UNIVERSITY OF EDINBURGH

EDINBURGH REGIONAL COMPUTING CENTRE

Seventh Annual Report

(1 August 1973 to 31 July 1974)

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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 P Vandome, M.A.
Professor F H McClintock, B.SC., M.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 J Muir, B.SC., PH.D.
Professor F T Last,
D.SC., PH.D., A.R.C.S., D.I.C.

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

Dr A P M Coxon, B.A., PH.D. (part year)
Mr A Bijl, B.ARCH., R.I.B.A., R.I.A.S.
(part year)

The Professor of Computer Science

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

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.R.S.E., F.I.M.A.
Professor P. Vandome, M.A.

University of Glasgow

Professor A M Potter, M.A., PH.D.
Professor J C Gunn, M.A.
Mr J McCargow, M.A.

University of Strathclyde

Professor A J T Colin, M.A.
Professor D S Butler, M.A., F.I.M.A.
Mr L. McGougan (Convener)
Mr W G R Brewer (Secretary to the Committee)

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

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.
Senior System Analyst	W Aitken, B.SC.
	R E Day, B.SC.
	G E Millard, B.SC., A.R.C.S.
	P D Stephens, B.A.
	D B Taylor, B.SC., D.PHIL.
System Analyst	M J Avis, B.A.
	F E J Barratt
	R B John, B.A., PH.D.
	A McKendrick, B.SC., PH.D.
	C H Nicholas, B.SC.
	D D M Ogilvie, B.SC.
	G M Stacey, B.SC., PH.D.
	J K Yarwood, M.A., M.SC.
Senior Programmer	M.D Brown
	S T Hayes, B.A.
	R G Kirsopp, B.SC., PH.D.
	R R McLeod
	R L Middleton, B.SC.
	N K Mooljee, B.SC.
	J M Murison, B.SC.
	A D Nolan, B.SC.
	J B A Wexler, B.A.
Programmer	K A Aitchison, B.SC.
	J W Allan, B.SC.
	P W Allan, M.SC.
	L C Carlton, B.SC.
	J I Davies, B.ENG.
	H P Drummond, B.A
	B A C Gilmore, B.SC.
	N Hamilton-Smith,
	D R Inglis

	A G Kettler, B.SC.
	N S Millar, B.SC.
	B R P Murdoch, B.SC.
	G T Watson, B.SC.
	D J W Stone, M.SC.
Executive Officer	J Robertson
System Engineer	R Hunter
	W Watson, B.SC., M.SC.
Engineer	R A F Chisholm
	J G Fordyce
	A H Roy
Alison House Services Manager	W M Gordon
Communications Manager	C C Davies
Operations Controller	D O Sturgess
	M T Sykes
User Liaison Officer	V M M Laing

Seventh Annual Report

Introduction

The Regional Computing Organisation has completed the first year of its official existence, in the course of which formal changes consequent upon its establishment were elaborated and approved.

A new Constitution for the Edinburgh Regional Computing Centre was drafted to take into account its extended role: to provide computing facilities and services to the University of Edinburgh, the Research Councils, and the Regional Computing Organisation. The new Constitution also provides that the Management Committee of the RCO should recommend the procedure to be adopted for the appointment of members of the ERCC who are to be employed in part or wholly in activities clearly identified as regional. Concurrently, the remit of the Edinburgh Computing Committee was drafted and submitted for the approval of the Educational Policy Committee and the University Court of the University of Edinburgh; in summary, the role of the Committee is to advise the Educational Policy Committee and the Court and, where appropriate, the Research Councils on the general policy, the operation, and the development of the ERCC and on the Edinburgh interest in the Regional Computing Organisation. A more general part of its remit is to advise the appropriate bodies or individuals on all computing matters within the University. It discharges that last part of its remit in a variety of ways: by giving advice to Faculties and to any who seek it on the acquisition and development of computing equipment and systems, and on their management; in the past year the Committee's advice was sought in the discussions that took place between the SRC and the University which led to the award of a grant for the enhancement of a DEC System 10 intended primarily to support research in the fields of Artificial Intelligence and Computer-Aided Design. The Committee has also established a Computing Equipment Panel to fulfil that part of its remit. This panel will perform some of the functions of the Computing Equipment Sub-Committee which has been disbanded in pursuance of a general University policy of devolving to individual Faculties decisions on the disposal of equipment grants received from the UGC. Computing equipment will cease to be treated in a special category. While the Computing Equipment Panel will not therefore have responsibility for the actual disbursement of funds, it will continue to give Faculties technical advice on the feasibility and desirability of any computing development under discussion, and it will try to ensure that adequate provision is made for the maintenance of such equipment.

