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CSO
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CSO DIRECTORY

Departmental Office	150	DCL	333-1637
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Documentation Center	1208	W. Springfield	333-9230
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Text Processing Consulting	212	CSOB*	333-7318
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Tape Service, Special Plots, Special Printers.	14	DCL	333-8640

*CSOB is the CSO Office Building, located at 101 South Gregory, Urbana.

DIAL-UP NUMBERS

IBM 3081 GX (uiucvmd)	300	baud	333-4006
Cyber 175 (uiucnosa)	300	baud	333-4000
SWITCH	1200	baud	333-4008
	2400	baud	333-4007
TELENET (local no.)			384-6428

LOCALNET CALL NUMBERS

Note: Certain CSO Sites are on a separate channel of LocalNet than the rest of the campus. These are designated below as **A Sites** and include the following CSO Sites: ME, EE, COMM, LH, and AGRIC. All other LocalNet access areas are designated as **B Sites.**

VMD	CALL 4000	(line mode - A Sites)
	CALL 4100	(line mode - B Sites)
	CALL 4400	(full-screen mode - A Sites)
	CALL 4500	(full-screen mode - B Sites)
VME	CALL 4600	(A Sites)
	CALL 4700	(B Sites)
uxa (Pyramid 90x)	CALL 66AC	(A Sites)
	CALL 66AA	(B Sites)
uxe (Pyramid 90x)	CALL 66FA	(A Sites)
	CALL 12EE	(B Sites)
uxf (Sequent)	CALL 66C0	(A Sites)
	CALL 66BB	(B Sites)
uxg (Gould)	CALL 1000	(B Sites only)
uxh (Convex)	CALL 1850	(A Sites)
	CALL 1800	(B Sites
NOSA	CALL 1650	(A Sites)
	CALL 1750	(B Sites)
LCS	CALL 6400	
TELENET	CALL 1550	

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NEW MICRO SITE OPENS

On January 25, 1988, a new microcomputer satellite station opened at the Illini Union. It is located in the northwest corner of the basement, adjacent to the cafeteria. **This site is a direct result (funded by) of the Student Computer Fee assessment.** The site has the following equipment:

- 15 MAC SE's
- 8 IBM PS2/30
- 8 Zenith Eazy-PC
- 2 Laser printers for the MAC
- 1 HP LaserJet for DOS systems
- 2 ImageWriters
- 2 Proprinter II
- 1 IBM/AT for conversion of diskettes from 5 1/4 to 3 1/2

Forthcoming are some MAC II's and Sun Workstations.

The hours are: Monday-Saturday, 9:00 am - 12:00 midnight; Sunday, 12 noon - 12:00 midnight. All students are encouraged to use this new facility.

WORKSHOP ON HYPERCARD AVAILABLE

Bob Jones, Professor of Sociology, is offering an ongoing workshop on Hypercard, an implementation of Hypertext on the Macintosh. The workshop will be of interest to anyone investigating the capabilities of Hypercard or developing Hypercard stacks. The workshop meets every Tuesday from 11am - 1pm in Room 336 Lincoln Hall.

NEW UNIX MANUAL AVAILABLE

A new UNIX manual, written by the CONVEX Computer Corporation and called the *CONVEX UNIX Primer*, is now available for purchase at the CSO Documentation Center, 1208 W. Springfield, Urbana. The price of the manual is $10.00. (The CONVEX UNIX operating system is an enhancement of Berkeley UNIX 4.2, which, in turn, is an enhancement of the standard UNIX operating system developed by AT&T.)

Although the manual has been written for CONVEX UNIX (uxh), the majority of the contents are applicable on any of CSO's UNIX systems (e.g., the Pyramids -- uxe and uxa, the Sequent -- uxf, or the Gould -- uxg) The manual is tutorial in nature, explaining in relatively simple language how to login, logoff, redirect input and output, communicate with others on the system, manipulate

directories and files, etc. There are also chapters on the *vi* text editor and the C shell, and on how to get online help using the CONVEX Info system.

We believe that new UNIX users will find this a useful manual.

RATE STRUCTURE FOR THE CONVEX

The rate structure for the CONVEX system (uxh) is set up as a sliding scale which initially begins at $80.00 and slides over a period of one (1) hour to $40.00, where it remains constant for charges of over an hour. For those readers interested in the actual formula, the sliding scale is (6600-T)/6000 times the $80.00 rate for $600 < T < 3600$ (where T is seconds).

CONTINUING CHANGES TO OFF-LINE

In our effort to keep expanding *Off-Line* to meet the interests/needs of the user community, we have decided to include a Question/Answer section in future issues. We invite users to submit questions which require short, brief answers (for example: How do I find out how much disk space I have left on VMD?). Questions should be submitted to: Lynn Bilger, Editor, Off-Line, 150 Digital Computer Lab, Campus, MC-256.

We have also added a tear-out Feedback sheet at the end of this issue so that users may give us their opinions, suggestions, gripes, etc. about our newsletter. Please feel free to fill out this sheet and return to us at your convenience. It will also be included in future issues.

Once again, we would like to invite our users to submit articles that they feel would be of interest to our users.

SAS USERS GROUP MEETING

A SAS Users Group meeting will be held on the UIUC campus sometime this semester. An announcement will be made as to date, time, and location.

The SAS Users Group meets each fall and spring semester to give users an opportunity to share applications and experiences. All users are welcome to participate and there is no membership fee. Meetings consist of two presentations on CMS/SAS, PC/SAS or statistics. These meetings for SAS users provide a great opportunity to meet people with similar interests and talents, to generate new ideas and to stimulate excellence among SAS users.

If you have any questions, please contact Vicky Dingler, CSO SAS Coordinator, CMS userid DINGLER, Cyber user number DINGLER, phone number 333-4668. (A message can be left with the departmental secretary at 244-1257). Hope to see you at this meeting!

LOCALNET ADDRESSES FOR CSO COMPUTER SYSTEMS

The Sytek LocalNet network is a CSO-operated and maintained data communications network that resides on a broadband cable system. It is commonly referred to as LocalNet. It works much the same way as a telephone system in that you "call" the computer you wish to access. Following is a list of the call numbers for CSO computers. (Note: LocalNet is actually divided into two "channels" — a student channel and a public channel. LocalNet terminals at the ME, EE, COMM, LH and AGRIC sites are connected to the student channel; LocalNet terminals at all other sites are connected to the public channel. A different call number is required for each LocalNet channel,

as shown in the list below.)

Machine	Call Number(s)	
UNIX Systems		
uxe (Pyramid 90x)	CALL 66FA	(student channel: ME, EE, COMM, LH & AGRIC)
	CALL 12EE	(public channel)
uxg (Gould)	CALL 1000	(public channel - no student channel)
uxh (CONVEX)	CALL 1850	(student channel: ME, EE, COMM, LH & AGRIC)
	CALL 1800	(public channel)
uxa (Pyramid 90x)	CALL 66AC	(student channel: ME, EE, COMM, LH & AGRIC)
	CALL 66AA	(public channel)
uxf (Sequent)	CALL 66C0	(student channel: ME, EE, COMM, LH & AGRIC)
	CALL 66BB	(public channel)
IBM/CMS Systems		
VMD	CALL 4000	(line mode - student channel: ME, EE, COMM, LH & AGRIC)
	CALL 4100	(line mode - public channel)
	CALL 4400	(full-screen mode - student channel: ME, EE, COMM, LH & AGRIC)
	CALL 4500	(full-screen mode - public channel)
VME	CALL 4600	(student channel: ME, EE, COMM, LH & AGRIC)
	CALL 4700	(public channel)
UIUC Library System		
LCS	CALL 6400	(LCS is the UIUC Library Computer System at ACC)

2400-BAUD COMMUNICATION LINES AVAILABLE

Esther Edwards-Iwe

CSO has recently installed 2400-baud access through the Gandalf switch to access most of our computer systems. We currently have 16 ports connected to the 2400-baud lines. To access a 2400-baud line, you need the following:

- 2400-baud modem
- A terminal, OR an IBM/PC, OR any other personal computer with a serial line and terminal emulation software.

2400 access via 2400-baud modem:

In general, these modems are commercially available from various vendors. If you have a modem that can transmit data up to 2400 baud rate (i.e., 240 characters per minute), then to communicate with any of our systems, you need to set your terminal and modem to 2400 baud and then dial the number 333-4007 and enter any one of the following classes:

dvmdfs	to access IBM/CMS (VMD)
duxe	to access Pyramid 90x (UNIX machine - uxe)
duxg	to access Gould PN9080 (UNIX machine - uxg) (Note: 2400 baud on uxg is not working correctly at this time. You may use rlogin from another UNIX system to get 2400 baud on uxg).
duxh	to access CONVEX-C1 (UNIX machine - uxh)

Terminal access to 2400-baud line:

a) Set the modem and terminal to 2400 baud
b) Dial 333-4007 (On a Hayes modem or a Hayes-compatible modem, you would use the command: **atdt3334007.**
Other modems use different commands; e.g. atd333-4007.)
c) Your terminal will respond with CONNECT 2400
d) Hit the RETURN key twice
e) The message "enter class or help" will appear
f) Enter a class from the above selection
(for example: **dvmdfs**)

IBM/PC or any PC-compatible using KERMIT:

[Note: In all cases your PC will emulate VT100]

a) Set up your PC as usual (i.e. boot-up DOS)
b) Call up the KERMIT program (depending on your set-up) as shown below:

```
B:>kermit
Kermit-MS> set baud 2400
Kermit-MS> connect
```

c) Dial 333-4007 (or atdt3334007)

d) Follow the sequence below:

CONNECT 2400
Hit RETURN key a few times
The message "enter class or help" will appear
Select any class from above
Hit the RETURN key
(VMD users note: You will be requested to enter your terminal type: You must enter **VT100**)
Do not forget to use **CNTRL**] followed by C to disconnect from host.

Other Personal Computer such as Macintosh, Apple II, or Commodore Amiga:

a) Run terminal emulation program
b) Make sure settings are set for full duplex, 2400 baud, 8 data bits, mark parity
c) Set telephone number to 333-4007, if possible
d) Dial telephone
e) Hit return a few times
The message ''enter class or help'' will appear
Select any class from above
Hit the RETURN key
(VMD users note: you will be requested to enter your terminal type: You must enter **VT100.**)
Do not forget to use **CNTRL**] followed by **C** to disconnect from host.

Sometimes, all the ports connected to the 2400-baud lines may be fully in use. As a result, when you dial 333-4007, you may not be able to connect. In such cases, just hang up the phone and try again later. If you have any problem using this service, you may call the CSO Communication section at 333-0969 or call the Systems Consulting Office at 333-6133.

FILE TRANSFER FROM CYBER 175 TO OTHER COMPUTERS

Daniel Pommert

Since the decision was made to remove the CDC Cyber 175 (NOSA) from service at the end of December 1988, it has become more important than ever to be able to transfer files from the Cyber to other computers. Until recently, the only reasonable way to transfer files to other computers was either to write them to a magnetic tape or to download them to a floppy disk. The tape or floppy disk could then be read on another computer or uploaded to another computer. In many cases, these are still the best ways of transferring files from the Cyber to other computers.

A new, third way to send files to other computers was recently added to the Cyber. The **PUNCHC** command has been modified to implement the /DEST= and /NODE= options. With these two additional PUNCHC options, one can now specify a user's signon on a particular computer who is to receive the files. The file will be sent as mail to the specified user. This should allow people to mail their Cyber files to anywhere on campus, or even to other installations around the world.

In general, the PUNCHC command has the following form:

PUNCHC,your file/DEST=destination login/NODE=destination computer

If your file is upper and lower case text, you should include the **/ASCII** option. You can specify more than one file if you desire. All of the files specified on a given PUNCHC command will appear as one message to the recipient. All file names are preceded by commas.

Several restrictions do apply:

- Presently, the PUNCHC command can only transfer files that are text or printable data files which are at most 80 columns wide. (This restriction should soon be lifted.)
- Files should not be more than about 60K or 120 PRUs in size.
- The **destination login** and **destination computer** fields are both limited to a maximum of 20 characters in length. If they contain characters other than letters and numbers, they should be enclosed in dollar signs. For example, **/NODE=$uxh.cso.uiuc.edu$**

If you send the file to our IBM VM machines, the file will appear on the recipient's reader. When it is RECEIVEd, it should arrive as an exact copy of the file sent from the Cyber. If you send it to other computers, it will have the normal information that is at the beginning of a mail message placed at the beginning of your file. (You would expect this because your file is sent through normal mail channels.)

When you are sending files to CSO's machines, you may use abbreviated addresses for the machine names. The following table is a (partial) list of allowable, abbreviated names.

Machine	Abbreviated Address
IBM (UIUCVMC)	VMC
IBM (UIUCVMD)	VMD
IBM (UIUCVME)	VME
Pyramid 90x (uxe.cso.uiuc.edu)	uxe
Gould (uxg.cso.uiuc.edu)	uxg
CONVEX (uxh.cso.uiuc.edu)	uxh

PUNCHC was originally designed to send character files to the card punches to be punched. These card punches were taken out of service several years ago and since then, the PUNCHC command has done nothing useful. Since the PUNCHC command has been changed to accept the /DEST and /NODE options and CSO's computers have been made to accept files from the PUNCHC command, this old and obsolete command has been given a new and very useful function.

CYBER CONVERSION ALTERNATIVE SAS/OR LINEAR PROGRAMMING PROCEDURES

Vicky Dingler

There are several procedures in SAS/OR (Operations Research) that provide linear programming research/management science routines. SAS/OR is a sublibrary of the SAS System on VMD.

These include procedures that allow one to perform:

- linear, integer and mixed-integer programming/optimization
- assignment and transportation problems
- critical path analysis and project management
- Gantt charts to represent graphically the progress of activities in a project such as one that may be scheduled by the CPM method.

Also included is a macro called SASMPSX, which can be used to convert an LP problem that is in the "Convert" format (as specified in Chapter 4 of the *IBM MPSX Program Description Manual*) to a format expected by Proc LP in SAS/OR.

More information on SAS/OR is available in the *SAS/OR User's Guide, Version 5 Edition.* The manual is for sale at the CSO Distribution Office at 1208 W. Springfield, Urbana (333-7752). It is also available for perusal in the closed reserved section of the undergraduate library.

If you have any questions concerning SAS/OR, please direct them to the Statistical Consultants in 85 Commerce West, 333-2170.

HOW CYBER USERS PRINTING TO THE 3812 SHOULD USE THE DEST=XEROX OPTION

Ed DeWan

As most of our users know, the Xerox 2700 has been replaced by an IBM 3812, offering the same essential features, i.e., ELITE (12 pitch) and TITAN (10 pitch) fonts, superscripts, subscripts, and a portrait version of the old XCP LANDSCAPE font. The line drawing and other graphic features are no longer supported.

To send a job to the "XEROX" (3812), use the PRINT command with the standard options as needed (/ASCII, /EJECT, /CC, etc.), plus the following options:

/DEST=XEROX (required)

NOTE: Do not use /DEST=3812, since this will cause your job to be printed on the 3812 at Electrical Engineering, and the xerox features will not be emulated on that machine.

/FONT=ELITE or **/FONT=TITAN** or **/FONT=XCP** (optional)

ELITE is the default font (12 pitch) and corresponds to ELITE on the Diablos. TITAN (10 pitch) corresponds to PICA on the Diablos. XCP is a 14-pitch font that is now offered in portrait mode only.

/BAN=BANNER (highly recommended)

where **BANNER** is your choice of job name. Jobs are filed by bin number, but a banner can sometimes help in locating your output.

Following is a sample job sent to the "XEROX":

PRINT,MYDOC/ASCII/EJECT/CC/DEST=XEROX/FONT=TITAN/BAN=LINDA

In general you should not use the /RIGHT option on the PRINT command, since this will probably push your output off the page on the right, or cause it to be off center.

XEROX output must be picked up in Room 14 DCL.

XEROX output is now charged at the same rate as standard line printer jobs, and is charged to your computer account. There is no longer a hard money charge.

Notes for RNF users: Margins are automatically set so that RNF output will meet Thesis Office requirements when RNF defaults are used, and the ELITE font is selected. In other words, .LM 1 and .RM 72 are appropriate for the ELITE font, and .LM 1 and .RM 60 are appropriate for the TITAN font. DO NOT USE THE .RIGHT COMMAND.

CHANGES TO FILE STORAGE FACILITY (FSF) ON THE VMD SYSTEM

Scott LeBaron

The File Storage Facility has been online for over a year now. This facility enables a user to "rent" a disk for a period of time. Unlike a temporary disk, this rented disk does not disappear after you log off or in the event of system failure. It is yours to use until you return it or until its expiration date is reached.

In the past, there was a two-day limit on rentals, with a 10-cylinder disk being the largest size available for rent. Looking at our usage statistics of FSF, along with comments received from those that have used it, we have reconfigured FSF to allow for a longer rental period and larger disks.

The possible disk sizes you can rent are listed here. FSF requires you to specify disk size in kilobytes, so these are listed here also. (The default is 1 cylinder/600 Kilobytes.)

Cylinders	Kilobytes
1	600
5	3000
10	6000
20	12000
50	30000

The maximum time you can have a disk rented has been increased to one week (168 hours). The default will continue to be two days, with an increase over weekends. (If you rent a disk on Friday, and don't specify a time limit, the time will be 3 days, so that the disk expires on Monday, not Sunday).

To gain access to FSF, use

LINKTO FSF

To borrow a disk, use

FSF BORROW diskname disksize (TIME hours WITH co-owner

Disksize must be stated in kilobytes, time of rental in hours, the diskname must be no more than 32 characters, and there is no default co-owner.

After you borrow the disk, use

FSF USE diskname

to link and access that disk so that you have access to it.

If you wish to return the disk before its expiration time, use

FSF RETURN diskname

The disk is formatted on its return so this could take a few seconds to complete.

FSF Q

will give you information on your rented disk: when it expires, who is co-owner, how big the disk is, etc.

For further information on FSF, see **HELP CSO FSF**.

FTP ON THE VMD SYSTEM

Scott LeBaron

Have some files or data on our VMD system that you suddenly need to have on uxh instead? Need to know if a certain file exists on uxc while you're logged onto VMD? You're in luck. Using the FTP (File Transfer Protocol) software, you can transfer files back and forth between two machines, or get directories of one machine while logged into another. To gain access to FTP, first issue the command

LINKTO TCPIP

Help on all the FTP commands can then be obtained from VMD by typing **HELP FTP MENU**. All the FTP subcommands are listed and help can be obtained for each of these in the usual HELP file manner.

To get you started, here is a sample FTP session, showing how to transfer files between VMD and uxc. Examples of listing files you have on uxc while you are logged onto VMD is also shown.

A Sample FTP Session

User input is indicated by *** (three asterisks). These asterisks, of course, are NOT to be typed in when issuing the commands.

Output or results you would get at your terminal is shown following the user input section.

First, after issuing the command LINKTO TCPIP, open the FTP session to the proper remote location. In this case we are on the VMD system, FTPing to the uxc computer.

```
*** ftp uxc

VM TCP/IP FTP
Connecting to uxc 128.174.5.50, port 21
220 uxc.cso.uiuc.edu FTP server
(Version 4.114 Mon Aug 24 16:24:48 CDT 1987) ready.
USER (identify yourself to the host):
```

We must sign in, using a login name on the remote computer. FTP issues a USER command upon initialization, so you need to enter a user name and password before continuing.

```
*** lebaron

>>>USER lebaron
331 Password required for lebaron.
Password:
***

>>>PASS ********

230 User lebaron logged in.
Command:
```

The "Command:" is the FTP prompt. To get a list of files that reside on the remote directory, use the **DIR** command.

```
*** dir

>>>PORT 128,174,5,98,3,236
200 PORT command successful.
>>>LIST
150 Opening data connection for /bin/ls (128.174.5.98,1004) (0 bytes).
total 908
-rw-r--r--    1 lebaron    cso          250  Jul 31   15:24   .cshrc
-rw-------    1 lebaron    cso          177  Oct 2    12:03   .login
-rw-r--r--    1 lebaron    cso           64  May 2    1985    .logout
-rw-r--r--    1 lebaron    cso           11  Jun 15   1987    .mh_profile
-rw-r--r--    1 lebaron    cso            2  Apr 10   1987    .msgsrc
-rw-r--r--    1 lebaron    cso       900584  Oct 23   11:47   big.one
226 Transfer complete.
Command:
```

Use the **CD** command to change directories as you would under any tree-structured environment.

```
*** cd ..

>>>CWD ..
250 CWD command successful.
Command:
```

We issue the **DIR** command again to see the files in this new directory.

```
*** dir

>>>PORT 128,174,5,98,3,237
200 PORT command successful.
>>>LIST
150 Opening data connection for /bin/ls (128.174.5.98,1005) (0 bytes).
total 128
```

```
drwxr-xr-x   2 banks     cso          512  Dec 21  22:14   banks
drwxr-xr-x   4 bscheid   cso         1024  Dec 15  10:30   bscheid
drwxr-xr-x   6 root      cray        1024  Aug 8   16:12   cray
drwxr-xr-x   4 danno     cso          512  Nov 4   10:54   danno
drwxr-xr-x   3 esther    cso          512  Nov 11  01:01   esther
drwxrwx---   3 grady     cso          512  Nov 20  12:03   grady
drwxrwx---   2 henning   cso          512  May 1   1987    henning
drwxr-xr-x   2 lebaron   cso          512  Dec 21  14:54   lebaron
drwxr-xr-x   2 primer    staff        512  Nov 21  07:26   primer
drwxr-xr-x   4 scilla    cso         1024  Dec 9   11:33   scilla
drwxr-xr-x   3 torch     cso         1024  Dec 21  19:46   torch
226 Transfer complete.
Command:
```

And, again the **CD** command is used to get back to our working directory.

```
*** cd lebaron

>>>CWD lebaron
250 CWD command successful.
Command:
```

The **CMS** command is used to issue CMS commands within FTP.

```
*** cms m scott test
09:25:33

MSG FROM SCOTT    : TEST

Command:
```

To retrieve a file from the foreign or remote system and copy that file to our local system, use the **GET** command. The format is:

```
GET local.name remote.file
```

FTP tells you of its progress by signaling how many bytes have been transferred.

```
*** get local.name big.one

>>>PORT 128,174,5,98,3,238
200 PORT command successful.
>>>RETR big.one
150 Opening data connection for big.one (128.174.5.98,1006) (900584 bytes).
86012 bytes transferred.
143356 bytes transferred.
258044 bytes transferred.
446463 bytes transferred.
671744 bytes transferred.
880639 bytes transferred.
226 Transfer complete.
```

```
1045111 bytes transferred. Transfer rate 15.11 Kbytes/sec.
Command:
```

If we wanted to switch to BLOCK mode (as opposed to STREAM) we would issue the **MODE** command. BLOCK transfer mode can only be used in VM to VM transfers, however. (See the table on Data Transfer Methods below for more details.) A message telling you that BLOCK mode cannot be implemented for non-VM systems is issued if you try.

```
*** mode b

>>>MODE b
502 Unimplemented MODE type.
Command:
```

To copy a local file to the remote site, use the **PUT** command. If you don't specify a remote name, the local name is used. You may see an automatic generation of the **SITE** command when transferring. As you can see, it is not always implemented. This can be ignored as it is not an error and all will proceed as you wanted.

```
*** put profile.exec

>>>SITE VARrecfm
502 SITE command not implemented.
>>>PORT 128,174,5,98,3,239
200 PORT command successful.
>>>STOR profile.exec
150 Opening data connection for profile.exec (128.174.5.98,1007).
226 Transfer complete.

2265 bytes transferred. Transfer rate 2.74 Kbytes/sec.
Command:
```

If you **GET** a file from the remote system, the local file with that same name will NOT be replaced unless you specify that you want it replaced...

```
*** get profile.exec

File PROFILE EXEC A was not replaced
Local file already exists
To replace it, use GET with the (REPLACE option
Command:
```

...like so.

```
*** get profile.exec (replace

>>>PORT 128,174,5,98,3,244
200 PORT command successful.
>>>RETR profile.exec
150 Opening data connection for profile.exec (128.174.5.98,1012) (2190 bytes).
226 Transfer complete.
```

```
2265 bytes transferred. Transfer rate 7.38 Kbytes/sec.
Command:
```

To get a listing of filenames only, use the **LS** command instead of **DIR**

```
*** ls

>>>PORT 128,174,5,98,3,240
200 PORT command successful.
>>>NLST
150 Opening data connection for /bin/ls (128.174.5.98,1008) (0 bytes).
 .cshrc
 .login.
 .logout
 .mh_profile
 .msgsrc
 big.one
 profile.exec
226 Transfer complete.
Command:
```

Use the **STATUS** command to retrieve status information from the foreign host. Some machines do not support the STATUS command.

```
*** status

>>>STAT
502 STAT command not implemented.
Command:
```

For information locally, use the **LOCSTAT** command.

```
*** locstat

Trace:FALSE Send Port: TRUE
Connected to:uxc.cso.uiuc.edu, Port:FTP control (21), logged in
Local Port:1003
Format:a, Transfer mode:s
Command:
```

You can erase files from the foreign machine with the **DELETE** command.

```
*** delete profile.exec

>>>DELE profile.exec
250 DELE command successful.
Command:
```

Use **LS** file.name to check on a single file.

```
*** ls profile.exec

>>>PORT 128,174,5,98,3,246
200 PORT command successful.
>>>NLST profile.exec
150 Opening data connection for /bin/ls (128.174.5.98,1014) (0 bytes).
profile.exec not found
Command:
```

You can use the (**DISK** option to write a directory to a file. The name of this file will be FTP DIROUTP A.

```
*** dir (disk

>>>PORT 128,174,5,98,3,241
200 PORT command successful.
>>>LIST
150 Opening data connection for /bin/ls (128.174.5.98,1009) (0 bytes).
226 Transfer complete.
Command:
```

Exit with **QUIT**.

```
*** quit

>>>QUIT
221 Goodbye.
R; T=10.22/11.81 09:29:28
```

Here is the file where we directed the output of the **DIR** command.

```
*** type ftp diroutp a

total 911
-rw-r--r--    1 lebaron  cso          250  Jul 31  15:24  .cshrc
-rw-------    1 lebaron  cso          177  Oct 2   12:03  .login
-rw-r--r--    1 lebaron  cso           64  May 2   1985   .logout
-rw-r--r--    1 lebaron  cso           11  Jun 15  1987   .mh_profile
-rw-r--r--    1 lebaron  cso            2  Apr 10  1987   .msgsrc
-rw-r--r--    1 lebaron  cso       900584  Oct 23  11:47  big.one

R; T=0.01/0.02 09:29:41
```

And to verify that our **GET** command worked when we retrieved the foreign file BIG.ONE and placed it in LOCAL.NAME...

```
*** l local name (d

FILENAME   FILETYPE   FM  FORMAT   LRECL     RECS     BLOCKS     DATE       TIME
LOCAL      NAME       A1  V            6   144527     1021       12/22/87   9:27:07
R; T=0.01/0.01 09:37:54
```

That's a sample session. Using the help files on FTP, you can try various things, but you'll find **GET** and **PUT** are the two you will use the most to simply transfer files back and forth between systems.

Recommended Methods for Data Transfer

The MODE subcommand specifies how the bits of data are to be transmitted and the TYPE subcommand defines the way in which the data is to be represented. The VM TCP/IP program supports file transfer of a file structured only as a continuous sequence of data bytes. However, record format can be preserved across VM hosts.

Transfer Between Host Types	Datatype	Transfer Type, Mode
VM to VM	text	EBCDIC, Stream
VM to VM	binary	EBCDIC, Block
VM to ASCII	text	ASCII, Stream
ASCII to VM	text	ASCII, Stream
ASCII to VM to ASCII†	all data	Binary, Stream

†The VM host is used for storage only. Data is not used on the VM host.

The appropriate transmission attributes must be used to transfer files between two hosts in order to preserve the content and structure of the files. The above table suggests how these attributes should be set for different host systems. A text file contains standard, displayable characters only, specifically not including the end-of-record characters (EBCDIC '1E' and ASCII '0D'). A binary file may contain any characters.

SURVEY OF INTEREST IN SIMUSOLV PACKAGE FOR CMS

CSO has been approached by Dr. Gary Koritz, Department of Veterinary Biosciences, about the possibility of site licensing the SimuSolv[1] computer software package for the IBM CMS system. This article provides a brief description of the program (supplied by The Dow Chemical Company) to enable users to decide if the package would be of use in their work. If, after reading about SimuSolv, you feel that you would be interested in the program, please contact Ahmed Kassem, 185 DCL (333-7159).

The SimuSolv computer program is an integrated, multifunctional software package designed to help scientists and engineers develop and use mathematical models of physical systems. It allows them to **simulate** the behavior of systems, to **optimize** performance, and to **estimate** best values for model parameters. The program was developed within The Dow Chemical Company by professional modelers to increase their own productivity and to encourage researchers without extensive computer experience to avail themselves of the power of computer-aided modeling techniques. As a result, SimuSolv is very user-friendly. Its philosophy is to provide maximal efficiency in problem-solving with minimal involvement in computational procedures. To this end, SimuSolv

[1]Trademark of The Dow Chemical Company

employs the powerful, high-level Advanced Continuous Simulation Language ACSL.[2] The language enables persons with limited programming experience to develop complicated models consisting of algebraic and differential equations. Yet it allows skilled programmers full rein to develop special applications utilizing MACROs, FORTRAN subroutines and sophisticated programming techniques. In addition, SimuSolv supplies extensive graphics, optimization and simulation capabilities which are made easy to use by having almost intuitive basic commands along with defaults for most auxiliary commands. Versatility is maintained by providing almost complete control of these capabilities when it is required.

SimuSolv has been used extensively during its evolution to solve modeling problems in such diverse fields as process engineering, toxicology, pharmacology, chemical kinetics, environmental sciences, and agriculture. This practical experience has provided a wealth of expertise in the use of the package as well as in modeling techniques themselves. This expertise may be tapped by users of SimuSolv through the hot-line support provided.

[2]Registered Trademark of Mitchell and Gauthier Associates, Inc.

CONVEX-C1 UNIX VERSION 6.1 INSTALLED

Esther Edwards-Iwe

The CONVEX-C1 UNIX operating system has been upgraded to version 6.1. This version contains many new features, plus bug fixes to the kernel. Some of the new features of interest to you are:

- New Object Code Format

  a.out is the name of the output file from the assembler (**as**) and the link editor (**ld**) under the UNIX operating system. The loader makes an **a.out** executable file after compilation of a program if there were no errors and no unresolved external references. Under CONVEX UNIX version 6.1, a new executable format is introduced. The Standard Object Format File (SOFF) replaces and obsoletes the previous format. However, CONVEX UNIX 6.1 is upward compatible with your existing executable files. This means your existing working executable files will continue to work. Note that the loader and assembler will no longer generate the old object code format in your **a.out** files.

  Any applications that read an object file developed under release 6.0 may need to be rewritten because the utilities no longer generate that format. Also, any applications that use **nlist** may have to be relinked. For more information, see the man pages for a.out.

- Added Support for IEEE floating point format

  Another feature of CONVEX UNIX 6.1 that might be of interest to you is the addition of the IEEE floating point arithmetic support. This feature is available to your programs when compiled with either Fortran 4.0, or 2.0 Vector C compilers. Of course, it is also available to the assembler, loader and runtime libraries (see the article on Fortran 4.0).

- CONVEX Networking Utilities Enhancements

  CONVEX UNIX V6.1 contains many bug fixes to the networking utilities as well as performance enhancements to the software. Many 4.3BSD networking changes have been incorporated into CONVEX UNIX and its utilities. General networking and interprocess communication bug fixes, performance improvements and extensions have been made.

  Support has been added for InterNet subnetting which allows you to use a single network number for multiple local area networks. The routing algorithm has been greatly improved to increase the efficiency of its performance. For example, data communication between machines (CONVEX and others) will now employ the first route found algorithm rather than the route with the lowest use count. Also, routes are initialized at the protocol layer rather than the link layer.

  A cached route is maintained in each protocol control block for TCP, IP, and UDP sockets. This improves the performance of networking output by avoiding route look-ups if the destination route has not changed since the last packet was output.

  Many bug fixes were made to the CONVEX UNIX V6.1 kernel to enhance the performance of the networking utilities. Network System Programmers are particularly urged to consult the on-line document in **/usr/doc** for detailed information, or contact the CSO Systems Consultants for help.

- NFS (Network File System) upgraded from Sun UNIX V3.2

  New NFS support for yellow pages was added to the new CONVEX UNIX V6.1 kernel. The 3.4 release of Sun Microsystems operating system has a bug in it which prohibits the transfer of large files from across the Ethernet between a Sun and CONVEX-C1 machines. This has been fixed, and users may now transfer large files between these machines.

- Support for up to 128 disk drives

  Getting enough disk space allocation for our files has been a major concern of most of our users. With the increased capability of on-line disk hookup, we can now add more disk space to the CONVEX-C1 if needed. At the time of this writing, we have not had any reason to increase the amount of on-line disk storage on the CONVEX-C1.

- Named Pipes

  A System V compatible implementation of named pipes (also known as FIFO files) has been added to CONVEX UNIX V6.1.

If you have any questions as to how these updates might affect your work, please call the Systems Consulting office at 333-6133.

CONVEX FORTRAN COMPILER V4.0 INSTALLED

Esther Edwards-Iwe

CSO has installed a new CONVEX Fortran V4.0 on the CONVEX-C1 machine. CONVEX Fortran V4.0 contains many new and enhanced features that greatly improve the execution time of your Fortran programs. Users using the vectorized feature of the CONVEX Fortran can take advantage of many new and improved optimization techniques available under this release for their programs (see the online document **/usr/doc** for details). CONVEX Fortran V4.0 reduces compile time for many programs by providing faster optimization, direct generation of object files, reduced space requirements, segmentation to mention just a few. Some of its new and improved features are :

- **Cray Fortran Features**

  To facilitate porting code written for the Cray compiler (cft), V4.0 provides the **-cft** compile-time option. When **-cft** option is used, the Cray language definition is used in place of the DEC language definition. The **-cft** option activates Cray functionality and changes the following aspects of the compiler behavior:

  The default integer type is INTEGER*8, rather than INTEGER*4

  The default real type is REAL*8, rather than REAL*4.

  Constants written in exponential form with an E format (e.g. 3.21E25) are stored in REAL*8 format. Constants written in exponential form with a D are invalid at this time.

  Intrinsics that work with the default integer and real types (currently 4 bytes quantities) will work with the Cray default types (8 bytes quantities) Intrinsics that work

with DOUBLE PRECISION values are invalid.

The compiler vectorizes loops whose iteration variable is declared INTEGER, or INTEGER*8.

- **IEEE Arithmetic**

The CONVEX-C1 hardware and the CONVEX UNIX V6.1 operating system support IEEE floating point format numbers. CONVEX Fortran V4.0 makes this support available to the Fortran Programmer. This mode has been configured as the default floating-point representation for the CONVEX. An alternative format (called "native-mode" arithmetic) can be used by including the **-fn** option when compiling programs. (The -fi option forces IEEE mode arithmetic regardless of the system default.) A third mode, **-fx**, is available if no floating-point constants are present. The compiler generates the correct floating-point assembler directives, and links with the correct libraries automatically, based on these options.

There are also run time routines available under V4.0 to convert between two floating-point formats. IRCVTR and IDCVTD convert from IEEE format to the default format in single and double precisions respectively.

RCVTIR and DCVTID routines convert from the default format to IEEE format in single and double precisions.

- Storage of Constants

Usually, the CONVEX Fortran language definition causes constants to be stored in the smallest possible space (2 bytes). This makes porting CONVEX Fortran code to other machines difficult. However, Fortran V4.0 allows integer constant to be stored in the default integer size (4 bytes). Users with Fortran programs written for the VAX may want to compile them with **-i2** option (**-i2** option allows you to store integer constants in 2 bytes) to make them work on the CONVEX.

- Multiple Common Block Initialization

The CONVEX Fortran compiler V4.0 allows you to initialize part of one COMMON block in one program unit and the other parts in other program units. For example:

```
PROGRAM MAIN
...
COMMON /XYZ/A(10), B(20)
...
CALL ABC
...
END

SUBROUTINE ABC
COMMON /XYZ/C(20), D(10)
...
RETURN
END
```

- Dynamic File Assignment

  Every unit in CONVEX Fortran is associated, by default, with a logical name of the form **FORnnn**, where **nnn** is the unit number. This logical name is used to create a default UNIX file name in the form **fort.n** to which the unit is preconnected.

  When a unit is opened, the logical name associated with the unit is compared to the UNIX environment variables. The logical name can be specified in the FILE= clause of an open statement, or can be the default logical name, the value assigned to that variable is substituted for the logical name, and the comparison process is repeated. If there is no environment variable with that name, the default value is taken as a file name in the current working directory. If the name contains slashes, it is taken as a path name.

  There are three special logical names you should be aware of:

  SYS$INPUT --- stdin --- (Standard Input)
  SYS$OUTPUT --- stdout --- (Standard Output)
  SYS$ERROR --- stderr --- (Standard output for error messages)

- Inline Substitution of Subroutines

  Inline substitution replaces a subroutine or function call with the actual body of the subprogram. During the substitution, actual arguments are mapped to dummy arguments and local variables are assigned unique names.

  Inlining can significantly improve the performance of your program. The inlined code can be optimized in ways not possible previously. For example, inlined code can be customized for a particular call based on the actual arguments passed in the call. In addition, portions of the inlined code might become "dead" code or the vectorization of loops might be enhanced. The overhead of the call linkage code is eliminated.

  To use the inlining feature, you must first compile the subroutines or functions to be inlined with the **-il** option. This creates a library of intermediate language representations for each subroutine in the source file. To perform the actual inlining substitution, you must compile the routine in which inlining is to be performed with the **-is** option. This option specifies the path name(s) of the intermediate language files that the compiler can use. If the compiler finds a call of one of these pre-processed routines, and if the call is valid, inline substitution takes place.

For more information on how to use the fc compiler see the on-line manual pages (fc).

EVERYTHING YOU EVER WANTED TO KNOW ABOUT LOTUS 1-2-3 (ALMOST)

Steven M. Miller

This article is Part I of a three-part series devoted to Lotus 1-2-3. The second and third parts will cover Graphics and Macros, respectively, and will be published in future editions of *Off-Line*. Also, this article and its companions will serve as reference material for the CSO Short Course titled **M53: Intermediate Spreadsheet.** You may copy this work in its entirety for whatever use you see fit. Lotus 1-2-3 is copyrighted by Lotus Development Corporation. All references to Lotus 1-2-3 in this article refer to Version 2.01. All commands are given in abbreviated form; i.e., /Worksheet,Global,Format,Fixed is represented as /WGFF. A question mark is used to represent a place where the user inputs some variable number, column, or row. For example, to set a column width to some variable number of spaces would be shown as /WCS?.

I. Databases

What is a database? Very simply a database is a collection of information arranged in a specific order which, in turn, is dependent on some of this information. The classic example of a database we each use is a telephone book. Databases have two parts: records and fields. A field is a data element within a record. For example, using the phone book, one record consists of four fields -- last name, first name, address and telephone number. Each entry in the phone book is a different record in the database. Therefore our database, the phone book, contains thousands of records, each containing four fields.

Records in Lotus 1-2-3 are represented by separate rows in the spreadsheet. Fields are represented by different columns. This makes it very simple to add or delete records and fields from our database using Lotus 1-2-3 (**/WIC, /WIR, /WDC,** and **/WDR**). Also, it is very easy to change the width of a field, the format of a field (percent, currency, etc.), the justification of the field, and whether or not other people using the database can see a field (**/WCS?, /RF?, /RL?, /RFH**). With this amount of flexibility, no one really needs a custom database package!

How do we create a database? Simple! Enter your field names in a row and then enter the appropriate data in the column under each field name. Instant database. Remember not to leave any blank lines between records.

For example:

	A	B	C	D	E	F
1	Rec. No.	Last	First	Phone	Grade	Average
2	1	Miller	Steven	244-0730	A	97
3	2	Student	Joe	123-4567	C	72

Aside from the manipulation of records and fields with standard Lotus 1-2-3 row and column operations, Lotus 1-2-3 provides us with a set of commands intended to deal specifically with databases. These commands are located in the submenu called DATA (/D). Although there are eight commands in this submenu, only three (Fill, Sort, and Query) are relevant to database manipulation.

The **Fill** command (/DF?) allows you to have Lotus 1-2-3 fill a specific range in a spreadsheet with numbers. This range can be a single column, or several columns and rows. Since Lotus 1-2-3 rearranges the order of the records in your database every time a Sort or a Query is done, the Fill command allows you to return the database to a given order after several such operations have been done. Also, the Fill command allows you to enter a very large amount of incremental data in a very short time.

The **Sort** command (/DS?) allows the sorting or arrangement of a database into different order, depending on selected criterion. The entire database, *excluding field names*, must be selected as the Data-Range (/DSD?). The **Primary-Key** option (/DSP?) specifies which field Lotus 1-2-3 will use for arranging the database. The **Secondary-Key** option (/DSS?) tell Lotus 1-2-3 which field Lotus 1-2-3 will use to break ties which occur in the Primary-Key field. For example the Primary-Key in the phone book is Last Name and the Secondary-Key is First Name. However, if both the Primary and Secondary keys are identical, it is not possible to say what order the records will be sorted into. The **Reset** option (/DSR) tells Lotus-1-2-3 to forget all settings that were previously set up in this submenu. The **Go** option (DSG) tells Lotus 1-2-3 to perform the sort that has been set up. The **Quit** option (DSQ) returns to the spreadsheet.

The last database manipulation tool provided in Lotus 1-2-3 is the **Query** command (/DQ?). This command allows the copying of selected records or fields from a database to another section of the spreadsheet. The **Input** range (/DQI) is the entire database, *including field names.* The **Criterion** range (DQC) is a separate range in the spreadsheet telling Lotus 1-2-3 which fields and what values in those fields are compared to the input range. Within this Criterion range, items that appear on the same row are connected with an AND and items on separate rows are connected with an OR.

For example: If the following is the Criterion range,

Last	First	Phone
Miller	Steven	
Student		123-4567
~A*		
~Z??		

Lotus 1-2-3 will match all records in the database where the Last field contains Miller AND the First field contains Steven OR the Last field contains Student AND the Phone field contains 123-4567 OR the Last field does NOT contain a name beginning in A OR the Last field does NOT contain a name beginning with Z that is three characters long.

In English this means that Lotus 1-2-3 will find all entries in the database that have a last name beginning with the characters B through Z. This is because the ~A* criterion will match all of these records. The * character matches any number of characters up to the field length and the ? character matches a single character in the position the ? occurs. The ~ (tilde) character represents negation (NOT).

The **Output** range (/DQO) is an area in the spreadsheet to which Lotus 1-2-3 copies records for the **Extract** and **Unique** commands. This range should be in a large open area. *Lotus 1-2-3 will overwrite any data which is below the output range when the Extract or Unique commands are executed.* The first line in the Output range must include the field names Lotus 1-2-3 is to display from the records that meet the Criterion range. Even though a database may have hundreds of fields, the Output range can contain any number of fields -- from one up to the entire number of fields in each record of the database. This allows complete control over what information is displayed from the

database. After these three commands (Input, Output and Criterion ranges) are set, Lotus 1-2-3 is ready to copy data from a database to the Output range.

The **Extract** and **Unique** commands (**/DQE** and **/DQU**) copy records from the database into the output range. The Extract command copies all records that match the criterion into the output range. This can result in the same record being copied into the output range several times. For example, if a database contained customer purchase information and the criterion was customer name, Lotus 1-2-3 would copy every record that matched the criterion to the output range even though the same customer name may appear hundreds of times. The Unique command makes sure no duplication occurs. So, in our customer information example, Lotus 1-2-3 would copy each name only one to the output range.

The **Find** command (**DQF**) allows scanning of the database based on the criterion range. Lotus 1-2-3 will go to the first record in the database that satisfies the criterion and highlight it. By using the down arrow key, Lotus 1-2-3 will highlight the next record that meets the criterion. The Find command does not need an output range specified. This is the fastest way to find specific records in the database.

The **Delete** command (**/DQD**) deletes all records matching the criterion range from the database. This command will prompt with Cancel or Delete options before performing the operation. Cancel will cancel the delete operation and delete will delete records. Always be extremely careful when deleting records from databases. One criterion can match several hundred records. This means that reentry of several hundred records could be necessary after a hasty delete operation.

The **Reset** command (**DQR**) causes Lotus 1-2-3 to forget all information it has remembered regarding the Query submenu. The last Query command executed is remembered by Lotus 1-2-3 and can be repeated directly from the spreadsheet by using the QUERY key. On A PC/AT this is the F7 key.

The **Quit** command (**/DQQ**) returns Lotus 1-2-3 to the spreadsheet level.

This concludes the information on manipulating databases from within Lotus 1-2-3. There are several database situations that Lotus 1-2-3 can handle. However, when relational operations are necessary, Lotus 1-2-3 will not be able to handle the database. Make sure you properly evaluate your needs before deciding on a database package.

II. Miscellaneous Data Commands

The **Data Table** commands (**DT1** and **/DT2**) allow fast calculation of formulas based on several different inputs. The **Data Table 1** command allows calculation of one or more formulas based on the change in a single variable in those formulas.

For example:

	A	B	C	D	E	F
1						
2			10*A2	20*A2	30*A2	40*A2
3		0.5	5	10	15	20
4		0.6	6	12	18	24
5		0.7	7	14	21	28
6		0.8	8	16	24	32
7		0.9	9	18	27	36

The formulas we want calculated are entered in C2-F2. Notice the reference to the blank cell A2. A2 is the input cell which will have values from column B substituted into it. The table range for this example would be B2-F7. Lotus 1-2-3 will fill in values for the cells C3-F7 based on the input value and the formula that intersect at the given output cell, as shown.

The **Data Table 2** command allows calculation of a single formula which has two variables. The setup for Data Table 2 is similar to Data Table 1 except that the formula to be calculated is placed in the upper left cell of the table range, there are two input cells, and the values to be substituted into the input cells are arranged across the top and along the left side of the table range.

For example:

	A	B	C	D	E	F
1						
2		A2*A4	10	20	30	40
3		0.5	5	10	15	20
4		0.6	6	12	18	24
5		0.7	7	14	21	28
6		0.8	8	16	24	32
7		0.9	9	18	27	36

The table range is B2-F7. Input cell 1 is A2 and input cell 2 is A4. The values for input cell 1 are arranged down the left side of the table range and the values for input cell 2 are arranged across the top of the input range.

The **Table Reset** (/DTR) causes Lotus 1-2-3 to forget the settings for the previous table calculation. The previous table can be recalculated from the spreadsheet by pressing the TABLE key. On a PC/AT this is the F8 key.

Both table 1 and table 2 can be used with database statistical functions by placing field names above the respective input cells. This is best left for a discussion of statistical functions and will not be discussed further in this article.

The **Distribution** command (**DD**) simply tabulates the number of occurrences in a value range which are less than or equal to a value in a bin range. If you had a spreadsheet of grades for a class and wanted to know the number of students in each ten-point interval, this command will give you that information.

For example:

	A	B	C	D	E	F
1	Steven	97		50	2	
2	Joe	76		60	0	
3	Janet	100		70	0	
4	Sheila	79		80	2	
5	Harry	43		90	0	
6	Dena	40		100	2	
7					0	

The values range is B1-B6 and the bin range is D1-D7. The frequency values are output in the column next to the bin range. Notice that there is one more frequency value than bin value. This is to account for values which are greater than the highest bin value. NOTE: The data fill command is very useful in creating a bin range of equal intervals.

The **Matrix** command (**/DM?**) is used to invert or multiply matrices. Remember, you can only invert square matrices and, when multiplying matrices, there must be the same number of columns in the first matrix as there are rows in the second matrix. The largest matrix for either operation is 90 X 90.

The **Parse** command (**DP?**) is used to convert an ASCII text file which has been imported as a column of long labels into several columns of labels or numbers. (This command is not covered in this course, but I felt it should be briefly mentioned.)

The last command is the **Regression** command. This command, like the database statistical functions, is best left for a course designed for statistical analysis. This command will not be discussed in this article.

This covers all of the commands in the Data submenu of Lotus 1-2-3. From the examples shown above, it is obvious that many database applications can be handled by Lotus 1-2-3. Relational databases and multiple database operations can be done in Lotus 1-2-3, but are *much* better suited to database packages.

If you have comments or questions regarding this article or Lotus 1-2-3 feel free to call me (Steven Miller) at 244-0730.

SAS PC UPDATE INFORMATION

Vicky Dingler

Due to legal issues with SAS Institute, the SAS PC license agreement needs revision. The SAS PC family of software can only be used in the United States and Canada. Item 4 on the license agreement has been revised to include this stipulation. A modified license has been sent to all licensed SAS PC users to be signed and returned to the following address. If you licensed the software with the intention of using it outside the United States and Canada, you are entitled to a refund. Please make arrangements with Vicky Dingler, at the following address.

Special arrangements can be made for those taking sabbatical leave who intend to use SAS PC while on sabbatical. Please contact Vicky Dingler at least one month in advance of your planned departure.

Vicky Dingler
150 DCL
1304 W. Springfield
Urbana, IL 61801
217/333-4668

Changes and Enhancements to SAS PC

The new version of SAS PC, version 6.03, will be available soon. Procedures for acquiring the new version will be announced when the products are available. There are several changes to the old version (6.02) that are documented in two manuals: *Technical Report: P-171 Changes and Enhancements to Base SAS Software for Personal Computers, Release 6.03*, and *Technical Report: P-172 Changes and Enhancements to SAS/IML Software for Personal Computers, Release 6.03*. Additions to the STAT version are documented in the *SAS/STAT Guide for Personal Computers, Version 6 Edition.*

Three new products for the PC will be available with version 6.03. They are SAS/GRAPH, SAS/AF and SAS/FSP. If there is enough interest in any or all of these products, they will be made available for licensing at the University of Illinois. Please fill out the form in the back of this issue to indicate your interest.

SAS/GRAPH for the PC includes all of the mainframe procedures for producing hard copy color graphics. The complete product will take 8 megabytes of hard disk storage because of the device drivers and map data sets. However, SAS provides a .BAT file to allow selective installation. The product is documented in the *SAS/GRAPH Guide for Personal Computers, Version 6 Edition.*

SAS/FSEDIT enables you to design entire screens for interactive data entry or display. For example, a researcher might design a screen as a facsimile of a lab report form and have lab assistants enter the data directly into a SAS data set for subsequent analysis. The screen can be designed in such a way as to have SAS check for the appropriateness of the data entered in the fields. This can help expedite or even eliminate the steps of raw data coding and data cleaning in data processing. SAS/FSLETTER also enables you to store business and form letters in SAS data sets for processing with SAS data sets containing names and addresses from mailing lists. The product is documented in the *SAS/FSP Guide for Personal Computers, Version 6 Edition.* SAS/FSCALC, the spreadsheet facility will not be available until version 6.04.

SAS/AF is a full screen tool used to develop menu-driven applications and fill-in-the-blank screens. Applications programmers can write functional front-ends for inexperienced users. The product is documented in the *SAS/AF Guide for Personal Computers, Version 6 Edition.*

All of these manuals are in the Closed Reserve Section of the Undergraduate Library for review.

A LOOK INSIDE YOUR PC MONITOR

Gary Faulkner
CSO Microcomputer Consultant

A PC monitor, regardless of the graphics board to which it is connected, is typically a standard CRT (cathode ray tube) design, very similar to the same technology found in modern television sets. The inside of a monitor consists of an electron gun which emits a beam of high-speed electrons that pass through focusing and deflection systems which, in turn, direct the beam toward specified points on a phosphor coated screen. The phosphor then emits a small spot of light at each point contacted by the electron beam. Each of these phosphor elements is referred to as a "pixel," which is actually a contraction of the phrase "pictures element." Since the light emitted by the phosphor fades very rapidly, some method is needed for maintaining the screen picture. One way to keep the phosphor glowing is to redraw the picture repeatedly by quickly directing the electron beam back over the same points. This type of display is called a refresh CRT.

A screen typically needs to be refreshed at least 25 to 30 times a second to eliminate annoying screen flicker. A method used by some CRT manufacturers to increase the apparent refresh rate without increasing the actual speed of the electronic components is called "interlacing." In a 30-frames-per-second interlaced system, for example, every other line on the phosphor screen is refreshed on the first pass in 1/60 second. On the second pass, the electron gun refreshes the other half of the phosphor screen in the same 1/60 second time frame. This method of screen refresh put the overall refresh rate closer to 60 frames per second.

