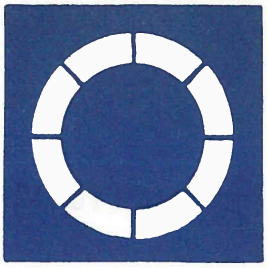
FORUM
195 COMPUTER NEWSLETTER



FORUM CENTRAL COMPUTER NEWSLETTER

Number 2 October 1976

Contents

Published by:

User Support Group
Computing and Automation Division
Rutherford Laboratory
Chilton, Didcot, Oxon.
OX11 0QX.

SECTION 1 195 GROUP REPRESENTATIVES MEETING (28/9/76)

The meeting was held at Rutherford Laboratory. The program was as follows:

9.30 GENERAL MEETING

Updated notes issued for the general meeting are given here. Formal answers to some of the raised questions are provided.

10.20 RULES OF TIME ALLOCATION - a brief revision.

10.30 COFFEE

10.45 ELECTRIC - a discussion of future facilities.

12.15 CATEGORY DISCUSSIONS

A period available for parallel sessions where representatives in the different User Categories may confer with their Category Representative.

12.45 LUNCH

2.00 THE MOVE OF THE 195 and the DUAL SYSTEM.

- the proposed configuration - capabilties of the proposed system - implications of the move (user facilities) - timetable

2.30 REPORTS FROM THE 195 ADVISORY COMMITTEE

This session was cancelled. Some notes are given in Section 8

2.45 COFFEE

3.00 REMOTE USERS SESSION (parallel session)

Looking at aspects of computing on the 195 remotely from Rutherford Laboratory. Part 7 of the general notes cover this.

3.00 CATEGORY REPRESENTATIVES SESSION (parallel session)

ATTENDANCE

INVITED SPEAKERS

T G Pett	C & A Division
H Hurst	C & A Division

CATEGORY REPRESENTATIVES

J Barlow	Film Analysis
C J Batty	Nuclear Structure
I Corbett	HEP
N J Diserens	RL (other divisions)
K Jeffrey	NERC

GROUP REPRESENTATIVES AND OTHERS

K Ahmad	Surrey
J W Alcock	Bristol Theory
J Allison	Manchester
D Asbury	RL Nuclear Structure
G G Baxter	IGS
D R S Boyd	RL CGA
R O Butt	RL Admin
D Candlin	Edinburgh
E Clayton	Imperial (Film Analysis)
A P Conway	Glasgow
M Coupland	Queen Mary
T Dimbylow	Appleton
P Domanski	IOS
E Eisenhandler	QMC/RL CGC
C W Fay	IMER
F D Gault	Durham Theory
Mrs E M Gill	NERC CCG
D Greenaway	RL C&A(CA)
K Guettler	University College, London
A W N Hames	MSSL
J C Hart	RL CGB
P Hashill	RL DHG
J Hutton	RL DHG
M W Johnson	RL NBRU
Mrs L Jones	Oxford Film Analysis
F G Kingston	Royal Holloway College
A Lotts	Durham Film Analysis
J Lowe	Birmingham Nuclear Structure
J Macallister	Oxford Film Analysis
F MacDonald	Birmingham Film Analysis
I R McDonald	Royal Holloway College
R S Mackintosh	Oxford Nuclear Structure
C Maclean	RL Electronics
A J Middleton	RL Technology
H E Mills	Manchester
I Mohammed	Oxford Theory

D Morgan	RL Theory
P J Negus	Glasgow Film Analysis
D Quarrie	RL DHG
T P Shah	RL CGC
H J Sherman	Daresbury
V J Smith	Bristol
A V Stokes	UCL(Kirstein)
S Strachan	IGS
M Waters	RL BCG
C J Webb	Kings College London
D M Websdale	Imperial College
C Williams	Imperial College

USER SUPPORT GROUP

M E Claringbold
G Dawson
P J Hemmings
A T Lea
D F Parker
D Rowley
D H Trew
S H Ward

NOTES FOR 195 GROUP REPRESENTATIVES MEETING

28 September 1976

1. INTRODUCTION

The reorganisation of computing divisions in the Rutherford Laboratory brought the IBM 360/195 and the ICL 1906A under a common management along with the III FR80.

A second 195 has been obtained which will be housed in the Atlas building (R27). The original 195 is to be moved into the same building early in 1977 to form a coupled system. All systems support activity is currently directed towards this system.

2. HARDWARE

2.1 GENERAL There have been no changes to the hardware in the last six months. the system will be reconfigured in December as the first step towards the dual system. Details of the move are given in "CENTRAL COMPUTING REORGANISATION - A NOTE TO ALL PROJECT HOLDERS". A copy of this notice appears in section 2 of this newsletter.

2.2 PERFORMANCE Problems have been experienced with the Memorex disk units. The slow access time problem was solved eventually. A further problem due to a faulty cable appeared in September, which caused delays and response problems for about 1 week. Tape drives have been satisfactory, and CPU about average.