Careful to hearken always to the advice of its Users' Sub-Committee, the Edinburgh Computing Committee, in considering matters of broad strategy and

likely to affect the Region, has had to act in close consultation with the Management Committee of the RCO, and it has done so willingly and effectively. For example, the Management Committee and the Edinburgh Computing Committee considered the forecast of recurrent expenditure of ERCC in full knowledge of the complete ERCC budget, and they also collaborated to produce for the Computer Board a strategic view of the capital requirements of the Region to 1979. When the Computer Board visited Edinburgh in March it met the Users' Committee, the Edinburgh Computing Committee and the RCO Management Committee; this indicates the diversity and the unity in the interests of these three Committees.

Regional Systems

In July 1973 a formal proposal by the Regional Management Committee to install an ICL 2980 computer system was approved by the Computer Board. This machine is due to be installed in September 1975, and the past year has been concerned with preliminary planning and with contractual negotiations. The most significant development was the appointment by ICL of a resident project team to assist in the introduction of a service on the new computer. This team was largely complete by January 1974, and was accommodated in the Centre at King's Buildings. It is expected to remain on site until at least mid 1976.

The regional service has been maintained on the IBM 370/155, which was upgraded to a 370/158 in April 1974. The changeover of machines involved an unavoidable gap in service of two weeks. Thereafter considerable hardware problems were experienced with the new machine but these appear to have been teething troubles, and the machine has now settled down to give a reliable service. During the year the biggest single share of the machine has been allocated to users in Glasgow University, who are still awaiting the arrival of the 1906S. The introduction of the 370/158 gave an increase in throughput of about 40%, which has been rapidly absorbed by the still unsatisfied computing requirements within the Region.

It had been expected that the 370/158 would be retained to provide an overlap with the ICL 2980. The Computer Board's decision to install an IBM 370/168 at Newcastle University, however, led to the proposal that the Region's IBM service should be transferred to the Newcastle machine in the late summer of 1975. Although the Newcastle machine should have sufficient power to satisfy users in Newcastle and in the RCO, the requirements of the two communities are quite different and a Working Party was established by the Computer Board including representatives from the RCO to consider the matter. This Working Party is expected to report to the Board in the Autumn 1974. In the meantime it is uncertain how long the Region will be able to retain the use of the 370/158.

Regional Communications

Activity on regional communications during the year has concentrated on the consolidation of the existing network serving remote job entry terminals and departmental computers, and in the planning of the major extensions necessary for the introduction of the ICL 1906S at Glasgow in the Spring of 1975 and of the ICL 2980 at the Bush Estate in the Autumn of that year. These extensions involve the enhancement of the Modular One used as a node processor in Edinburgh, the commissioning of node processors in Glasgow and Strathclyde and the introduction of high speed communication lines between Glasgow and Edinburgh and between Edinburgh and the Bush Estate. It is proposed to use Time Division Multiplexing equipment on most of these high speed lines and a local trial of one manufacturer's equipment for this purpose has taken place. Trials of other manufacturers' equipment are planned for the Autumn of 1974. Communication plans arise from extensive discussion throughout the Region, mostly through the activities of the Communications Coordination Group, the setting up of which was described in last year's Annual Report. This group operates as a Sub-Committee of the Regional Operations Panel and has been supplemented during the year by the establishment of a Regional Networks Working Party under the chairmanship of Professor Michaelson, which has been set up to advise the Regional Management Committee on matters of communications policy.

The implementation by manufacturers of hardware to match the new international Synchronous Communications standard referred to in last year's Annual Report has not been as rapid as had been hoped but it has become clear that moves towards standardisation, at least of the hardware concerned with communications, are taking place. The Region has agreed on the desirability of using the new standard (HDLC) for its internal communications, but is being forced to devise its own high level protocol to run within this standard. The definition of this high speed level protocol has occupied a good deal of effort during the year and is still not complete. Initial communication to the ICL 2980 will use the IBM HASP protocol but it is hoped that a change to HDLC will be possible during 1976.

Local System 4-75 Installation

The sixth report briefly noted that the Computer Board had approved the proposal of the ERCC to install a second 4-75 processor and its associated peripherals. Between June and September 1973 intensive work was carried out to modify the computer room suite and its associated services, and culminated in the delivery of the new processor and most of its peripherals. The machine failed its first acceptance trials early in December. This led to a protracted period of uncertainty as the energy crisis and consequent severe voltage restrictions ensued.

