DESY Computing Newsletter
No. 2 November 1991

A Publication of the DESY User Support Group

Contents

DESY Computing Newsletter No. 2

• Editorial

You have now finally received the second issue of our Newsletter. It took us a few weeks longer than we had hoped to complete this issue, but the (already forgotten) summer holidays and other pressing work delayed the completion.

Several people besides the editors have contributed to this newsletter, and we would like to thank them for the work they did in preparing their articles. Nevertheless, most of the articles were produced by the editors themselves. This is probably what happens to many publications like ours, but it is not what we are aiming at. We would happily accept many more contributions from other people.

Maybe you have noticed that certain areas are missing or are not covered properly in this newsletter. If you feel that YOUR main area of interest deserves more emphasis, then you should probably try to contribute to the newsletter and we will be happy to assist you.

The article by Don Knuth was not originally written for this Newsletter. The original article was printed in TUGBoat [1] 11, No.4, November 1990. We thought that you - like us - would appreciate the contents and the style of this article. Therefore we reprinted it with kind permission of the editors of TUGBoat.

We do our best to present the *"hard data"* correctly, but already in our first issue we omitted a complete table in the CERNLIB article. This table is now contained in this issue's CERNLIB update.

The opinions presented in named articles are clearly the opinions of the respective authors and should not be treated as the position of the editors or the position of DESY or any organizational unit at DESY.

The Editors

[1] TUGBoat is the publication of the TEX Users Group.

Editors of the DCN are:		
Katherine Wipf	RØ1WIP	ext. 3222
Michael Behrens	RØ1BEH	ext. 2556
Jan Hendrik Peters	RØ1NET	ext. 2583

• How to deal with hanging IBM Terminals

by Michael Behrens

Many of you have experienced at one time or another that a free terminal in one of the pools, which you wanted to use, was in a strange state and you were unable to use it. You then usually selected one of the other free terminals, but sometimes this was the only one available, and so you were in trouble. Before LOGON, the IBM is extremely stupid and expects you to give it exactly the input it waits for. If somebody fails to do so, the terminal will present an error message and from then on it is in some more or less strange state.

You - like many other people - do not know how to reset such a terminal to a normal state. All aspects of this problem will be covered in full detail in a future paper on how to access the various machines at DESY. Until this paper is completed, you may use one of the following recipes to recover from this situation.

There are 2 recipes and 2 special cases that have to be considered.

The *standard* method

After the following sequence of actions the terminal should be in its normal state again and you may initiate your session simply by following the instructions on the screen.

- press the **RESET** button
- press the **CLEAR** button
- press the **ENTER** button
- press the **RESET** button

If the terminal still does not show the accustomed LOGON screen, try the next recipe.

The *brute force* method

- switch the power OFF
- switch the power ON again and wait until the DESY logo reappears

The SAMON case

Some terminals will not display the DESY logo, but instead, show the SAMON screens. This can be very confusing to the new user who is not familiar with this. SAMON is used to logon to other IBM systems directly from a DESY terminal without using the DESY IBM at all. The SAMON screens display the word SAMON in the top left corner, as well as a list of possible SNA destinations and their status. If you simply wish to logon to the DESY IBM, either type in **TSO** and press the **ENTER** key or return to the usual DESY logo by typing **EXIT** and pressing **ENTER**.

The CERN case

On occasion you may find an IBM terminal displaying the CERN logo. In this case a previous user probably dit not know how to end his session at CERN properly and has left the terminal in this state. If you simply type the command

VMEXIT

in the command line close to the bottom of the screen then this terminal should return to normal state.

If all else fails

If none of the previous methods work, then the terminal is probably broken. In this case you are requested to report this to our dispatcher, Mr. Eichbaum, ext. 3888. You have to find another terminal then and with **Help TKAPUTT** you will find out all details on how to report the problem.

• Upgrade of the DESY Computing Facilities

by Michael Behrens

From now until the end of this year you will see an upgrade of the central computing facilities at DESY to prepare for the HERA experiments. This comprises the IBM, the VAX cluster and the *number crunchers* for the experiments. Details on the VAX upgrade are contained in a separate article in this issue and are omitted here.

Upgrade of the IBM filestore

Early this summer the processing power of the central IBM was doubled to cope with the increasing demands, together with a moderate increase in disk space.

Now the **disk space** for the IBM will be increased by another 120 GB by the end of this year. The new disks will be of the new 3390 type with shorter access times and a higher transfer rate than the 3380 disks that are already installed at the computing center. Details on track capacity etc. can be found in **Help Capacity** on the IBM. Despite the greater track length for the new disks, R1 does not propose changes for the DCBs currently used. Most DCBs in current use will give satisfactory utilization of the new disks.

Cartridge Robot Upgrade

A fourth library unit for the **ACS cassette robot** has been ordered as well and it will probably be installed between Christmas and New Year. This upgrade will extend the capacity of the cassette robot system to about 23 000 cassettes. This unit will come with 8 drives as usual. Besides this, 4 extra units for the robot system and 4 additional external cartridge units have been ordered. This will then give a total of 36 drives for the robot system plus 8 external drives. The external drives will mainly be used for the export to (and import from) other sites.

Exabytes

4 Exabyte drives have been ordered. They will be attached to the IBM. The new drives will be able to handle new (5 GB per cassette) and old (2.5 GB per cassette) media. These drives are currently under test and will be purchased if they prove to have the capabilities the manufacturer promises.

Purchase of central number cruncher

In order to fulfill the computing power requirements for the HERA experiments, DESY has ordered 5 Silicon Graphics computers 4D/460 with 6 processors and 256 MByte memory each. Three computers are intended for Zeus, two for H1. The computers will be connected via Ultranet to the IBM. All 5 systems have arrived and have already been installed in the computing center.

• Introducing the Central VAX-cluster at DESY

by Katherine Wipf

One of the biggest problems for scientists who occasionally visit other institutes is the tiresome task of having to learn a completely new computing environment before they can start to work. In order to alleviate this situation for scientists visiting DESY, the central VAX-cluster was installed in February, 1990. The cluster runs under the VMS operating system, which provides a uniform user interface all over the world and is comparatively easy to learn. DECnet, a network connecting VAX computers, also makes it possible for a guest physicist to work comfortably on the VAX system of his home institute.

The Hardware of the Central VAX-Cluster

The Current Configuration

A VAX-cluster consists of a number of central processing units (CPU's) all sharing the same disks. The cluster can be accessed via network by its cluster alias (for our cluster this name is VXDESY) and each CPU can be addressed separately by its own nodename. Because all the disks are shared between the computers, a user only needs to be registered once in order to use any of the computers in the cluster. At present the central VAX-cluster at DESY consists of the following computers and workstations sharing 18 Gigabytes of disk space:

3 Computers:

VXDSYA	VAX-6410	(64 Mbyte Memory)
VXDSYB	VAX-6410	(64 Mbyte Memory)
VAX58B	VAX-8350	(32 Mbyte Memory)

4 Workstations:

VSF58A	VAXstation 3100
VSF58B	VAXstation 3100
VSF58C	VAXstation 3100
VSR02A	VAXstation 3100/SPX

Future Expansion

The VAX-cluster is going to be enlarged at the end of this year by the addition of a VAX-9110, equipped with a 128 MByte memory, a second HSC (Hierarchical Storage Controller - controls and coordinates disk access), and 5 Gbytes of disk space. This upgrade increases the CPU power from 14 VUPs (VAX Unit of Performance) to 54 VUPs. The new HSC will reduce disk access times and improve reliability. The users should notice an improvement in performance and response times, especially when a large number of users are logged on.

