SLICE - converts a noncard file to a card format which can be used later to reconstruct the noncard file.
SNOBOL4 - runs the SNOBOL4 language processor.
TIDY - takes an input file and from it produces an output file in which tabs have been resolved to spaces and multi-line comments have been laid out.
TRANFILE - transfers a CMS file to RAL OS Disk, CERN, Daresbury or DESY.
ULINK - displays the time, date and userid for successful links made to any protected minidisk owned by the userid running the EXEC.
WHOIS - searches the file 'USER NAMES *' for information regarding the specified user.
XCOPY - translates a file so that all control characters are removed.

8. THE HITCH HIKERS GUIDE TO SRCNET

This document gives sufficient information to allow interactive access to any host (the computer to which access is required) from any Packet Assembler Dissassembler (PAD), the computer to which the terminal is connected. It is not intended to be complete and all the alternative methods of access and alternative forms of commands are not explored. Full details of network access can be obtained from the various manuals referenced in the text.

This guide is issued as Prime User Note 36 and GEC User Note 90 and those interested should apply to Prime or GEC User Support for copies.

9. INTERACTIVE COMPUTER GRAPHICS

The University of Manchester Computer Graphics Unit is running a repeat of its highly successful course on Interactive Computer Graphics from 6-9 September 1981. The course is aimed at programmers, systems analysts and research workers seeking a thorough understanding of interactive graphics. As well as indicating what can be done with computer graphics the course shows how it is done in practice.

All main types of graphics equipment are covered - plotters, storage tubes, refreshed vector and raster-scan displays and film recorders, together with techniques for programming them. The course also examines software packages and standards, portability and application program design.

Extensive use is made of slides, video tapes and live demonstrations, to show equipment characteristics and to illustrate programming techniques and algorithms. The course has support from the SERC Interactive Computing Facility and funds are available to pay the course fee for those supported by ICF. For full details please contact:

Miss Irene Delaney
Interactive Computer Graphics Course
Computer Graphics Unit
University of Manchester
Oxford Road
Manchester M13 9PL
Telephone: 061-273-7121, Ext 5001

10. IBM COMPUTER USAGE

Statistical information is given below for usage in the three financial years 1978/79, 1979/80 and 1980/81. On 10 April 1979 the IBM 3032 was introduced to service, linked to the two coupled IBM 360/195 computers. Initially it provided additional cpu power to the IBM 360/195 batch service and in this respect its cpu power was rated as half that of the 360/195 computer. Software development under the Virtual Machine environment on the IBM 3032 was directed at enabling the 3032 to take on the Front End functions for the complex and the transition finally took place on 17 June 1980. Since that date the 3032 has supported not only the Front End functions for the 360/195 batch service but also a growing community of users of the Conversational Monitor System (CMS) which will eventually replace ELECTRIC.

Funding Authority		1978/79	1979/80	1980/81
ASR Board	CPU Hrs	569	660	624
	Jobs	78495	83412	71464
Engineering Board	CPU Hrs	516	478	700
	Jobs	33401	31678	31365
Nuclear Physics Board	CPU Hrs	6239	6980	6782
	Jobs	344392	354373	341728
Science Board	CPU Hrs	1273	1661	1792
	Jobs	95015	118730	145507
Secretary's Department	CPU Hrs	362	360	298
	Jobs	148773	144069	143555
Other Research Councils	CPU Hrs	282	281	269
	Jobs	71025	79308	65605
External Users	CPU Hrs	53	64	189
	Jobs	16164	20720	30545
TOTAL	CPU Hrs	9294	10484	10654
	Jobs	787265	832290	829769

EDITOR'S NOTE

For economy's sake FORUM will continue to be printed on old style headed paper until all the old stock of paper has been used.

Rutherford and Appleton Laboratories

FORUM

195 COMPUTER NEWSLETTER

Newsletter of the SERC Central Computing Facility

No. 13 July 1981

1. THE 'SERC-NERC' NETWORKS

The use of telephone lines to enable University Departments to communicate with the main computer centres of the SERC has long been an established method of working. What has now become a widespread formal Network began as independent ventures at the original three sites, Daresbury, Atlas and Rutherford Laboratories. Because the individual Laboratories were addressing different problems, essentially different methods and communications were adopted.

