

Digital Computer Laboratory  
Massachusetts Institute of Technology  
Cambridge 39, Massachusetts

SUBJECT: BIWEEKLY REPORT, DECEMBER 23, 1956

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From: Scientific and Engineering Computation Group

1. MATHEMATICS, CODING AND APPLICATIONS

1.1 Introduction

During the past two weeks 461 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 46 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	71.6
106 C.	MIT Seismic Project	6.4
126 D.	Data Reduction	115.2
131	Special Problems (Staff Training, etc.)	19.4
141	S and EC Subroutine Study	14.8
162 N.	Nuclear Scattering Phase-Shifts	9.2
193 L.	E.V. Problem for Propagation of E.M. Waves	136.6
194 B,N.	Augmented Plane Wave Method (Sodium)	115.5
203 D,N.	Response of a Building Under Dynamic Loading	43.2
231 B,N.	Reactor Runaway Prevention	71.3
253 N.	APW as Applied to Face- and Body-Centered Iron	79.2
256 C.	WWI-1103 Translation Program	47.5
257 C.	Horizontal Stabilizer Analysis	80.7
260 N.	Energy Levels of Diatomic Hydrides	18.9
261 C.	Fourier Synthesis for Crystal Structures	37.9
262 N.	Evaluation of Two-center Molecular Integrals	3.0
273 N.	Cosmic Ray Air Shower	270.5
274 N.	Multiple Scattering	21.4
278 N.	Energy Levels of Diatomic Hydrides LiH	200.5
288 N.	Atomic Wave Functions	354.0
300 L.	Tropospheric Propagation	103.0
312 L.	Error Analysis	19.2
317 C.	Stability Derivatives from Flight Test Data	55.5
327 L.	Prediction Analysis	224.2
334 C.	Parametric Study of Coupling and Damping	32.9
341 C.	Statistical and Dynamic Methods in Forecasting	11.0

343 C.	Weather Prediction	37.9
346 B.	Complex Spectrum Analysis	10.2
350 D.	Computation of Variances and Covariances	54.7
354 D.	Response of a Single Story Concrete Building	5.5
361 B,N.	Growth of Fatigue Cracks	5.7
364 C.	Blast Response of Rotor Blades	80.0
372 B.	Design of Spherical Shell Segments	5.0
377 L.	Coverage Analysis	15.6
382 B.	Calculation of Prime Numbers	45.8
386 C.	Free Convection	30.1
387 C.	Determination of Velocity Potential	26.9
388 D.	Temperature Distribution Aircraft Generators	13.4
391 L.	Magnetic Relaxation in Thin Films	26.8
393 N.	The Inverse Bremstrahlung Spectrum	23.8
394 C.	Automatic Programming for Machine Tools	35.0
395 L.	Fay's Error Calculation	3.9
396	Subroutine Study	11.3
397 L.	Response Function of Air Shower Detectors	27.7
398 A.	Diagonalization of Matrices	232.7
399 L,B.	Domain Wall Motion	8.4

### 1.3 Computer Time Statistics

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

S and EC Programs	38 hrs.	30.2 min.
Lincoln Programs	9 hrs.	25.4 min.
Magnetic Tape Test		58.5 min.
Scope Calibration		9.9 min.
PETR Test		31.0 min.
Test Storage Check		11.3 min.
Demonstrations (No.131)		19.4 min.
Total Time Logged	50 hrs.	6.4 min.
Div. 6 Conversions, Inter-run Operations, etc.	7 hrs.	17.8 min.
Total Time Assigned	59 hrs.	26.5 min.
Usable Time, Percentage	96.55%	
Number of Programs	461	