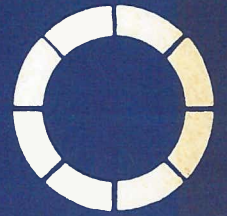# FORUM
195 COMPUTER NEWSLETTER

FORUM CENTRAL COMPUTER NEWSLETTER

Number 4   December 1977

Contents

SECTION 1   195 GROUP REPRESENTATIVES MEETING (1/12/77).

The programme was as follows:

09.30   Introduction.

09.35   General Meeting.

Updated notes issued for the meeting are given here
together with formal replies to some questions of
general interest.

10.30   COFFEE

10.50   The Volume Management Facility.

Some operational aspects of tape handling under VMF.

11.15   Machine Performance.

Discussing recent work to improve system performance
(including ELECTRIC response), and contributions users
may make.

12.00   Parallel Category Meetings.

LUNCH

14.00   Current work on ELECTRIC.

14.45   Network Commands.

15.00 (Parallel Session) Remote Users' Meeting.

Some aspects of using the system from remote links.

15.00 (Parallel Session) Category Representatives Meeting.

Including a discussion on facilities to control
allocations.

15.30   FINISH

Programme

ATTENDANCE

C & A DIVISION

C Balderson, V M Boulton, A D Bryden, P J Hemmings,
H Hurst, M R Jane, A T Lea, A R Mayhook, C D Osland,
D F Parker, T G Pett, D H Trew, S H Ward, J B Whittaker

Category Representatives

J Barlow	Film Analysis
C J Batty	Nuclear Structure
I Corbett	HEP
K C Jeffrey	NERC

Group Representatives and Others

J Alcock	Bristol
F Atchison	Nimrod Division
G S Baxter	IGS
C Blamey	AWRE
I Bloodworth	FA Birmingham
D R S Boyd	CGA
J V Carey	RGO
A G Carter	NCCG/NERC
E J Clayton	Imperial College/Film Analysis
C J Collie	TD CAG
J E Conboy	UCL Film Analysis
J R C Duke	PERME
E Eisenhandler	QMC/RL
F Gault	Durham/Theory
K M Gavin	Leicester Workstation rep
L Gill	UCE (ORLS)
M Godden	UCE (ORLS)
J Goodison	Sheffield
P J Grant	Oxford Theoretical Chemistry
G H Grayer	QMC/RL
M Grayson	Sheffield Univ (Chem)
G Hall	Imperial/Film Analysis
A Hames	MSSL
J C Hart	HEP
M Houlden	Liverpool FA/HEP
L L Jones	Oxford
L S Julien	Surrey Eng.Nuc.Struct.
D Kelvin	Glasgow NS
M L Kendall	Appleton Lab - IUE
J Lang	ARD Culham
G T Laws	Salford - Maths
J Linch	Exeter
A P Lotts	Durham/Film Analysis
J Lowe	Birmingham NS

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D A Lowther           Imperial College
J B MacAllister       Oxford
F MacDonald           Birmingham FA
D M McGregor          ISC Newbury
B Mack                RGO
R Martin              ROE
R Maybury             HEP/DHG
A J Middleton         Tech RL
I Mohammad            Oxford Theory
D J Munday            Cavendish Lab. Cambridge
P J Negus             Glasgow FA
M J O'Connell         RL Instrument Div.
M Pierce Butler       PERME
B Pollock             Westfield
I Quirk               MSSL
R Roberts             RL Theory
R Renaud              Royal Holloway College
K Robinson            Applications Group ACD RL
H Saraph              UCL London
T P Shah              HEP
H J Sherman           Daresbury Laboratory
A J Skarnulis         Oxford Univ
J Skoyles             IMER/NERC
J Smyth               Forestry Commission
S W Treadwell         ARPA/UCL
S J Watts             QMC/RL
C J Webb              Laser
N West                Oxford Film Analysis
C Whitaker            Cranfield
F Wickens             VTS
J N Woulds            Daresbury Laboratory
J Young               AWRE
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NOTES FROM 195 REPRESENTATIVES MEETING HELD AT RUTHERFORD LABORATORY 1 DECEMBER 1977.

1. INTRODUCTION

The last six months have been a period of consolidation after the introduction of the dual system. There have been few new innovations, but much work has gone into improving the reliability of the system.

2. HARDWARE

2.1 General

A new 3830 Disk Control Unit was installed in December; there is now one on each bank of disk drives. It is expected that this will improve ELECTRIC response and reduce wait times for disk I/O generally. The control unit is currently rented from IBM, but will be replaced by a purchased one in the new year; that change should be transparent to users.

2.2 Shutdowns

One shutdown is planned, for air conditioning maintenance, from 22nd to 25th April.

2.3 Routine Maintenance

Routine maintenance will continue as previously except that, with the end of the warranty period, maintenance on 195/2 will be done between 15.00 and 19.00 - the same as 195/1.

Dates for maintenance during the coming year are as follows:

195/1 - 5th January, 2nd February, 2nd March, 6th April, 11th May, 8th June, 6th July, 3rd August, 7th September, 5th October, 9th November, 7th December.

195/2 - 19th January, 16th February, 16th March, 20th April, 25th May, 22nd June, 20th July, 17th August, 21st September, 19th October, 23rd November, 21st December.

2.4 System Development

The system will continue to be required for System Development on Tuesdays and Thursdays from 17.30 to 19.00.

