

Digital Computer Laboratory
Massachusetts Institute of Technology
Cambridge 39, Massachusetts

SUBJECT: BIWEEKLY REPORT, MAY 30, 1954

To: Jay W. Forrester

From: Scientific and Engineering Computation Group

1. MATHEMATICS, CODING AND APPLICATIONS

1.1 Introduction

In the future programmers' progress reports will be included only in alternate biweekly reports beginning with the June 14 report. This present report and every other report thereafter will contain a brief summary of the group's activities, a list of problems that have used WWI time together with the amount of time used, operating statistics, and a brief section on computer engineering.

During the past two weeks 332 coded programs were run on the time allocated to the Scientific and Engineering Computation (S&EC) Group. These programs represent part of the work that has been carried on in 37 of the problems that have been accepted by the S&EC Group.

Programmers have found the expanded post-mortem facilities of the CS II system extremely useful. In particular the conversion post-mortem has proved valuable in detecting and exhibiting errors in the prepared Flexo program tapes.

The following new problem numbers have been assigned. Detailed descriptions will appear in future biweekly reports.

| <u>Problem #</u> | <u>Title</u> | <u>Originator</u> |
|------------------|--|--|
| 185 D. | A Scale of Turbulence | J. Howcroft and J. Smith-Meteorology Dept. |
| 186 C. | Tracking Response Characteristics of the Human Operator | J. Elkind Lincoln Laboratory |

| <u>Problem #</u> | <u>Title</u> | <u>Originator</u> |
|------------------|--|--|
| 187 C. | Response of a Fuel-Flow Controller | C.W.Steeg, Jr. D.A.C.L. |
| 188 C. | Effect of Gravity on Relative Water Production in Oil Reservoirs | L.R.Kern Atlantic Refining Co. |
| 189 C. | Distribution of Gustiness in the Free Atmosphere | A. Fleisher Weather Radar Research |
| 190 D. | Zeeman and Stark Effect in Positronium | H. Kendall Physics Department |
| 191 B. | Earthquake Epicenter Location by Geiger's method | D.R.Grine Geophysics Dept. |

1.2 Programs and Computer Operation

| <u>Problem #</u> | <u>Title</u> | <u>WWI Time</u> |
|------------------|--|-----------------|
| 100 | Comprehensive System of Service Routines | 237 minutes |
| 101 C. | Optical Properties of Thin Metal Films | 212 minutes |
| 106 C. | MIT Seismic Project | 342 minutes |
| 107 C. | (a) Autocorrelation and (b) Fourier Transform, Evaluate Integrals | 88 minutes |
| 108 C. | An Interpretive Program | 30 minutes |
| 109 C. | Fighter Gunsight Calibration, 8th Order D.E. | 27 minutes |
| 113 C. | Shear Wall Analogy, Simultaneous Linear Equations | 11 minutes |
| 119 C. | Spherical Wave Propagation | 74 minutes |
| 120 D. | The Aerothermopressor | 97 minutes |
| 123 C. | Earth Resistivity Interpretation: Integration of empirical functions | 62 minutes |
| 131 | Special Problems (Staff training, demonstrations, etc.) | 113 minutes |
| 132 C. | Subroutines for the Numerically Controlled Milling Machine | 31 minutes |
| 141 | S&EC Subroutine Study | 23 minutes |
| 142 D. | A Study of Shock Waves | 85 minutes |
| 144 C. | Self-consistent Molecular Orbitals | 25 minutes |
| 147 C. | Energy Bands in Crystals | 279 minutes |

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| <u>Problem #</u> | <u>Title</u> | <u>WWI Time</u> |
|------------------|--|-----------------|
| 149 C. | Digital Methods of Detecting Signal From Noise | 23 minutes |
| 155 D. | Synoptic Climatology | 226 minutes |
| 159 D. | Water Use in a Hydroelectric System | 167 minutes |
| 161 C. | Response of Mass-Plastic Spring System to Transient Loading | 62 minutes |
| 162 C. | Determination of Phase Shifts from Experimental Cross-Sections | 20 minutes |
| 163 C. | Ferrite Phase Shifters in Rectangular Wave Guides | 41 minutes |
| 166 C. | Construction and Testing of a Delta-Wing Flutter Model | 190 minutes |
| 167 D. | Products of Batch Distillations with Holdup | 140 minutes |
| 168 C. | Indicial Downwash Behind a Two-Dimensional Wing | 13 minutes |
| 169 B. | Utilizing a General Purpose Digital Computer in Switching-Circuit Design | 26 minutes |
| 171 C. | Improved Power Spectrum Estimates | 48 minutes |
| 172 B. | Overlap Integrals of Molecular and Crystal Physics | 478 minutes |
| 173 | Course 6.537 Digital Computer Application Practise | 240 minutes |
| 175 C. | Impurity Levels in Crystals | 32 minutes |
| 176 B. | Connector Provision in Automatic Telephone Exchanges | 74 minutes |
| 180 B. | Crosscorrelation of Blast Furnace Input-Output Data | 122 minutes |
| 181 C. | Perturbed Coulomb Wave Functions | 9 minutes |
| 183 D. | Blast Response of Aircraft | 85 minutes |
| 184 D. | Scattering Electrons from Hydrogen | 160 minutes |
| 187 C. | Response of a Fuel-Flow Controller | 19 minutes |
| 188 C. | Effect of Gravity on Relative Water Production in Oil Reservoirs | 14 minutes |

