication between the two groups is needed. Hence, should someone from Los Alamos spend the next month at Poughkeepsie? The reply to this was that there is no single person who can so represent all of Los Alamos' interests. It was decided to make more use of the telephone with first attempt next Tuesday.

Los Alamos asked if IBM intended to include a class of instructions to cause index incrementing, counting, comparing, etc. The reply was affirmative and Brooks listed them on the blackboard. They were discussed and met with tentative approval from all.

The following possible instruction formats were listed on the board:

1. "As is" -- full word with pre-post operation
2. "As is" -- full word without pre-post operation
3. Full word with 18 bit index address and 6 bit second address.
4. Half-word

Sweeney and Brooks requested that Los Alamos study format 4 and report whether it is completely untenable or is worthy of further discussion. After considerable discussion in which geometric indexing was included as a part of the half-word scheme, Los Alamos agreed to make this study by next Tuesday. There was little interest displayed in formats 2 and 3.

Voorhees presented a definition of the machine that he used in a study comparing it with the 704. He distributed copies of his definition and reviewed salient points. These were discussed by all and IBM promised to comment further after studying his write-up.

Los Alamos asked a whole miscellany of questions to increase their understanding of Notes on Stretch. Among the topics covered were the following:

1. Chain bit in the index word.
2. Lack of data flow from Exchange to computer registers.
3. Count to memory.
4. Overflow.
5. Instruction similar to Count To Memory but using contents of the byte size register.
6. Masking the bit address part of the value field of the indexing word.
7. Sign for the operand address.
8. A set-up command implying operations which follow are floating point.
9. Pre/Post operation.
10. Geometric indexing.
11. A comparator for value and limit versus a subtract technique.
12. Non-input-output interrupts.

The Los Alamos people expressed a strong desire to have geometric indexing and Pre-Post operations provided in their system. All present did a considerable amount of brainstorming on these topics and Los Alamos agreed to continue studying geometric indexing in an attempt to uncover its true value. Decisions were not clearly stated on the other topics, they were not really items of contention.

There were a few questions that indicated that certain members of the Los Alamos group did not have a clear understanding of the 3-in-1 concept. These were answered and may have been the basis of some past misunderstandings between our groups.

Los Alamos stated that their contract office may not permit them to accept a system without a separate input-output computer even though they may prefer the present system definition which excludes it. Their contract office probably would permit acceptance of this, however, if other features were compensating; e. g. extra memory. IBM stated that its personnel present were not the proper ones to discuss this, but they would carry the message to the proper ones.

Worlton presented the results of his investigation of locking the index address to the operand address versus not doing so. There was considerable discussion on this possible combinations he exhibited.

Brooks presented a few points too new to be in Notes on Stretch. They were:

1. Protecting the low 20 bits in the accumulator for floating point.
2. Add exponent immediate.
3. A timer (stops looping due to improper programming of indirect addresses).
4. Noisy mode floating point.
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These met general approval.

The Exchange as defined in the Notes on Stretch was discussed. There was considerable discussion in which all attempted to see if the interrupt techniques were practical. The general result was that Los Alamos would trust IBM to get a workable system as long as that system never lost essential information concerning input-output status and interruption on any control word is provided.

There was a discussion on the merits of interchanging zero and one in our definition of masking. All who expressed an opinion deemed it advisable.

Miscellaneous comments from Los Alamos on input-output were:

1. The Exchange should reject an instruction for a unit waiting to interrupt.
2. The status bits in the control word (in the Exchange) should be reset when they have been sent to the indicator register (in the computer).

3. Masking for interrupt of individual status indicators is not required.
4. Prefer that dummy word written on high speed output media when scatter writing be all 1's rather than all 0's.
5. It should not be necessary to use one control word for each line printed.
6. Ability to backspace "n" records on one command may be useful.
7. Proposed initial program loading technique is acceptable.
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2. The "roll" type of disk operation is seriously contemplated by IBM.
3. IBM is shooting for a disk speed of 8 usec. per word.
4. IBM will take another look at multiple input-output operations in one instruction such as "backspace - read," but complications in the controls are significant.
5. Both 729 I and 729 III tape units are contemplated.
6. It may be feasible for the high speed exchange to monitor large scale memory to memory transfers.

Buchholz made the following summary of the meeting, a summary on which there was discussion but general agreement.

1. Floating point codes are acceptable as proposed. Certain details may be modified but no major change or addition seems to be required.
2. Similarly with variable field length operations.
3. Transmit, branch, and indexing are dependent upon format and are not settled. The reset address should be 18 bits if possible.
4. A further discussion on format will occur Tuesday by telephone.

cc:

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Mr. S. G. Campbell  
Mr. J. Cocke  
Mr. E. F. Codd  
Mr. E. W. Coffin

Mr. S. W. Dunwell  
Mr. H. G. Jones  
Mr. H. G. Kolsky  
Miss E. McDonough  
Mr. B. Moncrieff

Mr. D. W. Pendery  
Mr. B. L. Sarahan  
Mr. W. W. Wolensky

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