3 SYSTEM SOFTWARE

3.1 HASP and OS

The reply to the command ++H ROUTE JOB=nnnn now contains information on the use of special forms, e.g.

JOB nnnn ROUTED LOCALLY FORMS=555

If the forms code is one of those assigned for de-spooling on the FR80 the reply will be

JOB nnnn ROUTED LOCALLY FORMS=FR80

3.2 Compilers_and_Linkage_Editor

Some modifications for the G1 compiler have been received, and these will go in in the new year. More information will be circulated with FORUM number 5.

A user has suggested that NOMAP should be the default option in the compilers and Linkage Editor. The comments of the meeting were invited and it was decided not to ask for NOMAP to be the default.

3.3 ELECTRIC

Changes directly affecting the user which have been made over the last six months are as follows:

i) The default region size for the ELSEND procedure has been reduced from 72K to 50K; this is sufficient for most needs. If you need more than 50K because you are reading from a data set with a large BLKSIZE, it is necessary to use the REGION parameter on the EXEC statement.

ii) The number of blocks occupied by an archived file is now stored in the directory entry, in the space formerly occupied by the retention date. As a result no warning is given if the retention date prevents deletion of an archived file.

iii) PARM commands are now retained whenever the subsequent command produces any fault (i.e. NF=n). To destroy the parameters type the new command NULL. Otherwise parameters can be re-set with additional PARM commands, or with the subsequent command.

iv) Commands can be abbreviated to the minimum number of characters which makes them unambiguous (usually 2). Exceptions are DELETE, CLEAR and NULL.

Future plans for the archiving facility include a second level archive disk, the ability to run the archive program while ELECTRIC is online and archive space management within ELECTRIC. (See Section 4).

MUGWUMP users are reminded that all routines which form the offline MUGWUMP package are contained in the library

SYS1.MUGWUMP, from where they can be obtained on auto-call by adding the parameter SYSLIB='SYS1.MUGWUMP' to the EXEC statement of the batch program. Any programs which still rely on the inclusion of these routines from SYS1.IDILIB or ULIB.CACA will need to be changed as the relevant members were deleted from these libraries on 1st January.

4 WORKLOAD

The turnround objectives are at present being met. (See the discussion in Section 5 of this FORUM issue).

5 WORKSTATIONS and TELECOMMUNICATIONS

5.1 IBM 360/195 Move

Since the last meeting the move of all Post Office lines to terminate in R26 has been completed, as has the IBM 360/195 communications system layout.

5.2 GEC 4080 Nodal Processor

Belfast (Queen's University) has joined the list of users connected via the Nodal 4080. They have requirements to access the 1906A, the 360/195 and the Daresbury 370/165, which can all be accomplished by this method.

5.3 CERN

Tally 300 l.p.m. printers have now been installed at CERN. It is hoped that this will ease the maintenance problems at CERN. Potential users should be aware, however, that the design of these printers does not allow for overprinting.

5.4 Newsheets

There have been occasions when newsheets sent to a workstation have been thrown out by users at the workstation. These newsheets are intended to provide information for all users and, particularly when they contain details of shutdowns, should be prominently displayed in the workstation area as well as being distributed to users. Workstation representatives are asked to ensure that this is done.

5.5 Bootstrap Loader

The default versions of the Bootstrap loader have been updated to the correct level for each workstation. Always use this default to load the 2050 software, ie do not indicate any version number in columns 60-63 of the /*SIGNON card.

6 LIBRARIES AND PACKAGES

6.1 Program Libraries

A user recently raised the question of support for the Program Libraries (i.e. CERN Library, AERE Library, NAG, etc.). He recently had a problem using a specific routine in RHELIB. This in turn led him to discover that, at least within his own group, people were using different routines from different libraries essentially to solve the same problem. Thus the group were not really able to exchange information and experiences in a way that would have been possible had they all been using a common routine.

The suggested support policy for libraries is as follows:

i) Recommend that one library be considered as the principal numerical library. The suggestion is that this should be the NAG Library. This library has gained very widespread acceptance within the UK University field. It is also felt to be a well tested and supported product, where all routines are of a uniformly high standard. However, it should be pointed out that some of the other libraries mentioned below contain specific routines which are superior to the NAG equivalent. Thus the user may well benefit himself if he is prepared to do some initial investigation and comparison.

ii) Continue to supply the existing libraries, namely those from AERE, CERN, CPC and IBM(SSP). These would be mainly for people coming from elsewhere with programs using routines out of these libraries. This is particularly relevant for the CERN library, which has recently produced a 360 version.

iii) Continue to provide our library (RHELIB) for its original purposes i.e. for routines not available elsewhere, for those specially tuned to the 195s etc., however being careful to stress in the writeups of each likely points of failure of the routine concerned.

iv) Finally, via CIGAR stress that users are ultimately responsible for testing that the routine they choose is suitable for the task they wish to do.

6.2 NAG Library

Section 8 of this FORUM gives a brief description of the NAG library. Information on how to use the NAG Library can be found in CIGAR, sections C10.1 and C10.7. Mini Manuals are now available to Group Representatives. Contact Mrs J Scholes.

