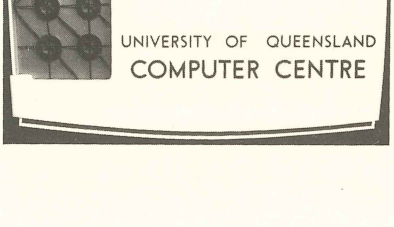
UNIVERSITY OF QUEENSLAND

COMPUTER CENTRE



SIXTH ANNUAL REPORT

1st January to 31st December 1967

UNIVERSITY OF QUEENSLAND

C O M P U T E R C E N T R E

SIXTH ANNUAL REPORT

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F O R E W O R D

Previous reports have dealt with the growth of the academic and service bureau functions of the Computer Centre with the GE 225 system as the sole facility.

A most significant step has now been taken in the development of improved computer services for University Departments and indeed for many non-University organisations. A dual-processor multiprogrammed computer with remote terminals has been ordered for delivery in April 1968, and thus greatly extended services will be provided, while still retaining the original system.

The financing of the initial stage of the new system and the desired development will however require close attention to revenue matters since it is clear that, unless there is a changed attitude by the Australian Universities Commission regarding allocation of capital sums, this new venture must be virtually self-supporting.

To strengthen the growth of the academic functions of the Centre, full departmental status is warranted. This is a planned development for the immediate future.

S.A. Prentice

Chairman
Computer Centre Executive Committee

March, 1968

MEMBERSHIP - COMPUTER CENTRE EXECUTIVE COMMITTEE 1967

Professor S.A. Prentice, B.Sc., M.E.E., MIE(Aust.), FIEE	Professor of Electrical Engineering (Chairman)
Professor D.W. McElwain, M.A., Ph.D., F.BPsS	Professor of Psychology (Deputy Chairman)
Professor D. Mugglestone, B.Sc., Ph.D., FRAS, FIP, FAIP	Professor of Physics
Professor J.C. Mahoney, ED., B.Litt., M.A., B.A.	Professor of French (President, Professorial Board)
Professor C.S. Davis, D.F.C., M.Sc., Ph.D.	Professor of Mathematics
Professor R.G.H. Prince, B.E., B.Sc., Ph.D., AMIChemE	Professor of Chemical Engineering
Professor S. Lipton, M.Sc.	Professor of Mathematics
Dr. S.A. Rayner, M.Ed., Ed.D., M.A.	Deputy Registrar
*Mr. K.S. Pope, LL.B. (London)	Treasury Department
Mr. R.E. Kelly, B.E.	Senior Lecturer in Computing (Officer-in-Charge)
Mr. E.J. Sokoll, B.E.	Lecturer in Computer Electronics
Mr. E.D. Murray, M.C., B.E., MIE(Aust.), FIEE	Chairman, Computer Centre Advisory Committee, University College of Townsville.
Mr. I.M. Hunter, B.Sc., AMIE(Aust.), AMIMechE, MIEE.	Lecturer in Computing, University College of Townsville.

*resigned 21.7.67

STAFF OF THE COMPUTER CENTRE 1967

(at 31.12.67)

Officer-in-Charge and Senior Lecturer in Computing	R.E. Kelly, B.E.
Lecturer in Computer Electronics	E.J. Sokoll, B.E.
Lecturer in Computing*	I. Oliver, B.Sc., B.Econ., Dip.A.C.
Lecturer in Computing (Systems Programming)	C.C. de Voil, B.E., M.Eng.Sc.
Lecturer in Computing (Temporary 1967)	R.N. Buchanan, B.Sc., Dip.Ed., Dip.A.C.
Demonstrators (Programmers)	J.S. Williams, B.Sc., Dip.A.C. G. Sonkkila, B.Sc.
Administrative Officer	J. Jauncey
Maintenance Technicians	G.L. Jerrard D. Brunner
Computer Operators	Patricia Banks Anne McArthur Noela Sparke Patricia Stevens Helen Otte
Data Preparation Assistants	Diann Wilkins Jackie Wilson
Steno-Typists	Delphine Dare Carole Chapman

*on leave 1967

ANNUAL REPORT

INTRODUCTION

The rapid growth in demand by University Departments and Administration, evident in 1966, required full three-shift operation in 1967 and confirmed the need for a new computer system of much increased capability.

The academic functions were extended to meet new demands for courses with consequent limitations on the research work of the staff. Further, a great deal of time has been devoted to details of the new computer system, particularly to preparation of software and to studies related to the economics of future operations.

Plans for rearrangement of facilities, following approval for the use of the Applied Mechanics Laboratory also required a major contribution of time by Computer Centre staff.

EXECUTIVE COMMITTEE ACTIVITIES

The Committee's main activity has been related to the selection of a new computer system and consideration of a policy on charges, in the light of very limited support from the Commonwealth and State Governments.

The Senate Committee on the future development of the Computer Centre advised that an increase in charges for administrative processes was appropriate and that non-University users should pay at rates which would bring a reasonable return to the Computer Centre.

The Executive Committee endorsed the submissions by the Officer-in Charge of the Computer Centre noting that computer charges for the PDP 10 system were based on facilities used by a particular program. Three scales appropriate to the different groups of users were agreed to.

STAFF CHANGES

Mr. I. Oliver was granted leave of absence for one year to take up a position at Ohio State University.

The following new appointments were made:

Lecturer in Computing	-	R.N. Buchanan, B.Sc., Dip.Ed., Dip.A.C. (formally Senior Demonstrator - temporary appointment)
Senior Demonstrator	-	C.C. de Voil, B.E., M.Eng.Sc.
Demonstrator	-	J.S. Williams, B.Sc., Dip.A.C.

TEACHING AND LIAISON ACTIVITIES

The teaching activities were further augmented and an increased number of persons attended programming courses, bringing the total since 1961 to approximately 2,200. In addition to the programming courses set out below, staff gave over 350 lectures, conducted 300 tutorials and seminars while demonstrating and consulting services occupied a further 1,500 contact hours.

Programming Courses and Enrolments

Type of Course	No. of Courses	Number Enrolled
Elementary Programming (GAP)	1	21
Basic FORTRAN	5	109
Advanced FORTRAN	1	56
GECOM	1	17
Totals	8	203

In addition to the above "service" courses, undergraduate teaching of computer courses increased substantially.

Enrolments for the postgraduate Diploma in Automatic Computing decreased to 12 (2 full-time, 10 part-time). Arrangements for the introduction of the new postgraduate Diploma in Information Processing were finalised.

Computer Centre staff participated in a number of conferences and symposia and delivered lectures to various professional bodies, including the Australian Computer Society; Australian Institute of Management; Institution of Engineers, Australia; Institution of Radio and Electronics Engineers; and a Vacation School - "Computers in Civil Engineering". The Officer-in-Charge of the Computer Centre, Mr. R.E. Kelly was Chairman of the Australian Computer Society, Queensland Branch for 1967.

RESEARCH AND DEVELOPMENT

A number of programs for general use have been developed at the Computer Centre. These are listed in Appendix I. During the year a considerable effort was involved in revising and upgrading software systems to take advantage of the additional 8K memory.

The reduction of consulting time has had the desired effect of allowing more staff to be devoted to development. A larger proportion of staff time will be directed towards program development from 1968 onwards for the PDP 10 computer system, but a further reduction in consulting services is not envisaged.

