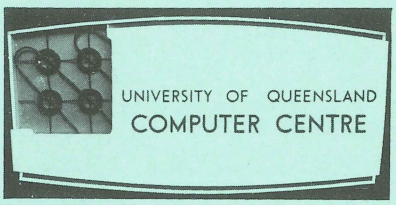
UNIVERSITY OF QUEENSLAND

COMPUTER CENTRE



FIFTH ANNUAL REPORT

1st January to 31st December 1966

UNIVERSITY OF QUEENSLAND

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

FIFTH ANNUAL REPORT

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F O R E W O R D

The foreword to previous Annual Reports has described the origin and operation of the Computer Centre as a co-operative venture with nineteen foundation contributors. The commitments to these and later supporters will have been substantially met during 1967 and, indeed, many contributors have now acquired their own facilities largely as a result of experience gained with the University system.

Growth in demand by University departments and Administration will shortly result in overloading of the computer system and hence particular attention has been given to the planning of a second system. Finance for this was expected from the Australian Universities Commission but instead a small amount only, intended to extend the present system, has been recommended. Hence it has been necessary to investigate the feasibility of obtaining much of the required capital from Computer Centre revenue.

The Computer Centre has become a vital part of the University's activities and I must point out that failure to avert saturation will have a progressively more serious effect on both teaching and research in almost all University departments. Further, a number of administrative processes will shortly have become totally dependent on computer methods and should be provided for with complete reliability.

S. A. Prentice
Chairman
Computer Centre Advisory Committee

September, 1967

COMPUTER CENTRE EXECUTIVE COMMITTEE 1966

Professor S.A. Prentice, B.Sc., M.E.E., MIE(Aust.)	Professor of Electrical Engineering (Chairman)
Professor D.W. McElwain, M.A., Ph.D., FBPsS	Professor of Psychology (Deputy Chairman)
Professor H.C. Webster, CMG, Ph.D., D.Sc., FIP, FIEE	Professor of Physics
*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 R.C. Gates, B.Com., M.A.	Professor of Economics
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

COMPUTER CENTRE ADVISORY COMMITTEE 1966
in addition to the above

Mr. J.E. Kindler, M.E., MIE(Aust.)	Co-Ordinator General's Department
Mr. S. Schubert, B.E., AMIE(Aust.)	Main Roads Department
Mr. E.F. Fell, AMIRE(Aust.)	Public Service Commissioner's Office
Mr. A.S. Faulkner, MIE(Aust.), FIEE	State Electricity Commission of Queensland and Regional Electricity Boards
**Mr. H.J.M. Clacher, Dip.(Mech.& Elec.), AMIE(Aust.)	State Electricity Commission of Queensland and Regional Electricity Boards
Mr. J.E.G. Martin, C.B.E., D.S.O., B.E., AMIE(Aust.)	Southern Electric Authority of Queensland
Mr. G.W. Barlow, B.E., MIE(Aust.)	Brisbane City Council
Mr. R.B. Menzies, B.E., AMIE(Aust.)	Mount Isa Mines Ltd.
Dr. L.E. Howard, B.Sc., Ph.D.	Mathematics Department, University of Queensland
Mr. E.D. Murray, M.C., B.E., MIE(Aust.), FIEE	Chairman, Computer Advisory Sub-Committee, University College of Townsville
Mr. I.M. Hunter, B.Sc., AMIE(Aust.), AMIMechE, MIEE	Department of Engineering, University College of Townsville

* replaced Professor Webster during 1966
** replaced Mr. Faulkner during 1966

STAFF OF THE COMPUTER CENTRE 1966

(at 31.12.66)

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.
Senior Demonstrator (Programmer)	R. N. Buchanan, B.Sc., Dip.Ed., Dip.A.C.
Demonstrator (Programmer)	G. Sonkkila, B.Sc.
Scheduling Clerk	J. Jauncey
Maintenance Technicians	G. L. Jerrard D. Brunner
Computer Operators	Patricia Banks Anne McArthur Patricia Stevens Noela Waters Noela Wilmington
Data Preparation Assistants	Vicki Lake Diann Wilkins
Steno-Typist	Carole Chapman

A N N U A L R E P O R T

INTRODUCTION

This year has seen further growth in the teaching, research and service bureau functions of the Computer Centre. Although full third shift operation could not be introduced because of limited availability of staff, extended second shift operation occurred on many occasions; it is clear that the loading of the system to capacity is limited only by available hours of computer time.

Staff continue to be engaged in both the academic and service bureau work of the Centre and, because of the day-to-day demands of users, tend to apportion most of their time to the latter. Further consideration is being given to the separation of academic and service bureau functions of the Centre so as to permit the academic staff to have more time for research projects.

COMMITTEE ACTIVITIES

The Executive and Advisory Committees met as required to consider policy matters. These were concerned principally with shift operation; the extent to which residual entitlements of contributors after the five year period ending 30th June, should be met (in special cases), and the provision of a new computer system.

A decision was made by members of the Advisory Committee to recommend its dissolution on the basis that the future decisions were likely to be primarily concerned with internal matters. This Committee has been of very considerable assistance throughout the development of the Computer Centre and the University is greatly indebted to the external members for their valuable advice and practical interest.

The Executive Committee has been retained, with the addition of Mr. K.S. Pope of the State Treasury Department. This Committee gave particular attention to the development of a new postgraduate Diploma in Information Processing which was intended for introduction in 1967.

Another 8K memory module was ordered for delivery early in 1967, thus increasing the fixed core store to its maximum of 16K words.

STAFF CHANGES

The following new appointments were made :

Lecturer in Computing	-	I. Oliver, B.Sc., B.Econ., Dip.A.C., (formally Senior Demonstrator)
Demonstrator	-	G. Sonkkila, B.Sc.
Scheduling Clerk	-	J. Jauncey

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 2,000. In addition to the programming courses set out below, staff gave over 400 lectures, conducted 280 tutorials and seminars while demonstrating and consulting services occupied a further 3,000 contact hours. In connection with the latter, it must be pointed out that for some years, consulting activities have occupied a large proportion of staff time thus restricting research and development activities. Therefore, steps were taken during the year to limit hours of consultation.

Programming Courses and Enrolments

Type of Course	No. of Courses	Number Enrolled
Elementary Programming (GAP)	1	9
Basic FORTRAN	5	114
Advanced FORTRAN	1	60
Totals	7	183

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

Enrolments for the postgraduate Diploma in Automatic Computing increased to 18 (6 full-time and 12 part-time students).

Computer Centre staff participated in a number of conferences and sumposia and delivered lectures to various professional bodies, including the Australian Computer Society.

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, much of the documentation of programs for the GE 225 has been revised and consolidated.