6.3 PATCHY

The overlaid version of PATCHY 4 is now held in the library member YPATCHY in ULIB.CACA; the name BMP4TEMP is being retained as an alias for the time being only. All the PATCHY utilities are available via catalogued procedures; instructions for use are contained in the document 'PATCHY on the Dual 195 Computers', which can be obtained from Mrs. Scholes.

We are trying to compile a mailing list of PATCHY users; this list is temporarily held in the ELECTRIC file FEMAINDR.PATCHY.USERS and it would help if any users who wish to be included check that their name is there – users who wish to have their names added should contact Barrie Whittaker or Sue Ward of User Support Group.

6.4 TPCOPY (CIGAR Part E – UT/2)

TPCOPY was modified on 7/11/77 to cure the following problems:

i) Failure to terminate the last file of the output tape with a double end of file mark when copying only part of a tape. This problem caused file positioning abends on subsequent writing to the tape of further files. (Note, this bug was only evident on partial copies, full tape copies were written correctly).

ii) Failure to recognise the 'End of Tape' condition on the output tape. This problem generated the message 'PERMANENT WRITE ERROR – JOB ABORTED'. A message of the form 'END OF OUTPUT TAPE ENCOUNTERED' is now produced in both the HASP log and the program output when end of tape is reached. The job is then aborted. The 'WRITE ERROR' message is only produced if a genuine I/O error has been encountered.

iii) The procedure TPCOPY was found to be incorrect when requesting the LIST option. Parameter COUT should be set to NULLFILE, not to LIST, when analyzing a tape using the TPCOPY procedure. Note that this bug did not apply to, or affect, the version in the ELECTRIC Jobfile.

6.5 PFORT

FORUM number 3, section 3, refers to PFORT, a standard FORTRAN verifier. This program is now available on the 360/195, and details of how to use it are available from the 360 PAO's.

6.6 IDVICE

A revised version of RHELIB routine IDVICE (SY/23) was installed on 18th November. It is now as described in Part E of CIGAR.

6.7 MTINV4

The problem with an RHELIB member, mentioned in 6.1 above, concerned the routine MTINV4. This routine will not cope with a near singular matrix, neither will it warn the user that there are problems.

6.8 CPC Program Library

The CPC Program Library is now maintained on the 195 by the CPC Library staff themselves, from Belfast. This should considerably reduce the period between a program being published in the CPC Journal and its availability on the 195. The procedures RLCPCGET and RLCPCSRC described in section C10.6 of CIGAR have been modified internally.

6.9 Harwell Subroutine Library

A second supplement to the catalogue of subroutines (AERE R7477) was published, dated August 77.

7 SHORT ITEMS

7.1 Introductory Course

An Introductory Course for users new to the 195 has been devised, and the first course was held in December. This course is aimed mainly at people having experience on other machines. It is possible that more of these courses might be held and a suitable application form is at the back of this FORUM.

7.2 Card_Punches_in_R1

IBM are to conduct an audit of these punches; the machines are rented from IBM and they will send an engineer to examine them and check if they can be repaired or if they should be replaced, and take action accordingly.

7.3 Accounts_Information_for_Grant_Supported_Users

The Jobfile GRANTS has been created to give grant supported users information on the current state of their computing accounts. The file contains details of grant end date, hours awarded, time used to date and pro-rata allocation. The file is updated approximately weekly and may be inspected by using the ELECTRIC command

TYPE JB=GRANTS

Fuller details are being circulated to the users concerned.

7.4 Transferring_work_to_the_Daresbury_Laboratory

Users who are transferring work to the Daresbury Laboratory are advised to get in touch with Howard Sherman or John Woulds of User Support Group at Daresbury.

7.5 Standard_Character_Codes

RL-76-121/C - 'Standard Character Codes for the RL Central Computer System' - has now been reproduced and should be available from the Computer Receptionist or the library.

7.6 Cambridge_Editor

RL-77-136/C - 'Rutherford/Warwick/Cambridge Text Editor - User's Guide' - is now available from the Computer Receptionist. This describes version 1.2 of the ('Cambridge') editor, and the procedure that runs it. The new procedure avoids earlier problems with JCL caused by the procedure containing two steps.

7.7 Symbolic_Algebra_User_Notes

Symbolic Algebra User Notes 1,2, and 3, describing initial releases of REDUCE, SCHOONSCHIP and CAMAL, are now available from the Computer Receptionist.

7.8 SMOG

Graphics User Note 10, describing additions to the SMOG library on the 195, and in particular the DRPLOT package, is now available from the Computer Receptionist. Note that DRPLOT has been enhanced considerably in the last few months. Log axes are not available yet, but should be operational by the end of January 1978.

7.9 FR80 Hardcopy Paper

A paper was circulated earlier entitled 'Soaring Cost of (FR80) Consumables - Need for Economy', outlining methods of reducing consumption, especially of hardcopy paper.

A sample of a new type of paper was tested to see if an improvement could be made in the edge sharpness and overall contrast of the characters used in typesetting applications. The tests showed that offset printing plates could be made directly from such output. Intermediate bromide plates become unnecessary. In addition, the same chemicals and number of overstrikes could be used as with the current paper. Furthermore the paper, although thicker than the current material, was less prone to exude chemical deposits after a few days and was also significantly cheaper. The exposed areas were more intensely black but thin lines, as in the standard FR80 hardware characters, came out more thinly than on the current paper, which could be a disadvantage on occasions. On the other hand, the finer lines allow more use to be made of the MANYUP feature without loss of detail.

