UNIVERSITY OF EDINBURGH

EDINBURGH REGIONAL COMPUTING CENTRE

Eighth Annual Report

EDINBURGH REGIONAL COMPUTING CENTRE

Eighth Annual Report

1 August 1974 to 31 July 1975

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Appendices

MEMBERSHIP OF EDINBURGH COMPUTING COMMITTEE

Nominees of the Educational
Policy Committee

Professor E A V Ebsworth, (Convener)
    SC.D., M.A., PH.D., F.R.I.C., F.R.S.E.
Professor F H McClintock, B.SC., M.A.
Professor G Whittington
    B.SC., M.A., PH.D., F.C.A.

The Director
Edinburgh Regional Computing Centre

Dr G E Thomas
    B.SC., M.SC., PH.D., M.I.E.E.

The Deputy Director
(Local Systems)

Dr J G Burns, B.SC., PH.D.

Representatives of the
Research Councils

Dr N W Simmonds
    SC.D., A.I.C.T.A., F.R.S.E., F.I. BIOL.
Dr B G Jamieson, B.SC., PH.D.

Representatives of the
Users' Committee

Mr P D Schofield, B.SC., A.R.C.S.
Mr W Lutz, B.SC., M.SC.
Mr A F Purser, B.SC., A.R.C.S.

Representatives of the
Faculty of Science

Dr I F Christie
    B.SC., PH.D., F.I.C.E., F.I.P.H.E., M.I.W.E.
Dr J. Muir, B.SC. PH.D.

Representative of the
Faculty of Medicine

Professor J R Greening
    PH.D., D.SC., F.INST.P., F.R.S.E.

Representative of the
Faculty of Social Sciences

Mr A Bijl, B.ARCH., R.I.B.A., R.I.A.S.

The Professor of Computer Science

Professor S Michaelson,
    B.SC., A.R.C.S., F.I.M.A., F.R.S.E.

Secretary to the Committee

Dr Y Nadeau, M.A., PH.D.

MEMBERSHIP OF THE MANAGEMENT COMMITTEE OF
THE REGIONAL COMPUTING ORGANISATION

University of Edinburgh	Professor E A V Ebsworth, SC.D., M.A., PH.D., F.R.I.C., F.R.S.E. Professor S Michaelson, B.SC., A.R.C.S., F.I.M.A., F.R.S.E. Dr J Muir, B.SC., PH.D.
University of Glasgow	Professor A M Potter, M.A., PH.D. (Convener) Professor J C Gunn, M.A. Mr J McCargow, M.A. (until May 1975) Mr J M Black, B.A. (from May 1975) Mrs D M Baker, M.A. (Secretary to the Committee)
University of Strathclyde	Professor A J T Colin, M.A. (until May 1975) Professor A M Rosie, PH.D., F.I.E.E., M.I.E.E. (from May 1975) Professor D S Butler, M.A., F.I.M.A. Mr L McGougan
Research Councils	Dr N W Simmonds, SC.D., A.I.C.T.A., F.R.S.E., F.I.BIOL.
Computer Board	Professor H H Rosenbrock, PH.D., D.SC., M.SC., F.I.E.E.
Director	Dr G E Thomas, B.SC., M.SC., PH.D., M.I.E.E.

Senior Staff of the Edinburgh Regional Computing Centre

(as at 31 July 1975)

Director	G E Thomas, B.SC., M.SC., PH.D., M.I.E.E.
Deputy Directors	J G Burns, B.SC., PH.D.
	P E Williams, B.SC.
Administrative Officer	D B Marshall, T.D., M.A., B.COM.
Principal Computing Officers	W Aitken, B.SC.
	R E Day, B.SC.
	A Gibbons, B.SC., PH.D.
	G E Millard, B.SC., A.R.C.S.
	P D Stephens, B.A.
	D B Taylor, B.SC., D.PHIL.
Senior Computing Officers	M J Avis, M.SC.
	F E J Barratt
	W D Hay, B.SC., D.PHIL.
	S T Hayes, B.A.
	R B John, B.SC., PH.D.
	R G Kirsopp, B.SC., PH.D.
	A McKendrick, B.SC., PH.D.
	R R McLeod
	C H Nicholas, B.SC.
	A D Nolan, B.SC., M.SC.
	D D M Ogilvie, B.SC.
	G M Stacey, B.SC., PH.D.
	R B Vaughn, B.SC., M.SC.
	J Wexler, B.A.
	J K Yarwood, M.A., M.SC.
Computing Officers	K A Aitchison, B.SC.
	P W Allan, B.SC., M.SC.
	M D Brown
	L C Carlton, B.SC.
	R A F Chisholm
	M J Cross, B.SC., PH.D.
	C C Davies
	J I Davies, B.ENG.

