## Digital Computer Laboratory Massachusetts Institute of Technology Cambridge 39, Massachusetts

SUBJECT: BIWEEKLY REPORT, March 31, 1957

To: Frank M. Verzuh

From: Scientific and Engineering Computation Group

## 1. MATHEMATICS, CODING AND APPLICATIONS

## 1.1 Introduction

During the past two weeks 479 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 42 of the problems that have been accepted by the S and EC Group.

## 1.2 Programs and Computer Operation

Comprehensive System of Service Routines  Comprehensive Project  Com	Problem	No. Title	Minutes
106 C. MIT Seismic Project  120 Data Reduction  1206.9  131 Special Problems (Staff Training, etc.)  12.8  193 L. E.V. Problem for Propagation of E.M. Waves  166.7  194 B,N.Augmented Plane Wave Method (Sodium)  245.0  203 D,N.Response of a Building Under Dynamic Loading  158.7  119 Linear Programming  22.9  1253 N. APW as Applied to Face- and Body-Centered Iron  1266 C. WWI-1103 Translation Program  1270 Linear Programsing  1271 C. Horizontal Stabilizer Analysis  100.8  100			
126 D. Data Reduction Special Problems (Staff Training, etc.) 12.8 193 L. E.V. Problem for Propagation of E.M. Waves 166.7 194 B.N.Augmented Plane Wave Method (Sodium) 245.0 203 D.N.Response of a Building Under Dynamic Loading 58.7 219 Linear Programming 22.9 253 N. APW as Applied to Face- and Body-Centered Iron 70.0 256 C. WWI-1103 Translation Program 19.9 257 C. Horizontal Stabilizer Analysis 260 N. Energy Levels of Diatomic Hydrides 261 C. Fourier Synthesis for Crystal Sturctures 262 N. Evaluation of Two-center Molecular Integrals 26.6 273 N. Cosmic Ray Air Shower 274 N. Multiple Scattering 278 N. Energy Levels of Diatomic Hydrides LiH 279 N. Energy Levels of Diatomic Hydrides LiH 285 N. APW as Applied to Chromium Crystal 290 N. Polarizability Effects in Atoms and Molecules 45.4 312 L. Error Analysis 72.0 317 C. Stability Derivatives from Flight Test Data 386 C. Pattern Identification 15.0			
131 Special Problems (Staff Training, etc.) 12.8 193 L. E.V. Problem for Propagation of E.M. Waves 166.7 194 B.N.Augmented Plane Wave Method (Sodium) 245.0 203 D.N.Response of a Building Under Dynamic Loading 58.7 219 Linear Programming 22.9 253 N. APW as Applied to Face- and Body-Centered Iron 70.0 256 C. WWI-1103 Translation Program 19.9 257 C. Horizontal Stabilizer Analysis 260 N. Energy Levels of Diatomic Hydrides 273 N. Cosmic Ray Air Shower 274 N. Multiple Scattering 275 N. Cosmic Ray Air Shower 276 N. Energy Levels of Diatomic Hydrides LiH 277 N. Energy Levels of Diatomic Hydrides LiH 278 N. Energy Levels of Diatomic Hydrides LiH 2790 N. Polarizability Effects in Atoms and Molecules 370 N. Cosmic Ray Air Shower 371 C. Stability Derivatives from Flight Test Data 371 C. Stability Derivatives from Flight Test Data 372 L. Prediction Analysis 3736 C. Pattern Identification 373 D. Polarizability Source 374 D. Polarizability Source 375 D. Polarizability Source 376 D. Pattern Identification		•	