The diagram at the end of this article shows the new hardware configuration after the upgrade.

A Few Statistics

When the central VAX-cluster was created by expanding a cluster run by F58, it had roughly 180 users from various groups at DESY. Now, a little over a year and a half later, the number of users has increased to 1067. The table below shows the composition of the VAX user community on the 27th of September, 1991:

# of users from ZEUS	: 375
H1	: 225
Hasylab	: 146
Other groups	: 321
Total	: 1067

The number of registered users is still growing at the rate of about 40 to 50 new users a month.

During the day there are generally 70 to 100 users logged on at the same time and around 120 processes running (this includes subprocesses, batch processes, and users who are logged on more than once). During a month, between 75 and 80% of the registered user log on and use the VAX-cluster.

Network Connectivity

One of the most important features of the central VAX-cluster is its close connection to the DESY IBM computer. This connection is provided by the INTERLINK software, running on both machines, which allows the VXDESY to interact with the IBM as if it were another DECnet node. From a session on VXDESY it is possible to copy files to and from the IBM, to submit jobs on the IBM, to print files on the printers attached to the IBM, or to log on to the IBM. Similar operations are also possible between the VXDESY and other IBM computers running the INTERLINK software (for example CERNVM). Although it is not yet possible to access VAX files from an IBM session, you can log on to the VAX-cluster with the help of INTERLINK. For more information about INTERLINK and how to use it, refer to the following:

- HELP INTERLINK - *on VXDESY*
- HELP COSY- *on VXDESY*
- HELP SNA - *on VXDESY*
- HELP VT - *on the IBM*
- LIST RØ1UTL.INTERDOC - *on the IBM*

The central VAX-cluster can also be reached via TCP/IP (Internet Protocol), DATEX-P, and DECnet, as well as locally over the LAT (Local Area Transport) server. The table below gives an overview of these connections:

Network	Where to find Help	How to find the VAX-cluster's Address
DATEX-P	$ help P.S.I.	$ help X.25
DECnet	$ help set host	*nodename is VXDESY*
LAT	Select LAT in V.24 Switch then Tutorial	show service vxdesy *within LAT*
TCP/IP	TELNET then Help	$ ucx show host vxdesy

Electronic Mail

Since the DESY VAX-cluster is a node on both DECnet (nodename VXDESY) and BITnet (nodename DESYVAX), it serves as gateway between the two mail networks. BITnet mail sent from the VAX is forwarded to the IBM by JNET software running on VAX58B. This software also provides a SEND/FILE command for sending complete files to a remote user. PMDF (Pascal Mail Delivery Facility) software is running on all the computers in the cluster and provides a consistent addressing syntax as well as automatic forwarding to remote VAXes (even for users who do not have accounts on VXDESY). Information on the correct address format for sending mail from the IBM to a DECnet node or the VAX-cluster to a BITnet node can be found under:

- HELP VXDESY - *on the IBM*
- HELP BITNET - *on VXDESY*

It is planned that the VAX-cluster will also become a gateway for SMTP (Simple Mail Transfer Protocol) mail which runs on the TCP/IP network. The VXDESY will then be DESY's official mail gateway, connecting three widely used mail networks.

Available Software

The central VAX-cluster is not as fortunate as the IBM in having a whole group at DESY dedicated to its support. The two full-time system managers of the cluster only just have enough time to install software manufactured by DEC (the company which makes VAX computers), and have to leave the installation and maintenance of all other software to the users themselves. As a result, it is almost impossible to put together a complete list of all the software running on the VAX-cluster. I will therefore just mention a few of the products which are available.

DEC Products

The following 5 language compilers are installed on VXDESY:

- ◇ C
- ◇ FORTRAN
- ◇ LISP - *only on VXDSYB*
- ◇ PASCAL
- ◇ PL/I - *only on VXDSYA and VXDSYB*

You can get a list of all the DEC products installed on the VAX-cluster with the command `$ SHOW LICENSE` or `$ LICENSE LIST`.

Other Software

The Theory group has installed a few programs which might be of interest to users from other groups:

- ◇ FORM - a REDUCE-like algebraic program
- ◇ MONGO - an interactive graphics program
- ◇ NAGlib - a mathematical subroutine package

For more information about how to use these programs, consult H. Wittig (WITTIG on VAX, T00WIT on IBM, tel. 2414) or K. Wipf (WIPF on VAX, R01WIP on IBM, tel. 3222).

ZEUS has also installed software on the VAX-cluster, most notably the CERNLIB. The article *Usage of CERNLIB at DESY* in the last Newsletter gives a brief description of how to use the CERNLIB on the VAX. For more details look at the file `CERN_ROOT:[HLP]CERNLIB.HLP`