2.3 JOB SUBMISSION FROM R1 Please refer to section 6 of this issue of FORUM.

2.4 SHUTDOWNS 14 days, probably at the end of February as part of the move.

2.5 ROUTINE MAINTENANCE Routine maintenance is scheduled between 1600 and 2030 hours on the following dates: 7 October, 4 November, 2 December, 6 January (provisional).

2.6 SYSTEM DEVELOPMENT System Development will continue to be required on most Tuesdays and Thursdays between 1730 and 1845 hours.

The systems group are making use of facilities at the IBM Test Centre in preparation for the dual system, and will also be using the alternate 195 for test purposes until the systems are coupled.

3. SYSTEM SOFTWARE

3.1 HASP & OS Recent changes are:

1) The Message Space (i.e. contents of /*MESSAGE cards) was increased on 20th July. Previously messages were ignored when space ran out resulting in lost instructions to operators etc.

2) A new version of the Fortran H-Extended Plus compiler is being introduced on Tuesday 12th October which fixed some obscure problems experienced by single users. The compiler printed output identifies which version is being used.

With a few exceptions software development on the existing

system is due to cease at the end of October. Effort is now directed toward the dual 195 system. In particular the following are under preparation:

1) A bigger job queue i.e. more than 999. It will be set at approximately 1500 and will be implemented following the HASP cold start in October.

2) The Automatic Tape and Disk Management System (TDMS) which gives tapes a higher degree of security. Each tape will have a list of authorised users. The system will involve a change to the SETUP card to incorporate the use of a password. Associated with this system is the reorganisation of the tape library. This system was described in FORUM Newsletter 1 (1976).

3.2 ELECTRIC

Some internal changes in Electric are due that will improve the performance slightly.

There are 2 Mugwump data sets now, text files and picture files. After a short period in which picture files were default, text files became the default from 11 August onwards.

The USER command has some new mutually exclusive parameters:

TERM=(terminal no.) will give the identifier of user currently using that terminal.

JOB=ALL will give a list of jobs logged in.

JOB=(jobname) will say if a specific job is logged in.

The COPY command will be changed some time in the future. This will involve several internal changes, and will allow several COPY commands to be processed at the same time.

Some other recent additions are:

1. Allow a maximum number of 50 users to be simultaneously "logged in".

2. Copying a file into itself does not perform layout operations.

3. Correction of a bug to allow "ADDPTNR" with CREDIR command.

4. Setting DOC=FILENAME is expanded into FL=M.DOCUMENT.FILENAME

5. The user of the MAIL command is made a partner, with APPEND access, to the mailed file.

6. Some changes have been made to the use of the 'ROUTE' parameter (see Electric file, DOC=ELECTRIC.SUPP.ROUTE).

7. The parameter REMOTE which could be given with LOGIN to set the default printer for routed output has been changed to ROUTE for the sake of consistency with the job submission commands.

8. The default value of LINENUM is NO if FORMS=555 is given.

A New Electric Manual, as opposed to reprints, is nearing completion. Parts 1, 2 and 3 are available in the R1 Manuals Library for inspection and comment.

The documentation directory formerly referred to as M.MANUAL has been renamed M.DOCUMENT.ELECTRIC. So users may refer to DOC=ELECTRIC.etc.

3.3 MAST The addresses of terminals attached to the 360 via the Memorex 1270 controller (including the dial-in ports on Rowstock 631) were renumbered on 21st May (by adding 80).

A new standard for character codes has been specified for translations to and from EBCDIC. This is in the course of being implemented in the various terminal driver programs. The majority of characters including all those used by Fortran remain unaffected.

4. DISKS

4.1 RHEL03, RHEL04, RHEL05, and RHEL08

Three disks assigned for user data sets namely RHEL03, RHEL04 and RHEL05 have been copied to dual-density (200 MB) packs. The disk RHEL08 which users sometimes refer to by VOL=REF=ATLAS has become a 100 MB pack. Long term data sets should no longer be placed on that disk but should be

registered by contacting the program advisory service who will advise which of the three 200 MB packs should be used.

After Monday 11th October the rules for FREEDISK apply to RHEL08. Namely (1) delete illegally named data sets (2) delete after 15 days disuse. Legal names begin MON. or USER.MON where MON are the first three letters of the current or preceding month.

4.2 2314 Disks

It has been decided that the dual 195 system will not include the 2314 disks. A survey of use and requirement was made during the summer among owners of private 2314 packs. Some consequences of this are given in paragraphs 8.6, 8.8 and 8.9 below. Arrangements are to be made for the transfer of data sets which will still be required. With regard to the data sets on the permanently mounted public packs RL1401 and RL1402, users will be contacted to arrange a suitable disposition of their data. No new data sets are being placed on these disks.

4.3 User Libraries

The two user libraries ULIB.ATLAS and ULIB.ATLAS74 are being reorganised. These are being replaced by a number of group libraries reflecting the computing categories with a few subdivisions. The following libraries have been created:-

ULIB.CHEM	for general use by chemistry groups;
ULIB.ATMOL	for ATMOL modules;
ULIB.PHYSICS	for non-nuclear physicists;
ULIB.NERC	for NERC supported users;
ULIB.ISC	for seismology groups;

and others will follow. Users are being contacted about moving existing modules etc.

