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Memorandum M-2455

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Date: 1-1-60

Division 6 - Lincoln Laboratory
Massachusetts Institute of Technology
Cambridge 39, Massachusetts

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SUBJECT: Summary of MIT--IBM Collaboration, Sept. 11 thru Sept. 30, 1953
To: J. W. Forrester, R. R. Everett, J. C. Proctor, C. R. Wieser,
N. H. Taylor, D. R. Brown, S. H. Dodd, P. Youtz
From: A. P. Kromer
Date: October 13, 1953

Abstract: Concurrence on basic circuits for the arithmetic element, magnetic core memory layout, drum logic and phone line specifications were reached during the period. Work is continuing on development of the display system, equipment cooling and output system.

Engineering Visits

IBM people working on the project spent approximately 96 mandays in Cambridge, while MIT people spent a total of approximately 103 mandays at IBM High Street, Poughkeepsie.

Exchange of Publications

During the period we have forwarded to IBM 36 M-Notes and 1 E-Note, plus miscellaneous drawings and standards book sheets.

We have received from IBM 35 H-Notes, 3 IM-Notes, 1 TR-Report and 2 Biweekly Reports.

General Comments

Design work on the plug-in unit led to the construction of a model which was generally regarded to be adequate insofar as rigidity is concerned. About this time, however, considerations regarding the equipment cooling problem led to the conclusion that air must be introduced around each vacuum tube if the desired bulb temperature is to be maintained. Thus, additional design work on the plug-in unit became necessary. This was underway as of the end of the month. The plug-in unit design now contemplates the use of etched wire cards for all of the circuits to be housed in these units.

Development on basic circuits has continued, and agreement has been reached between the circuits group and the systems group at both locations for the following basic circuits: Flip-flop, Model A and Model C; Gate tube circuit; Pulse amplifier, Model A and Model B; Register driver, Model A and Model B.

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General Comments (Continued)

Group 62 and IBM engineers attended a meeting with representatives from other sections of Lincoln and A.T.&T. Company to discuss specifications for the telephone lines to be used for data transmission in connection with the Transition System.

Preliminary considerations of the circuits contemplated for the video mapper and input line counters indicate them to be generally satisfactory for use in AN/FSQ-7. IBM has placed a subcontract with Bendix Corporation, and engineers from this latter company are now resident at High Street working with that group in connection with development and design of video mappers.

Joint study of the logic and circuits to be used in the several drum systems has led to agreement on output switching logic for these units. The drum which IBM is to furnish to MIT to be tied in with the MTC computer will be shipped early next month. In order to be familiar with the circuitry involved, a Group 62 engineer has been resident at Poughkeepsie for an extended period of time.

In connection with memory development, an agreement has been reached between the MIT and IBM groups regarding packaging for the digit planes, general layout of the memory equipment, memory timing, circuit details, selection system arrangement, etc.

Considerable attention has been given to the matter of outputs of the system during the month. Study started on ground-to-air and ground-to-ground communication problems, along with study of the requirements for guidance for the various weapons (both manned and unmanned) that will be under command of the FSQ-7 System.

Study and development work in connection with the display system has continued with activity regarding the possible use of the Charactron tube being carried forward at MIT, and development of an electronic character generator using cores being carried forward at IBM. The decision regarding the choice of one of these two methods of display will be made about Nov. 1. Work during the month has led to consideration on the question of high voltage power supplies for the display scopes, the use of analog vs. digital methods to achieve expanded displays, etc.

A joint visit of IBM and MIT people was made to the west coast facilities which are presently manufacturing Charactron tubes in order to evaluate status of development and the availability of this component.

Representatives from Group 61 have joined in the activity of display system development in connection with both track situation and DID displays. IBM has decided to have the display scope console development work done under a group at their Vestal Laboratory in order to relieve the manpower problem at Poughkeepsie. The centralized portion of the display system will still remain at High Street, however.

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General Comments (Continued)

Activity in connection with detail planning for the equipment cooling to be built into the various electronic units is underway. Early considerations led to design changes in the plug-in unit as mentioned above. Study of the need of the equipment cooling system indicated that a serious problem exists with regard to fitting the XD-1 model into the Basement of Building A at Lexington. It is now evident that considerable additional floor space (in other buildings, or an added building) will be required to house the equipment contemplated for XD-1. Even so, this prototype system will have a considerably reduced operational capacity in comparison with the proposed production system for a typical Combat Information Central.

The previously established arrangement for subcommittees and a central standards committee to determine the materials, processes and component parts to be used in the prototype models has been streamlined in order to prepare purchase specifications for electronic components more rapidly. IBM has started to collect information to lead to the determination of the quantity of parts of each type that will be required. Upon completion of both of these items, their purchasing organization will undertake actual purchase negotiations with manufacturers.

To improve the coordination of engineering activities at both locations, a systems office has been set up here and at IBM. These groups have agreed on a procedure for setting three levels of grades for drawings. The three levels represent a) preliminary status, b) concurrence between the two engineering organizations, and c) final authorization and release for use in construction of the model.

Cost estimates for the completion of the prototype development and construction program were prepared by IBM and reviewed with Air Force representatives.

The number of IBM persons of staff level working on the project as of the end of the period was approximately 180, with additional administrative and non-professional persons supporting this group.

Signed:


A. P. Kromer

Approved:


N. H. Taylor

APK/mmt

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