As a result of the response to a questionnaire sent out to users of hardcopy it has now been decided to adopt the new paper as the standard for hardcopy output. Stocks should arrive within the next two to three months. Please contact Paul Nelson on extension 498 if any difficulties arise over the use of this paper.

7.10 Next Meeting

The next 195 Representatives Meeting will be held on Wednesday 5th April at the Rutherford Laboratory in the Lecture Theatre. Details will be circulated later.

Q1. When does activity rise to normal?
A1. 9 - 9.30 am.

Q2. Could page throws on compiler output be suppressed?
A2.   A better solution would be a forms queue (eg. SYSOUT=C
for continuous) which substituted four 'line feed's for 'page
throw' at print time. This has been added to list of SYSOUT
changes and will be done as part of the SYSOUT improvement
project. (C.D.Osland).

Q4. If you were to run Introductory Course next year, could
information be published earlier?
A4. The December course and its overflow are pilot studies.
If it is decided to hold further courses, the dates will be
published in good time. (P.J.Hemmings).

Q5. An option to switch off linkage editor printing would be
useful.
A5. If manpower permits, Systems Group will rationalise all
standard language procedures with CPRINT (default NO for FH,
YES for others) and LPRINT (default YES for all) on all C and
L steps respectively. (C.D.Osland).

Q9. The RHELIB subroutine MTINV4 should be used with caution.
A9. Yes. (See the reply to Q18). (P.J.Hemmings).

Q10. What is the card-code of the CPC library?
A10. EBCDIC. However some instances have been found of
different codes. The recent internal changes in the retrieval
procedures should ensure that all routines are now in the
correct code. (P.J.Hemmings).

Q11. Can the NAG Mini Manual be sent   to   Groups
Representatives?
A11. We have a supply of Mark 5 Mini Manuals which will be
issued   to Group__Representatives__on__Request to Computer
Reception. (P.J.Hemmings)

Q13. On which machine is the NAG library available?
A13. Burroughs (35700, 36700), CDC (3300, 6000/Cyber series,
7600), DEC 10, Honeywell Series 60, IBM 360/370 series, ICL
(1900 series, System 4, 4100, 2900 series), Prime 300,
Univac 1100 series. In preparation DEC PDP-11, Harris 4,
Modcomp 4, Philips P1400, Rank Xerox 530, Siemens 4004,
Telefunken TR440, Gec 4070/4080. (K. Robinson).

Q15. Are any NAG subroutines optimised for the 195?
A15. Not practicable for NAG to undertake individual machine
versions. (K.Robinson).

Q16.   What release of NAG is on 195 at present?
A16.   Mark 4 - Mark 6 will be put up shortly. (K.Robinson).

Q.18.   Would it be possible to establish a central ELECTRIC
file giving faults discovered in particular routines? There
should be central way of finding out if local users have had
problems with a particular routine.
A18.   We have established an ELECTRIC directory DOC=ALERT
which   will   contain   a   set   of   files.   For example,
DOC=ALERT.RHELIB contains a   list   of   current   problems
associated with routines in the Rutherford Library. We shall
eventually establish several such files.   You can see the
current set by - TYPE DOC=ALERT. (P.J.Hemmings).

Q19.   Is there any likelihood of NAG library being exported to
other places - eg. CERN?
A19.   The NAG library is available on a commercial basis to
any computing centre who would have to deal with NAG directly.
(P.J.Hemmings).

Q37.   Is there an automatic check for long 'soaker' type jobs
(non set-up, low core) to see if they can be run during the
day? Or do we have to notify the operators?
A37.   There is no automatic check but the operators do get to
know certain jobs. Message cards should be used to inform
operators that you consider your job suitable. (A.T.Lea)

Q38.   Is there any possibility that long jobs 'hogging' core
could be made roll-outable?
A38.   No. (A.R.Mayhook).

Q39.   If a job asks for say 4K less core, is there a better
chance of it running?
A39.   Not really. However if everyone ensured their jobs took
no more core than say 10K extra then all would benefit. It is
surprising the large amounts of core often wasted by users.
Some of the worst offenders are now being contacted
individually. (A.T.Lea).

Q40.   Are there turnround statistics for jobs submitted in the
period 2-6 pm.
A40.   Yes, for jobs submitted. (A.T.Lea).

Q41.   Could there be any high priority at weekends?
A41.   If you realise you are likely to be working at the
weekend, then approach your Category Representative (if one
exists) to see if spare time is available. In the longer term
this concept could be largely provided for by a suggestion
made at the 195 Category Representatives meeting (held at the
end of the Group Representatives meeting).   They suggested
that time within a category remaining at the weekend should be
automatically pooled and made available to anyone in the
category working at the weekend. (A.T.Lea).

Question/Answers

Q42. Is it possible to keep an initiator and core free at weekends for short jobs at high priority?
A42. An initiator is kept free for short jobs at all times but a job may still have to wait for long running jobs to release core and tape or disk drives as necessary. As core is a scarce resource now it is not justified to reserve say 210K for short jobs outside prime shift. (G.A. Lambert).

Q43. What is the present size of MAST and ELECTRIC?
A43. ELECTRIC 208K - MAST 88K. (P.J.Hemmings).

