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Memorandum M-2558

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Division 6 - Lincoln Laboratory  
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By: L. B. Everett  
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SUBJECT: BIWEEKLY PROGRESS REPORT FOR AN/ESQ-7 December 17, 1958  
To: J. W. Forrester, R. R. Everett, Division 6 Group Leaders  
From: A. P. Kromer, P. J. Gray

General

Although it has been generally agreed the production systems will consist of a duplex center (two computers with a single set of input and output equipment), it appears undesirable to incorporate this change into the prototype XD-1 and XD-2 systems. The change is one which primarily involves the facilities for switching from the computer to the output and display equipment. However, final decision has not been made on this point pending a few days of further study of the design time required, and its effect on the release of XD-1. This change may well be made between the time the prototype drawings are prepared by Project High and the time that they are released to the manufacturing organization for use in the construction of subsequent production machines. The manner of incorporating such engineering changes, and the availability of manpower to do the work is being considered by IBM.

Arithmetic Element and Control

The arithmetic element will be released from engineering to the construction organization in the very near future. At present work is being completed to incorporate the change involving the use of a medium power cathode follower circuit based on the 7AK7 tube. This change will result in a saving of approximately 1100 cathodes as compared to using the 5965 type tube in a cathode follower circuit.

Information has been passed to IBM that timing diagrams for the central machine, except the in--out class, can be considered to have reached the concurrence stage insofar as the MIT Systems Office is concerned.

Memory

The latest scheduling at IBM indicates that the completion of testing of cores for the first bank of memory for XD-1 will be February 15 instead of January 1 as previously planned.

Work is continuing on the development of a sensing amplifier using the type 6072 tube in the first stage in place of the 5965 tube to take care of the problem of microphonics.

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Drums

It has been decided that all rotating drum units, except perhaps the input buffer drum, will be housed in a single frame. Associated frames will contain the electronic equipment with the necessary electronic switching to permit time sharing of a large portion of the circuitry. This arrangement is estimated to save approximately 8,000 cathodes as compared to having six completely independent drums, each with its associated electronics.

Depending on the amount of storage capacity for incoming data determined necessary, a seventh drum may be added to the system. It will share electronics in the manner indicated above.

Memorandum M-2525 has been issued providing a proposal for output buffer drum specifications. In brief, this proposal provides for random access on the output side of the drum, one word slots and three fields of capacity.

Display

Work is being carried forward to prepare a tube which will have an additional set of electrostatic plates so as to try to combine the advantages of a dual deflection tube and the Charactron. It will be several weeks before much additional information regarding the value of this work will be available.

The IBM Vestal group is constructing a mockup of a display console having a round 19" tube. This unit will be available for study at MIT on Monday, December 7.

Recent meetings at the Vestal Laboratory led to discussions concerning circuits involved with digital transmission data, digital expansion schemes, magnetic deflection amplifier and power supplies. Further details on these discussions will be available as Memorandum M-2534.

Outputs

A series of biweekly meetings will be held for discussion of the design parameters and requirements for the various devices which will place output information on the phone lines. These will probably extend through February.

Power Equipment

The question of providing power at 120-208V during the initial installation and operation period of XD-1, in case M-G sets are not delivered on schedule, has been investigated further, and it has been determined that Division 7 of Lincoln has transformers which will step down 4160V to 120V. The cost of installing these temporarily is estimated to be considerably less than the cost of having taps put on the large

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Power Equipment (Continued)

transformers now on order from Westinghouse. Since this appears to be a desirable arrangement, steps are being taken to have the present purchase order for transformers changed to call for a secondary voltage of 480-277V instead of 208-120V. This is expected to save about 30% of the initial cost of the transformers.

In view of this, it will be necessary to have the order issued by IBM for motor generator sets changed to specify motors operating at the higher voltage. This change which is now in process should effect a saving of approximately \$6,000 on each of the three M-G sets for XD-1.

In the interest of reducing the cost of the power equipment, it has been decided not to have the M-G sets operate in parallel. The reduction in the switching gear as a result of this will provide a saving of at least \$20,000, based on present estimates.

Signed: *A. P. Kromer*  
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Signed: *E. J. Gray*  
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Approved: *N. H. Taylor*  
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