

Digital Computer Laboratory
Massachusetts Institute of Technology
Cambridge 39, Massachusetts

SUBJECT: BIWEEKLY REPORT, FEBRUARY 17, 1957
To: Frank M. Verzuh
From: Scientific and Engineering Computation Group

1. MATHEMATICS, CODING AND APPLICATIONS

1.1 Introduction

During the past two weeks 432 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 49 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>Minutes</u>
100	Comprehensive System of Service Routines	59.9
106 C.	MIT Seismic Project	39.6
126 D.	Data Reduction	224.1
131	Special Problems (Staff Training, etc).	6.2
141	S and EC Subroutine Study	4.8
162 N.	Nuclear Scattering Phase-Shifts	33.4
193 L.	E.V. Problem for Propagation of E. M. Waves	132.6
194 B,N.	Augmented Plane Wave Method (Sodium)	120.6
203 D,N.	Response of a Building Under Dynamic Loading	178.6
225 B,N.	Neutron-Deuteron Scattering	125.4
236 C.	Transient Response of Aircraft Structures to Aerodynamic Heating	2.6
245 N.	Theory of Neutron Reactions	127.3
253 N.	APW as Applied to Face- and Body-Centered Iron	152.6
257 C.	Horizontal Stabilizer Analysis	216.3

260 N.	Energy Levels of Diatomic Hydrides	15.4
261 C.	Fourier Synthesis for Crystal Structures	16.9
262 N.	Evaluation of Two-center Molecular Integrals	215.8
273 N.	Cosmic Ray Air Shower	467.9
274 N.	Multiple Scattering	51.3
278 N.	Energy Levels of Diatomic Hydrides LiH	56.8
309 B,N.	Pure and Impure Potassium Chloride Crystal	49.1
310 C.	Rocket Trajectory Calculations	39.5
317 C.	Stability Derivatives from Flight Test Data	90.0
326 C.	Production for Transportation Study	85.8
327 L.	Prediction Analysis	36.7
329 N.	First Approximation Solution on Ore Body	5.6
336 C.	Pattern Identification	23.4
337 N.	Nonlinear 2nd Order Differential Equations	129.1
341 C.	Statistical and Dynamic Methods in Forecasting	80.6
350 D.	Computation of Variances and Covariances	56.4
361 B,N.	Growth of Fatigue Cracks	4.8
364 C.	Blast Response of Rotor Blades	39.5
368 B,N.	Condensation in a Vertical Tube	15.8
372 B.	Design of Spherical Shell Segments	12.9
377 L.	Coverage Analysis	35.8
380 B.	Switching Circuits	13.5
382 B.	Calculation of Prime Numbers	2.9
384 B.	Prompt Neutron Emission Probability	8.6
386 C.	Free Convection	3.2
387 C.	Determination of Velocity Potential	61.4

388 D.	Temperature Distribution Aircraft Generators	19.7
389 D.	Supersonic Flow of Air in a Tube	13.9
390 B.	Mitchell's Wave-Making Integral	49.9
391 L.	Magnetic Relaxation in Thin Films	18.8
394 C.	Automatic Programming for Machine Tools	61.3
396	Subroutine Study	9.0
397 N.	Response Function of Air Shower Detectors	17.3
400 C.	Temperature and Stress Response	38.4
401 N.	Non-Stationary Queusing Problems	47.8

1.3 Computer Time Statistics

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

S and EC Programs	51 hrs.	11.4 min.
Lincoln Programs	4 hrs.	1.2 min.
Magnetic Tape Test		44.7 min.
Scope Calibration		8.0 min.
PETR Test		19.3 min.
Test Storage Check		10.9 min.
Demonstrations (No. 131)		6.2 min.
Total Time Logged	<u>56 hrs.</u>	<u>44.0 min.</u>
Div. 6 Conversions, Inter-run Operations, etc.	5 hrs.	45.4 min.
Total Time Assigned	64 hrs.	32.1 min.
Usable Time, Percentage	96.77%	
Number of Programs	432	