At the heart of a monitor is the electron gun. The gun's basic components in a CRT are the heated metal cathode and a control grid. Heat is supplied to the cathode by directing a current through a coil of wire, called the filament, inside the cylindrical cathode structure. This causes electrons to be "boiled off" the hot cathode surface. In the vacuum inside the CRT envelope, the free, negatively charges electrons are then accelerated toward the phosphor coating by a high positive voltage. This is supplied by the cathode's structural opposite -- the anode.

Intensity of the electron beam is controlled by setting voltage levels on the control grid, which is a metal cylinder that fits over the cathode. A high negative voltage applied to the control grid will shut off the beam by repelling the negatively charged electrons and stopping them from passing through the small hole at the end of the control grid structure. A smaller negative voltage on the control grid simple decreases the number of electrons passing through. Since the amount of light emitted by the phosphor coating depends on the number of electrons striking the screen, we control the brightness of a display by varying the voltage on the control grid. A control knob is available on video monitors to set the brightness for the entire screen.

The focusing system in a CRT is needed to force the electron beam to converge into a small spot as it strikes the phosphor. Otherwise, the electrons would repel each other, and the beam would spread out as it approaches the screen. This compression of the electron beam is accomplished by directing the beam through a small metal cylinder with a positive charge.

CRT monitors pass an electron beam horizontally over each line of the screen, controlling the intensity of the electron beam so that the phosphor elements that are lighted correspond to the image displayed on the screen. The monitor knows when to turn the electron beam on and off, or to vary the intensity of the electron beam at any one pixel, by reading a series of bits stored in the memory buffer of the display adapter inside the PC. The display buffer contains a bit pattern of the image that is to be displayed on the screen. The speed at which the adapter can read the display buffer and translate its contents to the screen display is referred to as the "scan rate" of the video adapter.

With a higher scan rate, the adapter has time to read more bits from the display buffer, thus controlling more pixels at a time to produce a screen image with higher resolution.

Your monitor's resolution is measured by the number of pixels that stretch across a single line on the screen multiplied by the total number of lines on the screen. For example, if your PC monitor is said to have a resolution of 640 X 480, this means that each horizontal line on your monitor is made up of 640 pixels, and that the entire screen area is composed of 480 horizontal lines. The more pixels in a monitor's display area, the higher the resolution and the better quality image you will see. However, since the physical dimensions of PC monitors can vary, a more accurate measurement of screen resolution is the "dot pitch," the distance in millimeters between the center of two adjacent pixels. Screen displays with a small dot pitch will produce sharper screen images.

When looking at the differences between color and monochrome monitors, color monitors have a few more design considerations because of the complexity of color output. A monochrome monitor has only one electron gun which focuses its beam at every pixel location of the phosphor screen. Since each pixel on a monochrome screen is composed of the same type of phosphor, only one color appears on the screen. It is possible to enhance the appearance of a one-color monitor by varying the intensity of the electron beam over different parts of the screen, thus creating different shades of the same color.

Color monitors are structurally more complex. Instead of one electron gun, three electron guns are used -- a red gun, a blue gun, and a green gun. Each electron gun is directed toward a different portion of the screen. The color CRT phosphor screen is composed of pixels situated in tiny rectangular patterns. Each pixel in each triangle is composed of a different type of phosphor. One phosphor dot emits a red light, another emits a green light, and the third emits a blue light. The phosphor dots in the triangles are arranged so that each electron beam from the appropriate color gun can activate only its corresponding color dot. By varying the intensities of the different color guns at each triangular pixel pattern, the red, green, and blue light created by each pixel can be properly combined to produce a wide range of colors. Compared to monochrome adapters, color adapters use up more display buffer memory because not only are screen characters or pixels entered in the display buffer, but now the screen's color information is also maintained there.

Even though this has been a short and simplified look at the basic workings of a PC monitor, we hope this article has given you a better insight into how the most important interface between you and your computer works.

WISC-WARE COLLECTION AVAILABLE IN THE MRC

Bi-Shen Chuang
Microcomputer Resource Center

The Microcomputer Resource Center's software collections are constantly expanding to include products varied in both nature and application. The MRC staff would especially like to bring to the attention of all users our Wisc-Ware academic software collection that consists of fifty-four demonstration copies of software programs and documentation in a variety of fields, including engineering, humanities, medicine and business.

What is Wisc-Ware?

Wisc-Ware is a software distribution network, based at the University of Wisconsin, designed to aid university faculty authors in developing and distributing courseware funded by IBM. So far, through IBM's Advanced Educational Project (AEP) which has the purpose of improving instructional and research software, there have been about 3000 projects undertaken for the development of original software. Our university is one of the members in the Wisc-Ware consortium through project EXCEL.

The **primary goals** of Wisc-Ware are (1) to provide a convenient mechanism that allows faculty members to locate software appropriate for their teaching and research activities; and (2) to assist university authors in distributing software they have developed to faculty members and other researchers nationally.

Wisc-Ware provides the **advantages** of bringing newly-developed software packages to the public as soon as practical so that users can take advantage of these new creations without any unnecessary delay. Secondly, the network allows early classroom use of the software by faculty and students nation-wide, thus critical feedback can be given to the original author to make further improvement. Thirdly, with the policy of non-exclusive license, faculty's intellectual rights are protected. Their rights to license or sell their courseware packages through any other channel later on are not jeopardized. This feature serves to provide incentive to developers to publish their programs at the earliest possible time.

Demonstration centers are set up in the participating institutions to allow evaluation of the packages. The University of Illinois has two demonstration centers. One is the Center for Instructional Microcomputing, 307 Engineering Hall. The other is the Microcomputer Resource Center located at 101 S. Gregory St. in Urbana. At the Microcomputer Resource Center, demonstration copies of all the Wisc-Ware software and documentation published to date are available. Users can browse through the latest catalog or the Wisc-Ware database installed on an IBM PC-AT to view and search for information about the academic software. All the Wisc-Ware programs run on the IBM microcomputers. The following is a list of the Wisc-Ware titles and a brief description of each package.

INSTRUCTIONAL PROGRAMS

(* License Status: Public Domain)

In the following list (divided alphabetically into academic fields), the number and name of the package appear in bold face type, followed by the author/university and a brief description of the package.

ARCHAEOLOGY

52. Fugawiland T. D. Price and M. J. Kolb, Anthropology, University of Wisconsin-Madison. Employs extensive graphics to teach users the problems, data, and perspectives of archaeology. It involves the selection and excavation of an archaeological site with a follow-up testing module.

BIOLOGY

55. MEKA/MEKAEDIT T. Duncan and C. A. Meacham, University Herbarium, University of California-Berkeley. MEKA is an interactive Multiple-Entry Key Algorithm that allows identification of an unknown specimen or the characterization of a group of taxa. MEKAEDIT is an editor that allows users to create their own keys for access by MEKA.

BUSINESS

16. Advertising Planner K. M. Lancaster and H. Katz, Advertising, University of Illinois. Provides documentation and easy accessibility of state-of-the-art advertising media planning theories, concepts, and procedures.

24. SOLON Y. J. Stephanedes, Civil Engineering, University of Minnesota. A menu-driven program for transit managers to plan and to improve service efficiency and productivity of an existing or new transport operation.

ELECTRONICS

34. SPEKL A. Scheeline, et al., Chemistry, University of Illinois. A function key driven program coded in Turbo Pascal to teach modern electronics users several aspects of data acquisition and processing, e.g., data acquisition via a triggered digitization system.

FORESTRY

15. UNEVEN J. Buongiorno and R. D. Boothby, Forestry, University of Wisconsin-Madison. Answers some perennial questions about the management of uneven-aged forests. For example, UNEVEN helps predict how a particular uneven-aged stand will develop under various assumptions regarding how and when the stand is cut.

LOGIC DESIGN

54. CAFE-Connection Arrays D. L. Dietmeyer, Electrical and Computer Engineering, University of Wisconsin-Madison. Consists of (1) an editor for preparing sets of Boolean equations and processing control statements and (2) a processing program for converting equations to truth tables, connection arrays, or sets of equations.

53. LNS - Logic Network Systems D. L. Dietmeyer, Electrical and Computer Engineering, University of Wisconsin-Madison. Includes (1) an editor for preparing descriptions of logic networks and viewing simulation results and (2) an event-driven simulator of networks of logic blocks (AND, OR, NOR, etc.).

MATHEMATICS

4. FIT* R. Austin and D. Davidson, Physics, Princeton University. A non-linear least squares fitting program that allows the user to fit many functions of the form X(T) + - SIG, where X is the dependent variable, T the independent variable, and SIG the estimated error in X.

25. LP A. Wassyng, Civil and Mineral Engineering, University of Minnesota. LP solves linear programming problems, i.e., optimization problems whose objective function and constraints are linear.

29. PCFT M. Miller, Chemistry and Biochemistry, UCLA. Performs a Fourier transform on an IBM-PC.

44. Solver-Q F. Alvarado, College of Engineering, University of Wisconsin-Madison. Solves large numbers of simultaneous nonlinear equations. A user can enter and edit equations as well as perform symbolic manipulations on the equations.

NUTRITION

57. UCB HG72 Diet Analysis System S. P. Murphy and K. R. Grose, Nutritional Sciences, University of California-Berkeley. Uses a nutrient database derived from the 1986

version of USDA's Home and Garden Bulletin No. 72, Nutritive value of Foods. The program calculates and displays the nutrient totals and percents of RDA according to a user's diet plan.

PHARMACY

18. Institutional Patient Simulation L. M. Pitterle and J. Wiederholt, Pharmacy, University of Wisconsin-Madison. Improves students' medication problem solving skills by using a patient database that allows them to analyze patient's disease state, recommend drug therapy and evaluate the consequences of their decisions.

39. USC PC-Pack R. Jelliffe, et al., School of Medicine, University of Southern California. USC PC-Pack is for researching and studying drug behavior and calculating probable drug dosage and infusion requirements for patients.

PHILOSOPHY

13. Philo the Logician R. G. Wengert, Philosophy, University of Illinois. Philo has exercises in truth-functional logic where the user is invited to enter a logically equivalent, yet syntactically variant formula to match the logical sense of a given English sentence.

17. Simulations for Philosophy* R. L. Causey, Philosophy, University of Texas-Austin. A scientific problem-solving reasoning program that encourages the user to create his original hypothesis and explanations.

PHYSICS

31. PCWAVE S. Wilks, et al., Physics, UCLA. Helps the first year physics students to understand the interaction of electromagnetics radiation with a medium of index of refraction less than 1.

42. VIVAS* G. Parker and S. Parker, Physics and Astronomy, University of Oklahoma. An efficient algorithm for solving the quantal coupled-channel scattering equations representing collisions of an atom with a diatomic molecule.

POPULATIONS

50. Population Pyramids D. Slesinger, et al., University of Wisconsin-Madison. Enables the user to build population models, analyze pyramid shapes, and interpret population trends based on his own data.

PSYCHOLOGY

37. A Production system for Driving an Automobile G. Saxe and T. Bergantino, Jr., Education, UCLA. Introduces the features of a production system used to model human problem solving behavior and demonstrates how a production system works to model a specific behavior: driving an automobile along various routes.

5. Operant Conditioning* Huei-hsuan Ma, University of Texas-Austin. A tutorial program with "real-life" examples for students to understand the four principles of operant conditions: positive reinforcement, negative reinforcement, response cost, and punishment.

SOIL MECHANICS

22. Soil Mechanics Demonstrations A. Drescher and H. Haitjema, Civil and Mineral Engineering, University of Minnesota. Demonstration tools to teach courses on continuum mechanics, strength of materials, soil mechanics and rock mechanics. Assigned parameters and associated mechanics are represented graphically.

23. TUNNEL I. Vardoulakis and N. Schwanz, Civil and Mineral Engineering, University of Minnesota. Relates to limit analysis of shallow circular tunnels in cohesive soil and deals with kinematical failure mechanisms for plane strain circular tunnel and heading stability; e.g., the user can determine the uniform tunnel pressure required for a user-specified factor of safety.

STATISTICS

36. Data Transformation P. Ender, et al., Education, UCLA. Displays the different effects of mathematical transformations (square, square root, reciprocal, etc.) on different data distributions (normal and skewed).

38. SIMLAB M. H. Krieger, School of Urban & Regional Planning, University of Southern California. A statistical distribution simulation package including six exercises: random walk, percolation, ball-and-urns, steering, cellular automation, and ising model.

35. Z-Score Practice Exercises P. Ender and N. Daves, Education, UCLA. Presents practice problems on interpreting z-scores; has randomly generated test parameters such as sample size, mean and standard deviation.

TOOLS

APPLICATION PROGRAM INTERFACE

9. API* Faculty Support Center, University of Wisconsin-Madison. This "Application Program Interface" program facilitates automation of the interaction of an IBM PC with an IBM host 370 computer.

AUTHORING SYSTEMS

40. SCriptWriter E. Horowitz, Computer Science, University of Southern California. Combines a graphics editor, a font editor, a text editor, and a programming language in a single user interface.

DECISION

26. DETREE A. Wassyng and S. Sharp, Civil and Mineral Engineering, University of Minnesota. Implements the Decision Tree Analysis method by presenting a decision tree that helps users make decisions, compare the effects, and determine the value of various decisions.

DRIVER

11. Controlling the IBM 6 Pen Plotter* WOKSAPE, University of Minnesota. Uses a set of Pascal routines that drive the IBM 6 pen (6-color) plotter to plot a high quality hard copy of graphics information.

33. IBM 5083 Driver J. E. Pickrell, Theater, Film and Television, UCLA. This driver allows the IBM 5083-2 digitizing pad to be used with AutoCAD, a computer-aided design program.

13. LogiTech Mouse Drivers* WOKSAPE, University of Minnesota. Describes a set of assembly language routines. These routines are "interrupt" serial port drivers that allow the user to collect the characters sent to the IBM from the LogiTech Mouse.

12. Turbo Pascal EGD Driver* WOKSAPE, University of Minnesota. Describes a set of Turbo Pascal Routines that drive the IBM Enhanced Graphics Adapter (EGA) to display graphics information (lines and Text) at the highest resolution of the EGA (640 x 350 pixels).

1. VDINETPL* B. Dickinson, Electrical Engineering, Princeton University. VDI-NETPL is a VDI device driver for the IBM 7372 plotter. The driver operates from within the IBM PC Network Program to provide plotter output on a remote server that has shared its plotter with the network.

EDITORS

28. YFORTH R. S. Weber, Chemical Engineering and Chemistry, Yale University. A version of FORTH-79 that has 2 executable files: FORTH.COM is a rudimentary FORTH equipped with an editor and an assembler, and WEBSOFT.COM adds an extensive vocabulary of graphics and numerical analysis words.

FONTS

41. Duke Language Toolkit J. W. Gillette, Humanities, Duke University. Includes three types of files: Fed, a generic font editor, Loadfont, which loads custom fonts to the computer's memory, and PC-Write word processor and sample data files.

GRAPHICS

30. Plot D. Radcliffe, Chemistry and Biochemistry, UCLA. A graphic plotting package that gives a basic X-Y plot (Up to 1024 X-Y pairs may be plotted.)

20. Prograph T. D. Kehoe, Yale Computer Center, Yale University. This routine is an installed and resident assembly language program that prints an EGA (Enhanced Graphics Adapter) high resolution screen image to an IBM Proprinter. Only the green plane of the EGA screen RAM is printed.

56. Turbo Graphic Tools W. F. Polik, Chemistry, University of California-Berkeley. A transportable Turbo Pascal graphics program that overcomes the hardware differences of the Hercules, IBM Jr, IBM CGA, and IBM EGA graphics adapters, and permits printing of graphics images in publication quality resolution on Hewlett-Packard plotters and LaserJet printers.

2. VDIPLOT* R. Austin and D. Davidson, Physics, Princeton University. A compiled Basic program used in a freshman physics course to plot data to the CRT screen or a plotter or a graphics printer; can handle up to four graphs simultaneously.

NETWORKS

51.PC/IP on NetBIOS Madison Academic Computing Center, University of Wisconsin-Madison. PCs on a NetBIOS network can run Telnet for remote log-in and TFTP for file transfer without being directly connected to an Ethernet.

PROFESSIONAL GRAPHICS CONTROLLER

10. Controlling the Professional Graphics Display* WOKSAPE, University of Minnesota. Describes three methods to program graphics on the IBM Graphics display: 1) Professional Graphics Controller device driver; 2) Direct output to the Professional Graphics Controller; 3) Direct output to the PGC from Turbo.

3. PGC Libraries* Interactive Computer Graphics Lab, Princeton University. A library of routines written in FORTRAN (with Professional Fortran Compiler)and C (with Microsoft

3.0) to provide a mechanism for the high level calling of the complete Professional Graphics Controller Command Set.

SCHEDULING

27. CRITPATH S. Sharp and Alan Wassyng, Civil and Mineral Engineering, University of Minnesota. Implements the critical path method for scheduling and managing projects.

TYPESETTING

45. TechSet F. Weinhold, Chemistry, University of Wisconsin-Madison. Enables technical writers to use their own word processor and the Hewlett-Packard LaserJet to produce a typeset quality text with mathematical formulae and chemical symbols.

47. TSGragh F. Weinhold, Chemistry, University of Wisconsin-Madison. Automates the production of an X-Y graph, the type most frequently used for data presentation in a technical manuscript.

48. TSIndex and TSMerge F. Weinhold, Chemistry, University of Wisconsin-Madison. TSIndex reads in a TechSet Preview file and produces an alphabetical listing of words in the document with the corresponding page number(s). TSMerge merges several index files into one single master index.

46. TSRef & RefEntry F. Weinhold, Chemistry, University of Wisconsin-Madison. This utility is for constructing bibliographic references in the particular style of a journal or publisher.

UTILITY

8. Ask* P. Wu, Faculty Support Center, University of Wisconsin-Madison. Allows batch files to accept a one-character response from users; e.g., simple Yes/No questions or menu-driven type questions.

32. ESS MCL Utilities* T. Halderman, et al, Earth and Space Science, UCLA. This package currently contains five routines: X-Y plotting, column sorting, fast Fourier transform, X-Y contouring, and Lat-lon contouring.

49. LogIt! A. Robertson and J. Beasley, Medical School, University of Wisconsin-Madison. A memory resident program (10k) that keeps a record of the various activities on your PC.

6. MV* P. Wu, Faculty Support Center, University of Wisconsin-Madison. Moves files/sub-directories within one physical disk by manipulating directory entries without copying or deleting files.

7. RM* P. Wu, Faculty Support Center, University of Wisconsin-Madison. Deletes files/sub-directories with user confirmation.

This is only a partial list of Wisc-ware, as new packages are added bimonthly. Most non-public domain packages can be licensed for about $40 to $50 to cover everyone (faculty and students) in a given course.

WHAT'S NEW IN THE MRC?

The MRC (Microcomputing Resource Center) acquires new software packages every week. If you would like to see something that we do not have, please take the time to fill out a suggestion form. These forms are always available at the MRC, 101 S. Gregory, Urbana. For your convenience, we have included a copy of the form at the end of this issue that you may fill out and return to us via campus mail.

Please note that while our public domain software is free (may be copied at no charge), you are morally obligated to send money to shareware authors for software you use regularly. Our commercial software library is for evaluation only (may be looked at in the Center, but may not be copied).

The following software has been acquired since publication of the extensive list in the December issue of *Off-Line*. **NOTE: Packages marked (IBM) are for IBM PCs or Compatibles; Macintosh packages are marked (MAC).**

New Commercial Software Packages:

Title	*Publisher*	*Application*
DoubleDos (IBM)	SoftLogic Solutions, Inc.	Multi-tasking Software
Dr. Halo III V3.00.08 (IBM)	Media Cybernetics, Inc.	Graphics
Electric Desk V1.1 (IBM)	Alpha Software Corp.	Integrated Software
Hercules Write On! (IBM)	Hercules Comp Tech	RamFont Word Processor (Pre-Release Version)
HyperCard (MAC)	Apple Computer, Inc.	Database/Organizer

New Demo Packages:

Title	*Publisher*	*Application*
Enable (IBM)	The software Group	Integrated Software
GPIB-410 (IBM)	National Instruments	GPIB Monitor/Analyzer
Microsoft Write (MAC)	Microsoft Corp.	Word Processor

IBM Products:

IBM RT PC AIX Programming Tools and Interface
IBM RT PC AIX C Language Guide and Reference
IBM RT PC AIX DOS Services
IBM RT PC AIX Assembler Language Reference
IBM RT PC AIX Operating System Technical Reference
IBM RT PC Virtual Resource Manager

Updates for IBM-PC & Compatibles

Dos 3.3 Backup Command; Date: 9/9/87; Disk ID: 917MN
Microsoft Chart 3.0
Microsoft Fortran Optimizing Compiler 4.01
Microsoft Macro Assembler 5.0
Microsoft Multiplan 3.04
Microsoft Project 4.0
Microsoft QuickBASIC 4.0

Updates for Macintosh

Microsoft Excel 1.04 (An addendum; we have put with V1.03 for checkout)
Microsoft Multiplan 1.11
Microsoft Word 3.01
Microsoft Works 1.1 (An addendum; we have put with V1.0 for checkout)

Please check the blue binder in the MRC for the call numbers on above items.

The most recent IBM Update Disk we have received is the IBM-PC Local Area Network LAN-Program 1.23 (Disk ID 072MD). This disk is in the IBM UPDATES box. We also can order an update for IBM COBOL/2 if anyone is interested (and lets us know).

We also have received Lotus Speedup & Lotus Learn, two add-ins for Lotus 1-2-3 Release 2.01 (IBM). The Lotus Speedup add-in allows users to enhance the performance of Lotus 1-2-3's worksheet recalculation. Learn creates Lotus 1-2-3 macros by recording keystrokes that you type during a 1-2-3 session. This disk may be copied.

ACCESS: YOUR INFORMATION SOURCE (MAC), which is on a 3.50" disk, is an index to all issues of the MACazine, MacWorld and MacUser magazines from January 1986 through May 1987. Interested users may make a copy of it.

NEW KERMIT FOR MS-DOS AVAILABLE FROM MRC & PC CONSULTANTS

Mark Zinzow

The following excerpt from Info-Kermit Digest V7 #1 describes an exciting new version of Kermit available from the Micro Resource Center in CSOB and the Micro Consultants in Commerce West. (Please bring a formatted blank high density diskette, or two 360K diskettes on which to make your copy.) Be sure to read issue number two and the MSKERM.BWR file for notes on minor bugs and problems. The digests are available on VMD on the Kermit disk with the filename of INFODGST and a filetype of V#N# where the # is a number. As usual, the files described below were on the VMD Kermit disk within a few days of the announcement. To have these announcements mailed directly to you on VMD issue the following command:

TELL LISTSERV SUB I-KERMIT your name

These digests are also available on most campus UNIX systems with the command:

notes comp.protocols.kermit

Please direct requests for special versions of non-IBM MS-DOS systems by email to MARKZ@UIUCVMD.BITNET.

Info-Kermit Digest Wed, 13 Jan 1988 Volume 7 : Number 1

SPECIAL EDITION:

Announcing MS-DOS Kermit 2.30
Announcing version 2.29Z of MSKERMIT ported to RMX86 & RMX286

Date: Mon, 11 Jan 88 19:55 MST
From: Joe Doupnik <JRD@USU> and Frank da Cruz <SY.FDC@CU20B>
Subject: Announcing MS-DOS Kermit 2.30
Keywords: MS-DOS Kermit 2.30, IBM PC Kermit 2.30, DEC Rainbow
Keywords: Tektronix Emulation, NetBIOS

This is to announce a major new release of the MS-DOS Kermit communication and file transfer program, version 2.30, the first major release since version 2.29 appeared in May 1986. The code has been frozen as of January 8, 1988. Any further features or fixes will be deferred for future releases.

The major new features of version 2.30 are:

- Long file transfer packets (up to 1000 bytes)
- NetBIOS local area network support
- A simple script language for automated dialogs with other computers
- Tektronix 4010 graphics terminal emulation
- Improved DEC VT102 and Heath 19 emulation
- ANSI printer control
- Selectable initialization file names
- File transfer performance statistics reporting
- A new, more powerful, more portable key redefinition facility
- Support for new IBM keyboards
- A mechanism for installing COM3 and COM4 support
- Ability to assign Kermit connect-mode "verbs" to arbitrary keys
- Keyboard and port input character translation during terminal connection
- Support for both 7-bit and 8-bit (international) character sets
- Improved interaction with DOS batch programs
- More flexible command-line invocation options
- Security features for server operation

- Ability to operate Kermit through an external console via CTTY
- Compatibility with most internal modems
- Modem status report (CD, DSR, CTS)
- Increased memory for screen rollback, macro and key definitions
- Garbage collection of macro and key definition memory
- Improved cooperation with half-duplex hosts
- Improved DOS error handling
- Improved debugging and logging functions
- Improved consistency of command syntax
- A completely rewritten manual

The program requires DOS 2.0 or later, and 90K+ of memory. Version 2.30 currently runs on the entire IBM PC family, including the new PS/2 series, on IBM clones such as the Compaq, AT&T 6300, and DEC VAXmate, and on "semi-clones" like the Seequa Chameleon and Data General/1, which have different serial port adapters. There is also a specific version for the DEC Rainbow (which does not include Tektronix emulation), and a "generic MS-DOS" version that should run on any DOS machine, using only DOS calls (no specific terminal emulation).

Thanks are due to James Sturdevant of A.C. Nielson Company for the initial implementation of the script language, to Joe Smith of the Colorado School of Mines and Brian Holley of the University of Cambridge (UK) for the original Tektronix emulation code, to David Knoell of Basic American Foods for the initial implementation of "Kermit verbs" assigned to keys, and to AT&T for supporting the NetBIOS development.

And thanks also to the hundreds of Info-Kermit Digest subscribers who tested the many prereleases of this program, reported bugs, and suggested new features, and who read and commented on drafts of the new manual.

The new IBM version replaces several previous versions that were distributed separately, including the MSVCLO version (for IBM near-clones like the Seequa Chameleon and DG/1) and the Olivetti M24 version.

Untested versions are included for the HP-150, HP-110 and Portable PC, and the Grid Compass II -- if you have any of these machines, please try out the new version!

Previous releases of MS-DOS Kermit also ran on a number of other machines, including the Wang PC, Victor 9000, Sanyo MBC, NEC APC and APC3, etc. The code for these non-IBM compatibles will also be to 2.30 level, and released when available. Volunteers to test and fix the code for these machines are heartily encouraged to step forward!

The files for version 2.30 have been installed in Kermit Distribution at Columbia University. They are available on the Internet from host CU20B.COLUMBIA.EDU (a DECSYSTEM-20) as follows:

run FTP, log in as user ANONYMOUS, any password, and GET (or MULTIPLE GET, or MGET, according to the syntax of your FTP program) the desired files. They are also available on BITNET and EARN from host CUVMA (an IBM mainframe) by sending a message to KERMSRV@CUVMA requesting the desired files. To learn more about KERMSRV, send it a message "HELP". KERMSRV at the University of Toledo (UOFT02) (a VAX/VMS based Kermit file server) also has the files, and eventually, they will also be available via UUCP from Oklahoma State University, from and from dialup bulletin boards around the world.

[Note: These files are available locally on campus from VMD. They may be ftp'd from VMD by users on other systems by using one of the MICRO signons (username or login id MICRO1 through MICRO9, all with the password MICRO) for free access to public domain software and issuing a CD command to **PUBLIC.424** (the Kermit disk accessed on VMD by LINKTO KERMIT).]

The executable files are stored in a special printable bootstrap format, called "BOO files". These are decoded into .EXE files using a "BOO-file decoder" program.
[This program is distributed on Campus Kermit Distribution disks.] These are available written in various languages, including Basic, MASM, C, and Pascal. The documentation is available online in plain ASCII text format, and in Scribe text formatter source format. Following is a synopsis of the files. The KERMSRV name is the same as the CU20B name, except the "KER:" should be omitted, and the period between the filename and filetype should be a space, e.g. KER:MSAAAA.HLP on CU20B is MSAAAA HLP on CUVMA.

CU20B Name	Size		Description
KER:MSAAAA.HLP	7K		Explanation of file naming conventions
KER:MSB*.*	130K	total	BOO-file encoding/decoding programs
KER:MSVIBM.BOO	97K		IBM PC Kermit, BOO-encoded executable
KER:MSVRB1.BOO	68K		DEC Rainbow Kermit BOO file
KER:MSVGEN.BOO	62K		Generic MS-DOS Kermit BOO file
KER:MSTHP1.BOO	63K		HP-150 (untested)
KER:MSTHPX.BOO	64K		HP-110 and Portable PC (untested)
KER:MSTGRI.BOO	64K		Grid Compass II (untested)
KER:MSKERM.DOC	263K		MS-DOS Kermit manual, plain ASCII text
KER:MSKERM.MSS	263K		Scribe text formatter source for manual
KER:MSKERM.HLP	12K		A summary of MS-Kermit commands
KER:MSKERM.BWR	11K		List of known restrictions, bugs, etc.
KER:MSS*.*	638K	total	System-independent MASM Source files (13 files)
KER:MSG*.*	110K	each	System-dependent source (graphics, IBM only)
KER:MSU*.*	70-85K	each	Sys-depn source (keyboard support, all systems)
KER:MSX*.*	39-150K	each	Sys-depn source (port i/o, etc, all systems)
KER:MSY*.*	100K	each	Sys-depn source (terminal emulation, IBM only)
KER:MSZ*.*	183K	each	Sys-depn source (term emul, cont'd, IBM only)
KER:MSV*.MAK	2K	each	Microsoft MAKE files for each version
KER:MSV*.BAT	2K	each	Batch files to build each version
KER:MSV*.LNK	1K	each	LINK command files for each version

The utility program MSUCHK.C (and .BOO), contributed by Phil Benchoff of Virginia Polytechnical Institute, allows convenient determination of MS-Kermit's new keyboard codes on the IBM PC family.

Be sure to read the MSKERM.BWR file before trying to use the new version, or reporting any problems with it.

Here are the minimum files needed for the new release ("xxx" stands for the specific version, IBM, RBI, or GEN):

1. For everybody: The documentation -- MSKERM.DOC, MSKERM.HLP, MSKERM.BWR.
2. For those who already have Kermit on their PC: MSVxxx.BOO. If you don't have the MSBPCT "BOO-file decoder", also get that.
3. For those who want to make modifications to the sources: MSS*.*, MSGxxx.* (if any), MSXxxx.*, MSYxxx.* (if any) ,MSZxxx.* (if any), MSVxxx.MAK (or .BAT if you don't have MAKE), and MSVxxx.LNK.

The systems for which we don't yet have the new version ready are still in the Kermit distribution as before, under the MSV, MSX, and MSY prefixes. These will be replaced as the new ones appear.

The IBM PC and DEC Rainbow versions may also be ordered on diskette from Columbia, along with typeset, printed copies of the manual. The IBM version is available on 5.25-inch 360K DS DD diskettes, and on 3.5-inch 720K DS diskettes for the PS/2 family. The Rainbow version is on RX50. Send mail to Info-Kermit-Request@CU20B.COLUMBIA.EDU or **KERMIT@CUVMA.BITNET** for ordering information. The distribution diskette for the IBM PC version will also be submitted by Columbia to various user groups and diskette services.

New Features

Of particular interest are the Local Area Network and Tektronix items. Both are available only for the IBM PC version of Kermit-MS.

LANs can be used as a communications pathway between cooperating Kermits and between Kermit-MS and a host which allows direct remote logins from the LAN. The mechanism is the NetBIOS emulator program supplied with each network, and thus it works with most LAN systems. Any station can become a Kermit network server or a client, without interference with the regular network fileservers, to allow multiple Kermit to Kermit links on a voluntary peer to peer basis. The mechanism uses just the NetBIOS and not vendor dependent Asynchronous Communications software packages (Kermit puts its own packets or Connect mode characters in NetBIOS packets and uses the NetBIOS protocol in addition to the standard Kermit protocol).

Tektronix terminal emulation provides standard line drawing, dot, and character graphics of the 4010 class terminals using true graphics on the PC. Kermit-MS automatically determines the display and display adapter board in current use and does high resolution graphics in response to Tek style commands (which are described in the new Users Manual). Display adapters currently supported are EGA, CGA, Hercules, AT&T/Olivetti, and even regular Monochrome (with text characters rather than dots). The graphics will be in color (foreground and background) and will be

preserved separately from ordinary text (VT102, VT52, Heath-19) screens if the hardware permits and one can switch back and forth from the keyboard. Tektronix specifications have been extended slightly to allow the host to switch Kermit-MS into and out of graphics mode automatically for easy plotting from packages such as SAS.

The IBM PC version now supports the COM3 and COM4 ports available on many machines with added hardware, provided the user informs the BIOS of their presence. The Users Manual shows how to do this. Kermit-MS/IBM adapts to screen dimensions found at startup, such as 132 columns or 43 lines, and is able to switch several popular non-IBM EGA boards to 132 column mode under host control.

Long packets, up to 1000 bytes, are supported to increase efficiency on long haul communications circuits. Efficiency increases by using fewer packets and thus less overall time waiting for packets to be acknowledged. Strong three byte CRC checking is encouraged; it does not degrade local performance. Long packets are a reasonable alternative to the sliding windows approach which has a problem on PCs when they attempt disk i/o while receiving characters on the serial port (interrupts can get lost and packets need to be repeated).

Translation mechanisms are present to assist multilingual usage of essentially ASCII or English style machines. These are not panaceas for a very complex problem, but testing in Europe indicates it is a step in the right direction. The mechanisms are conversion of characters about to be displayed, control of character size (7 or 8 bits), and the new generalized keyboard handler present for all MS DOS machines.

A sustained awareness of supplementary input and output devices used by disabled and other individuals is present in many parts of the program. As we learn more about such devices Kermit-MS will try to make their use possible and comfortable.

Overall, the interior technical improvements are numerous. This gives us added flexibility and increased performance.

And may we share with you -

Like any Kermit program, MS-DOS Kermit is for everyone to use and share. Once you get it, feel free to pass it along to your friends and colleagues. Although it is copyrighted and not in the public domain, we ask only that you not attempt to sell it for profit, and that you use it only for peaceful and humane purposes. If you have comments, suggestions, improvements, or fixes, please send them to Kermit Distribution at Columbia University, where they can be considered for the next release or added to the "beware file". Happy New Year, and use Kermit in good health!

Joe R. Doupnik
Cntr for Atmospheric & Space Sciences
& Dept of Electrical Engineering
Utah State University
Logan, Utah 84322
JRD@USU.BITNET

Frank da Cruz
Cntr for Computing Activities
Columbia University
612 West 115th Street
New York, NY 10025
SY.FDC@CU20B.COLUMIBA.EDU

MICROCOMPUTER TRAINING OPPORTUNITIES IN THE C-U AREA

NOTE that this listing is probably incomplete, and that this listing is for information only; no endorsement is implied. Additions and corrections will be received gratefully by Ron Szoke, 333-8630.

Busey Bank -- Microcomputer Training Center, Race and Main Streets, Urbana. Toni Beatty, 384-4510 or Pat Schmidt, 384-4573.

ComputerLand -- Learning Center, 505 S. Mattis Avenue, Champaign. 359-0895.

Micro Resales -- 130 W. Main Street, Urbana. 367-9242.

Parkland College -- Business Division, Microcomputer Training Center, 2400 W. Bradley Avenue, Champaign. 351-2213.

University of Illinois -- Computing Services Office, 162 Digital Computer Laboratory, 1304 W. Springfield Avenue, Urbana. 244-1257 or 333-8630.

University of Illinois -- Continuing Education and Public Service, Extramural Courses, 302 E. John Street, Suite 1400, Champaign. 333-6305.

University of Illinois -- Department of Computer Science, 252 Digital Computer Laboratory, 1304 W. Springfield Avenue, Urbana. 333-4428.

University of Illinois -- Personnel Services Office, Staff Development, Computer Education Center, 225 Training and Development Center, 505 E. Green Street, Champaign. 333-6110 or 333-8342.

Urbana Community Schools -- Adult Education, 706 E. Elm Street, Urbana. 384-3530 or 384-3531.

ValCom Learning and Computer Center, 723 S. Neil Street, Champaign. 398-4838.

Wordlink, 24 E. Green Street, Champaign. 359-9378.

COLLEGE OF ENGINEERING NETWORK PERFORMANCE

Caroline Badger
Computing/Network Coordinator

(Ed. Note: This article is being reprinted, with permission of the author, from the College of Engineering's Exchange of November 23, 1987. Our networking group felt that it might help our users understand a little better how a network functions.)

Performance benchmarks for the College of Engineering Network (CEN) were run during the month of October. A number of measurements were taken including throughput and transfer rate.

Widgets and Bits

The CEN with its connected local area networks and many users can be compared to a circular, high-speed, multilane superhighway with numerous secondary roads feeding into it. Very Fine Widgets, Inc. has a manufacturing plant, several warehouses, and a number of retail stores, all located on different secondary roads off the superhighway.

Highway Throughput

The superhighway is capable of transporting a thousand vehicles per hour around the ring. This fact is of interest to Mr. Widget, president of Very Fine Widgets, Inc., only if the traffic on the highway becomes so heavy that his business is affected.

Like the superhighway, CEN has a maximum design capacity. It is theoretically capable of continuously transmitting 80,000,000 bits of information a second. During a recent 13-day period, the 10 active and 13 passive sites now connected to CEN sent a total of 2.7 billion bits across the network, or an average of 2410 bits per second. Until the backbone approaches capacity, users of CEN will be unaware of and unaffected by the traffic.

Local Access

Even if he wished to take advantage of the full capacity of the superhighway, Mr. Widget cannot possibly expect to ship a thousand truckloads of widgets per hour among the various company locations. The number of widget trucks that can make the journey from one site to another in an hour is limited by the number of men working on the loading docks, the width and condition of the driveway leading into the plant, the speed limits on the secondary roads, and the amount of other traffic on them.

Similarly, many factors are involved in the service that an individual computer user will experience over the college network, including the speed of the local and remote hosts, the amount of work being performed by other users on these hosts, the speed of the local networks over which the data travels, and the traffic over these two networks.

If Mr. Widget wanted to measure the maximum number of trucks he could send between plant A and distribution center B, he would need to close both access roads to local traffic; stop all other processes running at both sites; and load, dispatch, and unload trucks as quickly as possible at each site simultaneously. Since the superhighway is never saturated, traffic would not need to be

restricted for the test.

Local network access to CEN was measured using two Sun 3/160 workstations located on two separate ethernets connected to CEN. To ensure that the results reflected the capacity of CEN and not local traffic, no other users were allowed on the hosts during the test and no other traffic was allowed on the ethernets. However, no restrictions were placed on any other connected networks or on the backbone traffic.

Test packets were sent and echoed in two simultaneous streams between the two workstations. Measurements were taken over a range of packet sizes and this test was repeated several times. Two packet sizes are reported here -- a small packet that would be representative of data sent during a text editing session and a large packet that would reflect large file transfers.

pkt size	average pkts/sec (one way)	minimum pkts/sec (one way)	maximum pkts/sec (one way)	std dev
50 bytes	467.63	430.70	484.38	15.75
2088 bytes	43.18	40.03	44.81	1.37

The peak rate observed was 95,000 bytes per second one way or 1,520,000 bits per second through each gateway. The peak rate occurred when the packet size was 1024 bytes.

Transfer Rate

The management of Very Fine Widgets needs to know not only how many trucks it can send over the highway per hour but also the time it takes a particular truck to arrive at its destination, unload, and return to its home base.

CEN packet transmit times were measured by sending a message across the network from one host to another and waiting for the echo from the remote host before sending the next packet. Measurements were made over a range of data packet sizes and the entire test was repeated a number of times.

The average round trip transit time for small (8 byte) data packets was 0.017 seconds per packet. Packet transfer rates for small packets are of particular interest because they reflect the delay an interactive user might see during an editing session.

MIT TO OFFER WORKSHOP IN TECHNICAL JAPANESE

Cambridge, Mass. -- The Japan Science and Technology Program of the Massachusetts Institute of Technology will hold its first intensive workshop in technical Japanese language for computer scientists and electrical engineers next summer, it was recently announced.

According to Professor Richard J. Samuels, the program's director, the majority of American scientists and engineers, even those who have had some training in the Japanese language, are at a severe disadvantage when attempting to read the large volume of published Japanese technical materials in their field or in undertaking productive long-term research visits to Japan.

This is in marked contrast to their Japanese counterparts, most of whom read technical English fluently and in depth.

To address this information gap between Japan and the United States, MIT is embarking on a three-year pilot program to develop an intensive summer course in technical Japanese for scientists and engineers. For its first workshop in this program, the focus will be on computer science, electrical engineering and related subjects. The course is being partially funded by grants from the Japan Foundation, the Japan-U.S. Friendship Commission, the Hitachi Foundation, and the National Science Foundation.

The goal of the planned workshop is to develop in the participants the ability to read technical Japanese language documents in their area of expertise. As prerequisites, the applicant should have knowledge of computers and computer science, electrical engineering or a related field as well as a command of the basic structure of the Japanese language (equivalent to two to three years of college Japanese).

Participants in the workshop will be limited to 20. The dates for the course will be June 6-July 29, 1988, and tuition has been set at $3,000, with limited financial assistance available. Deadline for application is March 1, 1988. More information concerning the workshop can be obtained by writing Susan L. Sherwood, Technical Japanese Language Project Coordinator, MIT Japan Science and Technology Program, E38-659B, Cambridge, MA 02139 or calling her at (617) 253-8095.

EQUIPMENT FOR SALE

The Water Resources Center has the following equipment for sale:

AB Dick Magna SL Word Processor and Printer

Price: Negotiable -- Must use internal Stores Voucher

Contact: Glenn E. Stout or Mary Limp
Water Resources Center
208 North Romine
2535 Hydrosystems Lab
Urbana, IL 61801
Phone: (217) 333-0536

FOR SALE

2 Imaging Technology PCVISION Frame Grabber 512 X 512 resolution, 8 bit planes With **ImageAction** image processing software	$1000 ea. $1500
2 Number Nine 1024 X 768 Revolution High-resolution, 256 colors from 16.8 million color palette, includes driver files for AutoCAD	$1000 ea.
Vectrix Midas graphics card set 672 X 480 resolution, 512 simultaneous colors, AutoCAD compatible, includes 2D and 3D onboard command set and Paint Pad software	$650
Lattice C Version 3, industry standard C language compiler, bundled with **Media Cybernetics HALO** - Library of graphics routines, supports all popular display, pointer and output devices, lastest Version 2.26A	$300
IBM Professional Fortran By Ryan-McFarland, math chip support, ideal for scientific and technical use	$150
IBM PASCAL Compiler Version 2.00, structured language compiler for PC.s	$50

Prices are negotiable. Contact Jim Kaufman or Mike Brandys at the Electronic Imaging Lab (333-5839) for more information.

FOR SALE

CSO has retired the 1453 Zeta plotter and two Diablos. We have some extra supplies which we will sell at half-price to any department that can use them:

20 Diablo Elite 12 96-Char. metalized print wheels
(Central Stores #311903-01)

17 Diablo Titan 10 96-Char. metalized print wheels
(Central Stores #311900-01)

Packages (6 per pkg) Nicolet 1453 plotter pens
17 300722 blue pens
29 300723 red pens
50 300724 green pens

Packages (6 per pkg) Graphic Control 1453 plotter pens
50 92-03-0301-06 black pens
10 92-03-0302-06 red pens
30 92-03-0303-06 blue pens
10 92-03-0304-06 green pens

PDP-11 REMOVABLE DISKS

We have 3 (three) 80-meg removable disks for a PDP-11 which we will give to any UI person/department who needs them. They are identified by the label RL02K-DC and are 14" hard disks. If you can use them, please contact Ron Rosoff, 352-6511, ext. 664 (CERL).

SAS PC INTEREST SURVEY

If you might be interested in obtaining the following SAS PC products, please complete the survey below:

I am interested in the following SAS PC products:

SAS/GRAPH_____ SAS/AF_____ SAS/FSP_____

Please return survey to:

Vicky Dingler
CSO SAS Representative
150 DCL
1304 W. Springfield
Urbana, IL 61801

READER FEEDBACK

In our attempt to keep improving *Off-Line*, and answer your needs and interests, we will be adding this page to each issue. We sincerely hope that many of our readers will take the time to give us this "Feedback". Please fill out, fold in half, and return to address on back. Your reply may be anonymous, or you may add your name and department. Thank you for your comments/suggestions.

1. Please give us comments about articles in this issue. Mention the article by name and be as specific as possible in your comments. For example, did you find the articles informative, of a reasonable length, etc.?

2. What topics would you like to see covered in future issues?

3. What sections would you like to see expanded or added? For example, a question-answer column or articles about other department's computing activities?

4. Additional comments or suggestions:

5. Would you be interested in contributing articles, questions, etc. to *Off-Line*?

Send to:

OFF-LINE
Computing Services Office
150 Digital Computer Laboratory (M/C 256)

University of Illinois at Urbana-Champaign
1304 West Springfield Avenue
Urbana, Illinois 61801

OFF-LINE MAILING LIST

If you wish to be placed on our mailing list, have a change of address, or wish to be deleted, please check the appropriate box and fill in the information below. Please help us keep our mailing list up-to-date by informing us if issues are being sent to someone no longer in your department; fill in the information below and return to us so that his/her name may be removed from the list.

Please check as appropriate:

_____ Please *ADD* my name to the mailing list.

_____ Please *DELETE* my name from the mailing list.

_____ Please *CHANGE* my address (provide old address also).

If you have a campus mailing address:

Name _____

Department _____

Bldg. & Room _____ M/C_____

If you do not have a campus mailing address:

Name _____

Address _____

_____

_____

City, State, Zip _____

If you are requesting a change of address, please indicate your old address:

_____

_____

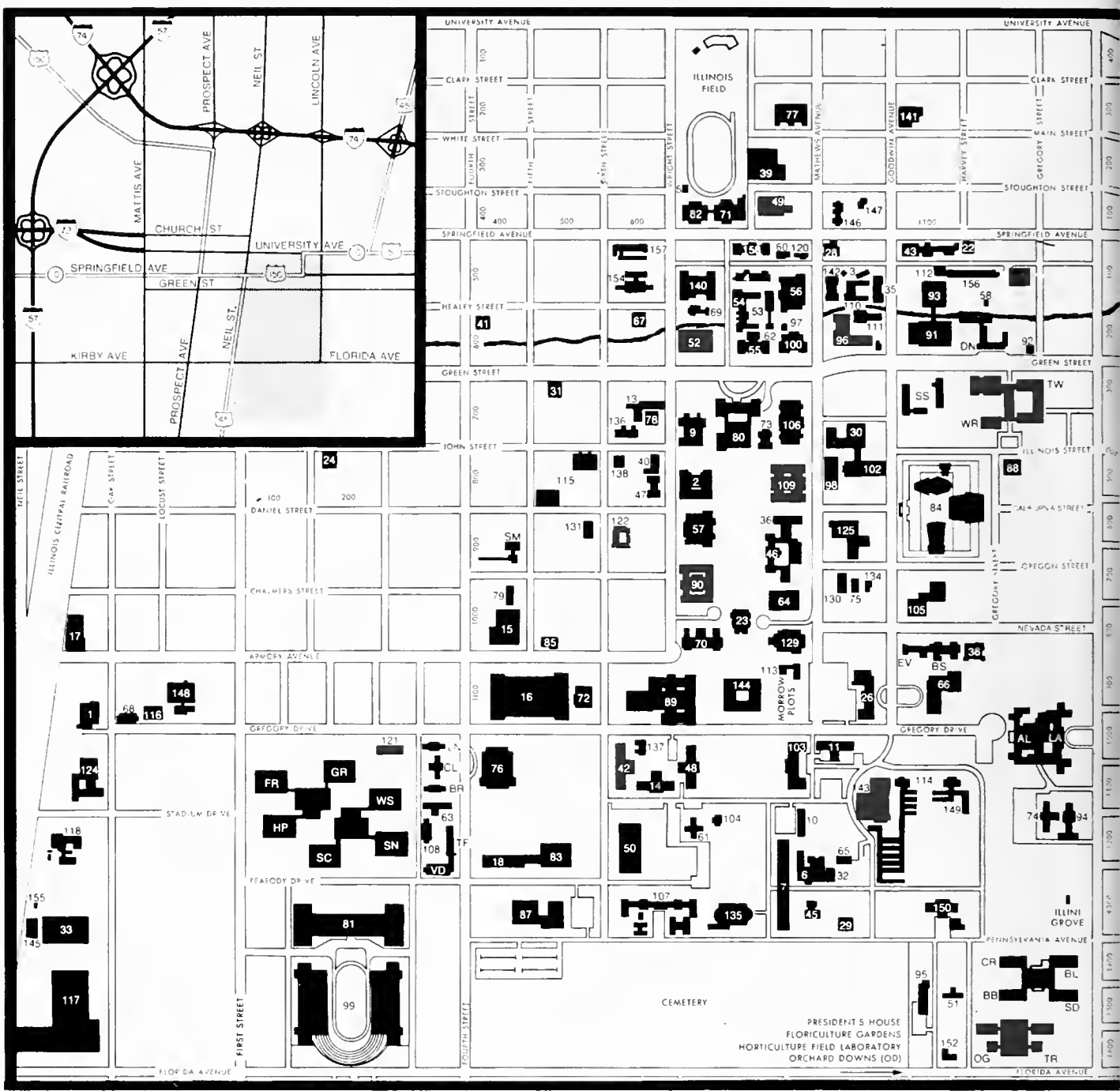
Mail to:

OFF-LINE
Computing Services Office
150 Digital Computer Laboratory (M/C 256)

University of Illinois at Urbana-Champaign
1304 West Springfield Avenue
Urbana, Illinois 61801

CSO SITES

CSO NORTH (DCL)	
14 Digital Computer Lab 333-7685	Monday-Saturday, 24 hours/day Sunday, 12 noon - 12 midnight
CSO SOUTH	
70 Commerce West 333-4500	Monday-Saturday, 8 am - 12 mid. Sunday, 12 noon - 12 midnight
AGRICULTURE	
N-120 Turner Hall 333-8170	Monday-Thursday, 8 am - 10 pm Friday, 8 am - 5 pm Saturday-Sunday, Closed
CHEMISTRY	
150-154 Noyes Lab 333-1728	Monday-Friday, 9 am - 5 pm Saturday-Sunday, Closed
CRH SNACK BAR	
120 Snack Bar 333-1851	Daily, 12 noon - 12 midnight
ELECTRICAL ENGINEERING	
146 Electrical Engineering 333-4936	Monday-Friday, 8 am - 12 mid. Saturday, 8 am - 5 pm Sunday, Closed
FAR	
Florida Avenue Residence Halls 333-2695	Daily, 12 noon - 12 midnight
ISR	
Illinois Street Residence Halls 333-0307	Daily, 12 noon - 12 midnight
MECHANICAL ENGINEERING	
65 Mechanical Engineering 333-1430	Monday-Saturday, 8 am - 12 mid. Sunday, 12 noon - 12 midnight
PSYCHOLOGY	
453 Psychology 333-7815	Monday-Friday, 8 am - 5 pm Saturday-Sunday, Closed
SOCIAL SCIENCE	
202 Lincoln Hall 333-0309	Monday-Friday, 8 am - 12 mid. Saturday, 10 am - 5 pm Sunday, 12 noon - 5 pm



CSO Sites (marked in blue on map)

42 Commerce West
49 Digital Computer Lab
52 Electrical Engineering
90 Lincoln Hall
96 Mechanical Engineering
109 Chemistry - Noyes Lab
121 CRH Snack Bar
122 Psychology
143 Agriculture - Turner Hall
Illinois Street Residence Halls
Florida Avenue Residence Halls
CSO Office Building
(101 South Gregory)

GIFT & EXCHANGE DIV
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CAMPUS

16, No. 2: March/April 1988

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ersity of Illinois at Urbana-Champaign

ctor: George Badger
or: Lynn Bilger

CSO

puting Services Office

CSO DIRECTORY

Departmental Office	150	DCL	333-1637
User Accounting Office	1208	W. Springfield	333-7752
Documentation Center	1208	W. Springfield	333-9230
Systems Consulting	1208	W. Springfield	333-6133
Statistical Consulting	85	Comm West	333-2170
Microcomputer Consulting	91	Comm West	244-0608
Text Processing Consulting	212	CSOB*	333-7318
Maintenance & Repair Service	194	DCL	333-0969
Tape Service, Special Plots, Special Printers.	14	DCL	333-8640

*CSOB is the CSO Office Building, located at 101 South Gregory, Urbana.