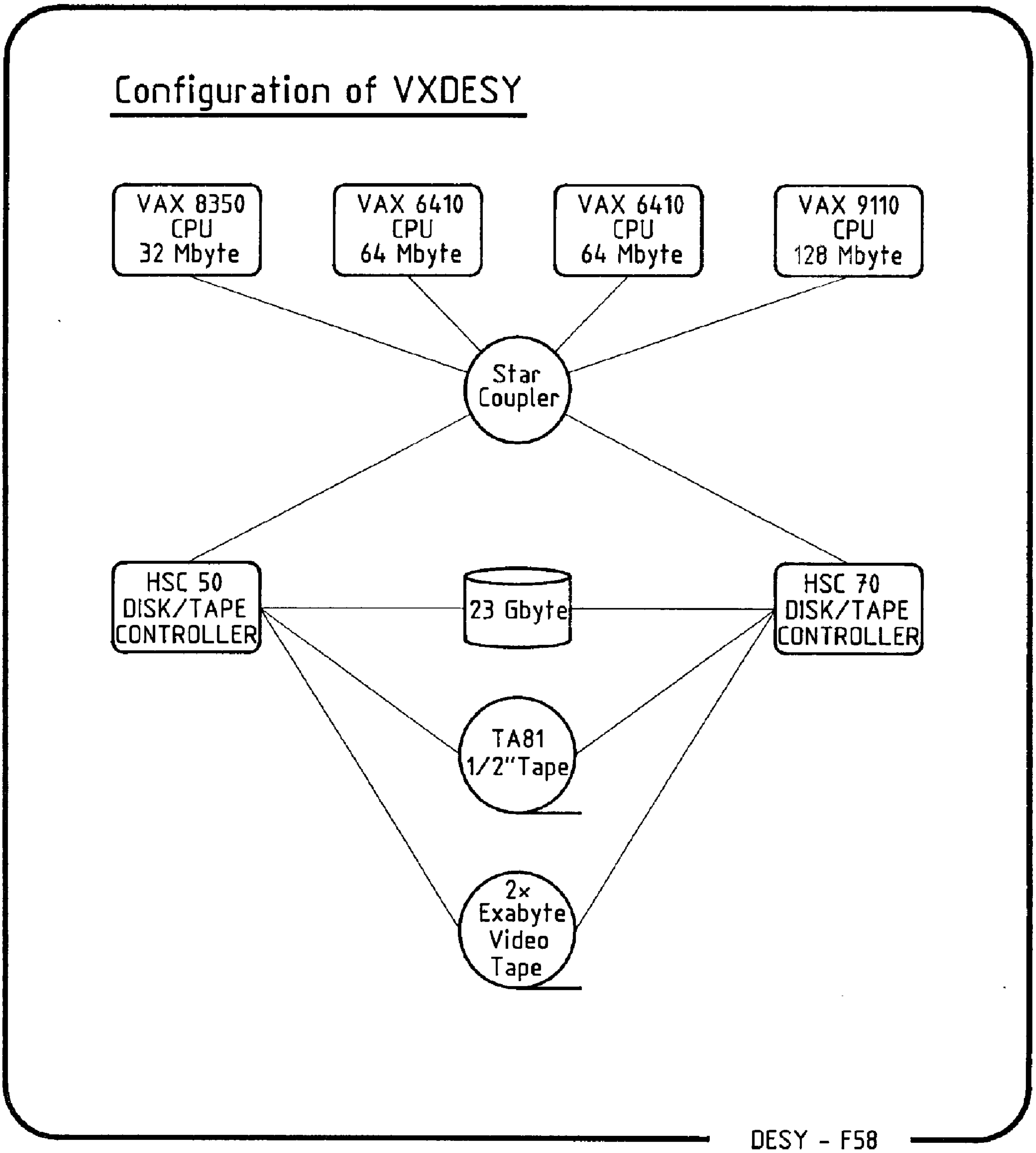
User Support

The central VAX-cluster is operated and maintained by two full-time system managers, W. Krechlok and V. Heynen of F58. To help reduce their work-load somewhat, they have designated group managers for the various groups of users working on the VAX. These group managers are responsible for registering new users, managing disk space, and resetting passwords for the users in their group. Below is a list of the groups and their managers. The userid of the manager is added in parentheses where it differs from the last name:

Group	Manager
Argus	S. Khan
External Users	K. Wipf
F15	A. Hoelscher (`HOEL`)
F51	R. Pforte
F52	K. Rehlich
F58	V. Heynen
	W. Krechlok
Hasylab	O. Beimgraben
	T. Kracht
	H. Schultz
HERMES	M. Dueren
H1	E. Deffur
	S. Egli
KRYO	M. Clausen (`CLAUS`)
M	F. Lohse
OPAL	T. Behnke
	J. Hagemann
R1	E.-A. Knabbe
	K. Wipf
R2	M. Kuersten
Theory	H. Wittig
University	H. Kreiser
W1	H. Peters (`PETERS_HB`)
ZEUS	I. Klein
	T. Poser
	C. Youngman
1^{st} Institute	A. Puskeppel

If you need help with a problem on the VAX, you should ask your group manager first. You can also bring your problems to the User Consulting Office (see `$ HELP CONSULT`). You should only consult the system managers with serious problems which cannot be solved by your group manager or the UCO.

There is a committee, the VCC (VAX Computer Committee), where VAX managers and interested users meet to exchange their experiences. The meetings take place at irregular intervals and are announced via electronic mail. If you wish to be placed on the mailing list, please send a message to VXDESY::KRECHLOK.


Configuration of VXDESY
VAX 8350
CPU
32 Mbyte
VAX 6410
CPU
64 Mbyte
VAX 6410
CPU
64 Mbyte
VAX 9110
CPU
128 Mbyte
Star
Coupler
HSC 50
DISK/TAPE
CONTROLLER
23 Gbyte
HSC 70
DISK/TAPE
CONTROLLER
TA81
1/2"Tape
2×
Exabyte
Video
Tape
DESY - F58

• DESYNET (* 1979, † September 19, 1991)

by Peter Schilling

After over twelve years of successful operation, DESYNET, the packet-switching local area network created by R2, has passed away due to unrecoverable hardware failure.

DESYNET was an important part of the "Interactive Plotting System" IPS, because it served to connect the IPS-terminals (equipped with Tektronix 619 storage tube and Conrac raster displays) used for interactive graphic work to the IBM mainframe. Since DESYNET was also connected to the V.24-switch (MICOM), it was possible to use Atari PCs (with R2-software) as low cost graphic terminals with full-screen capability, too.

In '87 R2 started to develop a new generation of graphics for the growing demands at DESY. Prices for powerful workstations had come down so much that it was no longer reasonable to extend the old IPS further. The concept was based on workstations using standards like UNIX, TCP/IP, X, and GKS.

The main features of the new system, called IPS '90, are:

- support of the *old* IPS-applications (i.e. full-screen and interactive graphics) on the IBM mainframe,
- *in addition* the possibility to run applications locally on the workstations (which could not be done on the old "dumb" IPS-terminals),
- high connectivity of the new stations via TCP/IP.

After successful prototyping R2 presented IPS '90 to the public at a CUC (Computer Users Commitee) session in June '90. In particular, users were advised to put their private graphic applications on a GKS-basis in preparation for the new system. It was announced that IPS and DESYNET would be supported officially only up to the end of 1990, since it was clear that the old hardware would not last forever.

An internal R2-paper of January '91 described a schedule to replace the old IPS-terminals step by step by HP-Apollo workstations HP9000-425t for which all necessary software had already been prepared. Work was in progress to eventually add X-terminals[2] to the workstations to allow for more than one user per workstation.

After the purchase and installation of a number of workstations (mainly for use at H1), we could not get more of them to make the next steps for two reasons: 1. shortage of money, 2. the appearance of new and more powerful workstations with a very attractive price/performance ratio.

This implied a modification of our concept: Connect a large number of X-terminals to only relatively few workstations. Unfortunately this requires additional work.

The situation with respect to IPS on the mainframe after the final breakdown of DESYNET on September 19, 1991, is the following:

- The old IPS-terminals (Tektronix 619 and Conrac) are out of operation and will be removed.
- Ataris and Falcos can access the IBM mainframe via MICOM-destination 'IBM' and Falco terminals in addition with the MICOM-destination 'LAT' (here you type *c ibm*) ; GKS-based applications (like private GKS-programms, GEP, and PAW) are supported, but TEX-previewing is not possible.
- GKS-based applications *and* TEX-previewing works on
  - on IBM graphic terminals (3192 G, 3193),
  - on the HP9000-425t workstations,
  - and *almost* on X-terminals.

The current situation with respect to IPS '90 is the following:

- Some of the new workstations and a number of X-terminals have been ordered.
- The physical placement of X-terminals on the DESY-site will be controlled by the management.
- R2 has to set up the whole system and get it to work reliably.

[2] "X-terminals" are basically specialized, stripped down (and therefore cheap) workstations, which allow graphic access of workstations via the standard "X-protocol".

• File Transfer Service extended

by Michael Behrens

During the last months, the UCO PC has been heavily used for file transfer to and from the IBM. The transfer used an emulation that connected the PC to our central IBM, thus excluding other systems and especially the VAXes. It it was also not the fastest or most elegant method. We could - and can - transfer files to and from $3\frac{1}{2}$ or $5\frac{1}{4}$ inch diskettes (IBM compatible) using both single- and double-density diskettes.

We have recently installed TCP/IP on the UCO PC and connected it via Token Ring to the Internet. It is now possible to transfer between the PC and any machine with an internet address via FTP using the standard FTP commands. As a result, the file transfer service was extended to any machine with a TCP/IP implementation (i.e. VAXes, Workstations, PCs, etc.). The name of the PC is **ucopc.desy.de** (in short **ucopc**) and its address is **131.169.7.38**.