Daresbury Laboratory, from its earliest days, adopted the policy of using the mainframe computer as an integral component in the data acquisition systems developed for the NINA accelerator. This policy defined certain requirements for high speed data transfers, which led to the development of front-end techniques now based on Interdata machines and also CAMAC systems which were used to interface specialised equipments using standard modules. Daresbury's requirement for remote workstations in University Departments was contemporary with the early work by the Post Office in providing a Public Data Transmission service. This work led to the development of a 'Packet-Switched' protocol known as EPSS (Experimental Packet-Switched Service). This jargon phrase essentially describes a system within which a block of data is transmitted into a network with sufficient information supplied in pre-determined areas of the data block to inform component units of the network of the service and destination of the particular block. It also transmits sequencing information to enable blocks to be finally presented to the 'user' or 'server' end in the correct order. It was natural that Daresbury should adopt these techniques for their new workstations which utilised their expertise and engineering strength in the area of CAMAC with small computers such as PDP11/04. It should perhaps be stressed that Daresbury adopted the EPSS protocol over their own private circuits: they did not use the Post Office Experimental Public service.

Atlas Laboratory in the early days of data communications had an ICL1906A as the mainframe. In addition a 20% share of the Rutherford IBM 360/195 was available to Atlas. Communications protocols for the two machines were entirely different with the 1906A using a poll scanner system in the ICL 7903 front-end to interrogate connections for readiness to transmit or receive data, while the IBM 360/195 using a HASP communications system maintains a constant link with all signed-on stations, either transmitting or receiving data as available or 'hand-shaking' when there are no real data. At Atlas the conflict of handling these two protocols for remote workstations was resolved by using a GEC 4080 to act as a second front-end to the 1906A, emulating the 7903 on the computer side, but on the workstation side this machine used the HASP protocol. The GEC 4080 thus became a 'Gateway'. It enabled those workstations connected to send jobs to either the 1906A or the 360/195 and to receive the outputs.

At Rutherford, HASP RJE (Remote Job Entry) was established for workstations from early 1973 with first IBM 2780 on 1130 workstations, then GEC 2050 computers with emulators for the two IBM workstations. The special development in this case was the ability to communicate interactively from one of a number of terminals on the GEC 2050's to the ELECTRIC file handling system on the 360/195, by adapting the HASP console support system.

Various factors in the technological and political spheres have continued to cause the various bodies within SERC to embrace a common communications system.

- The Atlas and Rutherford Laboratories combined in 1975 with the 1906A closing down and the 360/195 with a twin being installed in the old Atlas buildings.
- Rosenbrock reported on computing for Engineering which led to the setting up of the Interactive Computing Facility (ICF).
- A requirement to support the Northern EPSS-style workstaion on the Rutherford IBMs when HEP was moved from Daresbury.

The ICF activities were based on essentially three types of machine, two DEC 10's in UMIST and ERCC which were able to support the manufacturer's specific DECNET communications system with a terminal concentration (DN82) at Rutherford. The second type is the Prime computer which again can support its manufacturer's specific PRIMENET but which has now developed the new standard 'X25' interface. The third arm of the ICF is the very successful GEC 4070 group of multi-user-minis. These all communicate via the X25 protocol. The requirement to support the 'Northern' workstations

at Rutherford was met by introducing a special process running within the MVT environment of the 360/195 called DKNCP which was the Network Control Program for this machine. This process handled the 'EPSS-style' links, extracting the data for onward passage to HASP or packetising HASP derived data for transmission through Daresbury. This DKNCP program has undergone much development and now connects to the GEC 4080 Packet-Switch-Exchange at Rutherford using the new standard X25 protocol.

The foregoing has opened a few loops which have been left hanging in the air. In conclusion an attempt will be made to close these loops and indicate the current status.

- new standard X25 protocol,
- Packet-Switch-Exchange, where did that come from,
- NERC - part of the title - not mentioned since!!
- HDLC, BI-SYNCH not even mentioned!!

Standard X25 protocol. Out of the Post Office EPSS and the efforts of other countries in this same area, there has evolved new CCITT standards for data transmission. One of the most important is the X25 standard which has been adopted within the SERC Network for bulk data transmission.