The system was finally accepted in March 1974 and has now settled down to support a substantial part of the interactive work load. The peripherals can be interchanged between the two systems and the ERCC continues to strive towards a situation where failure of individual components can be largely concealed from the user. During the year the original 4-75 has continued to perform adequately and it is hoped that the twin system will provide interactive service for 70 to 80 concurrent users.

The year has also seen the introduction of an integrated system which provides interactive graphics on EMAS utilising the PDP-15 and its associated refresh display units. EMAS has thus reached a significant milestone, in that it now provides a full range of service from the conventional batch system through 'conversational RJE', complete terminal interaction, to a full interactive graphics mode.

The annual capital submission of the ERCC to the Computer Board in March 1973 requested enhancements to the 4-75 installation by an additional drum and associated control equipment. The request was approved, and delivery of the equipment is scheduled for summer 1975. The delivery date for these items underlines an increasing problem with major capital enhancements, in that the time-span from initial formulation of a submission to final delivery and commissioning can easily exceed two years.

Local Communications

The previous report noted delivery difficulties with the preferred front end processor for EMAS and it was not until late 1973 that a decision was finally approved by the Board to acquire DEC equipment for this function. An order was placed in early 1974 and the various components, four processors in all, were delivered by April. As a temporary measure to overcome delivery problems from ICL two processors were placed in service in May, and, together with the Computer Science concentrator in the Appleton Tower, have provided the bulk of the terminal support for the new System 4-75. Further enhancements to the front end were approved by the Computer Board in response to the March submission and these provide for disk storage and for paper tape and card peripherals. In addition the ECC approved a further terminal concentrator to be sited at Alison House.

So, equipment delivered or on order can now provide buffers to support 160 terminals or fixed lines at a variety of speeds up to 1200 baud, dependent on location, and 32 Datel 200 'dial-up' lines for speeds up to 300 baud. The front end processor is intended to have access to the RJE network which currently services 17 terminals in the Edinburgh area via a connection to the Edinburgh node processor.

Development of the software to support this network is proceeding towards the planned disposal of the ICL communications equipment in Spring-Summer 1975 although late deliveries from both ICL and the Post Office could prejudice these targets.

System-10

As reported in a later section of this report, ERCC assumed management responsibility for an SRC-provided System-10 in June 1974. An SRC Grant of some £300,000 announced in March 1974 provided for recurrent costs to the end of the quinquennium and also for substantial upgrading of the System. Most of the enhancements were delivered in July 1974 and the machine now has 192K words of core store, 256K words of fixed head disk, 150 Mbytes of replaceable disk store and substantial communication equipment.

Whilst the user community is strictly prescribed it is planned to integrate the System into the general communication network wherever possible.

Data Capture

Alison House continued, along with its other activities, as the Centre's main focus for data capture. The year saw an accelerating decline in card punch provision on the do-it-yourself side on account of the increasing impact of EMAS especially on student teaching, and the number of punches dropped from 22 to 16. Alison House staff examined whether the concept of direct entry of data to the mainframe would be similarly applicable to the IBM 370 batch service, and developed a proposal to upgrade the Satellite One remote job entry terminal to enable the attachment of a number of Visual Display Units at which users could enter and edit source program, data and job control, submit their jobs to the 370 and examine their output prior to printing. This proposal was eventually turned down by the Computer Board on economic grounds. Instead ERCC has been allowed to install a local concentrator to support, initially, eight video terminals in addition to the twelve Teletypes already provided for access to EMAS.

Increasing use was made during the year of the Ferranti Freescan Digitiser by a variety of departments with traces, graphic, or film material of which a digital interpretation was desirable. Consideration continues of the desirability of attaching the digitiser to a small processor to provide a degree of interactive digitising.

The demand for the main data preparation service has continued at a high level and this, together with a desire for more flexibility in this activity, and the need to reduce expenditure (including that on cards), has encouraged ERCC to alter radically the nature of this service. The Centre has chosen to rent a key-to-disk

system to handle the greater part of the work. The configuration, to be installed in September 1974, is a CMC5 Keyprocessing system comprising a processor, supervisor's console, exchangeable disk unit, six operator key stations and a magnetic tape drive for the eventual transfer of data to the mainframe. The system provides, in addition to the conventional keying and verifying, facilities for editing, reformatting and validation of data at the data input stage. It is anticipated that this will become a substantially more effective medium than the conventional key punch.

