CHANNEL

1. Persuade everybody else to make their I/O efficient.
2. Do the same yourself.

DEVICE

1. Pay the turnround penalty and do not use permanently mounted disks.
2. In particular if a sequential data set is read once only, use magnetic tape. (Remember a rewind can give the longest DEVICE access time of all. Do not issue rewind during your program. Let the system do it at the end).

ARM

1. Confine your data set to a single extent.
2. Distribute data sets over separate volumes if they are accessed alternately (but unless these are exclusive use volumes it is possible for other users to disturb the arm).
3. If you have a Read (1), Write (2) program, you can make data sets share the same cylinders using the SPLIT parameter.
4. Use the preallocated work files mentioned under ALLOCATION.

ROTATION

1. Make sure tracks are fully used so when one I/O ends another may start immediately, (assuming no ARM movement is needed). The best way of achieving this is to use full track blocking eg. DCB=TRACK30.
2. If the size of the data set exceeds 10 tracks (130KB), specify space in cylinders or use the ROUND subparameter.

P J Hemmings (User Support Group).

SECTION 8 THE NAG LIBRARY

NAG (Numerical Algorithms Group) was founded in 1970 by six University groups who had ICL 1906A computers. The intention was to provide a common library of numerical software, thereby preventing software duplication and easing maintenance. Computer Board support over the years has enabled the project to be extended to other machine ranges, including IBM. In March 1976 NAG became a non-profit making limited company. Contributions to the library belong for the most part to University mathematics departments, computing centres and Government research establishments.

The library is available in three language versions (FORTRAN, ALGOL 60 and ALGOL 68); only the FORTRAN version is available on the 360/195. Routines are chosen for robustness, accuracy and efficiency, and errors notified to NAG are circulated to all and corrected at the next Mark (issue) of the library. The current version on the 195 is Mark 4 but Mark 6 will be mounted early in 1978. Documentation is to very high standards with consistent specifications. The library is divided into chapters (see Table); each chapter is headed by an introduction which is an invaluable aid to algorithm choice and should be read. Each routine specification includes a sample program and output. Full Manuals are available for reference in the Advisory Offices; most University computing services also have copies. Personal copies of the Full Manual can be obtained from NAG Central Office, 7 Banbury Road, Oxford, OX2 6NN; cost is approximately 22 pounds.

| Chapter | Contents |
|---|---|
| A02 | Complex Arithmetic |
| C02 | Zeros of Polynomials |
| C05 | Roots of Transcendental Equations |
| C06 | Summation of Series and Transforms |
| D01 | Quadrature |
| D02 | Ordinary Differential Equations |
| D04 | Numerical Differentiation |
| D05 | Integral Equations |
| E01 | Interpolation |
| E02 | Curve & Surface Fitting |
| E04 | Minimisation |
| F01 | Matrix Operations |
| F02 | Eigenvalues & Eigenvectors |
| F03 | Determinants |
| F04 | Simultaneous Linear Equations |
| G01 | Simple Statistical Calculations |
| G02 | Correlation & Regression Analysis |
| G04 | Analysis of Variance |

| | |
|---|---|
| H | Operations Research |
| M01 | Sorting |
| P01 | Error Trapping |
| S | Approximation of Special Functions |
| X01 | Mathematical Constants |
| X02 | Machine Constants |
| X03 | Inner Products |

Mini Manuals are published containing the chapter contents and introductions. Workstation and Group Representatives may obtain copies on request to Computer Reception.

K Robinson (Atlas Computing Division).

## SECTION 9 JOB CORE SIZE AND TURNROUND

As you are well aware the two 195 CPUs each have less core (2 Mbytes) than the previous single CPU (3 Mbytes).

To attempt to run the machines reasonably efficiently yet retain acceptable turnround for the majority of users we wish to revise the current turnround guidelines. Our proposed guidelines are based on the general concept "larger core means longer turnround".

Based on experience gained so far with the dual 195 system we suggest the turnround guidelines quoted in Table 1 be the yardstick we use in future. These figures relate to the average turnround over a week, turnround being defined from job submission to the end of execution.

These proposed figures would relate to new internal classes set up by Operations. In particular the boundary values are chosen to try to optimise use of both machines while retaining the previous main boundary of 210K (about 85% of all jobs are 210K or less). With such boundary values Operations believe they can make best use of both the front and back end CPUs.

The main change is that the previous 500K boundary is now replaced by two boundaries, namely 350K and 560K. Previously 13% of all jobs were between 212-500K, now 8% will fall in 212-350K and 5% in 352-560K.

With these new boundary values Operations believe they can

offer a better turnround for the 212-350K, but slightly worse for 352-500K. This a reflection of the fact that less core per CPU means the larger the core requested the more impact it will have on other users in order to run it.

With the present configuration it will not be possible to run any job over 560K in the front end. Thus no such job can access ELECTRIC.