Packet-Switch-Exchange. Rutherford Laboratory has developed a GEC 4080 system to handle data packets generated to the X25 protocol. Connections can be from 2.4 Kb/sec to 50 Kb/sec either with the Binary Synchronous interface or with the High-Level Data-Link Control (HDLC) interfaces now becoming available. A PSE of this design has now been installed at Daresbury, enabling suitably equipped machines to be connected.

NERC. The Natural Environment Research Council (NERC) which has for some time been collaborating with SERC in computing matters, is also obtaining two of these machines for installation at its own main sites at Bidston and Swindon. Connections between Daresbury and Bidston and between RAL and Swindon with existing connections RAL to Daresbury and from Swindon to Bidston will provide access points and main trunk routes for the users of NERC and SERC main computer sites, all using common protocols.

Hitherto a severe restraint on service for network users needing to be routed via the RAL - DL trunk route has been a severe restriction on data-rate. Because of the hardware available and the protocol used the 'effective' data-rate on this trunk has been less than 4 Kb/sec. At the time of writing the first tests are taking place on the HDLC link between the two GEC PSEs at RAL and DL. This should provide almost the nominal 9.6 Kb/sec rate. It is anticipated that this will shortly be doubled by adding another line.

These developments have all been brought about by the Network Development meeting, a collaboration between those parties with interests in this field. A parallel meeting is the Network Operations Coordination meeting, which examines the operation of the Network as a whole, seeks to define operational standards and lobby the development meeting where necessary. Two user meetings of the 'teach-in' variety have been convened, one at Daresbury and the other at Rutherford to inform more widely on the technical detail.

Not every aspect of the Network has even been mentioned in this article and several should ideally have more development - perhaps in a later article.

2. GENSTAT NEWSLETTER

All GENSTAT sites receive a newsletter from NAG Ltd (distributors of the GENSTAT Statistical package) describing topics of interest to Genstat users. These topics include descriptions of new macros, unusual applications of Genstat, suggestions concerning the future development of the package and using Genstat in the teaching of statistics. The Newsletter is issued twice yearly and a copy will be kept in the Atlas Centre Library at RAL. If you are interested in receiving a copy please write to:

The GENSTAT Co-ordinator
NAG Central Office
7 Banbury Road
OXFORD OX2 6NN

The subscription is 2.50 pounds per year (or 1.50 pounds if sent with the order. You are of course welcome to read the copy in the Atlas Centre Library if you are visiting the Rutherford site at any time but we are unable to act as distributive agents for this Newsletter.

3. CAD82

CAD82, to be held in Brighton from 30 March - 1 April 1982, will be the fifth in the series of biennial international conferences covering the significant developments in the use of the computer as a design aid. CAD82 will again provide an important 'talking shop' for the various theories, ideas and experiences in the use of the computer as a design tool.

Anyone interested in knowing more about the conference should contact Mrs M Dickson, Atlas Centre, Rutherford and Appleton Laboratories, Chilton, DIDCOT. Tel Abingdon 21900 Ext 272.

4. COMPEDA'S DRAGON

Compeda are marketing a draughting and schematic layout system called DRAGON. It was developed from a system made by the construction company George Wimpey for use by their designers and draughtsmen who had no previous computer or typing skills. It provides a simple efficient tool for the production of all types of logic and schematic drawings and some types of scale drawings. These are stored in a format which permits user analysis and a link to more complex systems such as PDMS or GAELIC. Compeda state typical industrial applications include:

Engineering Drawing - orthographic views, sections etc
Pipework and Instrumentation Diagrams
Electrical Schematics
Logic and Circuit Diagrams
Specification Sheets
Form Layouts
Critical Path Networks
Precedence Diagrams

Please write to the Editor of FORUM with your views on whether the ICF should provide such a draughting system and whether it should be DRAGON or some other package.

5. JIFFY BAGS

Jiffy bags are padded paperbags. They might be very useful for all sorts of things but they are no use for transporting magnetic tapes. When we open up such bags in the machine room, we lift out the largest chunk consisting of the tape wound on the metal spool, then upend the bag to get rid of the bits. We then have to get the vacuum cleaner to clean the remains of the tape, which has been liberally coated with the dusty fibrous material used as the padding of the bag. Even so, the resultant tape is lethal to magnetic tape drives as it still harbours tiny splinters of plastic and dust.