During the year, a significant proportion of time was spent in developing the FORTRAN IV system for the GE 225, and for programming an extensive scientific package in FORTRAN IV. The objective was to provide a compatible set of programs for the GE 225 and PDP 10.

A number of hardware modifications were made to the GE 225 to improve further the high reliability of this system. These modifications included a "stop at top of page" feature on the high speed printer, and improved protection of the central processor power supply. Design of an 8-bit N register for the paper tape unit, and an enlarged character set on the high speed printer have begun and should be implemented in 1968. Publications by the Computer Centre Staff are listed in Appendix II.

COMPUTER USE

The distribution of computer time is illustrated in Figure 1 which shows the proportion of time used by various functions.

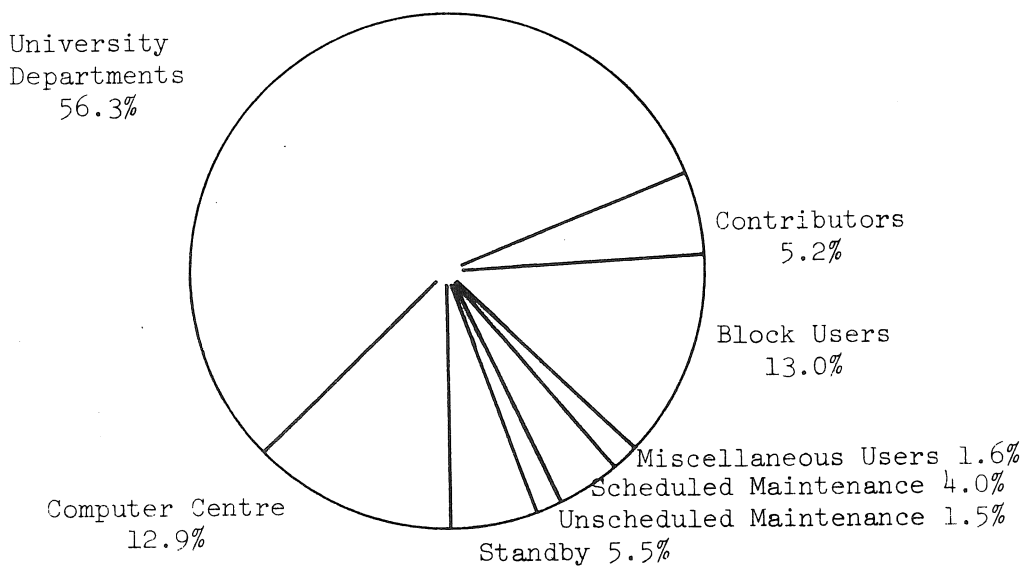


Fig. 1. Distribution of Hours of Total Switched-on Time (4,314 hrs. = 100%)

The total switched-on time for the year was 4,314 hours with a total usetime of 3,869 hours. This latter figure should be compared with a scheduled availability of 4,212 hours. It is again obvious that the availability of the computer is limiting the time used. For this reason full three-shift operation was introduced during October.

Appendices III and IV show the distribution of computer time used by University Departments and non-University organizations, respectively. The computer time shown as 'Computer Centre' is significantly greater than other users, this time being distributed between development projects, demonstrations and normal operating overheads. It should be noted, that use of the computer by University Departments is increasing rapidly, while external use is gradually falling off. Despite the installation of a number of other computer systems in Queensland during recent years, the use of the computer by external organisations continues to be significant.

A graph of the growth of computer use since 1962 is shown in Figure 2. The continued upsurge in computer use for University purposes results from increasing requirements for undergraduate teaching and administration.

Most users of the computer facilities have provided a list of new programs developed during the year, and this information, edited for uniformity of presentation is given in Appendix V. Attention is drawn to the very wide variety of computation and data processing work which has been carried out with the present facilities.

FACILITIES AT TOWNSVILLE UNIVERSITY COLLEGE

The IBM 1620 equipment has continued in service at Townsville University College but is approaching saturation. A grant of $40,000 has allowed disc and line printer facilities to be added to the system in the past year. The loan of the basic system is subject to periodical review by the Computer Centre Executive Committee.

BUILDINGS AND AIR CONDITIONING MODIFICATIONS

Following the decision to instal a new computer system in 1968 while still retaining the GE 225 system, and agreement by the Faculty of Engineering to transfer the Applied Mechanics Laboratory to the Computer Centre, a major rearrangement of the building space and redesign of the air conditioning were found necessary. The Commonwealth Department of Works undertook the redesign and construction of the air conditioning services while ensuring that the existing computer system would continue in service. The complexity of the programme would have made it impractical to call tenders and the University is again indebted to personnel of the Department for excellent planning and the fullest possible cooperation.

Additional space has been provided for staff thus enabling a post-graduate room to be transferred to the Department of Chemical Engineering early in 1968.

FINANCIAL POSITION

The financial position, shown in Appendix VI, is considered satisfactory. The salary payments of the members of staff are arranged thus:

University General Funds	10
Computer Centre Operations Account	10

The Sinking Fund, originally established to provide for minor capital equipment additions and/or replacements, has been added to substantially and is intended to be used, in full, towards the purchase of the proposed new system.