5. TAPES

The shortage of tapes continues. Users are requested again: to release unwanted tapes; to switch to 6250 bpi tapes if they have not already done so; and to reuse old tapes rather than request new ones.

The archive tapes are not normally kept in the main tape library. Therefore the user must give the Tape Librarian 24 hours notice before attempting to use such a tape. These tapes are "READ ONLY" tapes so that the MESSAGE

facility should be used to inform the operators if you wish to write such a tape in order to avoid your job being cancelled.

6. WORKLOAD

The workload continued to increase to such an extent that it has been necesssary to reduce the priority 1 rations to zero. This was because not more than two or three jobs were being processed per week and the HASP job queue was filling with jobs that had a very small chance of running. In some cases approval was given for an account to receive a small quantity of priority 3 for speculative or upgradable jobs.

The turnround profile depends of course on the nature of the workload. Targets have normally been met but during afternoons priority 8 work averages have been about 3 hours.

7. TELECOMMUNICATIONS

7.1 General Since the merging of C & A Division with part of the Atlas Computing Division, all telecommunications are under the Telecommunications Group with Dr. M.R. Jane as Group Leader. One of the immediate results of this was to centralise the fault recording and reporting for GEC 2050 workstations whether supplied initially by C & A Division or by Atlas, and whether connected to the 360/195 or to the 1906A. All problems should now be reported direct to the 360/195 Shift Leader (0235 83486). The Shift Leader is then responsible for logging the call and assisting if possible in getting round the problem. If it is necessary to call for maintenance, the call to GEC will be made by the Shift Leader and will be progressed by the Communications Group. Workstation representatives are asked to maintain logsheets supplied by RL, and to return these to Cyril Balderson on a fortnightly basis together with the customer copy of the Service Visit Reports (SVR) left by GEC engineers on site visits. This information is used as the basis for a bi-monthly meeting with GEC Field Service when discussions on reliability of systems takes place.

7.2 Port Contention There has been a growth in the number of workstations connected to the 1906A which have identified requirements for connecting to the 360/195. Because of a number of factors it is necessary to share some of the access ports into the 360/195. The main problem is in the number of suitable lines connected between the two sites, but also in the number of binary synchronous ports available onto the 360/195 through the Memorex 1270 interface. Work is at an advanced stage with a Nodal Processor (a GEC 4080) which will act as a software switch between the two mainframes, with all RJE's running a HASP multileaving control program. Until this is ready, a purpose built 'contender' is being used to share accesss for up to 8 incoming lines onto the 4 available ports to the 360/195. Connection to the 1906A for these lines is via a switch which gives a path to the 1906A or to the contender. It is therefore necessary to arrange for an operator to change this switch when required. It is not possible to permanently man the 1906A communications area and so it will usually be necessary for those wishing to change between mainframes to contact the 1906A control console to arrange this. The foregoing is intended as information only, those users affected know who they are and what operational requirements are necessary.

7.3 The Move With the installation of the second 360/195 and the transfer of the existing machine to the Atlas building those remote users connected to the existing 195 will be affected by a number of points.

1. It is proposed that those stations currently using Post Office 7B modems will have them replaced with commercial modems. These units can be purchased for less than 2 years PO modem rental and are very much smaller.

2. For lines to be moved so that they terminate in the Atlas building instead of R1 it is necessary for the Post Office to set up end-to-end tests on each line. This involves engineers being available at different points at the same time and takes some time to organise. With the scale of operation required it would be impossible for the Post Office to move all the lines within the given 'window' of available time. It has therefore been decided to retain Post Office Wires as currently connected but to provide new cables between the two sites and onward unite the connections. This can be done in the necessary timescale without involvement by the Post Office.

3. The Post Office are being asked to provide control equipment suitable for the combined telecommunications area which will arise after the move. This will probably not be fully available until mid-1977. At

that point, the Post Office will start to move lines across so that they terminate clearly at the new site.

7.4 SHUTDOWNS Users will be kept informed of general shutdowns by the usual means. However there will be small amounts of 'out' time for each line as they are individually moved. It is anticipated that details will be planned well in advance and representatives will be informed of developments affecting them.

7.5 WORKSTATIONS Two new workstation have been connected to the 360/195:-

ROE (previously connected to the 1906A only).

Edinburgh High Energy Physics.

At the end of April the Compumag (Computer Magnet Design) conference took place at St. Catherine's College, Oxford. About 200 electrical engineers from all parts of the world participated. A GEC 4080 was temporarily installed for demonstration purposes, and linked to the 360/195 by public telephone network to simulate the Graphics 4080 at RL.

8 SHORT ITEMS

8.1. STAIRS The online retrieval system STAIRS is available between 0830 and 1000 each Monday to Friday. It has access to (1) the SLAC high energy physics preprint database and (2) the Rutherford Library database containing references to preprints and books received by the Library. Details of how to use STAIRS are available from the Computer Receptionist or from the ELECTRIC file M.DOCUMENT.STAIRS.