193 L. E.V. Problem for Propagation of E.M. Waves 166.7 194 B,N.Augmented Plane Wave Method (Sodium) 245.0 203 D,N.Response of a Building Under Dynamic Loading 58.7 219 Linear Programming 22.9 253 N. APW as Applied to Face- and Body-Centered Iron 70.0 256 C. WWI-1103 Translation Program 19.9 257 C. Horizontal Stabilizer Analysis 100.8 260 N. Energy Levels of Diatomic Hydrides 31.1 261 C. Fourier Synthesis for Crystal Sturctures 3.0 262 N. Evaluation of Two-center Molecular Integrals 26.6 273 N. Cosmic Ray Air Shower 369.1 274 N. Multiple Scattering 26.1 278 N. Energy Levels of Diatomic Hydrides LiH 509.9 285 N. APW as Applied to Chromium Crystal 42.7 290 N. Polarizability Effects in Atoms and Molecules 45.4 312 L. Error Analysis 72.0 317 C. Stability Derivatives from Flight Test Data 38. Burled Elastic Wave Source 52.3 36. C. Pattern Identification		· ·	
194 B,N.Augmented Plane Wave Method (Sodium) 203 D,N.Response of a Building Under Dynamic Loading 58.7 219 Linear Programming 22.9 253 N. APW as Applied to Face- and Body-Centered Iron 70.0 256 C. WWI-1103 Translation Program 19.9 257 C. Horizontal Stabilizer Analysis 260 N. Energy Levels of Diatomic Hydrides 261 C. Fourier Synthesis for Crystal Sturctures 3.0 262 N. Evaluation of Two-center Molecular Integrals 26.6 273 N. Cosmic Ray Air Shower 369.1 274 N. Multiple Scattering 26.1 278 N. Energy Levels of Diatomic Hydrides LiH 509.9 285 N. APW as Applied to Chromium Crystal 312 L. Error Analysis 72.0 317 C. Stability Derivatives from Flight Test Data 328 B. Burled Elastic Wave Source 52.3 336 C. Pattern Identification		<u> </u>	
203 D,N.Response of a Building Under Dynamic Loading 219 Linear Programming 22.9 253 N. APW as Applied to Face- and Body-Centered Iron 256 C. WWI-1103 Translation Program 257 C. Horizontal Stabilizer Analysis 260 N. Energy Levels of Diatomic Hydrides 261 C. Fourier Synthesis for Crystal Sturctures 30.0 262 N. Evaluation of Two-center Molecular Integrals 26.6 273 N. Cosmic Ray Air Shower 369.1 274 N. Multiple Scattering 26.1 278 N. Energy Levels of Diatomic Hydrides LiH 509.9 285 N. APW as Applied to Chromium Crystal 312 L. Error Analysis 326 C. Stability Derivatives from Flight Test Data 337 L. Prediction Analysis 338 C. Pattern Identification 358 Suried Elastic Wave Source 352.3 368 C. Pattern Identification	193 L.	E.V. Problem for Propagation of E.M. Waves	
Linear Programming 22.9 253 N. APW as Applied to Face- and Body-Centered Iron 70.0 256 C. WWI-1103 Translation Program 19.9 257 C. Horizontal Stabilizer Analysis 100.8 260 N. Energy Levels of Diatomic Hydrides 31.1 261 C. Fourier Synthesis for Crystal Sturctures 3.0 262 N. Evaluation of Two-center Molecular Integrals 26.6 273 N. Cosmic Ray Air Shower 369.1 274 N. Multiple Scattering 26.1 278 N. Energy Levels of Diatomic Hydrides LiH 509.9 285 N. APW as Applied to Chromium Crystal 42.7 290 N. Polarizability Effects in Atoms and Molecules 45.4 312 L. Error Analysis 72.0 317 C. Stability Derivatives from Flight Test Data 183.7 327 L. Prediction Analysis 194.0 328 B. Buried Elastic Wave Source 52.3 336 C. Pattern Identification 15.0	194 B,N	.Augmented Plane Wave Method (Sodium)	245.0