H P Drummond, B.A.
K M Farvis, B.SC., M.A.
J G Fordyce
B A C Gilmore, B.SC.
W M Gordon
N Hamilton-Smith
R Hunter
D F Inglis
A Kettler, B.SC.
C McArthur, B.SC.
R L Middleton, B.SC.
N S Millar, B.SC.
N K Mooljee, B.SC.
B R P Murdoch, B.SC.
J M Murison, B.SC.
D J W Stone, M.SC.
D O Sturgess
G T Watson, B.SC.
W Watson, B.SC., M.SC.

Assistant Computing Officers	A M Anderson, B.SC.
	J H Butler, B.SC.
	J C Meredith, B.SC.
	L Morris
Executive Officer	J Robertson

Eighth Annual Report

Introduction

At the beginning of the year the Chairmanship and servicing of the Management Committee of the Regional Computing Organisation passed from the University of Strathclyde to the University of Glasgow. These functions will remain with that University for two years before passing to the University of Edinburgh. Professor A M Potter succeeded Mr L McGougan as Convener and Mrs D M Baker served as Secretary in place of Mr W G R Brewer. Of the Edinburgh representatives, Professor Vandome resigned and Dr J Muir was appointed in his place. In May, Mr J McCargow of Glasgow University was replaced by Mr J M Black, and Professor A J T Colin of Strathclyde University by Professor A M Rosie.

The structure of the Edinburgh Computing Committee remains unchanged, but Professor Whittington succeeded Professor Vandome, and Dr I F Christie was appointed one of the representatives of the Faculty of Science in place of Professor Last.

Regional events attracted the greater part of the committees' attention. The announcement of changes in ICL's plans for the delivery of the expected 2980 caused some disappointment, tempered by satisfaction at ICL's success in the European field which had caused the delay, and alleviated to a large extent by the promise of a 2970 to be delivered in July to allow software development and the testing of operating systems. The machine was delivered in July and housed, by courtesy of the Department of Computer Science, in accommodation designated for the use of that Department. It will be retained until delivery of the 2980, which is now expected in March 1976. The appointment of staff to the development team proceeded as planned.

At the same time, discussions, often anxious, continued about the transfer of the Regional IBM services to Newcastle. Working relations between NUMAC and ERCC staff were steadily established and provided a stable background against which discussions about operating systems and other detailed requirements of Regional users could be carried out. These discussions did not lead to smooth agreement and the feeling persists among the RCO users that the Region have been led to conclude an unsatisfactory agreement.

This was the first year of operation of the Computing Equipment Panel established by the Edinburgh Computing Committee to advise Faculties and Departments on the purchase of computing equipment and its maintenance. Applications from the Faculties of Science, Social Sciences, Arts and Veterinary Medicine were assessed, and individual members of the Panel helped Departments to frame technically and financially optimal schemes for submission to Faculties or other funding bodies.

The cold wind of financial austerity did not spare the ERCC. Staff vacancies had to be referred to the Vacancies Committee established by the University and three posts thus referred were extinguished. In addition, maintenance cover of the System 4 had to be reduced from three shifts to two, and charges for certain services, especially EMAS, were increased.

Regional Services

The Regional service has been maintained throughout the year on the IBM 370/158 in Edinburgh. The continued delay in the installation of the ICL 1906S at Glasgow University has meant that, as last year, users in that university have had the largest single share of the 370/158.