8.2. COMPUTER OUTPUT ON MICROFILM Two methods of producing 'lineprinter' output on microfilm are now available:

1. SYSOUT=M

Output from a job may be sent to microfilm, instead of lineprinter by changing, or over-riding, the 'DD' card for the stream from SYSOUT=A to SYSOUT=M. This will produce 42X reduction microfiche, simulating a lineprinter with 8 lines per inch, 132 columns wide. Each fiche can hold up to 216 pages of output. If you require simulation of a 6 lines per inch lineprinter specify SYSOUT=(M,,COM6) and for report format with 6 lines per inch and 85 columns specify SYSOUT=(M,,COM5). Normal Carriage Control Characters are obeyed but if the stream is other than 6 remember to include the parameter DCB=PRINTER (ie SYSOUT=(M,,COM5),DCB=PRINTER). Also, remember if over-riding stream 6 to put the JCL card in the correct place in the deck/file. All JCL stream over-ride cards go before any additional stream cards in the order 5, 6, 7 for the RL standard procedures. Output without carriage control characters will be listed continuously except for a small gap between pages. Do not specify a linecount on your job card of greater than 80 (for SYSOUT=M) or 60 (for SYSOUT=(M,,COM6) or SYSOUT=(M,,COM5)). Multistreams from any number of steps may be sent to microfiche but only one of the three formats may be used in any one job.

The microfiche will be returned to the user via the same distribution system as for lineprinter output.

Further work is in progress to allow users to specify eye-readable titles and a further note will be issued when this is available.

2. Procedure FLIST

This procedure takes output that has been stored on intermediate datasets instead of being directed to lineprinter and produces FR80 output on microfilm, and output to any FR80 camera - 16mm, 35mm, microfiche or hardcopy. By default microfiche is produced at a reduction of 48X (232 pages per fiche). User titling is available and simulations of 6 or 8 lines per inch. Further details may be obtained from the Program Advisory Office.

8.3. ELECTRIC TEXT FILES TO THE FR80

Electric text files may be output to the FR80 microfilm recorder using additional parameters on the PRINT command.

```
PRINT FL=MYFILE,LIST=FR,CAMERA=MFCH,LPI=6,TITLE= 'TEST 1'
```

where

LIST=FR	Routes output to the FR80. Omit if lineprinter required.
CAMERA=MFCH	Microfiche output (default)
HCS	Hardcopy output
BW16	16MM film output
BW35	35MM film output
LPI=6	6 lines per inch (default)
=8	8 lines per inch lineprinter representation.
TITLE='Char. String'	The string specified is printed as a title on each fiche - maximum 36 characters. By default no title is produced.
MODE=T (typewriter mode)	should be used for film to be copied later to A4 plates.

8.4. HASP Line Count

HASP used to take no account of page throws. On 6 July this was changed with each page counting 88 lines whatever the actual number thus giving a more accurate estimate of paper consumption. Users therefore have to reconsider the lines limit asked for on the JOB card.

8.5. PRIORITY 12 Lines Limit

For an experimental period the 2000 lines limit on priority 12 jobs is lifted. The default lines limit is now the same as for other jobs, namely 5000.

8.6. SORT/MERGE

A modified version of SORT/MERGE which does not require 2314 disks has been undergoing tests. There are no outstanding problems and this becomes the standard version on 12 October.
Users may continue to use existing JCL but should note the following. No more than six work areas may be used. References to TEMP14 etc. should be changed to refer to the 3330 disks as 2314 disks are being phased out.

8.7. HASP_COLD_START

A HASP cold start ie. elimination of all work in the machine, whether completed or not, takes place on Monday 18th October.

8.8. VOL=REF=ONEDAY

The experimental facility using a 2314 for data sets required for one day only is withdrawn from Tuesday 12th October.

8.9. TEMP14

The facility for placing large temporary data sets on a 2314 disk will not be available following removal of the 2314's. Temporary data sets which are too large to use UNIT=WORK30 will have to use the demountable 3330 assigned for this purpose, namely USDSK2. Setup cards will be required as follows:-

```
/*SETUP USDSK2,DISK30
/*SETUP TEMP30,Q1,E
```

The purpose of the second Setup card is to avoid simultaneous competition for large quantities of temporary space.

8.10. Revised_PAO_opening_times_(for_all_users)

Monday	0900 - 1200	1330 - 1630
Tuesday	1030 - 1200	1330 - 1630
Wednesday	1030 - 1200	1330 - 1630
Thursday	0900 - 1200	1330 - 1630
Friday	0900 - 1200	1330 - 1530

8.11 POSTAL_OUTPUT

All users requiring their output returned by post should now be using

```
/*ROUTE PRINT POST
```

Previously Atlas users were routing via Remote 24. Likewise for punched output.

8.12. FR80_SHUTDOWN

It is planned to shutdown the FR80 for 2 days. The expected dates are 25th - 26th October.