Q44. Can the print command be made to print more than 5 files?
A44. There is no limit on the number of files that can be printed except the limit of ten PARM commands or a maximum of 40 parameters with any one command. (T.G.Pett).

Q.46. Is it possible to have default of only 1 warning when command is typed into a file?
A.46. This would not solve the problem as you might still forget to type $$ at the end. These warning messages have been removed completely for an experimental period and the situation will be kept under review. (T.G.Pett).

Q.47. Will it be possible to archive files from level 1 to level 2?
A.47. Yes, but only at weekends. (T.G.Pett).

Q48. Are there any immediate plans for dealing with long lines of input and output?
A48. No immediate plans. (T.G.Pett).

Q49. Will it be possible to print files on level 1 archive?
A49. No. (T.G.Pett).

Q50. Is it possible to switch non-console terminals?
A50. To 195 or 1906A, but not to Daresbury. (P.M. Girard).

Q51. Private wire termination - are they switchable through to the Shift Leader?
A51. The equipment for switching the private wire terminations from the telecommunications area to the Computer Operation area is about to be installed by the Post Office (end Dec 1977). A simple telephone handset will be available with keys to select the calling line. (C. Balderson).

Q53. The table of device types is inadequate (especially at CERN)?
A53. This table can be extended or modified as required. Discuss it with User Support Group. (T.G. Pett).

Q54. Is it possible to have workstation accounts summary by quarter?
A54. At present this is not possible although variable period analysis is available at the Workstation level it has still to be programmed at the user or account number level. It is hoped to do this during the 1st Quarter of 1978 and to be able if required to provide such summaries back to the 2nd Quarter of 1977 (beginning of Financial year).Where this level of accounting is required please contact C. Balderson.

Q55. Are there plans for making more than 1.2 MB available?
A55. No. (A.T.Lea).

Q56. Can a user with time allocation at Rutherford exchange part of it for allocation at Daresbury or does he have to make a separate allocation?
A56. Computing time is allocated (in terms of equivalent 195 CPU hours) for the Rutherford 195s and Daresbury 165 together. The division of work is agreed between the two centres. A user of one site who might need to use facilities at the other should first contact the group issuing allocations at the desired site who will advise on the suitability of transferring the work. These are: at Daresbury, User Support Group (Dr.H. Sherman); and at Rutherford, Grant Support Group (Mr. E.B. Fossey). (P.J.Hemmings).

Q57. How can a large disk file at Rutherford best be transmitted to Daresbury for processing?
A57. For the time being you need to copy the data onto 6250 bpi magnetic tape. (P.J.Hemmings).

Q58. How compatible is the job control language for the Rutherford 195 and the Daresbury 165 particularly with respect to overlay and scratch files and what facilities are there for temporary file storage at Daresbury?
A58. The JCL for the two machines is very similar. The specification of overlay structures is the same. Data set rules are different but the JCL statements are the same (including names like DISK30). Fortran procedures have the same names and parameters. There is a facility similar to FREEDISK. Instead of ELECTRIC there is TSO (whose files are accessible from jobs). Prospective users should obtain a copy of "The Daresbury Computer Users Guide" from the User Support Group at Daresbury. (P.J. Hemmings and H. Sherman).

Q59. Can one submit a job to Rutherford from a remote terminal to pick up files, transfer them to Daresbury, execute there and send the output for Rutherford for transmission to the users terminal?
A59. No. (See A57.) You need to get the files there first. Then you may to LOGON to TSO from any terminal connected to the 195 (see Section 10). That allows you to submit jobs. (P.J. Hemmings).

Question/Answers

Q60. Rutherford is due to link to METRONET. What about Daresbury?
A60. The full network facilities are still being developed but eventually a network linked to Rutherford will be able to select mainframes including the Daresbury 165. (P.J.Hemmings).

Q61. Is it possible to change ID's within one LOGIN?
A61. This would give an unfair advantage over other users who are also trying to log-in. It is planned to implement a log-in queue so that it will not be necessary to keep re-trying the LOGIN command. (T.G. Pett).

Q62. How about $Q equivalent to $$ ACTION=NO.
A62. No! (T.G.Pett).

Q65. In the graphics area, when will it be possible to provide microfiche titles, indexes and forms?
A65. It is anticipated that user titles on microfiche via SYSOUT=M will be implemented in the first release of the new DESPOOL if the appropriate FR80 software is available. Automatic (ie. system generated) indices and forms are not currently being planned. It is more likely that these will be made available by a comprehensive applications program (eg. NROFF), if at all. (C.D.Osland).

Q67. Is there a utility to list JCL cards (including /*SETUP - apparently these cause CCOPY to fail)?
A67. CCOPY will work correctly with //SYSIN DD DATA,DLM=.. when the DLM parameter is reimplemented. This is currently a project held pending by Systems Group until more urgent work is complete. All utility programs will suffer from the same problem until DLM is available. (C.D.Osland).

Q70. The ability to input any valid EBCDIC character via a Hex specification would be useful?
A70. Future objective. (T.G.Pett).

Q71. Will there be a facility for displaying non-printing characters besides TAB?
A71. Not planned. (T.G. Pett).

Q72. The 360 link via the 4080 seems to be unsatisfactory. The failure rate is rather high and it is frequently difficult to discover if the 4080 is down or the 360 response is poor. Is it possible to improve error notification?
A72. The high failure rate is noted and is being worked on. The problem is usually due to the failure of the connection between the 4080 and the Network Central Program. The NCP allows the 4080 to maintain contact with the 2050 and will respond to !!IBM or !!SIXA messages thus verifying that connection. (C. Balderson).