253 N. APW as Applied to Face- and Body-Centered Iron 256 C. WWI-1103 Translation Program 257 C. Horizontal Stabilizer Analysis 260 N. Energy Levels of Diatomic Hydrides 261 C. Fourier Synthesis for Crystal Sturctures 3.0 262 N. Evaluation of Two-center Molecular Integrals 26.6 273 N. Cosmic Ray Air Shower 369.1 274 N. Multiple Scattering 26.1 278 N. Energy Levels of Diatomic Hydrides LiH 509.9 285 N. APW as Applied to Chromium Crystal 42.7 290 N. Polarizability Effects in Atoms and Molecules 312 L. Error Analysis 317 C. Stability Derivatives from Flight Test Data 318.7 327 L. Prediction Analysis 328 B. Burled Elastic Wave Source 336 C. Pattern Identification 315.0	203 D,N	Response of a Building Under Dynamic Loading	58.7
256 C. WWI-1103 Translation Program 257 C. Horizontal Stabilizer Analysis 260 N. Energy Levels of Diatomic Hydrides 261 C. Fourier Synthesis for Crystal Sturctures 3.0 262 N. Evaluation of Two-center Molecular Integrals 26.6 273 N. Cosmic Ray Air Shower 369.1 274 N. Multiple Scattering 26.1 278 N. Energy Levels of Diatomic Hydrides LiH 509.9 285 N. APW as Applied to Chromium Crystal 42.7 290 N. Polarizability Effects in Atoms and Molecules 312 L. Error Analysis 317 C. Stability Derivatives from Flight Test Data 328 B. Buried Elastic Wave Source 336 C. Pattern Identification 15.0	219	Linear Programming	22.9
257 C. Horizontal Stabilizer Analysis 260 N. Energy Levels of Diatomic Hydrides 31.1 261 C. Fourier Synthesis for Crystal Sturctures 3.0 262 N. Evaluation of Two-center Molecular Integrals 26.6 273 N. Cosmic Ray Air Shower 369.1 274 N. Multiple Scattering 26.1 278 N. Energy Levels of Diatomic Hydrides LiH 509.9 285 N. APW as Applied to Chromium Crystal 42.7 290 N. Polarizability Effects in Atoms and Molecules 312 L. Error Analysis 72.0 317 C. Stability Derivatives from Flight Test Data 183.7 327 L. Prediction Analysis 328 B. Burled Elastic Wave Source 52.3 336 C. Pattern Identification	253 N.	APW as Applied to Face- and Body-Centered Iron	70.0
260 N. Energy Levels of Diatomic Hydrides 31.1 261 C. Fourier Synthesis for Crystal Sturctures 3.0 262 N. Evaluation of Two-center Molecular Integrals 26.6 273 N. Cosmic Ray Air Shower 369.1 274 N. Multiple Scattering 26.1 278 N. Energy Levels of Diatomic Hydrides LiH 509.9 285 N. APW as Applied to Chromium Crystal 42.7 290 N. Polarizability Effects in Atoms and Molecules 45.4 312 L. Error Analysis 72.0 317 C. Stability Derivatives from Flight Test Data 183.7 327 L. Prediction Analysis 194.0 328 B. Buried Elastic Wave Source 52.3 336 C. Pattern Identification 15.0	256 C.	WWI-1103 Translation Program	19.9
261 C. Fourier Synthesis for Crystal Sturctures 3.0 262 N. Evaluation of Two-center Molecular Integrals 26.6 273 N. Cosmic Ray Air Shower 369.1 274 N. Multiple Scattering 26.1 278 N. Energy Levels of Diatomic Hydrides LiH 509.9 285 N. APW as Applied to Chromium Crystal 42.7 290 N. Polarizability Effects in Atoms and Molecules 45.4 312 L. Error Analysis 72.0 317 C. Stability Derivatives from Flight Test Data 183.7 327 L. Prediction Analysis 194.0 328 B. Buried Elastic Wave Source 52.3 336 C. Pattern Identification 15.0	257 C.	Horizontal Stabilizer Analysis	100.8
262 N. Evaluation of Two-center Molecular Integrals 273 N. Cosmic Ray Air Shower 369.1 274 N. Multiple Scattering 26.1 278 N. Energy Levels of Diatomic Hydrides LiH 279 N. APW as Applied to Chromium Crystal 290 N. Polarizability Effects in Atoms and Molecules 312 L. Error Analysis 317 C. Stability Derivatives from Flight Test Data 3183.7 327 L. Prediction Analysis 328 B. Buried Elastic Wave Source 336 C. Pattern Identification 369.1 369.1 369.1 369.1 369.1 369.1 369.1 369.1 369.1 369.1 369.1	260 N.	Energy Levels of Diatomic Hydrides	31.1