Please do not use jiffy bags to transport magnetic tapes. Your packaging must be able to protect the tape from the blow resulting from dropping the package from a height of six feet on to a concrete floor.

This item was originally published in NUMAC newsletter May 1981 and is endorsed by Operations Group.

6. UPGRADED SITES MEETING

A meeting of the managers of the upgraded MUMs was held on 4 June 1981 at the Rutherford Laboratory. The computers represented were 2 x PDP 11, 2 x VAX, 2 x PRIME, 1 x DEC-10 and 1 x Perkin Elmer 32/20. Topics discussed included Computing Division re-organisation and its effect on the upgrades, accounting methods and the AL54 (Application form for Computer Resources). Professor Hopgood gave a brief but informative talk on the future of the ICF and the re-organisation of the SERC computer resources, particularly its financial implications.

Despite the diversity of computers the meeting had provided a better sense of involvement for the participants and it was agreed to hold regular meetings. The next meeting was planned for November.

7. CMS-UDISK - USER COMMANDS LIST

The U-DISK facility available to CMS users contains files that have been supplied by users which they consider may be of general interest. A list of topics available on the U-DISK follows. Further details of any topic may be found by HELP 'topic' eg HELP PASCAL. You must connect the U-DISK to your virtual machine via the UDISK command before making use of this facility (see HELP UDISK for details).

Please note that Computing Division does not offer support for files on the U-disk (they can be used on an 'as is' basis) though the individual authors, where stated, may be willing to assist if problems occur.
If you have a program that you think may be of interest to other users then store a copy of the module plus a HELP file on the U-disk (see HELP UDISK for details). You can only store modules/execs that are accompanied by a relevant HELP file and each user is restricted to 100 blocks of UDISK space.

BCPL8086 - produces Intel 8086 machine code from OCODE produced by a suitable BCPL compiler.
BOOTHEAD - is NOT intended to be called other than from the EXEC file BOOTVERS EXEC.
BOOTVERS - provides information on the versions of BOOTSTRP currently available.
CARD - used to exchange files with other users.
CHAT - CP MSG is used to send messages to specified logged-in userid(s).
DELE - prompts the user with the name of all files found by LISTFILE for automatic deletion if required.
EXAMPLE - example of a HELP file. Gives a brief description of the control commands available to construct a HELP file.
FCOPY - used by FSPLIT EXEC to copy individual routines from an input file of FORTRAN to separate CMS files.
FETCHIN - FETCH is used by TRANFILE to transfer a file from CERN, Daresbury or DESY to RAL OS Disk.
FSCLOSE - useful to clear up when another command has either failed and left files open or if a bug has caused files to be left open.
FSPLIT - takes an input file of FORTRAN routines and splits it into individual files containing subroutines, functions, block data subprograms and main routines.
GPLOTDRV - generates an MVT job which will drive a G-EXEC G-PLOT graphics file from the graphics spool files to a user specified output device.
KWIC - runs the modified IBM KWIC/360 system: this program will take a file in KWIC input format and from it produce a KWIC index in a CMS file.
LAYASSM - takes an input file and from it produces an output file in which tabs have been resolved to spaces and multi-line comments have been laid out.
LAYOUT translates a file from ELECTRIC layout file format to CMS SCRIPT format.
MORTRAN2 - used to process a program written in MORTRAN into ASA FORTRAN and optionally to compile it.
PASCAL - used to invoke the Pascal compiler.
PLANTB - adds a 'group' ability to the PLANT/SUPPLY program which copies CMS files with optional planting and supplying.
PRINTER - used to submit a network job that prints several files of type LISTING.
RSX - writes an rsx-task or card file to a tape in rsx-readable format.
RUNPASC - provides an interface for running Pascal programs.
SEEXEC2 - allows you to generate a file containing all the information in the HELP files associated with EXEC2.
SEEXEDIT - allows you to generate a file containing all the information in the HELP files associated with XEDIT.
SENDOUT - SEND is used by TRANFILE to transfer a file from CMS or RAL OS Disk to CERN, Daresbury or DESY.