NEW COMPUTER SYSTEM

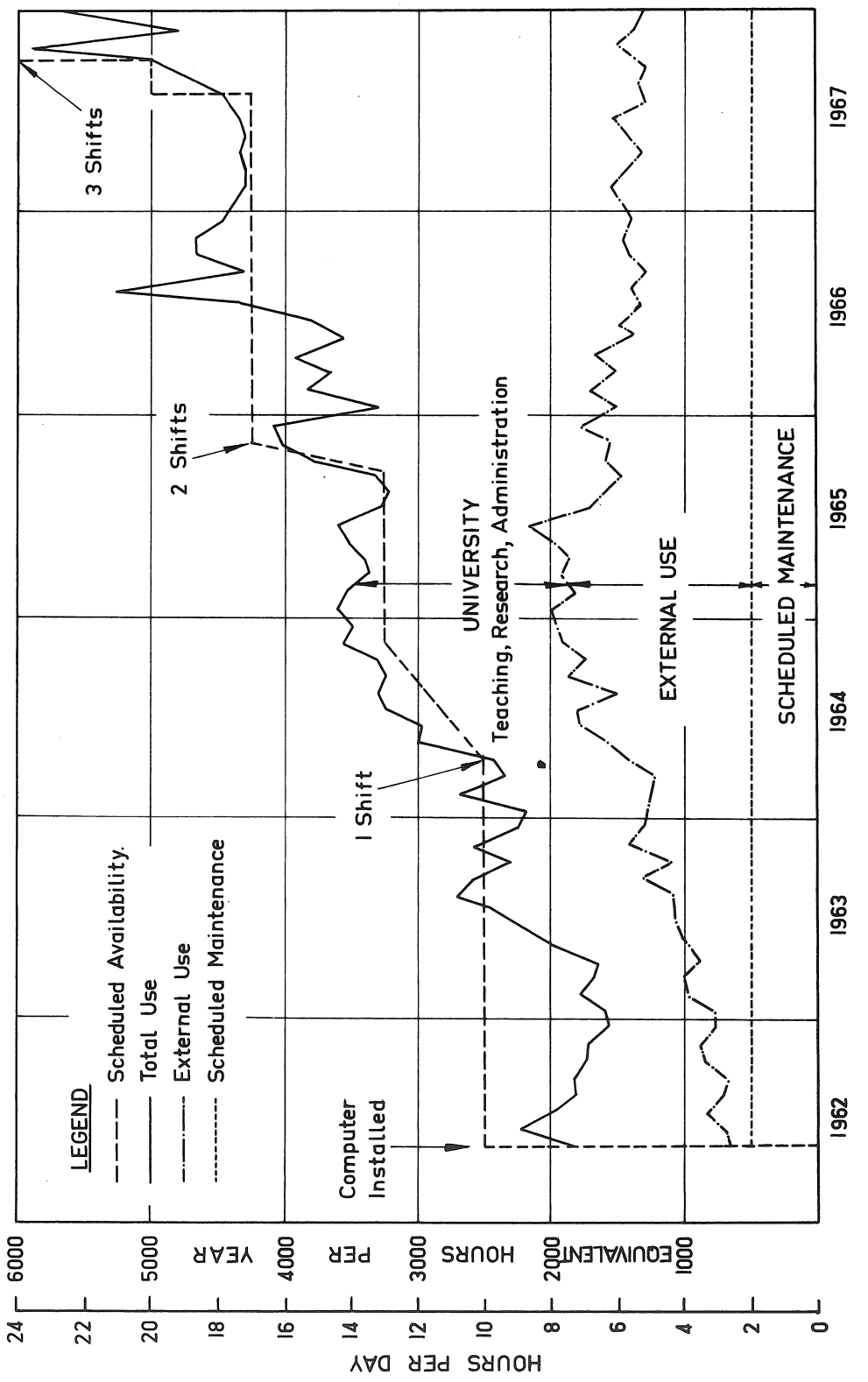
The University has placed an order for a dual processor PDP 10 computer system, manufactured by Digital Equipment Corporation, Mass., U.S.A. This time-sharing system will augment the present GE 225 and will make available significantly improved computer facilities for research and teaching purposes. It is expected that the operation of the PDP 10 will result in reduced per unit computing costs. Full details of the PDP 10 will be given in a separate publication.

FUTURE NEEDS

In spite of the difficulties already encountered over finance of the initial stage of the new system, plans for expansion of the system have been developed for the period 1968-1972. The additional needs will include a further number of remote terminal stations and file storage facilities.

Full departmental status is now overdue and the establishment of a Chair in Computer Science will be sought during 1968.

FIG. 2. GROWTH OF COMPUTER USE 1962–1967



APPENDIX I

DEVELOPMENT PROJECTS - COMPUTER CENTRE STAFF

The following programs have been developed by Computer Centre Staff members during 1967.

C.C. de Voil	New Tape routines for FORTRAN IV - To provide proper binary tape facilities and to include a number of safe-guards against faulty use.
	NOT, LAND etc. - Logical functions on a bit by bit basis for FORTRAN IV.
	Relocatable Binary Deck Analyser - Tabulates all card images produced for FORTRAN IV or MCML II.
	CPYMG - Card Fortran to FORTRAN IV magnetic tape translating and copying program.
G.M. Sonkkila	Additional routines for FORTRAN IV monitor to recognize additional Job Card fields.
	A series of elementary statistical subroutines for FORTRAN IV.
J.S. Williams	A series of matrix subroutines for FORTRAN IV.
	Modifications to the General Purpose lister to give proper treatment of FORTRAN card images.
	Solution of simultaneous linear differential equations using Runge Kutta integration. - A modified version of INTEGRATE, for FORTRAN IV.
	A program for the analysis of Job Statistics.
	WISP - A list processing language.
E.J. Sokoll	Complete revision of GAP to include Macro and relocatable pseudo-operations.
	Programs for finding the distinct representatives of a set.
	Improved synchronous switch for magnetic tape system.
	Stop at top of page feature on high speed printer.

APPENDIX I - Continued.

E.J. Sokoll — Power supply protection in central processor

Paper tape 8-bit N register specifications.

R.N. Buchanan — Simplex Package: This package replaces the previous Simplex Package. It is intended as an aid in the studying of linear programming and very comprehensive tableaus may be printed after each iteration.

Simplex Subroutine: The Simplex Subroutine is written in FORTRAN IV and solves Linear Programming problems by means of the Simplex Method.

Mixed Programming Package: This package allows the user to restrict some (or all) of the variables in L.P. problems to be integral. It handles most mixed C.P. problems satisfactorily but occasionally the program will not find a solution when one can be proved to exist. A solution to this aspect is currently being sought.

Plot Subroutine: This FORTRAN IV subroutine plots several cross variables against a base variable.

NOTE that considerable effort has been expended in

(a) Testing and conversion of standard programs to work in the 16K environment.

(b) Conversion of existing programs to FORTRAN IV

APPENDIX II

I. Oliver — *Analysis of Factorial Experiments using Generalized Matrix Operation.* Association for Computing Machinery Journal, Vol. 14, pp. 508-519, July, 1967.

