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PROJECT BETA

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FILE MEMO #9

SUBJECT: A Problem of Memory Addressing

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There are several cases where it may be desirable to block a reference to memory and delay the request or obtain the data from a temporary location in an automatic fashion. This could occur if a delayed store system, program loop storage, or temporary index register storage, etc. were included. (See BETA File Memos #8 and 10)

*Temp. Memory*

A method of making this automatic for the program loop is to compare every address with the temporary high speed storage. If a comparison is made, the instruction is obtained from the loop storage; otherwise, it is obtained from the memory address.

Another problem, which may be solved by address comparison, is the problem which arises due to a reference to memory location which is yet to be changed by a store in type of instruction, even though the store instruction precedes the reference to memory location in the program sequence. This problem, also, can be solved by a comparison of addresses provided that the references to memory location are compared only with the unexecuted stores which precede, in the program sequence, the reference to the memory location.

The comparison is facilitated if all references to the memories are made in a sequential fashion. (Sequential as used here means, no two memory references are made at the same time.) If the references are not made in a sequential fashion, a further logical breakdown by memory may be necessary.

Assuming the sequential references, the following describes a comparison scheme. Since the temporary high speed storage will have to have an address register or its equivalent associated with it, a comparison can be made by transmitting, only the ones of the address being sent to the memory address register, to all the address registers associated with the temporary storage registers, where they complement the respective bits of the addresses associated with the temporary address registers. Each of these registers can be tested for comparison with the original address by testing for all zeros. The addresses can be restored by again complementing the registers with the one bits of the original memory address.

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