DIAL-UP NUMBERS

IBM 3081 GX (uiucvmd)	300	baud	333-4006
Cyber 175 (uiucnosa)	300	baud	333-4000
SWITCH	1200	baud	333-4008
	2400	baud	333-4007
TELENET (local no.)			384-6428

LOCALNET CALL NUMBERS

Note: Certain CSO Sites are on a separate channel of LocalNet than the rest of the campus. These are designated below as **A Sites** and include the following CSO Sites: ME, EE, COMM, LH, and AGRIC. All other LocalNet access areas are designated as **B Sites.**

VMD	CALL 4000	(line mode - A Sites)
	CALL 4100	(line mode - B Sites)
	CALL 4400	(full-screen mode - A Sites)
	CALL 4500	(full-screen mode - B Sites)
VME	CALL 4600	(A Sites)
	CALL 4700	(B Sites)
uxa (Pyramid 90x)	CALL 66AC	(A Sites)
	CALL 66AA	(B Sites)
uxe (Pyramid 90x)	CALL 66FA	(A Sites)
	CALL 12EE	(B Sites)
uxf (Sequent)	CALL 66C0	(A Sites)
	CALL 66BB	(B Sites)
uxg (Gould)	CALL 1000	(B Sites only)
uxh (Convex)	CALL 1850	(A Sites)
	CALL 1800	(B Sites
NOSA	CALL 1650	(A Sites)
	CALL 1750	(B Sites)
LCS	CALL 6400	
TELENET	CALL 1550	

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MICROCOMPUTER RESOURCE CENTER MOVES TO UNION SITE

The CSO Microcomputer Resource Center (MRC) has moved from Room 106 CSOB, 101 South Gregory, Urbana, to the Federal Room in the basement of the Illini Union. The Federal Room is north (to the left as you come down the stairs) of the Microcomputer site, which, in turn, is north of the cafeteria. The MRC hours are 10am - 6pm, Monday through Friday; the telephone number is 244-6261.

MICROCOMPUTER SITE NOW OPEN IN UNDERGRADUATE LIBRARY

A new microcomputer site, funded by the Student Computer Fee, is now open and operable in the Undergraduate Library. It is located by the Media Center and contains 24 IBM PS/2 Model 30s, 6 dot matrix printers, and 1 laser printer. The hours are: Monday-Thursday, 8am-1am; Friday, 8am-12mid; Saturday, 9am-12mid; and Sunday, 12noon-1am.

NEW LOCATION FOR CSO SHORT COURSE REGISTRATION!

Due to the construction of the Digital Computer Laboratory addition, registration for CSO Short Courses has been moved to 1208 West Springfield, Urbana (CSO's Distribution/Accounting Office) for an indefinite period. Calls will still be taken at 244-1257 for the remainder of this semester.

At the beginning of the Summer 1988 Session, CSO will advertise the new procedures and policies for registering for Short Courses. Your understanding and patience during the construction period will be most appreciated.

SURVEY OF DATABASE MANAGEMENT SYSTEMS FOR CAMPUS USE

CSO would like to thank the many users who responded to the Survey of Database Management Systems. Almost 600 survey sheets have been returned to us at this time and we appreciate the fact that people have taken the time to respond with their suggestions and comments. We are currently analyzing these responses and will publish our findings in the next issue of *Off-Line*.

A quick perusal of the returned forms showed us that many people are still unaware of CSO's Microcomputer Resource Center (MRC), located in the Federal Room in the basement of the Illini Union. (The MRC was previously located in 106 CSOB on S. Gregory, Urbana. They moved to the Union site on March 23.) The MRC has various microcomputer database management packages that can be examined and/or checked out for comparisons (see the article "What's Happening in the MRC" in this issue for more information about the Center). The CSO Systems, Statistical, and PC Consultants are also a good source of information for users.

S INSTALLED ON THE CONVEX-C1

CSO has installed S on the CONVEX-C1 machine. S, a product of AT&T, is a statistical package designed for exploratory data analysis. The S system consists of an interactive matrix language with high-level statistical and graphic functions. The statistical procedures include regression, ANOVA, canonical correlation, discriminant analysis, hierarchical clustering and time series analysis. The graphic procedures include scatter plots, box plots, pie charts, maps, contour plots and 3-dimensional perspective drawing. S also has an extensive macro facility for creating user-defined functions and procedures.

S is invoked on the Convex by typing the capital letter S. To exit from S, type lower-case q, for quit.

The manual for S is called *S, An Interactive Environment for Data Analysis and Graphics* by Richard A. Becker and John M. Chambers. This manual will be sold at the CSO Distribution Center, 1208 W. Springfield, Urbana (though it may not be available yet at the time of this printing).

CHANGE IN CONVEX RATE STRUCTURE

A slight change is being made in the way that charging is being done on the Convex (uxh) computer. The first ten minutes of usage in a day will always be charged at full rate ($80 per hour). The rest of a days usage will be charged at a sliding rate based on the total amount of CPU time used. If the total time is over 1 hour the rate for anything over the first ten minutes will be $40 per hour. If the total time is less than an hour, the rate varies linearly. The multiplier is (6600-T)/6000 where T is in seconds. Note that the lower rates only apply to CPU usage over 10 minutes, but the total time is used to determine the rate.

NEW AND REVISED REFERENCE GUIDES

Following is a list of new and revised Reference Guides now available:

RF-0.1	Reference Guide List	02/19/88 Rev
RF-0.3	CSO Sites	02/10/88 Rev
RF-0.3a	RJE Information for Handicapped	02/10/88 Rev
RF-0.11	LocalNet	02/10/88 Rev
RF-0.14	Accessing CSO Computer Systems	02/10/88 Rev
RF-0.20	The 3800 Printer in Line Printer Mode	01/12/88 New
RF-20.6	VMBATCH	02/19/88 Rev
RF-20.7	VMBATCH Class Specification	02/19/88 Rev
RF-20.11	VMTAPE	02/21/88 New
RF-23.1	The SAS Sample Library	03/15/88 New
RF-23.8	SPSS-X Under CMS	02/10/88 Rev
RF-25.2	Producing Hard-Copy Zeta Plots with SAS/GRAPH	02/11/88 Rev
RF-30.5	Standard Terminal Settings for all CSO Computer Systems	02/10/88 Rev
RF-30.6	Microcomputer Software Available at Commerce West and Electrical Engineering	02/10/88 Rev
RF-30.7	CSO Microcomputer Support Services	02/10/88 New

GENERAL CAMPUS NEWSBRIEFS

Local faculty among authors of computer software packages which have won EDUCOM awards. -- The 1987 EDUCOM/NCRIPTAL Higher Education Software Awards were presented to the designers of the eight best software packages at the EDUCOM'87 banquet.

The Best Tutorial Award went to authors Stanley Smith, University of Illinois, Ruth Chabay, Stanford University, and Elizabeth Kean, University of Wisconsin for their "Introduction to General Chemistry." The package runs on the Apple II series, and IBM PCs and compatibles. It consists of a series of ten diskettes designed to supplement and enhance classroom learning and lab activities. These programs use the computer's teaching abilities in a variety of ways, including simulated experiments, colorful graphics and animation, and diagnostic feedback including answer judging and spelling markup. The package is produced by COMPress, A Division of Wadsworth, Inc., P.O. Box 102, Wentworth, NH 03282; 800-221-0419.

The Best Chemistry Software Award went to authors Loretta Jones and Stanley Smith, University of Illinois, for their "Interactive Video Disc Lessons for General Chemistry." The package will run on an IBM PC with InfoWindow, and LDV 6000 disc player. This series of computer-assisted programs is designed for use in beginning Chemistry courses. It incorporates the computer and the random access videodisc to illustrate in dynamic fashion concepts in Chemistry otherwise difficult to understand and present. Students can see what is actually happening in a chemical situation, then change conditions and observe what happens. This software is also produced by COMPress.

The Best Psychology Software Award went to Robert W. Hendersen, University of Illinois for "Eventlog." Eventlog will run on IBM PCs or compatibles. The objective of the package is to teach students the rudiments of observational research. Students without prior programming experience can configure keyboard and timers to match the requirements of their own experiments. Eventlog is easy enough to use in an introductory course, yet is sophisticated and powerful enough to be used in advanced undergraduate or graduate courses, or even for research purposes. Eventlog is being marketed by CONDUIT Educational Software, University of Iowa, Oakdale Campus, Iowa City, Iowa 52242; 319-335-4100.

IBM Funds Five Consulting Scholars. A new Consulting Scholars Program has been established by IBM. The first five recipients have been announced and Loretta Jones from the Chemistry Department at the University of Illinois is one of the five selected. As part of this new Program, she will take a year off from her teaching duties to share her knowledge about academic computing with colleagues around the country.

Apple's "Design the Personal Computer of the Year 2000." The University of Illinois won first place in Apple Computer's Project 2000 contest. The idea behind the winning design, "Tablet: Personal Computer of the Year 2000," was to integrate the power of computation and communication into a portable, notebook-sized package. The small, rectangular slab for Tablet would have a high-resolution color display and a pressure-sensitive skin, responsive to the touch of a fine stylus, on the front and would talk to peripherals transparently.

Princeton University won second place for "The Apple PIE" (Personal Information Environment), which would integrate portable radio, television, telephone, and other information technologies. The University of Minnesota won third place for "CORE," which would let users carry the core of their computer (memory, processing power, etc.) wherever they went.

WHAT'S HAPPENING IN THE MRC?

Bi-Shen Chuang & Mark Zinzow
CSO's Microcomputer Resource Center

Since its opening in January 1987, the Microcomputer Resource Center (MRC) has been a major technical information center and hardware/software evaluation site for campus personal computer users. Microcomputer specialists are available to provide information services to users on a walk-in or telephone basis. PCs such as IBM-PC AT, XT, Macintosh Plus, SE, AT&T 7300, and Zenith Data Systems illustrate our wide variety of hardware for patron evaluation. Over 800 PC-SIG diskettes for the IBM-PC, many Commodore Amiga disks, and about 300 diskettes from the Champaign-Urbana Macintosh Users Group comprise our public domain software collection. In addition, 40 microcomputer journals, weekly newspapers, and reference publications may be read in the MRC. University faculty, staff, and students are cordially invited to use the MRC facilities and its resources.

Recently, in response to increasing user needs for software evaluation, the MRC staff has solicited or purchased from vendors a variety of new packages. We also simplified our charge-out/circulation procedures to better serve our patrons.

Charge-Out/Circulation

The Resource Center has automated its charge-out/circulation procedures. Many packages must be reviewed in the MRC, but some software may be checked out for three days. To check out a commercial software package, please bring in the following:

1. A valid University staff or student ID. First time users must also present their driver's license for home address.
2. A deposit in the form of personal check or department account number. The deposit amount varies according to the retail price of each package, and will be returned as long as all the regulations are followed and all disks and documentation are returned in good shape by the due date.

The Center staff will input all the necessary user information into a dBase circulation program. Two printouts of the Center's rules and loan agreement will be automatically generated, one of which needs to be signed and maintained at the Center. The other is for the borrower to keep. A list of all available commercial software is always available at the Center.

New Packages

NOTE: In the following list software packages are for the IBM PC or IBM PC Compatibles, unless specifically marked for the Macintosh.

COMPUTER-AIDED DESIGN

We received from Generic Software, Inc. two CAD programs: **FirstCADD 2.0** and **Generic CADD 3.0** for the IBM-PC. Accompanying **Generic CADD 3.0**, the main program, are five add-on productivity packages which may facilitate your application. These additions are **AutoDimensioning** (add dimensions to a drawing automatically), **AutoConvert 3.0** (exchange drawings between Generic CADD and AutoCAD), **Drafting**

Enhancements 1&2 (create solid or hatched areas within a drawing), and **DotPlot 3.0** (print drawings on a dot matrix printer).

GRAPHICS

A new program for the MAC is **CANVAS**, from Deneba Software. It as a graphics program that integrates MacDraw type objects, high resolution 300 to 2540 dpi images, PostScript and MacPaint type graphics in a single document.

DATABASE SOFTWARE

Database software users now have three more packages to evaluate on the IBM-PC. **dBase Tools for C** gives dBase III Plus users the advantages of C by including more than 40 new functions essential to business, financial, statistical, and math calculations. In addition, C programmers can use this tool to add database management facilities to C. Users looking for a dBase III Plus-compatible product with greater speed may find Fox Software, Inc.'s **FoxBase+ Revision 2.00** ideally suited for your applications. **Oracle**, donated from Oracle Corp., is a Structured Query Language (SQL) relational database management system available for evaluation.

INTEGRATED SOFTWARE

Innovative Software, Inc. has provided us with its **Smart Software System, Version 3.1**. This integrated software system is designed for single-user PCs and multi-user networks. Users can try out Smart's Word processor with Spellchecker, Database Manager, and Spreadsheet with Business Graphics. All modules include asynchronous communications, time manager, and the Smart programming language.

LANGUAGE

The Whitewater Group, Inc.'s **Actor** for the IBM-PC, is an object-oriented programming language which generates Microsoft Windows applications. Unlike conventional programming, object-oriented programming makes it easier to develop, change, and debug advanced programs.

SPREADSHEET

Quattro, Borland's new spreadsheet for the IBM-PC, combines database, business graphics, and application development environments into one package, and also speeds a number of jobs such as graphics, recalculations, macros, searching, sorting, etc.

TYPESETTING

In addition to two copies of **Smart Eyes**, the speed reading training program introduced in the December 1987 issue of *Off-Line*, Addison-Wesley Publishing Company has loaned our library one copy of **Textures** (TEX plus pictures). **Textures for the Mac** is a typesetting package especially applicable to books and technical reports with numerous mathematical formulae and symbols. It combines Macintosh's graphics ability and the TEX document formatting language.

UTILITY

Thanks to Central Point Software, Inc., we have two copies of **PC Tools Deluxe** for the IBM-PC, which include the most popular DOS commands and provide additional features such as recovering files that have been accidentally deleted, locating files on the disk,

finding specific text within a file or disk, etc. This disk and file utility program may be useful in hard disk backup, data recovery, and disk management.

IBM PRODUCTS

BASIC Reference Version 3.20
IBM-RT PC SQL/RT Data Base Interactive Command User's Guide
IBM-RT PC Problem Determination Guide

WISC-WARE

Wisc-Ware is a growing library of academic software. The latest distribution has four new titles:

58. PUFF This computer aided design program for microwave integrated circuits is available at no charge from the Department of Electrical Engineering at the California Institute of Technology.

59. Stage Lighting A disk course in stage lighting with emphasis on technical aspects such as electricity, optics, lighting instruments, lighting control devices, etc.

61. EDC-Elementary Digital Computer An editor for preparing programs and data for the elementary digital computer and a high performance simulator for that computer.

62. MCS-Microprogrammed Computer Simulator An editor for writing and changing microprograms and a simulator that rapidly executes those programs.

(Wisc-Ware has altered their bi-monthly schedule to a quarterly distribution. Please check the January/February 1988 issue of *Off-Line* for the previously published packages. 50 copies of the premier issue of Wisc-Ware News are available. Please ask for your free copy of this newly published newsletter.)

UPDATES

Our update packages include **Apple Computer's Macintosh System Software Update Version 5.0**. This package's two system tools disks and two utilities disks (containing **Apple HD SC Setup, Font/DA Mover, TeachText, Find File, HD Backup, Disk First Aid,** and **Apple File Exchange**) are available at the Center for Mac users with original versions to copy freely.

The much celebrated **HyperCard** has a new update - **Version 1.1**. Apple's HyperCard for the Mac is a simple, programmable database manager which has been considered the most innovative software of 1987. It may change your way of manipulating information.

STATGRAPHICS has a new release, **Version 2.6**. The Office for Information Management has provided the Resource Center the updated documentation and the new diskettes of this package. Anyone who wishes to copy the nine 360k DS/DD diskettes must present a current, valid University staff or student ID, and must fill out and sign a registration form.

DEMO PACKAGES

Demonstration kits of several commercial software packages are on file at the Center for your testing and evaluation. All demo disks may be freely copied.

IBM Demos:

Ingres (SQL relational database management system)
Microsoft QuickC Compiler (demo disks & manuals only)

Microsoft Word 4.0
Zenographics' business graphics software demo disks

Macintosh Demos:
Dimensions (3-D CAD system)
Microsoft PowerPoint (a desktop presentation program)

SITE LICENSE

CSO has purchased a campus wide site license for **Learning Tool (TM)** from Arborworks. Please see the recent *Off-Line* article (Vol. 15, No.4: August-September 1987, page 45) on Learning Tool for a description of this valuable study tool and thought organizer. Copies are available in the MRC. To obtain a copy, bring a blank disk to the MRC, ask for Learning Tool and a free label for proof of license (required on all copies by the terms of the site license) to place on your copy. Copies are FREE.

The Office for Information Management is negotiating a campus site license for SIMSCRIPT II.5 as this article goes to press. Watch for details in the next issue of *Off-Line.*

Hardware and public domain software continue to expand. An IBM PS/2 Model 50 is now available. We expect the arrival of Amiga 500 and 2000 systems shortly. Our collection of public domain software, for the Amiga, currently found on the mainframe, uxe (in /micro/amiga or simply amiga via anonymous ftp), will also be placed on diskette for duplication in the MRC. Another valuable information source is our vertical file, which contains product literature, vendor information, seminar announcements, and newsletters. For example, "Portable Computer News & Views," published by U. S. Ultrasoft, is a newly added newsletter; the first issue focuses on Tandy Laptops. Please drop in and browse through our files; an MRC staff member will assist you in locating materials. Users also may call 244-6261 for MRC information.

The Microcomputer Resource Center has moved to the Federal Room, located in the basement of the Illini Union.

EVERYTHING YOU EVER WANTED TO KNOW ABOUT LOTUS 1-2-3 (ALMOST): PART II

Steven M. Miller
CSO's Microcomputer Group

This article is the second of a three-part series. The first article dealt with database manipulation and miscellaneous data submenu commands. This article covers graphics and the last article will cover macros. These three articles serve as reference material for the CSO short course **M53:Intermediate Spreadsheet**. You may copy this work in its entirety for whatever use you see fit. Lotus 1-2-3 is copyrighted by Lotus Development Corporation. All references to Lotus 1-2-3 in this article refer to Version 2.01. All commands are given in abbreviated form; i.e., /Worksheet,Global,Format,Fixed is represented as /WGFF. A question mark is used to represent a place where the user inputs some variable number, column, or row. For example, to set a column width to some variable number of spaces would be shown as /WCS?.

III. Graphics

There are five different types of graphs that Lotus 1-2-3 can create. These are Line, Bar, XY, Stacked Bar, and Pie graphs (**/GTL, /GTB, /GTX, /GTS,** and **/GTP,** respectively). The Line graph allows comparison of from one to six data ranges over time; e.g., comparing sales figures, net income, and expenditures over the twelve months of a year. Bar graphs emphasize the differences between data sets; e.g., comparing net income to expenditures for the twelve months of a year. XY graphs show relationships between data sets. This allows comparison of one to six data sets to another set; e.g., comparing net income, and expenditures to sales figures. The pie graph compares parts to the whole; e.g., the various parts broken out into percentages which comprise net income. Lotus 1-2-3 allows you to change graph types once data ranges have been set. This, in turn, allows you to choose which graph type best displays the results you wish.

The seven choices of the Graph submenu labeled X and A through F allow setting of the different data ranges for a graph (**/GX** and **/GA...F**), as follows:

- The X range specifies the set of labels for the horizontal axis on line and bar graphs.
- On XY graphs the X range specifies the data set which is to be plotted on the X-axis. The A through F ranges specify the first through sixth data sets to be plotted on the Y axis.
- Pie graphs only use the X, A, and B data range specifications. The X range specifies the labels for the different sections of the pie. The A range specifies the set of values Lotus 1-2-3 will represent as sections of the pie. The B range tells Lotus 1-2-3 which fill pattern to use for each section and whether or not that section is exploded from the pie.

  There are eight different fill patterns which can be used in Lotus 1-2-3. The numbers 1 through 7 are fill patterns as documented in the Lotus 1-2-3 manual (try them!). 0 and 8 represent no-fill patterns. In order to have a section exploded from the pie chart, give Lotus 1-2-3 a fill value of 100 plus the desired fill pattern. For example, if you want to explode an unfilled section, you would use a fill value of either 100 or 108; if you want to explode a filled section, you would use any fill value between 101 and 107.

The **Reset** option (**/GR?**) causes Lotus 1-2-3 to forget the settings for the entire graph or simply a specific range (substituted for the ?).

The **View** option (**/GV**) displays the graph as it is currently configured on the display.

The **Save** option (**/GS**) saves the graph to a file with the extension **.PIC**. This file can be used by other graphics processing software for further manipulation. (PRINTGRAPH and FREELANCE are two examples of this type of software.)

The **Options** submenu has eight options which allow further clarity to be added to graphs. Two of the options, **Color** and **B&W** (**/GOC** and **/GOB**), simply tell Lotus 1-2-3 how to display the graph, in color or black and white. Lotus 1-2-3 will allow graphs to take advantage of color even though the monitor may not be capable of color display. This allows color plots to be made from non-color machines. If the **Color** option (**/GOC**) is chosen, Lotus 1-2-3 will display (View) graphs in black and white, but will plot (using PRINTGRAPH) in color.

The **Legend** option (**/GOL?**) inserts a legend across the bottom of the graph for the data range specified. This will label the different fill patterns, markers, or colors which Lotus 1-2-3 has used to differentiate between the data sets which are displayed on the graph.

The **Format** option (/GOF?) determines how the data points for a given range are displayed on the graph. The points can be represented by symbols, connected by lines, both lines and symbols, or neither (not displayed at all). If 'neither' was chosen but it is still desirable for the data range to be displayed, **Data-Labels** (see below) must be defined for the given data range.

The **Data-Labels** option (/GOD?) specifies a range of cells that Lotus 1-2-3 will use to label data points in a given range. This allows detailed data information to be included in a graph. For example the highest and lowest data points can be labeled as such. If the **Format** option of 'neither' was chosen, **Data-Labels** must be set in order for the points in the data range to be visible. The options A through F in the Data-Labels sub-menu simply specify the data range the labels apply to.

The **Titles** option (/GOT?) allows you to add descriptive titles to the entire graph and to the X and Y axes. The **First** option (/GOTF) specifies the primary title of the graph. This title will be displayed in large type, centered at the top of the graph. The **Second** option (/GOTS) sets a secondary title which is displayed centered under the first title, in smaller type. The **X Axis** and **Y Axis** options (/GOTX and /GOTY), as you would expect, allow you to place labels on the X and Y axes, respectively. These labels will be centered with respect to the particular axis they refer to.

The **Grid** option (/GOG?) allows you to have Lotus 1-2-3 place horizontal, vertical, both horizontal and vertical, or no grid lines on your graph. These grid lines are placed on the graph at intervals corresponding to the scale factors you have set (see **Scale** option).

The **Scale** option (/GOS?) allows you to set the scale factors for the X and Y axes. The **X Scale** and **Y Scale** options (/GOSX and /GOSY) give you several choices as to how you want Lotus 1-2-3 to format your X and Y axes. The **Automatic** option (/GOSXA or /GOSYA) causes Lotus 1-2-3 to scale the axes so that the data points will fill the screen. This causes your smallest data point to be on the bottom of the screen and your largest data point to be on the top of the screen. The **Manual** option (/GOSXM or /GOSYM) causes Lotus 1-2-3 to display the data according to limits which you specify. These limits are set using the **Lower** and **Upper** options (/GOSXL, /GOSYL, /GOSXU, and /GOSYU). The **Lower** option specifies the lower limit for data to be displayed on your graph. For example, if your lower limit is 5, no data points less than 5 will be displayed. Likewise, the **Upper** option sets the upper limit of data which will be displayed on your graph. This means that if your upper limit is set to 100 no values greater than 100 will be displayed on the graph. Also, the lowest value on your X or Y axes will be 5 and the highest value on that axes will be 100, given the above limits. (NOTE: Lotus 1-2-3 ignores a positive lower limit for bar and stacked bar graphs.) The **Format** option (/GOSXF? or /GOSYF?) allows you to specify the format of numbers in the graph scale. This means you can display two digits after the decimal point, integers only, a dollar sign preceding your numbers, or whatever you decide is most meaningful for your graph. The last submenu command for X Scale and Y Scale is the **Indicator** option (/GOSXI or /GOSYI). This option simply determines whether or not Lotus 1-2-3 uses scale indicators when you display the graph. The default is yes. The final option in the Scale submenu is the **Skip** option. The **Skip** option (/GOSS?) tells Lotus 1-2-3 to only label every nth element on the X axis. For example a skip factor of 3 labels the first, fourth, seventh, etc., data elements along the X axis. This command only affects the X axis.

This concludes the discussion of the Options submenu. As you can see, there are a large number of options which you can use to tailor your graphs to fit your needs. Now, let's return to the original Graph submenu and finish exploring its options.

The last option in the Graph submenu is the **Name** option (/GN?). This option allows you to name a graph. This causes Lotus 1-2-3 to save all the settings pertaining to a graph under a name which you can use at a later time. This means you can have several graphs associated with a single worksheet and switch between them at will. In order to name a graph, it first must be created. To do this use the **Create** option from the Name submenu (/GNC?). Lotus 1-2-3 will prompt you for a graph name which you input. If you input the name of a currently existing graph, Lotus 1-2-3 will replace that graph with the current settings you have selected. WARNING! You will not be prompted or warned about overwriting a previously existing graph! Now, since we have a named graph, all we need do to display it is tell Lotus 1-2-3 to Use the settings it has saved. This is done with the Use option from the Name submenu (/GNU?). Once you have input, or selected from the displayed list, a graph name, Lotus 1-2-3 replaces the current graph settings with those saved under the graph name and displays that graph. The last two commands in the Name submenu are **Delete** and **Reset** (/GND? and /GNR). The **Delete** option deletes graphs you no longer wish to keep. This frees up the graph name for other use. The **Reset** option erases ALL named graphs from Lotus 1-2-3's memory. Only the current graph settings will remain. These settings are not named. **A note of caution: BOTH THE DELETE AND RESET OPTIONS DO NOT PROMPT FOR CONFIRMATION. THEY ACT IMMEDIATELY AND RETURN YOU TO THE GRAPH OPTIONS MENU. BE CAREFUL!!**

This finishes the discussion of the graphics capabilities of Lotus 1-2-3. As you can see, Lotus 1-2-3 is an easy-to-use and effective means of quickly generating graphs from your data. Lotus 1-2-3 contains a great deal of flexibility not always present in other packages.

If you have questions or comments regarding this article feel free to call me (Steven Miller) at 244-0730.

MODIFYING TERMCAP (UNIX) TO WORK WITH APPLE KERMIT

Brad Carlson
CSO's PC Custom Services Consultant

This document describes the theory and procedure for creating a custom termcap file for use with Apple][+ Kermit v3.79. It is assumed that the reader is aware of, if not familiar with, vi, the Kermit program, the concept of a character, and the fact that different terminals work differently--each is picky about the characters sent to it.

Recently, I installed Kermit v3.79 on an Apple][+ with a modem, primarily for its vt100 terminal emulation capability. The idea was to use it with vi on a Unix machine. However, it was having problems replotting the screen.

When vi replots the screen, it first clears the screen and then sends cursor positioning commands; Kermit would clear the screen properly, but then drop some of the vt100 control characters. The problem was that Kermit and/or the Apple took so long to clear the screen that it was not ready by the time more data came in. The solution was to insert some type of delay after the clear screen operation.

As it turns out, somebody has already thought of this. On Unix BSD 4.2/4.3 machines there is a file called /etc/termcap that contains the descriptions and requirements for a large number of terminals. Each terminal has an entry with its name (and nicknames) followed by a colon-separated list of all its capabilities. Each capability is represented by a two-letter code. For example, the clear-screen

operation is represented by **cl**. The UNIX command **man termcap** describes termcap. Type **man 5 termcap** to get definitions of the two-letter codes.

A fragment of the termcap entry for vt100 is shown below:

```
d0|vt100|vt100-am|vt100|dec  vt100:\
    :cr=^M:do=^J:nl=^J:bl=^G:co#80:li#24:cl=50\E[;H\E[2J:\
    . . . and so on
```

The **cl** entry specifies a number (50) and a sequence of characters (\E stands for the <esc> character). The sequence of characters forms a command for the vt100 to clear the screen. The number 50 tells a program like vi to wait 50 milliseconds after sending the command before doing anything else, since it will take this long for the vt100 to complete the operation. This feature is called padding.

Kermit v3.79 running on an Apple][+ is a lot slower than a genuine vt100: it takes more than 50 ms to clear the screen and so will drop characters received during that time. After some experimenting it was found that 300 ms of padding was sufficient.

Below is part of the modified termcap entry (note the name apple):

```
# For Kermit-65 vt100 emulation; Apple ][e cannot clean screen
# fast enough in standard padding time, and thus will drop chars
# Lines like these are comments
d0|apple|vt100-am|vt100|kermit vt100 mode with extra padding for cl:\
    :cr=^M:do=^J:nl=^J:bl=^G:co#80:li#24:cl=300\E[;H\E[2J:\
    . . . and so on
```

Now, how does one put these ideas into practice? One solution is to make a termcap file of your own. To do this, first type

cd; vi /etc/termcap

then look for the entry for vt100; type

/vt100

Then, hit **k** to move up one line; now type

:1,.d

to delete earlier entries; then move the cursor down, using **j**, to the beginning of the next entry after vt100 and type

:.,$d

to delete entries after vt100. Now, refer to the example above and put the cursor at the start of the 50 (or whatever) for the **cl** specification; to change it to 300 type

cw300<esc>

(That's a single <esc> keypress instead of <return>.) Now type

:w termcap

to save the entry in a file in your home directory. Exit the vi editor by typing **ZZ** (be sure to use capital ZZ, not lower case zz).

In order to use this custom termcap file, you must tell Unix about it each time you login using an Apple with Kermit. After logging in, type

setenv TERMCAP ~/termcap; set term=vt100; tset

If you use /bin/sh, type

TERMCAP=${HOME}/termcap; export TERMCAP

For those with more expertise, you may include entries for all your commonly used terminals in your private termcap file, and have your .login script use it automatically.

SITE LICENSING ARRANGEMENT FOR DOS & MAC SYSTAT AT THE UNIVERSITY OF ILLINOIS

Anup Roy
CSO Statistical Consultant

The Statistical Services group at CSO has set up site-licensing arrangements (for UIUC faculty, staff, and students) for a comprehensive statistical software package called **Systat** for both DOS and Macintosh systems. **Users will have to sign an end-users agreement with the University and they will have to pay an initial royalty/licensing fee (for each copy licensed) as well as a yearly renewal fee.**

Systat (The System for Statistics) is a comprehensive statistical, graphics and data management package. It is available on a variety of machines/operating systems, including IBM PC, PC/XT and PC/AT and PC-compatibles under MS-DOS (or PC-DOS), and the Apple Macintosh. It is marketed by Systat. Inc., Evanston, Illinois.

Systat Version 3.0 on the IBM PC (or compatibles) requires DOS 2.0 (or a later version) on a machine that can read standard 5 1/4" diskettes. It requires 256K RAM of memory, and two double-sided floppy disk drives or a hard disk. Systat operates with or without the 8087 or 80287 math coprocessor. Compatible machines include, but are not limited to: AT&T, Burroughs, Columbia, Compaq, Corona, HP Vectra, Leading Edge, Sperry, Tandy, Televideo, TI Professional, Wang, and Zenith.

Three flavors of Systat Version 3.1 are available for the Apple Macintosh: (1) a version for 512K machines, (2) a version for machines with 1 megabyte of RAM, and (3) a version for machines with 1 megabyte of RAM memory and the 68020/68881 coprocessor.

Systat Distribution

In keeping with the License Agreement that the University of Illinois at Urbana-Champaign has entered into with Systat, Inc., an agreement/contract between the University and the end-user has been developed. The end-user agreement will have stipulations for compliance. It will contain a form to be filled out with questions pertaining to hardware specifications and the actual location of the hardware. The end-user agreement can be obtained from the Systems Consulting Office at 1208 W. Springfield, or the Statistical Consulting Office in Room 85 Commerce West. The completed end-user agreement (**including both office & home addresses and phone numbers**) should be brought to the CSO Accounting Office at 1208 W. Springfield. A photocopy may be made for personal files.

The end-user agreement will serve several purposes. First, it will be a means by which the University can uphold the stipulations in the License Agreement between Systat and itself. Secondly, it will aid CSO in keeping accurate records of who has licensed the software. Third, the information will be added to the Systat User's Mailing List which will be used to inform users about updates, etc.

DOS Systat Version 3.0 consists of five 360K 5 1/4" DS/DD diskettes, numbered 1 through 5, containing all the statistics modules, a DOS "Mystat" (personal version of Systat) disk, and a "Lazerte editor" disk. The MAC Systat Version 3.1 comes on four 800K 3 1/2" DS/DD disks. Users will have to specify which of the three MAC flavors they are planning on using; viz., 512K MAC, or 1 Meg MAC (i.e., MAC-SE & MAC+), or the 68020/68881 MAC (1 megabyte of RAM memory and a coprocessor -- i.e., a MAC II). **The price for obtaining either one of the Systat versions is $100.00, which includes the initial royalty fee, license fee for the first year, copying fee, and the price of the diskettes.** Please note that the user has to take his/her pick among the four available options; if the user wants more than one version (say, one for a MAC II in the office, and one for a MAC+ for home use), the user will have to pay for multiple versions.

The license fee covers free software updates. Thus, when Systat Version 4.0 is made available (promised release date is around the middle of 1988), the user will **not** have to pay for the diskettes and the copying fee if he/she desires the updated software. **However, since one is mandated by the License Agreement to purchase the documentation in order to qualify for software licensing, users should be forewarned that they will need to purchase the new, updated documentation to be able to upgrade to Version 4.0 when made available.**

The license between Systat, Inc. and the University will be renewed on the 18th of July every year. Similarly, **the end-user agreement must also be renewed on each anniversary date in successive years.** Subsequent yearly renewals will cost from $50.00 - $80.00, depending on various factors too complicated to make an accurate forecast as of now.

The software is licensed, in general, for use on a single machine only. Multiple machine use requires the purchase of multiple copies. The only exception to this stipulation is that home use is permitted, provided that the total number of copies in home use does not exceed the total number of copies in use on University premises under the terms and conditions of the pertinent end-user agreement.

Systat may be licensed by any bona fide faculty/staff or student at the University of Illinois (Urbana-Champaign campus only). **A valid University faculty/staff/student ID card (along with a valid picture ID) will suffice as proper identification. Please bring these to the Accounting Office at 1208 W. Springfield when you apply for the package.** A University Store Voucher with

the proper 11-digit University account information can be processed by the people in CSO's Accounting Office. Individuals may also pay by personal check, made out to the University of Illinois. Cash will **not** be accepted.

Summarized below are the prices for the software and documentation:

Product	Price
Systat initial royalty, yearly license, diskette and copying fees (per copy)	$100.00
Systat DOS/MAC documentation	$40.00
MAC Systat supplemental documentation (graphics option)	$10.00
Systat yearly renewal fee (estimate only)	$50 - $80

Systat Diskette Replacement Policy

If, for any reason, a Systat diskette is deemed defective and hence unusable, a free replacement will be made. Please call Anup Roy at 244-1201; he will replace the defective diskette with a new one.

Systat Consulting

The CSO Statistical Consultants will provide consulting on Systat. Their office is in 85 Commerce West. Office hours are 9am-1pm Mondays and Wednesdays, 9am-5pm Tuesdays and Thursdays, and 9am-11:45am & 1:15pm-5pm Fridays. The telephone number is 333-2170.

The Statistical Consultants will be able to consult on Systat programming techniques and statistical procedures. They also will be able to consult on any questions regarding installation procedure.

Anup Roy will take ultimate responsibility for all issues concerning Systat. These issues include, but are not limited to, the following: licensing, copying, distribution, installation, consulting, use and training. All questions and/or problems that can not be handled by the Statistical Consultants may be referred to him at 244-1201.

Systat Description

The remainder of this article is an updated version of an article that appeared in the October-November 1987 issue of *Off-Line*. It gives a brief description of Systat to help you decide if this package might be of use to you.

Systat is easy to use, flexible and very powerful. Its broad range of statistical capabilities includes the full array of univariate and multivariate analyses. Extensive graphics and a full-screen editor allow easy visual displays of data. Optional statistical modules offer state-of-the-art procedures not available in most general purpose statistical packages.

Systat was not written for any particular computer. It was designed, instead, to provide a modular working environment which can easily adapt to new machine architecture and user interfaces. On MS-DOS machines, Systat takes advantage of coprocessors and RAM-disks as well as code optimizers to achieve extraordinary speed. On the Apple Macintosh, Systat uses windows, scroll bars, menus and dialog boxes to simplify learning. On any given machine, you'll appreciate the tailored feel of the package. If you use more than one machine, you'll avoid having to learn new program syntax.

Systat is highly portable. Special care was taken to ensure that Systat prints exactly the same results regardless of the computer installation. For instance, the random number generator produces the exact same sequence of numbers for the same starting seed on every machine.

Getting started with Systat is easy. The commands are familiar to users of SAS, SPSS-X, and BMDP. Systat uses a combination of commands and menus which allow new users to learn the system in small steps and experienced users to perform complex operations in a few keystrokes. Systat avoids complicated options, semicolons, special symbols and jargon, and rigid command syntax.

Systat allows processing of datasets containing up to 200 variables. Character or alphanumeric variables are allowed. The maximum number of columns permitted for a single variable is 12. Any one data file can contain up to 32,000 cases.

Many companies claim that their programs are interactive. That's because they are comparing the way their programs work on the PC to the rigid way they operate on a mainframe. However, porting a package to a PC and dressing it up with windows and menus does not make it interactive. In a truly interactive program, the order of commands should not matter. An interactive package is not littered with numbered options, duplicated procedures, and error logs. Systat truly operates as an interactive package. When you make an error with Systat, you can correct it immediately and continue with your work. If one doesn't want to work interactively, Systat can be used in a "batch-processing" mode as well.

Systat claims to be the most accurate comprehensive statistical package available on any computer. Numerous academic reviews have demonstrated Systat's regression routine, for instance, to be more accurate than SAS Proc GLM and SPSS-X Regression, and other widely used programs.

Systat is written in Fortran and translated with optimizing compilers. It is optimized to take advantage of numeric coprocessors and other special features of different machines. Systat is alleged to be faster on microcomputer versions than the average mainframe time-sharing system running statistics under moderate loads. On a standard IBM PC, Systat computes a 25 by 25 Pearson product-moment correlation matrix as fast as the data can be read into the system. A multiple regression of a single dependent variable, regressed on these 25 continuous variables, can be computed in less than 15 clock seconds.

Systat has a full-screen editor which looks like a spreadsheet. Unlike most spreadsheets, however, this editor is capable of handling a file as large as one's disk can hold. One can enter data into a Systat file by moving the cursor anywhere on the screen. Cursor controls include up, down, left, right, page-up, page-down, home, and end. Files from mainframe and other micro spreadsheet and database packages can be imported and edited in much the same fashion.

DOS Systat Version 3.0 comes with another high-speed data editor called the "Lazerte editor," which resembles the one in Systat. PC/XT/AT users with numeric coprocessors may want to use this for most of their data editing.

Like most statistical packages, Systat can input new data and transform variables. In addition, Systat includes a comprehensive database manager. Systat's data module can merge files with different numbers of records, match different files on key variables, and select subsets of files for analysis with a single command.

In addition to file management commands, Systat includes simple commands to sort, rank and standardize single variables or whole files. You may create value labels or recode values with a single command. There is even a command to transpose a whole file.

Systat includes an extended precision programming language with advanced statistical functions. Thus, if one needs to program complicated data transformations, one has access to the appropriate programming tools.

The graphics module in Systat (yet to be released for the MS-DOS version; but scheduled for April/May 1988 availability) offers more types of statistical graphics than most mainframe packages. In addition to the usual histograms, bar charts and scatter plots, it produces stem-and-leaf diagrams, single and grouped box plots, detrended probability plots, contour plots and quantile plots. All standard graphics fit on a single screen or 80-column computer printout. These displays will print on any type of system printer — daisy wheel, dot matrix, or laser. On IBM PC-compatible machines, Systat can use the extended graphics character set for continuous lines and special symbols. Of course, graphics can be saved into disk files so that one may use them in concert with word processing and other text documents. The Apple Macintosh version contains high resolution statistical graphics. Two- and three-dimensional plots allow one to display more complex data, and specialized graphics, such as scatterplot matrices, providing unique analytic displays.

Highlighted below are some of the statistical capabilities of Systat:

Basic Statistics

- Descriptive statistics
- t-tests (dependent and independent)
- Bartlett's test for homogeneity of variance
- Duncan, Tukey and Newman-Keuls post-hoc tests for one-way and factorial designs

Tables

- Multiway crosstabulations
- Multinomial confidence intervals
- Hierarchical loglinear modeling (including structural zeros)
- Numerous coefficients/measures of association and their asymptotic standard errors

Correlations

- Pearson
- Spearman
- Gamma
- Sum of product
- Covariance
- Kendall's tau
- Euclidean distances with pairwise or listwise deletion of missing data
- Saving of output matrices for direct analyses using other statistical modules

Nonparametrics

- Nonparametric coefficients including Spearman's rho, Kendall's tau-b, Goodman-Kruskal's gamma, and Kendall's coefficient of concordance
- Sign test
- Wilcoxon signed ranks test
- Runs test
- Friedman's two-way analysis of variance
- Kruskal-Wallis one-way analysis of variance
- Mann-Whitney U
- Kolmogorov-Smirnov one- and two-sample tests
- Lilliefor's test

Canonical correlation analysis

- Includes ability to save canonical scores into a Systat file

Discriminant analysis

- Fisher's two-group and multi-group discriminant analyses
- Save discriminant scores

- Classification of new observations into groups
- Rotation of discriminant function axes

Cluster analysis

- Single, complete, average, median and centroid linkage
- Hierarchical clustering
- Labeling of cases on dendrograms/tree displays
- Tukey's gapping method for identifying unidimensional clusters
- k-means clustering

Analysis of variance and covariance

- Factorial designs including fixed and random effects, balanced and unbalanced designs
- True least-squares estimation, with custom selection of error terms
- Repeated measures analysis via univariate and multivariate models
- Analysis of covariance, with homogeneity of slopes test
- MANOVA (including repeated measures)
- True general linear model tests including: arbitrary contrasts on dependent variables, and arbitrary contrasts on independent variables
- More accurate effects matrices than in SAS Proc GLM and other widely-used analysis of variance programs

Multidimensional scaling

- Kruskal or Guttman methods
- Monotonic or linear models in up to 5 dimensions
- Input starting configuration specification
- Minkowski metric
- Saved computed distances, configurations or residuals
- Shepherd diagrams

Time series analysis

- Time domain methods including linear and nonlinear smoothing
- Lowess scatterplot smoothing
- Box-Jenkins seasonal and nonseasonal ARIMA models
- Identification and diagnosis via autocorrelation plots, partial autocorrelation plots and error correlation plots
- Differencing, logging, squaring, demeaning and detrending
- cosine tapering transformations
- Frequency domain methods including regular and inverse fast Fourier transform
- Periodograms
- Residuals and forecasts from all routines can be saved into Systat files

Regression

- Simple, multiple linear and polynomial regression
- Stepwise estimation option
- Extensive regression diagnostics including colinearity measures, condition indices, variance proportions, residuals, leverage statistics, Cook's D, externally studentized residuals, Durbin-Watson statistic, Mahalanobis distances
- Multivariate regression routines including multivariate F-tests, canonical variates
- More accurate regression estimates than SAS "Proc Reg" and other widely-used regression packages

Principal components and factor analyses

- Principal components or classical common factor analyses or image factoring, with optional rotation, factor scores and plots
- Can save loadings, component/factor scores or coefficients into a file
- Three types of rotation: varimax, equimax and quartimax
- Correlation and covariance matrices accepted as input

Systat has additional products available that are not included in the site-licensed package, but may be purchased separately. If you are interested in acquiring copies of any of these supplementary products, please contact Anup Roy through campus mail to 150 DCL or call 244-1201. Some of these products are listed below:

Design (MS/PC-DOS and Macintosh)

It provides three distinct capabilities:

- Sample size estimation to obtain desired statistical power given an effect size and significance levels (can also be used to estimate statistical power at specific sample sizes)
- Tables of expected mean squares for balanced experiments using the Cornfield and Tukey algorithm (1956)
- Randomization plans generated by specifying details of an experiment through a series of commands

Logit (MS/PC-DOS and Macintosh)

- Logistic regression for binary and multinomial dependent variables estimated by the maximum likelihood method
- Interactions entered directly on the model statement
- Dummy variables generated automatically using one command

Probit (MS/PC-DOS and Macintosh)

- Method for estimating multiple regression or analysis of covariance model when the dependent variable is categorical (and more specifically binary)
- Produces parameter estimates and standard errors by the method of maximum likelihood; also variance-covariance matrices, z-scores, and Mill's ratios
- Automatic generation of dummy variables and interactions

Report writer (MS/PC-DOS only)

- For scientific presentations and business reports

Testat (MS/PC-DOS and Macintosh)

- Provides test summary statistics, reliability coefficients, standard errors of measurement for selected score intervals, and item analysis statistics for multiple item tests
- Summary statistics for individual respondents
- Graphic displays of test and item/scale cumulative histograms

Tobit (MS/PC-DOS only)

- Designed for regression analysis with any form of one-sided censored data

- Produces parameter estimates and standard errors by the method of maximum likelihood; also variance-covariance matrices, predicted values, residuals and Mill's ratios

2SLS (MS/PC-DOS only)

- Estimates two-stage least-squares regression models
- Computes heteroscedasticity consistent (robust) standard errors for both OLS and 2SLS
- Can optionally test ordinary regression models for heteroscedasticity and neglected non-linearity

Stat/transfer (MS/Pc-DOS only)

- Provides an easy method for transporting data between Systat and Lotus 1-2-3, SPSS/PC+, STATA, Gauss, dBase II and dBase III, and SPSS-X export files (via Kermit)

Large 512K version (MS/PC-DOS only)

- This "large-memory" version works exactly like the regular 256K version of DOS Systat, but allows one to work on much larger scale problems. This version of Systat is not any faster — just larger.

Mystat (the "personal version" of Systat)

- Mystat is a condensed version of Systat which is designed for educational use on a DOS-based system. It can work with 256K RAM bytes of memory and a system containing two floppy disk drives or a hard disk. Mystat can handle up to 32,000 cases and 50 variables. It provides a full-screen data editor and has extensive statistical capabilities. Mystat enables one to perform full algebraic transformations and to sort and rank variables. The entire program functions under a single menu, with extensive on-line help and an interactive tutorial to demonstrate its use. The manual also comes on the disk.

  Because Mystat is completely self-contained and is a proper subset of Systat (with identical routines as those used in Systat), it is ideal for instructional purposes. There is no charge for the program. Although the disk is copyrighted, it may be duplicated in unlimited quantities for non-commercial teaching purposes. It may not, however, be resold.

  Mystat is available from the CSO Microcomputer Resource Center (101 S. Gregory, Urbana). Please bring a formatted 360KB double-sided double-density diskette to make your copy of Mystat.

Program Documentation

Wilkinson, Leland, *SYSTAT: The System for Statistics (1987)*, Systat, Inc., Evanston, Illinois [$40.00. Must be purchased with the site-licensed version of the product].

Systat, Inc., *SYSTAT Graphics for the Macintosh* (1987), Systat, Inc., Evanston, Illinois [$10.00. Must be purchased with the Macintosh version.]

SITE LICENSING ARRANGEMENT FOR STATGRAPHICS (MS/PC-DOS) AT THE UNIVERSITY OF ILLINOIS

Ram Reddy
Head Consultant, Office for Information Management

Anup Roy
CSO Statistical Consultant

During the summer of 1987, the Office for Information Management (OIM) of the College of Commerce and Business Administration at the University of Illinois at Urbana-Champaign negotiated an unlimited site license agreement with STSC, Inc., Rockville, Maryland, for STATGRAPHICS. Under the terms of the license, "University of Illinois may place such copies only on computers that are owned, leased, rented, or borrowed by the University of Illinois, its faculty, its employees, and its students. Such copies may be used only by the faculty, employees, and students of the University of Illinois for nonprofit academic use."

OIM handles the distribution of Statgraphics to members of the College of Commerce and Business Administration only. However, since OIM was gracious enough to decide to release this software package for FREE to any bona fide faculty/staff/student at UIUC for academic use, they gave a copy of the package to the Microcomputer Resource Center (MRC) for general distribution to those outside the College of Commerce. Persons interested in obtaining a copy of Statgraphics must present a current, valid University ID and sign a license agreement form; they should also bring nine (9) diskettes to copy the program.

The entire Statgraphics Version 2.6 product comes on 9 360K DS/DD diskettes. The disks are as follows: Startup disk, Program disks #1-5, Sample data-sets/online help disk, Graphics drivers disks $1-2.

The Statgraphics Version 2.6 documentation is available for purchase at the Illini Union Bookstore on Wright Street for approximately $50.00. There is a manual available at both the MRC and the Statistical Consulting Office (85 Comm West) for perusal by any interested user. Please note, however, that copying pages from these manuals is illegal under the terms of the site-license agreement.

Users should call OIM at 244-5000 if they have any questions regarding the mechanics of using the product. If the questions, on the other hand, deal with intricate statistical details of any particular Statgraphics routine, users will be expected to call the CSO Statistical Consultants (85 Comm West) at 333-2170.

The remainder of this article is devoted to providing a brief description of Statgraphics so that you may determine if this particular package might be of any use to you.

Statgraphics is a software package that was written exclusively for the IBM PC (and compatibles) environment. In addition to having a wide variety of statistical and numerical functions, the package also has very high resolution graphics. It allows the user an exhaustive look at data from numerical and graphical perspectives, with minimal effort and without the user having to master a new language. All procedures can be accessed through menus. Easily understood on-screen messages and prompts make the package's power accessible, even to novice users.

Statgraphics has context sensitive on-line help which is thorough enough to make the user's manual redundant for most procedures. However, to fully exploit this package's power, the manual is a

must. The experienced user can bypass the menus altogether and invoke procedures with simple 3-6 letter mnemonics.

The package is written in APL -- a version of APL called STSC's APL*PLUS PC. The program allows optional access directly to an APL window for data manipulation. The user can write his/her own procedures and incorporate them into Statgraphics (Note: in addition to Statgraphics, one needs to have STSC's APL*PLUS PC system software to do this). This option allows expandability and inclusion of procedures and algorithms specific to the user's application(s).

Statgraphics needs the following minimum hardware and system software to work properly: an IBM personal computer (XT, AT, or PS/2) or 100% compatible; at least 512K of RAM (640K is required for some procedures); a standard DOS keyboard; two disk drives; a graphics adapter and display; and DOS Version 2.0 or later. First time installation of the package is non-trivial; device drivers can be loaded into memory and removed without rebooting the machine. This allows one to recover all the memory grabbed by Statgraphics' device drivers at the end of a session.

Statgraphics allows presentation of results in a wide variety of ways. It has a slide show capability that allows one to select and display graphics and text screens. A number of printers, high resolution color and monochrome graphics adapters, and pen plotters are supported by the package.

The program can import and export data in a wide variety of formats (e.g., Lotus, ASCII, DIF, dBase, etc.). It also allows graphs to be saved in metafile format, which can then be imported into graphics packages like Freelance Plus and some desktop publishing packages.

Statgraphics has a spreadsheet-like data editor which is very easy to use. The editor in Version 2.6 is entirely menu driven, unlike the earlier versions. During start-up, the program automatically locates and opens files, and prepares all previously saved variables for analysis. The user does not have to explicitly open or close files. Variables can be annotated (with up to 30-character "variable labels") for recognition at a later date -- this makes life a lot easier when coming back to a data set after a couple of months. Variables can be included in the same procedure even if they belong to different files.

Some of the capabilities of Statgraphics Version 2.6 are: data management, report writing and graphic display, descriptive statistics, exploratory data analysis, analysis of variance, regression analysis, forecasting, smoothing, time series analysis, quality control, categorical data analysis, non-parametric statistical methods, and multivariate methods (e.g., principal components, factor, cluster, canonical correlation and discriminant analyses, etc.).

It is our contention that Statgraphics Version 2.6 has enough breadth to make it an all-purpose analytical tool. However, it really lacks the depth of some of the other PC statistical packages like Systat, SPSS/PC+, PC/SAS, etc. For instance, one of the principal limitations of this package is the relatively small number of variables and cases it can handle under normal circumstances. Its capacity can be considerably improved, however, by removing all but the necessary device drivers from RAM. In general, one could say that Statgraphics Version 2.6 is a great "teaching tool" for graduate statistics classes, but that it may not be appropriate for large research projects.