APPENDIX III

DISTRIBUTION OF COMPUTER TIME (HRS.) USED BY UNIVERSITY DEPARTMENTS

Code	Month and Working Days / Department	Jan. 20	Feb. 17	March 17	April 21	May 19	June 16	July 21	Aug. 18	Sept. 22	Oct. 20	Nov. 17	Dec. 22	1967 TOTALS	TOTAL TO DATE
001	Computer Centre	21.6	35.2	33.4	39.3	26.9	28.3	51.1	42.8	71.4	79.4	35.8	78.8	544.0	2,957.6
002	Civil Engineering	4.9	10.7	13.1	18.8	19.3	22.5	21.0	12.4	23.7	21.6	12.8	8.8	189.6	331.4
003	Economics														8.0
004	Physics	14.0	16.4	25.0	31.6	24.7	24.9	27.0	24.9	29.5	33.4	75.0	63.5	389.9	1,592.7
005	Psychology	1.2	3.7	4.0	1.1	4.0	3.7	6.3	17.5	12.4	5.3	5.8	0.3	65.3	270.1
006	Electrical Engineering	5.8	15.5	11.3	7.7	1.9	5.7	2.3	2.6	4.5	10.7	7.7	6.0	81.7	314.9
007	Mechanical Engineering	1.6	9.3	9.6	9.2	6.8	8.6	6.6	10.8	13.2	13.2	12.5	10.4	111.8	334.6
008	Mathematics	2.7	0.8	1.7	2.7	4.7	2.5	0.3	0.2	1.1	2.2	1.5	0.7	21.1	154.6
009	Geology														26.0
010	Animal Husbandry		0.3	1.5	2.5	3.5	2.4	2.6	2.5	1.5	0.8	0.9	3.2	21.7	242.6
011	Data Processing	37.4	77.1	73.1	72.3	56.9	66.3	101.1	65.4	121.1	71.2	69.8	138.6	950.3	1,617.3
012	Agriculture	2.7	1.5	1.3	3.8	4.4	8.5	18.0	7.4	10.1	14.0	12.2	7.8	91.7	191.8
013	Education	0.8	0.5	1.4	0.3	1.2	4.2	3.5	0.7	1.3	6.4	2.3	14.8	37.4	143.0
014	Mining and Metallurgy	1.8	2.6	5.8	6.0	1.3	2.1	4.2	0.8	3.9	9.1	5.7	6.1	49.4	198.3
015	Computer Research														33.7
016	Parasitology							0.7	0.4	0.1	0.2	0.5	0.2	2.1	22.1
017	Veterinary Preventive Medicine	0.2												0.2	43.1
018	Surveying	0.2	2.9	2.7	4.1	3.3	2.3	0.6	0.1		1.4	1.1	1.6	20.3	26.6
019	Veterinary Anatomy			0.1									0.1	0.2	17.1
020	English	0.6			0.1	0.9	0.6	2.1	0.5	2.4		0.2	1.0	8.4	23.4
021	Veterinary Clinical Studies														2.6
022	Remedial Education		1.0					0.2					0.4	1.6	9.0
023	Accountancy				0.8	0.3		0.3	0.2	0.4	0.1	0.6		2.7	4.1
024	Microbiology	0.2		1.3	2.7					0.5	2.4	3.3	5.1	15.5	53.3
025	Physiology			0.3	0.6	0.3	0.3	1.7	2.8	1.4	0.8	0.9	1.3	10.4	11.5
026	Chemistry	1.5	4.7	5.9	5.7	2.8	2.4	5.6	3.8	7.2	11.4	8.0	11.6	70.6	140.1
027	Geography														12.6
028	Townsville University College	1.2	0.4											1.6	7.1
029	Child Health	0.4	0.3		0.1									0.8	10.5
030	Social and Preventive Medicine	1.8	0.9	1.3	0.1		0.8	3.9	2.1	1.7	0.2	1.3	3.5	17.6	46.7
031	Examinations Section		2.7	0.3										3.0	42.9
032	Botany						0.2		0.4	0.3	0.3	0.2		1.4	4.6
033	Philosophy														
034	Chemical Engineering		0.2	2.8	5.1	10.8	9.7	19.1	20.5	31.2	14.8	8.6	12.3	135.1	244.7
035	History														2.0
036	Zoology														0.1
037	Dentistry	6.3	2.7	3.1	7.0	4.2	1.1	6.7	7.8	5.3	7.0	14.6	16.9	82.7	176.8
038	Administration														2.1
039	Surgery	0.7		0.4								0.1		1.2	18.0
040	Photography	0.4	0.9	1.2	1.6	1.6	1.4	1.9	1.7	1.0	1.5	1.2	1.8	16.2	37.1
041	Social Studies				0.1	0.1	0.1	1.8	0.9	1.2	0.3	0.1	0.3	4.9	4.9
042	Anatomy														2.8
043	King's College														0.5
044	French														
045	Neurology	0.2				0.1								1.0	2.5
046	Anthropology and Sociology				0.7	1.3	1.5	1.8	2.2	2.6	1.1	1.8	1.2	13.5	20.1
047	Institute of Technology														0.2
048	Veterinary Science Faculty														2.1
049	Medicine (Medical School)		0.9	1.1	0.2								0.3	2.5	4.2
050	Political Science		0.4	0.1	1.3		0.7	3.0	2.9	7.3	6.5	7.8	4.3	34.3	34.6
051	External Studies	4.4				1.0	1.2	1.9	0.2	0.4	0.4		9.8	19.3	24.7
052	Pharmacy				0.7	3.0								3.7	3.7
053	Biochemistry														
054	Student Counselling								0.6	0.3	3.2	3.9	2.4	10.4	10.4
055	Medicine (Princess Alexandra Hospital)										0.2		0.1	0.3	0.3
056	Entomology											0.3	0.3	0.6	0.6
057	Pathology											0.3	0.5	0.8	0.8
	TOTALS	112.6	191.6	201.8	226.2	185.3	202.0	295.3	235.1	357.0	319.1	296.8	414.0	3036.8	9487.1

APPENDIX IV

DISTRIBUTION OF COMPUTER TIME (HRS.) USED BY EXTERNAL ORGANIZATIONS

Code	Month and Working Days / Organisation	Jan. 20	Feb. 17	March 17	April 21	May 19	June 16	July 21	Aug. 18	Sept. 22	Oct. 20	Nov. 17	Dec. 22	1967 TOTALS	TOTAL TO DATE
	CONTRIBUTORS:														
101	Main Roads Department *														1,046.2
102	Southern Electric Authority *	2.9	1.6	3.6	4.5	*								12.6	204.0
103	Primary Industries Department *														120.9
104	Irrigation & Water Supply Comm.	6.3	7.8	6.1	3.7	4.6	1.5	3.0	3.0	5.4	4.0	*		45.4	266.7
105	Co-Ordinator General's Dept.	5.4	5.3	4.3	6.1	4.7	8.2	6.2						40.2	141.7
106	Forestry Department *														157.2
107	Survey Office *														105.4
108)															
109)	Brisbane City Council *														157.1
110)															
111	Aust. General Electric ϕ						0.3	0.8	1.3					3.5	9.0
112	Queensland Govt. Railways *	0.7	0.4		0.6	1.9		3.6	2.9	2.8	4.7	1.2	2.5	20.2	52.2
113	P.M.G. Department *			0.3	0.1	0.9	1.3	8.9		8.1	2.0	5.0	3.7	30.3	61.6
114	C.S.I.R.O. *	0.7	0.1											0.8	148.0
115	State Electricity Comm. of Queensland *				2.7	5.0	4.6	2.0	7.9	4.1	0.9	8.0	7.4	42.6	47.3
116	Mt. Isa MInes Ltd.	0.7	0.4											3.5	26.9
117	Wide Bay-Burnett R.E.B.				0.6	1.9		3.6	2.9	2.8	4.7	1.2	2.5	20.2	167.8
118	Capricornia R.E.B.			0.3	0.1	0.9	1.3	8.9		8.1	2.0	5.0	3.7	30.3	20.6
119	Cardno and Davies	0.7	0.1											0.8	40.6
120	Townsville R.E.B.				2.7	5.0	4.6	2.0	7.9	4.1	0.9	8.0	7.4	42.6	47.3
121	Cairns R.E.B.	0.2	0.3	1.0	1.4	3.7	5.7	1.5	3.0	5.7	0.1	2.7	6.3	31.6	45.7
122	Mackay R.E.B.	0.4	1.3											1.7	36.8
															3.1
	TOTAL CONTRIBUTORS	16.6	16.8	15.3	19.1	20.8	21.6	26.0	18.1	26.1	11.7	16.9	19.9	228.9	2,858.8
	BLOCK USERS:														
401	Main Roads Department	0.2	0.1	0.1	0.1	0.2	0.5	0.7	0.9	0.2		0.7	0.8	4.5	470.4
402	Southern Electric Authority					2.8	7.6	3.4	1.9	1.6	3.2	3.6	4.7	28.8	28.8
403	Primary Industries							4.9	4.6	4.5	5.8	6.9	8.4	35.1	71.0
404	Irrigation & Water Supply Comm.											3.2	5.3	8.5	8.5
406	Forestry Department	2.0	6.5	2.3	3.9	0.7	1.3	1.9	1.9	0.5	0.3	2.9	0.2	24.4	145.8
407	Survey Office	2.7	3.8	5.8	6.8	3.0	4.9	2.9	2.2	1.6	0.7	1.6	1.0	37.0	110.7
408)															
409)	Brisbane City Council (Works)						0.4		0.4	0.2	0.3	0.5	0.1	2.1	2.1
410)	(Elec.)	7.1	6.1	5.6	5.1	11.1	15.8	9.7	2.4	6.7	6.2	2.9	2.6	81.3	94.8
412	Queensland Govt. Railways	0.1	0.2			1.8	0.1		0.1					2.3	22.3
413	P.M.G. Department	1.2	4.9	7.3	10.4	3.3	5.3	9.5	3.6	2.9	3.7	9.0	5.2	66.3	165.6
414	C.S.I.R.O.	3.1	6.5	8.0	2.9	0.3	3.4	4.1	3.9	2.9	1.8	1.5	1.9	40.3	182.9
415	State Electricity Comm. of Queensland	2.6	3.9	8.5	3.8						1.9	0.5	6.4	27.6	117.5
423	Commonwealth Dept. of Works	5.4	12.3	11.3	11.3	8.5	10.4	11.1	17.9	19.9	25.1	16.7	9.2	159.1	238.1
424	Sugar Research Institute	3.9	10.3	1.6	2.1	2.2	1.4	2.2	1.3	3.4	15.8	2.1	7.3	53.6	90.1
	TOTAL BLOCK USERS	28.4	54.7	50.5	46.4	33.9	51.1	50.5	45.0	44.4	64.8	52.1	53.1	574.9	1,752.6
	TOTAL MISCELLANEOUS USERS	9.3	7.9	9.4	11.4	12.2	4.6	4.5	1.8	2.3	4.2	1.6	3.4	72.6	306.8
	TOTALS	54.3	79.4	75.2	76.9	66.9	77.3	81.0	64.9	72.8	80.7	70.6	76.4	876.4	4,918.2