The PDP-15 now offers a comprehensive set of programs for analysis of x-ray crystallographic films. The films are converted to digital form using a SAAB film scanner, owned by the Chemistry Department, in conjunction with the comprehensive analogue-digital conversion facilities available on the PDP-15. Subsequent analysis of the data takes full advantage of interactive graphic capability and of EMAS. A general purpose analogue-digital conversion service together with a suite of signal processing programs is becoming more widely used although the major problem remains the initial design of experiments rather than the actual data capture.
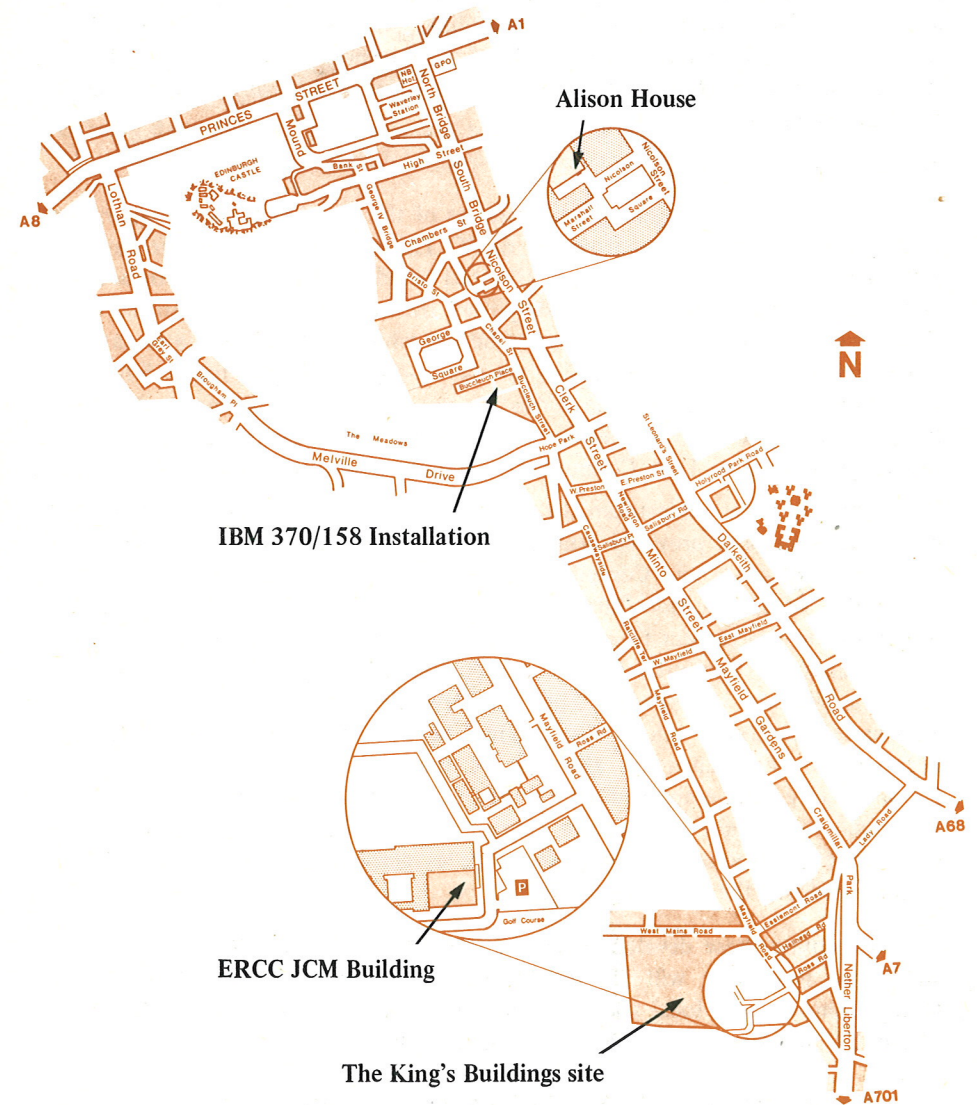
Accommodation

The ERCC establishments remain geographically distributed as illustrated in the accompanying figure within central Edinburgh. The main grouping of staff and equipment are permanently housed in Phase 1A of the James Clerk Maxwell Building at the King's Buildings site. The Alison House accommodation adjacent to the administrative centre of the University provides interim accommodation for the central computer terminals available to all Faculties other than Science together with the main group of advisory and application staff within the User Information Services Group.

The regional computing service provided on the 370/158 is conducted exclusively by wire to the computer housed in the temporary computer building at the rear of Buccleuch Place. In the same area, systems support and other staff are housed in somewhat disconnected buildings.

