

6889
Memorandum M-1397

Page 1 of 2

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Computer Digital Laboratory
Massachusetts Institute of Technology
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SUBJECT: WHIRLWIND II MEETING OF FEBRUARY 1, 1952
To: Whirlwind II Planning Group
From: Norman H. Taylor
Date: February 6, 1952

Abstract: This note abstracts the discussion of the meeting attended by the following engineers. It is intended to provide a record to trace the evolution of the WWII System.

- | | |
|---------------|------------|
| C. Adams | W. Hosier |
| D. Brown | J. Jacobs |
| R. Everett | R. Jeffrey |
| H. Fahnestock | W. Linvill |
| J. Forrester | R. Mayer |
| H. Grosch | W. Papian |
| | R. Wieser |

CLASSIFICATION CHANGED TO:
Auth: DD 254
By: R.R. Everett
Date: 2-1-60

This was the first in a group of meetings which are being held to stimulate ideas in development of a new Computer which will be used as a part of the Air Defense Program. For the first few meetings it has been suggested that no specific topic be discussed, but general comments of the group be recorded in an effort to let each express himself as to what a second Whirlwind Computer should be like.

The discussion was opened by Mr. Forrester with a few comments which stressed the importance of striving toward simplicity in a future machine. It was pointed out that the idea of a single register computer, as discussed in Memorandum M-1319, SECOND MEETING ON AIR DEFENSE COMPUTER, November 6, 1951, would be a good starting place for the logical design of a system. Additional registers, which may be added during the logical design period, should be evaluated on the increased efficiency which they provide and some balance arrived at between the number of registers used, the speed of the computer, and the complexity.

A brief discussion of an idea which has been suggested by R. Mayer concerning the control section of a computer followed. This idea suggests the use of Iron Cores as the connecting links in a Control Matrix. The Iron Cores can be considered to make a connection at the intersection of the Matrix if magnetized in one direction or break the connection if magnetized in the opposite direction. Such an arrangement suggests the possibility of connecting the Control Orders of the machine by writing a program.

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6889

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Page 2 of 2

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Mr. Adams brought out the desirability of variable length orders and the resultant simplicity in writing sub-routines if such orders as square root or coordinate conversion could be an integral part of the order code. It was decided that such matters should probably be deferred until more experience with the defence problem was available and the evaluation of such orders could be made in the light of the problem to be solved.

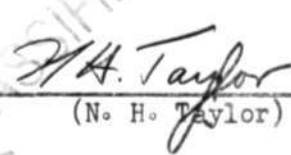
The discussion then turned to the In-Out or Terminal Equipment. Mr. Wieser pointed out that the present In-Out Equipment is very slow compared to the Whirlwind I speeds and the need for a speed change is a very limiting factor in the type of circuitry one can use in the Terminal Equipment. A brief discussion followed concerning the feasibility of using Iron Cores as a means of doing this Terminal Equipment job and their relative value as compared with the Magnetic Drum. There is little doubt that this discussion will come up continually throughout the evolution of Whirlwind II. There is considerable difference of opinion as to how important the Terminal Equipment will be in determining the nature of the new system. The main difference of opinion concerns the timing of such a decision. The Cape Cod Experiment will have to progress considerably farther than it has in order to provide the necessary data which will allow an intelligent decision to be made on this point, and some feel that present data is so meager that effective study is impossible.

The control portion of this Computer is of course one of the largest problems that we have to face. There seems to be unanimous opinion that a centralized control system should be used, as opposed to the de-centralized control of the Whirlwind I system which has an Electrostatic Control, an In-Out Control, an Arithmetic Control, and a Magnetic Drum Control.

Mr. Forrester pointed out that a few high power vacuum tubes injecting the energy into a large group of passive circuits such as Iron Cores and Crystal Diodes may be a much more attractive way of engineering a system than the present method of having a large number of small active elements, each capable of generating its own power. Considerable discussion on the advisability of this approach indicated that it may be necessary to think in terms of overall systems performance to take advantage of some of the inherent simplicities in the method. If one uses the building block technique such as the gate-tube and flip-flop circuits, it is possible to proceed with the design of one portion of a system without consideration of what lies ahead because of the complete flexibility and versatility of the building block. When dealing with the passive elements such as Iron Cores or Crystal Diodes, it may be necessary to consider the overall job to be done before one can decide on just how to use the individual components.

It was decided at the close of the meeting that even though the discussion had been rather rambling and that no decisions had been made, this type of approach to the problem was probably the best at this stage, and for the next few weeks at least, we should continue in this vein.

NHT:rdf



(N. H. Taylor)~~CONFIDENTIAL~~