Digital Computer Laboratory
Massachusetts Institute of Technology
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SUBJECT: BIWEEKLY REPORT, MAY 27, 1956

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From: Scientific and Engineering Computations Group

1. MATHEMATICS, CODING AND APPLICATIONS

1.1 Introduction

During the past two weeks 659 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 61 of the problems that have been accepted by the S and EC Group.

1.2 Programs and Computer Operation

Problem No.	Title	Minutes
100	Comprehensive System of Service Routines	66.4
106 C.	MIT Seismic Project	27.9
120 B,N.	The Aerothermopressor	56.5
122 N.	Coulomb Wave Functions	4.7
126 D.	Data Reduction	143.9
131	Special Problems (Staff Training, etc.)	46.7
141	S and EC Subroutine Study	14.7
193 L.	E.V. Problem for Propagation of E.M. Waves	140.2
194 B,N.	Augmented Plane Wave Method (Sodium)	187.1
203 D,N.	Response of a Building Under Dynamic Loading	33.7
204 N.	Exchange Integrals between Real Slater Orbitals	27.7
216 C.	Ultrasonic Delay Lines	15.4
219	Linear Programming	227.9
226 D.	Circulation of the Atmosphere	41.1

231 B,N.	Reactor Runaway Prevention	16.0
236 C.	Transient Response of Aircraft to Heating	6.7
240 A.	Electrons and Photons in Cascade	2.4
245 N.	Theory of Neutron Reactions	1089.8
253 N.	A PW as Applied to Face- and Body-Centered Iron	6.1
257 C.	Horizontal Stabilizer Analysis	364.7
260 N.	Energy Levels of Diatomic Hydrides	1.7
261 C.	Fourier Synthesis for Crystal Structures	60.4
262 N.	Evaluation of Two-center Molecular Integrals	288.0
264 C.	Optimization of Alternator Control System	33.9
270 B.	Critical Mass Calculations	323.9
273 N.	Cosmic Ray Air Shower	58.9
278 N.	Energy Levels of Diatomic Hydrides LiH	198.6
288 N.	Atomic Wave Functions	527.0
290 N.	Polarizability Effects in Atoms and Molecules	22.2
293 C.	Rolling Bearings	17.3
300 L.	Tropospheric Propagation	28.6
306 D.	Spectral Analysis of Atmospheric Data	38.6
309 B,N.	Pure and Impure Potassium Chloride Crystal	41.7
310 C.	Rocket Trajectory Calculations	5.7
312 L.	Error Analysis	64.9
315 C.	Torpedo Hit Distribution	116.9
317 C.	Stability Derivatives from Flight Test Data	25.3
326 C.	Production for Transportation Study	15.9
327 L.	Prediction Analysis	128.2
334 C.	Parametric Study of Coupling and Damping	52.8
337 N.	Nonlinear 2nd Order Differential Equations	48.5

338 C.	Optimization of Ram-Air Cooling Systems	11.3
341 C.	Statistical and Dynamic Methods in Forecasting	69.6
342 B.	Transient Heat Flow in Solids	45.8
343 C.	Weather Prediction	148.1
346 B.	Complex Spectrum Analysis	45.7
350 D.	Computation of Variances and Covariances	18.4
351 B.	Non-Uniform Fuel Distribution	15.4
354 D.	Response of a Single Story Concrete Building	16.2
356 B.	Partially Continuous Wooden Beams	49.7
359 B.	Solution of Transverse Web Frame	21.2
360 B.	Dynamic Response of Shear Walls	267.3
363 A.	Asymptotic Integration of Equations Concerning Torroidal Shell	3.5
364 C.	Blast Response of Rotor Blades	32.4
365	Problems Concerned with Comparison and Testing of Whirlwind I and IBM 650	16.0
367 B.	Determination of Critical Mass	33.9
368 B.N.	Condensation in a Vertical Tube	26.2
369	Temperature Distribution in a Beam	85.1
371 L.	Atmospheric Propagation of Radio Waves	16.7
373 B.	Flux Leveling in Homogeneous Reactor - Part I.	14.0
377 L.	Coverage Analysis	5.6

1.3 Computer Time Statistics

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

S and EC Programs	85 hours	29.8 min.
Lincoln Programs	6 hours	24.2 min.
Magnetic Tape Test	1 hour	15.0 min.
Scope Calibration		23.2 min.
PETR Test		37.6 min.
Test Storage Check		8.1 min.
Demonstrations (No.131)		46.7 min.
Total Time Logged	95 hours	4.6 min.
Division 6 Conversions, Inter-run Operations, etc.	18 hours	43.5 min.
Total Time Assigned	114 hours	10.1 min
Usable Time, Percentage	99.68%	
Number of Programs	659	