We propose to run such a scheme outlined above for a trial period. If you have any comments on these proposals please contact myself or any member of User Support Group.

## TABLE 1 - TURNROUND GUIDELINES

### SHORT JOBS

| CORE SIZE REQUESTED | P12 | P10 | P8 | P6 | P4 |
|---|---|---|---|---|---|
| 0-210K | 15 min. | 30 min. | 2 hr. | Overnight | Weekend |
| 212-350K | - | 1 hr | 3 hr | " | " |
| 352-560K | - | 2 hr | 4 hr | " | " |
| 562-1000K | - | ..... | Overnight | ..... | " |
| >1000K | - | ..... | Weekend | ..... | " |

### LONG JOBS (Over 90 seconds CPU requested).

Priority $\geq$ 6 and under 1000K : Turnround overnight
Priority 4 : Turnround weekend
Any job over 1000K : Turnround weekend.

Note

i) that no priority 3 work will usually be run until all other work has been cleared.

ii) turnround is defined from job submission to end of execution.

iii) these guidelines only refer to a fully operational system. Prolonged equipment failure always invalidates turnround targets.

A.T.Lea (User Support Group).

Proposed Class Structure.

## SECTION 10 ACCESSING TSO AT DARESBURY

The TSO system at Daresbury can be used from any terminal which has access to MAST or ELECTRIC. This is done as follows:

i) Change the terminal's default destination (which is normally ELECTRIC) to talk to the network instead:

```
++B DEST 100    for the time being
but ++B DEST N  from a date in early 1978.
```

ii) Next, make a network call to Daresbury by typing:

```
@P1
```

In the normal case, the reply 'CALLING DARESBURY' should first be received, followed after a short pause by 'CALL CONNECTED'.

iii) It is now possible to LOGON to TSO in the normal manner (see the Daresbury Computer Users' Guide).

iv) After the session simply LOGOFF from TSO. The call will be cleared automatically by the Daresbury end.

v) Finally, reinstate the terminal's normal default destination by typing:

```
++B DEST ELEC
```

### Some Special Points

i) TSO normally prompts the user for input. On a MAST terminal typing ahead to TSO is allowed and the prompts, together with the bell, are suppressed. For instance, the last message received back in reply to LOGON is the word 'READY'. If typing ahead is actually used the user is advised to ensure that all the necessary operands are typed in with each command; if TSO has to prompt for a missing operand any further typed ahead input will be disregarded and must be reentered.

ii) TSO requires a 'null line' in some circumstances, for instance to get out of 'CHAT' mode. On a MAST terminal a null line may be input by typing a single '@' symbol.

iii) Any line of data which happens to begin with '@' should have the first character doubled up to '@@'. The network software will convert this back to a single '@' and forward the resulting message to TSO.

iv) To gain TSO's attention, for instance while TSO is outputting to the device, the two characters '@Y' may be typed.

v) The message '@Q' may be typed to terminate the call. This will clear the call as far as the 360/195 is concerned, even if contact with Daresbury has been lost or is blocked. It will not in general log the user out of TSO, however, so the user should LOGOUT in the normal way if at all possible.

Fault Conditions

If the Daresbury system is not operational an attempt to set up a call will fail and a message will be received followed by a pair of codes:

CALL REJECTED aa bb

Loss of contact or other faults can cause the call to be terminated, in which case a different message is received:

CALL TERMINATED aa bb

If the codes aa bb are 40 0B, this indicates that the call has been idle for 10 minutes and was closed for that reason. In principle this particular reply can be received at call setup time also, if Daresbury appears to be active but has not responded within 15 seconds.

The intention is to introduce explicit messages in place of codes as soon as possible. Meanwhile the only action that can reasonably be taken if these faults occur is to try again later.

P.M.Girard (Applications Group).

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* indicates the previous series of Forum Newsletters.

# 195 USERS COURSE I  APPLICATION

The purpose of this course is to cover those topics which most users will need to know. It takes as its starting point the document RL-77-008, "A First Introduction to the 195". The course is arranged in a series of sessions which review various sections of CIGAR. Interspersed are a number of tutorial sessions which feature uses of ELECTRIC.

Since most of the basic information is now printed in CIGAR the course will be of most use is the sessions can be reviews leading into discussions of concepts which give users difficulty. Therefore the ideal student might well be someone who has used the system for a few weeks and having learnt how to do the elementary things is ready to find out the kind of things he can do on the 195.

NAME: .....

ADDRESS: .....  PHONE (with STD prefix)
.....
.....  .....
.....

Are you an authorised user
of the IBM360/195 at Rutherford? YES / NO

If YES, give ACCT .....  ID ....

Date of first use .....

Previous Computing System .....

Do you have access to: RL-77-008 YES / NO
CIGAR YES / NO
ELECTRIC MANUAL YES / NO

---

Return this form to:

Mrs M Copperthwaite

Building R27

Rutherford Laboratory

Chilton, DIDCOT, Oxon.

OX11 0QX.