It can be used during UCO office hours as a file server from any machine on the site, or you may alternatively do the file transfer on the PC to and from your favorite host. In file server mode, the PC files can in principle be accessed by several users simultaneously. As this includes your private diskettes in the PC's diskettes drives, you should *write protect* all source diskettes you put there.

PC's have no real access control mechanism. Thus everyone could copy whatever software is stored on the UCO PC. We would like to remind you that most software is copyright protected and that it is illegal to make unauthorized copies. Apart from legal considerations, it is good practice to respect other peoples property and not to copy their files unless explicitly authorized.

In addition, we have taken measures to protect the hard disk *drive* **C:** against write access to maintain the PC's integrity.

• Usage of CERNLIB at DESY

by Harald Keller

Current State of CERNLIBs

The DESY computer center intends to update the CERN program libraries at the same frequency as at CERN. The latest installed version at DESY corresponds to the publication of the CERN Computer Newsletter 201 (or short CNL201). There was no formal release of binary PAM files in CNL202, that's why we plan to install CNL203 as the next version at DESY, which is expected to be distributed during the next weeks.

Current state of CERNLIBs on the IBM

NOTE: You should use the command

```
help CERNLIB
```

under NEWLIB to verify the current state of the CERNLIBs on the IBM, because by the time this information is printed it might already be obsolete.

CNL LINE	OLD-PRO-NEW Line
Every set of libraries corresponds to a CNL version	from the CNL Line 3 generations are maintained.
r01utl.cern.*suffix* *)	r01utl.cern.OLD.*suffix*
r01utl.cern.cnl200.lib.*suffix*	r01utl.cern.PRO.*suffix*
r01utl.cern.cnl201.lib.*suffix*	r01utl.cern.NEW.*suffix*

*) Version of November 1989

Up to and including the version CNL200, DESY had supplied only KERNLIB, GENLIB and PACKLIB. Starting with CNL201, GRAFLIB and PAWLIB are supplied as well.

The contents of the various libraries is as in the following table. By mistake it was not complete in the DESY Computing Newsletter No 1.

"suffix"	containing	
KERNLIB	KERNIBM	
	KERNFOR	
	KERNBIT	
	UMON	(since CNL201)
	KERNNUM	
GENLIB	GENLIB	
PACKLIB	KERNLIB	*is included here to save one extra concatenation for PACKLIB users*
	EPIO	
	FFREAD	
	HBOOK4	
	IOPACK	
	KAPACK	
	KUIP	
	MINUIT	
	ZBOOK	
	ZEBRA	containing: ZEBRA, ZEMQ, ZEFQ, ZETEST, DZEBRA, FZCONV, RZEBRA, RZTEST
and from CNL201 on:		
GRAFLIB	HIGZ	
	HPLOT5	
PAWLIB	PAW	
	COMIS	
	SIGMA	

Compilers / Dynamic COMMON

The recent versions of CERNlib are produced for use with the IBM VS Fortran compiler only. We no longer provide versions for other compilers, e.g. the Siemens FORTRAN 77 compiler.
For all versions from 'CNL200' on and for the PRO and NEW versions, the compiler option

DC(PAWC)

is used. This means that this compiler option

- MUST be used beginning with versions 'CNL200' and 'PRO'
- MUST NOT be used with older versions

If you use one of the newer versions and omit this option, your program will not run as expected and produce strange results (or abend) without any error message during compile or link. The same will happen if you use DC(PAWC) for versions before 'CNL200', e.g. the current OLD version.

Here are examples for Newlib
```
COmpile member CPRM DC(PAWC)
```
and for JCL
```
// EXEC VFORTCLG,CPRM='DC(PAWC)'
```

Format of Program Library source code

CERN plans to distribute the PAM files in a different format beginning with CNL204. Up to now, the CERNlib PAM's were distributed in binary format; in future they will be distributed in "CARD format". This means that PAM files at DESY will be in binary format up to version CNL203 and from then on in card format.

What does it mean for the user?

Users who maintain their own code with PATCHY and access CERNLIB PAM files will have to change the `+PAM` line in their cradle to:
`+PAM, 11, T=CARDS.`
for every PAM file in card format. Own PAM files which are still in binary format can be attached in the usual fashion with:
`+PAM, 12.`

CMZ users will not be affected, because CMZ already uses PAM files in CARD format.

• Manuals and Writeups

by Michael Behrens

In the last few weeks the User Support Group has tried to improve the supply of manuals and other documentation needed by the users of the Computing Center.

We tried to identify what written or printed documentation would be needed by our users, who should get what documentation and how we could distribute it efficiently and (cost-)effectively. Finally we arrived at the following guidelines:

- The full set of documentation should be available in the DESY library.
- All terminal pools should contain the same "standard set" of documentation.
- Documentation for a limited user community can be obtained from the UCO, it will not be distributed to all pools.
- Extra copies of some manuals can be obtained from the UCO on request for group/personal use.
- DESY documentation is available in the self service area of the computing center.
- CERN documentation is available on request from the UCO.
- Old, invalid documentation is removed from the pools.
- Valid *non-standard* documentation found in the pools is left there.

We do not yet have a policy for distributing larger amounts of VAX or Unix documentation under the responsibility of the User Support Group.

We will no longer distribute the CNL - Cern Computer Newsletter in the terminal pools. The CNL is not really a reference document for a pool. Besides the copies kept at the DESY library, many people from DESY get their personal copies already, and whoever wants to be added to this list may make a request in the UCO.

Available printed documents at the DESY computer centre

On the next two pages you will find an overview of what literature is available and where. More information on what you can find in the terminal pools is in

`Help LITPOOL` on the IBM.

Besides the literature mentioned below, the User Consulting Office (UCO) has extra copies for several manuals. If you have a request, please contact the UCO and see if the consultant is able to help you. When we expect that very few people will be interested in using a manual, we will usually stock a few copies in the UCO instead of distributing it to all pools.

CERN program manuals will in future be imported from CERN through the DESY User Support Group (USG) only. An arrangement to this effect has been made with CERN. If you need any personal copies of CERN documentation please address the User Consulting Office (UCO) - R01UCO -

Where can I find what ? [3]

	S	U	L	P
Introduction to the DESY Computer Center:				
The First Three Days, DESY Computer Center Primer	S			
How to Get Started on a VAX		U		
CERN Computer Newsletter		U	L	
DESY Computer Newsletter	S		L	
NEWLIB:				
NEWLIB Reference Manual	S		L	P
Einführung in NEWLIB (deutsch)	S			
FORTRAN and Preprocessors:				
VS FORTRAN Version 2, Language and Libr. Ref., IBM	S		L	P
VS FORTRAN Version 2, Programming Guide, IBM			L	P
VS FORTRAN Version 2, Interactive Debug, IBM			L	P
FORTRAN 77 Language Reference, Siemens			L	
FORTRAN 77 Programmer's Guide, Siemens			L	
FORTRAN 77 Library Reference, Siemens			L	
IBM FORTRAN IV Language Reference			L	
IBM FORTRAN IV Programmer's Guide			L	
An Introduction to FORTRAN 77 (M. Metcalf)	S		L	
FORTRAN Error Monitor			L	
MORTRAN 3			L	
Other Programming Languages:				
C Language Manual			L	P
C Compiler User's Guide			L	P
Pascal Reference			L	
Pascal Programmer's Guide			L	
PL/1 Reference			L	
PL/1 Programmer's Guide			L	
PL/1 Compiler Messages			L	
Assembler Language			L	
Assembler Programmer's Guide			L	