Research activities included investigations into timetabling problems, integer linear programming and a concise method for analysis of complete factorial experiments. A paper by I. Oliver on the latter topic has been accepted for publication in the Journal of the Association for Computing Machinery. Work is continuing on the design of fast adder and multiplier circuits.

COMPUTER USE

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

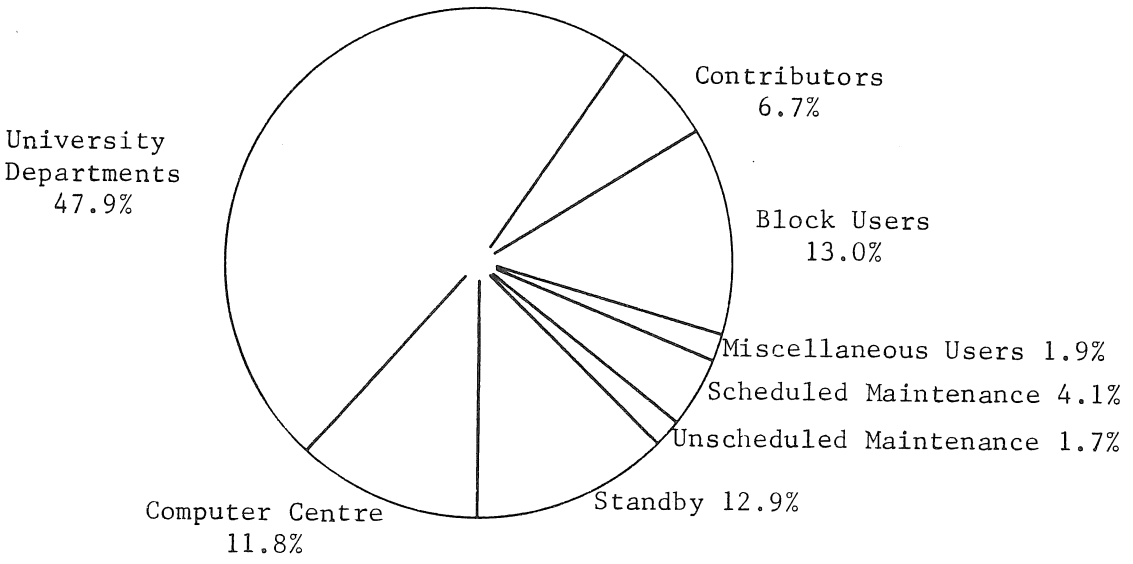

Fig. 1. Distribution of Hours of Total Switched-on Time (4,064 hrs. = 100%)

The total switched-on time for the year was 4,064 hours with a total usetime of 3,465 hours. This latter figure should be compared with a scheduled availability of 3,978 hours. The standby time of 527 hours was incurred largely outside normal working hours and because of unavoidable delays during normal running. It is again obvious that the availability of the computer is limiting the time used. For this reason full three-shift operation will be introduced as soon as possible.

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. The latter effect is undoubtedly due to the installation of the other computer systems in Brisbane during 1965-6.

A graph of the growth of computer use since 1962 is shown in Figure 2. The upsurge in computer use for University purposes during 1966 resulted from the 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 installation of an IBM 1620 computer system at Townsville University College has continued to stimulate the use of computers; support for extension of the system has been recommended by the Australian Universities Commission. Loan of the original equipment is to be continued, subject to periodical review by the Computer Centre Executive Committee.

AIR CONDITIONING

Extension and rearrangement of the air conditioning system was carried out by the Commonwealth Department of Works. The resulting improvement in reliability and the reduction in noise have both been greatly appreciated; the University is particularly grateful to staff of the Department of Works for the modifications to the design and for the high standard of maintenance of the equipment.

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	8
Computer Centre Operations Account	8

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 part, towards the purchase of the proposed new system.

FUTURE NEEDS

Discussions on the need for the installation of a second computer system of greatly increased capacity have taken place in each of several committees; as a result, a supplementary submission was sent to the Australian Universities Commission in March. Unfortunately, no opportunity was given for discussion of the proposal with the Commission. Our recommendation was rejected and further, the alternative, now recommended by the Commission, of providing "ancillaries for the GE 225" has no discoverable basis. Hence every effort is now being made to have the allocation used towards the purchase of a new system.

A specification was prepared by staff of the Computer Centre and issued in December. The principal requirements were high speed, large memory and remote terminals, as referred to in the 1965 Report.