8.13 MULTIPLE COLUMN OUTPUT FROM ELECTRIC FILES

Two or more columns of output may be printed "side by side" on lineprinter or FR80. To obtain this facility on lineprinter set the parameter LIST=MC (multiple cols) on the PRINT command. The number of columns is determined by the width of each column which may be set by the WIDTH command. The value of WIDTH must lie between 10 and 65 inclusive and has a default of 65. The first and last columns are left and right adjusted on the page with an equal number of spaces between each column:

eg PRINT FL=MYFILE,LIST=MC,WIDTH=62

gives two columns per page each of width 62 and separated by 8 spaces. Users must ensure that the output record length is not greater than the value of WIDTH. In particular for layout instructions (see Electric DOC=ELECTRIC.SUPP.LAYOUT) the layout parameter W must not be greater than WIDTH. The default value of LINENUM is NO if the LIST parameter is given on the PRINT command. The number of lines printed per page can be changed with the LNCNT parameter. After LNCNT lines a "page throw" is generated. The default of LNCNT=9999:

ie PRINT FL=FRED,LIST=MC,WIDTH=62,LNCNT=60

8.14 MICROFICHE VIEWERS

Microfiche viewers are available in both Rutherford Laboratory Program Advisory Offices (R27 and R1) and a viewer for general use is available in the R1 Manuals Library. The R1 Computer Receptionist will assist on use of the latter viewer if required.

P J Hemmings
User Support Group.

SOME QUESTIONS ASKED BY USERS

Q1. Can the Status reply 'JOB INPUTTING' be improved?
Q2. Can the reply to the Change Priority command be status?

Improvements such as these must await the completion of the coupled 195 system. (OS Working Party).

Q3. Can a list of HASP commands be made available?

See Section 5 of this issue of FORUM. (Editor).

Q4. Why does HASP reply 'JOB EXECUTING' when it is not?
Q5. How do jobs get run out of priority order?
Q6. What does position in Job Queue mean?

Answers to questions like these may be found in the article given as Section 4 of this FORUM. (Editor).

Q7. Can Job Numbers be given as part of response to ++H LIST ?

This is not given because space is limited. (M M Curtis).

Q8. Can all HASP and MAST commands be handled by ELECTRIC?

That is on the list of things to do, but some ambiguities must be resolved first, eg LIST, and for the MAST commands an extension to the Online package is required. (T G Pett).

Q9. Is there an optimum size for a User Library?

Frequency of archive is controlled by the Trip Level which should be about 20% above the normal size of the library agreed between the Group Representative and User Support Group. In special circumstances it has proved necessary to divide a library to avoid problems associated with the archiving and cleanup processes. The mechanism is described in RL-76-078. (P J Hemmings).

Q10. Can the Program Advisory Office be double manned during peak periods?

As people are doubtless aware, C & A Division is suffering from a manpower shortage. Although the PAO is double manned in the heavy period (ie afternoons), through sickness, leave etc., this cannot always be mantained. Currently we have attempted to alleviate the problem by concentrating all 195 PAO work in the one office (R1), closing temporarily the second office in R27(Atlas). We would ask users to, when possible, spread the load into the slacker periods (eg early morning). (A T Lea).

Q11. Can there be separate routing for FR80 and line printer output?

The whole question of Route Parameters is under review, but again nothing can happen until after the implementation of the coupled system. (OS Working Party).

Q12. Is it possible to have a list of relevant documents?

System documentation generally is kept in the ELECTRIC directory M.DOCUMENT. Such a list will be provided in a file named WHAT. (User Support Group).

Q13. Users would produce more documentation on their packages if they did not have to own the files.

Contact User Support Group about any file that you think would be suitable for public ownership. (P J Hemmings).

Q14. Is it possible to send lower case messages with MESS TOID= ?

Yes. Use text="whatever".

Q15. Can the access, partners, etc. of edit files default to those of the text file?

Ways are being studied of suitable occasions to use the suffixes .tx and .both. One possibility is on the Change command. Apart from this facility, it is intended to leave the access mechanism for text and edit files independent. (Tim Pett)

Q16. When you retrieve a member of a User Library, is it possible to rename it to avoid confusion with a member of the same name?

If there is a member in the active part of the library, then you will be unable to retrieve another member of the same name. To rename the member being retrieved you should specify MEMBER=oldname(newname). Alternatively you may rename the existing member first using the procedure RENAME, which has the same parameters of LIBRARY and MEMBER. (P J Hemmings)

SECTION 2 CENTRAL COMPUTING REORGANISATION

Reprint of document CCR/1 - A NOTE TO ALL PROJECT HOLDERS

INTRODUCTION:

This note provides information on changes which are taking place in the computing service at the Rutherford Laboratory and to draw your attention to the projected program of installation of a second IBM 360/195 processor and possible disruptions in service which will occur during the next six to nine months.

BRIEF HISTORY

As a result of decisions taken by Council, responsibility for the ATLAS Laboratory was transferred to the Director of the Rutherford Laboratory at the end of August 1975. Following approval by Council to enhance the central computing facilities by the purchase of a second IBM 360/195, a decision was taken to move the present IBM 360/195 from its existing position into the ATLAS building and to combine responsibility for all computing operations within one division (Computing and Automation Division).