The Sixth Annual Report referred to the Computer Board's decision that the ICL 2980 computer system should be accommodated in a new building to be constructed on the Bush Estate outside Edinburgh. A comprehensive brief for the design of this building was produced by the Centre, and Dataspace, a subsidiary of ICL, were selected to manage the construction of the building. A detailed design was completed in the Autumn of 1973 but the award of a contract for the construction of the building was delayed by the six month freeze on Government-funded building imposed on 1st January 1974. A contract was finally signed in

CENTRAL EDINBURGH

Alison House

IBM 370/158 Installation

ERCC JCM Building

The King's Buildings site

July 1974 and work commenced later that month. The building is due to be completed in 1975 and is large enough to accommodate the largest likely expansion of the ICL 2980. The design of the building and its positioning on the site is such as to permit simple expansion to provide three times the computer and plant accommodation available in the initial building. Office space will be provided for the Systems Programming and Operational staff responsible for the operation of the operation of the ICL 2980, user access to which will be provided exclusively through communications links.

Staffing and Organisation

One of the main organisational features of the year has been the separation of the Program Library Unit from the ERCC. This separation was seen to have the advantage that the responsibilities of the staff could be defined more satisfactorily in terms of separate units, that it simplified the complex situation arising from ERCC having local and regional responsibilities while PLU had local and national responsibilities, and that it simplified the day-to-day handling of funds. While the separation makes good sense in terms of management and administration, the Program Library Unit continues to work in close collaboration with ERCC, and the Program Library Unit Committee to function as a sub-committee of ECC.

The ERCC has undertaken the management of a DEC System-10 supported by a SRC grant and provided primarily to carry out SRC-sponsored research in Artificial Intelligence and Computer-Aided Design. This management falls within the duties of Dr Gordon Burns as Deputy Director (local systems) who is responsible in this respect to a management committee convened by the Chairman of the School of Computer Science and Artificial Intelligence, and on which all user interests are represented. The Executive Secretary of the Committee is Mr Charles Mackinder who is also the link between it and the grant holder, the Secretary to the University. Members of the system group, which is led by Dr W D Hay, are employed within ERCC on SRC-funded contracts and the additional operational services are charged to the SRC grant. The Management Committee is responsible to the Secretary as grant holder and to the ECC in matters involving the resources of ERCC.

Excepting these developments, the level of staff of the ERCC has remained stable but next year will see the formulation of the ICL 2980 Development Group composed of local and regional staff to work towards the establishment of the ICL New Range machine which is to serve the region.

The budgeting procedures of ERCC were further refined in the course of the year to take account of internal use by ERCC of different ERCC services so as to arrive at a proper assessment of the actual cost of regional and local services.

The Alison House Advisory Service, after a lapse of about nine months, re-started for this academic year. In its new form, it is staffed entirely by members of Information Services resident in Alison House, and enables users in the central area of the University again to tap advice daily on all the Centre's services. Alison House staff will also, from summer 1974, be participating in a short term Experimental Information Network Project involving on-line access to selected bibliographical data-bases via interactive information retrieval systems. This work is being done under a grant awarded to the Centre by the Research and Development Department of the British Library (formerly OSTI).

Appendix A (i)

370/155−8 Utilisation during 1973/4 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	153811	32.67	£155,671.68	28.96	£21,823.66	32.62	£177,495.34	29.37
Glasgow University	90823	19.29	£112,051.25	20.85	£15,518.51	23.19	£127,569.76	21.11
Strathclyde University	68493	14.55	£106,691.41	19.85	£11,143.99	16.66	£117,835.40	19.50
Other Universities	15366	3.26	£27,492.55	5.12	£927.26	1.39	£28,419.81	4.70
Research Councils	72694	15.44	£45,075.87	8.39	£11,898.44	17.78	£56,974.31	9.43
Treasury Supported	14273	3.03	£8,616.62	1.60	£1,963.31	2.93	£10,579.93	1.75
Commercial Users	2826	0.60	£2,483.61	0.46	£677.79	1.01	£3,161.40	0.52
ERCC Regional Use	12452	2.65	£7,258.41	1.35	£629.25	0.94	£7,887.66	1.30
Overheads	40040	8.51	£72,128.18	13.42	£2,324.80	3.48	£74,452.98	12.32
TOTALS	470778	100.00	£537,469.58	100.00	£66,907.01	100.00	£604,376.59	100.00

Appendix A (ii)