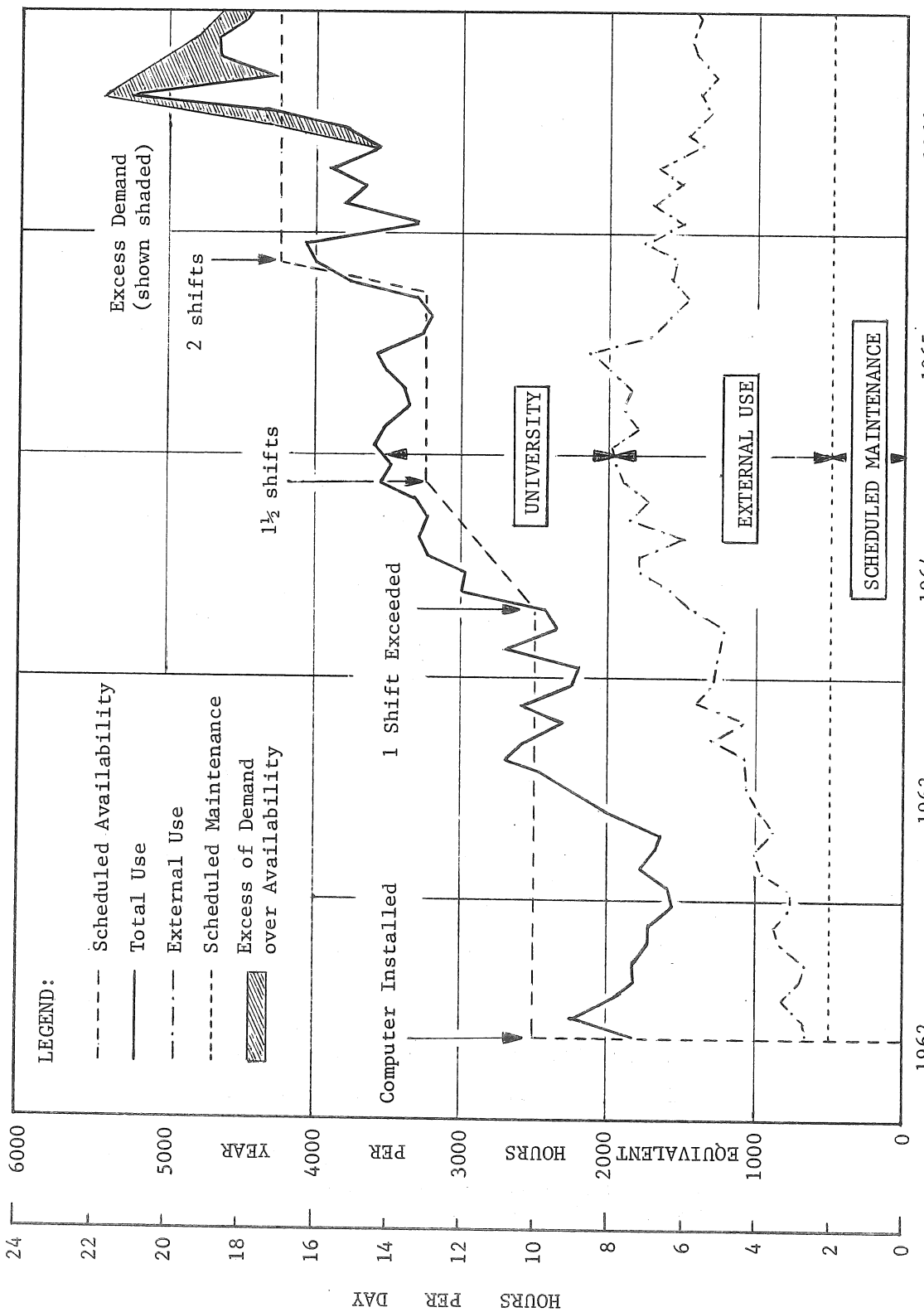

Fig. 2. GROWTH OF COMPUTER USE 1962-1966

APPENDIX I

DEVELOPMENT PROJECTS - COMPUTER CENTRE STAFF

The following programs have been developed by Computer Centre staff members during 1966.

R. N. Buchanan	MLRP II with Symbolic Labelled Input and Transform - A complete program for performing multiple linear regressions on sets of data, including facilities for simple input of data and a compiler language for the specification of data transformations.
R. E. Kelly	Conversion of Compacted Account and Invoicing programs for decimal currency.
I. Oliver	RANORM - Random Normal Deviate Generator is a FORTRAN subroutine which generates a pseudo-randomly distributed deviate x. MATINV - A FORTRAN subroutine which finds the inverse of a square matrix, its determinant, and solves associated sets of simultaneous linear equations. SQRTL - A FORTRAN subroutine which finds the square root of a lower triangular matrix. CDET - A FORTRAN subroutine which finds the determinant of a matrix whose elements are complex numbers. ORTHOG - A FORTRAN subroutine which generates a matrix of orthogonal polynomials assuming equally spaced independent variables. USOP - A FORTRAN subroutine for constructing orthogonal polynomials when the independent variable is unequally or equally spaced.
I. Oliver R.E. Kelly	SLIP - Symbolic Labelled Input Routine is a general purpose input subroutine which allows the data to be identified with symbolic names. SLIP/OUTPUT PACKAGE is a pre-assembled package consisting of the SLIP and OUTPUT subroutines.
E.J. Sokoll	A magnetic tape version of the Card FORTRAN system which allows for"compile-and-run" and job stacking. Consolidation of systems programs and subroutines to permit efficient operation. A highly efficient version of the GAP assembly system incorporating additional pseudo-operations for control of the assembly process.

APPENDIX I - Continued.

E.J. Sokoll	A series of programs for consolidating and analysing invoice details.
G. Sonkkila	OBCD - A subroutine which converts a single length binary number to its octal equivalent, one octal digit per word.
	DOLLAR - A subroutine which converts a double length binary number representing an integer value in cents to BCD characters one per word with a floating dollar sign and decimal point character added.
	SEARCH - A general purpose subroutine for searching through an ordered table of records to find an individual record which matches a given record.
	CORRELATION - This is a complete FORTRAN program, which computes the sums, means, variances, standard deviations, the matrix of covariances, and the matrix of correlation coefficients.
W.J. Whiten	DEVIN - A FORTRAN subroutine for calculating the normal deviate corresponding to a given probability.
	PROBN - A FORTRAN subroutine for calculating the probability corresponding to a given normal deviate.
D. Swan	FPTD - The Floating Point Tape Dump is a program which dumps normalised floating point numbers from magnetic tape on the high speed printer.
R. Eldershaw	Card CPM - A complete program to calculate and print a critical path schedule for a network of up to 2000 activities.