[3] Legend for *Where to find what*
S → Self service in the user area of the computer room
U → Available from the UCO office
L → Available for reference in the DESY library
P → Available for reference at most terminal pools

Batch operation/ IBM General				
JCL - Job Control Language			L	P
Linkage Editor and Loader			L	P
VS2 System Messages Vol.1			L	P
VS2 System Messages Vol.2			L	P
VS2 System Codes			L	P
Principles of Operation			L	
Program Libraries:				
CERN Program Library Manual		U	L	P
ESSL (Vector subroutine library for IBM)			L	
NAG Manual			L	
NAG MiniManual			L	P
FLOP - A FORTRAN Language Oriented Parser	S			
Graphics:				
G E P - Graphical Editor Program Manual	S		L	P
G K S		U		
I P S User's Guide	S		L	P
HBOOK User's Guide		U	L	P
Text Formatting:				
Die Textformatierungssprache G M L und ihre Verwendung bei DESY			L	
Summary of AMS-TEX	S		L	
How to use TEX at DESY	help TEXGUIDE on IBM			
Using LATEX at DESY	help LOCALGUIDE on IBM			
Formatting Tables with TEX	S		L	
Symbolic Computing:				
Standard LISP Report	S		L	P
Manual for Standard LISP on IBM system 360 and 370	S		L	P
REDUCE 3 User's Manual	S		L	P
Other long Write-ups:				
B O S Manual	S		L	P
CMZ		U	L	P
EPIO		U	L	P
F S P The Full Screen Package (2 documents)			L	P
GEANT		U	L	P
HPLOT		U	L	P
KUIP		U	L	P
Minuit		U	L	P
PATCHY		U	L	P
PAW		U	L	P
Valley			L	P
ZEBRA		U	L	P

• The Future of TEX and METAFONT

Donald E. Knuth

> Reprinted from TUGBoat 11, No.4, November 1990 with kind permission of the editors of TUGBoat.

My work on developing TEX, METAFONT, and Computer Modern has come to an end. I will make no further changes except to correct extremely serious bugs.

I have put these systems into the public domain so that people everywhere can use the ideas freely if they wish. I have also spent thousands of hours trying to ensure that the systems produce essentially identical results on all computers. I strongly believe that an unchanging system has great value, even though it is axiomatic that any complex system can be improved. Therefore I believe that it is unwise to make further "improvements" to the systems called TEX and METAFONT. Let us regard these systems as fixed points, which should give the same results 100 years from now that they produce today.

The current version number for TEX is 3.1, and for METAFONT it is 2.7. If corrections are necessary, the next versions of TEX will be 3.14, then 3.141, then 3.1415, ..., converging to the ratio of a circle's circumference to its diameter; for METAFONT the sequence will be 2.71, 2.718, ..., converging to the base of natural logarithms. I intend to be fully responsible for all changes to these systems for the rest of my life. I will periodically study reports of apparent bugs, and I will decide whether changes need to be made. Rewards will be paid to the first finders of any true bugs, at my discretion, but I can no longer afford to double the size of the reward each year. Whenever I have created a new version, I will put it in the official master TEX archive, which currently resides at Stanford University. At the time of my death, it is my intention that the then-current versions of TEX and METAFONT be forever left unchanged, except that the final version numbers to be reported in the "banner" lines of the programs should become

`TeX, Version` π

and

`METAFONT, Version` e

respectively. From that moment on, all "bugs" will be permanent "features."

As stated on the copyright pages of Volumes B, D, and E, anybody can make use of my programs in whatever way they wish, as long as they do not use the names TEX, METAFONT, or Computer Modern. In particular, any person or group who wants to produce a program superior to mine is free to do so. However, nobody is allowed to call a system TEX or METAFONT unless that system conforms 100% to my own programs, as I have specified in the manuals for the `TRIP` and `TRAP` tests. And nobody is allowed to use the names of the Computer Modern fonts in Volume E for any fonts that do not produce identical `tfm` files. This prohibition applies to all people or machines, whether appointed by TUG or by any other organization. I do not intend to delegate the responsibility for maintenance of TEX, METAFONT, or Computer Modern to anybody else, ever.

Of course I do not claim to have found the best solution to every problem. I simply claim that it is a great advantage to have a fixed point as a building block. Improved macro packages can be added on the input side; improved device drivers can be added on the output side. I welcome continued research that will lead to alternative systems that can typeset documents better than TEX is able to do. But the authors of such systems must think of another name.

That is all I ask, after devoting a substantial portion of my life to the creation of these systems and making them available to everybody in the world. I sincerely hope that the members of TUG will help me to enforce these wishes, by putting severe pressure on any person or group who produces any incompatible system and calls it TEX or METAFONT or Computer Modern—no matter how slight the incompatibility might seem.

◇ Donald E. Knuth
Department of Computer Science
Stanford University
Stanford, CA 94305

Locating a DESY Library Book by means of a Database

by Peter Dobberstein

General

By means of IBM's relational database system DB2, we have created an application to locate a DESY library book if author or title are known. This only applies to the BOOKS, NOT to the PREPRINTs. If you would like to find a preprint, please use the High Energy Physics Index (HEPI or HEP on the IBM). For information about the High Energy Physics Index ask in the library or use the online help ('help HEP') on the IBM mainframe.

Compared with HEP, the FINDBOOK application described here is very simple. You can use two substrings of the list of authors and two substrings of the title (+ substrings of the edition, the signature and the ISBN/ISSN-number) as search criteria, whereas in HEP a lot of search criteria can be combined. Since the catalog of books is much smaller than the High Energy Physics Index, these search criteria are nevertheless sufficient to make FINDBOOK a useful tool.

The underlying database for the FINDBOOK application presently contains all books since 1979 and a fraction of the older ones (together 85 % of the library stocks). The missing older books will be inserted in the future, new books are added with the actual updates, which will take place every few weeks. Before new books appear in the database, you can find them as described in the online help ('help BOOKS').

FINDBOOK runs under IBM's Query Management Facility QMF, which is a user interface for DB2. For this reason, you must enter the QMF environment, which has a larger complexity than FINDBOOK itself.
Most people who would like to find a book will not be interested in QMF and DB2. Therefore we give a short description below of how to use FINDBOOK and include a few examples.
If you would like to know more about QMF and DB2 you should also read the last section of this article ('More detailed information about the environment used').

Short description of the procedure of locating a book

In this section we give a step-by-step description of the procedure.

1. Start the QMF-clist from NEWLIB with the command

   QMF

   and wait until a panel appears. The first usage of QMF within a TSO session may require a bit more time before the QMF home panel is shown (allocation of required files).
   All subsequent calls of QMF run much faster, since most of the required files are then preallocated.

2. Enter the desired print destination for your QMF session. By default, the actual NEWLIB destination is taken. If you want to keep it, simply press ENTER. Otherwise overtype it and then press ENTER (the output will not be printed until you leave QMF).
   If you use QMF from a terminal which is not able to display GDDM graphics, you will get the message:

   ADM0873 I IF AVAILABLE, PLEASE SELECT PCLK. OTHERWISE, PRESS 'ENTER'

   Ignore it, press ENTER and proceed. The only background of this message is to say that you can't produce graphics.

