

Digital Computer Laboratory
Massachusetts Institute of Technology
Cambridge 39, Massachusetts

SUBJECT: BIWEEKLY REPORT, DECEMBER 26, 1955

To: Jay W. Forrester

From: Scientific and Engineering Computation Group

1. MATHEMATICS, CODING AND APPLICATIONS

1.1 Introduction

During the past two weeks 522 coded programs were run on the time allocated to the Scientific and Engineering (S&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&EC Group.

1.2 Programs and Computer Operation

<u>Problem No.</u>	<u>Title</u>	<u>Minutes</u>
100	Comprehensive System of Service Routines	293.4
101 N.	Optical Properties of Thin Metal Films	4.1
106 C.	MIT Seismic Project	135.5
126 D.	Data Reduction	101.5
131	Special Problems (Staff Training, etc.)	40.6
155 N.	Synoptic Climatology	132.7
172 B,N.	Energy Bands in Graphite	301.4
193 L.	E.V. Problem for Propagation of E.M.Waves	60.8
194 B,N.	Augmented Plane Wave Method (Sodium)	90.2
203 D,N.	Response of a Building Under Dynamic Loading	17.4
225 B,N.	Neutron-Deuteron Scattering	2.7
226 D.	Circulation of the Atmosphere	36.0
231 B,N.	Reactor Runaway Prevention	12.3
236 C.	Transient Response of Aircraft to Heating	10.6
241 B,N.	Transients in Distillation Columns	51.4
245 N.	Theory of Neutron Reactions	41.7

246 B ₂ N.	Scattering From Oxygen	20.0
253 N.	APW as Applied to Face- and Body-Centered Iron	178.9
257 C.	Horizontal Stabilizer Analysis	21.4
261 C.	Fourier Synthesis for Crystal Structures	127.3
262 N.	Evaluation of Two-center Molecular Integrals	31.0
264 C.	Optimization of Alternator Control System	28.5
266 A.	Calculations for the MIT Reactor	21.8
270 B.	Critical Mass Calculations	105.4
273 N.	Cosmic Ray Air Shower	3.3
274 N.	Multiple Scattering	37.3
275 B.	Buckling of Shallow Elastic Shells	50.3
278 N.	Energy Levels of Diatomic Hydrides LiH	2.8
285 N.	APW as Applied to Chromium Crystal	184.1
288 N.	Atomic Wave Functions	46.6
290 N.	Polarizability Effects in Atoms and Molecules	27.1
293 C.	Rolling Bearings	51.6
306 D.	Spectral Analysis of Atmospheric Data	4.6
309 B ₂ N.	Pure and Impure Potassium Chloride Crystal	29.2
312 L.	Error Analysis	186.8
317 C.	Stability Derivatives from Flight Test Data	6.0
318 C.	3D Aerodynamic Lead Pursuit Study	7.7
320 B ₂ N.	Moment of Inertia of a Spheroidal Nucleus	16.2
321 B ₂ N.	E.V. and E.F. for a Spheroidal Square Well	32.9
322 B.	The Maximum Bubble Size	29.5
323 N.	Analysis of Cloud Chamber Photographs	3.3
325 B.	Diffusion Equation	116.1
327 L.	Prediction Analysis	20.6
329 A.	First Approximation Solution on Ore Body	26.6
330 C.	Postfailure Response of Aircraft Structures Subjected to Blast Loading	1.0
331 D.	Matrix Iteration	18.1
332 C.	Game Theory Optimization	12.6
333 A.	Combustion Problem	74.4
334 C.	Parametric Study of Coupling and Damping	14.3
335 D.	Course 6.25, Fall 1955	32.1

1.3 Computer Time Statistics

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

Programs	47 hours, 41.1 minutes
Magnetic Drum Test	8.7 minutes
Magnetic Tape Test	58.8 minutes
Scope Calibration	13.7 minutes
FETR Test	19.8 minutes
Test Storage Check	8.4 minutes
Demonstrations (No. 131)	<u>40.6 minutes</u>
Total Time Logged	50 hours, 11.1 minutes
Inter-run Operations, etc.	16 hours, 18.6 minutes
Total Time Assigned	66 hours, 50.7 minutes
Usable Time, Percentage	99.47%
Number of Programs	522