APPENDIX II

PUBLICATIONS - COMPUTER CENTRE STAFF

I. Oliver	Macro Assembly Programming Languages.
R. N. Buchanan	Integer Linear Programming.

APPENDIX III

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

Code	Department \ Month and Working Days	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	TOTALS FOR YEAR					TOTAL TO DATE
		19	13	20	23	18	19	25	19	25	20	20	25	1962	1963	1964	1965	1966	
001	Computer Centre	27.4	18.2	39.8	52.3	34.7	29.2	44.8	21.9	73.2	50.6	45.1	67.5	381.0	475.8	470.3	581.8	504.7	2413.6
002	Civil Engineering	5.3	4.3	2.5	6.9	5.6	7.9	8.1	5.1	2.9	3.8	7.5	6.3	11.3	18.9	18.3	27.1	66.2	141.8
003	Economics									.6	.2		1.6	0.7	2.8	1.8	0.3	2.4	8.0
004	Physics	6.8	5.1	22.9	47.3	15.7	32.3	52.8	115.7	42.5	112.6	88.2	41.4	79.3	131.9	194.7	213.6	583.3	1202.8
005	Psychology	3.5	4.7	6.8	3.5	3.1	4.3	7.1	8.9	13.9	9.2	2.2	.9	0.8	20.5	78.2	37.2	68.1	204.8
006	Electrical Engineering	3.4	.5	.5	6.7	5.1	.9	6.0	4.5	7.4	12.6	19.8	15.6	22.5	20.0	19.7	88.0	83.0	233.2
007	Mechanical Engineering	5.4	6.7	4.3	7.8	7.8	10.2	11.4	9.0	6.1	5.4	2.5	8.7	16.5	25.1	35.5	60.4	85.3	222.8
008	Mathematics	.4	.6	1.4	2.5	3.0	3.7	4.8	4.2	11.3	3.6	4.2	2.7	7.8	8.3	25.2	49.8	42.4	133.5
009	Geology			1.4	.1	.1				.1				4.2	0.2	7.2	12.7	1.7	26.0
010	Animal Husbandry	1.9	1.2	8.8	5.7	9.9	4.4	16.9	13.6	15.6	1.3	.5	3.3	14.7	47.8	33.8	41.5	83.1	220.9
011	Data Processing (Admin.)	29.6	25.7	32.0	28.7	23.5	29.4	60.7	39.2	53.0	38.0	52.8	74.7	7.9	2.3	29.9	139.6	487.3	667.0
012	Agriculture	1.6	1.6	3.0	4.9	3.4	4.4	5.9	3.1	2.8	2.8	2.7	2.5	2.3	18.4	23.6	17.1	38.7	100.1
013	Education	.6	.3	.3	1.5	.8	2.6	2.0	1.3	.4	2.9	6.8	6.6	3.4	35.2	24.3	16.6	26.1	105.6
014	Mining and Metallurgy	1.8	6.0	5.3	6.8	7.7	3.1	6.9	11.4	15.6	6.7	6.0	6.7	2.7	6.7	33.4	22.1	84.0	148.9
015	Computer Research													4.6	29.1				33.7
016	Parasitology	3.4	3.5	2.1	.7									1.2			9.1	9.7	20.0
017	Veterinary Preventive Medicine	4.6	4.7	3.3	2.7	2.4	1.4	1.4	3.7	8.5	.1	4.6	.1	1.4	0.3		5.2	36.0	42.9
018	Surveying						.2	1.3		.9	1.0				0.1		2.8	3.4	6.3
019	Veterinary Anatomy	.1								.1	.1			1.6	3.2	0.7	11.1	0.3	16.9
020	English	.6	.9		.4	2.3	.1			.2	.3		.1	0.4		0.4	9.3	4.9	15.0
021	Veterinary Clinical Studies														0.6	2.0			2.6
022	Remedial Education	.4						.7	.3	.4					1.8	0.7	3.1	1.8	7.4
023	Accountancy								.3	.2	.3					0.5	0.1	0.8	1.4
024	Microbiology			.3	.9	4.0	3.8	1.9	3.3	2.0	1.6	.3			2.2	11.0	6.5	18.1	37.8
025	Physiology		.1	.1	.1								.1		0.3	0.4		0.4	1.1
026	Chemistry		2.6	1.8	2.0	2.0	8.5	12.0	4.0	3.3	1.8	1.6	8.9		0.3	1.6	19.1	48.5	69.5
027	Geography	.6	.6		1.5	.3	1.8	.1							0.6	4.5	2.6	4.9	12.6
028	Townsville University College								2.7	.4					0.5	1.9		3.1	5.5
029	Child Health	.9	.5	1.0	.8	.2	.4	.8	.9			1.9	.3				2.0	7.7	9.7
030	Social and Preventive Medicine	.3	.7	.9	.3	.5	.6	.1	.8	3.1	2.5	2.9	5.1			4.9	6.4	17.8	29.1
031	Examinations Section		4.9		.5							1.3	9.1			8.6	15.5	15.8	39.9
032	Botany			.2		.2	.3					.4	.2			1.7	0.2	1.3	3.2
034	Chemical Engineering	3.0	.6	.4	3.4	6.6	5.6	13.8	13.5	12.7	16.2	6.7	3.4				23.7	85.9	109.6
035	History																2.0		2.0
036	Zoology																0.1		0.1
037	Dentistry	7.3	2.8	9.2	7.5	.2	3.9	4.3	4.0	1.2	6.9	4.0	7.3				35.5	58.6	94.1
038	Administration																2.1		2.1
039	Surgery					.4	.6		.3	.3	5.0	9.6	.6					16.8	16.8
040	Photography	.5	.3	1.0	1.3	1.0	.9	1.5	.7	1.1	1.3	.8	1.4				9.1	11.8	20.9
042	Anatomy				.6					.1	.8	1.3						2.8	2.8
043	King's College	.2				.1		.1				.1						0.5	0.5
045	Neurology	.5		.4	.1								.5					1.5	1.5
046	Anthropology and Sociology		.2	.3	1.7	.9	1.0	.6	1.6				.3					6.6	6.6
047	Institute of Technology						.2											0.2	0.2
048	Veterinary Science Faculty						.2	1.8	.1									2.1	2.1
049	Medicine						.3		.2	.4			.8					1.7	1.7
050	Political Science										.2		.1					0.3	0.3
051	External Studies												5.4					5.4	5.4
	TOTALS	110.1	97.3	150.0	199.2	141.5	162.2	267.8	274.3	280.3	287.8	273.8	282.2	564.3	852.9	1034.8	1473.3	2526.5	6451.8