3. **Printer Setup**
   When you use FINDBOOK for the first time, you may have to change your QMF profile to have the correct printer setup.
   If you use the line printers or the IBM 3820 (LI1), you'll use the landscape format and nothing has to be changed.

If you use the QMS printers (L1, ..., L6), then it is useful to change your QMF profile to use the portrait format (it saves a lot of paper). This is done as follows:
When you see the QMF home panel, press function key PF11. You will then see a panel for setting up your profile. Overtype the printer WIDTH with 80 (default: 132) and the printer LENGTH with 87 (default: 60) and press function key PF2 to save the values. DON'T INSERT anything in the empty field PRINTER! After pressing function key PF3 you'll return the QMF home panel and you can proceed.

4. When you see the QMF home panel, type in the command FINDBOOK and press ENTER.

5. You will now see a panel where values for the variables

   &AUTHOR, &ALSO_AUTHOR,
   &TITLE , &ALSO_TITLE,
   &EDITION, &SIGNATURE
   and &ISBN

   are requested. All variables other than &AUTHOR and &TITLE are preset to the string '%'. Now give substrings of the list of authors and the title obeying the following rules and hints:

   (a) The strings have to be enclosed in apostrophes,
   (b) % (percent) is a substitution for an arbitrary number of unknown characters,
   (c) _ (underscore) is a substitution for exactly one unknown character,
   (d) both &AUTHOR and &TITLE have to be entered,
   (e) if the variables &ALSO_AUTHOR and &ALSO_TITLE are overtyped, they will be used as additional restrictions (logical 'AND' with &AUTHOR, &TITLE and the other variables),
   (f) &EDITION, &SIGNATURE and &ISBN are also taken as additional restrictions, if overtyped (logical 'AND' with the other variables),
   (g) the database is case sensitive. E.g., a title search for 'data' will not find titles containing 'Data'.

An example: When you are looking for all books containing the substrings 'database' or 'Database' in the title (author arbitrary), type

&AUTHOR = '%' and
&TITLE = '%atabase%'

and press ENTER. If you would like to find the books which have 'data' (or 'Data') and 'base' (or 'Base') at separated positions in the title (again with arbitrary author), use

&AUTHOR = '%', &TITLE = '%ata%' and
&ALSO_TITLE = '%ase%'.

For more examples, see below (Section 'More examples of how to locate a book').

After a few seconds, you'll get a list of all catalogued books satisfying your search criteria (it can be empty). For every book the following is displayed:

```
authors
------
title
------
edition (may be missing)
------
signature (may be missing)
------
ISBN/ISSN number (may be missing)
```

The signature is important for finding the physical location of the book in the library (if you don't know how, ask the library staff). You can move around in the list using the function keys PF7 (backward) and PF8 (forward) as well as the commands BACKWARD HALF, FORWARD HALF, TOP and BOTTOM. At the bottom the number of books found is shown. The list will be printed if you press function key

PF4.
When you press function key PF3, you'll return to QMF's home panel.

6. Now you can leave QMF by pressing PF3 again or you can start a new book search by typing the command FINDBOOK and pressing ENTER.

7. *Depending on the applications used, the NEWLIB message 'ISPSTART ENDED ABNORMALLY' appears when you leave the clist QMF. Don't worry in this case, in general nothing terrible happened. It simply means that somewhere inside QMF a non-zero return code occured, which causes NEWLIB to show a warning.*

More examples of how to locate a book

Here we give you a list of examples from which you can get an idea of how to use FINDBOOK:

- **Try to determine which conference proceedings of the year 1987 are in the library.**
  To solve this problem, you can take advantage of the fact that up to 10 title lines are stored in the database. The subtitles contain the required information. A suitable search criterion is

  &AUTHOR = '%', &TITLE = '_roceedings%'
  and &ALSO_TITLE = '%1987%',

  since the titles of all conference proceedings start with 'Proceedings' (or 'proceedings' due to typing errors) and the year of the conference is usually part of the title. The search terms '%onferen%' ('Conference', 'conference' or 'Konferenz') and '%ymposi%' ('Symposium', 'symposium',
  'Symposia', 'symposia', 'Symposion' etc) could also be useful.

- **Try to list all books with 'High Energy Physics' or 'High energy physics' in the title.**
  The problem will be solved with

  &AUTHOR = '%' and
  &TITLE = '%igh _nergy _hysics%'.

  &TITLE = '%igh %nergy %hysics%' would find some additional books, e.g. those containing 'high energy' and then 'astrophysics' in the same title line.

- **Try to list the library's holdings published in 1990 and belonging to the category 'Computer'.**
  Solution: Simply use

  &EDITION = '%1990%',
  &SIGNATURE = 'C%' and
  for all other variables '%'.

  The different categories of books in the DESY library are

```
A    = Allgemeines (General)
C    = Computer (Computers)
E    = Elementarteilchenphysik,
       Beschleuniger oder
       Quantenfeldtheorie
       (Particle Physics,
       Accelerators or
       Quantum Field Theory)
K    = Kernphysik (Nuclear Physics)
Konf = Konferenzen (Conferences)
L    = Bibliothekswissenschaften
       (Library Science),
       ask the library staff
M    = Mathematik (Mathematics)
N    = Naturwissenschaften (Science)
P    = Physik (Physics)
Q    = Quantenmechanik
       (Quantum Mechanics)
T    = Technik (Engineering)
Woe  = Woerterbucher (Dictionary)
```

  The signature of a book always starts with the category; the year of publication is usually contained in the specification of the edition.

- **Try to find all books with the authors 'Feynman' and 'Sands'.**
  Simply use

&AUTHOR = '%Feynman%',
&ALSO_AUTHOR = '%Sands%'
and &TITLE = '%'

to get the desired books.
For an author search it can be useful to terminate the desired name with a comma. For example, &AUTHOR = '%Schulz,%' will find only the books with author 'Schulz', not those with authors 'Schulze' or 'Schulz-Weidenbaum' etc. (without typing errors in the database, all names should be terminated with a comma).

- **Try to display the library's holdings published by Springer.**
  Solution: Simply use &EDITION = '%Springer%' and '%' for all the other variables.
- **Try to display all books contained in the catalog (which is not recommended).**
  Use &AUTHOR = '%' and &TITLE = '%', which means that author and title strings are arbitrary. The generated list is so huge, that your TSO session could crash.

More detailed information about the environment used

As mentioned above, FINDBOOK uses the IBM products DB2 and QMF. If you would like to have more information about the environment, also read the corresponding online helps ('help DB2' and 'help QMF'), the help panels in QMF or the available literature, which is present in the UCO (the titles are listed in 'help DB2').
Of special interest for the FINDBOOK user could be:

- **Recursive NEWLIB call.**
  When you are in QMF, you can write "NEWLIB" instead of "FINDBOOK" in the command line of the main panel. You will then enter a recursive NEWLIB session. That's often easier than leaving QMF with a subsequent re-loading of QMF. A recursive NEWLIB session will be left with the NEWLIB command "EXIT".
  Together with the recursive NEWLIB call, you can enter the first NEWLIB command to be executed. For example: If you are in QMF and would like to read the online help for FINDBOOK, type "NEWLIB H FINDBOOK" in the command line of the main panel and press enter. You will then immediately see this help and can return to QMF with the command "EXIT".
- **Function key PF12 (REPORT).**
  If your FINDBOOK search was successful and you then performed other actions with QMF, your FINDBOOK report may still be available (if it was not overwritten by your other QMF actions). You can display it again by pressing PF12.
- **The table editor (function key PF8).**
  In principle, you can edit every DB2 table with this table editor. The table editor is also another way of searching for special data in a table. At your own risk (maybe you will waste a lot of time), you can enter the editor by pressing PF8, then give the table name R01DB2.BOOKS and try to find out whether you can use it to your advantage. This is an application for specialists only. For this reason we'll give no further explanations here. In principle, the QMF help panels should be sufficient.