HP LASERJET WARNING

Hewlett-Packard has recently warned that users of LaserJet printers should not connect them to mechanical switchboxes used for sharing one printer with multiple computers. Manually turning such a switch without turning off the printer can send slight voltage spikes to the printer that, over time, can wear out an expensive component in the printer. Anyone using a manually switched box for sharing a LaserJet should look into getting an automatic switchbox as a replacement -- or remember to turn off the printer before manually switching.

Users should also remember the earlier warning -- laser printing onto output from a photocopier or a previously laser-printed page can damage a laser printer by melting the toner from the first pass onto the printer drum. However, it is safe to print onto the **back** of such materials if necessary.

SELF SERVICE COMPUTER GRAPHICS CENTER

Warren Johnson
Office of Instructional and Management Services

(Editor's Note: This article has been submitted for publication by the Office of Instructional and Management Services. CSO joins in encouraging the user community to fully utilize this facility.)

The Self Service Computer Graphics Center is a resource provided by the Office of Instructional and Management Services for teaching faculty and assistants who want to prepare their own materials for the classroom, such as slides, overhead transparencies, and printed handouts.

The Self Service Computer Graphics Center is also an excellent resource for faculty, staff, and students producing their own graphic presentation and publication materials for non-instructional purposes.

Facilities

The Self Service Computer Graphics Center has IBM-PC and Apple Macintosh microcomputers outputting to an Apple LaserWriter, a Polaroid Palette camera, and an HP pen plotter. Many current software packages are available, including: Lotus Freelance, MS Word, PC Storyboard, Cricket Draw, Cricket Graph, Pagemaker, MS Chart, MacWrite, MacDraw, MacLink, and Adobe Illustrator. Reservations are taken, so users do not have to wait for access to equipment.

Charges

Those producing materials for instruction pay only for materials used, such as film or laser prints. For non-instructional uses, there is a facilities charge of $2.00 per hour, and charges for consultation time in excess of fifteen minutes.

Information and Reservations

The Self Service Computer Graphics Center is open Monday through Friday, 8-12 and 1-5. For reservations to use the Self Service Computer Graphics Center, contact the Office of Instructional and Management Services, Division of Instructional Media and Technology, 405 Engineering Hall, 333-3690. For more information, contact Warren Johnson at 244-2585.

STUDENT HAS INVENTED A HARDWARE/SOFTWARE INTERFACE BETWEEN IBM AND APPLE PC'S AND POCKET COMPUTER

This article has been contributed by Louis Wozniak, Department of General Engineering, and his wife, Jo Ann. The article is about their son, Louis Wozniak, Jr.

Louis Wozniak, Jr., has invented a hardware/software interface between IBM and Apple PCs and the Sharp pocket computer. It all began when Louis wondered what the interface port on his Sharp could be used for.

But let's go back into young Wozniak's life to see what led him to this point. Since he was very young, Louis has been a non-stop question machine. Unlike most of the rest of us, the questions are still coming. He has long satisfied his curiosity by building things; e.g., robots out of oatmeal boxes, strobelights out of old motors, a skiing machine from a lawnmower-turned-motorbike.

Then, for Christmas his sophomore year in high school, he received a computer. Although many might think of a computer as a finished product, it wasn't long before Louis was spreading its contents over three desktops. Electric cables, printed circuit boards and testing equipment soon edged out earlier projects.

During his junior year in high school, he programmed pipe corrosion data for the Corps of Engineers. In the summer between his junior and senior years, his work with the Corps took him to Texas to work on voice recognition. During this period he created a voice-recognition program for a pocket calculator. He won first place at the Illinois Junior Academy of Science fair during his senior year for this voice-activated calculator. His principal talked him into creating a keypad for the school computer.

Three years after receiving his first computer, and during his freshman year at the University of Illinois, Louis built his own computer. He is currently working on the design of another computer and working with his father to optimize digital control of hydrogenerators for the United States Bureau of Reclamation. He has worked in California and Colorado, interfacing personal computers with power dam controllers.

This brings us back to the point of inventing the pc-pocket computer interface. Like most engineering students, Louis had to take Electrical Engineering 260. He programmed his Sharp pocket computer to aid him in his calculations when taking exams, and also used it for entering programs and data. However, because the pocket computer had such a tiny keyboard, he found it frustrating to work with. So Louis created software and a peripheral card to connect the portable Sharp pocket computer to a desktop IBM or Apple computer. Two software programs resulted: PortaLink and Databus.

He has used PortaLink in class work. With it, he can create programs on the desktop computer and download them to the pocket computer. His pocket computer suddenly became a powerful, time-saving tool for class and exams, especially in his circuits class. A similar product, Databus, allows data taken on a pocket computer to be uploaded directly to a desktop computer. He is the first person to have designed such a system for the Sharp computer.

He has carried things a step farther by starting his own company (with his father as a partner). His company, Chipper, markets two products, PortaLink and Databus. The new company has its own P.O. Box, 124, Champaign and its own logo, a chipmunk working at a computer. The United States Department of Transportation and the United States Army's Construction Engineering Research Lab have already bought and are using Chipper products. Questions about his products are now being fired at the "kid" who likes to ask the questions. The computer that enchanted the teenager who was struggling with school, has eased his way through scholastic and real-world education.

ATTENTION!
CYBER 175 TO BE REMOVED DECEMBER 1988

The Computing Services Office will remove the Cyber 175 in **December 1988.** In recent years more and more people have moved their computing from the Cyber to other systems. Nonetheless, a large number of people still use the Cyber. These users are encouraged to consider whether their current computing projects can be completed on the Cyber before December 1988, or whether their work should be moved to another system. CSO's central services are being structured around the dual offering of CMS and UNIX. Our efforts are to continuously improve the services on both operating systems.

In deciding which system is best as a target for conversion, we suggest the following:

- Obtain a document entitled "Cyber Conversion -- An Overview" from the Systems Consulting Office (1208 W. Springfield, Urbana) or the Statistical Consulting Office (85 Commerce West). This document describes the options currently available to users wishing to convert from the Cyber, and CSO's policies governing assistance available to users undergoing a conversion.

- SPSS users should obtain a document titled "Converting Your SPSS Program and Data from the CDC Cyber." (See article in this section.)

- Attend one of the several Short Courses we will be offering with regard to the conversion.

- Questions requiring a **short** answer may be asked via email directed to CSO at UIUCVMD.

ATTENTION!
INSTRUCTORS WHOSE CLASSES USE THE CYBER

An examination of our Cyber database indicates that numerous classes still use the Cyber computer. Since Cyber service will be discontinued in December, 1988, it will be necessary for instructors to place their classes on other computers.

It is our intention at CSO to accommodate your teaching needs by providing, on other machines, software which is equivalent or similar to that which you have been using on the Cyber. In addition, the CSO consulting staff can assist you if you have questions regarding converting your own software to run on another computer. We encourage you to begin now to plan the move of your classes from the Cyber to another machine. To assist you, we have written a document which provides an overview of conversion issues. This Cyber conversion document is available in the Systems Consulting Office (1208 W. Springfield, Urbana) and in the Statistical Consulting Office (85 Commerce West).

Joan Alster of CSO will coordinate the conversion of Cyber instructional applications. If you have concerns, comments, or questions regarding your conversion needs, please contact her at 244-0937, or via electronic mail with the Cyber command TELL,ALSTER@UIUCVMD. We at CSO are anxious to help make your transition to another computer as smooth as possible. Please evaluate your needs now and let us know of special requirements you may have, so we can begin to address your concerns.

SPSS CONVERSION DOCUMENT AVAILABLE

Joan Mills
CSO Statistical Consultant

A document titled, "Converting Your SPSS Program and Data from the CDC Cyber," is now available in the CSO Consulting Offices (Statistical Consulting Office, 85 Commerce West; Systems Consulting Office, 1208 West Springfield, Urbana). A supplementary document that contains general Cyber conversion suggestions is called "Cyber Conversion - An Overview." This document is also available at the Consulting Offices.

Cyber SPSS users are encouraged to examine this document and to plan the conversion of their programs and SPSS system files to another system. Users are strongly advised to assess the resources needed to convert their particular project (person-time, computer-time, computer tapes, etc.) and to schedule their conversion in a timely way.

The SPSS conversion document is also available on-line on the Cyber. It may be obtained via the command

WRITEUP,SPSCONV

CYBER SHARE-LIB: SPP CONVERTED TO RUN ON IBM

Joan Mills

The Cyber Share-lib program (accessed by GRAB/SHARED) called SPP has been converted by its support group to run on IBM CMS. It is stored on the VMD machine's SHARED disk. SPP, which is mnemonic for Student Problem Package, is a package of programs for analyzing item response patterns of student test data.

To access SPP on VMD, type

LINKTO SPP (SHARED

To get more information on-linne, follow the LINKTO with

HELP SHARED SPP

The help file will tell you how to contact the Office of Educational Testing, Research and Service, which supports the product, and how to view or purchase documentation.

Some other Cyber Share-lib programs are also being converted by their supporters to run on other systems. Their availability will be announced in future issues of *Off-Line*.

WHAT IS TCP/IP?

Dave Katz, University of Michigan

(Editor's Note: This article is reprinted, with permission, from the The University of Michigan's Computing News, June 1, 1987. Some references specific to the University of Michigan's environment, or not applicable to our site, have been deleted or replaced by local references.)

The TCP/IP protocol suite is a set of de facto standards developed for the Department of Defense (DOD) for interconnecting computer networks and hosts on those networks. Transmission Protocol (TCP) and Internet Protocol (IP) are two of the protocols in this suite.

TCP/IP is used by the INternet, a supernetwork made up of more than one thousand subnetworks including such well-known networks as the ARPAnet, CSNET, and NSFnet. The Internet connection allows the exchange of files and mail, as well as terminal connections. The Internet spans the U.S. and extends to some foreign countries as well. Many networks using TCP/IP, including most university networks, are part of the Internet, and every network on the Internet uses the TCP/IP protocol suite.

There are many ways to establish a connection between a local area network and the Internet, and these communications options are expanding rapidly. This article presents some background information on the Internet communications protocols.

What Is a Protocol?

A protocol is a well-defined way of communicating certain kinds of information between two or more parties. This includes both syntactic, or structural content (which bits mean what) as well as semantic content (which messages mean what; which exchanges of messages are meaningful). A protocol suite is a family of protocols that work together.

Multiple protocols exist in order to break up the functions of a network into component parts. This is done both to make the network easier to understand, and to allow a choice of protocols that can be used, depending on the situation.

Some protocols are layered (Figure 1). A protocol at a higher layer is said to "run on top of" the lower layer protocol. The lower layer protocol provides a needed service to the higher layer protocol, which in turn provides further enhanced service to yet another protocol or an application.

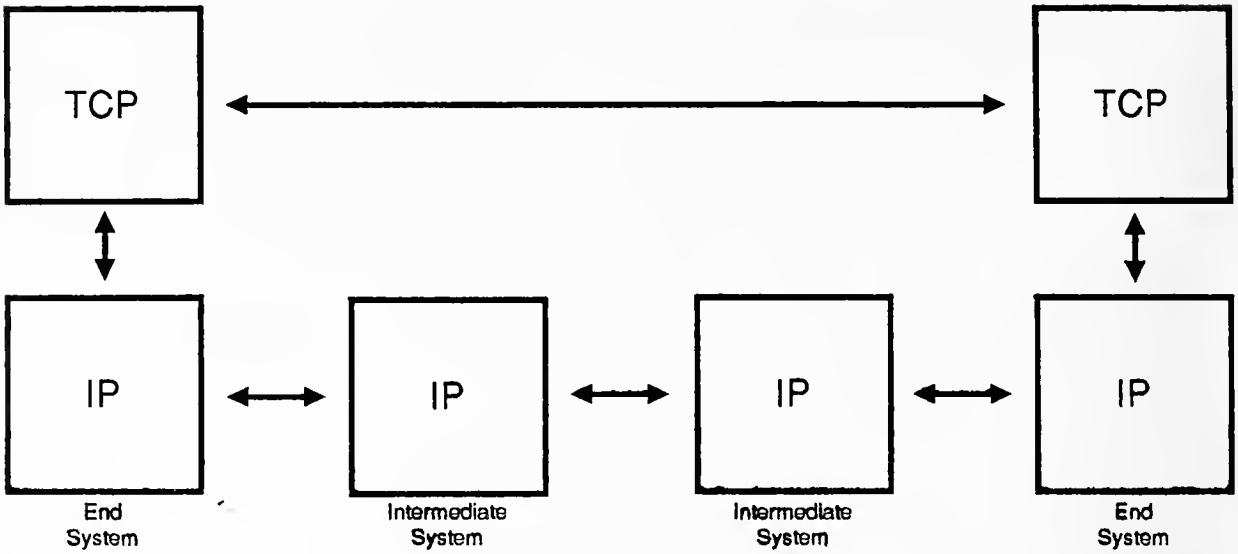
Other protocols run conceptually "next to" each other. These protocols provide a similar level of service, but of a different type. The particular protocol used depends on the application needed.

The Internet Protocol

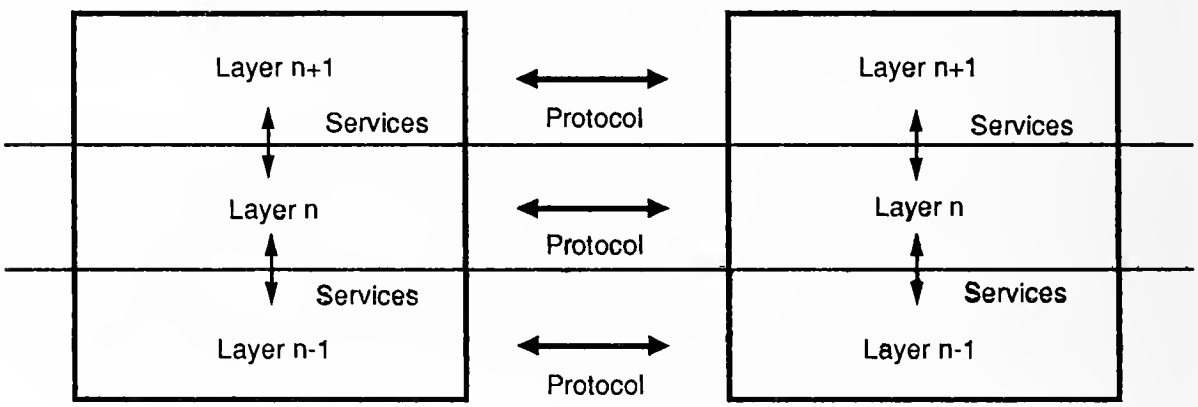
The Internet Protocol (IP) is the lowest layer protocol defined in the DOD suite. It runs on top of whatever protocols are in use in the local subnetwork (Ethernet, Token Ring, etc.).

IP provides a way of moving a block of data from one host machine to another through the Internet. This block of data is known as a "datagram."

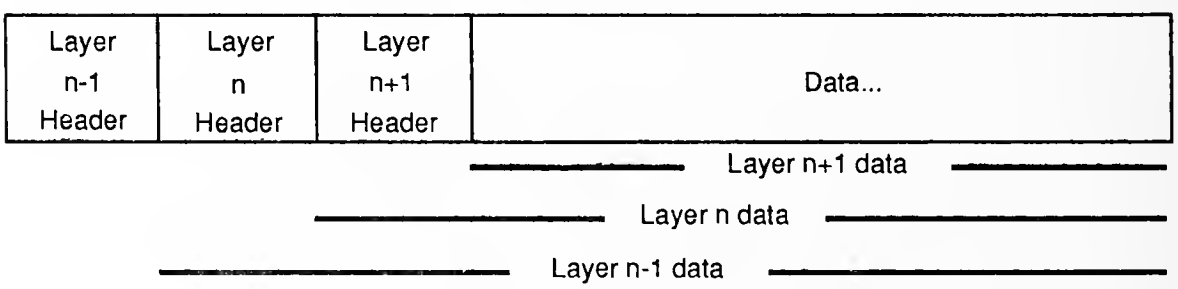
The delivery of datagrams is made possible by assigning an IP address to every host in the Internet. These addresses are 32 bits in length, and are commonly denoted as four decimal numbers separated by periods, e.g., 128.174.5.54. The first part of the address tells which network the host resides on, and the rest of the address tells where within that network the host can be found. (The host network



Protocol Layering



Protocol Layering Abstracted



Encapsulation

Figure 1

can be a class A, B, or C network consisting of 1, 2 or 3 digits. Currently, UIUCnet is assigned a class B network number 128.174.x.x. All UIUCnet attached to TCP/IP networks will have the same first two decimal numbers of 128.174.

IP is an unreliable protocol. This means that datagrams sent from one host to another may not be delivered in the order in which they were sent, may be delivered more than once, or may not be delivered at all! This is not as bad as it sounds, since higher layer protocols can correct this deficiency. Leaving reliability out of this protocol makes it much simpler and cleaner to implement and facilitates dynamic routing of datagrams within the networks.

The Transmission Control Protocol

The Transmission Control Protocol (TCP) runs on top of IP. It provides a reliable, ordered connection between hosts. This means that higher layer protocols can establish a TCP connection to another host and be confident that their data will arrive successfully and in order.

A TCP connection is conceptually an error-free pipe from one host to another. There is no inherent meaning at this layer to the data sent over this pipe. This generality allows a variety of higher layer protocols to run on top of TCP.

The fact that this protocol is connection-based means that there is some overhead required in setting up and tearing down the connection. This is appropriate for applications that need to send a fair amount of data to one place, but might not be so appropriate for quick, short exchanges.

Higher Layer Protocols

There is a rich set of protocols that can run on top of TCP. These protocols are tailored to the particular application that they implement, as opposed to the generality provided at the lower layers. The protocols described below are only a small part of the protocols defined. It is possible to define your own private protocol and use it through the Internet, so long as both you and your remots host agree on what to do.

Telnet

Telnet is the protocol used to provide terminal access to hosts. (This should not be confused with Telenet, which is a completely unrelated public data network.) Telnet runs on top of TCP, and provides fairly minimal terminal support.

The File Transfer Protocol

The File Transfer Protocol (FTP) does exactly what it says -- it provides a way to transfer files between host on the Internet. FTP runs on top of TCP.

FTP will do translation between different types of hosts, freeing the user from worrying about the specifics of character codes and so forth. It gives the ability to require IDs and passwords in order to access files, thereby making it practical to use with private files.

The Simple Mail Transfer Protocol

The Simple Mail Transfer Protocol (SMTP) is the Internet electronic mail exchange mechanism. It runs on top of TCP. SMTP provides a way for dissimilar hosts to exchange mail. There is often an SMTP implementation grafted onto the native mail system in the host. SMTP traffic is probably the largest use of the Internet.

The Network File System Protocol

The Network File System (NFS) Protocol is not properly part of the official Internet protocol suite, but has become a de facto layer for use in building distributed file systems. NFS provides the ability for host computers and workstations running NFS to transparently share files across the entire Internet. For example, an IBM PC or Apple Mac could logically have files resident on an Apollo or Sun, totally transparent to the user.

Domain Naming

A generalized way of assigning names to hosts is provided by the Domain Naming system. Name are preferable to addresses both because they are easier for humans to work with, and because an address may change if a host is moved or a network is reorganized.

The Domain Naming system defines a hierarchical naming structure. At the highest level is the organization type (EDU for educational, COM for commercial, GOV for governmental, etc.). Below that is the organization name. Further levels may be needed in large organizations. For example, the domain name of the IBM system at CSO is UIUCVMD.CSO.UIUC.EDU. In this domain name EDU is the organization type, UIUC is the organization name, CSO is the Computing Services Office (department within UIUC), and UIUCVMD is the name of the specific IBM machine within CSO.

When a name is used to refer to a host, the name must be mapped to an IP address. In order to avoid proliferating thousands of independent address tables in every host, the mapping is done by server machines in each domain. A protocol is used to query the name server, which may in turn ask another name server if it doesn't know. This distribution of names means that each server need not know all of the hosts in the Internet, and also that if a host is assigned a new IP address, only the name server local to that host needs to be updated. The change will then be available to other name servers and hosts as needed.

Conclusions

The use of the Department of Defense Protocol Suite (TCP/IP) is expanding rapidly. Vendors are making it available for their machines, and more and more networks are being set up that use it.

TCP/IP provides the first instance of widely-available integration of all ranges of machines. Although not perfect, it makes possible a level of functionality that wasn't previously achievable. This kind of interconnection will lay the foundation for the network environment envisioned for the future.

NETWORK NAMES AND ADDRESSES: TWO FREQUENTLY ASKED QUESTIONS

Ed Krol
CSO's Networking Group

There are two frequently asked questions about the Internet of which the campus network is a part. The first question is "What machines are out there?" and the second question is "To contact a machine should I remember the name or the address of it?." Neither of these questions can be answered definitively. The answer to question one is "No one knows." and the answer to question two is "It depends, but usually the name."

The distributed and cooperative nature of the network invites movement, but through movement frustration. This is because the technology is evolving. Each host on the network is following the technology at various distances. The user of the network is at the mercy of the particular end points one is using, but by design newer versions of software will typically interoperate with the old. Such is the case with name-to-address translations.

In the good old days when things were simple and the Internet was small, there was a name registry where people registered host names and their addresses. (The names are for human consumption. The network actually uses a 4 byte address for delivering messages. For example, uxe.cso.uiuc.edu is the name for the host whose address is 128.174.5.54.) One could, during this era, print a list of all names on the network. Now, with over 300 network locations and hundreds of thousands of hosts from PCs to supercomputers, listing the names is impossible.

Under the new distributed way of naming hosts (called domain names), a group is given responsibility for maintaining their own set of names. When one uses a name, the host software on the originating end contacts the name database for the destination and asks it to convert the name into an address. This address is then used for the communication. In the above example of uxe.cso.uiuc.edu, the **uiuc.edu** tells the host software how to reach the particular machine responsible for resolving the name **uxe.cso** and that machine is then contacted to turn the name into an address. (Currently, the name data is spread around the country in about 1000 locations.)

So much for question one - now on to the second. Host software varies in its ability to contact outside name servers. The software that really matters is the software on the machine on which the name is used, not the machine named in the command. For example, if when logged onto the machine uxe.cso.uiuc.edu a

telnet tcgould.tn.cornell.edu

is issued, the software on uxe scrounges around the network until it contacts the server responsible for cornell.edu. The cornell.edu server is then asked for the address of tcgould.tn and it responds with an address or addresses. Therefore, if one sits at a particular system and telnets, ftps, or mails from that system to many other systems and finds that the use of various names normally works, one should then use those names confidently. Notice that since the turning of a name into an address requires that the network be available, there will be times when a name cannot be converted into an address. Knowing the address will not help in these cases since if the network is down one cannot get to the target system anyway.

One may ask why not just remember the address and bypass the whole process. There are three reasons. One is that humans naturally find it easier to remember names than numbers, especially if the names are memorable. The second is that some hosts are connected to multiple networks. An address specifies the port into a machine on a particular network. If the connection to a port is down and the address of that port is specified, the host will be unreachable even if the machine is up. Name servers can return all interface addresses for that host. In this case the originating software can try multiple paths to the destination. The last reason is that the name sets up a symbolic reference to a host. It is sometimes necessary to move a host from one network to another. When a host gets moved, the address will necessarily change but the name will not. So the name uxe.cso.uiuc.edu will remain constant even if the address of that machine changes.

If one operates in a mode of traveling around and using various machines to contact a central machine (for example, checking e-mail on uxe.cso.uiuc.edu from various hosts), to be safe, one should know the address. If using the name gets an 'unknown host' message, it may be because the

host on which the request is made does not know how to turn the name into an address. If, on an unfamiliar system, a host name reference fails, using an address may bring success.

As time goes on more systems will become better able to turn names into addresses so the issue will become less important. If a host knows how to turn many names into addresses, it is unlikely that there would be any problem with dealing with any names for networks which can be reached. When dealing with unfamiliar source machines for network access, using the address may be an "ace in the hole" to steal victory from the jaws of defeat.

SPSSX RELEASE 3.0 ON VMD

Joan Mills
CSO Statistical Consultant

Release 3.0 of the SPSSX statistical package is now available on the IBM CMS system VMD machine. Release 3.0 corresponds to the new third edition of the *SPSSX User's Guide* available at the CSO Distribution Office at 1208 W. Springfield, Urbana. Release 3.0 can be accessed on VMD by typing

LINKTO SPSSX(F

Release 3.0 is to become the default version of SPSSX on VMD after the current semester. At that time the current release (2.2) will become past, as in

LINKTO SPSSX(P

and Release 3 will be the current version, accessed via

LINKTO SPSSX

The changed features of Release 3 are described in the INFO ALL document available by adding the command

INFO ALL

to an SPSSX Release 3 program, or from the SPSSX Release 3 disk accessed with LINKTO SPSSX(F, or (soon) on the shelf at 85 Commerce West, the Statistical Consulting Office.

Briefly, the new and changed features are as follows:

- The new SPSSX MACRO facility allows you to build your own blocks of SPSSX syntax elements and to control the execution of those blocks.
- The new MATRIX DATA command creates an active file from "matrix" data entered by the user. For example, a user-entered correlation matrix becomes an active system file rather than becoming a single use file.
- There are two new output data formats; one to reverse the role of the comma and decimal point as customary in some foreign countries and one for percents, printing a percent sign (%).
- There is a non-linear regression procedure (NLR).
- Notable among the changed features of procedures is the use of keywords instead of OPTIONS and STATISTICS statements in almost all procedures. (Old syntax is supposed to still work.)
- SPSSX can now be run interactively, similar to SPSS/PC+, with commands executed as they are issued. Such commands are stored in a "journal" which can be edited and resubmitted as a program or part of a program in a later SPSSX run.

Note: If you have recently purchased an *SPSSX User's Guide* or anticipate purchasing one, the currently available edition is Edition 3 that corresponds to Release 3 of SPSSX. Therefore you may want to begin routinely using SPSSX Release 3 right away. You may alter your PROFILE EXEC to contain LINKTO SPSSX(F until the Release 3 version becomes the default at the end on the semester.

Running SPSSX Release 3 interactively is described on page 18ff. of the **SPSSX User's Guide**, Edition 3. The method is briefly described as follows:

```
LINKTO SPSSX(F
SPSSX *
```

Response from SPSSX includes the prompt:

```
SPSS-X>
```

Enter lines of an SPSSX program, terminating a complete statement with a period and the enter key. Here is a sample:

```
FILE HANDLE SYS/NAME='fn ft fm'.
```

where **fn ft fm** is the identifier of an available SPSSX systems file.

```
GET FILE=SYS.
DESCRIPTIVES  ALL.
```

SPSSX runs each command as it is given. Results go to the screen and to a file called **SPSSX LISTING A**. Commands and error messages go to a file called **SPSSX JOURNAL A**. At a CONTINUE> prompt, continue typing your command to the period. If you get a CONTINUE> prompt when your command is finished, type the period (.) or send a blank line. Do not type another command until the first command is terminated. To terminate an interactive SPSSX session type **FINISH** at the SPSS-X> prompt.

A complete or partial SPSSX program may be placed in the interactive job stream by using the interactive SPSSX command:

```
INCLUDE FILE=name SPSSX
```

where **name SPSSX** is an SPSSX program file (or part of a program) to be entered from accessed disk storage.

There are some subtle changes described in the new SPSSX (Edition 3) manual, like DESCRIPTIVES and CONDESCRIPTIVE being aliases for the same program. Users of SPSSX Release 2.2 may use the "Help for Old Friends" section in the back of the new manual for other details.

IMSL LIBRARY INSTALLED ON THE CONVEX SYSTEM

Stan Kerr
CSO Systems Consultant

The IMSL Subroutine Library, which CSO had installed on the Cyber and IBM systems, has been installed on the Convex UNIX system. There is an online 'man' page which can be accessed by the command

man imsl

and there is a longer overview document in file

/usr/local/doc/imsl/guide

which can be printed with the command

ibmprint -b 99 -cc f -e /usr/local/doc/imsl/guide

Manuals for IMSL are on view in the Systems and Statistical Consulting offices.

IMSL can be accessed when compiling a Fortran program by using the **-limsl** option. For example, if file **prog.f** contains a Fortran program which calls IMSL routines, then you can compile it and create an executable binary file by entering the command

fc prog.f -limsl

(Note: **-limsl** MUST be entered in lower case.)

This causes the program to be compiled and loaded to create an executable file named **a.out**. The program is then run by entering

a.out

VECTOR PROCESSING IS KEY TO SPEED

(Editor's note: The dual CONVEX-C1 computer was installed and made available to users last November. The CONVEX-C1 architecture is based on supercomputer design principles which feature 64-bit integrated scalar and vector processing. The following article has been reprinted from the January 1988 issue of Vector, a CONVEX Newsletter, to help users understand a little more about the advantages of vector processing.)

The words *vector processing* and *vectorize*, when discussing supercomputing, simply mean *fast.*

Vector versus scalar processing. Computers with vector processing perform operations (like *load, add, multiply, store*) on many numbers at the same time. Most computers, however, operate on only one number at a time. This type of processing is called scalar processing.

Vector processing is likely to be 10 times faster than scalar processing. Not all code, however, can be vectorized. CONVEX achieves maximum performance by integrating vector processing with the

standard scalar processing.

Programs with arrays. For vector processing, repetitive calculations are required. Repetitive calculations involve operations on arrays. An array of data is a collection of the same type of mathematical elements (like single-precision or double-precision floating-point numbers).

Programs with arrays are computationally intensive and typically are used in computer-aided design (CAD), scientific research and development, and industrial research and product development.

Vectorized loops. These programs typically manipulate arrays in loops; this takes considerable processing time in scalar mode. Each loop iteration operates on individual elements of the referenced arrays.

In a vectorized loop, however, many loop iterations are combined and process at the same time. CONVEX computers have vector registers that can hold up to 128 numbers (in contrast to scalar registers that hold only one number). This special vector hardware enables single instructions to process many elements (up to 128) at the same time instead of one at a time.

The following example is a simple loop that adds 15 to each element of array B and stores the sum in array A. The variable I is the index into arrays A and B and ranges from 1 to 110 in increments of 1.

```
      DO  10  I = 1 , 110
10    A(I) = B(I) + 15
```

Processing this loop in scalar mode would take at least 550 instructions because each element is operated on singly instead of as an array. In vector processing, one instruction loads all the elements of array B into a vector register, one instruction adds 15 to each of the elements of array B, and a third instruction stores the result into array A.

Compilers Work for You

The CONVEX compilers vectorize and optimize FORTRAN and C programs to take advantage of the CONVEX architecture. No special vector syntax is required; the compilers take standard programs and generate high-performance executable code.

Vectorizing a loop is a complicated process. In general, many loops cannot be vectorized because of dependencies or interactions with other code. The CONVEX vectorizing compilers, however, are so sophisticated that they often vectorize the innermost loop, and distribute outer loops so even they can be vectorized.

Vector processing is sometimes not as efficient as scalar processing. If an array has fewer than 3-5 elements, for example, the hardware start-up time for vector processing takes longer than scalar processing in a loop. Under this circumstance, CONVEX compilers automatically use scalar processing.

A recurrence means the results of one iteration of a loop are used in another iteration of the same loop. CONVEX compilers recognize certain "safe" instances of recurrence and either vectorize or partially vectorize them.

The CONVEX optimizer often eliminates apparent recurrences or moves them outside the innermost loop. Recurrences and apparent recurrences, however, are some of the most common reasons the compiler does not vectorize a loop.

Enhancing Vectorization

Although the CONVEX vectorizing compilers are industry leaders and automatically produce highly vectorized code, there's more. You can help the compilers improve vectorization using compiler directives.

Compiler directives tell the compiler that certain optimizations are safe or unsafe. Sometimes the compiler cannot determine whether it is safe to vectorize a loop with an apparent recurrence. Using directives, you can tell the compiler to vectorize the loop.

Because the CONVEX compilers do such a good job of optimizing and vectorizing your code, you should take care when attempting to improve on the compiler's efforts. The outlined procedure below allows you to quickly make performance improvements (if possible) to your code in a controlled fashion.

Vector Performance

Optimization and vectorization have a dramatic effect on the performance of many programs. The following subroutine does standard matrix multiplication.

```
      SUBROUTINE MMUL (A,B,C,N)
      DIMENSION A(N,N),B(N,N),C(N,N)
      DO 10 I = 1,N
        DO 10 J = 1,N
        C(I,J) = 0
          DO 10 K = 1,N
          C(I,J) = C(I,J)+A(I,K)*B(K,J)
10    CONTINUE
      END
```

If the size of the matrices is 200 by 200, the execution times on a CONVEX C1-XP (with different levels of optimization) are as follows:

Seconds	Optimization
53.2	None (fc -no)
44.6	Basic Block (fc -O0)
15.3	Program Unit (fc -O1)
00.6	Vectorize (fc -O2)

STEP BY STEP TO FASTER CODE

The CONVEX vectorizing compilers are designed to produce highly optimized executable code from standard programs. In some cases, however, you may be able to improve the performance of your program by following these steps.

1. First compile your program without any optimization (*fc -no*). Before you start changing your code and attempting to make it execute faster, you need to make sure you have a working program (a reproducible test case).

2. Next profile your program. CONVEX supports three profilers as part of the CONVEX Consultant package, *prof*, *gprof*, and *bprof*. The profilers help you identify routines that may need improving.

   Profiling information includes the number of times the code was executed and the amount of execution time spent in the code. *prof* gives you the times for each routine, *gprof* gives you the timing information for subroutines called from your program, and *bprof* gives you the timing information at the statement level.

3. Now try optimizing the most time-consuming routines. Start with a few routines, called subroutines or statements that were executed the most times and for the longest times. To improve these routines, try the following:

   - If there is a VECLIB routine that computes the same result, use it.

   - Let the compiler do the optimizing for you. Use increasing levels of optimization (-O0, -O1, -O2) and evaluate the effect.

4. Profile again to see if any routines need more optimization.

5. Study the compiler messages to determine if you could improve performance by rewriting sections of your program.

   - Check the optimization log to find out what the compiler did and see if you can improve it.

   - Use directives to help the compiler in places that didn't vectorize.

   - Use a different algorithm, if necessary.

6. After rewriting a routine, recompile and check your answers against the original test case.

7. Repeat steps 4, 5, and 6, if necessary.

READER FEEDBACK

In our attempt to keep improving *Off-Line*, and answer your needs and interests, we will be adding this page to each issue. We sincerely hope that many of our readers will take the time to give us this "Feedback". Please fill out, fold in half, and return to address on back. Your reply may be anonymous, or you may add your name and department. Thank you for your comments/suggestions.

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If you wish to be placed on our mailing list, have a change of address, or wish to be deleted, please check the appropriate box and fill in the information below. Please help us keep our mailing list up-to-date by informing us if issues are being sent to someone no longer in your department; fill in the information below and return to us so that his/her name may be removed from the list.

Please check as appropriate:

_____ Please *ADD* my name to the mailing list.

_____ Please *DELETE* my name from the mailing list.

_____ Please *CHANGE* my address (provide old address also).

If you have a campus mailing address:

Name _____

Department _____

Bldg. & Room _____ M/C_____

If you do not have a campus mailing address:

Name _____

Address _____

_____

_____

City, State, Zip _____

If you are requesting a change of address, please indicate your old address:

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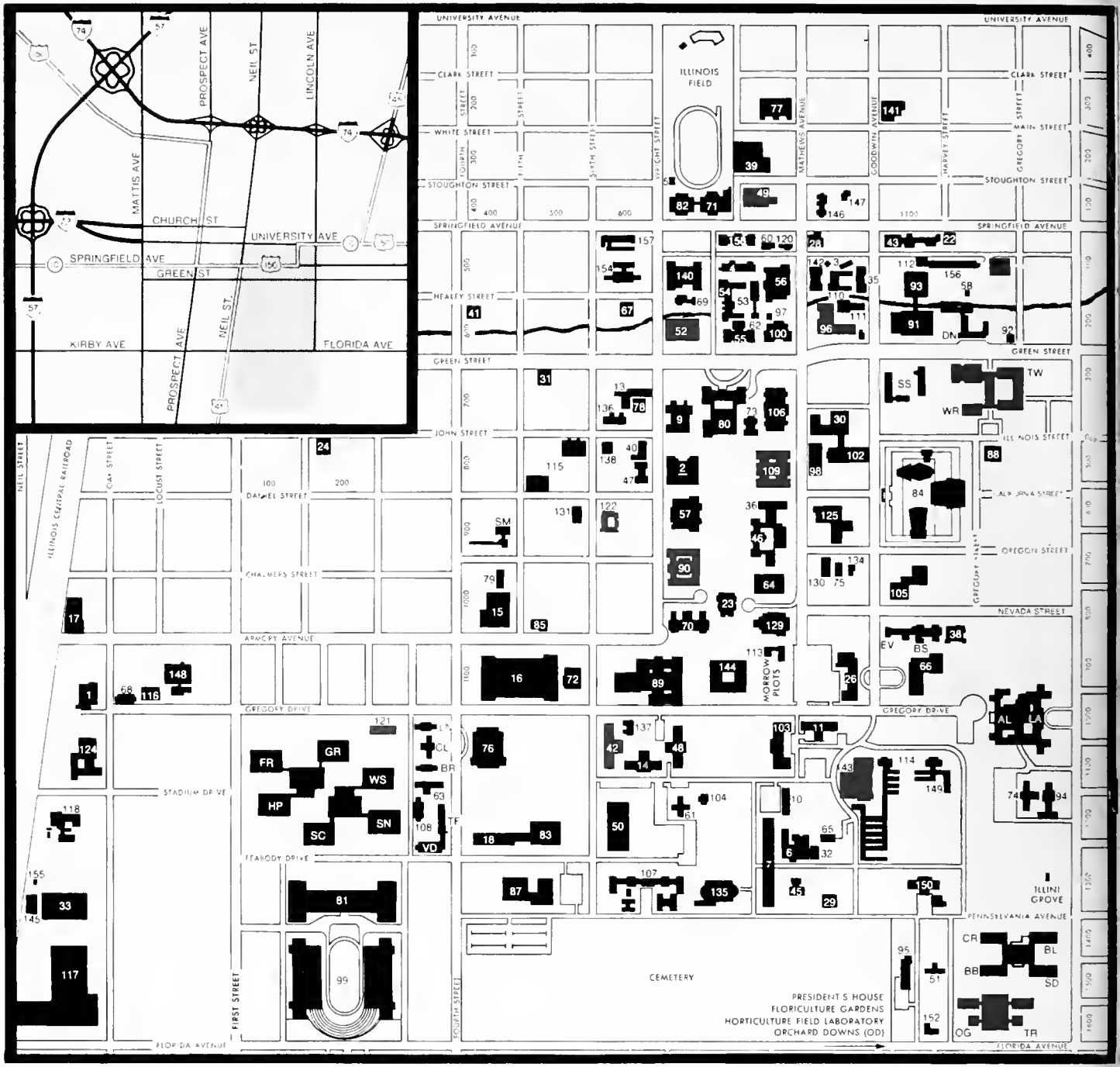
1304 West Springfield Avenue
Urbana, Illinois 61801

CSO SITES

CSO NORTH (DCL)	
14 Digital Computer Lab	Monday-Saturday, 24 hours/day
333-7685	Sunday, 12 noon - 12 midnight
CSO SOUTH	
70 Commerce West	Monday-Saturday, 8 am - 12 mid.
333-4500	Sunday, 12 noon - 12 midnight
AGRICULTURE	
N-120 Turner Hall	Monday-Thursday, 8 am - 10 pm
333-8170	Friday, 8 am - 5 pm
	Saturday-Sunday, Closed
CHEMISTRY	
150-154 Noyes Lab	Monday-Friday, 9 am - 5 pm
333-1728	Saturday-Sunday, Closed
CRH SNACK BAR	
120 Snack Bar	Daily, 12 noon - 12 midnight
333-1851	
ELECTRICAL ENGINEERING	
146 Electrical Engineering	Monday-Friday, 8 am - 12 mid.
333-4936	Saturday, 8 am - 5 pm
	Sunday, Closed
FAR	
Florida Avenue Residence Halls	Daily, 12 noon - 12 midnight
333-2695	
ISR	
Illinois Street Residence Halls	Daily, 12 noon - 12 midnight
333-0307	
MECHANICAL ENGINEERING	
65 Mechanical Engineering	Monday-Saturday, 8 am - 12 mid.
333-1430	Sunday, 12 noon - 12 midnight
PSYCHOLOGY	
453 Psychology	Monday-Friday, 8 am - 5 pm
333-7815	Saturday-Sunday, Closed
SOCIAL SCIENCE	
202 Lincoln Hall	Monday-Friday, 8 am - 12 mid.
333-0309	Saturday, 10 am - 5 pm
	Sunday, 12 noon - 5 pm



CSO Sites (marked in blue on map)

42 Commerce West
49 Digital Computer Lab
52 Electrical Engineering
90 Lincoln Hall
96 Mechanical Engineering
109 Chemistry - Noyes Lab
121 CRH Snack Bar
122 Psychology
143 Agriculture - Turner Hall
Illinois Street Residence Halls
Florida Avenue Residence Halls
CSO Office Building
(101 South Gregory)

GIFT & EXCHANGE DIV
ROOM 314
MAIN LIBRARY
CAMPUS

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16:3 1988

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off line

iversity of Illinois at Urbana-Champaign

ector: George Badger
itor: Lynn Bilger

nputing Services Office

CSO DIRECTORY

Departmental Office	150	DCL	333-1637
User Accounting Office	1208	W. Springfield	333-7752
Documentation Center	1208	W. Springfield	333-9230
Systems Consulting	1208	W. Springfield	333-6133
Statistical Consulting	85	Comm West	333-2170
Microcomputer Consulting	91	Comm West	244-0608
Microcomputer Resource Center	106	CSOB*	244-6261
Text Processing Consulting	212	CSOB*	333-7318
Maintenance & Repair Service	194	DCL	333-0969
Tape Service, Special Plots, Special Printers.	14	DCL	333-8640

*CSOB is the CSO Office Building, located at 101 South Gregory, Urbana.

DIAL-UP NUMBERS

IBM 3081 GX (uiucvmd)	300	baud	333-4006
Cyber 175 (uiucnosa)	300	baud	333-4000
SWITCH	1200	baud	333-4008
	2400	baud	333-4007
TELENET (local no.)			384-6428

LOCALNET CALL NUMBERS

Note: Certain CSO Sites are on a separate channel of LocalNet than the rest of the campus. These are designated below as **A Sites** and include the following CSO Sites: ME, EE, COMM, LH, and AGRIC. All other LocalNet access areas are designated as **B Sites**.

VMD	CALL 4000	(line mode - A Sites)
	CALL 4100	(line mode - B Sites)
	CALL 4400	(full-screen mode - A Sites)
	CALL 4500	(full-screen mode - B Sites)
VME	CALL 4600	(A Sites)
	CALL 4700	(B Sites)
uxa (Pyramid 90x)	CALL 66AC	(A Sites)
	CALL 66AA	(B Sites)
uxe (Pyramid 90x)	CALL 12FA	(A Sites)
	CALL 12EE	(B Sites)
uxf (Sequent)	CALL 66C0	(A Sites)
	CALL 66BB	(B Sites)
uxg (Gould)	CALL 1000	(B Sites only)
uxh (Convex)	CALL 1850	(A Sites)
	CALL 1800	(B Sites
NOSA	CALL 1650	(A Sites)
	CALL 1750	(B Sites)
LCS	CALL 6400	
TELENET	CALL 1550	

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May/June 1988

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Articles, suggestions, comments and/or subscription requests may be sent to: Lynn Bilger, Off-Line Editor, 150 Digital Computer Lab, University of Illinois, 1304 W. Springfield, Urbana, IL 61801 (telephone: (217) 333-6236; email: bilger@uxe.cso.uiuc.edu).

NEW MANUALS AVAILABLE

Several new manuals are available for purchase at the CSO Accounting/Distribution Office, 1208 W. Springfield, Urbana. The new manuals are:

Introduction to GML	$4.00
Script Mathematical Formula Formatter	$10.00
SAS System for Elementary Statistical Analysis	$20.00
S (Interactive Environment for Data Analysis and Graphics)	$31.00
Berkeley UNIX 4.3 User's Manuals (3 vol.)	$25.00
Berkeley UNIX 4.3 Programmer's Manuals (3 vol.)	$25.00
Convex UNIX Primer	$10.00

CSO SUMMER SHORT COURSES

CSO's Summer Short Courses announcement was recently mailed to those persons on the *Off-Line* mailing list. If you did not receive a copy, or if you know someone who would like a copy, call 244-7724 and ask them to send a copy to you. Extra copies may also be picked up at the CSO Accounting Office, 1208 W. Springfield, Urbana, or at the Consulting Offices.

IMSL PROTRAN PACKAGE TO BE REMOVED FROM CYBER

Due to low usage, the IMSL PROTRAN package will be removed from the Cyber in July 1988. CSO does not plan at present to acquire PROTRAN for any of its other machines.

SAS NEWS

The seventh SAS User's Group Meeting was held on March 15th. Milt McGiffen of the Natural History Survey presented techniques for data analysis with PROC REG. The discussion that followed focused on outliers and their meaning. Some favored discarding the data points. Others favored keeping the data points, but performing further tests to learn more about outliers and their use. The discussion was excellent and challenging.

Matt Higgins from the Department of Economics presented the group with an introduction to ARIMA modeling. The theory of ARIMA models was presented followed by an elementary example of PROC ARIMA and PROC FORECAST. Most of the people in the group were unfamiliar with ARIMA models and benefited enormously from the presentation.

Many thanks to these gentlemen for their time and expertise, and to the SAS User's Group Steering Committee for suggestions and help.

SAS Institute , Inc. has published a new statistics manual for those who have little or no knowledge of statistics. It is titled *SAS System for Elementary Statistical Analysis* and is written in the form of a tutorial. There is an introduction to sampling theory, descriptive statistics and general linear

models. There are lots of examples describing the appropriate procedures to analyze example data. The manual is sold at 1208 W. Springfield in the CSO Accounting/Distribution Office, 333-7752. The manual is also in the Closed Reserved Section of the Undergraduate Library.

DCL CONSTRUCTION NEWS

Leslie Frillman

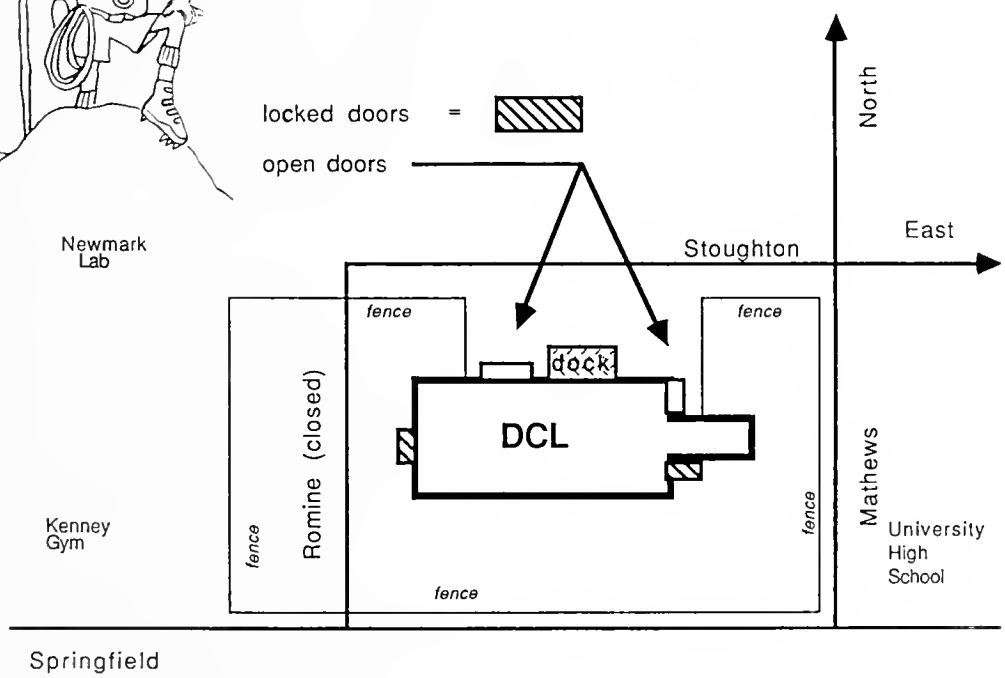
As most of you know by now, the area surrounding DCL is a construction site. The DCL addition will take 2 years to complete, with the resulting building being 2 1/2 times the size of the original building (most of the space will be going to Computer Science). They are currently removing 20,000 cubic feet of dirt from around the present building (that's 3000 dump trucks full of dirt!), so there is a lot of noise, traffic and dust.

Half of the the building's entrances are closed. So is Romine street to the west. The only two doors open are on the north and northeast side of the building (at the back, across from Newmark CE Lab). Below you will find a map that shows you how to get into the building. Parking is still available in the front (south) of DCL (meters), and there is parking on some of the streets near DCL, when you can find it. Remember also that Short Course registration has been moved to the CSO Accounting/Distribution Office, 1208 W. Springfield (244-7724). A new listing of Short Courses for Summer 1988 will be available at the end of May.

CSO suggests that whenever possible, you try to use one of our CSO Sites instead of DCL. If you need any information about CSO Sites you can pick up a copy of Reference Guide RF-0.3 at any Site (locations are listed on the back cover of this *Off-line*). CSO wants to thank all of you for your continued patience in the long and arduous task of living in a "hard hat area."

Do you feel like this trying to reach DCL?

Below you will find a map:



1988 COMPUTER FAIR

Dave Long
Microcomputer Services Group

The third annual Computer Fair was held this April in the Illini Union. On Monday the 25th, 34 seminars were presented on topics such as desktop publishing, hypertext, computer graphics, and networking. Most of these were given by various University faculty and staff, although four seminars were presented by faculty from other universities participating in IBM's Consulting Scholars program. Approximately 1000 people came to see these seminars, which went very smoothly with the exception of two unexpected fire alarms. On Tuesday the 26th, the Illini Rooms were packed with over 60 exhibits by faculty and staff from all over campus. The Ballroom was occupied by exhibits from 21 vendors, 5 user's groups, and the Computer Center of Central Stores. Ten of the vendors also presented seminars. Over 4,000 people came to see the exhibits on this day, and reactions were generally favorable.

1988 Computer Fair Seminars

The seminars were organized by Bob Penka (Manager of CSO's Microcomputer Services Group), who arranged them into groups of talks concerning topics of current interest. They dealt with desktop publishing, networking, hypertext, graphics, computer-aided instruction, dynamic modeling and advanced mathematical computation, and the various organizations on campus which provide computer services. Attendance was very impressive at most of the seminars; particularly popular were all of the seminars on desktop publishing, several of those on networking, both seminars dealing with hypertext, the seminar on the program "Mathematica," and the panel discussion "Selecting and Acquiring Microcomputer Hardware and Software."

Three seminars were presented that dealt with the topic of desktop publishing. The first was a group presentation entitled, "Desktop Publishing on the IBM PC." This was presented by four University professors, Spud Baldwin, Brian Brill, Jim Marchand, and Patrick McLane, who discussed their experiences with desktop publishing on the PC and demonstrated some of the hardware and software which they have used in their work. The second seminar , "Desktop Publishing: Options in the Apple World," was given by a University student, Leonard Rosenthal. In it, he discussed his experiences with desktop publishing, and the various software packages available for the Macintosh, and their relative attributes. The last seminar in this series, "A Week in the Life of Desktop Publishing," was presented by Mike Smeltzer of the Journalism Department. He discussed how he and the department produced the 140 page book, *A Week in the Life of Champaign-Urbana.*

Five seminars were presented that dealt with networking. The first was a general overview of the topic presented by Claudia Jordan of CSO. The second, entitled "Creating an In-Building Local Area Network," was presented by Mike Gardner of CSO. Third was "Teaching in a Networked Environment: Or, How I Learned to Stop Worrying and Love the Network" which was a talk given by the staff of the Office of Information Management on their experiences with their 125-node token ring network. Next was another talk by Claudia Jordan, this one on how to connect to UIUCnet, the campus network, the costs, benefits, and various options available. The fifth and last presentation was given by Greg Kesner and Paul Pomes of CSO, and was an introduction to electronic mail entitled "Communicating Electronically: On and Off Campus."

Bob Jones demonstrated his Macintosh hypertext project. It featured the use of a HyperCard stack to organize a library of art images stored on videodisk for random-access browsing.

"Mathematica, a New Software System for Doing Numerical, Graphical and Symbolic Computation," was the subject of keen interest at the fair. Over 50 people attended a seminar on Mathematica given by Steven Wolfram of the Physics Department, the author of the program.