1.3 Computer Time Statistics

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

| | |
|-------------------------|---------------------------|
| Programs | 61 hours, 08 minutes |
| Conversions | 8 hours, 10 minutes |
| Magnetic Drum Test | 47 minutes |
| Magnetic Tape Test | 70 minutes |
| Scope Calibration | 34 minutes |
| PETR Test | 21 minutes |
| Demonstrations(#131) | <u>1 hour, 53 minutes</u> |
| Total Time Used | 74 hours, 03 minutes |
| Total Time Assigned | 89 hours, 02 minutes |
| Usable Time, Percentage | 83.1% |
| Number of Programs | 332 |

2. COMPUTER ENGINEERING

2.1 WWI System Operation

(A.J.Roberts, L.L.Holmes)

Of 1834 Allied plug-in relays which were recently checked, 115 were found to have poorly soldered connections. All relays of this type in the system have now been inspected.

Two of the new-type sensing amplifiers are now operating in core memory.

The second magnetic-tape printout system should be ready for use about 1 June. It would be appreciated if any tapes which produce faulty printouts or punchouts were saved for examination by the Systems Group.

2.11 Typewriter and Paper Tape

(L.H.Norcott)

A recent rash of carriage-return troubles with the delayed printer seems to have been cured by increasing the pickup time of one relay in the magnetic-tape printout control register.

A complaint that the delayed-punchout system intermittently dropped #3 code hole continued even after the punch was changed. This fact, plus a close examination of the original punch and defective tapes, convinces us that the trouble was not caused by the punch itself. Similar programs have since been recorded on magnetic tape and punched out properly.

2.12 Fairchild Camera

(L.H.Norcott)

Contacts have been installed on the footage indicators of four camera magazines. These contacts will be used with a proposed system which will give an alarm when the supply of film is running low.

2.2 Terminal Equipment

2.21 Magnetic Drums

(H.L.Ziegler)

Changeover from relay switching to electronic switching of heads for writing in the auxiliary drum is proceeding slowly and without incident. Work is about on schedule, and the three digits converted so far are performing satisfactorily.

An effort is being made to "streamline" the testing and maintenance of drum chassis. A test setup both larger and more flexible is being planned. To aid in this work, standardization of pin assignments on the chassis is being investigated. Changes required to effect this standardization do not seem excessive for the simplification of test setups obtained.

(L.D.Healy)

The auxiliary-drum checking procedure was tested and has been modified accordingly.

Work was begun on a similar checking procedure for the buffer drum.

2.22 Ferranti PETR

(F.E.Irish)

The newly installed production model of the Ferranti PETR amplifier now appears to be operating satisfactorily. It gave some trouble for a few days when one of the information-channel amplifiers started putting out spurious signals. They were traced to what appeared to be a microphonic 5695 dual triode used in that particular channel amplifier.

The final decision on how the reader will be mounted on the console table has not been reached. Operators, in general, seem to be dissatisfied with the present mounting. Any opinions on how it should be mounted would be appreciated.

3. ADMINISTRATION AND PERSONNEL

Staff Termination (J.C.Proctor)

Saul Fine

New Non-Staff (R.A.Osborne)

Eileen Barrett is a new secretary in Group 61.

Bernard Gardner is a new clerk who will run one of the Ozalid machines in the Print Room.

Donald Haff is a new technician in the Construction Shop.

Robert Kyle has returned to Group 6345 on a part-time basis.

Morris Sadofsky is another new technician in the Construction Shop.

Manual Spector has also joined the Construction Shop as a technician.

Non-Staff Terminations (R.A.Osborne)

Katherine Campbell

Roseanne Gillette

Daniel Lynch

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