• Do it better or do it the same ?

by Otto Hell

In a seminar of E. Lohrmann, N.A. McCubbin of RAL told us the other day:

Don't do it better - Do it the same !

I have been chewing on this ever since. I can't swallow it. What does it mean ?

- Do it the same as yesterday ?
- Keep punching cards for FORTRAN IV ?
- Wylbur ?
- No VM/CMS, no UNIX, no NextStep ?

Although I see FORTRAN IV and Wylbur score a few "yes", this is certainly not the aim of Mr. McCubbin. But then what does he mean ?

- Do it the same as everyone else ?
- Do it the same as many business companies ?
- Do it the same as "the HEP community" ?
- Do it the same as CERN ?

Much closer, eh ?

And who should do it the same, rather than better ?

- The physicists ?
  Should they still hand-wire detector electronics ?
- The computer scientists ?
  No CERNlib, Fatmen, PATCHY, SHIFT, WYLBUR, or ZEBRA ?
- The computer scientists of DESY ?
  No NEWLIB, no GEP, no central catering for magnetic tapes ?

Very close, I suspect !

The slogan obviously isn't meant for all times and all people. This would keep us back in the caves. No, it is meant for MY ENVIRONMENT, EVERYTHING EXCEPT MY OWN WORK !

This is quite an acceptable position. Let the environment of the high energy physicists evolve, but evolve slowly.

This seems to be a special case of what Peter Kafka calls the cancer of modern life: Everything evolves so quickly that it cannot be evaluated before it takes over. When something is found to be "considered harmful" (e.g. dioxine, GO TO, nuclear technology, asbestos, propellent gases, ...) it is difficult or impossible to get rid of it. So let's have slower progress and take time to get used to new things, find out about their merits and their shortcomings or even dangers - and maybe even reject them.

But now back to practice. We seem to have arrived at

COMPUTER SCIENTISTS: DO IT THE SAME AS THE REST OF THE HEP COMMUNITY !

What has been practice ?

- Once upon a time CERN initiated an ingenious code manager, PATCHY, in order to cope with many "copies" - only slightly changed - of piles of punched cards. CERNLIB centralized much-used routines. "The same" would have meant doing nothing and would have saved DD a lot of manpower.
  Meanwhile there have been and are attempts to do better than PATCHY, but so far the community has preferred to have it the same.
- About the same time DESY started NEWLIB in order to do better than TSO or IEBUPDTE. (Don't worry if these words are unknown to you.) "The same" in those days would indeed have meant more punched cards.
  And NEWLIB has stayed "the same" ever since. (Excuse me, Harald, I am not denying that it has also become better all the time !)
- But what did the rest of HEP do ? The same ? Oh no ! CERN e.g. started WYLBUR, did "better" in 1984 with VM/CMS, and is now talking

of doing it even "better" with UNIX. At least they did the same as SLAC, but certainly not the same as DESY or the same as yesterday.

- Similar with graphics. CERN didn't do the same as DESY, with well-proven GEP, it did "better", with the new PAW (meanwhile of course well-proven too).
- Is DESY doing "the same" ? Yes we are:
  - NEWLIB has been "the same" for over 20 years.
  - The CERN libraries have been here for a long time.
  - We made the Siemens FORTRAN 77 compiler standard in 1984, "better" than FORTRAN IV, and "the same" as at CERN.
  - We followed CERN and made the IBM VS FORTRAN compiler standard in 1986, not as good as Siemens, but "the same" as at CERN.
  - We followed CERN and introduced HISTORIAN, "better" than PATCHY, but "the same" as at CERN.
  - PAW is here, "the same" as at CERN.
  - So is CMZ, "better" than PATCHY, but "the same" as at CERN.
  - FATMEN are coming.
  - XFIND is coming - I hope !
  - OOP (Object Oriented Programming) is coming. It's not the same as in the past - There has never been anything like it. But already people are telling me, we should do it "the same" as HEP, namely with C++. Who is bothering to find out whether Eiffel might not be much better than C++ ?

Enough. Let me sum up. I think we understand what Mr. McCubbin and the rest of our users mean. We try to introduce standards, also HEP and CERN standards. The empire is there, though it does not want to be one. We try to cooperate with CERN, though it seems to be difficult to get involved in the analysis phase of things.

But we insist on

- not doing it the same when we consider a solution poor.
- trying to do it better when we consider it important.

If you don't want your computer centers to do it "better" then you want them not to follow their insight.

If you want academically trained people at your computer centers then you should not stop them trying to do it "better".

• Archiving inactive Cartridges

by Michael Behrens

The cartridge robot in the computing center has a total capacity of about 17000 cartridges today. Its capacity will increase to about 23000 cartridges by the end of the year after the upgrade mentioned elsewhere in this Newsletter.

Nevertheless we will not be able to store all cartridges permanently in the cartridge robot. This situation already arose some time ago, when all the cartridges in the robot were full. At this time we removed some 6000 inactive[4] cartridges and stored them in an external rack.

You should not have noticed this action, and this should be the case in the future as well. Our statistics show that datasets that have not been used for a longer period, will almost certainly stay inactive. So we only rarely need the extra manual effort of mounting them to some external drive or of placing them in the robot again.

Thus, for the time being, inactive cartridges will simply be removed from the robot and stored in a rack somewhere outside the robot. New scratch cartridges will then be added to the robot system, so that we will always have a set of scratch cartridges available in the robot.

For the old (round) magnetic tapes R1 had developed an archiving system for inactive datasets. In this system archive tapes (A-tapes) were treated differently from the normal M-tapes, but this system is not used for the inactive cartridges.

Later there will be a real archive for cartridges in remote archive rooms, and the users will be able to "see" the location of their data sets. This system will be an extension of the present archive system and it will be described in detail in a future issue.

For the the large amounts of raw data and DST cartridges, R1 has, together with the HERA experiments, developed a different scheme. This scheme will also be described in a later issue.

[4] Inactive cartridges are such cartridges that contain only datasets that have not been used for a longer time. Currently this means not used for more than 6 month.

• Questions and Answers from the UCO

by Katherine Wipf

The User Consulting Office answers quite a variety of questions, but usually only a few people hear the answers. This column tries to bring the answers to more frequently asked questions to a larger audience.

. . . *about FORTRAN*

Question: I have two versions of my FORTRAN program, one is single and the other is double precision. The single precision version runs without errors but the double precision program produces an underflow exception in a certain subroutine. How can this happen when my programs are identical except for the precision of the variables?