The panel discussion "Selecting and Acquiring Microcomputer Hardware and Software" featured Mark Sapoznik from Central Stores' Computer Center, Marsha Hardmann from the Purchasing division, Mark Zinzow from the Micro Resource Center, and Jerry Neal, manager of the CSO Maintenance Group. Mark Sapoznik talked about the Computer Store's operations, what they carry and why; Marsha Hardmann talked about the various paperwork requirements from the standpoint of Purchasing; Mark Zinzow talked about the services offered by the Microcomputer Resource Center; and Jerry Neal talked about options for buying maintenance services.

1988 Computer Fair Exhibits

The exhibits were organized by Al Avner of CERL and Dick Wilson, the Associate Chancellor. Al Avner organized the University exhibits which were located in the Illini Rooms of the Illini Union. Dick Wilson organized the vendor and users' groups exhibits, which were located in the Ballroom.

There were over 60 exhibits from all over campus in the Illini Rooms, three of which were from CSO. These were: the CSO Graphics Group, with Jim Bozek, Randy Cetin, and Mike Grady, presenting various examples of the services offered by this new group; the Networking Group, with Steve Dorner and Sue Greenburg presenting information on CSO's nameserver; and the Microcomputer Group, with Mark Zinzow giving information on the Microcomputer Resource Center, Jack Knott presenting information on CSO's Microconsulting Hotline, and Jerry Neal presenting information on microcomputer maintenance offered by CSO.

The Ballroom was filled with 21 commercial exhibitors, 5 user's groups, and a booth from Central Stores' Computer Center. Apollo, Apple, AT&T, Control Data, Digital, Epson, Hewlett-Packard, IBM, Informix, Lotus, Microsoft, Sun, Tandy, Wang, and Zenith were all at the fair, as well as some small local companies. Notable among these was Chipper, which was started by a University student who built an interface between a PC and a hand-held Sharp calculator which enabled him to transfer programs and data back and forth between the two, helping him in his classwork.

The users' groups present were the U of I chapter of the Association for Computing Machinery (ACM), the Champaign-Urbana Commodore Users' Group and their Amiga Special Interest Group, the Champaign-Urbana Macintosh Users' Group, and the UIUC PC Users' Group. The PC Users' Group booth was staffed by Greg Kesner, Vicky Dingler and Anup Roy of CSO, and the Mac Users' Group booth was staffed partially by Dan Pommert of CSO.

There were few problems on the day of the exhibits. Some power outages were experienced, but these were taken care of fairly quickly, and did not constitute a major disturbance to the fair in general. The fair was well received by most of the people who attended; most of the commercial participants were very impressed with the turnout and the general high quality of the exhibits, some of them considering it one of the best of such events occurring in the entire country.

CSO GRAPHICS GROUP: COMPUTER FAIR SUMMARY

CSO introduced a number of new services related to computer graphics output, visualization and consulting. The CSO Graphics Group presented examples of some of these services currently being offered at the newly opened CSO Graphics and Imaging Lab located in Room 117, 101 S. Gregory, Urbana (244-5157).

At the booth, 35mm slides and prints of both vector-based and pixel-based images were displayed. The vector-based output was created from vector data (i.e., HPGL) that was generated with CADAM, SAS and AutoCad. The HPGL vector files were then transferred, over the campus network or with a DOS floppy disk, to a Compaq DeskPro Model 130 which hosts a digital film recorder capable of recording computer images at a resolution of up to 2000 x 4000.

The pixel-based images were generated in different ways: digitized with a camera at the Graphics and Imaging Lab; synthesized with software currently running on uiucuxh or uiucuxe; grabbed from a camera, microscope, or video player attached to a TARGA board or other frame grabber; etc. The images were transferred to the Compaq and film recorder (cited above), but with different software than that used for vector images.

Also displayed were B-size color prints, produced from the same vector or pixel data mentioned above. This was done in the same manner as the slides and prints, since the Compaq also hosts a thermal transfer printer capable of producing A and B size prints at 300 dpi. In the future, production of color transparencies, to be used with overhead projectors, will be supported.

Finally, three short computer animations were shown: a fly-around of the Beckman Institute, a presentation of a tractor design for a project in Industrial Design, and the visual results of robot motion simulations by researchers at the Coordinated Science Lab (CSL).

The above examples were used because they showed the versatility of the system which supports these new services; because they showed that such services are applicable to many disciplines; and, because the services are available to the entire campus community.

The CSO Graphics staff, consisting of Jim Bozek, Randy Cetin, and Mike Grady, is available for general consulting in computer graphics and imaging in all disciplines. For further information, call 244-5157.

RESULTS OF CSO SURVEY ON DATABASE MANAGEMENT SYSTEMS

CSO wishes to thank everyone who took the time to reply to the Database Management Survey. We have finished tabulating the responses and are ready to report our findings at this time. The announcement about which database management system CSO will choose as a result of this survey will appear in the next issue of *Off-Line*.

Of the 578 people who responded, 416 (72%) said that they currently use a DBMS in their work. Most of the respondees said they use a microcomputer-based DBMS on one or more types of micros. Some persons use a mainframe DBMS only, while others use a combination of mainframe and microcomputer packages.

Lotus 1-2-3 was the most popular package with 193 users, although over a hundred of these people said they also used dBase, RBase, or some other DBMS in addition to Lotus 1-2-3. dBase ran a fairly close second in popularity, with 161 users. Others, in order of preference, were RBase (74), NoteBook (23), PCFile and REFLEX (each 18), INFO (14), their own program (12), and Excel and UWRIM (each 9).

The major uses of database management systems were for the storage of research data followed by mailing lists, accounting, library information storage/retrieval, inventory, student records, instructional use, or keeping track of records, jobs, notes, personnel, etc.

When asked about how much experience they had with using a database package, most people said that they had between one to five years experience. A large majority felt that the package they were using met their needs. They also felt that there were four major factors to be considered in the selection of a DBMS: (1) ease of use, (2) ease in updating, (3) ease of implementation, and (4) simplified application program interface. As an aside question, we found that 81 people are using some external database — with 56 different ones being mentioned.

Several questions were directed toward persons not currently using a DBMS. Since we got 143 responses to this section, we felt that some DBMS users may have responded to these questions as well. However, of those responding to this section of the survey, 104 said that they would be likely to use a DBMS in the future; approximately 1/3 of these thought it would be a PC-based system. Future use of DBMS followed the current use (above) with storage of research data being the main usage.

Of the 578 respondees, 47 people said they currently use the Cyber and 48 people use IBM/CMS. Many of these people also use various PC or other micro-mini computers as well.

In summary, we found: (1) the main use of database management systems is the storage of research data (as expected); (2) the important factors in choosing a DBMS are ease of use, ease in updating, ease of installation and maintenance, simplified interface/integration to applications, and cost; and (3) support was desired from CSO for help in choosing what DBMS was best suited to their purposes, help in installing a DBMS, and in helping users make good use of a DBMS.

RENTAL LAPTOPS NOW AVAILABLE FROM MICROCOMPUTER SERVICES

Bob Penka
Manager, Microcomputer Services

We have recently ordered eight laptop computers which we will offer for rent to faculty, staff, and students. We will buy more as demand warrants.

Two kinds of systems have been ordered, the Zenith Z-183 and the Toshiba T1000. Both are highly rated by reviewers, but for different reasons.

The Zenith Z-183 is given high marks for its display, one of the best available. The screen measures 6" x 8" and employs backlit LCD display technology. It is readable even in poor light. The Z-183 comes with a 80C88 processor (4.77 and 8mHz, switchable), 640 K of RAM, one 3.5" floppy drive and a 20MB hard disk. It measures 3.25" x 13.75" x 13.2" and weighs slightly less than 16 pounds. The onboard battery will power the system for 3.5 - 5 hours, depending on disk use.

The Toshiba's strong point is its portability. It weighs in at slightly over 6 pounds and measures 2" x 12.2" x 11". The screen is 3.25" high by 9.75" wide. It also employs supertwist LCD technology but is not backlit. It is powered by an 80C88 processor running at a fixed 4.77mHz and has a single floppy drive. The standard unit comes with 512K of RAM. Battery life is 2 hours.

The rental units will be equipped with modems. In addition, each T1000 will be equipped with a 768K memory expansion which retains information even when the machine is powered off. Part of this memory can be used as a hard disk to compensate for the lack of a second disk.

These systems should prove useful to individuals with a short term need for a portable computer. Possible uses are capturing data during a field trip, or taking notes while doing research at a library.

Rentals will be handled through the CSO Accounting Office, 1208 W. Springfield, Urbana. The Z-183s will rent for $6.00/day, the T1000s for $4.00/day. The maximum rental period will be three weeks. As of this writing, seven of the eight systems have arrived, but we are still waiting for the memory expansion boards and modems. Contact the Accounting Office (333-7752) for availability information.

WHAT'S NEW IN THE MRC

Bi-Shen Chuang and Mark Zinzow
Microcomputer Resource Center

On March 23, 1988, the CSO Microcomputer Resource Center (MRC) moved from 101 S. Gregory St. in Urbana to the Federal Room (Room 25B) in the Illini Union, located close to the new Student Microcomputer Site and the Central Stores Micro Order Center. Now, in addition to our continuing effort to acquire new software and hardware, the MRC is more conveniently located for University faculty, staff, and students. We would like to highlight the improvements listed below.

First, because the Illini Union has comfortable dining areas and reading rooms, we have decided to let readers study our magazines outside the Center. Simply leave your ID card with the Resource Center library operator, and you will be able to enjoy reading magazines in the Union.

Second, interesting and informative materials are free of charge and on display in our handout rack. These items vary each day as we receive new literature, but will often include the latest issue of *Off-Line* and the most current list of commercial software available for check-out and on-site evaluation (this list is also available on uxe in two files called **check.doc** and **site.doc** in **/micro/mrc** and are available via anonymous ftp).

Third, we now have a Commodore Amiga 500 graciously provided by Keepin' Pace Computers. The Amiga provides some very attractive features such as extensive graphics and multitasking at a competitive price. We plan to make the large collection of free software on UIUCnet for the Amiga also available in the MRC on diskette.

In addition, vendors and patrons who believe in the concept of software resource facilities have donated to the Center many new software packages in the past month. We would like to share with you these valuable resources. Here are the lists of the new items:

New Commercial Software Packages

(The following products, if not specified, are for the IBM PCs and compatibles. An asterisk indicates that the package may be checked out.)

Title	Publisher	Application
ASYST: A SCIENTIFIC SYSTEM	MACMILLAN SOFTWARE CO.	DATA AQUISITION & ANALYSIS (FFT's etc.)
ENABLE 2.0*	THE SOFTWARE GROUP	INTEGRATED SOFTWARE
EUREKA: THE SOLVER 1.0*	BORLAND	EQUATION PROCESSOR
EUREKA: THE SOLVER 1.0(MAC)	BORLAND	EQUATION PROCESSOR
FOXBASE+/MAC	FOX SOFTWARE	RELATIONAL DBMS
MICROSOFT WORKS 1.0	MICROSOFT CORP.	INTEGRATED SOFTWARE
PARADOX 2.0	ANSA/BORLAND	RELATIONAL DBMS
QUATTRO 1.0*	BORLAND	SPREADSHEET
REFLEX: THE ANALYST 1.1	BORLAND	ANALYTICAL TOOL/ DATABASE MANAGER
REFLEX PLUS: THE DATABASE MANAGER 1.0 (MAC)	BORLAND	DATABASE MANAGER
R&R RELATIONAL REPORT WRITER 3.0*	CONCENTRIC DATA SYSTEMS, INC.	REPORT GENERATER
SAVVY PC	EXCALIBUR TECHNOLOGIES CORP.	ARTIFICIAL INTELLIGENCE DATABASE

Title	Publisher	Application
SIDEKICK PLUS 1.0	BORLAND	INTEGRATED SOFTWARE
SIDEKICK: THE DESKTOP ORGANIZER 2.0* (MAC)	BORLAND	INTEGRATED SOFTEARE
SUPERKEY: THE PRODUCTIVITY BOOSTER 1.1	BORLAND	KEYBOARD ENHANCER
SYSTAT (manuals only)	SYSTAT, INC	STATISTICS
TURBO C 1.5	BORLAND	LANGUAGE
TURBO PASCAL 4.0	BORLAND	LANGUAGE
TURBO PASCAL 4.0 DEVELOPER'S LIBRARY	BORLAND	PROGRAM-BUILDING TOOLS
TURBO PASCAL FOR MAC 1.1	BORLAND	LANGUAGE
TURBO PASCAL DATABASE TOOLBOX 1.0 (MAC)	BORLAND	DATABASE PROGRAMMING
TURBO PASCAL TUTOR FOR THE MAC 1.0	BORLAND	PASCAL TUTORIAL
TURBO PROLOG 1.1	BORLAND	LANGUAGE POPULAR For ARTIFICIAL INTELLIGENCE
TURBO PROLOG TOOLBOX 1.0	BORLAND	SOURCE CODE FOR GRAPHICS FILE CONVERSION, COMMUNICATIONS AND MUCH MORE.

NEW DEMONSTRATION PACKAGES:

MICROGRADE (IBM & MAC)	CHARIOT SOFTWARE GROUP	GRADEKEEPING
MICROTEST II (IBM & MAC)	CHARIOT SOFTWARE GROUP	TEST GENERATER
MACPACQ (MAC)	BIOPAC SYSTEMS, INC.	DATA ACQUISITION

(MacPacq is a data acquisition system for the Macintosh. It is a low power battery operated system which can be operated when disconnected from the Macintosh. MacPacq runs on any Macintosh with at least 512k of memory and supports three language interfaces: TrueBASIC, Microsoft BASIC, and TurboPascal. This vendor would like to answer any questions about MacPacq. Please contact: BIOPAC SYSTEMS, 412 AERO CAMINO SUITE 215, GOLETA, CA 93117 (805) 986-8880)

New Materials

On May 13 we received the latest update of the PC-SIG CD ROM with over 1000 disks of public domain software. New access software and migration of the new files to the campus network are in progress.

The Microcomputer Resource Center is now a member of Apple Programmer's and Developer's Association (APDA). Their quarterly magazine APDAlog is now available on our magazine shelf.

You can read about Apple and DEC's alliance to establish network links between Macintosh and DEC VAX computers, and about A/UX, Apple's UNIX system. Also from APDA comes product literature on HyperDA and R-Server software. Symmetry Corp's HyperDA is a desk accessory for opening, browsing, and searching HyperCard stacks. Solana Electronics' R-Server makes communication with the AppleTalk network possible from any point in the world. The Resource Center Staff will assist you in locating the literature in our vertical file.

Correction: In the Jan/Feb 1988 issue of *Off-Line*, p. 37, we listed Microsoft Works for the Mac 1.1 as an addendum for checkout. This is incorrect, as we have only one copy and it should be kept in the Center for patron evaluation. We apologize for any inconvenience caused by this error.

PCTeX SITE LICENSE UPGRADED TO VERSION 2.1

Edmund DeWan

[*The following article is an update to a previous article which appeared in the October-November 1987 issue of Off-Line, announcing the initial purchase of the PCTeX site license. Much of the explanatory material is repeated here, for the benefit of readers who do not have a copy of the original article. New features are described in the section, "Improvements and New Features," near the end of the article.*]

CSO has upgraded its site license for the mathematical text formatting program, PCTeX. The original license was for Version 1.50f, and we have purchased a maintenance agreement which gives us automatic upgrades for a period of one year. We have now acquired the upgrade to version 2.1.

What is PCTeX?

TeX — pronounced "tech," as in "technology" — is a typesetting/formatting language, developed by Donald E. Knuth at Stanford University. It provides textbook-quality formatting of printed material, especially material involving scientific and mathematical notation. Initial implementations of TeX, which is in the public domain, were for large computers and powerful workstations.

Personal TeX, Inc. markets a proprietary, PC-based implementation of the TeX language. CSO holds a site license from Personal TeX, allowing us to distribute PCTeX on the University of Illinois campus.

The PCTeX Program

PCTeX is a text *formatter*. A formatter, instead of being "what you see is what you get," is more like "what you get depends on what you see, after the program gets done with it." The user creates a file containing embedded codes along with the text, using any standard editor or word processor, and then submits the file to the formatter to be processed.

For example, your file might contain the following line of input text:

```
\it This is italic type, \rm and this is Roman.
```

The output from this line of text would be:

This is italic type, and this is Roman.

The reason this approach is so attractive to many people is that good formatters stand head and shoulders above even the best word processors, when it comes to complicated formatting operations. They offer power and flexibility, and give the user almost complete control over the end result. In addition, the command sets are usually mnemonic and easy to remember, which cannot be said of many word processing systems. The particular advantage of PCTeX is that it offers a complete mathematical typesetting capability, in addition to its normal text formatting, and this is a feature offered by very few word processors.

PCTeX has the ability to paginate, hyphenate and justify, draw rules, and do many other functions associated with professional typesetting. It has accents for words in foreign languages that are based on the Roman alphabet, and devices for indicating proper hyphenation for exceptional words.

PCTeX has a macro language facility that allows single commands to serve as abbreviations for complicated sequences, such as those used for formatting the beginning of a new chapter or for specifying the page header style. Macros can be written by the user, or pre-defined macro packages can be used. The PCTeX package includes four macro packages, called VANILLA, LATeX, PLAIN, and AMS-TeX, which can be used for varying purposes, from simple applications to complicated mathematical text. Of these, the LATeX macro set is probably the most popular because it provides the user with most document formatting capabilities, and is very well documented. (See the later section, Documentation, for further remarks on the available manuals.) Readers who wish to find out more about the language can examine a copy of the PCTeX Manual at the Microcomputer Resource Center.[1]

Device Drivers

When you run PCTeX, the program reads your input file, and creates an intermediate file containing device-independent commands. This file is called a DVI file. In order to produce the output on some kind of device, such as a printer, the DVI file must be translated by a program called a device driver. PCTeX comes with three device drivers, for dot-matrix printers. These are 1) Epson FX, RX, IBM Graphics Printer, and IBM Proprinter, 2) Epson LQ (800, 1000, 1500, & 2500), and 3) Toshiba 1340, 1341, 1350, 1351, and P3xx printers. You can separately purchase screen previewers, and laser printer drivers. For further information on these items, see subsequent sections in this article.

System Requirements

PCTeX Version 2.1 requires the following minimum system features: 1) IBM PC, XT, AT, or compatible and MSDOS 2.0 or later, 2) Standard display (graphics adapter required for previewers), 3) 512K RAM, 4) 10 MB hard disk (uses 1-2 MB; TeX device drivers may require as much as 1 to 3 MB additional disk space; output DVI files take up a modest amount of space, and converted DVI files take up lots or huge amounts of space, depending on whether you use draft or final mode — plan on using up most of your 10 MB), 5) text editor or word processor, 6) at least one floppy disk drive, high-density or low-density, to read the distribution disk files onto your hard disk.

[1]The CSO Microcomputer Resource Center is located in the North Basement of the Illini Union, phone 244-6261. Their hours are 10am - 6pm, Monday through Friday.

TeX Fonts

The Computer Modern family of fonts supplied with the TeX device drivers were created at Stanford University using the font-design program METAFONT. Two versions of these fonts are available: the AM fonts, and the CM fonts, the latest version of the Computer Modern fonts. Because Personal TeX, Inc. now distributes the CM fonts as the default version, we have purchased the CM fonts with the PCDOT drivers. See the section "Improvements & New Features" for more information on the AM and CM fonts.

Prices and Distribution

PCTeX is distributed on the Urbana campus to individuals who are affiliated with the University of Illinois. Software and manuals are handled separately. The manuals are sold and distributed at the CSO Accounting/Distribution Office,[2] independently of the software. The manual costs $15.00, for all purchasers.

The software is sold at the CSO Accounting/Distribution Office, and distributed at the Microcomputer Resource Center, in the North Basement of the Illini Union. This separation of functions is necessitated by the large number of disks involved in the transfer operation.

There are three price components for the software, and the total price paid depends on your circumstances. First, there is the software fee of $45.00, based on the original site license purchase. In addition, there is an upgrade surcharge of $7.00, based on the maintenance contract purchase. Finally, there is a printing surcharge of $2.00, to cover the cost of printing the upgrade documentation. Thus, the total price of the package is $54.00, if you are a non-student, original purchaser. Students may now obtain the software free, but must pay the $2.00 documentation costs (as well as $15.00 apiece for any manuals purchased). Non-student users who have already purchased PCTeX through the site license need only pay the $7.00 and $2.00 surcharges, bringing their cost to $9.00. Students who have already purchased PCTeX through the site license may now obtain the upgrade free, but must still pay the $2.00 printing surcharge.

When you pay for your software at the CSO Accounting/Distribution Office, you will be asked in which category you qualify, and will be given a receipt for the appropriate amount. The only identification needed at this point is an ID to prove that you are a student.

After you have paid for your software, go to Microcomputer Resource Center and show them your receipt. You will be shown how to copy the software to your disks, using one of the Center machines. Note that you will be required to bring your own diskettes. If your receipt is for the upgrade (i.e., for $9.00), your name will be checked against our list of known PCTeX owners, and if it is on the list, you will be eligible. If your name is not on the list, you will be required to present some proof of purchase, such as your original receipt. (All new purchaser's names are placed in the database to receive notification of future upgrades and other pertinent information.)

[2]The CSO Accounting/Distribution Office is located at 1208 W. Springfield Ave., Urbana, phone 333-9230. Their normal working hours are from 8-12am and 1-5pm Monday through Friday.

Diskettes

Each disk you bring to the Resource Center should be formatted in advance on your own machine, and it is a good idea to run CHKDSK on each disk, to make sure they are all good. Bring one or two extras, for good measure.

The program comes on 4 low-density diskettes. In addition, there are two sets of PCDOT printer drivers, one set consisting of 5 low-density diskettes, and the other of 6 low-density diskettes. Also, there is one installation diskette, bringing the total to 16. The set of 6 is for EPSON FX dot-matrix printers, and the set of 5 covers both EPSON LQ and Toshiba dot-matrix printers. Thus, if you wish to have the full package, you will need 16 low-density diskettes.

If you have a 5 1/4 inch or 3 1/2 inch, high-density diskette drive, you will need 5 diskettes of at least 1.2 MB capacity. The Microcomputer Resource Center is equipped to handle both low- and high-density diskettes, in both 5 1/4 inch and 3 1/2 inch formats.

IBM Proprinter & Others

Since the IBM Proprinter is the successor product to the IBM Graphics (5152) printer, you can use the EPSON FX printer support package with the Proprinter, with the IBM Graphics printer, with the IBM 3812 Pageprinter (which operates in IBM Graphics mode), and any other printer which correctly emulates one of the printers supported by the PCDOT package.

Laser Printers

Since there are several different kinds of laser printer currently in use on campus, we have decided to leave laser printer support up to the individual purchaser. Personal TeX, Inc. sells laser printer drivers at prices of $195.00 and $225.00. Printers supported are Cordata LP-300/LP-300X, Canon LPB-CX (HP LaserJet and others), HP LaserJet Plus and Series II, QMS Lasergrafix 800 and 1200, PostScript (Apple LaserWriter, QMS-PS 800/1200/2400, Data Products LZR 2660/5, NBI model 8, Linotype Linotronic 100/300, etc.), and Imagen 8/300, 12/300, 24/300. For further information on laser printer support and other items, see the Personal TeX, Inc. Product Catalog, which can be examined at the Microcomputer Resource Center. (Note: the catalog also lists laser drivers by ArborText, Inc., the former supplier for Personal TeX, Inc.)

Screen Previewers

Screen previewers present a similar difficulty, in that there are two available from Personal TeX, Inc., Preview and MAXview. We have opted to leave this up to the purchaser as well. You can get further information on the three previewers by consulting the Product Catalog mentioned above.

Technical Support

Technical support is strictly through the Text Processing Consulting Office (333-7318), and consists primarily of help with installation, since Personal TeX, Inc. does not commit itself to support on TeX language questions. However, although there is no official language support, our consultant will provide general assistance whenever possible. Also, our consultant maintains a list of local PC-TeX purchasers through the site license program, and will put out bulletins requesting help on particularly difficult problems.

Personal Use Option

Along with the software and documentation, we have purchased a Personal Use Option, which permits qualified buyers to keep and use their software after they have left the Urbana campus, or have severed their ties with the University.

Documentation

PCTeX purchasers can buy the PCTeX Manual, by Michael Spivak, at the CSO Accounting/Distribution Office for $15.00, as noted above. This is an excellent instructional manual, but it is not the only manual available.

You can also buy, through the Personal TeX catalog, "The TeXbook," by Donald Knuth ($24.95), which is an exhaustive discussion of the TeX language, complete with extensive exercises and answers, and the "LATeX User's Guide," by Leslie Lamport ($24.95). This manual describes the LATeX macro utility, which comes with the PCTeX package. In the opinion of the author of this article, the LATeX User's Guide is the better buy, at least initially, for the following reasons: a) it is very well organized and written, and is therefore much more useful than the other manuals as a reference work (the PCTeX Manual and The TeXbook are good for initial study, but are poor as reference works), b) the LATeX macros, which come with the PCTeX package, form a self-contained, complete text formatting system for most applications, so it is generally not necessary to write original TeX code.

Note that it may also be possible to buy various TeX manuals in local bookstores.

The address of Personal TeX, Inc., is 12 Madrona Avenue, Mill Valley, California 94941 (phone 415-388-8853). (Remember, this phone number must not be used for consulting purposes, under the terms of the site license agreement, except for products that have been purchased directly from Personal TeX. Please call 333-7318 if you have any questions about or problems with your site license software.)

Improvements & New Features

PCTeX Version 2.1 supports path names to locate support files called from the main program. This means, in essence, that the user no longer has to keep the TeX program, macro packages, and device drivers on the same disk partition or in the same general directory area in order to operate PCTeX. Additional improvements to Version 2.1 include support for networking PCTeX, improved speed performance, and larger capacities for string pools, input buffer sizes, and stacks.

Finally, as noted earlier in this article, the CM fonts are now the standard distribution fonts, instead of the earlier AM fonts. Version 2.1 lets you install the program to work with a designated "primary" font set (CM by default), and optionally with a "secondary" font set. Thus, you can install the AM fonts as your primary set, and continue to work with your old AM printer drivers. Alternatively, you can install the CM fonts as your primary set, and the AM fonts as the secondary set, allowing you to use both the CM and AM fonts, if necessary. This will, of course, take up a considerable amount of your hard disk space. Other options include installing only the CM fonts as the primary set, and installing the AM fonts as the primary set and the CM fonts as the secondary set.

Users who have separately purchased laser printer drivers with the AM fonts will, in the same manner, be able to continue using their upgraded program with the old printer drivers. However, if they wish to upgrade to the CM fonts, they will have to do so directly through Personal TeX, Inc., for a fee of $35.00.

Hewlett-Packard LaserJet Series II Print Service

CSO is establishing a print service in Room 70 Commerce West for PCTeX users. The service should be fully operational by the time this article goes to press.

The print service will use an IBM AT attached to a Hewlett-Packard LaserJet Series II printer, which operates through a plastic card system like the others now installed at numerous other sites on campus, both for laser printers and for copiers. The printer driver, Personal TeX's PTI Laser HP+ Series driver, will be installed on the hard disk. Operational details are not yet complete as this is being written. Printed instructions will be provided on-site, and further information will be mailed to all purchasers through the PCTeX local mailing list. (The driver will also work for HP LaserJet Plus printers; therefore, users will be able to prepare output files that can then be taken back to another installation and printed on a LaserJet using the DOS COPY command with the /B option. This will enable LaserJet owners to prepare output on their printers without purchasing a printer driver.)

FILE CONVERSION ISSUES

Joan Schraith
Microcomputer Consultant

Why would you be interested in converting your file? Maybe you have been using a program which no longer meets your needs, but you have just purchased a better program which is capable of doing what you need. Perhaps you put some data into a microcomputer spreadsheet or database program because it was easier to enter data in that environment, but now you want to send it to VMD to run SAS on this data. Maybe you typed a document on the Macintosh, but a collegue would like it on disk, and he only has an IBM-PC.

You should be aware that although it is usually possible to convert data between different file formats, the ease of doing so depends entirely on the program the data was originally entered into, in what format it stored your data to the disk, and the stringency of formatting demanded by the target program. In other words, if all you want is straight text from a word processor, without bolding, underlining, page breaks, margin settings, etc., the conversion will generally be very easy. If however, you are working with a program which assumes that you would never want to convert FROM it to something else, the conversion may require a great deal of effort to strip the file down to straight text. In the same way, if the program you want to read the data into has very strict demands on the formatting of the data it brings in (as SAS does), file conversion will also be more complicated.

Since file conversion has become one of our most heavily demanded services at MicroConsulting, we thought you might be interested in some of the issues and options available for various types of conversions. This month we will concentrate on converting into and out of spreadsheets, and in the months to come we will be exploring conversion issues for other types of software.

From Lotus 1-2-3 to ASCII

Unfortunately, Lotus does not have a convert-to-ASCII utility. However, you can print your worksheet to a file. Before describing the details of this procedure, some things need to be mentioned.

1. If your worksheet is wider than three screens, you are going to have problems unless you can easily define meaningful chunks of data which are 240 or fewer characters wide. In other words, if your worksheet is set up such that you have data in cells A1 through AH1, which cannot be broken up into two separate files A1 through X1, and Y1 through AH1, it may prove faster to retype the data on the mainframe. The 240 character limit is a maximum with Lotus. Furthermore, depending on which program is going to read in your data (and whether it can accept lines of data longer than 80 characters) you may have further limitations on how wide your worksheet can be.

2. After 100 lines of data (or whatever length you designate your page), there will be some blank lines before data begins again. Expect a little bit of editing.

You will basically be proceeding as if you were printing your data to a printer. If you do not understand the basics of working with Lotus (how to highlight a range, how to use the Slash key menu, etc.) you may need to refer to the manual. I assume you know how to do these things.

Call up the menu by pressing the / key. Choose print.

```
Worksheet  Range  Copy  Move  File  Print  Graph  Data  System  Quit
Output a range to the printer or a print file
```

Choose File.

```
Printer  File
Send print output directly to file
```

Type a filename to which you want to store your data. If Lotus prompts you with the wrong drive name, you will have to press Escape and type the correct drive designation before the filename.

```
Enter print file name: B:\
```

Now you will begin to set up the margins and page length. This will save you editing later. After you designate the file name and press return, you should see the following menu :

```
Range  Line  Page  Options  Clear  Align  Go  Quit
Header, Footer, Margins, Borders, Setup, Page-Length, Other
```

Choose Margins.

```
Header  Footer  Margins  Borders  Setup  Pg-Length  Other  Quit
Set left, right, top, or bottom margin
```

Choose Left.

```
Left  Right  Top  Bottom
Set left margin
```

Type 0.

```
Enter Left Margin (0..240): 0
```

Choose Margins.

```
Header  Footer  Margins  Borders  Setup  Pg-Length  Other  Quit
Set left, right, top, or bottom margin
```

Choose Right.

```
Left  Right  Top  Bottom
Set right margin
```

Type the width of the range of data you want to print out; the widest option is 240.

```
Enter Right Margin (0..240): 240
```

Choose Margins.

```
Header  Footer  Margins  Borders  Setup  Pg-Length  Other  Quit
Set left, right, top, or bottom margin
```

Choose Top.

```
Left  Right  Top  Bottom
Set top margin
```

Type 0.

```
Enter Bottom Margin (0..32): 0
```

Choose Pg-Length.

```
Header  Footer  Margins  Borders  Setup  Pg-Length  Other  Quit
Set number of lines per page
```

Type 100.

```
Enter Lines per Page (1..100): 100
```

Choose Range.

```
Range  Line  Page  Options  Clear  Align  Go  Quit
Specify a range to print
```

Highlight the range of data you wish to include in the file just as you would if you were printing the data out on a printer.

```
Enter Print range: A1
```

Choose Go.

```
Range  Line  Page  Options  Clear  Align  Go  Quit
Print the specified range
```

If you print several 80-character-wide ranges of data, it is then possible to write a program in BASIC which will shuffle them together line by line. Be sure that you format your worksheet such that there is a column of a single x beginning each print file, and print out as many as are needed. Then use the following type of program (written by one of our consultants, Brian Shearer) to merge them.

```
10    OPEN "filenam1.prn" FOR INPUT AS 1
20    OPEN "filenam2.prn" FOR INPUT AS 2
30    OPEN "filenam3.prn" FOR INPUT AS 3
40    OPEN "filenam4.prn" FOR INPUT AS 4
50    OPEN "output.fil" FOR OUTPUT AS 6
60    FOR I = 1 TO 96
70    INPUT #1,A$
80    INPUT #2,B$
90    INPUT #3,C$
```

```
100    INPUT  #4,D$
110    PRINT  #6,A$
120    PRINT  #6,MID$(B$,2)
130    PRINT  #6,MID$(C$,2)
140    PRINT  #6,MID$(D$,2)
150    NEXT  I
160    CLOSE  #1
170    CLOSE  #2
180    CLOSE  #3
190    CLOSE  #4
200    CLOSE  #6
```

From Lotus to PC-SAS

This procedure is much simpler, as PC-SAS is able to create a valid data set from a DIF format file. Be sure that you have deleted all extraneous rows in the worksheet, and that each variable is in one column. In this case, instead of printing to a file, we will use Lotus's Translate Utility. Translate can handle files from either release of Lotus 1-2-3, dBase II or III, DIF, Jazz, Symphony, and Visicalc. It is entirely menu-driven, and self-explanatory.

First, it asks you what format you want to translate FROM. In this case, you are translating from Lotus 1-2-3 rel ? (depending on which release you are using), so move the lighted bar to that option and press RETURN. Then it will ask you what format you wish to translate TO. In this case, you want to translate to DIF. (DIF stands for Data Interchange Format). Once you have selected what the translation type will be, it will ask you to select the file you want to translate, and choose a name for the new file. It gives you one last chance to change your mind, and then begins the translation.

Once you have the worksheet in DIF format, you will need to enter PC-SAS. You will use the PROC DIF command (described on p. 133-136 of the SAS Procedures Guide for Personal Computers). Replace LOTUS.DIF with the name of the DIF file and SASDATA.SET with the name of the SAS file you want.

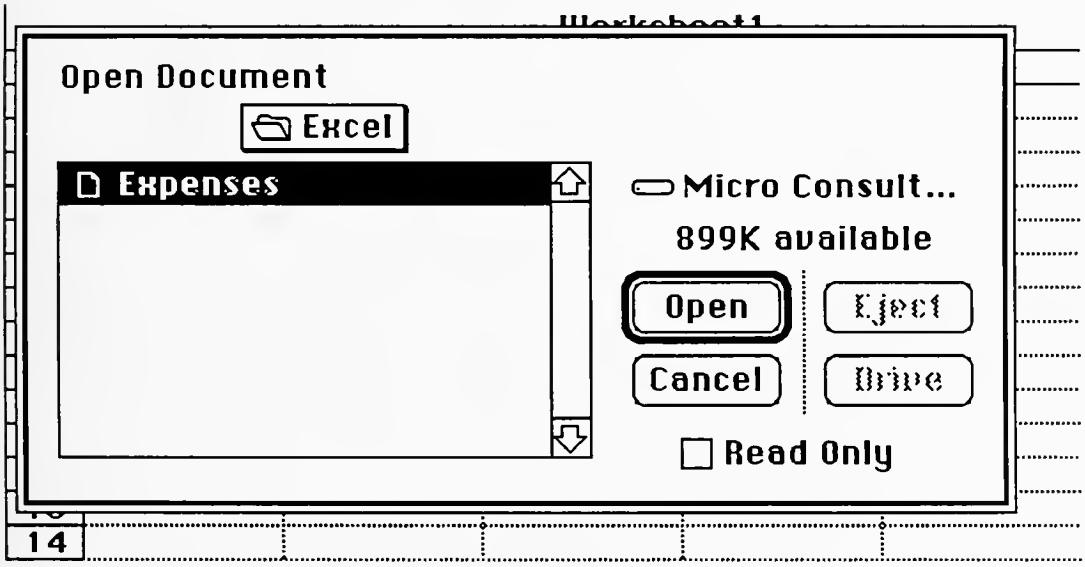
```
PROC DIF DIF=LOTUS.DIF OUT=SASDATA.SET
```

From Lotus to EXCEL on the Macintosh (and Vice Versa)

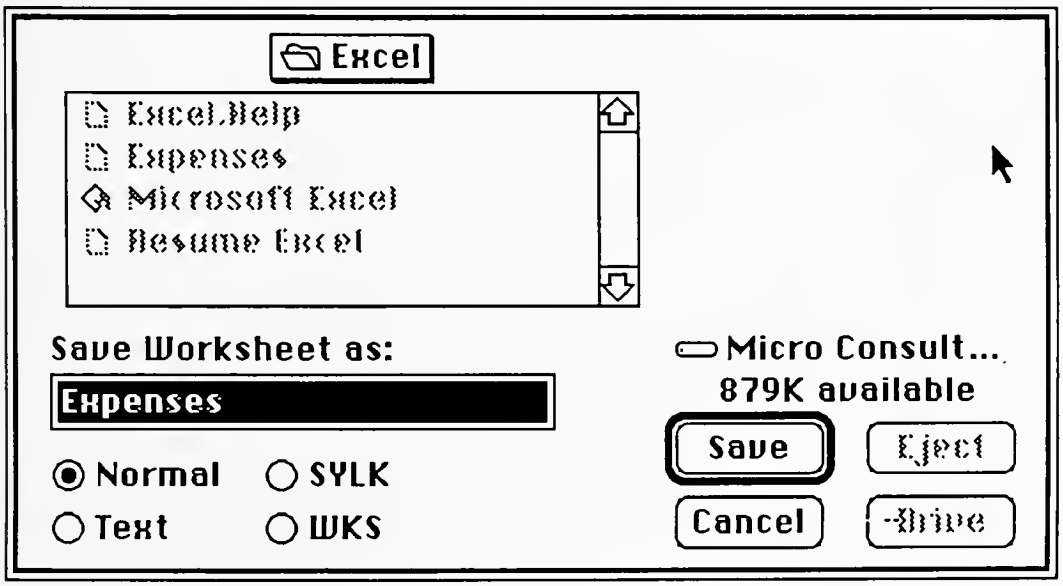
This is actually one of the simplest possible conversions to do. Microsoft Excel has the ability to read in a Lotus worksheet file as is, and to save in a Lotus format. You will need to use a network, such as TOPS, or serial port transfers to get the IBM PC worksheet onto the Macintosh disk (or vice versa).

You won't be able to open the Lotus worksheet by double-clicking on it (Excel isn't THAT smart), so you'll have to enter Excel first. Double-click on the Excel icon.

Then select OPEN from the FILE menu. When you do, the following dialogue box will appear:



The Lotus worksheet file will be available for selection. Highlight it, and click on OPEN. Excel will translate the file for you as it opens it. Converting from Excel to Lotus is almost as easy. Choose Save As... from the FILE menu. The following dialog box will appear:



Give the new worksheet a name, and click on the button next to WKS. Then click on SAVE. You will notice that it is possible to export a document to ASCII in Excel without the kind of trauma that Lotus causes — just save as Text.

From ASCII to Lotus

The last problem is how to bring in an ASCII file into Lotus. This is extremely easy if the file is either all labels or all numbers. If it is a mixture of labels and numbers, things get a little trickier. First of all, enter Lotus. Choose **/File Import** from the slash key menu. You will be presented with the following options:

```
Text     Numbers
Enter each line of a file as a single label
```

If you choose TEXT, each line of the file will be brought into column A, rows 1 through n, as a single 80-character-long label. If you choose NUMBERS, only numbers will be brought into the file, but they will break correctly into cells (any labels present will not be translated). Then Lotus will ask you for the name of the file to import. Lotus will only find files that end in **.PRN** to display to you, but can import any file if you type its name.

If you have a file that is both text and numbers that you wish to bring into Lotus, first import the file as text. Next, be sure your cursor is on the top row of the data, and use the DATA PARSE command to split the one long label into several columns. (This command is described on pages 161-165 of the Lotus Manual.) Choose **/Data Parse** from the slash key menu. You will see the following options:

```
Format-Line     Input-Column   Output-Range   Reset     Go     Quit
Create or edit format line at current cell
```

Choose Format-Line to create a format line above the top row of data. Lotus will assume a particular way to split the line into columns. This initial format line is nearly always too detailed to be useful, but it can be edited. The format line looks like this:

```
****L>>>*****L>>***********L>>>>>>>*******V>>>>>>>
    Wilson   May             Rosebud          1050.234
```

A new column will begin where the L's and V's are indicated. Both * and > will be contained in the width of the cell. * just means to Lotus that a space was in that position, > means that a character was in that position, L means "Label" and V means "Value". Edit the line if you don't like where it will split your data.

Now, select **Input-Column**. Your input-column is as much of column A as holds data. Select **Output-Column** to tell Lotus where to put the new "parsed" data. While you can choose A1, and just copy over the original data, or you can play it safe, and tell Lotus to put it somewhere else. When you choose **Go**, the data will be split up into columns.

SAS FOR THE PERSONAL COMPUTER--1988

Vicky Dingler
Statistical Consultant

SAS Institute has recently distributed SAS Version 6.03 for the IBM personal computer, and IBM clones. There are six products currently licensed by the University of Illinois: BASE, STATS, RTERM, IML, FSP and GRAPH.

The SAS Base product for the PC includes the procedures available in the mainframe version. Additional procedures are available that allow the PC windowing facility to be used to its full extent, as well as mainframe interfacing facilities. The Base product consists of 21 diskettes formatted at 360K, and will occupy 5.5MB of disk storage. There are several changes to the old version (6.02) that are documented in the following manual: *Technical Report: P-171 Changes and Enhancements to Base SAS Software for Personal Computers, Release 6.03.*

SAS STAT for the PC includes almost all of the statistical procedures available for the mainframe. Included in the list are: ACECLUS, ANOVA, CANCORR, CANDISC, CATMOD, CLUSTER, DISCRIM, FACTOR, FASTCLUS, FREQ, GLM, LIFEREG, NESTED, NLIN, NPAR1WAY, ORTHOREG, PLAN, PRINCOMP, REG, RSREG, SCORE, STEPDISC, TREE, VARCLUS, and VARCOMP. The procedures not included in SAS STAT are LIFETEST, NEIGHBOR, PROBIT, RANK, RSQUARE, and STANDARD. The STAT product consists of 15 diskettes formatted at 360K and will occupy 4MB of hard disk storage. The STAT version is documented in the *SAS/STAT Guide for Personal Computers, Version 6 Edition.*

SAS/RTERM is a terminal emulation facility that allows the IBM PC to emulate the Digital Equipment Corporation VT100 terminal for text and the Tektronix 4105 terminal for graphics output. Here at the University of Illinois, it can be used with a 1200 baud SWITCH port or a 9600 baud LOCALNET port with the IBM 7171 to allow full screen text editing to emulate a DEC VT100 terminal. It can also be used with the SWITCH or LOCALNET to emulate a TEKTRONIX 4105 graphics terminal for using SAS/GRAPH on the mainframe to generate graphics. RTERM is one diskette formatted at 360K and will occupy less than 1MB of hard disk storage.

SAS IML for the PC is an interactive data manipulation language that operates on entire matrices of values. IML consists of 4 diskettes and will occupy less than 1MB of hard disk storage. There are several changes to the old version (6.02) that are documented in the following manual: *Technical Report: P-172 Changes and Enhancements to SAS/IML Software for Personal Computers, Release 6.03.*

Two new products for the PC will be available with version 6.03. They are SAS/GRAPH and SAS/FSP. SAS/GRAPH for the PC includes all of the mainframe procedures for producing hard copy color graphics. The product will take 7.2 megabytes of hard disk storage because of the device drivers and map data sets. SAS provides a menu driven installation procedure to allow selective installation. The GRAPH product consists of 28 diskettes formatted at 360K and will occupy 4.5MB without the map data sets (7.2MB with the map data sets). The product is documented in the *SAS/GRAPH Guide for Personal Computers, Version 6 Edition.*

SAS/FSEDIT enables you to design entire screens for interactive data entry or display. For example, a researcher might design a screen as a facsimile of a lab report form and have lab assistants enter the data directly into a SAS data set for subsequent analysis. The screen can be designed in such a way as to have SAS check for the appropriateness of the data entered in the fields. This can

help expedite or even eliminate the steps of raw data coding and data cleaning in data processing. SAS/FSLETTER also enables you to store business and form letters in SAS data sets for processing with SAS data sets containing names and addresses from mailing lists. The FSP product consists of 4 diskettes formatted at 360K and will occupy less than 1MB of hard disk storage. The product is documented in the *SAS/FSP Guide for Personal Computers, Version 6 Edition.*

SAS/FSCALC, the spreadsheet facility will not be available until version 6.04.

All of these manuals are in the Closed Reserved Section of the Undergraduate Library for review.

SAS Version 6.03 for the IBM XT and IBM AT is called PC DOS SAS and requires at least 20 megabytes of hard disk storage. The IBM PC DOS operating system that is required is release 2.0 or later. The machines that are supported are the IBM PC AT, PC XT and the 3270 PC. There is a minimum of 640K real memory required for all three machines. The control program required for the 3270 PC is release 1.21 or 1.22 only. The control program will consume about 200K of the available 640K in PC DOS. Since SAS requires at least 640K, the control program should be reconfigured to support only one mainframe session and the PC DOS session.

CSO has purchased the licenses for these SAS PC products. There will be an initial fee for each product as well as a yearly renewal fee for each product.

SAS PC Distribution

SAS for the PC is distributed through the CSO Distribution Office at 1208 W. Springfield. In keeping with the license agreement the University of Illinois has entered with SAS Institute, a license agreement between the University and the user has been developed that meets various criteria. The license agreement will have the stipulations for compliance. It will also have a form to be filled out with questions pertaining to hardware specifications and its location. The license agreement can be obtained at 1208 W. Springfield or 85 Commerce West. The completed license agreement will be brought to the person(s) managing SAS PC distribution at the CSO Distribution Office at 1208 W. Springfield. A photocopy can be made for personal files.

The license agreement will serve several purposes. First, it will be a means by which the university can uphold the stipulations in the license agreement between itself and SAS Institute. Second, it aids CSO in keeping accurate records. Third, the information will be added to the SAS PC User's Mailing List. The SAS PC products can be purchased at the CSO Distribution Office at 1208 W. Springfield.

The Base product is 22 diskettes and costs $32.00. The Stat product is 15 diskettes and costs $23.00. The RTERM product is one diskette and costs $19.00. The IML product is 4 diskettes and costs $19.00. The FSP product is 4 diskettes and costs $34.00. The GRAPH product is 28 diskettes and costs $49.00. These prices include the yearly license fee, the diskettes and the copying fee. The license fee includes free updates. If there are updates for this version, the cost will include the price of the diskettes. The license will be renewed between SAS and the University each year, as will the license between the University and the user.

Those entitled to buy the product are those who are employees of the University. A valid staff ID card will suffice as proper identification when you visit 1208 W. Springfield. A purchase order with the following information and the SAS PC license agreement should be brought to 1208 W. Springfield when purchasing the SAS products and documentation.

Product	Price
SAS BASE	$32.00
SAS STAT	$23.00
SAS RTERM	$12.00
SAS IML	$19.00
SAS FSP	$34.00
SAS GRAPH	$49.00
SAS Intro. Guide for Personal Computers	$13.15
SAS Language Guide for Personal Computers	$17.45
SAS Procedures Guide for Personal Computers	$17.45
Technical Report P-171: Changes to Base Product	$15.95
SAS/STAT Guide for Personal Computers	$17.45
SAS/IML Guide for Personal Computers	$17.45
Technical Report P-172: Changes to IML Product	$11.00
SAS/RTERM User's Guide	$ 9.85
SAS/GRAPH Guide for Personal Computers	$30.95
SAS/FSP Guide for Personal Computers	$29.95

SAS PC Diskette Replacement Policy

If for any reason a SAS PC diskette is unusable, a replacement will be made free of charge in room 94 Commerce West.

Please bring the defective diskette to room 94 Commerce West. The PC consultant will replace the defective diskette with a new diskette. The PC Consulting hours are 10:00 am to 5:00 pm Monday through Friday. The phone number is 244-0608.

If there are any questions about this policy, please contact the CSO Statistical Consultants in 85 Commerce West, 333-2170, or Vicky Dingler at 333-4668.

VIRUSES RAMPANT — TRUTH OR FICTION?

Lynn Bilger, Editor

(Editor's note: Information for this article was gathered from a large variety of sources: newspapers such as the New York Times, Pittsburgh Press, Chicago Tribune; campus computing newsletters such as BACSpace (Indiana University), Connections (University of Pittsburgh), Computing Center Log 88 (Virginia Polytechnic Institute and State University), and the Micro Monitor (University of Wisconsin-Madison), among others; and other sources such as UNIX notesfiles, electronic bulletin boards, etc.)

Much has been written about the proliferation of "viruses" (also known as "virii") in the software for microcomputers and, in some cases, in the software for mainframes. I have recently read some articles that claim viruses are a major problem (e.g., an article in The New York Times of Sunday, January 31 begins with "It could be a science-fiction nightmare come to life..."), while other articles say that the problem is not as bad as people have been led to believe. Perhaps the word

"rampant" exaggerates the truth. The problem, however, does exist. Users should not only be aware of the problem, but should also learn about how to protect themselves against unwanted viruses.

Although, at the time of this writing, CSO had heard of only two incidents of viral infection occurring on the UIUC campus, we felt we should address the issue. (The two incidents were a virus in Amiga microcomputers and the SCORES virus on some of the Macs at the Illini Union Site. In both cases the virus was discovered quickly and brought under control.) The following article presents some of the more pertinent information we have gathered and been able to verify to some degree. An accompanying article discusses how you can protect yourself from viruses, and provides a list of available software for the prevention/detection of viruses for IBM PCs or compatibles.

Before we begin, we should first bring to all users' attention the fact that two things will actually be discussed below — "viruses" and "Trojan Horses." Surprisingly, very little has been written about Trojan Horses as such, even though they can destroy hard discs, FAT tables, etc. Perhaps the fact that they do not spread like a virus is the reason they have not received as much publicity. Or, perhaps, many people have lumped viruses and Trojan Horses together under the label of viruses.

Viruses

How did viruses get their name? In biology, a virus can be highly contagious. It can start with one host, use that host's resources to replicate itself, and then spread rapidly to other hosts, infecting more and more hosts along the way. In the same manner, infected computer programs can infect one machine and its programs and then spread to other machines and their programs through use of the infected software -- hence, the name virus. Viruses can be spread through the exchange of software between individuals or even over telephone lines. Many viruses are believed to have been spread through electronic bulletin boards.

Although some viruses do no damage and seem to be written by hackers just to "have a little fun" by putting out simple messages, many viruses have been written with malicious intent. This second type of virus often has an incubation period before symptoms appear. This is sometimes referred to as having a "time bomb" in the program. In other words, the virus enters the system and resides, usually in memory, for a time before it begins to do its work. Viruses can attack directories and file allocation tables (FAT), reformat disks, make subtle changes in data in spreadsheets or other files, destroy data and files, destroy hard disks, and have even been known to cause damage to monitors.

There are so many different viruses, it is hard to specify definitive symptoms. Most of the virus programs that we know about seem to be aimed at damaging or disrupting the operating system. Viruses written for MS-DOS computers usually reside in infected COMMAND.COM files, or files with extensions of .COM or .EXE. The viruses in these files make the files grow in size, or change date and time stamps in some cases. Erratic behavior or a slow-down in your system may indicate the presence of a virus.

A virus that has received much publicity is the one that appeared at the Hebrew University in Israel. This virus, which had spread to many of the computers on campus, threatened to destroy thousands of the University's computer files, wiping out years of research. The virus contained a time bomb set to go off on Friday, May 13, 1988, which would destroy all files. Many believed that this was a politically-motivated virus since the time bomb was set to coincide with the date of Israel's declaration of independence.

Another well-known virus is the one discovered at Lehigh University in Pennsylvania. That virus would replicate itself into the COMMAND.COM file of any accessible disk. When an infected disk was used in another machine, the virus would spread. Once in the operating system of an IBM PC, it counted the number of new applications that it infected. When the count reached four, it immediately erased all programs and data it could reach. Hundreds of students had text and data files destroyed before the virus was discovered and a remedy developed.

The February 1988 issue of "Connections", the newsletter from the University of Pittsburgh, reported that a virus, known as "Brain," had recently surfaced there. This virus does a number of things. First, it alters Sector 0 in the boot area of the disk and the volume label in the disk. It also picks three sectors, apparently at random, and marks them as "bad sectors" in the FAT. If there is data stored in those three sectors, there is no way to recover the data. The virus spreads to any disk that is accessed in an affected machine by DOS commands (e.g., DIR, FORMAT, COPY), or just by accessing a file. If it is inspected with a utility program (such as Norton Utilities), several things are noticeable. The words "Welcome to the Dungeon," "Brain Computer Services," and "Beware of this Virus" are prominent.