APPENDIX IV

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

Code	Organisation \ Month and Working Days	Jan. 19	Feb. 13	March 20	April 23	May 18	June 19	July 25	Aug. 19	Sept. 25	Oct. 20	Nov. 20	Dec. 25	TOTALS FOR YEAR 1962	1963	1964	1965	1966	TOTAL TO DATE
	CONTRIBUTORS:																		
101	Main Roads Department	*												46.6	215.6	551.4	232.6		1046.2
102	Southern Electric Authority	6.2	3.4	6.9	7.2	5.8	3.6	5.7	5.1	5.6	3.2	4.4	7.1	5.2	40.0	29.5	52.5	64.2	191.4
103	Primary Industries Department	*												12.7	39.9	39.4	28.9		120.9
104	Irrigation & Water Supply	6.5	.3	4.2	2.5	3.7	3.2	5.7	4.6	2.6	2.9	2.2	.1	35.5	72.2	43.3	31.8	38.5	221.3
105	Co-Ordinator General's Dept.	1.5	1.1	1.6	1.2	1.8	2.0	2.5	2.0	5.6	1.9	5.9	9.1	5.2	2.9	13.8	43.4	36.2	101.5
106	Forestry Department	*												18.4	43.2	95.6			157.2
107	Survey Office	*												14.1	20.6	70.7			105.4
108)																			
109)	Brisbane City Council	9.3	7.4	3.2	7.5	2.6	4.4	9.2	8.0	7.9	11.5	*		1.6	1.2	9.3	74.0	71.0	157.1
110)																			
111	Aust. General Electric	ø												1.0	7.5	0.5			9.0
112	Queensland Government Railways	1.9	.3	2.5	1.8	4.1	2.0	6.1	*					2.3	9.9	1.7	19.6	18.7	52.2
113	P.M.G. Department	*												3.3	20.0	23.9	14.4		61.6
114	C.S.I.R.O.	*												1.0	40.2	88.3	18.5		148.0
115	S.E.C. of Queensland	*													7.6	19.3			26.9
116	Mt. Isa Mines Ltd.	2.4	6.1	4.7	4.3	2.2	4.4	2.6	1.1	3.7	1.5	4.9	3.5		31.1	59.8	32.0	41.4	164.3
117	Wide Bay-Burnett R.E.B.	.1														0.1	0.2	0.1	0.4
118	Capricornia R.E.B.			.3	.1	.3	.1	.1								1.1	8.3	0.9	10.3
119	Cardno and Davies	3.0	1.8	3.0	2.5		.9				.5	.3	.1			13.5	20.9	12.1	46.5
120	Townsville R.E.B.												1.0			1.4	0.7	1.0	3.1
121	Cairns R.E.B.	.1	.2			.2	.8			.8	1.0		.1			0.1	1.9	3.2	5.2
122	Mackay R.E.B.											1.0					0.4	1.0	1.4
	TOTAL-CONTRIBUTORS	31.0	20.6	26.4	27.1	20.7	21.4	31.9	20.8	26.2	22.5	18.7	21.0	146.9	551.9	1062.7	580.1	288.3	2629.9
	BLOCK USERS:																		
401	Main Roads Department	20.1	12.7	18.0	24.3	14.1	9.2	6.5	1.3	.3	.5	.4	.2				358.3	107.6	465.9
403	Primary Industries Department	2.1	1.2	1.5	3.1	1.9	5.5	6.4	2.6	3.0	4.7						3.9	32.0	35.9
406	Forestry Department	2.8	3.0	3.0	3.1	2.0	2.4	1.6	2.4	4.0	4.8	2.0	3.7				86.6	34.8	121.4
407	Survey Office	2.2	1.4	1.6	2.5	.9	1.1	3.8	3.4	2.2	3.9	3.0	2.8				44.9	28.8	73.7
410	Brisbane City Council											4.0	9.5					13.5	13.5
412	Queensland Government Railways								3.9	5.5	3.3	2.4	4.9					20.0	20.0
413	P.M.G. Department	5.2	5.6	5.6	2.5	2.2	4.5	12.6	7.7	6.1	9.8	4.2	7.9				25.4	73.9	99.3
414	C.S.I.R.O.	2.1	6.1	6.6	7.7	4.0	8.8	6.8	7.7	13.8	5.5	8.9	8.6				56.0	86.6	142.6
415	S.E.C. of Queensland	.1	1.4	6.6	10.1	9.6	8.5	1.8	.9	5.2	1.9	10.1	4.4				29.3	60.6	89.9
423	Commonwealth Dept. of Words	2.9	1.5	5.2	7.4	1.4	4.4	6.9	5.1	6.7	8.3	11.6	12.0				5.6	73.4	79.0
424	Sugar Research Institute	.2	3.2	1.2	1.3	2.0	2.0	2.6	7.3	.4	1.8	7.9	5.6				1.0	35.5	36.5
	TOTAL-BLOCK USERS	37.7	36.1	49.3	62.0	38.1	46.4	49.0	42.3	47.2	44.5	54.5	59.6				611.0	566.7	1177.7
	TOTAL-MISCELLANEOUS USERS	10.2	6.4	7.1	7.8	6.2	6.0	5.3	4.5	6.8	6.4	5.2	11.7	2.4	8.7	55.8	83.5	83.8	234.2
	TOTALS	78.9	63.1	82.8	96.9	65.0	73.8	86.4	67.6	80.2	73.4	78.4	92.3	149.3	560.6	1118/5	1274.6	938.8	4041.8

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

APPENDIX V

SOME WORK CARRIED OUT BY USERS OF THE COMPUTER IN 1966

UNIVERSITY DEPARTMENTS

Dept.No.	Department	Work carried out on Computer
002	CIVIL ENGINEERING:	
	C. O'Connor	Analysis of elasto-plastic stress distributions in a non-uniform polycrystalline material. Elasto-plastic analysis of stress distributions in a notched tension specimen.
	R. Nilsson	CIVTEST - A system to process and prepare Civil Engineering Test Certificates. ENGINEXAM - Extensions to the system for processing Engineering Faculty examination results.
	J. Meek	Elastic analysis of plane frames. Elastic analysis of grid structures. Elastic analysis of parabolic arches. Elastic analysis of high-rise frames. Elasto-plastic analysis of plane frames. Analysis of sections of arbitrary cross section for torque by finite element. Analysis of cable structures. A general force programme by free structure algorithm.
004	PHYSICS:	
	J.R. Catchpoole	Calculations of pitch and energy spectra of photoelectrons emergent from ionosphere to magnetosphere.
	I.M. Brazier	Conversion of 8-bit binary information on paper tape to card data. Derivation of correlation coefficients and power spectra for very low frequency electromagnetic radiation.
	R.H. Clarke	Computation of electron densities in the ionosphere from data derived from ionograms.
	R.W. Parsons	Evaluation of integrals for line-shape calculations.
	L.F. McNamara J.D. Argyros	Development of a programme to solve the statistical equilibrium equations for an N-level atom in a radiation field.

APPENDIX V - Continued.

Dept.No.	Department	Work carried out on Computer
004	CONTD.	
	A. Mir	Calculation of power and focussing factor at a particular range.
	L. A. Meara	Calculation of sunrise and sunset times over great circle VLF paths. Also mean cosine solar zenith angles.
	R. J. Stening	Calculation of electric currents and fields in the ionosphere using model atmosphere and wind systems.
	R. L. Young	Calculation of line-profiles of stellar absorption lines under conditions of coherent and of non-coherent scattering.
	K. L. Jones	Analysis of radio-satellite ionosphere observations.
	Z. Rahmani	Calculation of sunrise and sunset times at ionospheric heights. Hop theory of low frequency propagation.
	M. J. Bourke	Evaluation of drifts in the ionosphere from serial correlation coefficients of radio signals recorded on a close-spaced aerial system.
	S. Kham	Calculation of zenith and azimuthal angles. Study of ambiguities. Study of the structure of the ionospheric layers. Zero programme for solving of two simultaneous equations. Plotter programme for getting the actual shape of the trace.
	J. P. McGilvray	Developing programmes for calculation and printing of Tables of Treatment Times for Medium Voltage Therapy X-ray Units. Tables and plots of Idodose curves for various combinations of radium line sources.
	J. D. Whitehead	The formation of the horizontal layers of ionization produced by vertical movement and taking recombination and diffusion into account. Instabilities in gradients of ionization.

APPENDIX V - Continued.

Dept.No.	Department	Work carried out on computer
005	PSYCHOLOGY	
	J. Bennett	Response to proximity between persons.
	L. E. Enticknap	Factor analytical study of personality variables. Studies in perception.
	A. Howard	Pair comparison scaling.
	J. E. Kearney	Cognitive scales for use with deaf subjects.
	G. McBride	Social stress in domestic animals.
	G. L. Mangan	Factor analysis of personality variables.
	H. Pickett	Psychological scale construction.
	A. Silcock	The nature of the environmental forces acting on kindergarten children.
	K. Smith	Multidimensional scaling.
	J. E. Kearney	Cognitive ability of Aboriginal Australians.
006	ELECTRICAL ENGINEERING:	
	R. Barham	A characteristic function approximation program for the design of low pass, bandpass, and high pass filters. Evaluation of transfer function from characteristic function. Modifications to the convergence test of a solution of polynomials. Evaluation of magnitude, group delay, and phase response of a given transfer function.
	R. Bogner	Calculation of scattered field due to reflection from an undulating surface. Phase curve plots for compatible single sideband modulation.
	R. Mathams I. Lauder	Calculation of step function responses of a nuclear reactor.
	S. Russell	Optimisation of I.S.E. of a control system without calculation of time response. Optimisation of general performance index for a control system with calculation of the time response.