* Converted from Contributor to Block User status. ϕ Special contract now terminated.

APPENDIX V

SOME WORK CARRIED OUT BY USERS OF THE COMPUTER IN 1967

UNIVERSITY DEPARTMENTS

Dept. No.	Department	Work carried out on Computer
002	CIVIL ENGINEERING:	
	J. Meek R. Nilsson C. O'Connor J. Behan	Programmes for Section I of Vacation School in Computers in Civil Engineering - placed on CIVSYSTEM tape.
	J. Meek	Rayleigh-Ritz method for elastic vibrations.
	J. Meek G. Carey	Axi-Symmetric finite element analysis.
	J. Meek G. Brameld	Elastic response of high rise buildings to seismic accelerations.
	J. Meek N. Long	Iteration of residuals in banded equation solutions.
	J. Meek W. Stitz	Expanded FORTRAN IV version of two dimensional frame analysis programme with load generation and intermediate bending moments.
	C. O'Connor	DESIGN - programmes for analysis of joints and elastomeric bearings. Subroutine for solution of nonsymmetric banded equations.
	R. Nilsson	PLASTIC : determination of collapse load factors. COGO 100 : simple version of a problem oriented language for coordinate geometry type surveying calculations. SMIS 1760 : fixed field problem oriented language for matrix operations. POLYFIT : least squares polynomial fitter with provision for determining confidence limits.
	R. Nilsson G. Brameld	SMIS 3000 : free field problem oriented language for matrix and submatrix operations.
	R. Nilsson J. Behan	SCHEDULE : simple reinforicng steel schedule preparation.
004	PHYSICS:	
	I.M. Brazier	Conversion of special paper tape data to card data. Graphing and W XY plotting. Auto and cross correlations. Power Spectra - all concerned with analysis of micropulsation data.

APPENDIX V - Continued.

Dept.No.	Department	Work carried out on Computer
004	CONTD.	
	J.D. Whitehead	Project 1 : Calculation of the effect of vertical ion drifts taking into account recombination with electrons and diffusion. Project 2 : A study of instabilities in gradients of ionization.
	Parsons et al	Microwave Group - numerical integration of expressions derived during a theoretical analysis of the shapes of microwave spectral lines.
	L.F. McNamara	Solar Astrophysics : Development of a method for the determination of the source function in a non-uniform (Plane-parallel) atmosphere for a multi-level atom under non-LTE conditions.
	J.D. Argyros	Solar astrophysics : Attempts at integration of a pathological function occurring in a generalized form of the frequency redistribution function for non-coherent scattering.
	L.A. Meara	Very low frequency radio propagation : Solution of complex model resonance equation by Newton's method. Curve fitting of experimental data by least squares (parabolic, cubic et alia). Calculation of sunrise and sunset times, and sunrise locations at specified times, on great-circle paths on the earth's surface. Attempted simulation of phase and amplitude curves during sunrise transition, involving theoretical calculation of phase and amplitude from propagation and path parameters.
	R. Clarke	Behaviour of various R.F. swept-frequency antenna and receiver networks.
	M.J. Burke	Evaluation of the coefficients of an ellipsoid for ionosphere measurements and error analysis.
	J.P. McGilvray	Group of programs (Fortran IV) for the reconstruction of sealed sources locations from stereo-radiographs.
	A. Mir	The calculations of skip angle, focussing factor at skip angle, and the backscatter coefficient for sea and land.

APPENDIX V - Continued

Dept.No.	Department	Work carried out on Computer
005	PSYCHOLOGY:	
	L.E. Enticknap	Study of personality and perception. Analysis of students' results.
	G.T. Evans	Categorizing behaviour
	A.V. Everett	Semantic factors in need achievement
	A. Howard	Scaling procedures
	H.G. Law	Scaling religious attitudes
	H.W.C. Pickett	Analysis of personality inventory items Factor analytic study of psychophysiological processes
	J.J. Ray	Study of interpersonal distance
006	ELECTRICAL ENGINEERING;	
	P. Calder	Sampled Data Control System Response. The time response to a step or ramp input of a sampled data position control system is computed by this program, by solving the set of first order differential equations which describe the dynamics of the continuous plant. The error information is updated at the sampling times, the system running open loop between samples. The program can handle linear and non linear systems up to 8th order.
	N. Gentle	Two programs to calculate marginal capacities for use in the design of telephone networks. Both programs use equivalent random methods for circuit groups offered non-random traffic. One program calculates marginal capacities for full availability groups while the other calculates marginal capacities for geometric groups.
	L. Skattebol	Signal detection by autocovariance model simulated. Radar detection model sequential plotting subroutine.
	S.G. Fraser	An optimisation program using a gradient method to find extrema of a performance index in a parameter space of up to eight dimensions.
	R.E. Hurley T.M. Parnell	Analysis of the dynamical behaviour of a charged field-emitting particle in an electrostatic field. Simultaneous solution of the Fowler-Nordheim equation and the equation of motion of the particle was required.

APPENDIX V - Continued.