INSTALLATION TIMETABLE

(a) The new equipment (central processor, one megabyte core store, two-channel Block Multiplexer, Byte Multiplexer, and control console) was delivered in mid-August and is now under test at the Rutherford Laboratory. Installation cannot proceed, however, until some necessary modifications are made to the ATLAS buildings.

(b) Building work is well advanced. Modifications to the air conditioning plant, however, will cause some unavoidable disruption to the ICL 1906A service in October/November for a period of 4 to 6 weeks. Users of the service were warned some time ago (5 July 1976) of the break in service and two external organizations (ROE and London Office) expressed concern. Discussions and arrangements to provide an alternative service for these users during this time are in hand.

(c) IBM expect to bring their specialist installation team from America on 20th November to commence installation of the new processor (195/2). This machine will first be commissioned with its new channels and a minimum of peripherals to carry out acceptance tests. This is expected to take place before the end of the year.

(d) In January/February, the existing IBM 360/195 (195/1)

will be taken out of service, and the peripherals plus two megabytes of core transferred to the new machine. The three megabyte service will be resumed on 195/2. Users will be without any IBM service for a period of two weeks whilst transfer of peripherals takes place.

(e) Little change in telecommunications is planned during the installation phase. At present about half of our leased lines terminate in the ATLAS building for access to the ICL 1906A, and are 'onward linked' for service to the 195. Once the computing service has moved to the ATLAS building, lines terminating in R1 will be 'onward linked' to the ATLAS building. Additional cables will be laid in October and tested before they are required.

(f) In February/March, 195/1 and the remaining equipment will be transferred to the ATLAS building and the two processors linked into a 2 times 2 Megabyte coupled system.

(g) The software for the coupled system is at an advanced stage and will be almost fully coded by November. Testing will be carried out on an IBM installation under VM which will simulate the coupled system. In this way, most of the software is expected to be tested before the actual coupled system is available.

(h) Service on the coupled system will not differ vastly from the current service. Each processor will have two megabytes of core; data sets on disks and fixed head file will be shared; tapes will be allocated; I/O, ELECTRIC and telecommunications will be handled through one machine. Hardware switching will enable either machine to be chosen for this purpose. Jobs will be controlled by HASP and COPPER and the scheduler will determine which machine is appropriate for a particular job.

USER REQUIREMENTS

Every attempt is being made to seek comment from Users on aspects of the installation program which are likely to affect them. Contact is made through Users representatives, workstation representatives, bulletins etc. If you feel that you may have special problems, please do not hesitate to contact Dr Andrew Lea, head of User Support Group.

W WALKINSHAW
Head of Computing and
Automation Division.
17 September 1976.

SECTION 3 R_L_CHARACTER_CODES

Character codes at Rutherford, as at almost all other other establishments, have been a source of confusion. As the number of different types of equipment connected to the central computer has increased several deficiencies have been exposed. This has hindered input of programs and documentation. For example, since the previous standard was formulated in January 1975, both the lower case print facility and the FR80 have appeared. Certain uses of the ARPA network have also been prevented. A new standard has been defined and is published in the document RL-76-121/C.

The new RL standard character codes will be introduced before the end of this year. At some stage, a major change will be made in several parts of the system. Given below is a list of the subsystems that are known to require modification. If there are any other subsystems requiring modification, please contact User Support Group.

1. ELECTRIC
2. MAST (terminal drivers)
3. GEC 2050 software
4. GEC 4080 software
5. ARPA gateway
6. Other workstations/satellites
7. MUGWUMP user package.

The_basis_of_the_new_standard

The laboratory standard describes two character codes, ASCII and EBCDIC by means of tables. The code used internally on the 195 system is EBCDIC. The only relatively standard and extensive EBCDIC table is that available on an IBM TN print train, so this table was made the ground base for the RL standard for EBCDIC. In addition, the FR80 film recorder has an extensive character set, so the standard has been constructed to allow all FR80 symbols to be available in EBCDIC. After these two sets had been catered for, the few remaining codes have been allocated to useful characters.

The code used by most of the terminals and devices attached to workstations is ASCII, for which a USA permissive standards document exists. The Rutherford standard ASCII is an interpretation of this taking up the modification options

to allow useful programming symbols such as 'logical not' and 'or', rather than 'tilde' and 'broken vertical bar'.

Following the unique definition of the two tables, the generation of the translation tables became simply a matter of noting the locations in the two tables of the same visible symbol. All symbols in ASCII are available in EBCDIC.

Principal codes affected by the new conversion tables

The following characters have, until now, been occasionally incorrectly translated from ASCII to EBCDIC. After the implementation of the new standard, the following characters can be used without confusion from terminals where they are available.

ASCII		EBCDIC		name
5B	[	AD	[	SQUARE BRA
5C	\	E0	\	BACKSLASH
5D	]	BD	]	SQUARE KET
5E	^	71	^	CIRCUMFLEX
5F	_	6D	_	UNDERSCORE
60	`	79	`	GRAVE ACCENT
7B	{	8B	{	CURLY BRA
7C	|	4F	|	LOGICAL OR
7D	}	9B	}	CURLY KET
7E	~	5F	~	LOGICAL NOT

C D Osland
Systems Group.