SECTION 2   FCC & RLCAC COMPUTING COMMITTEES

FACILITIES COMMITTEE ON COMPUTING

Since the last report on the activities of the FCC (in FORUM
number 3) the membership has changed slightly. The Board
representatives are now -

Astronomy, Space & Radio	Prof. A P Willmore (Birmingham)
Engineering	Prof. H H Rosenbrock (UMIST)
Nuclear Physics	Prof. W Galbraith (Sheffield)
Science	Mr. O S Mills (Manchester)
Other Research Councils	Mr. A E Seddon (NERC)

The committee met on 31 October to consider the financial
estimates for 1978/79. At this meeting they approved the
following -

i)   The purchase of a disk control unit for the 195's.

ii)   The purchase of a GEC 4070 for the Rutherford
      Laboratory on which to develop a data handling and
      file editing facility.

iii) Upgrading of the Daresbury 370/165 to 3Mbytes main
      memory.

Also they discussed a report from the CB/RC Network Unit,
which is recommending various rationalisation schemes. In
particular it is proposed that the existing packet switching
network be converted to X25 protocols. Also the question of
integrating this network with the ICF network is to be
investigated. Finally the meeting considered an application
from Professor Kirstein (UCL) asking the SRC to contribute to
the 1978 costs of the ARPANET link. This application was
referred to the SRC Boards for comment as the service is only
used by a handful of SRC users.

The meeting deferred to next time a discussion on workstation
policy. In particular they wish to discuss who should fund the
purchase of new workstations and who should provide the cost
of consumables; at the moment each Board has a different
policy on these issues.

This committee has held two meetings recently (6 July and 28 September). At both meetings a lot of time was spent discussing the enhanced workstation concept and the demand for such a facility. The basic idea is that such a station would be capable of providing at the user site file editing facilities as well as RJE access to the main SRC batch computers. In addition some groups would like to see such a station provide interactive graphics capabilities. Others would like the ability to test online data taking equipment before taking such apparatus to a central facility (e.g. the NSF at Daresbury). Within the N. P. Board both the H.E.P. community and the Nuclear Structure community had expressed strong support; other boards were also declaring an interest. Thus the committee has recommended that detailed studies of two typical sites be carried out, the two sites proposed being Liverpool and UCL.

Other topics discussed at these two meetings have included -

    i)   The proposals of the CB/RC Network Unit.

    ii) An introductory look at COPPER and its current
         working.

    iii) A review of STAIRS.

In addition there is always an extensive progress report presented to each meeting on the state of the central computer services.

                      A.T.Lea (User Support Group).

SECTION 3   THE VOLUME MANAGEMENT FACILITY - VMF

The volume management facility is intended to alleviate
problems with having the majority of users magnetic tapes
available for immediate use in the machine room.   Instead of
this vast number, (currently in excess of 30,000) a smaller
sub-pool will be kept available in the machine room and these
will be available for mounting.   All other tapes will be
stored at another location, and these may be made available
for use either by direct request to the Magnetic Tape Library
Staff, or via a request by Setup for a tape to be moved. This
will be done at regular intervals depending upon the exact
location of the required tape.   Additonally, extra security
facilities will be added to the system to protect and/or
restrict access to users tapes as necessary, all under user
control.

Pre-production testing of the facility has already commenced
with the intention of progressive introduction of it during
the first three months of 1978.   This should be in general
transparent to the users but when and as they are involved
full details will be published well in advance.

VMF Libraries

There will be three types of library:-

1.   LOCAL LIBRARY

     This will contain tapes in current use and will be kept in
     the machine room.   It is anticipated that this library
     will contain approximately 4000 tapes, and will be added
     to either by direct user request to the Tape Librarian or
     by Setup requesting a tape to be made available for use.
     Tapes will be removed from this library and returned to
     their place of origin when they are no longer required or
     have become inactive for a period. Removal of tapes from
     the Local Library will be under the control of the Tape
     Library Staff and in general users will not be consulted
     before any tape is removed.

2.   HOME LIBRARY

     There will be several of these and they will be some
     distance from the machine room. It is anticipated that
     these libraries will contain approximately 20,000 tapes
     which again can be available for use by request. Tapes
     will be moved from the Home to Local Library on a twice
     daily basis.

3. ARCHIVE LIBRARY

This library will contain tapes not in general use, or those not required on a regular basis. Nevertheless access will be possible if required on a twice weekly basis.

A fourth category of library will exist, this will be for Absent Tapes, ie. tapes removed from the library system either permanently or for a limited period.

Tapes can only be used if they are known to the tape library when a program is submitted which required a tape. The location of the tape is established. If the tape is unknown, or in an Absent Library the job is flushed. If it is in a Home or Archive Library a message is issued requesting the tape be moved to the Local Library, and only after this has been completed will the job be run. If the tape is already in the Local Library, no action is taken and the job will be processed normally.

USER INFORMATION

It is intended to provide all users with facilities for listing their current holdings and location of tapes. Initially this will be done by the submission of a batch job but it is intended in the long term to provide an on-line enquiry facility.