Utilisation of 370/155−8 in 1973/4

by University of Edinburgh and Research Councils

Faculty or Sub-Faculty or Research Council	Computer Transactions (excluding file storage)	Notional Cost	Proportion of Total Cost
		(£)	(%)
Arts	360	304.36	0.1
Divinity	—	—	—
Law	385	667.97	0.3
Social Sciences	11,140	25,909.33	10.7
Medicine	6,246	4,328.71	1.8
Dentistry	593	848.18	0.3
Veterinary Medicine	679	382.52	0.1
Physical Sciences	26,339	94,219.72	38.9
Engineering	5,569	8,097.05	3.3
Biological Sciences	2,051	3,349.14	1.4
Miscellaneous	4,565	10,865.96	4.5
Computing Service (Local)	15,903	28,522.40	11.8
Computing Service (Regional)	8,200	7,887.66	3.3
ARC	26,511	35,737.44	14.7
MRC	4,380	15,503.02	6.4
NERC	2,941	5,733.39	2.4
SRC	3	0.46	0.0
TOTAL	115,865	242,357.31	100.0

Appendix A (iii)

Analysis of Utilisation of system 4-75 in 1973—74

	Cost	Proportion of total cost
	(£)	(%)
Arts	246.83	0.1
Divinity	398.93	0.2
Law	640.74	0.3
Social Sciences	4,249.34	1.9
Medicine	7,686.81	3.4
Dentistry	99.69	0.0
Veterinary Medicine	44.73	0.0
Physical Sciences	107,852.04	47.1
Engineering	16,239.43	7.1
Biological Sciences	7,853.62	3.4
Miscellaneous	273.17	0.1
Computing Service (Local)	42,844.24	18.7
Computing Service (Regional)	10,675.95	4.7
ARC	10,529.86	4.6
MRC	1,928.39	0.9
NERC	9,203.42	4.0
SRC	—	—
OTHER UNIVERSITIES	2,161.32	0.9
OTHER TREASURY FUNDED USERS	4,768.45	2.1
COMMERCIAL USERS	1,179.94	0.5
TOTAL	228,876.90	100.0

Appendix B

List of User Departments (1973—74)

(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
Civil Engineering and Building Science
Clinical Chemistry
Community Medicine
Computer Science
Criminology
Data Processing Office
Dictionary of the Older Scottish Tongue
Economic History
Economics
Educational Sciences, The Centre for Research in
Educational Studies
Electrical Engineering
English Language
Forestry and Natural Resources
French
Genetics
Geography
Geology
Geophysics
Human Genetics
Linguistics
Mathematics
Mechanical Engineering

Medical Computer Group
Medical Physics
Medicine
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
Psychiatry
Psychology
Public Law
Radiotherapy
Respiratory Diseases
Restorative Dentistry
Social Administration
Social and Preventive Dentistry
Social Anthropology
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	National Institute of Agriclrural Engineering
ARC	Poultry Research Centre
ARC	Rothamsted Experimental Station
ARC	Scottish Horticultural Research Institute
ARC	Unit of Statistics
ARC	Scottish Plant Breeding Station
MRC	Unit for Research in the Epidemiology of Psychiatric Illness
MRC	Brain Metabolism Research Unit
MRC	Clinical and Population Cytogenetics Research Unit
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 Forestry Research
SRC	Royal Observatory

(iii) Other Universities

Aberdeen (Forestry)
Birmingham (Physical Education)
Bristol (Social Work and Social Administration)
Dundee (Computing Laboratories)
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

Appendix C

Financial Statement for the year to 31st July 1974

Expenditure

Salaries and Employer's charges		£361,593
Travel and subsistence		6,352
Other expenses		244,492
University services		31,000
Balances in hand		
Computer Board grants	£4,171	
Research Councils grant	592	4,763
		£648,200
Unexpended balance of University of Edinburgh contribution carried forward		42,689
		£690,889

Income

Computer time and services		£ 58,616
Administrative materials and services		30,348
Services to Program Library Unit		21,525
Computer Board grants: Regional	£ 43,900	
Local	108,000	151,900
Contribution from Research Councils		105,000
Contribution from University of Edinburgh		323,500
		£690,889

Balance brought forward from 1972/73	£ 9,246
Less Attributable to Program Library Unit	1,765
	£ 7,481
Add Unexpended balance for 1973/74	42,689
Balance carried forward to 1974/75	£50,170

Note: In addition, the Computer Board provided a grant of £208,626 to meet the rental of the IBM 370/158