APPENDIX V - Continued.

Dept.No.	Department	Work carried out on Computer
007	MECHANICAL ENGINEERING:	
	G. E. Russell C. R. Murry	Program to simulate the static operations of a sugar milling crushing train of from 2 to 8 mills with variable inhibition arrangements.
	G. E. Russell T. J. Solomon	Solution of any number of linear simultaneous equations having a matrix of coefficients in which all elements are zero except for those in a diagonal band.
	K. Bremhorst	Program to study the behaviour of hot-wire anemometers under non-isothermal conditions.
	G. F. Harvey	Program for the exact solution for the stresses in a solid circular cylinder subject to an axisymmetric radial surface loading.
008	MATHEMATICS:	
	B. L. Adkins	Analysis of multi-factor dental experiment - Project continuing.
	L. Bass	Computations of membrane potentials.
	A. S. Jones	Calculation of hypergeometric function.
	L. E. Howard	Earthquake location problems. Gravity interpretation.
010	ANIMAL HUSBANDRY:	
	A. W. Beattie	Analysis of variance of balanced factorials (mixed model with covariance). Curve fitting by orthogonal polynomials (equally or unequally spaced - weighted or unweighted). Numerical approximation to "F" ratio.
	I. S. Burgess	Analysis of data from poultry nutrition trials.
011	DATA PROCESSING SECTION:	
	K. Alderslade	Master student number index.
	H. Brownsdon	Enrolments and enrolment statistics.
	J. Pieloor	Assessment of student fees.
	A. Robson-Petch J. Wilson	Bookshop stock calculations.

APPENDIX V - Continued.

Dept.No.	Department	Work carried out on Computer
014	MIN. & MET. ENGINEERING:	
	B. A. Kathage I. B. Smith	Analysis of results of thermal conductivity measurements in rock.
	T. N. Hagan	Detonation products of ammonium nitrate/fuel oil explosives.
	R. Hoskings	Open-cut mining design.
	W. R. Bull	The development of methods of simulation of gravity and flotation concentration circuits formineral concentration.
	G. D. Roberts	Prediction of thermal gradients in the melt during freezing of a metal ingot.
016	PARASITOLOGY:	
	C. Dobson	Regression analysis. Routine calculations for the reduction of experimental data. Plotting specimen graphs from data listings.
017	VETERINARY PREVENTIVE MEDICINE:	
	R. M. Inglis	Ruminant electrocardiography.
	H. Winter	Volume distribution curves of ovine erythrocytes.
019	VETERINARY ANATOMY:	
	R. M. Butterfield	Studies of relative growth in cattle.
020	ENGLISH:	
	M. C. Cunningham	Program for the alphabetisation of work lists with translation and classification. Program for the counting of phonemes and phoneme sequences, from word lists in a language, given the symbols used for each phoneme.
021	VETERINARY CLINICAL STUDIES:	
	P. J. McCosker S. Hunt	Calculation of regression coefficients and fractional clearance values for B.S.P. Blood volume estimation.

APPENDIX V - Continued.

Dept. No.	Department	Work carried out on Computer
022	REMEDIAL EDUCATION:	
	E. R. Chamberlain R. J. Andrews	Product moment intercorrelation.
	R. J. Andrews	Principal components factor analysis from raw scores.
023	ACCOUNTANCY:	
	G. C. 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 Szabo and Skerman. 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 cluster analysis.
025	PHYSIOLOGY:	
	A. W. Blackshaw	Calculations of enzyme constants including Km, Vmax, and their standard errors using a Fortran program compiled by Mr. I. Horton.
	A. Lipton G. J. Huxham D. N. Barry	Program preparation for analysis of uptake and loss of Ca^{45} and Na^{22} in isolated perfused rat heart.
029	CHILD HEALTH:	
	A. E. Dugdale	Statistical analysis of clinical and research data.
030	SOCIAL AND PREVENTIVE MEDICINE:	
	J. H. A. Cane	Computer "diagnosis" techniques applied to skin-cancer data. Multivariate analysis of skin-cancer and arterial disease statistics.

APPENDIX V - Continued.

Dept.No.	Department	Work carried out on Computer
032	BOTANY:	
	H. T. Clifford	Numerical taxonomic studies of the Monocotyledoneae and Orchidaceae by means of matching coefficient similarity indices.
034	CHEMICAL ENGINEERING:	
	R. G. H. Prince	Further development of the model of an ethylene oxide plant. Comparison of optimization techniques in the face of noise.
	R. G. H. Prince R. N. Wensley	Adaptation to the GE 225, and extension of the Admundson-Pontinen multicomponent distillation calculation technique.
	R. G. H. Prince S. A. Liem	Calculation of parameters in correlation proposed for the weep point of perforated plates.
	E. T. White A. S. Anderssen	Numerical evaluation of the roots and weighting functions of Laguerre Polynomials of high order (up to 100).
	E. T. White A. S. Anderssen	Programme for resolving the convolution integral. Residence time distributions are calculated from the input and response signals of a system.
	E. T. White J. P. Murphy	Correlation of power requirement results for an agitated tank.
	D. B. Batstone	Development of a flexible programme for the simulation of complex chemical processes.
	D. J. McCann	Solutions to seal point equations.
037	DENTISTRY:	
	B. J. Kruger	Matrices for studying variability in dental examinations. Queensland Dental Survey: six programs to determine the statistical distribution of oral diseases and anomalies by age, sex and geographic location.
	I. Oliver B. T. Homan	Programs for a longitudinal study of dental health in 2,300 Brisbane children (a Bristol-Meyers project). Buffered character input/output sub-routines for CARD FORTRAN.

APPENDIX V - Continued.

Dept.No.	Department	Work carried out on Computer
037	DENTISTRY (CONTD.):	
	I. Oliver B. T. Homan	Updating of personal record file of names and addresses. Listing of personal record file. Listing of personal record file sorted by name. Listing of personal record file sorted by address. Updating of records for 1966 examinations for caries, oral hygiene, gingivitis, tooth stain. Listing of examination records. Reallocation of class code numbers. Reproducibility of examinations. Year-to-year reproducibility.
039	SURGERY:	
	W. Burnett P. Robinson M. Banks	A detailed study of the dietary habits of patients with gall-stones in Queensland has been undertaken. In addition, the clinical data from a series of patients with gall-stones and a series of patients matched clinically with these, but not suffering from gall-stones, has been undertaken.
	B. Mather	Multifactional linear regression analysis of data comprising dimensions and physical properties of human femora; solution of the equations so produced, in order to predict breaking strength of the femur.
045	NEUROLOGY:	
	J. M. Sutherland R. Schlesigner	Prospective study of head injury patients comprising analysis of psychological and neurological data to determine value of examination shortly after trauma in determining subsequent morbidity.
046	ANTHROPOLOGY AND SOCIOLOGY:	
	D. W. G. Timms	Factor analysis of semantic differential data. Classification of Brisbane collector's districts.

