

Digital Computer Laboratory
Massachusetts Institute of Technology
Cambridge 39, Massachusetts

SUBJECT: BIWEEKLY REPORT, NOVEMBER 1, 1954

To: Jay W. Forrester

From: Scientific and Engineering Computation Group

1. MATHEMATICS, CODING AND APPLICATIONS

1.1 Introduction

During the past two weeks 278 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 27 of the problems that have been accepted by the S&EC Group.

A rate structure has been established for the WWI computer to become effective on November 15, 1954. From that day on, each user of the WWI computer will be required to provide either a purchase order or a credit allowance from Professor Morse's Committee on Machine Computation to cover the WWI machine time used. The rate structure is set forth in Memorandum DCL-20 which has been sent to all programmers and all project supervisors.

One new problem (217 A. Variation-Perturbation Determination of Atomic Wave Functions and Energies, Arnold Tubis, Morse Fellow) was initiated during this period. A description of this problem will appear in Summary Report No. 40.

1.2 Programs and Computer Operation

<u>Problem No.</u>	<u>Title</u>	<u>WWI Time</u>
100.	Comprehensive System of Service Routines	726 minutes
107 C.	(a) Autocorrelation and (b) Fourier Transform, Evaluate Integrals	21 minutes
108 C.	An Interpretive Program	51 minutes

120 D.	The Aerothermopressor	232 minutes
122 B.	Coulomb Wave Functions	75 minutes
123 C.	Earth Resistivity Interpretation	307 minutes
126 C.	Data Reduction	65 minutes
141.	S&EC Subroutine Study	50 minutes
155 D.	Synoptic Climatology	89 minutes
159 C.	Water Use in a Hydroelectric System	102 minutes
166 C.	Construction and Testing of a Delta-Wing Flutter Model	6 minutes
167 D.	Products of Batch Distillations with Holdup	164 minutes
172 B.	Overlap Integrals of Molecular and Crystal Physics	100 minutes
180 B.	Crosscorrelation of Blast Furnace Input-Output Data	11 minutes
183 D.	Blast Response of Aircraft	177 minutes
184 D.	Scattering of Electrons from Hydrogen	491 minutes
193 C.	Eigenvalue Problem for Propagation of E.M. Waves	10 minutes
195 C.	Intestinal Motility	17 minutes
199 C.	Laminar Boundary Layer of a Steady, Compressible Flow in the Entrance Region of a Tube	141 minutes
203 C.	Response of a Five Story Frame Building under Dynamic Loading	3 minutes
204 C.	Exchange Integrals Between Real Slater Orbitals	28 minutes
207 C.	Check for REAC	197 minutes
211 C.	Servo Response to a Cosine Pulse	68 minutes
212 C.	Dispersion Curves for Seismic Waves	14 minutes
213 D.	Industrial Process Control Studies	20 minutes
215	Plant Surveys (for control systems)	32 minutes

220 A. Problem Arising from an Algebra

58 minutes

1.3 Computer Time Statistics

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

Programs	54 hours, 15 minutes
Conversions	0 minutes
Magnetic Drum Test	44 minutes
Magnetic Tape Test	54 minutes
Scope Calibration	33 minutes
Test Storage Check	<u>18 minutes</u>
Total Time Used	56 hours, 44 minutes
Total Time Assigned	58 hours, 20 minutes
Usable Time	98.77%
Number of Programs Run	278

2. COMPUTER ENGINEERING

2.1 WWI System Operation

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

Computer reliability continues to be good. The number of assigned hours for application work increased during the past biweekly period. During assigned applications time there were 7 incidents of interruption with 9/10 of the resultant downtime caused by a failure in the air-conditioning system. The #1 compressor had a blown head gasket resulting in the loss of about 30 gallons of oil and 900 pounds of Freon. The cause of the blown head gasket hasn't been determined.

2.2 Terminal Equipment

2.21 Test Programs

(T.J.Sandy)

A program has been written to place the intervention-register marginal checking on the consolidated PMC tape. During the week of 25 October this program will be checked out and added to the consolidated PMC tape.

2.22 Buffer Drum

(A.M.Werlin)

Weak tubes in some of the buffer-drum-storage insertion-register digit mixer were found, as well as burnt components in the panel feeding digits 4 and 5. This has been corrected and should give greater buffer-drum system reliability.

2.23 Typewriter and Paper Tape

Since 1953 we have been using a special opaque perforator tape which met our requirements. Tape recently furnished by the same manufacturer on order DICF 72334 was of a different type and had to be returned because our punches could not perforate it. The manufacturer cannot duplicate our original order at this time but is rushing us a sample carton of tape which he claims will meet our requirements. If the sample rolls prove satisfactory, the balance of the order will be filled within a week. In the meantime, we are almost out of opaque tape.

3. RECENT LIBRARY ACQUISITIONS

The following books and documents have been recently acquired by the Barta Building Library, Room 111.

<u>No.</u>	<u>Title</u>	<u>Source</u>
B-285	Faster Than Thought	Edited by B.V.Bowden London, 1953
C-176	Ferranti Linear Programming Conference	ONR London July 26, 1954
C-177	Comparison of UNIVAC with IBM 701	NYU AEC Computing Facility Feb. 1954
C-178	Notes on the Special Course on Digital Computers	Univ. of Michigan August 1953
C-179	Timing for the IBM Electronic Data Processing Machines	IBM New York City July 1952
C-180	Preliminary Report on the Electronic Data Processing Machines	IBM New York City March 1952
C-181	Electronics Down to Earth	Reprint Harvard Business Review March-April 1954
C-182	GE and UNIVAC: Harnessing the High-Speed Computer	Reprint Harvard Business Review July-August 1954
C-183	EDSAC Library of Subroutines Vol I	Univ. Math. Lab. Cambridge, England
C-184	EDSAC Library of Subroutines Vol II	Univ. Math. Lab. Cambridge, England
C-185	Manual for the ORACLE	Oak Ridge Nat'l Lab. December 1953
C-186	Production Control Through Electronic Data Processing: A Case Study	R.G.Canning Univ. of California May 1, 1954
C-187	Speedcoding System for the Type 701	IBM Sept. 1953.
C-188	Simplified Programming Method for use with the CRC-107 Digital Electronic Computer	NAVAER No. DR-1661 August 1954

<u>No.</u>	<u>Title</u>	<u>Source</u>
C-189	Research Reviews	ONR September 1954
C-190	On Solving Linear Algebraic Systems	A.S. Householder Oak Ridge Nat'l Lab September 1954
D-43	Summary Technical Report on the Logical System Design of the DYSEAC	NBS Report 3459 May 1954
DCL-19	Biweekly Report, October 18, 1954	S&EC Group
DCL-20	Letter to Users of WWI-Charge for Time	J.D. Porter
DCL-21	WWI Computer - Notes for CS Course	A. Siegel
DCL-22	Utility Control Program (not published yet)	F.C. Helwig
DCL-23	CS II Instruction STOP (not published yet)	F.C. Helwig
DCL-24	Memo on S&EC Performance Request (not published yet)	F.C. Helwig
DCL-25	Director Tapes (not published yet)	F.C. Helwig
DCL-26	Laboratory Personnel November 1, 1954	S&EC Group
DCL-27	Biweekly Report, November 1, 1954	S&EC Group