An Amiga virus that reportedly has occurred on some machines in this area displayed the message:

Something wonderful has happened
Your AMIGA is alive !!!
and, even better...
Some of your disks are infected
by a VIRUS !!!

!!! Another masterpiece of
The Mega-Mighty SCA !!

(SCA stands for Swiss Crackers Association, a group of European computer pirates who designed this virus. It was carried into the United States on a pirate copy of the German game program MOUSETRAP.) Although this virus is easily disabled and is primarily a "nuisance" virus, it can be dangerous because it writes its code on the boot sectors of disks; thus, some specialized software can be ruined beyond repair by the AMIGADOS INSTALL command.

A virus recently discovered on some of the Macs at the Illini Union site is known as the SCORES virus. Because this particular virus has affected many Macs on campus, we have decided that a separate article about SCORES would be more beneficial to our users than a brief paragraph here. Please see the article "SCORES Virus Found at UIUC" for more information.

Trojan Horses

Trojan Horses (named after the famous gift horse in Greek Legend) are destructive programs written for the express purpose of damaging computer systems. Trojan Horses are disguised as useful programs or utilities, often under familiar names. They differ from viruses in that they do not proliferate or spread to other systems. Users who frequently download programs from Bulletin Boards should be particularly aware of Trojan Horses.

The following list of Trojan Horses has been reprinted from the 4 April 1988 version of the "The DIRTY DOZEN -- An Uploaded Program Alert List" that is currently maintained by Eric Newhouse. Mr. Newhouse states that the following is by no means a comprehensive list as he is constantly being informed of new Trojan Horses, viruses, etc. He has also included several programs,

marked with (C), that have been reported but not verified as Trojan Horses — users should exercise caution in using these programs. (FAT stands for File Allocation Table)

123JOKE This so-called utility for Lotus 1-2-3 rewrites [hard] disk directories.

ALTCTRL.ARC This program reputedly trashes boot records.

ARC513.EXE This hacked version of SEA's ARC.EXE appears normal. However, it writes over track 0 of your [hard] disk upon usage, destroying the disk's boot sector.

ARC514.COM This is completely similar to arc version 5.13 in that it will overwrite track 0 (boot sector) of your hard disk. Also, I have yet to see an .EXE version of this program.

BACKALLY.COM This sophisticated Trojan will axe your FAT table after a couple of months of usage. Beware the delayed Trojan! BACKALLY may only work on floppy disks, but that sounds unlikely. Debug has shown that BACKALLY formats a track at one point as well as reading in the amount of freespace on your disk. It may only wipe out full disks, like NOTROJ. Please, be wary! An included .BAT file comes with a request for donations to "SomeWare" located in Frederickburg, VA. Look out for other products from SomeWare!

BACKTALK This once beneficial utility will write/destroy sectors on your [hard] disk drive. Use this with caution if you acquire it, because it's more than likely that you got a bad copy.

BXD.ARC This disk killer warns users that "your disk will be trashed in 5 seconds" on sector 17 on the included BXD.COM file. Watch out for this FAT killer!

CDIR.COM This program supposedly gives you a color directory of files on disk, but it in fact scrambles your disk's FAT table.

CHUNKER.EXE (C) A part of QEDIT v. 2.02, this program writes five apparently harmless files to disk. Chunker, which is supposed to split large text files into more manageable, smaller ones, may also scramble FATs.

COMPRESS.ARC This Trojan, dated April 1, 1987, destroys FAT tables. COMPRESS is executed from a file named RUN-ME.BAT and is advertised as a "Shareware 'ARC' from Borland!"

DANCERS.BAS This Trojan shows some animated dancers in color, and then proceeds to wipe out your [hard] disk's FAT table. There is another perfectly good copy of DANCERS.BAS on BBS's around the country; apparently the author altered a legitimate program to do his dirty work.

DEFENDER.ARC This Trojan both writes to ROM bios and formats [hard] disks. The Duplicators claim credit for this Trojan; beware of other products by them. Also, do not confuse this Trojan with DEFENDER by Atari. The latter is a pirated program.

DISCACHE.EXE (C) This program uses direct BIOS routines to write to disk. Apparently, those BIOS routines will scramble your FAT table. There is at least one legitimate DISCACHE.EXE file circulating, so not all DISCACHE programs are Trojan.

DISKSCAN.EXE This was a PC Magazine program to scan a [hard] disk for bad sectors, but then a joker edited it to WRITE bad sectors. Also look for this under other names such as SCANBAD.EXE and BADDISK.EXE...

DMASTER This is yet another FAT scrambler...

DOSKNOWS.EXE (C) I'm still tracking this one down -- apparently someone wrote a FAT killer and renamed it DOSKNOWS.EXE, so it would be confused with the real, harmless DOSKNOWS system-status utility. I'm pretty sure that the REAL DOSKNOWS.EXE is 5376 bytes long. If you see something called DOSKNOWS that isn't close to that size, sound the alarm. More info on this one is welcomed -- a bagged specimen especially. The malicious DOSKNOWS contains the string: "Ouch! Dos refused to tell me! Sob, sob, sob." Be careful; there may be a legitimate 6144 byte DOSKNOWS floating around too.

DPROTECT Apparently someone tampered with the original, legitimate version of DPROTECT and turned it into a FAT table eater.

DROID.EXE This Trojan appears under the guise of a game. You are supposably an architect that controls futuristic droids in search of relics. In fact, the program copies C:\PCBOARD\PCBOARD.DAT to C:\PCBOARD\HELP\HLPX if PC-Board SysOps run it from C:\PCBOARD

EGABTR BEWARE! Description says something like "improve your EGA display," but when run it deletes everything in sight and prints "Arf! Arf! Got you!"

ELEVATOR.ARC This poorly written Trojan suggests in the documentation that you run it on a floppy. If you do not run it on a floppy, Elevator chastises you for not reading the documentation. Regardless of what disk you run it on, Elevator will erase your files. It MAY format disks too; be careful. One more interesting point to note: my name is plastered all over this program; the writers attempt to lay the blame for this Trojan on me.

EMMCACHE V. 1.0 This program is not exactly a Trojan, but it may have the capability of destroying hard disks by: A) Scrambling every file modified after running the program, B) Destroying boot sectors. This program has damaged at least two hard disks, yet there is a base of happily registered users. Therefore, I advise extreme caution if you decide to use this program.

FINANCE4.ARC (C) This program is not a verified Trojan, but there is a file going around BBS's warning that it may be Trojan. In any case, execute extreme care with it.

FUTURE.BAS This "program" starts out with a very nice color picture and then proceeds to tell you that you should be using your computer for better things than games and graphics. After making that point it trashes all of your disk drives, starting with disk A:. Not only does Future scramble FATs, but it also erases files. As far as I know, however, it erases only one sub-directory tree level deep, thus hard disk users should only be seriously affected if they are in the "root" directory.

MAP This is another Trojan written by the infamous Dorn W. Stickle. I believe that there are legitimate MAP.EXEs floating around.

NOTROJ.COM This "program" is the most sophisticated Trojan Horse that I've seen to date. All outward appearances indicate that the program is a useful utility used to FIGHT other Trojan Horses. Actually, it is a time bomb that erases any hard disk FAT table that IT can find, and at the same time it warns: "another program is attempting a format, can't abort!" After erasing the

FAT(s), NOTROJ then proceeds to start a low level format. One extra thing to note: NOTROJ only damages FULL hard drives; if a hard disk is under 50% filled, this program won't touch it!

TIRED Another scramble the FAT Trojan by Dorn W. Stickle.

TSRMAP This program does what it's supposed to do: give a map outlining the location (in RAM) of all TSR programs, but it also erases the boot sector of drive C:.

PACKDIR This utility is supposed to "pack" (sort and optimize) the files on a [hard] disk, but apparently it scrambles FAT tables.

PCLOCK (C) This program reputedly destroys FAT tables! Be careful! Also, please bear in mind that there are more than one PCLOCK programs in circulation, so please don't confuse the Trojan program with a legitimate one. Simply exercise EXTREME caution when running a NEW PCLOCK program.

PCW271xx.ARC A modified version of the popular PC-WRITE word processor (v. 2.71) has now scrambled at least 10 FAT tables that I know of. If you want to download version 2.71 of PC-WRITE be very careful! The bogus version can be identified by its size; it uses 98,274 bytes whereas the good version uses 98,644. Version 2.7 of PC-WRITE occupies 98,242 bytes.

PKX35B35.EXE As of this writing, Phil Katz (author of PKXARC) has verified that version 35A35 is the latest version of his ARChive extractor. This phony PKXARC scrambles FAT tables.

QUIKRBBS.COM This Trojan claims that it can load RBBS-PC's message file into memory 200% faster than normal. What it really does is copy RBBS-PC.DEF into an ASCII file named HISCORES.DAT...

QUIKREF Little is known about this Trojan, other than it scrambles FATs.

RCKVIDEO This is another Trojan that does what it's supposed to do, then wipes out hard disks. After showing some simple animation of a rock star ("Madonna," I think), the program erases every file it can lay it's hands on. After about a minute of this, it will create 3 ascii files that say "You are stupid to download a video about rock stars," or something of the like.

SECRET.BAS BEWARE!! This may be posted with a note saying it doesn't seem to work, and would someone please try it. If you do try it, however, it will format your disks.

SEX-SNOW.ARC This Trojan deletes all of the files in your directory and creates a gloating message using those filenames. Ugly.

SIDEWAYS.COM Be careful with this Trojan; there is a perfectly legitimate version of SIDEWAYS.EXE circulating. Both the Trojan and the good SIDEWAYS advertise that they can print sideways, but SIDEWAYS.COM will trash a [hard] disk's boot sector instead. The Trojan .COM file is about 3 KB, whereas the legitimate .EXE file is about 30 KB large.

STRIPES.EXE Similar to STAR.EXE, this one draws an American flag (nice touch), while it's busy copying your RBBS-PC.DEF to another file (STRIPES.BQS) so Bozo can log in later, download STRIPES.BQS, and steal all your passwords. Nice, huh!

SUG.ARC Words can not express my feelings about this Trojan. SUG.ARC advertises that it can break SOFTGUARD copy protection, but upon invocation, it will scramble the FATs on drive A, B, C, and onwards to your highest drive. While this is certainly a nasty Trojan, it is particularly repulsive because Softguard Corp, the creators of Softguard copy-protection, wrote it - perhaps in response to declining business. They claim that anyone who runs SUG is breaking an original license agreement; therefore they may legally destroy data. I don't credit this, and neither does an attorney I know, so I eagerly anticipate Softguard's day in court.

TOPDOS This is a simple high level [hard] disk formatter. Do not confuse this with the pirated TOPDOS.COM.

VDIR.COM This is a disk killer that Jerry Pournelle wrote about in BYTE Magazine. I have never seen it, but two users of mine have.

WARDIAL1.ARC (C) This Wardialer may scramble FAT tables

If you have encountered a virus or Trojan Horse program yourself, or know of anyone else who has, please pass the information on to the CSO Consultants (System, Statistical, or Microcomputer).

PROTECTING YOURSELF FROM VIRUSES ON A PC

Mark S. Zinzow
Microcomputer Services Group

There are several ways to protect your hard disk from nasty software.

1. Always back up your software and hard disk regularly.

2. Never run software whose origin you can't trust. (''safe computing'')

3. Check the software you do have, and use protection software.

The importance of always having a backup of original disks, and regularly backing up a hard disk can not be overemphasized. Unfortunately this is a bother, and even this author is guilty of not backing up often enough. Work files created on a day-to-day basis are often backed up most easily using an incremental backup, i.e., a backup of only those files that have changed since the last backup. Many public domain or shareware utilities are available which can quickly report on just how many unbacked up files you do have on your hard disk. Regular complete backups of the entire disk are also important, as a long series of incremental restores would be a horrendous chore!

If you have downloaded software from a BBS and are not sure of its safety, you should not run it on your hard disk. First you can use a utility like CHK4BOMB to see if it might erase your hard disk. Then find a floppy based system, or a hard disk you can afford to reformat, and test it. If after several uses none of the other files on your disk, especially COMMAND.COM, IBMBIO.COM, and IBMSYS.COM are unchanged, then it is probably safe.

Eric Newhouse is the current author of the Dirty Dozen list of Trojan Horses, etc., for PC's. This list contains some good warnings on particular files and applications to watch out for. He also collected the information in VIRUS.ARC. His BBS is:

```
* The Crest RBBS/CAMS    (213-471-2518)    (1200/2400)
```

The program FLUSHOT Plus is probably the best guard available at this time, in terms of protection software, but what one programmer can do, another can always undo, so backups and safe computing are the most important safety precautions.

In order to help those concerned about viruses, a disk containing related useful software is available to freely copy in the Microcomputer Resource Center (MRC). Please note that some of the programs on it require donations to the authors. Also, some of the programs tell what to do if a virus is detected. Here is a partial list of some of the programs and text files that are on this disk:

File	Description	Source
PROTECT.ASM	Source code for protect.com	Simtel20.arpa
PROTECT.COM	Write-protect your hard disk	Assembled from above by M.Z.
CHK4BOMB.ARC	Check programs for possible problems	Pseudo BBS U-C
CHKSUM.ARC	Check files to see if they've been changed	Crest RBBS/CAMS
DIRTYD8B.ARC	List of bad files and programs	Crest RBBS/CAMS
FLUSHOT3.ARC	Anti-virus warning and protection programs	Pseudo BBS U-C
FSP.ARC	Flu-Shot Plus; latest version of above	Pseudo BBS U-C
SENTRY.ARC	Program to watch for viruses	Pseudo BBS U-C
VIRUS.ARC	Six detailed descriptions of major viruses	Crest RBBS/CAMS
README	Description of files on this disk (this file!)	Mark Zinzow
BOMBSAD.ARC		Exec-PC BBS Milw.
CRCDOS3.ARC	Another Checksum program	Exec-PC BBS Milw.
NOVIRUS.ARC		Exec-PC BBS Milw.
VIRUSES.ARC	On disk 2 (big collection, overlaps this)	Exec-PC BBS Milw.
VIRUSMAG.LIS	Article from New York Times (1/31/88)	Exec-PC BBS Milw.

(Note: Until we run out of disk space on uxe, the files from Exec-PC are available via UIUCnet on uxe.cso.uiuc.edu in /micro/exec-pc.)

For further information contact the Microcomputer Resource Center, Federal Room, Illini Union (244-6264) or send email to MARKZ@VMD.CSO.UIUC.EDU.

SCORES VIRUS FOUND AT UIUC

Lynn Bilger, Editor

(Part of this article has been reprinted from AppleLink because the information found there was the most informative and complete we could find. We wish to thank AppleLink for granting permission to use this information.)

At the time I began writing the previous article on viruses, CSO had heard of only a few minor problems with viruses at UIUC. However, as I'm sure you all know by now, the SCORES virus recently appeared on Macintosh microcomputers at the Illini Union site. Although no one knows how the SCORES virus was introduced, we do know that it has also been found on other Macs around the campus. Because of this and the possibility that it may still be around, we decided to do a separate article on SCORES, describing what it does, how to detect it, and how to get rid of it.

How Can I Tell if My Mac Is Infected?

When should you become suspicious that your Mac has been infected with a virus? Although lost data or other problems are often caused by something that you did or did not do yourself, there are some symptoms to make you suspect a virus. Some of these symptoms are: difficulty running MacDraw; difficulty printing from any application; difficulty using the "Set Startup" option; difficulty running Excel or corruption of Excel files; frequent crashes when starting applications; or, in general, when your Mac begins doing things out of the ordinary or stops doing things in the same way that it has always done in the past.

You can be almost positive your system has been infected by the SCORES virus if the icons of your **Note Pad** file and **Scrapbook** file look like document icons (blank dog-eared pages) instead of system icons (Mac computer icons). If you find this, you should then use a program such as ResEdit to look in your System folder. If you find files called **Desktop** and **Scores**, you can be 99% sure that you have the SCORES virus.

How SCORES Spreads and What It Does

(Note: This section has been reprinted from AppleLink, 4 May 1988)

The initial infection is caused by an application with a modified CODE ID=0 resource, and an additional CODE resource (first unused ID number plus 1). When the 'carrier' application is launched, the CODE ID=0 resource runs the virus installer code. This code checks for previous installation of the SCORES virus. If the virus is not there, the virus files are installed. The virus consists of three INITs, one atpl, and one DATA resource found in the files listed below:

File	Type	Creator	Resources	Size
Desktop (invisible)	INIT	FNDR	atpl ID = 128	2410 bytes
			DATA ID = -4001	7026 bytes
			INIT ID = 10	1020 bytes
Note Pad	INIT	ZSYS	INIT ID = 6	772 bytes
Scores (invisible)	RDEV	ZSYS	atpl ID = 128	2410 bytes
			DATA ID = -4001	7026 bytes
			INIT ID = 10	1020 bytes
Scrapbook	RDEV	ZSYS	INIT ID = 6	772 bytes
			ID = 17	480 bytes
System File	ZSYS	MACS	atpl ID = 128	2410 bytes
			DATA ID = -4001	7026 bytes
			INIT ID = 6	772 bytes
			INIT ID = 10	1020 bytes
			INIT ID = 17	480 bytes

If the Note Pad and Scrapbook files do not exist, they are not created. If they do exist, the type and creator of the files are altered to those listed above, and the corresponding resources are added to the files. The files still appear to function normally with the Note Pad and Scrapbook DAs, but their icons change to document icons. The Desktop and Scores files are invisible, and are created during the infection process.

The next time the infected system is rebooted, the INITs are loaded into memory and are ready to infect other applications. The INITs install a VBL task that actually modifies and installs resources into an application. After an application has been launched, an internal timer is started. Somewhere between two and three minutes later, the open application is infected and becomes a carrier. A new CODE resource is added to the infected application, and the application's CODE ID=0 resource is modified to execute the new CODE resource first, then continues with the application.

To determine if an application is infected, examine the CODE ID=0 resource. If the eleventh word of the resource (third word on the third line in the ResEdit listing) is NOT "0001," the application is suspect. If the third word is something other than "0001", convert the value to its decimal equivalent (the numbers are in hexadecimal). Then determine the resource number of the CODE resource at the top of the ResEdit resource list. If these numbers are the same, the application is probably infected, and should be replaced. Some applications will appear to be infected even though they are not. If the eleventh word of CODE=0 is not 1, check the tenth word; if it is "4EED" the application is most likely not infected.

(Editor's note: Some sources claim that the virus searches in a random fashion at an interval of 3 1/2 minutes. It has been noted that a disk drive will begin operating when nothing should be happening. This is believed to occur because the virus is writing code resource to another application. After a long enough period of time, this could cause every application on the disk to be infected if gone unchecked.)

Prevention Measures and Cures

A program called **Vaccine** from CE Software can be installed on your Mac as a prevention measure. The Vaccine program is put in your System folder and accessed via the Control Panel. If you want to check that you do not have a bogus version of Vaccine, select the Vaccine icon while in Finder and choose Get Info from the File menu. Verify that the size is 11,875 bytes and that the creation date is Saturday, March 19, 1988, at 11:49 PM. After Vaccine has been installed, restart your Mac to start Vaccine operating. If any of the following occurs, suspect that a virus is in operation: Vaccine randomly asks for permission to alter a resource; opening a new application triggers Vaccine; opening a resource causes a crash (usually ID=02); or opening an application causes Mac to hang up.

Apple has developed a detection tool called **Virus Rx** to determine whether or not a virus is present and what applications have been infected. Virus Rx will list damaged applications, INIT, cdev and RDEC files, invisible files, altered system files, and altered applications. Virus Rx reports different levels of concern, from simple comments to "dangerous" to "fatal." "Dangerous" indicates you have an invisible file named Scores or Desktop in your System folder, and very likely have a problem. "Fatal" means that applications or your system may be corrupted, and you should not go further until appropriate steps are taken.

A good program for eradicating the SCORES virus from an infected system is **KillScores**, written by the MacPack/Apple Corps of Dallas' task force, headed by Howard Upchurch. KillScores appears to remove all traces of the virus, and repair the system folder and all the damaged applications correctly.

The programs just mentioned, as well as other programs for the prevention, detection, and eradication of viruses, are available at the Microcomputer Resource Center in the Federal Room of the Illini Union (244-6264); ask at the desk for the collection of Mac anti-virus software.

Getting rid of a virus is very tricky, even with the help of a disinfection program like KillScores. The staff of the MRC will be able to offer advice and/or assistance to anyone believing they have a problem with viruses.

CHOOSING A DEPARTMENTAL NETWORK

Ed Krol
CSO Networking Group

Computer Networking is the buzzword of the '80s. NSF is putting in a national research network. The Campus is putting in a network to connect to it. Departments on the Campus feel pressure to network the machines in their department. Unfortunately, all of these efforts are not proceeding in synchronization and many times departments must proceed with their network before the campus network can get to their building. In some cases, networks may be installed to serve the department well, but these networks may be incompatible with both the campus and the national networks. Therefore, care should be taken when choosing a departmental network to insure that it is the best long-term solution to the department's needs.

When choosing a network there is confusion about what functionality and what scope is available. As is typical in high technology, networks which are proprietary to a single vendor or small group of vendors can offer very glitzy, user-friendly environments to work within, but cannot function with networks which are not part of the clique (high functionality but limited scope). Networks which are designed to function across a wide variety of vendor's offerings offer basic services and the tools to implement the higher level services (limited functionality but wide scope). One of the first choices you need to make is where on the functionality vs scope graph to look for candidates for your network. Will the project be a network unto itself (hence you can consider proprietary networks) or must it communicate with other hosts worldwide (who may have other vendors' equipment)?

This is not an either/or selection. There exists a continuum of networking technologies from which to choose. There are PC nets which offer basic services and only connectivity to the local network and PC networks which offer very advanced services with some interconnectivity. DECnet connects Digital Equipment Corporation machines both across the campus and the world, making the connection transparent to the user. The Internet, based on TCP/IP, offers basic functionality (remote login, file transfer, mail and the tools to build other applications), worldwide, over a wide variety of vendor hardware.

Since the campus network, UIUCnet, was conceived as the backbone to carry data both from campus point to campus point, and from a campus point to the world, technology was chosen to allow the greatest scope. The Proteon technology allows any host which can speak on a DECnet or a TCP/IP network to use the campus network to communicate.

Choosing a departmental network is a very hard decision for many people to make correctly for the following reasons:

1. The network must meet short-term goals but has long-term ramifications.

2. Networking is unfamiliar to the people making the decision.

3. Vendors are going door-to-door offering biased advice.

Installing a network in a building typically is motivated by meeting some short-term goal. For example, software to teach a class might require a central instructor's machine connected to a machine at each student's position. The desire is to install the lab, PCs and network in time for the fall semester. The short-term goal is now set. Should vendors be approached at this point, many

could suggest network designs using their product which would solve the problem as currently defined. One must ask the question: "Now that the department has sunk $3000/student position, what are we going to do with it when the students aren't using it?" Well, the PCs are still PCs so they are useful for PC applications. Might someone in the department want to use the site to access other machines on campus or one of the national labs? Will the proposed solutions allow these uses as well?

If the people selecting the network are afraid of networking, arguments by vendors about ease-of-use and installation might seem overly important. This is certainly a factor in choosing a network, but how long the investment will meet your needs is a function of the scope and functionality. Frequently this conflict is seen in networks where the major goal is electronic mail. Many electronic mail networks for PCs exist and frequently they are menu-driven, full-screen applications which perform quite well. They are very easy to use — as long as the mail remains on the departmental network. The ability to communicate to hosts off the department's network may be difficult to use, slow, or non-existent. People in the department learn to rely on electronic mail, see other people in the University using email to colleagues across the nation, and want to know how it is done — only to find that it is impossible from their current network.

Remember that technology changes quickly. The department is making a large capital investment. Buying a network which ties you to a particular vendor may cause you to throw out the old and invest in the new rather than incrementally changing the old. Technologies which have multiple vendor support (even if the basic technology is defined by a vendor) are less likely to be white elephants should the one vendor of "be-all and end-all net" technology go bankrupt.

THE CSO NAMESERVER AN INTRODUCTION

Steven Dorner
Computing Services Office

```
% ph steven dorner
-201 1:Database ready.
```

```
alias: sdorner
name: dorner steven c
email: dorner@uxg.cso.uiuc.edu
phone: (W) 333-3339 (H) 356-8892
address: 189 DCL, 1304 W Springfield, U
address: 1201 W. Washington, C
department: computing services office
title: research programmer
mailcode: 712
hours: weekdays
project: CSO Nameserver (Ph)
```

What Is It?

The CSO Nameserver could be considered a database containing information about people and things at the University of Illinois. It is designed to be extremely flexible in what information it keeps, and also to provide fast access to that information. Currently, most of the information in it comes from the University's Student/Staff Directory (the phone book).

The CSO Nameserver could also be considered to be a pair of programs; one that manages the actual data (this program is called **qi**, for **q**uery **i**nterpreter), and another one that handles user requests (the program CSO provides for this is called **ph**, for **ph**one book). To most people, the CSO Nameserver will be exactly this second program, **ph**, the program that gives them access to the University's Student/Staff Directory.

Where Is It?

The database for the Nameserver resides on a CSO minicomputer (a Gould) that runs the UNIX operating system; the name of this computer is uxg.cso.uiuc.edu. The program that manages the database (**qi**) runs on this machine. **qi** allows programs running on other computers to access the database by serving as an intermediary between them and the actual database. It communicates with such programs using the campus network, UIUCnet.

ph (the program that is usually used to communicate with **qi**) is installed on all of CSO's UNIX computers. A simple version of **ph** is also available on CSO's main IBM computer, a 3081 which uses a proprietary IBM operating system. **ph** is also installed on many non-CSO computers across the campus; later, I'll discuss how you can get **ph** installed on your system.

What Is It Good For?

The Nameserver is good for looking up phone numbers and addresses of University faculty, students or staff members, just like the Student/Staff Directory; but the Nameserver is good for more than just that. For one thing, the Nameserver knows the electronic mail address for thousands of faculty, students and staff; this information is not present in the Student/Staff Directory. For some people, it knows other things, such as office hours or vacation plans.

A key thing to know about the Nameserver is that, if you use a computer that has **ph** installed on it, you can change the information the Nameserver keeps about you. This means that if you change offices in the middle of the year, you can put your correct address and phone number in the Nameserver immediately, so that people can use **ph** to find up-to-date information about you.

What Isn't It Good For?

There are some things the Nameserver is not meant to do. One thing that should be mentioned right away is that the Nameserver can't be used to generate mailing lists for junk mail; you don't have to worry about getting junk mail because you appear in the Nameserver's database.

Another thing it isn't good for is notifying the University of changes of address. Changes you make to your information in the Nameserver are not automatically sent to your department, or the Office

of Admissions and Records, or Payroll, or anywhere else; you must still notify these places of changes in your address.

How Can I Have ph Installed on My Computer?

If one of the computers you use runs UNIX and is connected to UIUCnet, you can probably have **ph** installed on it. Tell the person who manages your computer that he can get the source code for **ph** by anonymous ftp to uxc.cso.uiuc.edu, in the net/ph subdirectory (don't worry — he'll know what that means). **ph** is also available for VMS computers running the Wollongong TCP/IP software: a "backup" image is available for ftp from uxc in the file **vms_ph.bck**.

How Do I Use ph?

There are two different ways to use **ph**. One way is good for finding information about people, and the other is good for changing the information the Nameserver keeps about you. I will give you a brief idea of how both these ways work; for more detailed information, you should read the manual page for **ph**, which you can read (if your computer runs UNIX) by typing the command,

man ph

To use **ph** to find out information, you should type **ph** and the name of the person you want to know about; **ph** will respond with information about that person:

```
% ph steven dorner
-201 1:Database ready.
_____________________________________________
alias: sdorner
name: dorner steven c
email: dorner@uxg.cso.uiuc.edu
phone: (W) 333-3339 (H) 356-8892
address: 189 DCL, 1304 W Springfield, U
address: 1201 W. Washington, C
department: computing services office
title: research programmer
mailcode: 712
hours: weekdays
project: CSO Nameserver (Ph)
_____________________________________________
```

If there are a lot of people who have the name you asked for, **ph** will let you view the list a screen at a time; just hit the spacebar to move to the next screen.

You don't have to know the exact spelling of a name to find information; you can put special symbols in the name for which you are searching that tell the Nameserver to find names for which you only know a few letters. I won't say anything more about that here; look in the manual page if you are interested in the details.

Sometimes, you will ask **ph** for a name, and it will refuse to give you information, because too many people have that name:

```
% ph smith
-201 1:Database ready.
502:Too many entries to print (373).
```

ph does this so that no one can use it to get mailing lists for junk mail or other nefarious purposes. If you really want to find the person, you will have to know something else about them, like part of their first name, or their phone number.

If you want to change the information the Nameserver keeps about you, you should just type **ph**. **ph** won't look up a name, but will instead give you a prompt. There are many possible commands you can type to **ph**; they are described in full in the **ph** manual page. You will only need to know three commands to change your information, however; **login**, **edit**, and **quit**. Before actually using **ph** for this, you will have to make some preparations.

The first thing you have to do is find your Nameserver **alias**. This is a unique name assigned to you by the Nameserver. It will be your first initial, followed by a dash, followed by your last name. If there is more than one person with the same first initial and last name as yours, there may be number tacked onto the end of your alias. The easiest way to find your alias is simply to look up your name with **ph**; it will be obvious to you which entry is yours.

Once your know your alias, you need to find out your Nameserver password. To do this, send electronic mail to **nameserv@uxg.cso.uiuc.edu**. You will receive (in a day or two) a reply that contains your password.

Now, it's time to use **ph** to change your information. Type

ph

and a return. You will get a **ph>** prompt. Now, type

login alias

(but use your real alias, not the word "alias"!) and a return. **ph** will ask for your password; type your password and a return. You should get a greeting from the Nameserver, and another prompt.

```
% ph
$Header: ph.c,v 2.10 88/03/09 09:59:32 dorner Locked $
Please mail questions or comments to dorner@uxg.cso.uiuc.edu.

ph> login sdorner
-201 1:Database ready.
Enter nameserver password: type your password here
200:sdorner:Hi how are you?
ph>
```

You are now ready to change your information. Your information is organized into "fields," each one containing a different piece of information. There is a field for your name, your address, your phone numbers, etc. To change a particular field, type

edit field

and a return, substituting the name of the field you wish to change for **field**. For example, if you want to change your phone numbers, type

edit phone

You will be placed in your favorite editor, with the contents of the field you asked for as the text. Make whatever changes you wish, and exit the editor. **ph** will then change the information for you.

Some information cannot be changed; the "name" field, for example, cannot be changed. If you need to change one of these fields, you should send mail to **nameserv@uxg.cso.uiuc.edu** and arrangements can be made.

Once you are done changing your information, type **quit** and a return.

Where Can I Find More Information?

More information can be found by reading the manual page on **ph**. Programmers who wish to access the Nameserver from their programs should obtain the document *Nameserver Server/Client Language*, available in the file **language.troff** in the same directory on uxc.cso.uiuc.edu as the **ph** source code.

What if I have trouble?

If you have problems or questions that are not resolved by reading this document, the **ph** manual page, or *Nameserver Server/Client Language*, feel free to ask me by sending mail to **dorner@uxg.cso.uiuc.edu**.

THE CSO STATUS SERVER
AN INTRODUCTION

Steven Dorner
Computing Services Office

```
% status
Resolving seka.cso.uiuc.edu...Trying 128.174.5.13...
Status currently available for:
uxg                        Apr 7 14:50
% status uxg
Resolving seka.cso.uiuc.edu...Trying 128.174.5.13...
::::::::::::::::::::::::::::::::::::::
uxg                         Apr  7 14:50
::::::::::::::::::::::::::::::::::::::
4/7/88  uxg will be down until 8:00pm for preventative
maintenance.
```

What Is It?

The CSO Status Server is used to make announcements about service outages. When a CSO service (be it a computer, a printer, a network, or any other service) will be out of commission for a significant period of time, an announcement will be put in the Status Server.

Such announcements may be read through the use of the **status** program. This program is available on all CSO computers that use the UNIX operating system. Additionally, CSO provides source code for those who would like to install **status** on their own computers; I will have more to say about that later.

Where Is It?

The Status Server currently runs on one of CSO's microcomputers ("seka", a Sun 3/50) and one of CSO's minicomputers ("uxf", a Sequent Balance 8000). Announcements are shared between the servers, so that they have the same information. The Status Server allows programs (usually **status**) running on other computers to read announcements by communicating with them using the campus network, UIUCnet.

What Is It Good For?

The Status Server can tell you (usually) why something isn't working, and when it should be fixed. For example, if you try to access a CSO computer, and it doesn't respond to you, you could check its status by using the Status Server (of course, you would have to be able to access a different computer to do so). Since the Status Server runs on more than just one computer, chances are that you will be able to find out what's going on, even if it is one of the Status Server computers that is broken.

CSO will make every effort to keep the information in the Status Server timely. If you suspect there is a problem with a CSO computer or other service, and the Status Server doesn't mention it, please call CSO at 244-1000 and ask about it. We will find out for you what the problem is, and when it will be fixed, and place an announcement about it in the Status Server.

How Can I Have status Installed on My Computer?

If one of the computers you use runs UNIX and is connected to UIUCnet, you can probably have **status** installed on it. Tell the person who manages your computer that he can get the source code for **status** by anonymous ftp to uxc.cso.uiuc.edu, in the net/status subdirectory (don't worry — he'll know what that means).

How do I Use status?

There are two different ways to use **status**. The first way will give you a list of what announcements are in the Status Server. The second way will let you read the announcements.

To get a list of the available announcements, just type

status

and a carriage return. The Status Server will respond with something like:

```
% status
Resolving seka.cso.uiuc.edu...Trying 128.174.5.13...
Status currently available for:
uxg                     Apr 7 14:50
3800                    Apr 5 08:32
zeta                    Apr 2 07:03
```

The first message tells you what Status Server is being asked for information; **status** has a list of Status Servers, and will try each one until it finds one who responds to it. **status** prints the name of each server as it is tried, so that you know what is happening.

Once a live Status Server receives your status request, it returns a list of the announcements that are available, along with the date and time each announcement was last changed.

Once you know what announcements are available, you can ask to see the announcements themselves using the second form of the **status** command. Just type

status name

where **name** is the name of the announcement you want to read. If you want to, you can give more than one name, or give a name like *, which tells **status** to show you all the announcements (for more about this capability, you should read the manual page provided with **status**).

```
% status zeta
::::::::::::::::::::::::::::::::::::
zeta                    Apr  2 07:03
::::::::::::::::::::::::::::::::::::
4/2/88 The frob on the zeta plotter is broken.
A new frob is on order and should arrive by the
end of the month.
```

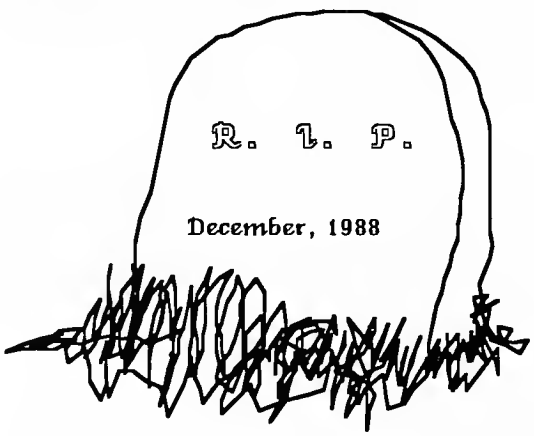
Where Can I Find More Information?

More information can be found by reading the manual page on **status** (if you are on a UNIX computer, type **man status**).

What If I Have Trouble?

If you have problems or questions that are not resolved by reading this document or the **status** manual page, feel free to ask me by sending mail to **dorner@uxg.cso.uiuc.edu**.

CYBER 175 MORIBUND



Convert Now!

ATTENTION!
CYBER 175 TO BE REMOVED DECEMBER 1988

The Computing Services Office has scheduled the removal of the Cyber 175 for**December 1988**. In recent years more and more people have moved their computing from the Cyber to other systems. Nonetheless, there is a large number of users still using the Cyber. These users are encouraged to consider whether their current computing projects can be completed on the Cyber before December 1988, or whether their work should be moved to another system. CSO's central services are being structured around the dual offering of CMS and UNIX. Our efforts are to continuously improve the services on both operating systems.

In deciding which system is best as a target for conversion, we suggest the following:

- Obtain a document entitled "Cyber Conversion -- An Overview" from the Systems Consulting Office (1208 W. Springfield, Urbana) or the Statistical Consulting Office (85 Commerce West). This document describes the options currently available to users wishing to convert from the Cyber, and CSO's policies governing assistance available to users undergoing a conversion.

- Attend one of the several Short Courses we offer with regard to the conversion.

- Questions requiring a **short** answer may be asked via email directed to CSO at UIUCVMD.

ATTENTION!
INSTRUCTORS WHOSE CLASSES USE THE CYBER

An examination of our Cyber database indicates that numerous classes still use the Cyber computer. Since Cyber service will be discontinued in December, 1988, it will be necessary for instructors to place their classes on other computers.

It is our intention at CSO to accommodate your teaching needs by providing, on other machines, software which is equivalent or similar to that which you have been using on the Cyber. In addition, the CSO consulting staff can assist you if you have questions regarding converting your own software to run on another computer. We encourage you to begin now to plan the move of your classes from the Cyber to another machine. To assist you, we have written a document which provides an overview of conversion issues. This Cyber conversion document is available in the Systems Consulting Office (1208 W. Springfield, Urbana) and in the Statistical Consulting Office (85 Commerce West).

Joan Alster of CSO is coordinating the conversion of Cyber instructional applications. If you have concerns, comments, or questions regarding your conversion needs, please contact her at 244-0937, or via electronic mail with the Cyber command TELL,ALSTER@UIUCVMD. We at CSO are anxious to help make your transition to another computer as smooth as possible. Please evaluate your needs now and let us know of special requirements you may have, so we can begin to address your concerns.

INITIALIZING TAPES FOR USE ON VMD

Becky Wetzel
Systems Consultant

VMTAPE, the tape security and management system on VMD, was placed into operation in September, 1987. One of the things VMTAPE does for you is to verify that any labeled tapes mounted have an internal label that matches the volume serial name (vsn) that you request on the MOUNT command and that is registered for the tape in the TMC (Tape Management Catalog). In turn, this means that you must sometimes ask CSO to initialize a tape (write something on the beginning of the tape) before you attempt to use the tape on VMD.

When we first began using VMTAPE, users could ask CSO to initialize a tape as standard labeled or unlabeled — to write a VOL1 label or a tapemark, respectively, at the beginning of the tape. To reduce confusion and simplify tape registration and operational matters, a slight change has been made. On March 28, 1988, CSO began initializing tapes with a tapemark only. If you want your tape to be standard labeled, you can then write the VOL1 label internally on the tape after CSO has initialized it.

Situations in which you might request initialization remain unchanged. (1) If your tape is absolutely brand new — contains no data of any kind — it must be initialized before it can be used on VMD so that VMTAPE can find something (in this case a tapemark) to read during its label verification process. (2) If you have an old labeled tape that you want to re-use under a new tape name, and the old tape contains ABSOLUTELY NO DATA THAT YOU MIGHT EVER WANT, you can request that the tape be initialized. This will obliterate the old name on the inside of the tape, allowing you to re-use it under the desired new tape name. IMPORTANT: The initialization will write over the old data on the tape, so that you will no longer be able to read it. Do not request initialization if the tape contains any data that you still want.

When you want your new or recycled tape to be a labeled tape, use the following CMS command to write the VOL1 label containing the tape name on your tape the first time you use it after CSO has initialized it. The command is:

TAPE WVOL1 tname (TAPn DEN xxxx

Replace **tname** with the 1-6 character name you have chosen for your tape (the same name that you wrote on the outside of the tape when you registered it in 14 DCL). Replace **TAPn** with TAP1, TAP2, etc., to correspond to the virtual address 181, 182, etc., at which you have mounted your tape. Replace xxxx with the density at which you want the label written. Density choices are: 800, 1600, 6250, and 38K. The first three (800, 1600, and 6250) can be used on 9-track reel tapes; 38K is the density for 3480 cartridge tapes. (You should also specify the density at which you want the tape written on the FILEDEF command when you write file one on the tape, since CMS rewrites the VOL1 label at the density of the first file when necessary.)

If you have questions about these procedures, please contact the consultants at the Systems Consulting Office, 1208 West Springfield, Urbana (333-6133) or at the Statistical Consulting Office, 85 Commerce West (3-2170).

NOTE: Tape initialization applies to VMD users only. Initialization is not needed for tapes to be used on the CYBER, and initialization is currently not needed for tapes to be used on the CSO UNIX systems.

VS FORTRAN 2.3.0 ON THE IBM 3081 (VMD)

Stan Kerr
Systems Consultant

CSO has installed VS Fortran 2.3.0 (Version 2, Release 3) on the VMD system. It is presently available as a future version, and can be accessed by the command

LINKTO FORTRAN (F

Barring problems, it will become the default version of VS Fortran at the beginning of July 1988.

Below is a list of the new features of VS Fortran 2.3.0.

1. Enhancements to the vector features have been made, but, as CSO does not have an IBM 3090 with a vector facility, these will not be further mentioned here.

2. Language enhancements

   a. The ability to specify the file name or data-set name on the INCLUDE statement, e.g.

   ```
   include 'mystuff fortran a'
   ```

   Text to be included no longer has to be a member of a MACLIB.

   b. The ability to write comments on the same line as the code to which they refer, e.g.,

   ```
   x = 12.3    ! this is a constant
   ```

   c. Support for the DO WHILE structured programming construct, e.g.,

   ```
   do while (x(i) .ne. 0.0)
      y(i) = 1.0/x(i)
      i = i+1
   end do
   ```

   d. Support for the END DO statement as the terminal statement of a DO loop.

   e. Enhancements to the DO statement so that the label of the terminal statement is optional, e.g.,

   ```
   do i = 1,10
     x(i) = i**2
   end do
   ```

   f. Support for statements extending to 99 continuation lines or a maximum of 6000 characters.

   g. Implementation of IBM's Systems Application Architecture (SAA) Fortran definition; support for a flagger to indicate source language that does not conform to the language defined by SAA.

h. Support for the use of a comma to indicate the end of data in a formatted input field, thus eliminating the need for the user to insert leading or trailing zeros or blanks.

3. Enhancements to the programming aids in VS Fortran Version 2

   a. Enhancements to the intercompilation analysis function to detect conflicting and undefined arguments.

   b. Ability to allocate certain commonly used files and data sets dynamically.

4. Enhancements to the Interactive Debug facility

   a. A new main debugging panel in full screen mode that allows you to:

      - Display AUTOLIST data in a monitor window, in addition to displaying your source listing in a source window and your interaction with Interactive Debug in a log window.

      - Change the size and configuration of the windows with the enhanced WINDOW command and the new commands SIZE and ZOOM.

   b. Automatic refresh of the main debugging panel by Interactive Debug after a specified number of lines of output have been written to the log.

   c. The addition of the new full screen commands RESTORE and RETRIEVE.

   d. Recognition of the restart file (AFFIN) and log file (AFFOUT) in line mode debugging.

   e. Enhancements to the include file (AFFON)

      - Defaults can be defined for listing and unlisted program units

      - A program information file can be defined for a program unit. This file is needed by Interactive Debug to gather vector tuning information.

      - Debugging hooks can be placed only at DO loops, to improve DO loop timing accuracy.

      - Sequence numbers in columns 73 to 80 on 80 column records are are ignored.

   f. Enhancements to the LISTTIME command to show average times.

   g. Enhancements to the format of the output produced by the ANNOTATE command.

   h. New IAD EXEC which allows you to invoke Interactive Debug in full screen mode using ISPF without PDF.

The VS Fortran help files have been updated to reflect the new features of Version 2 Release 3. These help files are accessed by the commands

LINKTO FORTRAN HELP
HELP FORTRAN MENU

The following manuals are available for VS Fortran 2.3.0. The prices are now about half what they were for 2.2.0, so it only costs about $60 to get a complete set. CSO does not stock these manuals; they must be ordered from IBM.

VS Fortran Version 2 Language and Library Reference
(IBM Order Number SC26-4221-03) Price: $26.50

VS Fortran Version 2 Programming Guide
(IBM Order Number SC26-4222-03) Price: $21.00

VS Fortran Version 2 Interactive Debug Guide and Reference
(IBM Order Number SC26-4223-02) Price: $12.00

SPSS-X TABLES — AN UPDATE

Joan Mills
Statistical Consultant

TABLES is an add-on SPSS-X product that produces frequency, crosstab, and summary statistics tables during an SPSS-X program run. It can be made to reproduce the functions of the six table-producing programs of SPSS-X (FREQUENCIES, CROSSTABS, CONDESCRIPTIVE, BREAKDOWN with CROSSBREAK option, MULTIPLE RESPONSE and REPORT), plus other table variations not previously possible.

The purpose of this article is to present methods of altering the default print format of TABLES to produce smooth outlined boxes and various type faces for table contents, thus enhancing the publication quality of the TABLES output and eliminating the need to edit or Script the output.

Before going into the refined printing technique recently discovered by this author, there will be a brief review of the letter-quality printing previously available. As with any SPSS-X output, ordinary TABLES output can be printed with any available line printer.

Steps of basic running and letter-quality printing:

1. Access the product on VMD via **LINKTO SPSS-X** and run an SPSS-X program containing a TABLES procedure statement. If the program file is TABL SPSSX A, then run it with the command SPSSX TABL.

   Sample input program with a BREAKDOWN and corresponding TABLES:

```
SET WIDTH  80
FILE HANDLE GSS84/NAME='GSS84 SPSSXFIL K'
GET FILE=GSS84
PRINT FORMATS HEALTH(F6.2)
BREAKDOWN VARIABLES=HEALTH     (LO,HI) RACE (1,3) SATJOB (1,5)/
   CROSSBREAK=HEALTH    BY SATJOB BY RACE
VARIABLE LABELS HEALTH    '' RACE '' SATJOB ''
TABLES OBSERVATION=HEALTH
       /FORMAT=BOX CWIDTH(13,10) MISSING(' ') OFFSET(3) INDENT(0)
       /FTOTAL=CTOTAL 'COLUMN TOTAL' RTOTAL 'ROW TOTAL'
       /TABLE= HEALTH > SATJOB + CTOTAL BY    RACE + RTOTAL
       /STATISTICS=MEAN('') VALIDN('    Count') STDDEV('    Std dev')
       /TTITLE 'Cross-Breakdown of Race'
               'By Job Satisfaction'
               'Average of Health Rating '
       /TFOOTNOTE '1=Good Health 4=Poor Health'
           .
```

2. TABLES is documented briefly in the *SPSS-X Users' Guide*, second edition and in more detail in the manual *SPSS-X TABLES*. There is also an INFO file on the disk accessed by LINKTO SPSSX.

3. To access some of the sample data mentioned in the TABLES documents, after LINKTO SPSSX type **SPSSX ?**. This command lists the data available from the procedure DEMO. For some of the remaining system files, note the mode letter after LINKTO SPSSX, say K, do **L * * K** to see the filenames, and use the files directly (with that mode letter on a FILE HANDLE)

4. TABLES results may come out in the LISTING file as does any SPSS-X output. This listing may be sent to a line printer without special considerations. To print results in 8 1/2" by 11" format on a laser printer (rotated like this article page) do the following:

   a. Include a command:

      SET WIDTH n

      where **n** is the number of characters in your longest line of output and is between 80 and 84, in your SPSS-X program (near the top). Note SPSS-X will honor this limit, and may partition an output table to do so.

   b. XEDIT your listing file and enter the following on the XEDIT command line:

      SET LRECL n+1

      where **n+1** is one more than the number specified above on the SET WIDTH command. (Note: if you use SET LRECL n, you will lose random characters on the right end of some lines that were too long, notably some page numbers. You may truncate any unused columns.) **FILE** this change.

   c. Without reentering XEDIT on this file, print it to the 3800 printer at DCL:

      NPRINT fn LISTING fm(DEST 3800 CC EJ BIN xx PDEF LR66 FONT GT12

      (Note: substitute your complete file identifier and bin number. Also, 12 characters per inch (FONT GT12) and 66 lines per page (PDEF LR66) depend on keeping within a line length of 85.)

Sample TABLES output using print technique above:

Cross-Breakdown of Race
By Job Satisfaction
Average of Health Rating

	White	Black	Other	ROW TOTAL
Very satisfied	1.83	1.98	2.00	1.85
Count	477	51	24	552
Std dev	.75	.76	.78	.75
Moderately satisfied	1.82	2.24	2.38	1.88
Count	357	51	13	421
Std dev	.73	.86	.77	.77
A little dissatisfied	2.08	2.06	2.17	2.08
Count	119	18	6	143
Std dev	.84	.94	.75	.84
Very dissatisfied	2.08	2.00	1.00	2.05
Count	65	18	1	84
Std dev	.80	.69		.77
COLUMN TOTAL	1.87	2.09	2.11	1.90
Count	1018	138	44	1200
Std dev	.76	.81	.78	.77

1=Good Health 4=Poor Health

The following steps introduce the refined printing technique:

1. The characters (+, – and I) used in forming boxes are default values. To send an SPSS-X TABLES listing to the 3800 printer and have it print with smooth straight lines and square corners on the box, do the following:

   a. Same as step 4a) above.

   b. In addition, put the following SET commands in your program near the top to provide codes for graphics characters needed to create smooth boxes (for more details, see the SPSS-X Users' Manual under SET and SHOW):

      SET TB1 X'BFFA8FABACBBBCEBECCCCB'
      SET TB2 X'40404040404040404040'
      SET TBFONT '0123'

   c. To follow through on the graphics presentation of your TABLES results, put this output on a separate output file so that it can be given special graphics carriage control.

Before TABLES procedure in SPSS-X program:

FILE HANDLE handle/NAME='fn ft fm'

where **fn ft fm** is the identifier of an output file that will contain the TABLE output for the run.

In the TABLES procedure of the SPSS-X program:

/WRITE = 9700 (handle)

The code 9700 literally refers to a Xerox 9700 printer, but our IBM 3800 printer is compatible in this application. (See page 155 of SPSS-X TABLES document for more details about the TABLES WRITE command).

d. A run of the program creates a separate output file for the TABLES output; other SPSS-X output (such as the input for TABLES) is on the usual listing file.

To print the special TABLES output file use:

NPRINT fn ft fm (DEST 3800 CC EJ BIN xx TRC CHARS 'GT12 GB12 GB12'

(Note required space between CHARS and 'GT...)

Or for a font with serifs, use:

NPRINT ... CHARS 'ST12 SI12 SB12'

Or if lines are no more than 73 characters long (instead of 85, see step 4a and 4b for changes) and a solid vertical border is desired:

NPRINT ... CHARS 'GT10 GT10 GT10'

The CHARS parameters specify 3800 fonts. The order in which they appear corresponds to the order in the SET TBFONT command (shown in step 1b above). The '0123' of the SET TBFONT command specifies that 0, 1, 2, and 3 are possible values for the second carriage control characters that appear in your TABLES output file when using the /WRITE command.

In our example, we used the editor to check that only 0 (zero) and 2 appear as these so-called TRC (second carriage control) numbers. We have CHARS fonts corresponding to the 0 (zero) and 2 positions; the 1 position (2nd font) is a place holder. In our NPRINT commands, GT12, ST12 and GT10 correspond to the 0 (zero) position of the TBFONTs; GB12, SI12 and GB10 correspond to the 1 (one) position fonts; etc. The 0 (zero) position is the font for the main body of the table, the 2 position is a bold font for table titles, and the 1 and 3 positions are two types of Italic fonts if they are needed (see the file TABLES INFO on the SPSS-X Rel. 3 disk for more information about font positions).

Normally, the fonts used for a given table are from a family, i.e., matched in shape and size so they fit well together. By examining different font samples, it is possible to mix and match. The author also tried the following CHARS sets with the sample program given above with good results.

```
ST10 RT10 RT10
OR10 OB10 OB10
CE10 PR10 PR10
```

More information may be found in documentation about the 3800 printer, or in the help file, HELP 3800 FONTS, on VMD.

