

Digital Computer Laboratory  
Massachusetts Institute of Technology  
Cambridge 39, Massachusetts.

SUBJECT: BIWEEKLY REPORT, FEBRUARY 21, 1955

To: Jay W. Forrester

From: Scientific and Engineering Computation Group

MATHEMATICS, CODING AND APPLICATIONS

1.1 Introduction

During the past two weeks 564 coded programs were run on the time allocated to the Scientific and Engineering (S and EC) Group. These programs represent part of the work that has been done on 50 of the problems that have been accepted by the S and EC Group.

1.2 Programs and Computer Operation

<u>Problem No.</u>	<u>Title</u>	<u>WWI Time</u>
100	Comprehensive System of Service Routines	198.6 minutes
106 C.	MIT Seismic Project	84.4 minutes
122 B.	Coulomb Wave Functions	16.3 minutes
123 C.	Earth Resistivity Interpretation	94.2 minutes
126 C.	Data Reduction	460.6 minutes

30 C.	Six-component Distillation	16.0 minutes
131	Special Problems (Staff Training, etc.)	121.6 minutes
132 C.	N. C. Milling Machine	13.3 minutes
141	S and EC Subroutine Study	39.3 minutes
144 C.	Self-consistent Molecular Orbital	143.3 minutes
155 D.	Synoptic Climatology	160.0 minutes
167 D.	Batch Distillations with Holdup	68.5 minutes
172 B.	Overlap Integrals	119.9 minutes
180 B.	Crosscorrelation of Blast Furnace Data	47.9 minutes
194 B.	Augmented Plane Wave Method (Sodium)	107.2 minutes
195 C.	Intestinal Motility	23.1 minutes
199 C.	Compressible Flow in a Tube	90.6 minutes
203 C.	Response of a Building Under Dynamic Loading	9.7 minutes
204 C.	Exchange Integrals Between Real Slater Orbitals	126.6 minutes
212 C.	Dispersion Curves for Seismic Waves	46.3 minutes
217 A.	Atomic Wave Function and Energies	7.5 minutes
218 C.	Stage B for Diatomic Molecules	8.9 minutes
219	Linear Programming	9.8 minutes
223 C.	Investigation of Turbulent Flow	7.7 minutes
224 C.	Vertical Velocity Fields	124.8 minutes
225 B.	Neutron-Deuteron Scattering	58.2 minutes
228 A.	Evaluation of Difference Diffusion Equation	1.8 minutes
230 C.	Bridge Response to Blast Loads	1.0 minutes
231 C.	Reactor Runaway Prevention	105.3 minutes
233 C.	Utility Stock Prices	5.0 minutes
234 A.	Atomic Integrals	10.0 minutes
236 C.	Transient Response of Aircraft to Heating	26.5 minutes

238 B.	Self-consistent Calculation of Nuclear Density	244.2 minutes
239 C.	Guidance and Control	241.4 minutes
241 B.	Transients in Distillation Columns	31.0 minutes
242 A.	Counting Structures of Relations	4.6 minutes
244 C.	Data Reduction for X-1 Fire Control	25.0 minutes
246 B.	Scattering From Oxygen	4.9 minutes
247 C.	Surface Pressure Prediction	20.3 minutes
248 B.	Propane Vibrations	7.9 minutes
249 C.	Flight Interceptor Control	77.2 minutes
250.	Translation Program for the NCMM	27.8 minutes
251 B.	Packed Column Dynamics	29.8 minutes
252 C.	Analysis of Two Story Steel Frame Building	19.5 minutes
254 C.	Thermal Stresses in a Flat Slab	9.8 minutes
255 C.	Energy Transfer in Biological Substances	6.1 minutes
256.	WWI -1103 Translation Program	337.6 minutes
257.	Horizontal Stabilizer Analysis	1.6 minutes

### 1.3 Computer Time Statistics

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

Programs	55 hours, 21.0 minutes
Magnetic Drum Test	35.4 minutes
Magnetic Tape Test	57.0 minutes
Scope Calibration	11.5 minutes
PETR Test	6.1 minutes
Demonstrations (No. 131)	<u>2 hours, 1.6 minutes</u>
Total Time Used	59 hours, 12.6 minutes
Total Time Assigned	60 hours, 41.6 minutes
Usable Time, Percentage	97.6
Number of Programs	564