Digital Computer Laboratory
Massachusetts Institute of Technology
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SUBJECT: BIWEEKLY REPORT, OCTOBER 18, 1954

To: Jay W. Forrester

From: Scientific and Engineering Computation Group

1. MATHEMATICS, CODING AND APPLICATIONS

1.1 Introduction

During the past two weeks 282 coded programs were run on the time allocated to the Scientific and Engineering Computation (S&EC) Group. These programs represent part of the work that has been carried on in 29 of the problems that have been accepted by the S&EC Group.

Five new problems (213, 214, 215, 216 and 220) were initiated during this period. Descriptions for each of these will be provided in later Progress Reports.

Thirty-two students were accepted for the two-week introductory coding course which started on Monday, October 18.

1.2 Programs and Computer Operation

Problem No.	Title	WWI Time
100	Comprehensive System of Service Routines	862 minutes
108 C.	An Interpretive Program	15 minutes
120 D.	The Aerothermopressor	137 minutes
122 B.	Coulomb Wave Functions	63 minutes
123 C.	Earth Resistivity Interpretation	107 minutes
126 C.	Data Reduction	112 minutes

131	Special Problems (Staff Training, etc.)	3 minutes
141	S&EC Subroutine Study	26 minutes
155 D.	Synoptic Climatology	341 minutes
162 C.	Determination of Phase Shifts from Experimental Cross Sections	3 minutes
166 C.	Construction and Testing of a Delta-Wing Flutter Model	11 minutes
167 D.	Products of Batch Distillations with Holdup	728 minutes
172 B.	Overlap Integrals of Molecular and Crystal Physics	23 minutes
180 B.	Crosscorrelation of Blast Furnace Input-Output Data	15 minutes
183 D.	Blast Response of Aircraft	412 minutes
184 D.	Scattering of Electrons from Hydrogen	476 minutes
193 C.	Eigenvalue Problem for Propagation of E.M. Waves	21 minutes
195 C.	Intestinal Motility	16 minutes
199 C.	Laminar Boundary Layer of a Steady, Compressible Flow in the Entrance Region of a Tube	44 minutes
200 C.	A Study of Recurrent Events	19 minutes
201 C.	Study of the Ammonia Molecule	12 minutes
203 C.	Response of a Five Story Frame Building Under Dynamic Loading	6 minutes
204 C.	Exchange Integrals Between Real Slater Orbitals	11 minutes
207 C.	Check for REAC	272 minutes
210 A.	Residue-Indices and Primitive Roots	19 minutes
211 C.	Servo Response to a Cosine Pulse	119 minutes
213 C.	Industrial Process Control Studies	38 minutes
214 A.	Interval Distribution	33 minutes
220 A.	Problem Arising from an Algebra	29 minutes

1.3 Computer Time Statistics

The following indicates the distribution of WWI time allocated to the S&EC Group.

Programs	66 hours, 10 minutes
Conversions	0 hours, 0 minutes
Magnetic Drum Test	55 minutes
Magnetic Tape Test	1 hour , 0 minutes
Scope Calibration	29 minutes
Test Storage Check	02 minutes
Demonstrations	03 minutes
Total Time Used	68 hours, 39 minutes
Total Time Assigned	72 hours, 50 minutes
Usable Time	94.3%
Number of Programs Run	282

2. COMPUTER ENGINEERING

2.1 WWI System Operation

(A.J.Roberts, L.L.Holmes)

Computer reliability was very good during this period. There were 12 interrupting incidents which occurred during applications time. Some of the important difficulties are listed below:

1. An intermittent cable caused failure to preset the program counter on startover. A wiring error resulted in the loss of intensification to the display scopes. These two difficulties accounted for almost half of the time lost during applications.

2. Multiple selection of variable voltage circuits resulted when the marginal-checking equipment was in the "PMC" mode and the release button was depressed. A design change is being made to prevent this from occurring.

3. As a result of several parity alarms in a single digit of core memory a cathode follower in the parity register and a digit plane driver were replaced.

4. The protective fuses for the "Y" write and "Y" read current lines for Bank A were found blown. One blew several days after the other. An intermittently shorting cable was found on the write line but no difficulty could be discovered on the read line. These circuits may have been overloaded at some time prior to the fuses blowing.

5. Considerable time was spent in determining the cause of a blown fuse when one of the equipment racks was turned off. The trouble was traced to the use of three filter circuits with one fixed-voltage switching relay. The relay could not break the inductive load fast enough.

6. Two transfer-check alarms occurred during this period. Their cause has not been determined.

1.22 Terminal Equipment

(A. M. Werlin, L.D.Healy)

Groups two and three of the buffer drum are now being checked regularly with the other auxiliary-storage groups for writing between the slots. The PMC program is being revised to check these new groups.

Test Programs

(D. A. Morrison)

Memo 6M-3058, "The Consolidated Test Program, T-3432," describing the operation of the combined test program, is now available. T-3432 is part of the daily marginal-checking procedure.