Sample output using graphics characters in print (CHARS GT10 ...):

Cross-Breakdown of Race
By Job Satisfaction
Average of Health Rating

	White	Black	Other	ROW TOTAL
Very satisfied	1.83	1.98	2.00	1.85
Count	477	51	24	552
Std dev	.75	.76	.78	.75
Moderately satisfied	1.82	2.24	2.38	1.88
Count	357	51	13	421
Std dev	.73	.86	.77	.77
A little dissatisfied	2.08	2.06	2.17	2.08
Count	119	18	6	143
Std dev	.84	.94	.75	.84
Very dissatisfied	2.08	2.00	1.00	2.05
Count	65	18	1	84
Std dev	.80	.69		.77
COLUMN TOTAL	1.87	2.09	2.11	1.90
Count	1018	138	44	1200
Std dev	.76	.81	.78	.77

1=Good Health 4=Poor Health

XMENU FULL-SCREEN MENU PACKAGE ON VMD

Stan Kerr
Systems Consultant

CSO has had the XMENU full-screen menu package for about a year now, but it has seen very little use. We would like very much to keep this package, but if our users are truly not interested, then we must cancel our license. This article describes some of the features of XMENU (in case you were not aware that XMENU exists) and what it might do for you. CSO will be keeping XMENU for a few more months; if enough interest appears, then we will keep it.

What a full-screen application is.

Most CMS users are already familiar with a full-screen application: XEDIT. XEDIT displays a complete screen of information about a file. You can use the cursor keys to move around on the screen and change information; when you press the ENTER key, the information is updated. PF keys can be used to move back and forth in the file, always displaying a full screen of information.

In more sophisticated full-screen applications, the screen may be split into many "fields". Each field can be an output field (where information is displayed) or an input field (where you are allowed to type data). The characteristics of each field can be controlled; for example, a field designated as a message field might be set up to flash its output in red letters, or a field used to input a password can be set up so that characters typed in it are not echoed. Fields can be protected and restricted, so that you can type data in only at certain points on the screen. To move around on the screen, one can use the cursor keys, but when the screen is divided into fields, you can use the forward-tab and backward-tab keys to jump quickly from field to field.

Some full-screen applications may require only that the screen be divided into certain fields, some of which are used for input and some for output; the program then uses these same fields throughout. In other applications, the fields may change from time to time; in these cases, you may design the program around several different screen layouts or panels which are used at different points in the program.

How do you do a full-screen application?

If you want to do a full-screen application, what tools are available? You have to be able to set up panel descriptions, telling what fields there are and what their characteristics are; you have to be able to display the panels (with changing information in some of the fields); and you have to be able to retrieve the information which is typed in the input fields, and use it. The software we currently have for doing such things is

1. **XEDIT** — some full-screen applications can be done using the editor. There are facilities in XEDIT for setting up a full-screen data entry panel. This is not easy to do and requires the writing of XEDIT 'macros' and a good knowledge of how XEDIT works.

2. **ISPF** — the Interactive System Productivity Facility is an IBM 'strategic' offering for full-screen applications. This means that IBM usually develops full-screen applications using ISPF, and that IBM is committed to a continuing support of ISPF. ISPF is powerful, but it is rather difficult for a novice to learn. Once a rather considerable time investment is made, it

can be quite useful, but the investment is not small.

3. **XMENU** — XMENU is by far the most easy-to-use package of those we have for doing full-screen applications. It permits you to easily set up screen formats or panels, and to easily display them from within a program or an exec. Data fields on the screen can be given names, and input typed in the field can be retrieved by the name of the field. XMENU also has data checking facilities that allow you to ensure that the data typed in input fields satisfies certain requirements, to minimize the work of data validation in your programs or applications.

How can you access and use XMENU?

XMENU is accessed on VMD by the command

LINKTO XMENU

Once XMENU is accessed, it can be used in several ways:

1. The XMENU program can be used to set up a full-screen layout or panel. For example, suppose you have a data entry application and you want to make a screen layout and call it INDATA. You would enter the command

```
XMENU INDATA
```

and XMENU would put you in a mode where you can set up the screen, define its fields, name them, and so forth. When you exit from XMENU with the PF3 key, the information on the screen layout is saved in a file called

```
INDATA MENU
```

2. If you have an EXEC which wants to display a full-screen panel which was set up by XMENU, the EXEC might contain the command

```
MENUEXEC INDATA
```

to display the INDATA menu. You can then type data in the input fields; when you press the ENTER key or a PF key, XMENU gives control back to the exec. The exec can then check its variables to see if data was entered. For example, there might be an input field named NAME. When control is given back to the exec, the exec variable NAME contains whatever was typed in the NAME field. Besides reading the input data, the exec can tell what key was pressed when the data was entered, whether it was the ENTER key or a PF key (and which PF key).

3. If you have a program, say in Fortran, which wants to display a full-screen panel which was set up by XMENU, the program might contain CALLs like the following:

```
CALL MLOAD(NUM,RC,'INDATA')
CALL MDSPRD(NUM,RC,KEY)
```

The first call is used to load the menu file into memory, and the second call is used to display the menu. Other calls would be used to retrieve input data.

Documentation for XMENU

There are complete manuals for XMENU on view in the CSO Systems Consulting Office at 1208 W. Springfield. Besides these, there are online help files. You can view these help files by entering the commands

```
LINKTO XMENU
HELP XMENU MENU
```

There is a special set of help files on the MENUEXEC program which is used within an exec to display a menu file. These can be viewed by entering

```
LINKTO XMENU
HELP MENUEXEC MENU
```

The library of Fortran-callable routines has a complete set of help files, which can be viewed by entering

```
LINKTO XMENU
HELP MSUBS MENU
```

There is a short booklet from the vendor of XMENU called "XMENU in Minutes," which describes very briefly how you can set up a full-screen layout using XMENU. This booklet can be viewed in the CSO Systems Consulting Office.

If you have questions about XMENU and how it might be useful to you, or you have a particular application which you would like to try doing in a full-screen mode, you can talk to Stan Kerr in Systems Consulting, or send him a note on VMD to userid STANKERR.

We believe XMENU is a very good product, and offers the ability to create full-screen applications more readily than any other tool we have available. Whether we are able to keep it depends on what interest exists in writing such applications.

AN EXEC ON VMD TO ACCESS CMS RELEASE 5

Stan Kerr
Systems Consultant

CSO has been running Release 4 of VM for a few years now. VM in this context means the system software called CP which manages the physical resources of the system, together with the CMS system which people use interactively for most work on the IBM system. Our system consists of CP Release 4 plus CMS Release 4.

IBM has produced a Release 5 of VM, which again consists of a Release 5 of CP and a Release 5 of CMS. Although CP Release 5 is currently available for our system configuration, we have for various reasons not installed it. We can however run CMS Release 5 without having CP Release 5. This is desirable because some applications have difficulty running under CMS Release 4. We do not use CMS Release 5 as our general default system because it is generally best to run the same releases of CMS and CP. For those users who may need it, we are making CMS Release 5 available

through the CMSR5 command.

> *NOTE on VME: CSO is running a complete Release 5 system (CMS and CP) on its VME system at Commerce West. This is possible because VME does not run the same variant of VM as VMD; VMD requires VM/HPO, whereas VME uses VM/SP -- Release 5 for VM/HPO has not been in the field as long as for VM/SP. If you use the VME system, then you are in fact using CMS Release 5 as your default system.*

Following are a few of the reasons for using CMS Release 5. Some of the problems with CMS Release 5 are listed later.

1. GLOBAL TXTLIB accepts up to 63 libraries

   Under CMS Release 4, at most eight subroutine libraries can be searched when a program is loaded. Some applications (DI3000 in particular) may require more than eight libraries; there is almost no way to run them except under CMS Release 5.

2. TXTLIBs can have up to 2000 members

   A subroutine library (TXTLIB) under CMS Release 4 is limited to 1000 members. Some large application libraries have more than 1000 routines, so they would have to be set up as two or more files under Release 4.

Since there is a slowly increasing need for some people to be able to access CMS Release 5, CSO is making it available to VMD users through a special exec called CMSR5. The CMSR5 exec is used to switch your CMS session from running our default system of CMS Release 4 to running CMS Release 5. CMSR5 is called by simply entering:

CMSR5

This will change the disks used to run CMS and then restart CMS for you. This will cause your currently accessed disks to be unaccessed and your PROFILE EXEC to be rerun. It is recommended that you enter the CMSR5 command immediately after logging on, although it is quite easy at a later time to switch back to Release 4.

You can put the CMSR5 command in your PROFILE EXEC to ensure that you are always logged on with CMS Release 5.

To switch back to CMS Release 4, enter

CMSR5 OFF

This will change the CMS disks back to Release 4 and restart CMS again (so your PROFILE EXEC will run again).

Problems with CMS Release 5

Not everything works properly under CMS Release 5. Below is a list of the known problems.

1. VMARCHIVE RECALL command fails -- program loops

   If you attempt to run VMARCHIVE, you may sometimes get "hung," particularly if you are doing a RECALL command. The terminal will cease to respond; the cursor may go to the lower right corner of the screen and stay there. You can stop this by doing the following:

   a. Clear the screen

   b. Enter **PA1**. If you are connected through the 7171 (VMDFS), this is usually done by striking the ESCAPE key followed by the COMMA key. On an IBM 3101, strike the ERASE EOS key followed by the COMMA key. When you do this, the terminal should go into CP READ mode.

   c. Enter: **IPL CMS5**. This restarts CMS Release 5.

2. The VMBATCH SUBMIT command fails

   If you are running CMS Release 5, the VMBATCH SUBMIT command gives the following strange error messages:

   ```
   Invalid filemode: *
   EXIT ON ERROR ... UNABLE TO USE VIRTUAL PUNCH.
   ```

   The job is then rejected by VMBATCH. You have to switch to CMS Release 4 to submit the job.

3. Help files -- conflicting CSO help menus

   CSO has placed copies of some system help menus -- in particular, the CMS and CP help menus -- on the public disk (known as USEFUL). Since the system help disk which contains IBM-supplied help files is always accesses as mode Z, the help menus on USEFUL will override the help menus on the Z disk. You will not see the true Release 5 help menus.

Restarting CMS Release 5

There are some situations in which you must restart CMS before continuing your work. You may be required to enter an IPL command. If you are running CMS Release 5, the proper IPL command is

IPL CMS5

If you mistakenly enter IPL CMS, you will get an error message, but you can continue by entering the correct IPL command as given above.

Commands which are different

Following is a brief list of the CMS commands which are different in Release 5. For complete information, you can see the help files after you start CMS Release 5, or consult the CMS Release 5 manuals in the CSO Systems or Statistical Consulting Office.

1. HELP

   The HELP command works much as it does in Release 4, but there are some new features that cause it to look different in some situations. Help files can have more 'sections' to them than before; in particular they can have an 'abbreviated help' section which HELP always tries to display by default. They can also have a 'related help' section which is accessed through PF key 11. 'Related help' allows a help file to contain a menu of other help files which are related to it; the user can easily consult the other help files.

2. RDRLIST, RECEIVE

   RDRLIST looks much the same in Release 5, but when a file is received, it is ALWAYS received onto the A disk, then copied (if necessary) to where you really want it. This can cause the A disk to become full in some situations.

3. COPYFILE command

   This command works the same as before, but it is now part of the CMS nucleus. This means that it can be called from within a user program without overlaying the program in memory.

4. The GLOBAL command; QUERY command

   The GLOBAL command in Release 5 permits you to set the library (MACLIB, TXTLIB, LOADLIB or DOSLIB) to up to 63 entries. The QUERY command (e.g., QUERY TXTLIB) outputs the list of library names using several lines of output if necessary.

SOFTWARE INSTALLED ON THE CONVEX SYSTEM

Stan Kerr
Systems Consultant

This article describes some of the software CSO has recently installed on the Convex system, and gives some indication what software will be installed in the next several months.

1. IMSL Library

   The IMSL Library is a large general purpose library of Fortran subroutines for performing computations in mathematics and statistics. It is available on CSO's Cyber and VMD systems. The newest version, Edition 10, has been installed on the Convex; the older Edition 9.2 is not available. For information on accessing IMSL on the Convex, enter the command:

   man imsl

2. GRG optimization package

   GRG is a package for nonlinear optimization. It also exists on the Cyber and VMD. The version installed on the Convex is based on the VMD version and is in double precision. For more information on GRG, enter the command

   man grg

3. ABAQUS finite element package

   ABAQUS is a package for solving partial differential equations by the method of finite elements. It is used in structural analysis and other areas. At this writing, ABAQUS is nearly ready for user access; the procedures for using it may be complete when this article is published. For more information, you can call the CSO Systems Consulting Office (333-6133) or visit the office at 1208 W. Springfield to see the ABAQUS manuals.

4. DI3000 graphics library

   The DI3000 graphics package (which we have on the Cyber and VMD) has been installed on the Convex. There is a man page which explains access to the routines; enter

   man di3000

   to see this man page. We can currently produce graphics on Tektronix terminals, and can produce Zeta plot files, but there is as yet no facility for sending Zeta plot files (or DI3000 metafiles) to a plotter; CSO is actively working on making such a plot facility available.

5. New version of VECLIB

   VECLIB is a library of linear algebra subroutines, very highly optimized for the Convex, which can be called from Fortran or C programs. The new version of VECLIB has some additional routines and also supports IEEE arithmetic. To use VECLIB from Fortran with IEEE arithmetic, you must compile your Fortran program with the **–fi** option. (Note: IMSL does not use IEEE arithmetic, so you cannot use IMSL with a program compiled with –fi; you will get incorrect results if you do.)

6. KERMIT installed

   The KERMIT program, which can be used from a microcomputer for terminal emulation and file uploading/downloading, has been installed on the Convex. If you have, say, a PC which has Kermit — you can copy it at the Microcomputer Resource Center in the Illini Union or the Micro Hot-Line Office in Comm West — then you can use Kermit to transfer files between the PC and the Convex. For more information on Kermit, enter the Convex command

   man kermit

   A Kermit manual is sold through the CSO Accounting Office at 1208 W. Springfield, Urbana.

7. COVUE -- for VMS users

   COVUE is a shell or command interpreter designed for VMS users, to make it easier for them to shift from VMS to UNIX. It has been installed on the Convex, and manuals are on view at the CSO Systems Consulting Office at 1208 W. Springfield. There is a man page which can be viewed by entering the command

   man covue

8. S — statistical analysis

   S is an interactive environment for statistical analysis. There is a man page which can be viewed by entering the command

   man S

   (S must be entered in capitals.)

9. MH mail handler

   MH is a collection of programs for managing UNIX mail, different from the **mail** command and its associated facilities. For more information about MH, enter the command

   man mh

   There are also separate man pages for each of the utility programs which make up the MH package.

10. Emacs editor — named gnuemacs

    The popular em :s full-screen editor has been installed. Since it is the version from the GNU Project, it has been called **gnuemacs**. If you wish to call it **emacs**, you can insert the following line in your .login file on the Convex:

    alias emacs gnuemacs

    For more information on gnuemacs, see the man page:

man gnuemacs

There is a manual available at the CSO Accounting Office, 1208 W. Springfield. The manual can also be ordered directly for $15; the online man page gives the address to use for ordering.

SPREADSHEET PROGRAMMERS WANTED

Professor Stuart Nagel is looking to hire experts in the writing of macros for Lotus 1-2-3, Framework, and other spreadsheet systems. The programming especially relates to decision-aiding software and multi-criteria decision-making. The application fields emphasize law, public policy, and governmental decision-making. Experience in decision analysis, operations research, or management science would be relevant, but especially experience in working with spreadsheet macros. Remuneration is subject to discussion, but can include wages, co-authoring of publications, royalties, and the excitement of developing new ways of reasoning and deciding.

HALF-TIME ASSISTANTSHIP AVAILABLE WITH CSO

CSO has a half-time research assistantship available with the Systems Consulting group. This job involves consulting with our mainframe computer users on problems they have using our systems, or helping them select software to solve their problems. It will provide the opportunity to learn about all of CSO's mainframe systems (Cyber, IBM, UNIX) and about the networking technology used to connect them to each other and to the rest of the campus via UIUCnet.

The applicant must have an excellent mastery of English, as the job involves constant contact with CSO's computer users and with other CSO staff. He or she should have some previous experience with the Cyber, CMS or UNIX. Good Cyber experience is very desirable so that the assistant will be able to help with Cyber conversions.

If you are interested in applying, please send a cover letter and resume to

```
Stan Kerr
Systems Consulting
Computing Services Office
169 DCL
```

You may also apply electronically by sending Mr. Kerr mail to one of the following (equivalent) addresses:

```
STANKERR@UIUCVMD
STANKERR@VMD.CSO.UIUC.EDU
```

PRINTER FOR SALE TO UNIVERSITY ACCOUNT HOLDER

Diablo 630 ECS Printer with Diablo F-33 Dual-bin sheet feeder with envelope feed. Neither heavily used; both in excellent condition. $950.00 or best reasonable offer. Price includes (in addition to the printer and feeder):

- The following seven manuals: 630/630 ECS Product Description; 630/630ECS API Interface Manual; Diablo Models 630API/API ECS Operators Guide; Model 630/630ECS Maintenance Manual; Diablo Print Wheel Data Books I and III; Diablo Supplies Type Book.

- The following six 192-Character Diablo ECS Printwheels: 4 Elite 12 Teletex wheels; 2 Pica 10 Teletex wheels.

- The following single 96-Character Printwheel: Diablo Elite 12.

- Several HyTypeII ribbons (only one is utterly pristine, but the others remain quite usable.

To buy, contact E. Melhado, School of Chemical Sciences, Box 3, Noyes Lab, 333-6175.

READER FEEDBACK

In our attempt to keep improving *Off-Line*, and answer your needs and interests, we will be adding this page to each issue. We sincerely hope that many of our readers will take the time to give us this "Feedback". Please fill out, fold in half, and return to address on back. Your reply may be anonymous, or you may add your name and department. Thank you for your comments/suggestions.

1. Please give us comments about articles in this issue. Mention the article by name and be as specific as possible in your comments. For example, did you find the articles informative, of a reasonable length, etc.?

2. What topics would you like to see covered in future issues?

3. What sections would you like to see expanded or added? For example, a question-answer column or articles about other department's computing activities?

4. Additional comments or suggestions:

5. Would you be interested in contributing articles, questions, etc. to *Off-Line*?

Mail to:

OFF-LINE
Computing Services Office
150 Digital Computer Laboratory (M/C 256)

University of Illinois at Urbana-Champaign
1304 West Springfield Avenue
Urbana, Illinois 61801

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_____ Please *CHANGE* my address (provide old address also).

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Department _____

Bldg. & Room _____ M/C_____

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Address _____

_____

_____

City, State, Zip _____

If you are requesting a change of address, please indicate your old address:

_____

_____

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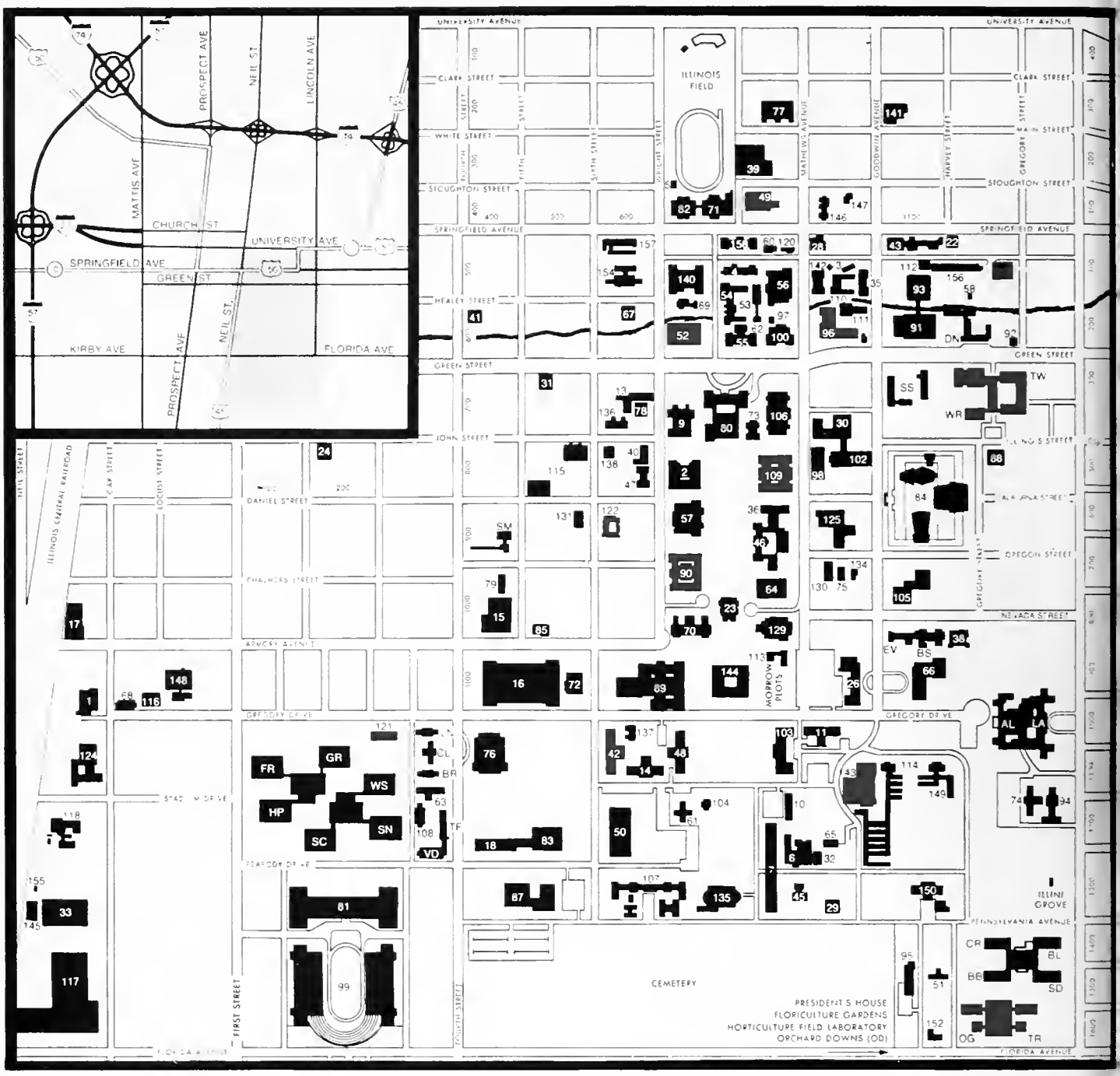
150 Digital Computer Laboratory (M/C 256)

University of Illinois at Urbana-Champaign
1304 West Springfield Avenue
Urbana, Illinois 61801

CSO SITES

CSO NORTH (DCL)	
14 Digital Computer Lab	Monday-Saturday, 24 hours/day
333-7685	Sunday, 12 noon - 12 midnight
CSO SOUTH	
70 Commerce West	Monday-Saturday, 8 am - 12 mid.
333-4500	Sunday, 12 noon - 12 midnight
AGRICULTURE	
N-120 Turner Hall	Monday-Thursday, 8 am - 10 pm
333-8170	Friday, 8 am - 5 pm
	Saturday-Sunday, Closed
CHEMISTRY	
150-154 Noyes Lab	Monday-Friday, 9 am - 5 pm
333-1728	Saturday-Sunday, Closed
CRH SNACK BAR	
120 Snack Bar	Daily, 12 noon - 12 midnight
333-1851	
ELECTRICAL ENGINEERING	
146 Electrical Engineering	Monday-Friday, 8 am - 12 mid.
333-4936	Saturday, 8 am - 5 pm
	Sunday, Closed
FAR	
Florida Avenue Residence Halls	Daily, 12 noon - 12 midnight
333-2695	
ISR	
Illinois Street Residence Halls	Daily, 12 noon - 12 midnight
333-0307	
MECHANICAL ENGINEERING	
65 Mechanical Engineering	Monday-Saturday, 8 am - 12 mid.
333-1430	Sunday, 12 noon - 12 midnight
PSYCHOLOGY	
453 Psychology	Monday-Friday, 8 am - 5 pm
333-7815	Saturday-Sunday, Closed
SOCIAL SCIENCE	
202 Lincoln Hall	Monday-Friday, 8 am - 12 mid.
333-0309	Saturday, 10 am - 5 pm
	Sunday, 12 noon - 5 pm



CSO Sites (marked in blue on map)

42 Commerce West
49 Digital Computer Lab
52 Electrical Engineering
90 Lincoln Hall
96 Mechanical Engineering
109 Chemistry - Noyes Lab
121 CRH Snack Bar
122 Psychology
143 Agriculture - Turner Hall
Illinois Street Residence Halls
Florida Avenue Residence Halls
CSO Office Building
(101 South Gregory)

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CSO DIRECTORY

Departmental Office	150	DCL	333-1637
User Accounting Office	1208	W. Springfield	333-7752
Documentation Center	1208	W. Springfield	333-9230
Systems Consulting	1208	W. Springfield	333-6133
Statistical Consulting	85	Comm West	333-2170
Microcomputer Consulting	91	Comm West	244-0608
Microcomputer Resource Center	106	CSOB*	244-6261
Text Processing Consulting	212	CSOB*	333-7318
Maintenance & Repair Service	194	DCL	333-0969
Tape Service, Special Plots, Special Printers.	14	DCL	333-8640

*CSOB is the CSO Office Building, located at 101 South Gregory, Urbana.

DIAL-UP NUMBERS

IBM 3081 GX (uiucvmd)	300	baud	333-4006
Cyber 175 (uiucnosa)	300	baud	333-4000
SWITCH	1200	baud	333-4008
	2400	baud	333-4007
TELENET (local no.)			384-6428

LOCALNET CALL NUMBERS

Note: Certain CSO Sites are on a separate channel of LocalNet than the rest of the campus. These are designated below as **A Sites** and include the following CSO Sites: ME, EE, COMM, LH, and AGRIC. All other LocalNet access areas are designated as **B Sites.**

VMD	CALL 4000	(line mode - A Sites)
	CALL 4100	(line mode - B Sites)
	CALL 4400	(full-screen mode - A Sites)
	CALL 4500	(full-screen mode - B Sites)
VME	CALL 4600	(A Sites)
	CALL 4700	(B Sites)
uxa (Pyramid 90x)	CALL 66AC	(A Sites)
	CALL 66AA	(B Sites)
uxe (Pyramid 90x)	CALL 12FA	(A Sites)
	CALL 12EE	(B Sites)
uxf (Sequent)	CALL 66C0	(A Sites)
	CALL 66BB	(B Sites)
uxg (Gould)	CALL 1000	(B Sites only)
uxh (Convex)	CALL 1850	(A Sites)
	CALL 1800	(B Sites
NOSA	CALL 1650	(A Sites)
	CALL 1750	(B Sites)
LCS	CALL 6400	
TELENET	CALL 1550	

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July/August 1988

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Articles, suggestions, comments and/or subscription requests may be sent to: Lynn Bilger, Off-Line Editor, 150 Digital Computer Lab, University of Illinois, 1304 W. Springfield, Urbana, IL 61801 (telephone: (217) 333-6236; email: bilger@uxe.cso.uiuc.edu).

CSO PUBLISHING "OFF-LINE NEWSBRIEFS"

As announced quite awhile ago, we have switched to publishing *Off-Line* every two months instead of every month. This means that there are times when we need to get brief announcements or information to our users between issues. To meet this need, we will publish the new *Off-Line Newsbriefs* whenever necessary — once, twice, or not at all between regular issues. The Newsbriefs will be sent only to those users on campus and within a 50-mile radius of UIUC. The announcements in the Newsbriefs will be repeated, or in some cases expanded on, in the following issue of *Off-Line*.

NEW CSO ECONOMETRICS CONSULTANT

The new CSO Econometrics Consultant is Pin Ng. His consulting hours are Tuesday through Thursday, 10 am to 12 noon. He consults in Room 73 Commerce West, 244-7189.

TAPE STORAGE POLICY

Our permanent tape storage facility at DCL now contains approximately 6000 tapes, and there is no more room. In the past, we have asked owners of tapes in temporary storage, or of tapes in permanent storage that have not been accessed in over a year, to pick up their tapes.

Once again we are asking users to help us remove un-accessed tapes from our library. A list of these tapes will be sent to the user's department as a reminder. Tapes may be checked out and picked up in Room 14 DCL between the hours of 8 am and 12 midnight. Due to the difficulty of accessing DCL during the construction period, CSO will arrange to deliver the tapes to your office if you call and request delivery.

If you have any questions, please contact Priscilla Peete at 244-0186.

HYPERCARD SITE LICENSE

We have acquired a site license for HyperCard, a Macintosh software product that is now bundled with every new Macintosh. Apple sells the software to any individual who bought a Macintosh system before the release of HyperCard. The site license enables us to equip any University-owned Macintosh with HyperCard at no additional cost. Note: the license does not cover privately-owned systems.

HyperCard requires a megabyte of memory, two 800K floppy drives (or one 800K floppy plus hard disk), system file version 3.2 or later, and Finder version 5.3 or later.

The terms of the license require us to maintain records of the copies we distribute and to apply a label to each copy bearing Apple's copyright notice.

To obtain a copy of HyperCard (for University-owned machines only), bring three 800K floppy disks and the serial number of your Macintosh to the Microcomputer Resource Center, which is located in the Federal Room, basement of the Illini Union.

CSA ADDED TO IBM MAINTENANCE CONTRACTS

CSO has added a Corporate Service Amendment (CSA) to its maintenance contracts with IBM. This amendment requires CSO to provide specified system management control procedures and centralized customer help facilities. In return IBM reduces our cost for maintenance contracts.

The Corporate Service Amendment has two options, a Systems Option for machine types installed at the computer center, and a Network Option for machine types capable of attachment to a telecommunications network.

CSO has qualified for a CSA and has selected both options. This means that IBM equipment for both the data center and the network are eligible for maintenance discounts. Other departments that connect to the campus network may be eligible for these maintenance discounts as an extension to CSO's agreement.

Maintenance charge discounts vary according to machine type and the term selected. For example, the current maintenance discount for a 3800 printer is 15, 20, or 25 percent for one, three, or five year terms, respectively. Other equipment may have greater or lesser discounts, depending on the device.

For additional information contact Bruce Gletty, who is in charge of operations at CSO's central site, at 333-5305.

NETWORK/COMMUNICATIONS OPERATIONS HOURS EXPANDED

The technical networking staff duty hours have been expanded, and are now 7:30 am to 10:00 pm Monday through Friday, and 10:00 am to 6:00 pm on weekends. This increase in coverage is made possible with the addition of Bob Johnson and Laura Weger to the networking group. They have just completed three weeks of intensive training, focusing on UIUCnet, the campus high-speed Proteon network, and the Sytek/LocalNet terminal network.

Networking problems can be reported to the CSO hotline at 244-1000. During the hours listed, the phone will be answered and a problem report opened immediately. Outside of those hours, the hotline will be routed to an answering machine. The problem reports will be examined at the beginning of each open period.

NEW VERSIONS OF KERMIT ANNOUNCED

Two new versions of Kermit — Macintosh Kermit 0.9(40) and MS Kermit 2.31 — were recently announced. These versions are currently available on VMD, but should be available from the MRC or the Microcomputer Consultants (94 Comm West) by the time this issue goes to press.

CSO CONSULTING SCHEDULES AVAILABLE ON-LINE

The office schedules for the CSO Systems and Statistical Consulting Offices are now available on-line on all CSO research systems -- the Cyber 175, the IBM 3081 (VMD), the IBM 4341 at Commerce West (VME), the Pyramid (uxe), the Gould (uxg) and the Convex (uxh). On all of these systems there are two commands, SYSCON and STATCON, which cause the current week's Systems or Statistical consulting schedule to be displayed.

SPSS-X TRENDS TO REPLACE IDA

The CSO Statistical Consultants are planning to remove IDA (Interactive Data Analysis) from the VMD system and replace it with the SPSS-X add-on product TRENDS for time series data. This change is likely to take place early in 1989 after the Cyber is gone. If you have special interest in either IDA or TRENDS please let us know.

Please direct comments concerning these proposed changes to Joan Mills, Statistical Consultant, 150 DCL, campus (email: MILLS@UIUCVMD), or the CSO South Consulting Office, 85 Commerce West (333-2170).

CUMULATIVE INDEX ADDED TO OFF-LINE

In response to several requests from users (on the Feedback Form), we are adding a cumulative index to Off-Line, rather than publishing an index only at the end of the year. We hope our readers will find this a useful addition to the newsletter.

We would also like to take this opportunity to thank all of you who have responded by taking time to fill in the Feedback Form. A file has been started, and your suggestions for future articles are being worked on.

UIUC PC USERS GROUP STATUS REPORT

Greg Kesner
CSO Users Services

The first issue of the UIUC PCUG Newsletter was recently distributed and included a status report on the group. We asked to have it included in *Off-Line* for those of you not on our mailing list.

Over the last six months, we have held one general session and two special sessions related to the Ingres and Oracle data base management systems. The PCUG Steering Committee (PCUGSC) has also been formed and has met regularly on the first Wednesday of each month. The PCUGSC has been laying a foundation for a number of users group activities, including various Special Interest Groups (SIGs), meeting formats for the general sessions, organizing a few "Brown-Bag Lunch Seminars" for the summer and fall semesters, setting up an Electronic Bulletin Board Service, and discussing issues surrounding some initial directions for the users group.

The steering committee has been initially formed from those members who have expressed a willingness to coordinate one of the SIGs. At the general meetings last semester, SIG Registration forms were available. We have included a form at the end of this issue. You are welcome to complete and return it to be registered for involvement in one or more SIGs or to coordinate a SIG. (A registration form for the UIUC PCUG members mailing database is also provided.) The SIG coordinators will use this information to notify you of future SIG activities. The SIGs are seen as being the vital working cells of the users group, so you are encouraged to become involved in those relating to your interests. Also, some proposed SIGs lack a coordinator, so if you're willing to lead a SIG, please indicate this in the appropriate space on the form. If you're interested in starting a SIG, feel free to include that on the form as well.

The steering committee serves as a means to coordinate the various activities within the PCUG. We very much welcome and need your suggestions and comments. If you would like to assist in the operation of the users group, propose a new SIG or activity for the group, or simply have some ideas you would like to discuss, please feel free to contact me via one of these means:


```
Greg Kesner,     E-mail:       Kesner@vme.cso.uiuc.edu
                               Kesner@uiucvme.bitnet
                 Voice-data:   244-0540
                 Hand-mail:    150 DCL (CSO)
                               1304 W. Springfield
                               Urbana, IL  61801
```


With some time now invested laying a modest foundation, we're ready to get moving and that involves you! This is YOUR PCUG -- the resources and possibilities are wonderfully far-reaching. In fact, all that limits us is our imaginations. What are your needs and interests in terms of microcomputers? How can we share our knowledge and expertise to help each other? Are you willing to share the benefits of your experience with others? Do you need help in getting started with microcomputers?

We're building a "Personal Network of Personal Computer Users". We hope you'll decide to become involved -- we need you -- you're what the UIUC PCUG is all about!

WHAT'S NEW IN THE MRC?

Bi-Shen Chuang and Mark Zinzow
Microcomputer Resource Center

Campus personal computer users are invited to the Microcomputer Resource Center (MRC), located in the Federal Room in the Illini Union. The MRC offers magazines, hardware/software for evaluation, and lots of public domain software.

The MRC's Amiga public domain software, including the Amicus and Fred Fish collections, is gaining increasing popularity among Amiga users. Diskettes from the Champaign-Urbana Macintosh Users Group are updated regularly. In addition, our PC-SIG Library on CD-ROM now contains 1,000 diskettes of shareware and public domain software which may be freely copied at the Center, and which have recently been uploaded to VMD (see the following article). To access the PC-SIG collection in a convenient way, a Get Disk (GD) program allowing menu-driven and command-line interfaces has been developed for the Center users. On VMD, there is an expanded PC-SIG help file explaining the downloading procedures via phone or campus network. These public domain files include educational programs, all sorts of games, and many more software applications. As users are encouraged to copy and distribute diskettes to friends, shareware authors also expect you to send a contribution if you find the program useful.

The MRC has available anti-virus software for MS-DOS, Amiga, and Macintosh systems. ThunderScanner for the Macintosh is available for scanning and saving images such as drawings, logos, or icons for use with other software. We will soon receive an evaluation copy of LightspeedC from Edutech. Product literature on this package is on file.

PC Digest (Vol. 2, # 5), May 1988, has a very good comparison and evaluation of thirteen different 80286 Systems (including AST, Compaq, IBM PS/2 Models 50 & 60, and PC's Limited) covering compatibility information, product recommendations, feature charts, and performance results. The July 1988 issue of *PC Report* has several articles on software viruses that are well worth reading.

The following list describes the newly added commercial software, demo disks, and magazines. (Software packages are for the IBM PC or IBM PC Compatibles, unless specifically marked for the Macintosh. An asterisk indicates the package may be checked out.)

New Commercial Software Packages

Title	*Publisher*
BiblioTech	Oberon Resources
(BiblioTech works in conjunction with Notebook II version 3.0 or higher to generate bibliographies and reference lists.)	
DESQview Version 2*	Quarterdeck Office Systems
DESQview Companions 1*	Quarterdeck Office Systems
EDT+ 4.0	Boston Business Computing, Ltd.
VCL 2.0	Boston Business Computing, Ltd.

(EDT+ 4.0 and VCL 2.0 are donations from Boston Business Computing, Ltd., the DEC Compatible Software Company. EDT+ is a text editor which emulates the VAX editor. VCL emulates a group of commands known as DIGITAL COMMAND LANGUAGE (DCL) used in the VMS operating system.)

STELLA* (MAC) High Performance Systems, Inc.
(The STELLA software is a teaching, learning, and research tool which emphasizes the benefits of active, discovery-oriented learning.)

Quarterdeck Expanded Memory Manager 386 Quarterdeck Office Systems

Updates

Macintosh System Software Update 6.0 (MAC) --- Apple Computer, Inc.
This four-disk package's system tools, printing tools, and two utilities disks (containing Apple HD SC Setup, HD Backup, Disk First Aid, Font/DA Mover, MacroMaker, Apple File Exchange, Map, Installer, and CloseView) may be copied by owners of the current system, but we are also required to provide a copy of the Single-Computer End User Software Site License Agreement with each copy.

HYPERCARD 1.2 Update Disk (MAC) --- Apple Computer, Inc.
Please present the following before you make your free copy of this disk: (1) An original "HyperCard Startup" or "HyperCard and Stacks" disk. (2) A sales receipt for a Macintosh CPU dated after Aug. 11, 1987.

WISC-WARE Additions

The eighth distribution of software from Wisc-Ware has six new packages:

63. NONMET II PLUS* H. Kritzer, U. of Wisconsin-Madison. A program for the analysis of non-metric (nominal and ordinal) data.

64. FONTGEN* R. Hendon, Yale University. A program for designing fonts for the display of text using either the Enhanced Graphics Adapter (EGA) or the Hercules Graphics Card Plus (HGCP).

65. UMCS* D. Worth, UCLA. UCLA Microcomputer Conferencing System (UMCS) is an electronic bulletin board system which allows the creation of subconferences and numerous independent topics under discussion. (This is a public domain program.)

66. GATOR* R. Giordano, et al., Princeton University. GATOR (Generalized Automatic Text Organization and Retrieval System) is designed to index and retrieve text stored in standard ASCII files. (Documentation for this package is not submitted by the author.)

67. APPLIED BASIC PHYSICS-VOL. 1* G. L. Swafford, Naval Postgraduate School. A series of programs for Applied Basic Physics. Volume 1 contains modules covering the following topics: (1) Acceleration as a function of time. (2) Freefall motion with air resistance. (3) Multiple stage rocket with air resistance. (4) Projectile motion-- air resistance with height variation. (5) Damped harmonic oscillator with driven option. (6) Central Force motion.

68. MILIM* T. Zahavy, University of Minnesota. Milim is a Hebrew vocabulary drill program utilizing advanced concepts in language acquisition education.

New Demo Disks

Title	*Publisher*	*Application*
AEWINDOS	Aesoft Corp.	Windowing Software for C Programmers
MANAGING YOUR MONEY (MAC)	meCA Ventures, Inc.	Financial Software
MACWRITE 5.0	Claris Corp.	Word Processing
MACDRAW, MACPAINT 2.0,		Graphics
AND MACPROJECT II		Project Management

(These four Macintosh upgrades are on one demo disk.)

New Magazines

Title	*Publisher*	*Frequency*
AMAZING COMPUTING (Described as "Your original AMIGA monthly resource.")	Pim Publications, Inc.	Monthly
ORACLE MAGAZINE (A SQL Database Journal)	Oracle Corp.	Quarterly
UNIX REVIEW (A magazine dedicated to the needs of the UNIX community.)	Miller Freeman Pub. Co.	Monthly

The MRC acquires new software packages every week. If you would like to see something we do not have, please fill out a suggestion form, available in our handout rack. For your convenience, we have included a copy of the form at the end of this issue which may be returned via campus mail. In addition to the CU-MUG public domain software, we are looking into software available on CD-ROM for the Macintosh.

USING THE PC-SIG CD-ROM LIBRARY ON VMD

Mark Zinzow
CSO Microcomputer Group

The PC-SIG Library is a collection of public domain and shareware programs for IBM PC's and other microcomputers. The entire collection is available on a CD-ROM (an optical compact disk) which contains copies of the over one thousand diskettes comprising the Library and can be accessed at the CSO Microcomputer Resource Center (in the basement of the Illini Union, phone 244-6261 or 244-6264). It has also been stored in a special form on VMD so that any person with access to VMD can obtain PC-SIG software from VMD and transfer it to a microcomputer.

The PC-SIG Library on VMD is accessed by the command

LINKTO PCSIG

This links and accesses the CMS minidisks containing the collection. Note: This article is available on-line via HELP CSO PCSIG.

For campus users without VMD accounts, nine free signons are available for downloading this software with a modem. The usernames are **micro1** through **micro9**, all with the password **micro**. When using the free signons, a menu will be provided to automatically LINKTO PCSIG (selection 1). It is also possible to use these signons to access the Amiga and some of the other IBM PC software on uxe.cso.uiuc.edu. Create a temporary disk with TD, then LINKTO TCPIP, and use ftp to copy the file you wish from uxe to the temp disk, and then use Kermit to download it from there.

All the disks from the CD-ROM Library are in binary files named

```
DISKxxxx ARC   or   DISKxxxx ZOO
```

where xxxx is the four digit number of the disk. The index file is 1_1000 UPP and is of type text. Use BROWSE or XEDIT to view it. BROWSE is preferred as you will need 6 megabytes of storage to use XEDIT on a file of this size. (The CSO STORAGE EXEC is useful for this; however, it may NOT be used with the free Micro signons. Type HELP CSO STORAGE for more information on this.)

The ALL command in XEDIT is particularly useful when searching for specific needs. It is useful to try to think of several related keywords. For example, when looking for Artificial Intelligence software, AI is probably too short, but the words EXPERT (for expert systems) or KNOWLEDGE (for knowledge base) may be helpful in locating software. Similarly for DESKTOP PUBLISHING the words GRAPH, DRAW, PICTURE, PAINT, WORD, WRITE, and EDIT are worth searching.

Printed indexes are available in the Microcomputer Resource Center. These catalogs, listing part of the disk collection and monthly magazine updates, are available with PC-SIG membership for $20 per year. (Order toll free by calling 1 (800) 245-6717, or 1 (800) 222-2996 in CA.) You may also wish to download the parts of the UPP index file for use on your own PC. The shareware program LIST is highly recommended for this purpose. Since the index file 1_1000 UPP is well over two megabytes long, it might be easier to download it in small parts:

```
Index portion   in file:
  1-100.UPP     DISK0270 ARC       Note: ARCUTIL may be used
101-200.UPP     DISK0270 ARC             to extract a single
201-300.UPP     DISK0271 ARC             index file from an
301-400.UPP     DISK0271 ARC             archive to a temp
401-500.UPP     DISK0400 ARC             disk.
501-600.UPP     DISK0400 ARC
601-700.UPP     DISK0605 ARC
701-800.UPP     DISK0804 ARC
801-900.UPP     DISK0804 ARC  and DISK0805 ARC
```

Disk 804 is designated for most recent updates and is sent free with most orders from PC-SIG. Please contact the Micro Resource Center, or Mark Zinzow (MARKZ on UIUCVMD) if you have a more recent version that we could copy to VMD.

For example, here are a few lines from the index file (1_1000 UPP):

```
0136 ------------------------------------------------
0136 DISK NO 136     PC-PICTURE GRAPHICS BY E. YING                    V1
0136 ------------------------------------------------
0136
0136 PC-PICTURE ALLOWS YOU TO CREATE GRAPHICS IMAGES ON YOUR COLOR MONITOR. A
0136 NUMBER OF READYMADE IMAGES ARE INCLUDED.  YOU CAN DIGITIZE TO A PLOTTER,
0136 CREATE YOUR OWN GRAPH FILES AND EVEN YOUR OWN SLIDE SHOW. IF YOU WISH TO
0136 CREATE A NICE-LOOKING VISUAL PRESENTATION WITHOUT SPENDING THOUSANDS, GIVE
0136 THIS DISK A TRY.
0136
0136 USAGE:  GRAPHICS DESIGN TOOL
0136
0136 SYSTEM REQUIREMENTS:  GRAPHICS BOARD, COLOR MONITOR.
0136
0136 HOW TO START:  LOAD DOS AND TYPE PCPG TO ENTER THE MAIN PROGRAM.
0136
0136 USER COMMENTS:   "EXTREMELY WELL DONE GRAPHICS PROGRAM!  IT RIVALS THE
0136 STUFF I'VE PAID LOTS OF GOOD MONEY FOR." "TAKES A LITTLE TINKERING TO
0136 UNDERSTAND IT BUT RESULTS ARE TERRIFIC."  "THE BASIC DOCUMENTATION WAS
0136 SOMEWHAT DIFFICULT TO UNDERSTAND."  "FINE GRAPHICS PROGRAM; TWO FONTS DON'
0136 WORK; EXCELLENT LIBRARY OF GRAPHICS."
0136
0136 SUGGESTED DONATION:  $20.00.
0136
0136 FILE DESCRIPTIONS:
0136
0136 PCPG      FT?  PART OF PC-PICTURE
0136 PCPG      EXE  GREAT GRAPHICS DRAWING PACKAGE(REQUIRES GRAPHICS BOARD)
0136 PCPG      PIC  PART OF PC-PICTURE
0136 PCPG      HLP  PC-PICTURE HELP FILE
0136 PCPG      SYM  PART OF PC-PICTURE
0136 DEMO*     GFL  DEMO FILES FOR PC-PICTURE CONTAINING GRAPHIC IMMAGES
```

To download this software to your PC you could simply type

```
KERMIT SET FIle-type BInary # SEND DISK0136 ARC *
```

You will be prompted to then type the PC-KERMIT's escape character (control-] C) and the RECeive command. Type HELP CSO KERMIT or see CSO's Technical Note TN-250 (available free at CSO sites) for more information on using Kermit.

Of course, file transfers with Kermit are ridiculously slow compared with using the campus network (UIUCnet). The VMD command LINKTO TCPIP may be used to access the FTP and TFTP programs on VMD. Here is an example session using FTP on an IBM PC (user input is in bold):

D:>**ftp vmd.cso.uiuc.edu**
Waiting for host.220-FTPSERVE at VMD.CSO.UIUC.EDU,
22:29:10 CDT SATURDAY 06/18/88
220 Connection will close if idle for more than 15 minutes.
vmd.cso.uiuc.edu username: **micro7**
331 Send password, please
vmd.cso.uiuc.edu password: **micro**
230 MICRO7 logged in; no working directory defined

ftp> **cd public.b00** (b zero zero)
250 Working directory is PUBLIC B00 (ReadOnly)

ftp> **type binary**
200 Representation type is IMAGE

ftp> **get disk0136.arc**
200 Port request OK
150 Sending file 'disk0136.arc'
106735 bytes received in 13 seconds (8.0 KBytes/s)
250 Transfer completed successfully

ftp> **quit**
221 Quit command received. Goodbye
vmd.cso.uiuc.edu connection closed.
D:>

This example shows how to use **tftp** to get PC-SIG disks using CMU Telnet.

C:\TMP>**tn vmd** (the CMU Telnet command)

IBM PC User Telnet Version 9.5 - bugs to pc-ip-request@mit-xx
To host vmd via Interlan Ethernet. Time is 19:56:20 on 1-Jul-1988
Last customized at 14:36:42 on 11-May-1988.
Telnet escape character is F10
Trying....Open
VM/370 ONLINE-PRESS ENTER KEY TO BEGIN SESSION
.l micro9 (Use one of the free userids micro {1-9} and password micro)

Enter logon password:
.**micro**SSSSSSSSSSSSSSSSSSS

Last logon at 19:56:01 CDT Friday 07/01/88 from TCPIP2.
LOGON AT 20:08:26 CDT FRIDAY 07/01/88
UIUC/CSO CMSL 4.17
A (191) R/O
SHARED YSTAT NOT AVAILABLE.
One moment please. . .
Enter:

1	to use the IBM PC-SIG library
2	to use the Apple Macintosh library
3	to access HELP for full screen environment
4	to access NOTES
5	to log off

.1 (Select the PC-SIG software)

.q disk (Check to see which filemode has the PC-SIG disks)

```
LABEL   CUU M  STAT   CYL TYPE BLKSIZE  FILES  BLKS USED-(%)  BLKS LEFT  BLK TOTAL
MICRO2  191 A    R/O    1 3380 1024         9         20-04         445        465
PC/SIG  120 C    R/O  300 3380 4096      1008      36240-81        8760      45000
```

```
ARCUTL 121 D   R/O    1 3380 2048        25        203-75          67        270
FEATRE 319 P   R/O   30 3380 4096       117       2812-62        1688       4500
USEFUL 193 R   R/O   20 3380 4096       485       1197-40        1803       3000
CMS417 190 S   R/O   28 3380 4096       193       2399-57        1801       4200
USERAP 31A X   R/O   12 3380 4096        45        829-46         971       1800
IPF    19E Y/S R/O   33 3380 1024       289       2760-18       12585      15345
HELP   19D Z/Z R/O   27 3380 4096        68       3266-81         784       4050
```

(Note that in this case the ARC and ZOO files are on FILE MODE C!)

R;
linkto tcpip (Get VMD tftp and ftp commands)

TCP592 LINKED AT MODE B
R;
.tftp 128.174.##.### (Use F10 i to send internet address of current PC)

Toggle tftp server asking. (Esc hot key: F10, A in this case)

Command:
.mode octet (Set binary file transfer mode)

Command:
.put disk0357 .aer.c b:disk0357 .arc
(Specify source then destination)

Host vmd is writing file b:disk0357 .arc

156 bytes transferred in 7.826 seconds. Transfer rate 0.020 Kbytes/sec.
Command:
.quit

R;
.logoff

CONNECT= 00:04:48 VIRTCPU= 000:00.42 TOTCPU= 000:01.05
LOGOFF AT 20:13:14 CDT FRIDAY 07/01/88
Closed

C:\TMP> (transfer finished; back at DOS prompt)

(NOTES: The IBM telnet is executed with **Telnet** not **tn**, and the escape character is Ctrl-] not F10. Also note that 'anonymous ftp' is a term commonly used to describe this same procedure to a host (such as uxe) that accepts the username 'anonymous' and any password.) After receiving a file, reconnecting to VMD, and logging off (if using Kermit), you would type

PKXARC DISK0136

to extract the files listed previously. If you are running on a floppy-based system you will need to run PKXARC from one disk to another either by specifying a destination disk like

PKXARC A:DISK0136 B:

or by making sure the default disk has enough room for the files you are extracting.

Although there are many ARC programs in the PCSIG DISKS themselves, the binary files PK36 EXE and ZOO200 EXE are also stored on VMD with the PC-SIG files for use in extracting ARC and ZOO files. Simply copy them to your hard disk and run them and they will extract all the related programs and documentation you need to use them. On a floppy system, simply specify another drive letter where you want the files. For example:

```
A>ZOO200 B:
```

The ARC format is used for most PC-SIG disks, but the ARC format does not allow storage of files in a tree structure, so we use ZOO format which does for those disks with subdirectories. You can extract individual files from ARC files on VMD using a program called ARCUTIL. Type HELP CMS ARCUTIL for information about it.

1. What are ARC files?

The rest of this note will cover two questions: What are archive files and what are they good for? How do I use or read an archive file?

1.1 What are archive files and what are they good for?

Public domain, Freeware, and other shared software is typically distributed in archived format, i.e., as files with an extension of .ARC. There are many good reasons for this. The two most important are that ARC files are about as small as they can be, and that they keep all the files for the software together.

File size matters most when software is shared on electronic bulletin boards where the longer the file, the longer it takes to transmit via a modem. This translates directly into money when the bbs is long distance from the caller, but it can also save charges on pay services like Compuserve, BIX, or the Source. Shorter files also mean that more files may be transmitted in a given period of time, and that there is less waiting around. Shorter files also save money by occupying less disk space. Since ARC files are typically as small as one half or one quarter of the size of the original file(s), they offer quite a savings.