The Centre was required by the Computer Board to transfer its IBM service from the 370/158 to machines at Newcastle University. The Working Party set up by the Computer Board to recommend the best solution to the conflicting requirements of users in Newcastle and in the RCO held a number of meetings in the autumn of 1974. It submitted a verbal report to the Computer Board. In the absence of a formal report the precise scale of the service which the RCO can expect from Newcastle remains a matter of dispute. The Working Party concluded that although a linked system, whereby the existing 360/67 and the forthcoming 370/168 were linked through common disk storage, represented the best compromise for meeting the needs of the two communities, the technical complexity of such an arrangement made it doubtful whether it could be achieved by the time the transfer of service from Edinburgh was expected to take place. The Working Party therefore recommended, and the Board accepted the recommendation, that although the linked system should remain the preferred objective, in the first instance a standard IBM OS system should be set up on the 370/168 to provide a service should the linked system be unavailable.

The 370/168 was handed over to NUMAC in April 1975 and work has proceeded at Newcastle to implement the operating system used by the RCO and to set up the linked system. Concern for the reliability of the aging 360/67 and at the magnitude of the technical task facing Newcastle led in the early summer to a joint approach to the Board for extension of the 370/158 to the end of 1975. The Board's worsening financial position led them to refuse this request and strenuous efforts are being made to achieve as smooth a transfer of work as possible.

It was reported last year that the Board had approved the installation of an ICL 2980 computer for installation in September 1975 and that ICL had set up a project team at King's Buildings to assist in the installation. In the event, delivery of the RCO machine was deferred for six months to enable an order from the European Space Agency to be fulfilled, and delivery is now expected at the end of March 1976. As an interim measure, to enable the RCO to develop a service for

New Range machines, the Board approved the installation of an ICL 2970. It was delivered at the beginning of July 1975 to accommodation generously made available by the Department of Computer Science, and was handed over two weeks later.

Regional Communications

Progress on the development of communications software was affected by the resignation of one member of the communications software team, and the departure on leave of absence for one year of another member. These deficiencies were made good by two new recruits who joined the team in the late autumn of 1974, and by the arrival of an Australian engineer on a year's sabbatical leave from September 1974. Development of the node processor at Edinburgh continued through the year and preliminary service trials are now taking place. The delay to the 2980 led to a revision of the service dates for high speed lines to the Bush Estate, and of other communications equipment, but much of the necessary work has already been carried out by the Post Office and all should be ready in good time for the 2980 service. Further trials of time-division multiplexing equipment took place during the autumn of 1974, a selection of the most suitable equipment was made and the equipment placed on order for delivery late in 1975. In addition, the need to provide communications to the interim 2970 led to the ordering of a pair of asynchronous multiplexors.

The development of high speed communications hardware for use with the various Modular Ones throughout the Region has continued, and the first prototype is in service use. It follows IBM binary synchronous communications standards, but variants to match the new international synchronous communications standard (HDLC) and for connection to the Post Office's experimental packet switched service are under development.

An ICL 7905 communications processor was delivered for use with the interim 2970 and is likely to continue to be used, at least initially, with the 2980. In the longer term, however, the Region considers that matching to the regional network will be achieved most effectively by the construction of a special-purpose communications processor for the 2980, and preliminary plans are being made to that end.

Local System 4-75 Installation

The year has seen a steady refinement of the service provided on the twin System 4-75 installation: the main aim has been to achieve stability and resilience in the file system. The introduction of the Local Network, reported below, has enabled the file store to be effectively shared between both processors thus

achieving a major design aim which was embodied in the Network proposals. The twin system is thus largely transparent to the user who need not know, in general, which processor is handling his work.

The ability to reconfigure the file store rapidly and dynamically between the processors has also enabled ERCC to allow engineering access to major components, say a processor, during the evenings without major service disruption.

During the year the accredited user population has grown to over one thousand and at any one time the twin system provides interactive computing facilities to a total of between eighty and ninety console users. The period has also seen an accelerating introduction of video terminals having access to EMAS, both character types, which have been funded through the ERCC, and storage tube types with full graphic capability which have been funded by user Departments. Whilst the need for hard-copy devices is still evident there is also a swing to faster and more refined terminals than the teletype.

The annual capital submission to the Computer Board in March 1975 was intended to be for disk equipment to replace the obsolescent fixed disks on the System 4. This proposal, which provided for disks compatible with the 2900 series, reached an advanced stage but had to be withdrawn at the last moment when ICL quoted an unrealistic price. The proposal was replaced, at short notice, by a request for additional core store for the second 4-75 and was approved by the Board.