APPENDIX V - Continued.

Dept. No.	Department	Work carried out on Computer
046	ANTHROPOLOGY AND SOCIOLOGY (CONTD.):	
	E. G. Moore	Development of ecological correlation programs. Error parameters in the alternation of population turnover. Mapping of area-specific data. Development of demographic potential programs.
047	INSTITUTE OF TECHNOLOGY:	
	R. W. Waldie	Load flow and transient stability calculations for power system.
051	EXTERNAL STUDIES:	
	R. D. Kitchen	Statistical analysis of a semantic differential used in the testing of students' attitudes.

EXTERNAL ORGANISATIONS

102	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.
	F. Schroder	Study of rate of rise of restriking voltage on H.V. systems.
	N. Galwey	Calculation of coal consumption and energy generated at power stations. Determination of economic generation schedules for forward planning. Coal allocation and costs. Costing of alternative generation schemes.
	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
104	IRRIGATION AND WATER SUPPLY COMMISSION:	
	T. J. Reardon	"CARD FORTRAN" programs to investigate various formulae for discharge computations on Queensland streams.
		"CARD FORTRAN" program to examine Transmission Loss Equation for determining upstream release required from storage by an empirical law.
		Monthly storage behaviour analysis, no restrictions, with downstream inflows and double draft distribution.
	J. A. Shaw	Analysis of linear response systems by means of Laguerre Functions.
		Storage probability analysis - Moran "Stationary State" solution by matrix methods.
		Storage behaviour analysis (monthly), dual storage system, with allowance for transportation losses.
105	CO-ORDINATOR GENERAL'S DEPARTMENT:	
	J. Gralton	Calculation of ranges and fixes for hydrodist surveying. Analysis of pinjointed truss. Analysis of an indeterminate frame structure by forcemethod. Analysis of a three dimensional pile group with rigid headstock. Analysis of grid structures.
	A. Contessa	Analysis of stresses in prestressed concrete box girders.

APPENDIX V - Continued.

Dept.No.	Department	Work carried out on Computer
116	MT. ISA MINES LTD.:	
	E. F. Gibbs	Function RELPOL (X,Y,Z,N,II). A reiterated interpolation procedure for interpolating within an ordered set of X-Y pairs.
		Calculation of orifice plate diameters for D and D/2 tappings. Produces tables of orifice diameters for measuring flows of water or air in pipes with diameters in the range 1 to 18 inches, the flow rates and differential pressures being specified.
		Simulation of transport fuel service. To determine whether it is better the fuel service station to be operated for the whole of day shift or for two periods of two hours each.
		Canonical form of the fitted second order equation for two, three or four factors. Determines the stationary point, the coefficients of the canonical variables, the transformations of the original variables to the canonical ones and the inverse transformations of the canonical variables to the original.
		SUBROUTINE GAUSEI (B,C,X,NF,ERR,MAX). Solves linear simultaneous equations by Gauss-Seidel iteration.
		Generalised cash flow model. Determines the viability of a capital investment proposal given capital expenditures, depreciation rates, costs, receipts, salvage values and other data. A number of options is provided for determining incomes, salvage values and royalty payments.
		Inventory levels for spares. Produces tables of minimum and maximum inventory levels for various lead times, mean annual usages, unit costs and shortage costs.
		Ground movement computations. Calculates reduced levels and vertical movements of stations used to monitor surface subsidence.

APPENDIX V - Continued.

Dept.No.	Department	Work carried out on Computer
119	CARDNO AND DAVIES:	
	C. J. James	Development of project and office costing programme and testing programme. Computation of road alignment, geometrics and earthworks.
	I. R. Astill	Computation of road alignment, geometrics and earthworks.
	C. G. King	Computation of road alignment, geometrics and earthworks.
121	CAIRNS REGIONAL ELECTRICITY BOARD:	
	L. M. Pearson	Stringing chart calculations for overhead transmission lines. Load flow studies (GE utility program package). Program for consumer complaint statistics.
	J. Marcellos	System fault calculations (GE utility program package).
122	MACKAY REGIONAL ELECTRICITY BOARD:	
		Calculation of power system load flow.
212	TITLES OFFICE:	Processing of survey computations.
213	A.C.F. & SHIRLEYS FERTILIZERS LTD:	
	C. O. Schaschke	Optimisation of formulations for mixed fertilizers using linear programming techniques. Calculation of volumes of bulk fertilizer stockpiles using Simpson's Rule approximation. Statistical analysis of sample weighings from fertilizer bagging runs.
	J. R. Anderson	Preliminary analysis of a central composite design investigating response of Kingaroy crops to nitrogen, phosphorus and potassium.
215	AMPOL REFINERIES LTD.:	Preparation of orifice plate calibration tables. Performance evaluation and trend forecasting of catalytic reforming plant. Indigenous crude oil price evaluations using the Modified Nelson method prescribed by the Tariff Board. Heat exchanger fouling factor calculations and trend forecasting. Linear programming model generation. Product blending correlations. Refinery turnaround maintenance scheduled by CPM and PROMOCOM programmes. Fuel oil blending by L.P.

APPENDIX V - Continued.

Dept.No.	Department	Work carried out on Computer
227	N. V. APPLETON PTY. LTD.:	
	L. Copley	Computations of range graphs for portal frames under 110-130 m.p.h. wind loads.
232	CUDGEN, R.Z.:	
	W. J. Whiten	Calculation of forces acting on mineral particles in a magnetic separator.
	K. L. Little	Calculation of sluice tray separator results. Calculation of metallurgical balances on mineral separation plants. Simulation of a gravity separation plant to predict performance.
233	I. EDMISTON:	Calculation of forces in pile groups and bridge structures.
406	FORESTRY DEPARTMENT:	
	N. B. Henry	Preparation of volume tables for plantation conifers and investigation of hyperbolic models for selected species. Plantation register data processing. Bark thickness studies, plantation species. Prediction of thinning yields. Analysis of 10% log sample.
	J. A. Winn	Assessment of volume and valuation of standing timber on areas proposed for freeholding.
	P. O'Gorman	Stumpage assessment computations. Calculation of set-to-earn rates.
410	B.C.C. ELECTRICITY DEPARTMENT:	
	J. Sands P. A. Clappison	Implementation of data processing systems for 11kV distribution transformer load records and half hourly distribution system loads. Development of various statistical programs for these systems. Forecasting of loads and growth rates for 33kV zone substations. Development of programs to calculate sag and tension in overhead transmission lines. Load flow and short circuit studies on existing and proposed distribution systems.
	D. J. Hennessey	Multiple linear regression analysis applied to the Council's distribution system for the resolution of class load curves.

