Memorandum 6M-3142

Division 6 - Lincoln Laboratory
Massachusetts Institute of Technology
Lexington 73, Massachusetts

SUBJECT: SUMMARY OF MIT-IBM ENGINEERING COLLABORATION FOR THE PERIOD SEPTEMBER 1 through OCTOBER 31, 1954

To: J.W. Forrester, R.R. Everett, J.C. Proctor, C.R. Wieser, N.H. Taylor, D.R. Brown, S.H. Dodd and P. Youtz

From: A. P. Kromer

Date: November 4, 1954

Approved: N H Taylor
N. H. Taylor

Abstract: Engineering activity level has increased with acceleration of planning and design for the production systems. Specifications for the prototype system (Exhibit AFCRC-1) has been brought up to date. Miscellaneous Radar Inputs specifications are nearing completion. A new design of maintenance console is being prepared for the production machine. Layout of the Direction Center Building has been agreed upon. A system for transmission of digital data via telephone lines has resulted from a series of joint conferences of the interested parties.

1. Engineering Visits

During this period a total of 211 man days were spent at IBM locations by MIT-Lincoln personnel. This is in addition to MIT personnel stationed full-time at Poughkeepsie in connection with the testing of the XD-1 System.

A total of 54 man days were spent at MIT-Lincoln by IBM personnel during the period. This is in addition to the full-time representatives who are stationed at Lincoln in connection with the installation work for XD-1 and liaison activity in connection with a prototype and production system.

2. Exchange of Publications

During this time approximately 101 M-Notes, 1 R-Report and 1 drawing were sent to IBM.

We have received from IBM 2 PM-Reports, 6 H-Reports, 6 IM-Reports, 6 TR-Reports, 5 PBW-Reports, 3 CRR-Bulletins and 35 other miscellaneous reports.

The research reported in this document was supported jointly by the Department of the Army, the Department of the Navy, and the Department of the Air Force under Air Force Contract No. AF 19(122)-458.

3. General Comments

With engineering activity continuing on the prototype program the level of activity associated with the production systems has been considerably increased during the period.

The following items are concerned with the prototype systems:

A. The equipment list for the prototype XD-1 and XD-2 systems was reviewed and brought up to date in accord with the latest engineering planning. This has been issued as IBM's report IM-67-2. Joint consideration was given to Amendments 3 and 4 to the Exhibit AFCRC-1 (System Specification) and to a Revision #1 to this Exhibit which will incorporate all four amendments plus other items to reflect the current status of the engineering design. A report covering the joint considerations of Revision #1 to the AFCRC Exhibit will be forwarded to CRC early next month. After their endorsement this will then serve as a basis for negotiation of a contract change on scope of work and costs between IBM, the Air Force and the Air Material Command organization and for extension of the contract to cover an additional 5 systems.

B. Manufacture of the equipment which will make up the XD-1 system is continuing and combined frame testing at Poughkeepsie, Plant 2, is well under way. Most of the central machine, less the memory, has reached the combined frame testing stage. Results to-date have been encouraging. Detailed planning has been started for the systems test period following the delivery of the XD-1 equipment to Lexington. The Group 62 Systems Office is coordinating this activity.

C. Study concerning the logical design for Miscellaneous Radar Inputs portion of the machine and for the masker units to be associated with the heavy radars has progressed. Specifications are about to be finalized. These will then serve as a basis for detailed design by IBM and subsequent manufacture. The question of construction and delivery of this equipment has not been fully resolved.

D. Study of the external communication circuits for tactical purposes and the internal communications systems for both tactical and maintenance purposes has proceeded with IBM and Bell system personnel participating. This will lead to preparation of specifications which Lincoln can issue to the New England Telephone and Telegraph Company from whom the equipment and circuits will be rented.

E. The basic circuits groups are continuing their joint work in the development and release of circuits for the prototype system.

The following activities are associated with the production systems:

A. IBM and MIT engineering planning groups are continuing meetings which lead to concurrence on specifications for design of various portions of the machine. This work includes selection of portions of the machine from the prototype systems and specifying the necessary modifications to reflect the duplex mode of operation and other conditions found to be desirable. During the period, the initial Technical Information Releases (TIR) for equipment specifications were processed by the PCO. These covered the arithmetic element, the programming code and the relay and master clock. Additional TIRs will be issued to release specifications which have been concurred on by the engineering planning groups.

B. Joint agreement was reached to undertake redesign of the maintenance console for the production system (duplex). The use of two consoles of the type originally designed for the prototype system did not provide a satisfactory operational condition. This work has been started at IBM.

C. At the request of the Air Force Installations and Construction people, study of the layout for the Direction Center Building for production systems was undertaken and a revised layout has been agreed upon and furnished to WE Co. for use as a basis of design by the architectural engineering organization. This revised layout represents the combined requirements of IBM from an equipment and maintenance standpoint and MIT and the Air Defense Command from an operational viewpoint.

D. Agreement has been reached by all interested parties concerning a standardizing on a system for transmission of digital data over telephone lines. This agreement includes provision of DDR and DDT units by the phone company as termination equipment for digital data circuits. Since portions of the input ouput frame equipment as presently designed by IBM are not compatible with this agreed upon system, IBM will provide necessary adapter units until such time that the in-out frames can be modified so as to match the DDR and DDTs.

In addition to the above activities which is pointed directly toward the XD-1 prototype and/or the production systems, general engineering activity in connection with research work on magnetic core materials and other electronic activities under way in the IBM laboratories have been reviewed by interested MIT personnel.

Signed A. P. Kromer

APK:mo

Distribution:
J. F. Jacobs
B. E. Morriss