

Digital Computer Laboratory
Massachusetts Institute of Technology
Cambridge 39, Massachusetts

SUBJECT: BIWEEKLY REPORT, May 16, 1955

To: Jay W. Forrester

From: Scientific and Engineering Computation Group

1. MATHEMATICS, CODING AND APPLICATIONS

1.1 Introduction

During the past two weeks 628 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

<u>Problem No.</u>	<u>Title</u>	<u>Minutes</u>
100	Comprehensive System of Service Routines	244.4
106 C.	MIT Seismic Project	16.0
120 D.	The Aerothermopressor	196.8
122 B.	Coulomb Wave Functions	55.6
123 C.	Earth Resistivity Interpretation	24.7
126 C.	Data Reduction	26.4
131	Special Problems (Staff Training, etc.)	188.2
132 C.	N. C. Milling Machine	6.6
141	S and EC Subroutine Study	30.3
144 C.	Self-consistent Molecular Orbital	12.3
155 D.	Synoptic Climatology	189.1
156 A.	Reflection in a Semi-Infinite Rect. W.G.	11.0

172 B.	Overlap Integrals	187.2
193 C.	E.V. Problem for Propagation of E.M. Waves	19.1
194 B.	Augmented Plane Wave Method (Sodium)	96.9
203 C.	Response of a Building Under Dynamic Loading	5.7
204 C.	Exchange Integrals Between Real Slater Orbitals	4.3
213 D.	Industrial Process Control Studies	26.3
217 A.	Atomic Wave Function and Energies	48.3
218 C.	Stage B for Diatomic Molecules	1.6
224 C.	Vertical Velocity Fields	196.4
225 B.	Neutron-Deuteron Scattering	7.3
226 D.	Circulation of the Atmosphere	36.5
228 A.	Evaluation of Difference Diffusion Equation	17.2
230 C.	Bridge Response to Blast Loads	145.9
235 B.	Eigenvalues for a Spheroidal Square Well	67.4
236 C.	Transient Response of Aircraft to Heating	11.2
238 B.	Self-consistent Calculation of Nuclear Density	186.8
241 B.	Transients in Distillation Columns	66.4
242 A.	Counting Structures of Relations	9.3
244 C.	Data Reduction for X-1 Fire Control	28.9
250.	Translation Program for the NCMM	25.1
252 C.	Analysis of Two Story Steel Frame Building	81.7
253 D.	APW as Applied to Face- and Body-Centered Iron	3.6
256.	WWI -1103 Translation Program	91.9
258 C.	Dynamic Analysis of an Aircraft Interceptor	19.6
259 C.	Ionosphere Computation	33.2
260 C.	Energy Levels of Diatomic Hydrides	40.9

261 C.	Fourier Synthesis for Crystal Structures	39.4
263 C.	Aircraft Pullup Flight Path	77.0
264 C.	Optimization of Alternator Control System	4.4
266 A.	Calculations for the MIT Reactor	131.2
267 B.	NCMM Turbine Blade	53.3
270 B.	Critical Mass Calculations	46.0
271 B.	Beam Splitting Technique	53.1
272 L.	General Raydist Solution	4.3
274 N.	Multiple Scattering	55.9
275 B.	Buckling of Shallow Elastic Shells	156.1
277 C.	Horizontal Stabilizer Study	42.0
278 N.	Energy Levels of Diatomic Hydrides LiH	10.4
280 B.	Correlation Function	145.6
281 C.	Correlations and Transforms	14.1
282 B.	Helicopter Blade Flapping Instability	28.4
283 B.	Information Handling in Task Groups	42.2
284 C.	Gulf Stream Motion Forecasting	14.7
285 C.	APW as Applied to Chromium Crystal	5.2
286 B.	Responses of the Human Pilot	94.3
287 D.	Probability Pattern	3.8
289 C.	Heat Transfer Thru High-Speed Laminar Boundary Layers	41.5
291 B.	Dynamic Buckling	7.1
293 C.	Rolling Bearings	2.9

1.3 Computer Time Statistics

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

Programs	55 hours, 44.8 minutes
Magnetic Drum Test	63.8 minutes
Magnetic Tape Test	64.7 minutes
Scope Calibration	10.9 minutes
PETR Test	16.4 minutes
Test Storage Check	6.1 minutes
Demonstrations (No.131)	<u>3 hours, 8.2 minutes</u>
Total Time Logged	<u>61 hours, 34.9 minutes</u>
Div. 6 Conversions, Inter-run Operations, etc.	16 hours, 52.9 minutes
Total Time Assigned	79 hours, 48.8 minutes
Usable Time, Percentage	98.3
Number of Programs	628

Treatment of Flexowriter Coded Characters
by The Comprehensive System

Binary Numerical Sequence

Octal Value	Character 123456	Lower Case	Upper Case	CS Treatment	Octal Value	Character 123456	Lower Case	Upper Case	CS Treatment
0	000000	not used		ignored	40	100000	t	T	accepted
1	000001	not used		illegal	41	100001	not used		illegal
2	000010	e	E	accepted	42	100010	z	Z	accepted
3	000011	8	8	accepted	43	100011	back space		illegal
4	000100	not used		illegal	44	100100	l	L	same as 1
5	000101			accepted	45	100101	tabulation		Same as carr. ret.
6	000110	a	A	accepted	46	100110	w	W	accepted
7	000111	3	3	accepted	47	100111	not used		illegal
10	001000	space bar		ignored	50	101000	h	H	accepted
11	001001	=	o	accepted	51	101001	carr. return		accepted
12	001010	s	S	accepted	52	101010	y	Y	accepted
13	001011	4	4	accepted	53	101011	not used		illegal
14	001100	i	I	accepted	54	101100	p	P	accepted
15	001101	+	/	accepted	55	101101	not used		illegal
16	001110	u	U	accepted	56	101110	q	Q	accepted
17	001111	2	2	accepted	57	101111	not used		illegal
20	010000	color change		ignored	60	110000	o	O	same as zero
21	010001	.)	accepted	61	110001	stop		ignored
22	010010	d	D	accepted	62	110010	b	B	accepted
23	010011	5	5	accepted	63	110011	not used		illegal
24	010100	r	R	accepted	64	110100	g	G	accepted
25	010101	1	1	accepted	65	110101	not used		illegal
26	010110	3	J	accepted	66	110110	9	9	accepted
27	010111	7	7	accepted	67	110111	not used		illegal
30	011000	n	N	accepted	70	111000	m	M	accepted
31	011001	,	(accepted	71	111001	upper case		accepted
32	011010	f	F	accepted	72	111010	x	X	accepted
33	011011	6	6	accepted	73	111011	not used		illegal
34	011100	c	C	accepted	74	111100	v	V	accepted
35	011101	-	-	accepted	75	111101	lower case		accepted
36	011110	k	K	accepted	76	111110	0	0	accepted
37	011111	not used		illegal	77	111111	nullify		ignored