Dept.No.	Department	Work carried out on Computer
007	MECHANICAL ENGINEERING:	
	A.W. Chaseling	Evaluation of the means square error and integral square error for Linear Control Systems up to 7th order.
		Probability density distribution programme.
	W.R.B. Morrison	Correction programme for Hot Wire Non-linearities.
	K.P. Byrne	Spectral Analysis of Ground Profiles.
	G.E. Russell	Determination of best operating conditions for three roll sugar mills.
	G.F. Harvey	Frequency response of a tractor represented by a two degree of freedom model.
		Sub-routine for determining the co-ordinates of contour levels.
		Spectrum of tractor vibrations determined from the frequency response and a representation of the ground spectrum
		Programmes for determining correlations and spectra for two parallel tracks using survey data.
	M. Winders	Cooling Tower Optimization programmes.
008	MATHEMATICS:	
	B.L. Adkins	Analysis of multifactor dental experiment.
	L. Bass	Computations of membrane potentials.
	L.E. Howard	Earthquake location problems. Gravity Interpretation.
	A.S. Jones	Calculations of blood flow.
	H. Rasmussen	Numerical integration of ordinary differential equations.
	W.G. Spunde	Calculations on free convection.

APPENDIX V - Continued.

Dept.No.	Department	Work carried out on Computer
012	AGRICULTURE:	
	I.F. Horton	Calculation of nett assimilation rates and analysis of these. Analysis of physiological data. Programme to carry out multivariate - covariance analysis of soil and plant data.
	M.C. Waldron	Sugar experiment (designed as Lattice square) analysis with varied transformation of data. Genetic correlation and regression on data.
		Analysis of variance of agronomy research data studies of the use of Antitranspirants on sorghum.
		Accounting programme for the department giving detailed account of maintenance moneys under specified sections.
		Programmes concerned with analysis of data from Downs wheat - rainfall studies. Card data transferred to magnetic tape ready for analysis programme to total wet periods in specific groupings of months, using this information in correlation and regression programmes. Frequency distributions of amount of rainfall and length of wet period. Correlation and regression of deviations between estimated and actual yield to study effect of cultivation.
0.3	EDUCATION:	
	R.P. Tisher	Exploratory analysis for dimensions on factors underlying the classroom behaviour of teachers and pupils.
		Sequential analysis of the verbal behaviour of science teachers.
		An examination of the effects of teacher behaviours and pupil characteristics, and the interactions between teacher behaviours and pupil characteristics on pupil achievement.
		Regression analysis involving pupil characteristics and pupil outcomes.
	M.A. Colston	Studies of the readability of primary school reading books.

APPENDIX V - Continued.

Dept.No.	Department	Work carried out on Computer
013	CONTD.	
	M.A. Colston	Investigation into the psychological meaning of the Minnesota Teacher Attitude Inventory.
		Development of programs for an investigation into students' attitudes and values.
	J.M. Genn	Marking tests and various statistical analyses in connection with a study being made of transition from secondary school to university in the subject of Chemistry.
014	MIN. & MET. ENGINEERING:	
	W.J. Whiten	Steady state simulation programme for arbitrary industrial grinding circuits consisting of ball mills, hydrocyclones and rake classifiers.
		Programme system for steady or unsteady state simulation of industrial grinding process under automatic control.
	P.D. Bush	Steady state simulation of breakage and mixing characteristics of continuous ball mill and operating in open circuit.
	D.J. McKee	Prediction of isothermal freezing contours of weld pools in automatic MIG welding of Aluminium.
016	PARASITOLOGY:	
	R.W. Sutherst	Routine regression and covariance
		Routine probit analyses
		Factorial arrangements of probit data
018	SURVEYING:	
	I.A. Harley	Camera resection in three dimensions. Partial calibration of close-range camera. Simple survey computations.
	P.C. Miller	General survey computations.

APPENDIX V - Continued.

Dept.No.	Department	Work carried out on Computer
023	ACCOUNTANCY:	
	G.G. Meredith	Effective rate of return of alternative investment projects given probability estimates of cash flow patterns. Interest return on investment given unlimited useful life of project.
024	MICROBIOLOGY:	
	E. Szabo	Single-linkage cluster analysis of the Sneath type.
		Complete-linkage cluster analysis, devised by Skerman and Szabo.
		Intra-cluster and Inter-cluster similarity estimation.
		Printout of similarity matrix in triangular format.
		Median organism estimation.
		Sokal and Michener unweighted variable group average-linkage analysis.
		Complete-linkage modification of the Sneath type of analysis.
		Bacterial culture collection catalogue.
025	PHYSIOLOGY:	
	A. Lipton G.J. Huxham D. Hamilton	Programs for analysis of experimental results
		Ion determination in heart and uterus muscle
		Specific ion electrode. Ion activities in solution
		Marking and analysis of student examination results
		Analysis of multiple choice questions
	S.R. O'Donnell	Linear least squares regression for analysing dose-response relationships
026	CHEMISTRY:	
	J.H. O'Donnell	Electron spin resonance spectra were used to identify and measure the concentrations of free radicals produced in organic solids by

APPENDIX V - Continued.

Dept.No.	Department	Work carried out on Computer
026	CONTD.	
	J.H. O'Donnell	γ-irradiation using a computer programme to calculate the radical concentration from the recorded first differential spectrum. A computer programme was designed to calculate and plot the spectrum to be expected with variations in a number of parameters. Kinetic investigations of radical reactions in the solid state were also analysed by a computer programme.
030	SOCIAL AND PREVENTIVE MEDICINE:	
	J.H.A Cane	Discrimination and allocation with discrete data. Construction of the correlation matrix which uses the maximum available information when many pieces of data are missing.
032	BOTANY:	
	H.T. Clifford	Numerical taxonomic studies of the Monocotyledoneae and Orchidaceae by means of matching coefficient similarity indices.
037	DENTISTRY:	
	B.L. Adkins T.J. Freer	Correlation coefficient program with special provision for missing data.
	I. Horton B.L. Adkins T.J. Freer	"Similarity analysis" of orthodontic patients as a preliminary investigation of indices of malocclusion. Special provision was made for missing data.
	T.J. Freer	Comparison of the data of successive examinations of orthodontic patients and models in order to test reproducibility of technique, with listings of both sets of data.
	T.J. Freer	Program to calculate arch dimensions from photographs using co-ordinates to indicate various landmarks, with provision for calculation of a magnification factor in each photograph.

APPENDIX V - Continued.

Dept.No.	Department	Work carried out on Computer
037	CONTD.	
	T.J. Freer	Calculation of various linear and angular measurements using co-ordinates, directly from lateral skull radiographs with provision for placing the radiograph in any relative position on the co-ordinate measuring apparatus.
041	SOCIAL STUDIES:	
	F. Pavlin	Professional Identification Process. Computation of statistical significances - correlations - factor analyses of data.
050	GOVERNMENT:	
	C.A. Hughes	Characteristics of Brisbane party polling booth workers
	C.A. Hughes J.S. Western	Use of mass media by a national sample
	J.S. Western	Attitudes to social change in Bangkok
	J.S. Western	Professional education in Australian universities
	J.S. Western P.R. Wilson	Political participation of a Queensland sample population
	P.R. Wilson	Police-public relations survey
	P.R. Wilson	Immigrant assimilation in relation to political behaviour
	K. Rowe	Testing of programmes written for calculating frequency distribution, 2, 3 and 4 way matrices, product moment correlations, point biserial correlation on survey data for the Department of Government staff and students
051	EXTERNAL STUDIES:	
	J.M. Genn (now in Education Department)	Marking of tests and various statistical analyses in connection with a study being made of transition from secondary school to University in the subject of Chemistry.
	R.V. McSweeney	Study of values of Queensland adolescents.

APPENDIX V - Continued.

