Digital Computer Laboratory
Massachusetts Institute of Technology
Cambridge 39, Massachusetts

SUBJECT: BIWEEKLY REPORT APRIL 15, 1956

To: Jay W. Forrester

From: Scientific and Engineering Computation Group

1. MATHEMATICS, CODING AND APPLICATIONS

1.1 Introduction

During the past two weeks 506 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 61 of the problems that have been accepted by the S&EC Group.

1.2 Programs and Computer Operation

Problem No.	Title	Minutes
100	Comprehensive System of Service Routines	140.5
106 C.	MIT Seismic Project	32.3
122 N.	Coulomb Wave Functions	34.6
126 D.	Data Reduction	130.1
131	Special Problems (Staff Training, Demonstrations,etc)	17.6
141	S&EC Subroutine Study	4.0
172 B,N.	Energy Bands in Graphite	116.4
179 C.	Transient Temperature of a Box-Type Beam	93.3
193 L.	E.V. Problem for Propagation of Electromagnetic Waves	64.1
194 B,N.	Augmented Plane Wave Method (Sodium)	47.4
199 N.	Compressible Flow in a Tube	5.6
203 D,N.	Response of A Building under Dynamic Loading	15.5
204 N.	Exchange Integrals Between Real Slater Orbitals	10.6
216 C.	Ultrasonic Delay Lines	37.5
219	Linear Programming	29.0
231 B,N.	Reactor Runaway Prevention	25.9
241 B,N.	Transients in Distillation Columns	11.5
244 C.	Data Reduction for X-1 Fire Control	10.9
245 N.	Theory of Neutron Reactions	204.3
246 B,N.	Scattering From Oxygen	188.4
253 N.	APW as Applied to Face- and Body-Centered Iron	7.3

256 C.	WWI-ERA 1103 Translation Program	72.1
257 C.	Horizontal Stabilizer Analysis	119.4
260 N.	Energy Levels of Diatomic Hydrides	144.4
261 C.	Fourier Synthesis for Crystal Structures	15.8
262 N.	Evaluation of Two-center Molecular Integrals	19.9
264 C.	Optimization of Alternator Control System	12.3
266 A.	Calculations for the MIT Reactor	20.2
270 B.	Critical Mass Calculations	82.4
272 L.	General Raydist Solution	4.3
273 N.	Cosmic Ray Air Shower	16.8
278 N.	Energy Levels of Diatomic Hydrides LiH	8.0
288 N.	Atomic Wave Functions	111.0
290 N.	Polarizability Effects in Atoms and Molecules	176.0
293 C	Rolling Bearings	28.7
297 B.	Diffusion Boundary Layer	38.7
300 L.	Tropospheric Propagation	64.1
306 D.	Spectral Analysis of Atmospheric Data	64.2
309 B,N.	Pure and Impure Potassium Chloride Crystal	77.9
312 L.	Error Analysis	35.6
318 C.	3D Aerodynamic Lead Pursuit Study	3.7
319 B,N.	Scattering from a Spheroidal Potential	50.2
326 C.	Production for Transportation Study	27.8
327 L.	Prediction Analysis	136.4
328 B.	Buried Elastic Wave Source	3.8
329 N.	First Approximation Solution on Ore Body	36.6
330 C.	Postfailure Response in Aircraft Structures	61.6
336 C.	Pattern Identification	9.2
337 N.	Nonlinear 2nd Order Diff. Eqs.	72.2
338 C.	Optimization of Ram-Air Cooling Systems	1.8
343 C.	Weather Prediction	231.8
345 B.	Matrix Multiplication	22.4
346 B.	Complex Spectrum Analysis	6.5
348 A.	Wave Propagation	109.2
350 D.	Computation of Variances and Covariances	63.4
351 B.	Non-Uniform Fuel Distribution	50.2
352 B.	Propeller Shafting Lateral Vibrations	9.3

354 D.	Response of a Singel Story Concrete Building	13.7
356 B.	Partially Continuous Wooden Beams	5.9
357 B.	Propagation of Roundoff Error	12.9
362 B.	Fourier Synthesis for Crystal Structure	7.1

1.3 Computer Time Statistics

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

Programs	54 hours, 16.7 minutes
Magnetic Drum Test	0 minutes
Magnetic Tape Test	49.8 minutes
Scope Calibration	10.1 minutes
PETR Test	29.1 minutes
Test Storage Check	6.4 minutes
Demonstrations (#131)	17.6 minutes
Total Time Logged	56 hours, 9.7 minutes
Div. 6 Conversion, Inter-run Operations, etc.	15 hours, 4.4 minutes
Total Time Assigned	73 hours, 53.1 minutes
Usable Time, Percentage	96.41%
Number of Programs	506