The enhancements described in the 7th Report, a drum and associated control, were delivered together with the additional core in early August and have been successfully commissioned. In making these proposals ERCC indicated to the Board that they represented the last significant upgrades to the System 4 complex and that it would not expect to add any further ICL equipment. The failure of ICL to advance a reasonable disk replacement proposal does however leave ERCC in an exposed position and it is now considering alternative sources for such equipment.

Local Communications

The 7th Report notes that certain components of the Local network had been placed in service as a temporary measure and also that enhancement to the communication complex had been authorised.

The network was placed in full service during March 1975 and has progressively taken over the complete interactive communication traffic, resulting in the release of our ICL communication equipment as scheduled. One of the ICL multiplexors was rented and has been returned to ICL whilst the second, original, unit was resited at Bristol in July.

There are now seven terminal control processors in all, four at the James Clerk Maxwell Building, and three sited remotely, An eighth has recently been authorised for the Social Sciences Research Centre. These machines all communicate with the Network Control Processor (PDP 11/45) which mediates access to the required service.

Capital submissions to the Computer Board in March 1975 were largely approved under two main headings; firstly a substantial improvement to the range and speed of our graphic output equipment and secondly new communication hardware to enable us to conform to the ISO standard, SDLC, for synchronous communication. The equipment has been delivered and is expected to enter service progressively during the forthcoming year.

Communication with the RJE network has increased steadily throughout the year and the recent introduction to service of the Edinburgh node should allow its capabilities to be fully exploited in the coming months.

During the period under review excessively late deliveries from the Post Office have continued to delay expansion of the Network.

The significant achievement during the year is that the Local Network is now largely independent of any mainframe computer and this should substantially ease problems of introducing new interactive services and of replacing existing machines.

System 10

The SRC-funded System 10 has seen a steady expansion of use during the year as it assimilated the full workload of the School of Artificial Intelligence. The communication equipment has been significantly enhanced and two remote terminal control processors are now installed at Forrest Hill, one controlling the Robot. A third TCP has also been authorised for the University of Sussex.

Data Capture

As anticipated in the previous Report, the bulk of the Centre's data preparation service is now based on a CMC Model 5 Key-to-Disk system located in Alison House. The system, which has six operator key stations, provides a more flexible and more effective service than conventional punched card equipment. In addition it enables greater throughput of work which has in part cushioned the effects of a 20% reduction in establishment enforced during the year.

The final output from the key-to-disk system is on magnetic tape, and this permits easy transfer of the data to the mainframe. Data from the Ferranti Freescan digitiser is handled in a similar manner. However, plans are being prepared for connecting both these services into the local communications network, so avoiding the need for an intermediate medium and the attendant delays in handling it.

Usage

The statistics of usage are shown in Appendix A and B. Although the total regional computing service (370/158) throughput increased by 34% in real computing terms in comparison with the previous year, the absolute usage by Edinburgh University dropped by 1% and that by the Research Councils rose only 5%. The explanation is that, with the system being fully used most of the year and Glasgow and Strathclyde Universities generating sufficient work, each institution was limited to its basic allocation.

There was an increase of 20% in absolute computing terms in the usage of the 4-75 system and, as in the previous year, the physical science departments used almost 50% of the service. In absolute terms the Research Councils' usage increased marginally.

There was no significant change in the relative usage of either service by the different groups of users within Edinburgh University.

Accommodation

There has been no significant change in the accommodation arrangements of the ERCC from those described in the 7th Annual Report other than the provision of space in the Department of Computer Science within the James Clerk Maxwell Building to house the ICL 2970 installation from July 1975.

The construction of the new building at the Bush Estate was largely complete at the end of the review period but a delay in final testing has been tolerated until late 1975 in view of the change of delivery date of the 2980 to March 1976.

The Centre has continued to explore alternatives to its accommodation in Alison House. To that end it has participated in joint studies with the Faculty of Science of potential reallocation of space in the Appleton Tower and the east side of George Square. It seems probable that agreement will eventually be reached, but the new accommodation is not likely to be available within the next two years and, meanwhile, attention is being given to repairing deficiencies in Alison House with respect to the excessive heat being generated by the increased complement of computing equipment, the contrasting lack of adequate heating in winter and the need to provide services for shift and advisory staff.