Answer: The subroutine with the underflow exception was passed a number of parameters and two of these were zeroes (i.e. the number 0. was passed) so that the subroutine call looked like this:

`CALL SUBR(X,Y,0.,0.,Z)`

The single precision version interpreted the zeroes correctly, but the double precision routine translated the 0. into 0.000000000000000120E-78 and gave an underflow message. This happens because 0. is a single and not a double precision zero. When 0.0D0 (double precision zero) is used, the error message disappears.

NOTE: It is dangerous to pass numbers (rather than variables) in a subroutine call because it can lead to a situation where the number 2 no longer has the value 2. The following short program demonstrates this effect:

```
PROGRAM MAIN
CALL CHANGE(2)
WRITE(6,*) 2
END

SUBROUTINE CHANGE(K)
K = K + 1
RETURN
```

The program output is the number 3 and instead of the expected value 2.

A FORTRAN subroutine does its calculations using the original data passed to it and does NOT work with a local copy. Thus when the value of the variable K is changed in subroutine CHANGE, it is really the value of the parameter passed into K which changes (in our example, the constant 2). Therefore, if you need to pass a subroutine a constant value, it is a much better practice to set a variable of the right precision to the value you wish to pass and then use this variable in your parameter list.

Question: I'm running a FORTRAN program on the IBM in batch which is supposed to read a member of a partitioned data set and write the contents to unit 6. The program doesn't run and complains about an illegal floating point character ':' although no ':'s are in the input file.

Answer: The file that the program should read was a member of a NEWLIB source library and thus in COSY format (this is a special compressed format used by NEWLIB because it saves space). FORTRAN cannot read the COSY format. There are two solutions to this problem:

1. The whole NEWLIB source library can be converted into a fixed block data set using the catalogued procedure LIBOUT (see `HELP LIBOUT` for a sample job). After the conversion any member of the library can be read by a FORTRAN program and can also be edited in NEWLIB.
2. The member to be read can be copied to a fixed block sequential data set. First the sequential data set must be allocated using the ALLOC command (do not forget to specify `DSORG ==> PS` and `CARDIM ==> X`). The member can then be copied with the command `PUT membname INTO seqds.name SEQ`

NOTE: File transfer programs like FTP and INTERLINK also have trouble with NEWLIB COSY data sets. For INTERLINK there is a new command `$ COSY` on the VXDESY which solves the problem. NEWLIB members which are to be transfered via FTP must be treated according to solution 2 above.

Question: Can I use the FORTRAN OPEN statement to open an IBM file using the dsname rather than a ddname?

Answer: Yes. You can indicate the dsname in the FILE= parameter of the OPEN statement. For the VS FORTRAN compiler it is necessary to put a "/" in front of the name to indicate that it is a dsname. It would look something like this:

```
OPEN(UNIT=2,FILE='/userid.a.b')
```

. . . about Tapes and Cartridges

Question: My FAST job ended with a system completion code S222 and my data sets were not copied to disk. The data sets were on archive tapes and I submitted a RETRA job for these data sets. This job claimed the data sets had been ADDED, so I assumed that they were now available. What went wrong?

Answer: The FAST job abended because the tapes were not yet in the machine room. The word ADDED on a RETRA job only means that the tape has been added to the list of tapes to be retrieved from the archives. The dispatcher fetches tapes from the archives at the following times:

Mon. - Thur.	9:00 and 14:00
Fri.	9:00 and 13:30

To be sure that your tapes have arrived in the machine room, you should not start your jobs using 'retraed' tapes much before 10:30 h or 15:30 h. Only if your RETRA job claims that a tape is PRESENT can you use it straight away.

Question: I am trying to copy a large partitioned data sets from tape to fast disk. My FAST Job failed with a system completion code B37. What can I do?

Answer: A system completion code B37 means that more space was needed for a data set, but was not available (generally the disk is full or the maximum number of extents have been used).

If the data set was migrated onto tape or copied to tape by one of the standard backup procedures, this error means that there is not enough space on the FAST disks to store the data set. The best solution is to try again early the next morning.

If the data set was copied to tape by any method other than those mentioned above, there is no information on the tape as to how large the data set is. The FAST program uses a default size for the disk data set when it cannot find size information on the tape, and if the data set is larger than this default size, a system code B37 will occur. The solution is to allocate a large enough data set prior to fasting (it must have the same DCB parameters as the data set to be fasted) and then use the PRE option of FAST (see `HELP FAST`).

Question: My job terminated abnormally after a data set I was writing had filled 5 cartridges and the job requested a sixth cartridge to continue writing. What can I do?

Answer: There is a default value for the number of volumes (cartridges or tapes) a tape data set can span. This value is 5. To request a larger number of volumes for a particular data set you must use the following parameter on your DD statement:

```
//        DD ...,VOL=(,,,N),...
```

where `N` is the required number of volumes and ... stand for other DD parameters.

NOTE: If possible you should avoid creating multi-volume data sets altogether (and then you will never need the solution shown above). The chance of your data set being lost due to a cartridge or tape error increases with each additional volume it uses. There is a DESYlib routine, SETEOT, which can help you detect the end of a cartridge or tape so that you can start a new data set on a new volume without stopping your program (please consult one of the yellow R1-INFO binders in the terminal pools for more information).

... *about Editing and Transfering Files*

Question: I was editing a new member and found that all the letters I added were changed to upper case when I pressed enter. How can I stop this from happening so that I can get lower case letters in this member?

Answer: All you need to do is give the command:

```
ASIS := 'MIX'
```

Question: I am using the EDIT editor for sequential files and every time I press ENTER, everything I have typed in is translated into capitals. How can I stop this?

Answer: There is a command CAPS in this editor which switches the translation to capital letters on and off:

`CAPS ON`	—->	All entered text is transposed to capital letters
`CAPS OFF`	—->	The text on the screen remains as entered

Question: What is the best way to copy my VAX files onto the IBM?

Answer: The best method is to use INTERLINK (see `$ HELP INTERLINK`) because the necessary commands are very similar to those you would use for copying files over DECnet. It is also possible to copy NEWLIB source files via INTERLINK (this is not possible using other methods) with the new COSY command (see `$ HELP COSY`). However, you must have accounts on both the VXDESY and the DESY IBM in order to use INTERLINK. The IBM userid must be defined under RACF (Resource Access Control Facility - a standard IBM security package) and you must have a proxy definition linking the two accounts. Please consult the RACF administrator of your group about RACF and proxy definition.

If you cannot or do not wish to meet the requirements for using INTERLINK, it is still possible to transfer files with the help of FTP (give the command `FTP` on the VAX and then `FTP> HELP`, or `HELP FTP` on the IBM).

Question: I have just transfered a file from a PC diskette to the IBM, and now I find that it contains unusual symbols which look like ':' but which can't be found with the FIND command. These symbols weren't in my PC file and I want to remove them. How can I do this without searching out each symbol "by hand?"

Answer: These apparent ':' symbols cannot be located with the FIND command because they are place holders for undisplayable characters and not real ':'s. Thus the first step in removing them is to find out their hex-codes. To do this, give the command

`LIST member HEX`

The member will now appear with the hex-codes written vertically below each character. Now give the commands

`SET P1:=X2C('hex-code')` and

`SET ESC:='%'`

It is now possible to remove or overwrite the symbols with the command

`CS %P1 ' ' ALL TOTAL`	——>	to overwrite with blank
`CS %P1 '' ALL TOTAL`	——>	to remove