TAPE SECURITY

Tape security will be extended by VMF in that all jobs requesting tapes will be subject to a check to ensure that the Personal ID and Account Number associated with the job corresponds with that associated with the requested tape. Non agreement will result in the job being flushed. Additionally users will have options of including in the VMF database various passwords and other restrictions of access to certain account numbers, read-only options etc. Full details of these facilities will be published later.

G.A. Lambert (Operations Group).

SECTION 4 ELECTRIC FILE STORAGE SPACE

The available free storage space for ELECTRIC files has virtually disappeared both on the on-line disk and on the archive disk. As there is no possibility at present of extending the on-line store, the total space available is to be extended by introducing a second archive disk. The current archive disk will be referred to as level 1 and the new one as level 2. The user will specify which disk by adding the parameter LEVEL=1 or LEVEL=2 to the ARCHIVE command with a default of LEVEL=1.

In order to reduce the amount of back-up dumping of these disks to tape, archiving to level 2 will only take place at the weekend. However, files to be archived to level 2 from the on-line disk will be moved to level 1 overnight with the move to level 2 at the weekend.

Restoring from either disk will take place overnight as will archiving to level 1 from level 2 or from the on-line disk.

An extension to this system will involve the on-line space accounting for both archive disks. This will mean that the ARCHIVE or RESTORE command will fail immediately if space is not available. Also users will be credited with the file space at the time the command is typed rather than when the file is actually moved.

Finally, ELECTRIC and the archive program will be altered so that the archive program can run whilst ELECTRIC is on-line. This will allow the possibility of archived files being restored during the day but probably only from level 1. Therefore users should try to arrange that files which may be required at very short notice are in level 1 and those for which an overnight restore is sufficient are on level 2.

T.G.Pett (Application Group).

Electric Archive

SECTION 5 IMPROVING THE PERFORMANCE OF THE 195s

A Working Party drawn from the groups of C & A Division has been set up to review the performance of the 195s and make recommendations on how that performance might be improved.

Three main areas are currently being looked at, namely -

i)   total throughput. The required capacity of 160 CPU
        hours per week can now be easily attained.

ii)   turnround. Bulk production work (priorities 6 and 4) is
        now cleared within the agreed time ie. overnight for
        priority 6 and weekend for priority 4. Short jobs at
        priority 8 for class A (210K or less) have a turnround
        of 1 hour or better, well within the required 2 hours.
        However both priority 10 and 12 (again for class A) are
        just on the agreed limits ie. 30-45 mins. for priority
        10 and 15 mins. for priority 12. Turnround for larger
        core jobs are, however, not so good as for class A.

iii)   ELECTRIC response. Although the average response is now
        with the 5 seconds limit the system is suffering peak
        response times well over this.

The Working Party is thus concentrating on two major items. The first is peak ELECTRIC response, what causes the holdups and why. Preliminary investigation indicates there is no one simple answer. There appear to be many independent causes which will have to be picked off one by one. Regretably it seems it will be a lengthy process.

The second is turnround, class structure and core requested. With less core on either CPU than was previously available (ie. 2 Mbytes per CPU as against 3 Mbytes on the single machine) the class structure against core requested is being reviewed. It is felt that perhaps we should revise the class structure taking note of the maxim "larger core requested = longer turnround expected". (See Section 9).

The Working Party would like to bring to your attention the following bad habits of users. Each of these in some way or other impacts total performance to the detriment of all.

Restart

Any long job or large core job which is run should have some form of restart. That is if the job is caught in a system failure or has to be cancelled then it should be possible for you to restart the job without having to go right back to the beginning again. This is discussed more fully in Section 6.

Core_wastage

Please take note of the warning in your HASP log that you had so much core unused. With reduced core available on either machine asking for a lot more core than you will actually use locks out other users and worsens turnround for all. You always reserve the amount specified by REGION and if you overestimate no one else can use the unused space.

Large_ELECTRIC_Files

Manipulating individual files over (say) 500 lines holds up other ELECTRIC users considerably. This is especially true when any copy operation is involved. Please break down all such files into smaller units.

PRINTing_from_ELECTRIC

Any operation involving allocating an OS data set can impact ELECTRIC peak response. The most common of these is the PRINT command. Until this can be dealt with by internal changes to ELECTRIC and OS please reduce the number of such operations. For example if you wish to print several files please do it via one PRINT command, rather than one command per file.

A.T. Lea (User Support Group)

SECTION 6   THE_HASP_RESTART

In the event of a system failure the system is eventually restarted and HASP has to take some appropriate action about those jobs which were executing at the time. The normal action is that the job is restarted from the beginning but there are certain circumstances which can give problems. These are:

   1)   If any NEW permanent data set has been created on a
         disk, or with an expiry date on a tape;

   2)   A data set used for some book-keeping or control
         purpose is updated;

   3)   Large amounts of CPU time are involved.

Restartable Jobs

The first situation should be guarded against by the /*NORESTART card. The second situation may also need the /*NORESTART card or else provision in the program to recover from or repair corrupt data.