SECTION 4 HOW THE JOB QUEUE WORKS

QUEUE POSITION

The system examines each job it receives to determine a place in the input queue. The relevant factors are:

a) the id and account;

b) what priority the job carries;

c) whether there are special setup requirements such as the mounting of disks or tapes;

d) whether it is Short ($\leq$90 seconds) or Long; and,

e) how much core it requires.

The ordering of the job queue is illustrated in the following table:

POSITION	NAME	PRIORITY	LONG/SHORT	SETUP	HELD
1	P12A	12			
2	P12B	12			Yes
3	P12C	12			
4	P8A	8	Long	Yes	
5	P8B	8		Yes	
6	P4A	4			
7	P3A	3	Long		

Note that all jobs with the same priority appear in consecutive positions. The order within the priority corresponds exactly to the order jobs were placed there which is not necessarily the order in which they were accepted by the system. If P8B for example had been changed to priority 8 from somewhere else, then it could be older or younger than the job P8A.

Suppose now a further priority 12 job is received called P12D. This job would go to position 4 in the queue with all jobs from P8A down losing one place. However, this placement is provisional as explained below.

The fact that a job might be held does not affect the position assigned to it in the queue. A job might be held for

several reasons:- it might be conditional on the result of another job already known to the system; the system may currently be executing another job with the same name; it may have been submitted in the held state; or, it may have been placed in the held state for some operational reason. The last two types may be regarded as temporary holding, and jobs held in such a manner may be released at any time. The first two types will only be released by the system itself.

When a user requests the status of a job in the input queue, the reply does not give the absolute position. The queue is considered to comprise four sub-queues: Short Non-Setup; Short Setup; Long Non-Setup; and, Long Setup. Thus in the above table, job P4A is position 4 in the Short Non-Setup queue.

It was stated above that the job is first assigned a provisional place in the queue. The system has to consult the ration tables to determine whether there is sufficient time available at the desired priority. If the id and account are not a permitted combination the job will now be rejected. If necessary the priority is successively lowered until a large enough ration is found or if that is not possible the job is then rejected. Priority 13 is a special exception to this, avoiding the P12 level.

There is a short period, usually less than a second before this takes place. Any status request which arrived before that will be told the provisional place in the queue. The system in its present form has no means of delaying a status request until the ration checking has taken place.

JOB SELECTION

The selection of jobs on the input queue involve the concept of Class. Normally the class of a job is determined by its maximum core requirements and by whether the job is short or long. Class is assigned by the system, except in certain special cases, according to the following table:

	≤210K	≤500K	≤960K	>960K
Short	A	E	F	G
Long	1	5	6	7

If any of these classes are specified on a Job card, the system overrides them.

The system may process up to 14 jobs at any one time of which up to 9 may be batch jobs. Each job being processed by the system is deemed to be executing even though such a job may be waiting, for core for example, to begin a step and not

appear in the list of running jobs given by MAST. Each of the 14 jobs is controlled by an Initiator. It is an initiator which selects a job from the input queue. Each initiator is set to select jobs only from specified classes, and these settings are under operational control. For example, during the prime shift the system concentrates on development work and normally only accepts jobs in the classes A and E, that is, no long jobs. Jobs with Setup requirements do not become available for selection until those requirements have been met. Independently of the job selection process, Setup scans the input queue relating the needs of queued executable jobs to the available tape and disk drives etc., issuing appropriate mounting commands to the operators. Executable jobs are those in classes selected by the operators which are not held. When the necessary mounts have been performed, Setup marks the job as being ready for selection. In the special case of class A the class is changed to B.

A job initiator might be given a setting of, say, BAE. When the initiator is free to accept another job, it will scan the input queue for jobs of the highest priority in class B, if there are none it will repeat for class A and then E if necessary. Failing that, it will move to the next priority and repeat the process. This continues through a High Priority Band which normally extends to priority 10. It then moves to a Medium Priority Band which extends down to priority 6 during prime shift. Here the search mechanism is for the highest priority class B job it can find, then A and then E. It will not select a job from the Low Priority Band. The setting of these bands is under operational control. Outside the prime shift the Medium Priority Band extends to priority 4 during the night, and includes all jobs at the weekend.

Priority	Class=B	Class=A	Class=E
13	1	2	3
12	4	5	6
10	7	8	9
8	10	12	14
6	11	13	15
4			
3			
1			

Daytime selection order described in the text.

Thus the selection of jobs from the queue is done by the initiators. These are set according to the operational requirements so that the conflicting requirements of turnround

and maximum throughput may best be served. Turnround clearly depends on the profile of the workload at any one time. It also depends on the type of work which is currently being processed. When the system is processing long jobs during the night, it is possible to have periods of up to an hour before an initiator becomes free to select a new job. It is therefore impossible to guarantee turnrounds measured in minutes then. The same applies during weekends. Consideration has been given several times to reserving an initiator for short high priority work during production shifts, but so far the demand has not justified the loss of production this would involve.