Staffing and Organisation

The only increase in the staff of ERCC arose from the formation of the 2980 development team. The cost of this increase was borne entirely by the Computer Board. Two new members were appointed to the team and, in addition, each of the participating universities seconded one of its staff to it.

The new staff structure and scheme of tenure for academically-related staff, which had been under discussion with the universities, the EAUT, and the staff concerned for more than a year, was finally introduced at the beginning of the year. An examination of the job content of Engineering Support Group technicians led to the conclusion that maintenance of all teletypes and other terminals could no longer remain their responsibility. Commercial contracts for this purpose were entered into. ERCC retained financial responsibility for the maintenance of terminals owned by ERCC and allocated mainly for use with EMAS, and helped owners of other terminals, including the Research Council users, to have their maintenance carried out on financially advantageous terms.

During the year, the Advisory Service of ERCC matured into an effective unit operating, at both King's Buildings and Alison House, within a framework set out in an Advisory Guide, published early in 1975. Among other things, the Guide recommended that the Advisory Service should be adequately staffed to allow advisors to have secondary activities of substance and to maintain the service at the required level. It is hoped that this establishment can be fully recruited by early 1976.

Staff of Information Services began in October 1974 to participate in the British Library Research and Development Department's Short Term Experimental Information Network project which afforded opportunities to many researchers in the University and Research Council community to use on-line bibliographic retrieval systems, including the American DIALOG and ORBIT systems. This experience has been of value to the Centre staff involved, while providing a useful service.

As the date of the transfer of the Regional batch service to Newcastle approached, it was decided that the on-going responsibility for ensuring that an acceptable service was provided by NUMAC to Edinburgh users should become a local function. Accordingly, staff of Information Services undertook this task in June 1975 with a view to gaining sufficient experience of OS, as implemented on the Newcastle computers, before the start of a user service. This was felt to be essential as the Newcastle OS was significantly different from that to which ERCC had been accustomed. It is anticipated that this activity will consume most of the time of these staff in the months following the departure of the 370/158. Where necessary, they will have the assistance of systems and operational staff seconded from the Regional sector.

At the beginning of 1975, the Centre appointed Mr J M Murison as full-time Documentation Officer with editorial responsibility for the Centre's documentation. It is expected that in fulfilling this role he will also be the principal author of a number of major documents the first of which will be the OS Users' Guide, describing the service at Newcastle.

ERCC followed a policy of allowing Faculties to assume greater responsibility for their computing requirements. The Post Office costs of operating terminals, which had previously been sustained by ERCC, were transferred to the users, and there are indications that this decision is already encouraging users to assess critically the kind of communications which they require. The user community has also been warned that the purchase of new terminals and their maintenance will in future be their responsibility. ERCC will only be responsible for equipping "public" sites.

Appendix A (i)

370/158 Utilisation during 1974—75 by participating Institutions

Institution	No of Jobs	Proportion of Total Jobs	Notional Costs	Proportion of Total Job Costs	File Storage Costs	Proportion of Total File Costs	Combined Costs	Proportion of Total Combined Costs
Edinburgh University	140640	26.99	£117,308.00	19.74	£15,361.70	20.81	£132,869.70	19.86
Glasgow University	127649	24.50	£220,198.61	37.05	£23,503.82	31.42	£243,702.43	36.42
Strathclyde University	71880	13.80	£112,601.98	18.94	£12,969.63	17.34	£125,571.61	18.77
Other Universities	16188	3.11	£ 25,442.29	4.28	£ 1,154.56	1.54	£ 26,596.85	3.97
Research Councils	82660	15.87	£ 37,869.02	6.37	£11,582.51	15.49	£ 49,451.53	7.39
Treasury Supported*	20749	3.98	£ 16,444.84	2.77	£ 1,411.27	1.89	£ 17,856.11	2.67
Commercial Users	1536	0.29	£ 1,246.63	0.21	£ 866.26	1.16	£ 2,112.89	0.32
ERCC Regional Use	25695	4.93	£ 7,177.36	1.21	£ 6,760.46	9.04	£ 13,937.82	2.08
Overheads	34027	6.53	£ 56,045.67	9.43	£ 976.94	1.31	£ 57,022.61	8.52
TOTALS	521024	100.00	£594,334.40	100.00	£74,787.15	100.00	£669,121.55	100.00