In the case of large amounts of CPU time, consider the following program:

```
         CALL INPUT(N)
         DO 9 I=1,N
9        CALL STEP(I)
         CALL ANALYS
         STOP
         END
```

For a large value of N this calculation may require say one hour of CPU time, so that if the system failed after 50 minutes the whole 50 minutes would have to be repeated. Now consider the following program:

```
         CALL INPUT(N)
         CALL RCHECK(J)
         DO 9 I=J,N
         CALL STEP(I)
9        CALL WCHECK(I)
         CALL ANALYS
         STOP
         END
```

The CALL WCHECK(I) copies all the relevant variables to a data set. Whenever the job starts the CALL RCHECK will restore the variables. Now if the system fails after 50 minutes, the restarted job need only run for the remaining 10 minutes and little CPU time is actually lost.

Two practical points to note. The control data set must be created by a separate job before the long calculation begins. Also you should arrange that output be printed only during the routines INPUT and ANALYS because no output is printed for jobs lost in a system failure.

It is considered that any job requiring 30 minutes CPU time should use this type of method. Some users consider it desirable for shorter times.

P.J.Hemmings (User Support Group).

Statistics Available

The following information is given in the HASP and JCL
logs: (i) Job Start and Job End times and hence the Elapsed
time for the job; (ii) Step Start times and hence the Elapsed
time for each step; (iii) the CPU time for each step; and
(iv) the total Wait time for the Job (but not the Wait time
for separate steps). Remember that these times are rounded
and therefore not very accurate for very short jobs.

In general each step of a job will have its own
characteristics. However, for most of this discussion we
shall assume the job consists of a single step. We shall see
in the discussion that follows that CPU time is approximately
reproducible but that Wait time is not normally so. However
if Wait time is large for one run it is unlikely to be
negligible during a repeat.

How Time is Spent

ELASPED = ALLOCATION + CPU + WAIT + READY

ALLOCATION is the time at the beginning of a step waiting
for core and data sets to be made available. It does not
contribute to Wait time but under adverse circumstances may
amount to several minutes.

READY is the time when the system is doing other work
usually some other job has the cpu even though your job is
ready to use it. This does not contribute to Wait time.

These two quantities are not reproducible except in the
extreme case when only one job is being processed. CPU is
more or less reproducible and is the time your job was being
processed by the cpu. Certain small inaccuracies in OS/MVT
accounting prevent it being reproduced exactly. Also
characteristics of the 195 eg pipelining and memory control
make exactly reproducible CPU time impossible.

WAIT is the time when your job was unable to continue
processing until an I/O or other request has been met. It has
some components which are approximately reproducible and
others which depend on the total activity of the system.

WAIT   =   ACCESS   +   TRANSFER

CPU and I/O Boundness

TRANSFER should be reproducible. It is calculable from the transfer rate for the device eg. 0.8MB/sec for a 3330, 1.25MB/sec for a 6250 bpi tape, 0.32MB/sec for 1600 bpi and 0.16MB/sec for 800 bpi. You should also allow start times for the data transfers. Remember that the quantity of data transmitted during an I/O request is normally given by the BLKSIZE. It is often the case that TRANSFER is much less than ACCESS particularly when small blocks are used.

ACCESS   =   CHANNEL   +   DEVICE   +   ARM   +   ROTATION

For a magnetic tape ARM and ROTATION do not apply and DEVICE will normally be zero except following a rewind. Also magnetic tapes require extra commands in order to position at the desired record.

On a public disk all of the terms depend on system activity. When you have exclusive use of a disk ARM movement time will be constant so you can seek to minimize it by an optimal placement of data. The arm is moved whenever the current cylinder changes.

CHANNEL and DEVICE refer to the times taken to acquire use of the channel and device respectively. ROTATION is the time taken for the disk to move the data to the read/write head.

CPU and I/O Bound Jobs

Suppose N jobs are running in a machine. Under ideal conditions the CPU times should add to the ELAPSED time over a given period. Ignoring ALLOCATION the I/O activity balances the cpu activity if on average

$$\frac{CPU}{ELAPSED} = \frac{1}{N}$$

or in terms that appear in the statistics

$$\frac{WAIT}{CPU} = N-1$$

CPU and I/O boundness describe departures from the average position. They are related to ability to keep the cpu busy.

I/O boundness means loss of CPU time to the system. Conversely a small WAIT/CPU ratio ie. CPU boundness means little use of the I/O equipment.

How Can Times be Reduced?

ALLOCATION   1.   Avoid overestimating REGION.

                2.   Never use DISP=OLD when DISP=SHR will do.

                3.   Make no unrealistic SPACE request.

                4.   If a SPACE allocation of (CYL,(2,1)) is
adequate for a work file then use
UNIT=WORK,SPACE=(6400,(38,19),,,ROUND),
DSN=&SYSUT1
You can use up to three such files in this
way with data set names &SYSUT1,&SYSUT2 and
&SYSLIN. However such data sets cannot be
passed across compile or link edit steps.

CPU   1.   Eliminate unnecessary computation.

                2.   Use H Extended Plus with OPT=3 for
Production Work.

                3.   Use G1 for short tests when execution times
are often shorter than compile times.

                4.   Improve efficiency following PPE studies.

                5.   Avoid formatted I/O when unformatted
will do.

                6.   Use special purpose I/O routines to shorten
processing of buffers.

READY   1.   Buy yourself a private computer!

TRANSFER   1.   Use the fastest device available. For
sequential data sets this means 6250 bpi
tape.

                2.   Eliminate unnecessary data transfers. Avoid
inefficient overlay structures.

                3.   Condense data using packing techniques
(but remember this costs CPU time).

CPU and I/O Boundness