APPENDIX V - Continued.

Dept.No.	Department	Work carried out on Computer
412	QUEENSLAND GOVERNMENT RAILWAYS:	
	I. Nibloe	Shear calculations - prestressed concrete girders.
	J. Seymour	Bridge substructure analysis.
	L. Copley	A train simulator. Buffering forces in trains. Speed-distance tables.
	G. Shannon	Dynamics of vehicle motion.
414	C.S.I.R.O.:	
	L. E. Donaldson	Analysis of production records from herds of beef cattle in North Queensland.
	C. T. Gates	Data for plant growth analysis and calculation of chemical parameters.
	A. Howard	Calculation of results of consumer preference survey. Development of techniques for estimation of scaled values of subjective measures.
	L. 't Mannetje	Calculation of botanical composition of pastures and nitrogen yields of pasture mixtures. Searching literature reference cards for bibliographies.
	J. S. Russell	Analysis of meteorological data and calculation of similarity matrices for soil data.
	E. J. Sparke	Beef production investigations in the Upper Clarence Valley of New South Wales comprising breeding preferences, parasites, supplementation and plant nutrient studies.
	G. B. Stirk	Water balance analysis under improved pastures.
	J. R. Wilson	Data for plant growth analysis and calculation of chemical parameters.
415	STATE ELECTRICITY COMMISSION OF QUEENSLAND:	
	G. Billard	Calculation of periodic growth rates and analysis of statistics.
	G. J. Francis	Modifications to economic load dispatch sub-routine.
	K. J. Freier	Development of a multi-machine transient stability program allowing for automatic voltage regulators, governors, saliency, damping and saturation.

APPENDIX V - Continued.

Dept.No.	Department	Work carried out on Computer
415	STATE ELECTRICITY COMMISSION OF QUEENSLAND (CONTD.):	
	K. J. Freier	Real and complex matrix inversion routines using the Shipley-Coleman method. Production of a network program to calculate reduced system matrices for symmetrical and unsymmetrical faults. Calculation of multi-machine steady state stability using synchronising torque coefficients. Development of an Adams-Bashforth "predictor-corrector" type numerical integration routine to permit integration using step lengths of 0.1 seconds.
	L. G. Pane	Modifications to a series of FORTRAN language programmes to process power system data to produce monthly and annual load duration curves, average daily load cycles and other information required for planning purposes. Modification to a FORTRAN language programme to make economic analyses of proposed power system developments. Development of a program in FORTRAN language to provide load forecasts on a monthly basis.
	W. C. E. Wager	Development of methods to simulate the scheduling of generation on interconnected power systems. Calculation of power-frequency over-voltages on long, compensated transmission lines. A program to calculate constants of untransposed, bundle-conductor lines. Study of the reserve requirements of interconnected power systems using probability techniques.
423	COMMONWEALTH DEPARTMENT OF WORKS:	
	D. Caulley	Production of program flowcharts from source listings. Analysis of branch design costs using statistical methods.
	P. Curtis	Design of hydraulic networks.
	R. Dick	Design and optimisation of electrical reticulation.
	E. Graham	Calculation of earthworks quantities and plotting of sections. Design of stormwater drainage systems.

APPENDIX V - Continued.

Dept.No.	Department	Work carried out on Computer
423	COMMONWEALTH DEPARTMENT OF WORKS (CONTD.):	
	M. Graham	Analysis of computer section accounts, and budget control.
	N. Harpham	Calculation of rainfall frequency tables for any location (Institution of Engineers Method).
	A. G. James	Calculation of ventilation rates for buildings contaminated by foreign gases. Plot of diesel/generator test results.
	A. G. James P. B. Jones	Analysis of diesel generator test results. Production of technical specifications.
	P. B. Jones	Project cost control.
	T. Maloney	Preparation of monthly design report.
	D. Merson	Time phasing of annual branch works programme.
	H. Went	Preparation of monthly construction report.
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 has been extended from measurement of delays from delivery point to weighbridge to include total turn-around times and delays in the storage yard.
	C. R. Murry E. E. Shepherd	Development of a program to edit an alphanumeric card file using control cards of the same format as the symbolic COR function control cards of BRIDGE II.
	R. N. Cullen	Analysis of certain data from factory experiments including information about the pneumatic separation of bagacillo from bagasse.

APPENDIX VI

FINANCIAL STATEMENT TO 31/12/1966

CAPITAL EQUIPMENT ACCOUNT - FOR PERIOD ENDING 31/12/1966

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 & 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)	51,407.48
State Government Grants		30,000.00	Auxiliary Equipment to 31/12/65	13,976.00
Commonwealth Government Grants		50,000.00	Auxiliary Equipment to 31/12/66	3,958.69
Transfer from Operations Account - for purchase of IBM 1620 in 1965	$15,825.33		Furnishings to 31/12/64	5,016.36
			Furnishings to 31/12/65	42.41
Less amount returned to Operations Account in 1966	9,490.00		Equipment Hire	2,048.17
		6,335.33	Miscellaneous to 31/12/65	5,501.10
Sale of Manuals		609.48		
Donation - C.J. Elliott & Son		150.00		
Excess of Payments over Receipts		3,958.69		
		$414,107.50		$414,107.50

OPERATIONS ACCOUNT - FOR YEAR ENDING 31/12/66

Balance b/f 1/1/66		$32,954.82	Salaries	$17,924.09
Revenue from Computer Operations -			Salaries (Univ. of Q'ld. contra)	26,744.26
University Departments		42,980.26	Maintenance (Univ. of Q'ld. contra)	5,208.67
Other Users		93,758.45	Equipment (Univ. of Q'ld. contra)	1,013.89
Contributions by University towards running costs -			Equipment	9,861.40
Salaries	$26,744.26		Maintenance	3,224.69
Maintenance	5,208.67		Magnetic Tape Stocks	5,254.18
Equipment	1,013.89		Rental	2,515.80
		32,966.82	Stationery	8,993.04
Transfer from Capital Account		9,490.00	Travel Expenses	526.65
			Electricity	4,281.20
			Furniture and Fittings	787.23
			Transfers to Sinking Fund	100,000.00
			Excess of Receipts over Payments	25,815.25
		$212,150.35		$212,150.35

SINKING FUND - FOR PERIOD ENDING 31/12/66

Revenue	$146,974.44	Investments	$133,858.62
		Credit Balance (for further investing)	13,115.82
	$146,974.44		$146,974.44

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