* Includes Edinburgh University Data Processing Office

Appendix A (ii)

Utilisation of 370/158 in 1974–75
by University of Edinburgh and Research Councils

Faculty or Sub-Faculty or Research Councils	Computer Transactions (excluding file storage)	Notional Cost	Proportion of Total Cost
		(£)	(%)
Arts	652	501.45	0.25
Divinity	86	50.32	0.02
Law	41	47.73	0.02
Social Sciences	12748	21,142.76	10.39
Medicine	4726	4,273.62	2.10
Dentistry	657	1,063.06	0.52
Veterinary Medicine	140	77.90	0.04
Physical Science	35672	75,602.74	37.14
Engineering	2100	3,297.12	1.62
Biological Science	4631	3,282.48	1.61
Miscellaneous	6706	10,431.81	5.12
Data Processing Office	3581	7,288.86	3.58
Computing Service (Local)	13153	13,098.71	6.44
Computing Service (Regional)	11288	13,937.82	6.85
ARC	29226	35,112.19	17.25
MRC	3758	7,808.08	3.84
NERC	4507	6,531.26	3.21
TOTAL	133672	203,547.91	100.00
Other Universities		395,870.89	
Treasury-funded users*		10,567.25	
Commercial users		2,112.89	
GRAND TOTAL		612,098.94	

*Excludes Edinburgh University Data Processing Office

Appendix A (iii)

Analysis of Utilisation of 4-75 in 1974–75

	Cost	Proportion of Total Cost
	(£)	(%)
Arts	3,405.63	0.44
Divinity	1,279.81	0.16
Law	447.90	0.06
Social Sciences	26,753.38	3.43
Medicine	12,132.23	1.56
Dentistry	857.80	0.11
Veterinary Medicine	175.84	0.02
Physical Science	378,483.68	48.55
Engineering	35,115.26	4.51
Biological Science	36,070.73	4.63
Miscellaneous	46,605.76	5.98
Computing Service (Local)	119,076.94	15.28
Computing Service (Regional)	35,554.92	4.56
ARC	28,763.68	3.69
MRC	5,594.61	0.72
NERC	27,855.16	3.57
Other universities	8,775.68	1.12
Other Treasury-funded users	9,474.45	1.21
Commercial users	3,138.94	0.40
TOTAL	779,562.40	100.00

Appendix B

List of User Departments (1974–75)

(i) University of Edinburgh

Accounting and Business Method
Agriculture
Anaesthetics
Anatomy
Animal Health
Archaeology
Architecture
    Architecture Research Unit
Artificial Intelligence, School of
Astronomy
Bacteriology
Biochemistry
Botany
Business Studies
Centre for Industrial Consultancy and
    Liaison
Chemical Engineering
Chemistry
Child Life and Health
Christian Ethics and Practical Theology
Civil Engineering and Building Science
Clinical Chemistry
Community Medicine
Computer Science
Criminology
Data Processing Office
Dental Surgery
Dictionary of the Older Scottish Tongue
Economic History
Economics
Edinburgh Association of University Teachers
Educational Sciences, The Centre for
    Research in
Educational Studies
Electrical Engineering
English Language
Fire Engineering
Forestry and Natural Resources
French
General Practice
Genetics
Geography
Geology
Geophysics
History
Human Genetics
Linguistics
Machine Intelligence
Mathematics

