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

SUBJECT: Group 62 Section Leaders Meeting -- December 14, 1953

To: Division 6 Group Leaders; Group 62 Staff Members

From: A. P. Kromer

Abstract: SDV demodulator circuitry has been reviewed and accepted. Phone line transmission characteristics are being determined in conjunction with Bell Laboratories Project ADES personnel. Simplification of equipment to handle inputs having a relatively slow data rate is under study. Coordination of output system and equipment development is to be done by a joint IBM--Div. 6--Div. 2 committee. Formalizing of the release for design completion and for construction of the two prototype systems is to be outlined in M-2575. Operational aspects of the display equipment for both Direction Center and Combat Center are being considered jointly by Lincoln, ADES and ADC.

1. SDV Equipment

Taylor indicated that in conversation with Mr. K. E. Gould of Bell Telephone Laboratories he had been advised that BTL would furnish a report covering the characteristics of transmission circuits for use in connection with SDV data transmission. This report will be available about January 1. The study made by Bell Laboratories indicated, however, that very little if any data existed in their organization regarding delay characteristics of various lines and transmission systems. It would therefore be necessary for them to make some field measurements in order to obtain information on this item. They plan to set up several men to take these measurements as early as possible. Due to the fact that some decisions regarding development of SDV must be made prior to the time that BTL can complete these measurements, Taylor requested Bell Laboratories to consider setting up a resident respresentative to be available here for consultation by people from Division 6, Division 2 and IBM. Mr. Gould indicated he would look into this matter, and felt confident that a man could spend most, if not all, of his time here so as to be available for this work.

Circuits and other developments completed at IBM for the SDV demodulators were reviewed by representatives of Division 2 and Division 6. Ed Rich is to furnish his comments after consideration of the data presented, and it is expected that, based on his comments, Division 6 will be able to sign off on the design specifications for the SDV demodulator.

2. Input

At the joint meeting between IBM and MIT last week, a change in philosophy regarding inputs to the system was evolved. In order to reduce the number of vacuum tubes, consideration is being given to having some of the input material which comes in at a slow rate handled on 128 toggle-switch registers instead of having this data go on to the input buffer drum. Significant saving in electronics seems possible at a very small expense of program time. This question is being studied further, and will be considered later this week for decision.

3. Display

Considerations on the display system development have led to a new arrangement of overlap format for expansion of the tactical display picture. Display selection switching at a main frame instead of in each console is currently being considered, since it is felt that some saving in equipment and use of more reliable types of switching apparatus may be possible in this medium.

A Charactron tube has been modified to incorporate a second pair of electrostatic plates to provide compensation for deflection. The preliminary operations indicate this to hold considerable promise and it may offer a saving in the time required for deflection and display of all of the various characters desired. It may also permit the same matrix to be used in both the DID and the tactical display tubes. The saving in time mentioned above may permit a reduction in the 2.9 second display cycle presently required for display of 17 characters, a point and a vector.

Preliminary operation of the Typotron tube, which is a combination of the Hughes direct view storage surface and the Charactron matrix, looks very promising for possible DID application. Circuitry to tie this tube into the MTC computer will be developed by Herb Platt. It is expected that this tube will be available for operation with MTC in about one month. An additional quantity of these tubes are to be ordered and placed on life test by Group 65.

VonBuelow was asked to prepare a summary report covering the display system design specifications so that this might be circulated for comments and approval, and thus provide a freeze on the design of this portion of the system.

4. MTC

A revised and complete programming manual for the MTC computer is now available in the Whittemore Library.

5. Equipment Application

A series of discussions were held with representatives of ADC, Project ADES, Group 61, Group 62 and Division 2 concerning the operational makeup of a Combat Center and a Direction Center. Further study will be given to this matter, but the initial discussions indicated that the thinking of Group 61 is generally in accord with the Air Force and will provide a good basis for initial planning.

The question of operational cross-telling, that is, passing of information between Direction Centers, and transfer of data from Direction Centers to a Combat Center will require considerable additional discussion. It is planned to arrange a meeting with representatives from IBM, MIT to discuss this matter and prepare a proposal for submission to the Air Force.

6. Outputs

Jacobs indicated that it is planned to have Division 2 and IBM set up a program covering the development of equipment, that is, modulator--demodulator combination for transmitting output data from the FSQ-7 Central. This group will work under the general guidance of the output committee mentioned below. In addition, it is desirable to have Ed Rich serve as the Division 6 consultant in connection with this work.

In order to coordinate and direct the activity on various phases of output system during the next six months it is planned to set up a working group with representatives of IBM Project High, Division 6 and Division 2. This group will consist of Messrs. Ross, Cypser and four others from IBM Project High, Messrs. Jeffrey, Hopkins, Aronson and Rising from Group 62, Messrs. Arnow and Morriss from Group 61, and Messrs. Rosen and Sebring from Division 2.

Jack Harrington presented a proposal which is presently being circulated for comment covering the output capacity to be provided for the various weapons which will be under guidance by the FSQ-7. Return of comments to Jack Jacobs in the Systems Office as promptly as possible is desired.

7. Design and Construction Release Procedure

In an effort to formalize further the release for design and/or construction of (XD-1), the Systems Office is working with the Project High Engineering Design Office to prepare a procedure which will cover the steps to be undertaken in connection with concurrence between these two offices for completion of engineering work, as well as the procedure for MIT Lincoln sign-off on the release for completion of design, as well as an additional release for actual construction for the prototypes. Jacobs will issue these procedures in M-2575.

7. Design and Construction Release Procedure (Continued)

The matter of subsequent release for manufacture of production systems is still to be investigated and a suitable control procedure developed.

8. Power Equipment

As previously indicated, action is being taken to simplify the planned system, and to have the power transformers and the motor generator sets operate independently with manual switching between them. Further study has indicated that this will reduce the physical size of the control equipment by approximately one-half. The cost of the equipment will be correspondingly reduced. IBM now plans to design and build the control and sequencing equipment for the various D.C. voltages. They will procure the D.C. supplies from General Electric Company. These supplies will have magnetic amplifiers.

9. Memory

The first 64 x 64 plane of a new memory for MTC will be placed into the array tester and power put on it this week. Papian feels that the entire memory will be assembled in the test equipment with power on it by the end of the following week.

10. Logical Design

Ron Mayer advised that IBM have forwarded a large number of drawings concerning the instruction frame to MIT for review and indication of concurrence. This work is currently going on.

Additional studies regarding the application of the light cannon indicates a majority of people favor System 1 of the proposal issued about 10 days ago. System 5 is considered as a second best choice.

11. Basic Circuits

Taylor requested the basic circuits group to undertake work on Thyrotron circuitry since the application of this type of tube to the input system seems to offer considerable promise to provide a reduction in the number of vacuum tubes and the simplification of the logic of the system. Experience in operation of the Thyrotron in WWI under certain conditions indicates them to have a very satisfactory and reliable life but care must be exercised that the circuit applications are carefully tailored to suit the conditions which provide this long life. Best indicated

11. Basic Circuits (Continued)

that some work in connection with this type circuitry had been going on at IBM, he would look into the matter in detail, and, if necessary, accelerate the program.

Signed: A P Kromer
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