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Memorandum M-2518

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

SUBJECT: GROUP 62 SECTION LEADERS MEETING -- November 9, 1953
To: Division 6 Group Leaders; Group 62 Staff Members
From: P. J. Gray
Abstract: Considerable attention was given to a review of the power equipment. The Charactron display system has been selected for AN/FSQ-7. The schedule for the MTC construction work is outlined.

1. Input-Output

Jacobs indicated that Hawley Rising is starting a study of phone line loading devices. Some results are expected in about one month. The purpose of the study is the loading from the output buffer drum through shift registers to output phone lines.

Consideration is being given to the use of a two dimensional magnetic core array as temporary storage for the signals from light guns until they can be accepted by the input drum. A study of the input system was recommended to see if this device could be used in other places where a matching of high speed inputs to the slower speed of the drum is needed.

2. Power

Gano presented a review of activity to date in power equipment for XD-1. The use of 120--208 volts on both sides of the motor-generator sets has recently been under fire by several people, so a discussion of this question followed. With regard to the voltage on the input side of the M-G sets, Gano pointed out that 120--208 volts was originally selected so that M-G sets could easily be by-passed in the event of failure or intentional damage. This is because 120--208 volts were to be used in the computer and the M-G sets merely act as a buffer on the line. However, it is estimated that the use of 277--480 volts on the motor side might permit savings of \$15,000--\$20,000 or higher. On the generator side, the savings would be smaller and the safety hazard involved in distributing high voltages through relays, etc., is not particularly enticing.

It was the group opinion that the higher voltage should be used only on the input side of the M-G sets. To provide for possible by-pass of the M-G sets, the transformers which reduce the incoming 4,160 volts can be tapped for both 120--208 and 277--480. Then in the event of failure of two M-G sets, the wiring could be changed over to the 120--208

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taps to provide power directly. This would also provide 277--480 directly from the transformers for use in air conditioning blowers and lighting.

The contract with General Electric for the d-c supplies is expected to be signed in about one week.

The question of cycling voltages when the computer is turned on or off was discussed briefly. The general concensus of the group was that the voltages should be turned on in two groups -- the bias voltages first and then the remaining voltages. This will be discussed later this week.

Dodd and several others expressed misgivings about the proposal for operating the transformers, M-G sets, and d-c supplies in parallel. Several possible difficulties present themselves in this method of operation, which is proposed to provide no interruption in service in the event of failure of one of the units. Perhaps we are buying more trouble in critical adjustments than would be involved if spare supplies were manually switched onto the line in event of failure. Dodd will discuss this further at IBM this week.

Gano outlined the order schedule for the power equipment which is as follows:

<u>Item</u>	<u>Vendor</u>	<u>Delivery</u>
Transformers (500 KVA)	Westinghouse	May
M-G Sets (200 KW)	General Electric	January (XD-2)
		April (XD-1)
Power Switchgear	Westinghouse	Feb. 15 (XD-2)
		April (XD-1)
D-C Supplies	General Electric	Feb-Mar. (XD-2)
		July 1 (XD-1)

The proposal to synchronize the computer timing with the drums to compensate for frequency variations was discussed. No completely satisfactory method for doing this has yet been devised. Mayer is to continue investigating this. Gano will furnish Mayer with an estimate of the frequency variation to be expected with diesel stand-by equipment.

3. Display

At a meeting at IBM last Friday it was decided that the Charactron display system under study at MIT would be used in AN/FSQ-7. Development of the IBM character generator will be continued as a precautionary measure. The main consideration in the decision was the quality of the characters, as the IBM system is somewhat faster.

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Display (Continued)

It was also decided that the central display system will be a combination of the systems designed at MIT and IBM.

VonBuelow pointed out that a decision is needed soon on the size and shape of the tube to be used.

Experiments are now underway with regard to providing an extra set of deflection plates to provide for electrostatic writing.

It is planned to have a group of Project High engineers come to MIT to study Cape Cod in considerable detail. Corderman will arrange this.

4. Memory

Six planes have been completed for the new MTC memory. An additional 7 or 8 are in process. The construction of the various panels is moving satisfactorily.

5. Magnetic Cores

The core testing program has been speeded up at IBM. The testing work is now being conducted on a two-shift basis. An additional 140,000 cores were received by IBM from General Ceramics. Testing at MIT has been slow recently due to frequent failure of the automatic core testers.

6. MTC

Anderson is working on circuitry for the MTC drum. It is expected that a working drum system will be installed by January 11. Boyd is working on amplifiers which should be ready for construction by the end of this month. Two people are working on switching circuitry --Bradspies using the diode approach and Hennegar using the core approach.

Installation of the core memory is scheduled for December 21, after two weeks of previous memory test. Power supplies are largely complete as of November 1 with additional work to be completed by November 30.

An automatic memory display will be provided which will display the contents of each digit plane. An attempt will be made to evaluate this type of display as a test medium.

The Ferranti tape reader will be tried out as it now exists, and a card reader will be installed in January as an input device.

All additional details connected with the current construction program will be cleaned up by March 1.

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MTC (Continued)

Five additional instructions have been added. These will be covered in the MTC Guide to Coding which is currently being rewritten by Bagley.

7. Drums

Taylor stated that drum design would be based on the assumption that small diameter drums will be used. If larger drums become available for later machines, the drum system can be redesigned. This will eliminate the necessity of providing for both drum sizes in the current design work.

It was indicated that the proposed drum field arrangement outlined in IBM Memorandum H-70 is gaining fairly wide acceptance.

A meeting will be held at MIT on November 18 to make a preliminary determination of specifications for the output buffer drum. A good representation is hoped for in order to get as many opinions as possible.

8. Basic Circuits

After a recent modification by IBM, the 5998 cathode follower circuit now has gain which makes it even more attractive for use in control. Its incorporation now seems fairly well assured.

A modification of the original read amplifier by using an input transformer has been worked out. This appears to allow considerable reduction in cathodes.

Hermetically sealed delay lines are now available with claimed 1% stability. This will be investigated.

Taylor indicated that a general review is in order of the basic circuits now completed. He requested that all pertinent information on margins, etc. be compiled.

Signed: 

F. J. Gray

PJG/mmt

CC: J. W. Forrester, R. R. Everett

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