Dept.No.	Department	Work carried out on Computer
052	PHARMACY:	
	W. Owen	Analysis of variants in a five factor experiment using 7 x 7 orthoginal latin squares
		Least squares curve fitting up to a tenth order polynomial by Gauss elimination with iterative refinements and using the Gauss criterion of goodness of fit
		Fitting a recursive line, test for linearity and calculation of inverse fiducial elements.
		Analysis of DSC data to calculate polarity values.
054	COUNSELLING SERVICES:	
		Summary statistics for psychological survey.
056	ENTOMOLOGY:	
	G.H.S. Hooper	Project Analysis of toxicological data.
EXTERNAL ORGANISATIONS		
105	CO-ORDINATOR GENERAL'S DEPARTMENT:	
	J. Gralton	Calculation of ranges and fixes for hydrodist surveying.
119	CARDNO AND DAVIES:	
	N. Gough	Computation of alignment, geometrics and earth-works for roadworks in New Guinea.
121	CAIRNS REGIONAL ELECTRICITY BOARD:	
		Stringing chart calculations for overhead transmission lines.
		Power system fault calculations.
		Statistics from consumers' complaints.
122	MACKAY REGIONAL ELECTRICITY BOARD:	
		Calculation of power system load flow.

APPENDIX V - Continued.

Dept.No.	Department	Work carried out on the Computer
203	CAMERON, McNAMARA AND PARTNERS:	
	G.H. Brameld	Analysis of portal frames. Analysis of three dimensional pile groups. Influence lines for continuous curved bridges. Torsion analysis of curved bridges.
204	MURPHYORES INCORPORATED PTY.LTD.:	
		Calculation of statistical correlations and standard deviations of drill core sample assay results.
205	J.H. COCKERELL:	
		Network analysis of bank of pontoons pinned together.
210	NORTHERN ELECTRIC AUTHORITY OF QUEENSLAND:	
	F.C. Chase	Power system load flow studies Power system stability studies Power system network reduction Statistical analysis of load characteristics Statistical analysis of stream flow records
	B.J. McKeon	Flood routing at Koombooloomba Dam
212	TITLES OFFICE:	
		Processing of survey computations.
214	MACDONALD, WAGNER AND PRIDDLE:	
	P. Higgins	Stability analysis of earth dam. Structural analysis of a single storey, multi-bay trussed frame.
221	AUSTRALIAN MILITARY FORCES:	
	M.A. Colston	Development of programs for item analysis and tetrachoric correlation. Determination of the predictive ability of tests used for selection of Papua and New Guinea university students.

APPENDIX V - Continued.

Dept.No.	Department	Work carried out on Computer
221	CONTD.	
	M.A. Colston J.D. Tucker	Investigation of the factor structure and an analysis of items of items of some army psychological tests.
230	QUEENSLAND EDUCATION DEPARTMENT:	
		Computation of single and multiple correlation co-efficients relating a number of predictive measures with success in Senior Mathematics I and University Pure Mathematics I.
311	DATA PROCESSING SECTION:	
	K. Alderslade H. Brownsdon J. Pieloor A. Robson-Petch J. Wilson	Fortnightly salaries Enrolment lists and statistics Student fees Degree examinations (Arts, Commerce, Law, Education) Senior Examinations UQSSS & insurance payments
340	PHOTOGRAPHY:	
	E.W. Hollywood	Internal accounts
402	SOUTHERN ELECTRIC AUTHORITY OF QUEENSLAND:	
	L. Olsen	Analysis of power system interruption records. Calculation of power system fault current distribution. Determination of fault location on a transmission system from readings of neutral current.
	L. Watts	Analysis of power system load flow, fault level and transient stability.
	N. Galwey	Calculation of coal consumption and energy generated at power stations. Determination of economic generation schedules for forward planning. Coal allocation and costs.
	B.C. Pyra	Survey calculations, profile plotting, and tower spotting for H.V. steel tower transmission lines.
	L. Toigo	Critical path analysis for Swanbank "B" Power Station.

APPENDIX V - Continued.

Dept.No.	Department	Work carried out on Computer
403	DEPARTMENT OF PRIMARY INDUSTRIES:	
	C.P. Hamilton	Multiple Regression Analysis of Wheat Farm Survey Data.
	S.R. Harrison A.C.E. Todd	Calculation of least cost rations for growing pigs for various districts in Queensland.
	Biometry Branch	Statistical analysis of data from an extensive range of research projects dealing with plant and animal performances in field and laboratory trials. Many types of designs are used.
	B.R. Champ	Analyses of dosage mortality and other data associated with entomological experimentation.
404	IRRIGATION AND WATER SUPPLY COMMISSION:	
		Card Fortran programs outputting current meter rating tables (OTT and ALBERTA propellor-type meters.)
		Card Fortran programs processing stream flow and evaporation records, repunching output on cards in required format for storage behaviour analyses.
		Card Fortran program for stream cross-sectional areas from co-ordinates of the section.
		Card Fortran program calculating quarterly probability matrices for storage probability analysis after Moran. The program computes yearly matrices, and stationary state probabilities by successive squaring of the yearly matrix.
		Card Fortran program processing monthly rainfall and evaporation data, to give evaporation indices (on punch cards) for use in storage behaviour analysis.
		Card Fortran program calculating tables for the determination of bore performance under intermittent pumping conditions.

APPENDIX V - Continued.

Dept.No.	Department	Work carried out on Computer
404	CONTD.	
		Wiz language program for routing of floods through reservoirs with gate controlled crests.
	Production calculations, as under, were performed by various programmers:-	
		Investigation of "Moran Storage Probability Analyses" for large Queensland storages.
		Production work associated with the programs mentioned in "Program Development".
		Various storage behaviour analyses.
		Maximum probable flood derivation.
		Earth embankment slip circle stability analyses.
		Reservoir flood routing for spillways with uncontrolled crests.
		Back water profiles in natural and artificial channels.
406	DEPARTMENT OF FORESTRY:	
	N.B. Henry	Preparation of volume tables for planation species.
		Plantation Register data processing.
		Statistical analysis of experiments.
		Prediction of frost damage in plantation areas.
		Preparation of a card key for the field identification of selected North Queensland rainforest species.
	J.A. Winn	Assessment of volume and valuation of standing timber on areas proposed for freeholding.
409	B.C.C. WATER SUPPLY AND SEWERAGE DEPARTMENT:	
	J. Clerke	Computation of inflow into lake storage.
		Computation of river flows from river height information.

APPENDIX V - Continued.

Dept.No.	Department	Work carried out on Computer
409	CONTD.	
	J. Clerke	Preliminary study of stability of a network of pumping stations and service reservoirs.
410	B.C.C. ELECTRICITY DEPARTMENT:	
	J. Sands P.A. Clappison	Preliminary study of a system for recording and analyzing consumer complaints.
		Further development of data processing system for distribution transformer load records.
		Forecasting of loads and growth rates for 33kV zone substations.
		Load flow and short circuit studies on existing and proposed distribution systems.
	J.S. Lyall	Programs for producing a transformer tender price schedule.
412	QUEENSLAND GOVERNMENT RAILWAYS:	
	J. Seymour	Pile Group Analysis and Ballast Survey.
413	POSTMASTER-GENERAL'S DEPARTMENT:	
	S.A. Howard	Analysis of C.P.M. Networks and resource scheduling for the installation of automatic telephone exchange equipment.
	J. Fursdon	Respacing of Pole Routes to reduce 'K' factor to the predetermined limit.
	P.J. Kitchen	Processing traffic measurements to produce collated traffic dispersion percentages.
		Composite growth factor calculations.
		Design of Crossbar G.V. stage for Production of Trunking Diagrams.
		Preparation of Priority List for Trunk Channel Provision.
	J.G. Bartlett	Telegraph Error Analyses.
		Telegraph Distortion Analyses.
		Statistical Analyses of Transmission Measurements.