Mechanical Engineering
Medical Computing and Statistics Group
Medical Neurology
Medical Physics
Medicine (Cardiology)
Medicine, Faculty of
Medicine (Western General Hospital)
Meteorology
Molecular Biology
New Testament Language, Literature
    and Theology
Nursing Studies
    Nursing Research Unit
Ophthalmology
Orthopaedic Surgery
Pathology
Pharmacology
Physical Education
Physics
Physiology
Politics
Program Library Unit
Psychiatry
Psychology
Public Law
Radiotherapy
Respiratory Diseases
Restorative Dentistry
Science, Faculty of
Social Administration
Social and Preventive Dentistry
Social Anthropology
Social Sciences, Faculty of
Sociology
Statistics
Surgery
Therapeutics
Tropical Animal Health
University Library
Urban Design and Regional Planning
    Planning Research Unit
Veterinary Anatomy
Veterinary Biochemistry
Veterinary Medicine
Veterinary Pathology
Veterinary Pharmacology
Veterinary Surgery
Zoology

(ii) Research Council Institutes and Units

ARC	Animal Breeding Research Organisation
ARC	Animal Diseases Research Association
ARC	Unit of Animal Genetics
ARC	Hill Farming Research Organisation
ARC	Scottish Institute of Agricultural Engineering
ARC	Poultry Research Centre
ARC	Rothamsted Experimental Station
ARC	Scottish Horticultural Research Institute
ARC	Unit of Statistics
ARC	Scottish Plant Breeding Station
MRC	Andrew Duncan Clinic
MRC	Unit for Research in the Epidemiology of Psychiatric Illness
MRC	Brain Metabolism Research Unit
MRC	Clinical and Population Cytogenetics Research Unit
MRC	Medical Sociology Unit (Aberdeen)
MRC	Molecular Genetics Unit
MRC	Radioimmunoassay
MRC	Speech and Communication Research Unit
NERC	Institute of Marine Environmental Research
NERC	Institute of Geological Sciences
NERC	British Antarctic Survey Unit
NERC	Institute of Terrestrial Ecology
NERC	Institute of Tree Biology
SRC	Royal Observatory

(iii) Other Universities

Aberdeen (Forestry and Geography)
Birmingham (Physical Education and Geography)
Bristol (Social Work and Social Administration)
Dundee (Computing Laboratories and Biochemistry)
Glasgow
Heriot-Watt
Manchester (Psychology, Business School)
Newcastle
Nottingham (Computer Centre and Geography)
Nuffield College
Open University (Mathematics)
St Andrews (Computing Laboratory and Statistics)
Stirling (Industrial Science, Computing Science, Economic History)
Strathclyde
Swansea (Electrical Engineering)

Appendix C

Financial Statement for the year 1 August 1974 to 31 July 1975

Income

	£	£	£
Direct grants			
Computer Board: Regional	73,100	142,180	
Local	4,171		
less overpaid		68,929	
			211,109
Fully charged-out services			
Research Councils	131,703		
less overpaid	592	131,111	
Commercial & Treasury supported		36,999	
SRC (PDP 10 operations)		4,880	
Other universities		5,535	
Services to Edin Univ DP Office		7,770	
			186,295
Recoveries			
Research Councils		8,543	
Edin Univ MS circuits		1,452	
Edin Univ Datel rentals		7,787	
Commercial & Treasury supported		1,037	
SRC (insurances)		532	
Other universities		20,166	
Edin Univ DP Office		189	
			39,706
Third & fourth shift usage			
Edinburgh University		2,719	
Glasgow/Strathclyde/other univs		4,778	
			7,497
Administrative services			
Miscellaneous charges & sales			54,964
Edinburgh Univ contribution			305,155
Balance b/f from 1973–74			50,171
			854,897

Expenditure

	£	£	£
Staff costs			
Academically related		243,935	
Other		190,670	
Casual		23,294	
			457,899
Materials & services			
Travel and subsistence	5,544		
Computer materials & expenses	61,127		
External service charges & rentals	146,335		
Telecommunications	44,162		
Engineering services & materials	8,319		
Information & training	3,241		
General expenses	33,285		
		302,013	
less stocks in hand		15,023	
			286,990
Overheads			
Edin Univ services: Local		23,915	
Regional		12,085	
			36,000
Transfer to Local Capital Reserve			
Ex Research Councils		40,000	
Ex Commercial & Treasury supported		6,000	
			46,000
Adjustments b/f from 1972–73 & 1973–74			
Overpaid by Edin Univ DP Office		336	
Med speed circuit recoveries		2,326	
Bad debts w/o		3,490	
			6,152
Balance c/f to 1975–76			21,856
			854,897

ERCC