

Digital Computer Laboratory
Massachusetts Institute of Technology
Cambridge 39, Massachusetts

SUBJECT: BIWEEKLY REPORT, FEBRUARY 7, 1955

To: Jay W. Forrester

From: Scientific and Engineering Computation Group

1. MATHEMATICS, CODING AND APPLICATIONS

1.1 Introduction

During the past two weeks 439 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 46 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>WWI Time</u>
100	Comprehensive System of Service Routines	216.9 minutes
106 G.	MIT Seismic Project	95.8 minutes
122 B.	Coulomb Wave Functions	69.3 minutes
123 D.	Earth Resistivity Interpretation	103.7 minutes
126 G.	Data Reduction	208.4 minutes
130 C.	Six-component Distillation	6.6 minutes
131	Special Problems (Staff Training, etc.)	166.3 minutes
132 C.	NCMM Subroutines	17.8 minutes
141	S&EC Subroutine Study	40.8 minutes
144 C.	Self-consistent Molecular Orbital	42.2 minutes
155 D.	Synoptic Climatology	63.3 minutes

156 A.	Reflection in a Semi-Infinite Rect. W.G.	7.6 minutes
162 C.	Nuclear Scattering Phase-Shifts	6.6 minutes
167 D.	Products of Batch Distillations with Holdup	14.3 minutes
172 B.	Overlap Integrals	166.9 minutes
177 D.	Low Aspect Ratio Flutter	26.8 minutes
194 B.	Augmented Plane Wave Method (Sodium)	124.7 minutes
195 C.	Intestinal Motility	25.2 minutes
199 C.	Compressible Flow in a Tube	66.0 minutes
203 C.	Response of a Building Under Dynamic Loading	16.3 minutes
204 C.	Exchange Integrals Between Real Slater Orbitals	55.5 minutes
212 C.	Dispersion Curves for Seismic Waves	23.5 minutes
217 A.	Atomic Wave Function and Energies	26.8 minutes
218 C.	Stage B for Diatomic Molecules	7.5 minutes
219.	Linear Programming	24.9 minutes
223 D.	Investigation of Turbulent Flow	7.3 minutes
224 C.	Vertical Velocity Fields	33.6 minutes
225 B.	Neutron-Deuteron Scattering	122.1 minutes
228 A.	Evaluation of Difference Diffusion Equation	4.1 minutes
230 C.	Dynamic Analysis of Bridges	114.7 minutes
231 C.	Reactor Runaway Prevention	37.5 minutes
233 C.	Utility Stock Prices	2.6 minutes
235 B.	Eigenvalues for a Spheroidal Square Well	73.8 minutes
236 C.	Transient Response of Aircraft Structures to Aerodynamic Heating	36.5 minutes
237 C.	Autocorrelation Function of Submitted Data	11.3 minutes
238 B.	Self-consistent Calculation of Nuclear Mass Density	15.3 minutes
239 C.	Guidance and Control	145.3 minutes

241 B.	Transients in Distillation Columns	7.6 minutes
244 C.	Data Reduction for X-1 Fire Control	12.5 minutes
246 B.	Scattering from Oxygen	27.5 minutes
247 C.	Surface Pressure Prediction	138.1 minutes
248 B.	Propane Vibrations	19.1 minutes
249 C.	Flight Interceptor Control	12.1 minutes
250	Translation Program for the NCMM	4.0 minutes
251 B.	Dynamics and Control of Packed Distillation Columns	58.3 minutes
252 C.	Analysis of Two Story Steel Frame Building	10.1 minutes

1.3 Computer Time Statistics

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

Programs	39 hours, 10.8 minutes
Magnetic Drum Test	35.4 minutes
Magnetic Tape Test	42.7 minutes
Scope Calibration	13.1 minutes
PETR Test	12.3 minutes
Demonstrations (#131)	<u>2 hours, 46.3 minutes</u>
Total Time Used	43 hours, 40.6 minutes
Total Time Assigned	47 hours, 49.6 minutes
Usable Time, Percentage	91.5%
Number of Programs	439

2. COMPUTER ENGINEERING

Typewriters and Paper Tape L.H.Norcott

In our search for an acceptable opaque uncoiled perforator tape we came across a gray tape which is opaque, punches cleanly, and has good tensile strength. Unfortunately, chad from this tape quickly jams up the FL die blocks so badly that the punch pins fail to perforate.

When various lubricants (oil, graphite, candle wax, water, etc.) were applied to the tape just before it entered the die, the tape perforated easily. The tape manufacturer is now making up some samples of this tape coated with a thin film of wax for us to test.

The model shop modified one die block to permit easier

ejection of chad, and we are using this now with unlubricated tape. This modified die block has operated satisfactorily for about 4 hours at this time. (Unmodified units failed after a few seconds.)

Three punches have been equipped with modified die blocks and oversize cam rollers. These punches satisfactorily perforate uncoiled gray tape which is opaque, shears cleanly, and has good resistance to tearing, but which is too tough for unmodified punches. We plan to incorporate the above modifications in the rest of our punches.