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Memorandum M-2679

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Auth: DD 254  
By: R. R. Everett  
Date: 2-15-60

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

SUBJECT: SUMMARY OF MIT-IBM COLLABORATION ON DESIGN OF AN/FSQ-7 (XD-1)  
COMBAT INFORMATION CENTRAL, JANUARY 1 THRU JANUARY 31, 1954

To: J. W. Forrester, R. R. Everett, J. C. Proctor, C. R. Wieser,  
N. H. Taylor, D. R. Brown, S. H. Dood, P. Korte

From: A. P. Kromer

Date: February 9, 1954

Abstract: Engineering development work has continued on all aspects of the system with emphasis on display and drum circuitry. IBM requested Lincoln to undertake output digital data transmission equipment development. Design specifications for the instruction control frame were approved and released to IBM. Proposed letter contract for initial two duplex centrals was presented to IBM by AMC.

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Engineering Visits

During the month, IBM people working on the project spent approximately 29 man days at Cambridge, while MIT people spent approximately 108 man days at IBM, Poughkeepsie.

Exchange of Publications

During this period we forwarded to IBM 34 M-Notes and other miscellaneous memoranda and drawings.

We have received from IBM 6 H-Notes, 3 CRR Bulletins, 1 Trip Report, 2 Biweekly Reports, 2 Progress Reports and 10 Miscellaneous Reports.

General Comments

The two laboratory groups have participated jointly in engineering work during the month covering the power supply system, including a distribution system throughout the central; preparation of a proposal for specifications for the equipment cooling system; circuits and logic for memory; magnetic core procurement and testing; program order codes; display generation and distribution systems; cathode ray display presentation; circuits; work programming; approval procedures and other aspects of the engineering development. More details regarding these and other

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General Comments (Continued)

phases of the engineering activity are covered in Division 6 report M-2676 which was issued during the month.

Considerable effort was devoted to development of a suitable means for switching the read-write circuits of the magnetic drums and thus provide for their use on a time shared basis. Development of a magnetic switch is being carried forward at IBM and development of a diode switch is being carried forward at MIT. It is expected that early in February a decision will be made selecting one of these two alternative methods at which time concentrated attention will be devoted to the selected method in preference to the other.

IBM have indicated that they do not feel qualified to undertake the development of suitable transmission equipment (modulators and demodulators) for output data and have requested that Lincoln perform this work or arrange to have it done by someone other than IBM. Work has started in Division 2 of Lincoln on development of this item.

More detailed consideration of the effect of the duplex central concept on the already completed engineering work for the AN/FSQ-7 has led to the conclusion that the XD-1 system will contain only those features of the duplex central systems which can be included without effecting any delay in the scheduled completion of engineering and construction of the XD-1. Additional features are those involved in having two computers operating in parallel or switching between them.

Formal approval and release was given to IBM by Lincoln Laboratory for specifications on the instruction control frame of the central machine. In addition, formal approval covering a revised equipment list for the FSQ-7 (XD-1 and XD-2) and a revised description of the system was given to IBM during the month.

Preparatory work towards a contract for the first two production duplex centrals was also carried on, including preparation of a revised budget estimate based on the duplex central concept. This estimate was prepared in collaboration with Project ADES and ADC representatives. Preliminary estimates of the production costs were received from the IBM manufacturing organization. On January 22, Air Material Command presented a letter of contract to IBM covering two duplex AN/FSQ-7 centrals. This is being considered at IBM now and it is expected that the contract will be accepted and signed early in February.

Signed: *A. P. Kromer*  
A. P. Kromer

Approved: *N. H. Taylor*  
N. H. Taylor

APK:hpm

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