The expected time spent on the input queue (which is not quite the same as turnround) for class A jobs is shown in the following table:

Priority 13	0-1 minutes (plus 2 minutes for Setup)
Priority 12	5-10 minutes
Priority 10	10-30 minutes
Priority 8	1-2 hours (plus 1 hour during afternoons)
Priority 6	Should be cleared overnight.
Priority 4	Should be cleared by Monday Morning.
Priority 3) Priority 1)	Will only be run when no higher priority work available.

The normal prime shift initiator settings as far as they affect the batch are:

BA; B; AB; AB; BA; BA; BA; BA; E; 2.

The first two of these initiators are scheduled for non-batch work during parts of each day. The last of these initiators is for CPU bound jobs specially arranged with operations group. During the night the above typically becomes:

BA; B; AB; AB; BA; BA; 1; 1; 5; 5.

Note that the classes F,G,6 and 7 which demand large areas of core will not run in either of these arrangements. Initiators are set to accept jobs in those classes only when it is clear that the turnround targets of the standard classes are in the process of being met. Some class F work is normally processed during lunch times.

P J Hemmings
User Support Group

SECTION 5 SOME_TERMINAL_COMMANDS

COMMANDS_AVAILABLE_FROM_ANY_TERMINAL_IN_ONLINE_MODE

The full format of an input line is:-

    ++dest space text

The short format of an input line is:-

    text

which is normally equivalent to:-

    ++ELEC space text   ie ELEC is the normal default.

The destination of a message must be at least one character and not more than four characters. Messages to ELECTRIC are normally in the short input format. In general a Destination will be either an online program, or a terminal. Certain destinations are acceptable in an abbreviated form:

    ++M is an acceptable prefix for MAST
    ++H is an acceptable prefix for HASP
    ++E is an acceptable prefix for ELECTRIC

    ++U addresses the Program Advisory Office.
    ++T addresses the Tape Librarian.

    ++S may be used to address one's own terminal.

    ++B initiates modes of using the terminal.

In particular, the default destination of messages may be changed. For example:-

    ++B DEST XYZ   makes it the program XYZ.
    ++B DEST 99   makes it terminal number 99.
    ++B DEST U   makes it the Program Advisory Office.

Reset the terminal to ELECTRIC when you finish.

Some Commands to MAST

++M TIME Mast responds with the 360 time and date.

++M JOBS Mast responds listing all jobs in core.

++M NAME Mast responds with a list of online jobs .

++M TLOP text Mast responds OK, and transmits the text to the main operators' console.

++M ASKO text Mast usually responds OK, transmits the text to the operators' console, and later returns an operator's response to your terminal.

Some Commands to HASP

++H LIST XYZ lists all Jobs with names beginning XYZ.

++H STATUS JOB=XYZ obtains the status of the Job(s) named XYZ.

++H STATUS JOB=123 obtains the status of the Job with the HASP number 123.

++H RATION ID=XY,ACCT=1234 obtains the current Priority Rations for account 1234.

++H CHANGE JOB=123,ID=XY,ACCT=1234,PRI=6 alters the Priority of the Job numbered 123 to Priority 6.

++H ROUTE JOB=123,ID=XY,ACCT=1234,ROUTE=REMOTE23 Reroutes printing for the Job numbered 123 to Remote 23.

++H CANCEL JOB=123,ID=XY,ACCT=1234 Cancels & purges Job 123.

Note that those commands which alter the status of a Job must use the HASP Job Number (obtainable using STATUS), and require the ID/ACCT combination matching those of submission.

HASP COMMANDS FROM WORKSTATION CONSOLES ONLY

In general, you are only permitted to change the status of a job or a device which belongs to your own workstation. The replies to some of the display commands are also limited to the workstation's own jobs. A job belongs to the place where its print is routed. For the commands given below, the console must be in Hasp Mode.

+++ puts the console in Online Mode (see above)

++- puts the console in Hasp Mode (default)

You may use the full form of online messages while in Hasp mode, but if you wish to use the short form, you should first enter Online mode.

If you have any difficulty using these commands, you should get in touch with your workstation representative.

COMMAND	COMMENTS
Information	
$DF	Display no. of jobs queued for output awaiting special forms.
$DI	Display classes and status of initators. (Which job classes are currently being run).
$DJ job-list	Display information on specified job(s).
$D'XYZ	Displays all (anywhere) jobs called XYZ.
$DJXYZ	Displays information on the first job XYZ.
$DJ123	Displays job numbered 123.
$DJ1-9999	Displays all jobs for this workstation.
$DLNE n	Displays the state of workstation n.
$DMn,'message'	Displays the message at workstation n.
$DM0,'HELP'	The message goes to 360 main console.
$DN	Display jobs queued for the workstation.
$DN,PRT	Display the print queues only.
$DN,XEQ	Display input queues only.
$DN,XEQA	Displays input queue for class A.
$DN,n,PRT	Display print queue for workstation n.
$DQ,XEQ	Display number of jobs in the input queues.
$DQ,n	Display no. of queued jobs for workstation n.
$DRMn	Display devices on workstation n.