273 N. Cosmic Ray Air Shower 274 N. Multiple Scattering 278 N. Energy Levels of Diatomic Hydrides LiH 279 N. APW as Applied to Chromium Crystal 290 N. Polarizability Effects in Atoms and Molecules 312 L. Error Analysis 317 C. Stability Derivatives from Flight Test Data 3183.7 327 L. Prediction Analysis 328 B. Burled Elastic Wave Source 336 C. Pattern Identification 369.1 26.1 270.2 28.1 290.1 290.2	261 C.	Fourier Synthesis for Crystal Sturctures	3.0
274 N. Multiple Scattering 26.1 278 N. Energy Levels of Diatomic Hydrides LiH 285 N. APW as Applied to Chromium Crystal 290 N. Polarizability Effects in Atoms and Molecules 312 L. Error Analysis 317 C. Stability Derivatives from Flight Test Data 318.7 327 L. Prediction Analysis 328 B. Buried Elastic Wave Source 336 C. Pattern Identification 326 11 327 L. Pattern Identification 327 L. Pattern Identification 328 D. Pattern Identification 329 L. Pattern Identification	262 N.	Evaluation of Two-center Molecular Integrals	26.6
278 N. Energy Levels of Diatomic Hydrides LiH 285 N. APW as Applied to Chromium Crystal 290 N. Polarizability Effects in Atoms and Molecules 312 L. Error Analysis 317 C. Stability Derivatives from Flight Test Data 318 C. Prediction Analysis 328 B. Buried Elastic Wave Source 336 C. Pattern Identification 509.9 42.7 42.7 42.7 42.7 42.7 42.7 42.7 45.4 45.4 45.4 45.4 45.4 45.4 45.4 45	273 N.	Cosmic Ray Air Shower	369.1
278 N. Energy Levels of Diatomic Hydrides LiH  285 N. APW as Applied to Chromium Crystal  290 N. Polarizability Effects in Atoms and Molecules  312 L. Error Analysis  72.0  317 C. Stability Derivatives from Flight Test Data  183.7  327 L. Prediction Analysis  328 B. Buried Elastic Wave Source  52.3  336 C. Pattern Identification	274 N.	Multiple Scattering	26.1
285 N. APW as Applied to Chromium Crystal 42.7 290 N. Polarizability Effects in Atoms and Molecules 45.4 312 L. Error Analysis 72.0 317 C. Stability Derivatives from Flight Test Data 183.7 327 L. Prediction Analysis 194.0 328 B. Buried Elastic Wave Source 52.3 336 C. Pattern Identification 15.0	278 N.		509.9
290 N. Polarizability Effects in Atoms and Molecules 312 L. Error Analysis 72.0 317 C. Stability Derivatives from Flight Test Data 183.7 327 L. Prediction Analysis 194.0 328 B. Buried Elastic Wave Source 52.3 336 C. Pattern Identification 15.0		The state of the s	42.7
312 L.Error Analysis72.0317 C.Stability Derivatives from Flight Test Data183.7327 L.Prediction Analysis194.0328 B.Buried Elastic Wave Source52.3336 C.Pattern Identification15.0	290 N.		45.4
317 C.Stability Derivatives from Flight Test Data183.7327 L.Prediction Analysis194.0328 B.Burled Elastic Wave Source52.3336 C.Pattern Edentification15.0	312 L.	·	72.0
327 L. Prediction Analysis194.0328 B. Buried Elastic Wave Source52.3336 C. Pattern Identification15.0			183.7
328 B. Buried Elastic Wave Source 52.3 336 C. Pattern Identification 15.0		<del>-</del>	
336 C. Pattern Identification 15.0		· · · · · · · · · · · · · · · · · · ·	
337 N. Nonlinear 2nd Order Diff. Eqs. 29.6		Nonlinear 2nd Order Diff. Eqs.	29.6