APPENDIX V - Continued.

Dept.No.	Department	Work carried out on Computer
413	CONTD.	
	J.F. Connors	Fault Analysis of Carrier Telegraph Equipment
	R.P. Tolmie	Program for evaluating Radiated Field of High Frequency Log Periodic Antennae as a function of Antennae elevation, ground conductivity and dielectric constant and the array parameters.
	I.G. McBryde	Calculation of a table of resistance values for '0' and 'π' pads over a range of attenuations from 1db to 100 db for any given values of input and output impedances.
	L.L. Birch	Medium Frequency Radiator calculations.
		Transmission Lines Calculations.
		Numerical integration.
		A.C. Network Analysis.
		Curve fitting, given a set of X, Y data points.
	G.R. Grant	Solution of the hyperbolic equation for an inclined catenary to facilitate deduction of tension in a guy rope from slope.
		Calculation of characteristic impedance of five wire coplanar unbalanced transmission line and extrapolation to lines of 7, 9, 11, 13 wires.
		Solution of the potential equations for N wire unbalanced line, N odd and not greater than 11.
		Examination on a geographical display basis of the coincidence of availability of skywave reception of medium wave broadcasting stations in Queensland.
414	C.S.I.R.O.:	
	L.E. Donaldson	Analysis of production records from herds of beef cattle in North Queensland.
	C.T. Gates	Analysis of data for plant growth in response to salinity and nitrogen fixation.

APPENDIX V - Continued.

Dept.No.	Department	Work carried out on Computer
414	CONTD.	
	A. Howard	Development and utilization of techniques for estimation of scaled values of subjective measures.
	L. 't Mannetje	Development of a biographical index program.
	G.B. Stirk	Water balance analysis under improved pastures.
	J. Tothill	Average, variance and standard error calculations.
415	STATE ELECTRICITY COMMISSION OF QUEENSLAND:	
	G. Billard	Calculation of periodic growth rates and analysis of statistics.
	K.J. Freier	Network analysis and stability calculations.
		Development of a program to design and cost transmission systems for comparison of conductor sizes and series compensation.
	L.G. Pane	Load analysis and forecasting. Economic comparisons of generation developments.
		Development of various load analysis programs.
	M.A. Sargent	Network analysis and stability calculations.
		Development of programs to calculate transients and select insulation levels on transmission lines.
		Calculation of double-circuit outage rates of transmission lines.
	W. Wager	Development of a program to determine the optimum combination of future generation sources.
423	COMMONWEALTH DEPARTMENT OF WORKS:	
	P. Curtis E. Graham	Backwater Curve Calculations.
	E. Graham	Design of Airfield Runways. Vertical Grade Calculation.

APPENDIX V - Continued.

Dept.No.	Department	Work carried out on Computer
423	CONTD.	
	E. Graham	Application of Critical Path methods with resource allocation to the Branch Design programme.
	A.G. James	Further work on development of a system of programmes for the preparation of technical specifications.
	D. Merson	Time phasing of annual Branch works programme.
	D. Muirhead	Further work on Calculation of Airconditioning, cooling, reheat and heating loads.
		Analysis of concrete test results.
		Analysis of Department Statistics.
	H. Went	Further development of a programme for control of Computer Section Accounts and Statistics.
		System of programmes for Quantitative costing of Works Projects.
424	SUGAR RESEARCH INSTITUTE:	
	C.R. Murry E.E. Shepherd	Use and further development of the system of programs to analyse results from mill tramway investigations. The system now measures delays from delivery point to weighbridge, delays in yard and total turn-around times and correlates delay and turn-around on an individual truck basis for the sample.
	R.N. Cullen	Extensive analysis of data from factory experiments particularly strain gauge data from the top roll shaft of a particular three-roll mill.
	C.R. Murry W. McWhinney	The development of a program to edit and convert 8-channel paper tape from a data logging system and store on a magnetic tape file.

APPENDIX VI

FINANCIAL STATEMENT TO 31/12/1967

CAPITAL EQUIPMENT ACCOUNT - FOR PERIOD ENDING 31/12/1967

RECEIPTS			PAYMENTS	
Contributor Donations to 31/12/64		$278,054.00	Purchase of initial GE 225 System to 31/12/64	$197,621.18
Contributor Donations to 31/12/65	$5,400.00		Purchase of Magnetic Tape Equipment -	
Less 1966 adjustment Land Administration	2,400.00		to 31/12/64	83,781.91
		3,000.00	to 31/12/65	9,890.00
Donation - Cardno and Davies 1966 adjustment		2,000.00	Purchase of IBM 1620 - part payment 1965	40,864.20
University of Queensland Grants		40,000.00	Building (with air conditioning) to 31/12/66	51,407.48
State Government Grants		30,000.00	Building (with air conditioning) 1/1/67 to 31/12/67	14,122.99
Commonwealth Government Grants		50,000.00	Auxiliary Equipment to 31/12/66	17,934.69
Transfer from Operations Account - for purchase of IBM 1620 in 1965	$15,825.33		Auxiliary Equipment 1/1/67 to 31/12/67	19,743.58
Less amount returned to Operations Account in 1966	9,490.00		Furnishings to 31/12/65	5,058.77
		6,335.33	Equipment Hire	2,048.17
Sale of Manuals		609.48	Miscellaneous to 31/12/65	5,501.10
Donation - C.J. Elliott & Son		150.00		
Transfer from Operations Account 1967		9,490.00		
Excess of Payments over Receipts		28,335.26		
		$447,974.07		$447,974.07

OPERATIONS ACCOUNT - FOR YEAR ENDING 31/12/67

Balance b/f 1/1/67		$25,815.25	Salaries		$22,517.11
Contributions by University towards Recurrent Costs -			Maintenance		1,691.55
Salaries	$36,283.35		Equipment	$12,109.05	
Maintenance	4,694.28		Less transfer from Capital Account	7,650.00	
Equipment	1,082.12				4,459.05
		42,059.75	Salaries (contra)		36,283.35
Revenue from Computer Operations -			Maintenance (contra)		4,694.28
University Departments		56,247.73	Equipment (contra)		1,082.12
Other Users		93,587.37	Magnetic Tape Stocks		4,056.95
Miscellaneous Credit		1,481.36	Rental		2,452.20
			Stationery		11,067.15
			Travel Expenses		980.53
			Electricity		4,231.08
			Furniture and Fittings		577.16
			Transfer to Sinking Fund		50,000.00
			Transfer to Capital Account		9,490.00
			Excess of Receipts over Payments		65,608.93
		$219,191.46			$219,191.46

SINKING FUND - FOR PERIOD ENDING 31/12/67

BALANCE $207,404.31

L.N. LIVINGSTON, F.A.S.A.
Bursar.