I often find that a quick way to make room on my hard disk is to archive a large subdirectory full of files into one small archive and then delete all the files (from that directory) but that archive. Then when I need them again, I don't have to go digging for the right floppy. Other times when I want to copy some files to a single floppy, the only way to fit them all is to use an archive file. Finally, backup of a subdirectory is facilitated since only one file is copied to a floppy disk.

Since software usually comes as a package of several files, usually at least a program in executable form (binary) and a human readable document or set of instructions (text), it is important that anyone who receives this software gets all of the files. Nothing is more frustrating than running software and then finding out that you are missing the file or help information needed for your particular use or system configuration. A good example of this would be word processing software with a separate file for every printer it supported. Most users of the software are likely to only be careful about keeping the file needed for their own printer.

Just like the old game where a message is passed by whispering from one person to another and then compared with the original message, files are often lost in transit after passing through many hands. Archives tend to prevent this.

ARC files also provide a means of verifying that files have not been corrupted in transit. Although rare, this is possible even with so called error-free protocols.

1.2 How do I use or read an archive file?

There are a number of programs available that allow the creation of ARC format files, and the extraction (or unarcing) of the original files from the archive. The best for the PC are those written by Phil Katz (now PKWARE, Inc.), although the format originates with a company known as System Enhancement Associates (SEAWare). Both programs are self documenting in that they provide a command, or use, summary when run with no arguments (files or options). Both programs are also distributed with excellent and detailed documentation, and users are encouraged to send a reasonable contribution to the authors for their use.

Mr. Katz distributes his software as a self extracting archive which is a program (currently PK36.COM) that extracts files from itself. When run, PK36 writes the following files to the current directory of the default drive: APPNOTE.TXT, MAKESFX.COM, MANUAL.DOC, ORDER.DOC, PKARC.EXE, PKARCJR.EXE, PKXARC.EXE, PKXARCJR.EXE, and README.DOC.

Examples:

To place the PK utilities in a utility directory (called ut) to be used on a hard disk one would use some commands like:

```
md \ut
cd \ut
a:pk36            (assuming PK36 is in drive a)
path c:\ut
```

To make an archive from all the files in the current directory on a floppy in drive a:

```
pkarc a a:myarc *.*
```

To list the files in a:myarc:

```
pkxarc /v a:myarc
```

To copy all the files from an archive (myarc) to the current drive and directory:

```
pkxarc a:myarc
```

These utilities are very versatile and more powerful than these examples show. Please refer to the program documentation for more details.

EVERYTHING YOU EVER WANTED TO KNOW ABOUT LOTUS 1-2-3 (ALMOST): PART III

Steven M. Miller
CSO Microcomputer Group

This is the third in a three part series. The first article, which appeared in the January/February issue, dealt with database manipulation and miscellaneous data submenu commands. The second article, which appeared in the March/April issue, covered creating graphics and manipulating them in Lotus 1-2-3. This article covers macros. All three articles comprise the reference material for the CSO short course **M53: Intermediate Spreadsheet.** You may copy this work in its entirety for whatever use you see fit. Lotus 1-2-3 is Copyrighted by Lotus Development Corporation. All references to Lotus 1-2-3 in this article refer to Version 2.01. All commands are given in abbreviated form; i.e., /Worksheet,Global,Format,Fixed is represented as /WGFF. A question mark is used to represent a place where the user inputs some variable number, column, or row. For example, to set a column width to some variable number of spaces would be shown as /WCS?.

IV. Macros

Macros are probably the most difficult yet, once understood, most beneficial tool provided with Lotus 1-2-3. Macros can be developed in many different ways. In the simplest form they save you the trouble of repeating the same key strokes over and over again; e.g., changing a label in fifty different columns. In the most complex form, the macro can act as a user interface to Lotus 1-2-3. In this instance the user does not see or use Lotus but is able to access all the power of Lotus 1-2-3 from a controlled environment established by the user. A user can access a database, compare the data there to a calculated formula entered by the user and then graph the two results, all at the touch of a key! My goal in this article is to describe the tools that are available to write macros and to provide a basic understanding of how they work. Also, I will present a few notes on style in order to help with debugging and improving the general form for complex macros. I will not try to teach programming even though there are many aspects of writing macros that do require some knowledge of programming techniques and control structures. These concepts are best left to an introductory programming course.

The Basics

Macros are simply a collection of keystrokes which Lotus 1-2-3 will execute. These keystrokes are entered in a single column, progressing down the column until the end of the macro (a blank cell) or an error condition is encountered. Lotus 1-2-3 reads the macro from left to right and then down the column. This means that you can put up to 240 keystrokes (the maximum number of characters per cell) in one cell and then continue your macro in the next cell down the column. However, this leads to VERY messy and hard to correct macros. I recommend writing one complete operation per cell of your macro. Also, since Lotus 1-2-3 only reads a single column, put comments in the column directly to the right of your macro that describe what you are trying to do in each cell of your macro. Each entry in the macro must be entered as a label, whether it is a formula, a command, or a number. This means that the first character in each cell must be a single quote ('). If you forget a quote, Lotus 1-2-3 will stop execution of your macro at that cell.

After entering your macro in a column, it is necessary to name the macro. This is done using the **Range Name Create** (/RNC) command. Place the cell pointer on the first cell of your macro. Type /RNC. At this point you will be prompted for a range name. Enter a backslash (\) followed by a single letter (A through Z). Accept the current cell pointer location by pressing ENTER or use the escape key to free the cell pointer and move it to the first cell in your macro. It is not necessary to specify the entire column that contains your macro. Only the FIRST CELL is necessary. This is because macros are read down a column until the end of the macro or an error condition is encountered. Once you have named the macro, use the column directly to the left of your macro to label which macro (since there may be several in a single worksheet) starts in the cell to the immediate right. This means that when you create a macro you will be using three (3) columns for each macro. The first column will contain a label for the macro (usually two characters: a backslash (\) and a letter (A through Z)). The second column will contain the keystrokes in your macro. The third column will contain comments describing what each line in your macro is trying to do.

Now all that is left is to invoke your macro. This is accomplished by pressing the ALT key and the letter corresponding to the macro you wish to invoke. You do not need to precede the letter with a backslash (\) as you did when you named the macro. The backslash is how Lotus 1-2-3 realizes that the entry should be treated as a macro after it is named. At this point Lotus 1-2-3 will start executing the commands you entered in the column containing your macro. If you find that Lotus 1-2-3 is not doing what you expected, you can interrupt the macro by pressing the ESC key. This may place Lotus 1-2-3 in an error condition. Continue pressing the ESC key until you recognize where you are in Lotus 1-2-3 and then go and correct your macro.

Now you know the basics of creating a macro. However, you are also probably wondering how do I make Lotus 1-2-3 move down 4 cells? How do I enter a carriage return and have Lotus 1-2-3 execute it? How do I get Lotus 1-2-3 to recalculate my spreadsheet? The answer is special keys.

Special Keys

There are twenty-six (26) special keys which are used to cause Lotus 1-2-3 to execute keystrokes usually done by keys on the numeric keypad or editing keys. These keys are as follows:

~	RETURN (called tilde)
{down}	moves the cell pointer down one cell
{up}	moves the cell pointer up one cell
{left}	moves the cell pointer left one cell
{right}	moves the cell pointer right one cell
{home}	moves to the top left of the worksheet
{end}	sets or resets the END indicator
{pgup}	moves up one page
{pgdn}	moves down one page
{bigleft}	moves one screen left
{bigright}	moves one screen right
{edit}	places you in edit mode
{name}	displays a list of range names
{abs}	cycles cell addresses through relative, absolute, and mixed in point and edit modes
{goto}	move to the following cell address

{window}	switch between windows when the screen is split
{query}	repeat last /Data,Query command
{table}	repeat last /Data,Table command
{calc}	recalculate the worksheet
{graph}	display most recently specified graph
{esc}	cancel current entry or return to previous command step
{bs}	backspace
{del}	erase current character in edit mode
{~}	causes tilde to appear as ~ instead of being treated as a return
{{} and {}}	cause braces to appear as { and }
{?}	stop macro execution and wait for user input

To have the same key executed more than once, simply include a repetition factor within the braces. For example, to move the cell pointer left 5 cells, type the macro entry as {left 5}.

Now you are thinking, "Great, now I know everything but how do I use this stuff?" How about an example?

AN EXAMPLE!

As an example, let's say we want to average three numbers in cells A1, A2, and A3, place the answer in cell C4 and format cells A1 through A3 as currency with 2 decimal places. The column which appears in bold type below is the macro. The text which is in Roman type are comments. When the macro is named, the cell containing '{goto}C1~ is the only cell which is specified. To invoke this macro which I have named 'A' simply type **ALT-A**.

'\A	**'{goto}C1~**	move cell pointer to cell C1
	'+(A1+A2+A3)/3~	average cells A1 through A3
	'/rfc2~A1.A3~	format A1.A3 as currency
		blank cell end macro

Note that the last command given to the macro is to format the cells A1 through A3 as currency. This command looks a little cryptic at first, but once you realize it is simply the keystrokes that you would press to do the operation manually, everything should become clear. This last command also emphasizes how important good planning is to effective macro development. I recommend going through the keystrokes you wish to emulate in your macro at least two times before typing in the macro. Once to write the keystrokes down and again to check your written keys against what you want as an end result. Don't forget that carriage returns count as a key (the tilde ~).

If we change the above macro to format some unspecified (user input) range as currency with two decimal places, all we need to change is the third line. The macro will then look as follows:

'\A	**'{goto}C1~**	move cell pointer to cell C1
	'+(A1+A2+A3)/3~	average cells A1 through A3
	'/rfc2~{?}~	format user input as currency
		blank cell end macro

When Lotus 1-2-3 encounters the {?} it will stop execution and wait at that point for the user to input a valid range.

Sometimes when writing macros they become very difficult to debug. Lotus 1-2-3 has an option which will allow you to have Lotus 1-2-3 execute your macros one step at a time. To switch Lotus 1-2-3 into this mode (step mode) press the ALT-F2 keys. You should notice the step indicator at the bottom of the screen. Also, if you find that there are a series of commands you execute every time you load a particular worksheet, Lotus 1-2-3 provides the option of an autoexecute macro. This macro will be invoked automatically every time the worksheet it is in is loaded. The only thing which distinguishes this macro is that it is given a special name. At the input range name prompt for naming your macro, type \0 (backslash zero). This is the only macro which does not begin with a letter and it cannot be invoked from the worksheet. If you want to use the autoexecute macro other than at load time you must copy it and give it another name.

Conclusions

The best way to learn macros is to try them and make mistakes. There are many more options which can be used in writting macros. There are macro functions to control the screen, keyboard input, program flow (control structures), data manipulation, and file manipulation. All of these commands are explained in the Lotus 1-2-3 manual under Advanced Macro Commands. Once you understand the simple macros and can create them with ease and confidence, get the manual and start to write some bigger and better macros. You will be amazed.

If you have questions, comments, or NEED HELP, feel free to call me (Steven Miller) at 244-0730.

RELEASE OF SPSS/PC+ VERSION 2 READIED FOR DISTRIBUTION

Anup Roy
Statistical Consultant

CSO has readied a new release of SPSS/PC+, SPSS/PC+ Version 2, for licensed users at the University. Currently licensed users of SPSS/PC+ will have received notification of the availability of the new release by the time this issue of *Off-Line* is in print. Users will have the option to trade in their original diskettes for the newly prepared diskettes (free). Users who decide to use the new release will have to erase their old copy of SPSS/PC+ from their hard disks and completely reinstall the new version from scratch. However, any SPSS/PC+ system file created using the old release will be directly readable by the new version.

SPSS has a streamlined installation procedure for this new release. All products, including separately purchased (non-site-licensed) copies of additional modules (i.e., Data Entry II, Graphics, Tables, Trends, etc.), can be installed using the same identical command. The new installation instructions are included with the new release.

The Base Product consists of four (4) diskettes (numbered B1 through B4), plus a tutorial diskette. (Please note that once again there is no key diskette.) The Advanced Statistics option has three (3) diskettes (numbered A1 through A3). A Kermit diskette is still supplied for micro-mainframe communications. In addition, there are four new diskettes labeled U1 through U4. These are the so-called "universal set" diskettes and contain software and utilities that are required to install or run any part of SPSS/PC+. The "universal set" diskettes are essential if the end-user plans to use any

separately-purchased, additional products/options (such as Trends, etc.) with the site-licensed version of the Base Product.

An article describing some of the features of this new release will appear in the next issue of *Off-Line*. If you have any general questions about SPSS/PC+, please contact the CSO Statistical Consultants, 85 Commerce West (333-2170). More specific questions about SPSS/PC+ can be directed to Anup Roy at 244-1201.

NOTEBOOK II, VERSION 3.0 UPGRADE RELEASED

Ed DeWan
Text Processing Consultant

[For a description of the original Notebook and Bibliography programs, see the article reprint "Notebook II and Bibliography," following this article.]

Notebook/Bibliography

The Notebook II/Bibliography program from Pro/Tem, Inc., has now been released in Version 3.0, which is being distributed at the CSO Distribution Center, 1208 W. Springfield, Urbana. The cost of the entire package is $25.00, according to the original site license agreement. New purchasers receive a shrink-wrapped package, containing the program disks and documentation.

Users who have already purchased Notebook/Bibliography may receive an upgrade package free of charge, by presenting proof of purchase at the CSO distribution Center. Proof of purchase normally consists of an original Notebook or Bibliography diskette. The upgrade package includes a reference card, a 15-page manual update, and 4 diskettes, 2 containing Version 3.0 of the Notebook program, 1 containing the Version 3.0 of the Bibliography program, and 1 containing Version 1.35 of the Convert program. You should bring to the Distribution Center four formatted, low-density (360K) diskettes, onto which to copy the programs.

New Features & Enhancements

Version 3 of Notebook II has the following enhancements:

1. Find and replace, with options for case and whole word.

2. Select on record numbers. For example, you can create a view that contains or excludes records 1, 3, and 50 to 63 of the database or view.

3. Find and select deleted or non-deleted records.

4. Reorder on first 30 characters in a field. Reorder with foreign or accented characters equal to un-accented characters.

5. Index records by keywords; write keys and index to diskfile or printer. The index contains each discrete word followed by the actual number of each record in which it appears.

6. Expunge duplicate records sequentially or by actual record number in the entire database.

7. Number printed records sequentially or by actual record number in the entire database.

8. Full control over bibliographic format.

9. Create bibliographies in Chicago, APA, MLA, Turabian, and other styles (see the next section of this article for further details).

NOTEBOOK II AND BIBLIOGRAPHY TOOLS FOR TEXT STORAGE, RETRIEVAL, AND ORGANIZATION

Ed DeWan
Text Processing Consultant

[A reprint, with minor modifications, of an article which appeared in the June, 1986 issue of Off-Line.]

CSO, the School of Life Sciences, the Psychology Department, and the Chancellor's Office have a purchase agreement with Pro-Tem Software to distribute the programs Notebook II and Bibliography. The package, which includes four diskettes and a paperback manual, sells for $25 at the CSO Distribution Center.

The Notebook package can be purchased by faculty, staff, or students. Under the terms of the agreement, consulting support is provided through the Text Processing Consulting Office, 333-7318. Upgrades will be available free on an on-going basis, as they become available from the vendor.

Notebook II and Bibliography comprise a powerful set of tools for many different text management applications. They are especially useful for handling research notes, for generating bibliographies from textual data bases, and for cross-referencing manuscripts. They can also be used for mailing lists, personnel files, medical records, inventories, recipes, and many other tasks.

Notebook

A Sample Record

To give the reader an idea of how Notebook works, here is a record from the sample BOOKS database that comes with the program:

```
==========================================================
Keyname       |Thomas, 1974
Author        |Thomas, Lewis
Title         |The Lives of a Cell: Notes of a Biology Watcher
Publisher     |New York: Viking Press
Date          |1974
Categories    |essays, natural science, biology, philosophy
Comments      |Short essays on the organization and
              |interdependence of life forms, at the cellular
              |level and otherwise...
```

When this record is displayed, the bottom of the screen shows the following message:

```
==============================
books   1/22 {}   99% left
==============================
```

This means that you are looking at record 1 out of a total of 22 records in the database, and that record 1 is only 1% full, i.e., there is 99% of the available space left for record 1. Notebook allows up to 28,000 characters in each record. (The curly braces, {}, are used to display text that is currently blocked with the Ctrl-F2 function.)

Record Fields

In the sample database, there are seven fields - Keyname, Author, Title, Publisher, Date, Categories, and Comments. The first field, Keyname, has been included for use with the Bibliography program. (Bibliography requires that the first field of each record contain the keyname by which you will refer to the work.)

The vertical bars in the display are called the "margin line," and serve to separate the field headings from the text of the fields. Its position can be adjusted up to column 22, to give a maximum of 20 characters for the size of the field name. This leaves a minimum of 54 characters for each text line in the field. (The margin line need not appear in printed versions of the database, since print formats are at the discretion of the user.)

> Note: There are no subfields in Notebook. However, you can usually create a separate field containing the necessary information, and get the desired results using the Selection rules.

Moving About

Moving within a record is a simple matter of using the cursor keys, plus other cursor-moving controls. To move from one record to another, you simply press the PgDn or the PgUp keys. You can jump to the beginning or end of the database, and you can jump to any record by number.

Context Searching

You can search upwards or downwards through the database for text strings that occur either at the start of any field, or anywhere within a field.

Entering New Text

When you enter text into a field, word wrap is in effect, so you just go ahead and type. You can use the Enter key at any time to start a new paragraph in any field. Also, you can use the Enter key to add new text to any field within any record. Fields and records grow dynamically as you add text. You have a choice of Indent or Overtype mode, which can be set as default, or toggled with the Insert key.

Modifying Records

You can delete and modify existing text in fields, "undo" an entire set of changes to a record, add new records, and mark records as deleted/undeleted.

Records that are marked as deleted can be made invisible or visible, but they remain in the database until you compact it, at which time they are discarded. Any record that is marked deleted can be "undeleted" at will, until you compact the database.

Also, you can copy any record to the end of the database, where it becomes a new record to be modified. This enables you to have several records based on a common set of data.

Creating, Reordering, and Merging Databases

When you create a new database, you establish the names and order of the fields (up to a maximum of 50). The simplest way to do this is to call notebook with the new name, like this:

```
NB MAGAZINE
```

New fields can be added, either when first creating a database, or in an existing one, and the entire order of the fields can be changed at any time using the Restructure menu in the Utilities module.

Two databases having the same structure can be merged, which allows you to combine databases into new databases. This technique can also be used to make a copy of an old database under a new name; just create the new one, and merge the old one into it.

View Selection

One of Notebook's most important and useful features it its ability to Select records according to various criteria, and assemble the selected records into "views," which can then be printed, saved to a file, or made into new data bases. (A view is just a set of pointers into the main database, and takes up relatively little space on the disk.) Note that all views are discarded when you compact or reorganize the main database.

Selection rules include Contains, Excludes, Begins with, NOT Begins with, Less than, Less than or equals, Greater than, Greater than or equals, OR, and AND. Stated more simply, this means that you can sort any view (including the main database, thinking of it as a view), either alphabetically or numerically, in ascending or descending order, based on any field. Furthermore, it means that you can extract a subset of any view, to create a new view, based on any field.

Once a view is created, it can be further narrowed by applying a new selection to it, or it can be broadened by merging two or more views. A view can be used to create a new, independent data base. By using the extended selection process (selecting on one field with one set of criteria, and then on another field with another set of criteria), you can create views based on the content of more than one field at a time. Records can also be sorted alphabetically or numerically based on the text at the start of any field.

After you have created a view, based on selection criteria, you may find that your selection either contains some records you didn't want, or there are some records you want to include that didn't get caught in the selection process. You can add records to a view from the main database, or subtract records from a view. Also, you can change views, merge views, delete all records in a view, undelete records in a view, and remove a view from the disk, i.e., delete the entire view.

Report Editor

Notebook contains a report editor that allows the user to extract information from any view, including the main database, and print it in different formats. Selected fields can be printed, and formats can be defined by the user. All the rules for record modification apply while in a view, and the modifications are made in the main database, since a view is a set of pointers into the main database.

Saving Your Work, and Backup Copies

One point not explicitly made yet is that Notebook consists of three main modules, driven by a command program. The modules are Edit, Print, and Utilities. The View menu resides in the Edit module, so manipulating views is fast and simple. Whenever you leave the Edit module, all work done is saved. Furthermore, you can save all work done with the Write option, while in the Edit module.

One slightly unusual aspect of this is that Notebook takes every opportunity to save your work to disk, even if you don't want it to. Since most word processors allow you to abandon an edit without saving the changes, this feature may take some getting used to.

For example, suppose you start Notebook, on the BOOKS database, and make some changes by way of experiment. If you leave the Edit module to try out the Utilities module, Notebook will immediately save your work, even though you really didn't want to capture the changes.

> Note: There is no way to abandon the session! If you find yourself in a situation where you are forced to save some changes you do not want, do not boot the system. This will disrupt the database pointer files, and may force you to restore it from a backup copy, or using the NBFIX program.

The moral of all this is that you should always make a backup copy of your database, before making any significant changes. The simplest way to do this is to keep all your databases in separate directories, with a separate directory for the backup copies as well. This way, making a backup (and by extension, restoring a database) can be done fairly easily, usually by deleting the "garbage" or trashed database and its auxiliary files, and then copying the backup copy from its directory.

Restoring a Database

The Notebook manual contains extensive instructions on how to restore a damaged database, as well as what to do if Notebook crashes. If you experience any difficulty, you should read these instructions very carefully. You then have a fair chance of salvaging something, if not the entire configuration.

Among the instructions given are: 1) remove unnecessary files and run Notebook again, 2) compact the database and run Notebook again, 3) use the NBFIX program, and finally, as a last resort, 4) restore from your backup copy.

Keywords

Notebook has a feature that can be used to generate a list of keywords. You can create your own keywords simply by entering them into a separate field (Categories in the example), or you can use the Key function to extract a list of keywords from any field, for the entire database. This function creates an alphabetized list of all the words in the database in the specified field, giving the frequency of occurrence for each word. For example, in the BOOKS database you could key on the Dates field to see how many books were published in each year.

On-Line Help

Notebook gives context-sensitive help in nearly all situations. Whenever you press the F1 key, you get a window containing useful tips on whatever function you were using or about to use at the time. You won't always find what you are looking for, but the on-line help will frequently save you a search in the manual. Pressing the Esc key takes you immediately back to whatever you were doing.

Importing and Exporting Text

Notebook can read information created by other databases, word processors, and programs. This includes on-line database services. Imported records are added at the end of the database.

There are two formats for importing records. First, there is the Notebook format. In this case, there must be an exact match between the number and names of fields in the the imported records, and the original database, and the imported records must be in a prescribed format, which looks like the following example:

```
%Start:
%Author:Wortman, Leon A. & Sidebottom, Thomas O.
%Title:The C Programming Tutor
%Publisher:Bowie: Robert J. Brady
%Date:1984
%Categories:computers, programming, "C"
%Comments:An introduction to the C programming language.
%End:
```

Each field must be preceded by a heading which is identical to the corresponding heading in the Notebook database, delimited by the characters % and :. Also, each heading in the Notebook database must have a corresponding heading in the imported file, and the fields in the imported file must be in the same order.

The Notebook format can therefore be generated by most word processors, using the print-to-file option. For example, in Microsoft Word, you would print to file in un-formatted mode.

The other format is the Basic Format, which is used by Microsoft Basic and many other programs. This includes WordStar's MailMerge and dBase II's system data file delimited format. This format is described in the Notebook manual.

Special Characters

Notebook has a Keep option that allows you to preserve embedded codes in an imported file, so that the original word processor formatting can be preserved. This enables you to manipulate the text with Notebook, and then create a new file, using the Print module, that can then be run through the word processor for further formatting. Notebook also has a Remove option to remove control characters, and a Mask option to convert extended ASCII characters to their lower ASCII equivalents.

The Options Menu

The Utilities module contains an Options menu that allows you to control various features, such as the position of the margin line (left margin), whether to show or hide records marked as deleted, whether Insert or Overtype is to be the default typing mode, the screen mode (mono or color), the background color, the way in which views are handled when you transfer from one module to another (keep current view, etc.), the database ID, the paragraph character, and the field start and end characters.

The Print Module

Notebook can prepare reports containing the records in a database, or any view of it. Reports can be sent to a printer, to the screen for previewing, or to a disk file for later processing by a word processor, posting to a bulletin board, uploading to a mainframe, etc. You can use the default format provided by Notebook, or make your own custom report format.

The Notebook print format includes headers and footers. Headers and footers can contain the page number, automatically incremented on each page, and the date and time stamp. Headers and footers can have multiple-line definitions.

When you create custom print formats, the editor provides you with a 16-line field in which to define text, and there is no scrolling or word wrap. However, you can generate vertical spaces by including the vertical bar symbol (|) in the text of the report.

The usual rules for headers and footers apply. In addition, any text typed in the report body will appear in each record. In this area, the symbol # is replaced by the record number, | inserts a newline, \ suppresses a newline to join two lines, and ^ sends a form feed to cause a page eject.

The most important aspect of using the Print module is the ability to select desired fields to be displayed. The way this works is that when in the Print Format Editor you go to a sub-menu and select a field to be included in the body of the report, and upon return you find embedded in the text a symbol like the following: <1:0 >. This entire string behaves like one character (you cannot type it directly), and causes the first record to be printed at that spot in the text. The :0 means that the record length is variable.

Print Options

The Print Options menu allows you to change a variety of parameters pertaining to the print format, such as margins, page size, pause or no pause between pages, etc. (the usual stuff). You can suppress or print any field that is blank, by setting an option. Also, you can generate hanging indents and autoindent on the first line of each field.

Hardware Requirements

Notebook requires two floppy disk drives or a hard disk, PCDOS or MSDOS 2.0 or greater, and a minimum of 256K of RAM. At run time, there must be at least 225K of RAM available. Notebook can be used with many memory-resident programs, including Random House Reference Set, Pro-Key, Superkey, and Sidekick, provided there is enough memory available.

Bibliography

Bibliography is a companion program to Notebook. It compares citations in a manuscript with entries in a Notebook database, and constructs a bibliography of all entries cited. The Notebook database therefore acts as a card catalog.

When you prepare a manuscript, you enter citations in your customary form, preceded by a percent sign (%); e.g.,

...see %Wood, 1969...

These entries are read by Bibliography, which searches a Notebook database for corresponding entries, and then constructs a bibliography in whatever format you choose. Also, you can instruct Bibliography to modify the original manuscript; i.e., remove the % signs, create footnotes, or replace citations with their numbers in the bibliography. However, Bibliography cannot be used to MODIFY a formatted Microsoft Word file, due to the way in which these files are constructed. It can be used to modify only un-formatted Word files.

Bibliography requires MSDOS or PCDOS 2.0 or higher, and 256K of RAM. Keynames can be up to 40 characters long. Bibliography can be used with a variety of word processors, such as WordStar, WordStar 2000, Spellbinder, WordPerfect, XYWrite II, and Microsoft Word (with the exception noted above for Microsoft Word).

BiblioTech

There is currently available, from Oberon Resources, a sophisticated package containing sample Notebook databases and custom report formats for the various bibliographic styles. Through a special arrangement with the vendor, this package is being sold on a temporary basis, through the CSO Distribution Center, for the introductory price of $31.00. (The current price when purchased direct from the company is $37.95, which includes an $8.00 shipping fee.) Users who buy *BiblioTech* from CSO, and who register their purchase with the company, will receive a free upgrade when the next version comes out, projected for Fall or Winter of 1988. (Note: prices for the product will go up substantially when the next version is released.) Please see the two- page flyer on *BiblioTech*, immediately following this article, for further details on the program.

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Take a look at the sample bibliographic citations we've provided on the reverse side. The information on authors, titles, and so forth, was entered in a single Notebook II database as it appears on the left. BiblioTech was used to reformat the data into the citations for different publishing styles that are printed on the right.

BiblioTech is easy to learn and use, even for people who don't consider themselves fully "computer literate." The documentation and samples provided enable you to begin using the package almost immediately. After you've used BiblioTech yourself, you will surely agree that there are more interesting and intellectually satisfying methods of building academic character than formatting, punctuating, and proofreading bibliographies.

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BiblioTech records

1

Year published	1987
Author	Williams, Peter R.
Addl Author(s)	Dole, Joy; Rice, Ann B.; Allen, Arlene T.; Doyle, Lester N.
Book ttl	Agriculture in the Sudan
Doc / Rept ID #	CRCS Rept. No. 28-7821
Place published	New York
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2

Year published	1988
Author	Petri, Susan R.
Item desc / ID	review of _Downsiding_, by Powell, Robin
Journal	Modern Culture Studies
Serial Volume #	8
Serial Issue #	3
Journ/magz pages	100-107

3

Year published	1976
Author	Petri, Susan R.
Essay/artcle ttl	Loafing in Las Vegas
Magazine	Popular Demographics
Day/month(or qtr)	7 January
Jour/magz pages	220-228

4

Year published	1984
Author	Rolline, Richard D.
Essay/artcle ttl	Freud and Einstein: On the Great War
Translator	Grant, Martha B.
Preface phrase	in
Anth/Multvol ttl	The politics of theory
Anthology editor	Campbell, Rose M.
Place published	New York
Publisher/press	White
Book pages	361-422

5

Year published	1981
Author	Rolline, Richard D.
Book ttl	Scientific citizenship
Vol #(whole,ttl)	2
Anth/multvol ttl	A history of science and politics
Editor	Young, Marvin
Translator	Grant, Martha S.
# vols:one cited	3 vols. to date
Place published	New York
Publisher/press	White

Citations generated with BiblioTech

MLA Format

1. Williams, Peter R., et al. Agriculture in the Sudan. CRCS Rept. No. 28-7821. New York: Lake UP, 1987.

2. Petri, Susan R. Rev. of Downsiding, by Robin Powell. Modern Culture Studies 8.3 (1988): 100-07.

3. ---. "Loafing in Las Vegas." Popular Demographics 7 Jan. 1976: 220-28.

4. Rolline, Richard D. "Freud and Einstein: On the Great War." Trans. Martha B. Grant. The politics of theory. Ed. Rose M. Campbell. New York: White, 1984. 361-422.

5. ---. Scientific citizenship. New York: White, 1981. Vol. 2 of A history of science and politics. Ed. Marvin Young. Trans. Martha S. Grant. 3 vols. to date.

APA Format

1. Williams, P. R., Dole, J., Rice, A. B., Allen, A. T., & Doyle, L. N. (1987). Agriculture in the Sudan (CRCS Rept. No. 28-7821). New York: Lake University Press.

2. Petri, S. R. (1988). [Review of Downsiding, by R. Powell]. Modern Culture Studies, 8(3), 100-107.

3. Petri, S. R. (1976, January 7). Loafing in Las Vegas. Popular Demographics, pp. 220-228.

4. Rolline, R. D. (1984). Freud and Einstein: On the Great War (M. B. Grant, Trans.). In R. M. Campbell (Ed.), The politics of theory (pp. 361-422). New York: White.

5. Rolline, R. D. (1981). A history of science and politics: Vol. 2. Scientific citizenship (M. Young, Ed.) (M. S. Grant, Trans.). New York: White.

Chicago A Format

1. Williams, Peter R., Joy Dole, Ann B. Rice, Arlene T. Allen, and Lester N. Doyle. Agriculture in the Sudan. CRCS Rept. No. 28-7821. New York: Lake University Press, 1987.

2. Petri, Susan R. Review of Downsiding, by Robin Powell. Modern Culture Studies 8, no. 3 (1988): 100-107.

3. ------. "Loafing in Las Vegas." Popular Demographics, 7 January 1976, 220-28.

4. Rolline, Richard D. "Freud and Einstein: On the Great War." Translated by Martha B. Grant. In The politics of theory, edited by Rose M. Campbell, 361-422. New York: White, 1984.

5. ------. Scientific citizenship. Vol. 2 of A history of science and politics. Edited by Marvin Young. Translated by Martha S. Grant. New York: White, 1981.

BiblioTech will produce similar printouts for the Turabian, Chicago B, ASR, ANSI, CBE, AMA, NEJM, and J. Clin. In. publishing styles. Additional publishing styles are currently under development.

CHANGES TO THE SHARED LIBRARY ON VMD

Joan Mills
CSO Statistical Consultant

Some programs from the Cyber 175 SHARED library (GRAB,SHARED) that are used heavily in the behavioral sciences have been converted by their sponsors and are now available in the IBM CMS/VMD SHARED library (accessed by the command LINKTO SHARED). As a rule, CSO does not maintain or consult on SHARED products (Cyber or IBM), but does provide disk space for their storage and points out documentation to potential users. Programs must be evaluated on an individual basis for inclusion in SHARED. The criteria include general usefulness to users other than the provider, adequate documentation, and the availability of a contact person whom users can arrange to see if there are questions.

The newly converted programs are as follows (more information, including references, is available on-line as indicated after the list):

SINDSCAL Individual differences in multidimensional scaling. (Based on the ideas of J. D. Carroll and J. J. Chang from a generalization of the Eckart-Young decomposition.)

KYST2A A flexible program for multidimensional scaling and unfolding. KYST2A was developed from the ideas of the statisticians Kruskal, Young, Shepard and Torgerson (K - Y - S - T).

MAPCLUS An algorithm for fitting the Shepard-Arabie Additive Clustering model. The method starts with a proximities matrix and uses least squares and mathematical programming with a penalty function.

INDCLUS A generalization of MAPCLUS to represent individual differences among subjects, etc. in the clustering solution.

To access these products and look at a brief on-line description on VMD, enter

LINKTO SHARED

or

LINKTO prod (S

where **prod** is the name of the product of interest. Then enter

HELP SHARED prod

Use the PF keys listed to move around in the help file.

Other programs currently in IBM SHARED are:

ACED Algorithms for the construction of experimental designs.

BILOG Item analysis and test scoring with binary logistic models.

BRAP	Bayesian regression analysis package.
GRAFSTAT	Interactive data analysis and graphics system.
LOGIST	Item parameter and examine ability estimation.
RATS	Regression analysis for time series.
SPP	Student Problem package. Item response pattern analysis.
TBROWSE	Interactive tape examination package.

Help files for these programs are accessed as described above.

ANNOUNCING VMSCHED ON VMD

Beth Engelbrecht-Wiggans
CSO Systems Consultant

VMSCHED is basically a batch system that runs jobs on your own virtual machine (as apposed to VMBATCH, which runs jobs on a BATCH machine). The job that you run can be as simple as a message to yourself about an upcoming meeting, or as complicated as an application program. You can schedule your virtual machine to 'wake up' and do processing at a specific time. There are many timing options available that allow you to have your job automatically rescheduled.

Although VMSCHED has a line mode and a full-screen mode of operation, this article shows only the line mode commands. The menus provided with full-screen mode are complicated and hard for the inexperienced user to understand. We therefore suggest that an inexperienced user of VMSCHED read this article, try using it in line mode until familiar with the software, and then proceed to the full-screen mode (full-screen mode is entered by simply entering VMSCHED after you have accessed the software as shown below).

To access VMSCHED, enter:

```
LINKTO VMSCHED
```

For on-line help in using the scheduling facility, enter:

```
HELP VMSCHED MENU
```

1. Sending Messages

VMSCHED can be used to remind you of re-occurring meetings by sending on-line messages. You must be logged on to receive the message from VMSCHED. This facility also allows you to send interactive messages from VMSCHED to any user at a time specified by you. The message sent will indicate the requesting user. The following shows the generic form of the line mode command for using the EXEC VMDMSG, which will send a message to the specified user at the specified time(s):

VMSCHED EXEC request VMDMSG user message (options

where

request is the name of your request. This needs to be a unique name and is how you refer to this request when communicating with VMSCHED.

user is the person you want to receive the message.

message is the message you want to send.

Some of the options are listed below. The items in brackets [ ] are the available choices for that particular option (you do not use the brackets when the command is issued). When times are required, you need to use the 24-hour clock (often known as military time: i.e., 13:30 for 1:30; 16:00 for 4:00, etc.), but you need not specify seconds. In the following list, bold upper case letters are used to indicate permissible abbreviations of the options; bold lower case letters must be replaced with your own values; upper case letters in choices on options must be used as specified (not abbreviated).

Again [HOURLY DAILY WEEKLY MONTHLY YEARLY MONTHEND]
AT hh:mm:ss
Every **hh:mm:ss**
FRom mm/dd/yy
On [MON TUE WED THU FRI SAT SUN]
To hh:mm:ss
UNtil mm/dd/yy

(More details about these options may be found in the options listing in the next section, section 2.)

EXAMPLE: The following example shows a session requesting VMSCHED to remind VMD user ENGWIG of a weekly Tuesday afternoon meeting.

```
linkto vmsched
VMSCHE LINKED AT MODE H
Enter  HELP VMSCHED MENU  for help.
R;
vmsched exec msg1 vmdmsg engwig meeting in 10 min (o tues at 13:50 a weekly
VMDSCH050I Request 'MSG1' FIRST run scheduled: TUE 06/14/88 AT 13:50:00.
R;
```

Then at 1:50 on Tuesday afternoon ENGWIG will get the following message:

```
VMSCHED MSG FROM ENGWIG : MEETING IN 10 MIN
```

2. Scheduling an Exec

VMSCHED's main mission is to schedule execs to be run on your own virtual machine at a time specified by you. To use VMSCHED in this manner, you must be able to write your own exec. There is a brief description of execs and macros in the manual *Introduction to CMS at UIUC*. Further information on creating and using execs can be found in the following IBM manuals:

CMS User's Guide

EXEC 2 Reference
System Product Interpreter User's Guide
System Product Interpreter Reference

The format of the VMSCHED Schedule command is:

VMSCHED Schedule rname execname (options

where

rname is the name of the request to be scheduled. You must not have a request already scheduled with the same name.

execname specifies the exec to be executed.

Available options are listed below. In the following list, bold upper case letters are used to indicate permissible abbreviations of the options; bold lower case letters must be replaced with your own values; upper case letters in choices on options must be used as specified (not abbreviated). When a time is requested, use 24-hour clock time (e.g., 13:30 instead of 1:30, etc.).

Again --- Specifies how often you want the request to initiate. The valid choices are HOURLY, DAILY, WEEKLY, MONTHLY, and YEARLY. (E.g., a daily; again yearly; a hourly)

AT hh:mm:ss --- The time of day the request is to initiate. If AT is not specified, the time of day defaults to one (1) minute after the request is issued. You need not specify minutes or seconds on an even hour; e.g., 10 is all that is needed, not 10:00:00. (E.g., AT 11:55; AT 14:30:15)

Every **hh:mm:ss** --- Specifies the interval of time until the request's next initiation on a given day. This interval is valid **for one day only**. The **E**very option does not extend past midnight. (E.g., e 1:30; every 2)

For **limit** --- The maximum number of times a request is to be rescheduled following an attempted initiation. The **F**or option overrides any other scheduling options, except the **O**n option. Your request will only initiate the number of times specified, even if you specify the **A**gain option. (E.g., f 10; for 5)

FRom **mm/dd/yy** --- The date of the first (or only) request initiation. If the **FR**om option is not specified, the first initiation defaults to the current date unless you specify that initiation is to occur on certain days of the week, or the specified time has passed for the current day. The date specified with the **FR**om option must be a date in the future. Month and year not always required. (E.g., fr 8/30/88; from 8/30; fr /30)

On **day** --- The day of the week on which the new request is scheduled to execute. Valid **day** values are MON, TUE, WED, THU, FRI, SAT, and SUN. You can specify a range of days with a hyphen (e.g., on MON-FRI, or on SAT-SUN). You can also specify the On option more than once (e.g., o MON o WED o FRI). The initial run date is calculated to fall on the next specified day. Specific day requests cannot be rescheduled using the **A DAILY** option; however, any other **A**gain rescheduling increments can be specified.

Password **password** --- Specifies the SIGNON password of the virtual machine being scheduled. If not entered, or if specified as ?, VMSCHED prompts for the password using a security mask.

Release **userid** --- Specifies a userid that is allowed to release the job for running through the VMSCHED RELEASE subcommand. Requests with the Release option are never explicitly scheduled for execution; therefore, all scheduling parameters are ignored. See section 7 for more information on using the Release feature.

TO hh:mm:ss --- The latest time of day at which a request rescheduled with the Every option is to initiate. The time specified must be later than the time of the first initiation. (E.g., TO 17; TO 22:30)

UNtil mm/dd/yy --- Specifies a date that limits the automatic rescheduling of the request. The date specified must be a date in the future. When the date is reached, the request is no longer resecheduled. (E.g., UN 8/30; until 9/15; until 10/1/89)

USer userid --- The userid on which the request is run. If not specified, the userid defaults to the userid that issued the VMSCHED command.

Within hh:mm:ss --- Specifies the amount of time you would like VMSCHED to keep trying to initiate your request should the system be unavailable at the time you specified (e.g., within 4:30; W 12:30). The maximum time you can use is 23:59:59.

EXAMPLE: The following example shows an exec to run a Fortran program and the VMSCHED commands needed to schedule it. The exec (in file RUN EXEC) compiles a Fortran program (in file RUN FORTRAN), issues the needed filedefs, and runs the program. In addition, it creates an echo of the job that will come to the reader.

```
/*  exec to run Fortran program run  */
'spool console *  start   '
'fortvs run '                          /*compile Fortran program*/
'filedef 1 disk tmp data a '
'filedef 2 disk outtmp data a '
'query filedef '                       /*echo filedefs*/
'load run (start '
'exec cost '                           /*determine cost*/
'logoff '
```

To schedule the exec RUN to execute starting at 11:55 on June 8, type:

```
linkto vmsched
vmsched schedule myjob run (at 11:55 from 6/8
```

VMSCHED will respond with

```
VMDSCH050I Request 'MYJOB' ONLY run scheduled: WED 6/08/88 at 11:55:00.
```

The job will not run if you are logged in at the time VMSCHED attempts to start your job. VMSCHED will send you a message telling you that it is attempting to initiate your job. The message will be similar to the following:

```
WNG FROM VMSCHED; VMDAUTO62W Attempting to initiate request 'MYJOB'
```

At this point you can do one of the following: log off, delay the execution of the job, cancel the job, or skip the current execution. See other sections in this article for information on these options, and see the on-line help files for additional information (HELP VMSCHED MENU).

When the job has completed you will receive confirmation in your reader. For the previous example, I received two reader files: the console file and a file from VMSCHED telling me that the job had run. The file from VMSCHED had a name of MYJOB VMSCHED and looked like this:

```
VMDAUTO60I Request 'MYJOB' started normally on 6/08/88 11:55:39.
VMDAUTO69I Request 'MYJOB' not rescheduled.
```

The console file looked like this:

```
VS Fortran 2.2.0
VS FORTRAN VERSION 2 ENTERED.  11:55:12

**TEST** END OF COMPILATION 1 ******

VS FORTRAN VERSION 2 EXITED.   11:55:15

FT06F001 TERMINAL
FT05F001 TERMINAL
FT01F001 DISK     TMP      DATA
FT02F001 DISK     OUTTMP   DATA
EXECUTION BEGINS...
8 Jun 1988 11:55:17
Connect time              0 minutes
COU/SIO/Memory         0.46 service units
Total service units used            0.46
Total cost                    $     0.27
   (Cost calculated at internal rate of $.59 per service
    unit.   Weekend reduced rates not reflected.)
CONNECT= 00:00:16 VIRTCPU= 000:00.50 TOTCPU= 000:01.28
LOGOFF AT 11:55:17 CDT WEDNSDAY 06/08/88
```

3. Determining What Requests Are Out There

To determine what requests exist, you should use the VMSCHED Query command. The format is:

VMSCHED Query rname (options

where **rname** is the name of the VMSCHED request you want to display. Request names can contain a trailing asterisk as a wild card. Options available for use with Query include:

File **fn** --- writes the output of Query to the file 'fn VMSCHED A'. If you do not specify the File option, the output displays on your terminal.

LAst --- displays the lastest request initiated for the specified userid.

Long --- displays a more detailed form of Query.

Next --- displays the next scheduled request for the specified userid.

Password **password** --- The signon password for the userid whose requests are being queried. The password must be specified when querying another userid's requests. Use this option with the **userid** option.

User **userid** --- The signon whose requests are being queried. If you do not specify this option, the default is your own userid.

4. How to Cancel A Request

The format of the command to cancel a request is as follows:

VMSCHED CANcel rname (options

where **rname** is the name of the request you want to cancel. Use an asterisk (*) to cancel all request for a specified userid.

Two options for the CANcel command are the User **userid** option and the Password **password** option. These options were described in the option listing in section 2.

5. How to Delay a Request

The format of the command used to delay a request is:

VMSCHED DELay rname UNtil hh.mm.ss (options

or

VMSCHED DELay rname For hh.mm.ss (options

where **rname** is the name of the request being delayed. **UNtil hh.mm.ss** is the time of day at which the rescheduled request should initiate, in hours, minutes and seconds. The delay interval specified by UNtil is added to subsequent initiations of the request. **For hh:mm:ss** is the amount of time a request should be delayed in hours, minutes and seconds. The delay interval specified affects only the next initiation of the request.

Two options for the DELay command are the User **userid** option and the Password **password** option. These options were described in the option listing in section 2.

6. Skipping a Request

Use the SKip command to skip the next initiation of a request. The format of the command is:

VMSCHED SKip rname [number] [options]

where **rname** is the name of the request to be skipped and **number** is the number of initiations to be skipped (the default number is 1).

Two options for the SKip command are the User **userid** option and the Password **password** option. These options were described in the option listing in section 2.

7. Using the Release Feature

The release feature allows you to sequence your VMSCHED requests. You may wish EXEC2 to run only after EXEC1 has successfully completed. To do this you would schedule EXEC2 to run when released as shown below:

```
VMSCHED SCHEDULE job2 exec2 (RELease ENGWIG
```

Then in EXEC1 you would issue the commands

```
LINKTO VMSCHED
VMSCHED RELease ENGWIG job2
```

The RELease (abbreviated as REL) command is used to sequence your jobs. An exec that is scheduled to run when released will not run until it gets told to run by the appropriate userid. The format of the RELease command is:

VMSCHED REL userid rname

where **userid** is the userid of the virtual machine owning the request and **rname** is the name of the request to be initiated.

8. VMSCHED and VMSECURE

By using VMSECURE RULES you can allow other signons to schedule, cancel and/or query a request on your signon. To edit your rules file, you must first issue the following commands:

```
LINKTO VMSECURE
VMSECURE RULES
```

This puts you in an XEDIT session on your rules file. After you have entered a rule and used the FILE command to save the file, VMSECURE checks the syntax and updates its rule database. The following are examples of templates you can use to create your own VMSECURE RULE for VMSCHED (you may use any or all of the following):

```
ACCEPT requestor VMSCHED CANCEL rname (options
REJECT requestor VMSCHED CANCEL rname (options
ACCEPT requestor VMSCHED QUERY rname (options
REJECT requestor VMSCHED QUERY rname (options
ACCEPT requestor VMSCHED SCHEDULE rname (options
REJECT requestor VMSCHED SCHEDULE rname (options
```

where

ACCEPT --- Specifies that the VMSCHED command is to be accepted.

REJECT --- Specifies that the VMSCHED command is to be rejected.

requestor --- The userid (or group) to whom you wish to grant or deny permission. If not specified, or if specified using an asterisk (*), the rule applies to all requests.

VMSCHED --- Must be specified on the rule to indicate this is a VMSCHED rule.

CANCEL or QUERY or SCHEDULE -- One of these must be specified.

rname --- The VMSCHED request name to which the rule applies. If not specified, or if specified as an asterisk (*), the rule applies to ALL requests.

Options are as follows:

DAY [SUN, MON, TUES, WED, THU, FRI, SAT] --- Specifies the day or days on which the rule applies. You may specify more than one day, or specify a range of days (e.g., MON-FRI).

EXPIRE mm/dd/yy --- Specifies the day that the rule expires.

GROUP --- Specifies that the 'requestor' is actually a group. At present there is only one group - VMBATCH. You must use the GROUP option if your requestor is specified as VMBATCH.

LOGPASS --- Causes the VMSECURE system to prompt for and verify the requesting user's signon password.

NOPASS --- Allows the requesting user unconditional access.

TIME hhmm hhmm --- Specifies the time of day the rule applies.

EXAMPLES:

1. Only users MOE and LARRY are allowed to schedule requests on CURLY's virtual machine due to the following rules in CURLY's rules files:

```
ACCEPT MOE VMSCHED SCHEDULE *
ACCEPT LARRY VMSCHED SCHEDULE *
REJECT * VMSCHED SCHEDULE *
```

2. If you want to restrict the requests that user SNOOPY can query, the following rules in your rules file allow him to query only the request called RED. (Note: no other user will be allowed to query any of your requests.)

```
ACCEPT SNOOPY VMSCHED QUERY RED
REJECT * VMSCHED QUERY *
```

3. The following rule in your rules file will allow SALLY to cancel any of your requests:

```
ACCEPT SALLY VMSCHED CANCEL *
```

REMINDER TO USERS OF THE CYBER 175 FOR CLASSES

Joan Alster
CSO Statistical Consultant

Due to its old age, the Cyber 175 is being removed from service in December 1988. Although it will still be possible for classes to use the Cyber during the 1988 fall semester, CSO strongly encourages instructors to convert their class applications to another computer as soon as possible. If at all possible, the conversion should be completed before the fall semester.

In choosing an alternative to the Cyber 175 computer system, you have a number of CSO-supported options. These include:

1. IBM VM/CMS mainframe service
2. UNIX mainframe service (4.2 BSD or 4.3 BSD)
3. Microcomputers -- CSO supports Apple, IBM, and IBM compatible computers.

CSO provides consulting assistance to users who need to convert their Cyber files and applications. Help can be obtained in the following offices:

1. Systems Consulting Office
   1208 W. Springfield, Urbana
   333-6133

   Hours: 9:00 am - 5:00 pm Monday through Thursday
   9:00 am - 11:45 am and 1:00 pm - 5:00 pm Friday

2. Statistical Consulting Office
   85 Commerce West
   333-2170

   Hours: 9:00 am - 1:00 pm Monday and Wednesdays
   9:00 am - 5:00 pm Tuesdays and Thursdays
   9:00 am - 11:45 pm and 1:15 pm - 5:00 pm Fridays
3. Microconsulting Hotline
   94 Commerce West
   244-0608

   Hours: SUMMER: 9:00 am - 5:00 pm Monday through Friday
   FALL: 9:00 am - 5:00 pm Monday through Friday
   7:00 pm - 10:00 pm Sunday through Thursday

CSO has written several documents to assist Cyber users with their conversions. These include: *Cyber Conversion -- An Overview; Differences Among Cyber Fortran, VS Fortran, and Convex Fortran; Converting Your SPSS Program and Data from CDC Cyber ;* and *SAS Conversion Document.* These documents are free and are available in both the Systems and Statistical Consulting Offices (see above).

CSO also offers three free Cyber conversion short courses: Converting from the Cyber -- An Overview; Cyber Conversion for SPSS Users; and Cyber Conversion for SAS Users. These courses are being offered each term until the Cyber is removed in December 1988. Details of the short courses are available in the CSO Short Course listing distributed at the beginning of each term (some copies are available from the CSO Accounting Office, 1208 W. Springfield -- phone 244-7724).

Joan Alster at CSO is coordinating the conversion of classes which use the Cyber. If you have questions, feel free to contact her for assistance. She may be reached at 244-0937, or via electronic mail from the Cyber using the command

```
TELL,ALSTER@UIUCVMD
```

We at CSO would like to help make your conversion as smooth as possible. To avoid last-minute panics, please assess your needs now and contact us for any assistance you may need.

FILE TRANSFER FROM CYBER 175 TO OTHER COMPUTERS

Daniel Pommert
CSO Systems Consultant

In the January-February 1988 issue of *Off-Line*, I discussed considerations related to transferring files from the Cyber 175 system (NOSA) to other CSO and non-CSO machines. I presented there the use of the **PUNCHC** command to send files to other systems via their mail systems. Since that time two restrictions on the use of **PUNCHC** have been eased:

- The **PUNCHC** command now has a **/FOLD** option which allows you to send text files which have lines that are more than 80 characters wide to other systems. The lines will be folded into 80 column wide lines in a reversible way. Programs are available on all of our systems for unfolding the folded lines back to their original form.

- Files still should not be more than about 60K or 120 PRUs in size if they are being sent to non-CSO, non-BITNET machines. This restriction is now largely lifted when sending to CSO machines. It is possible for problems to still occur for large files. The usual rule when sending files to CSO machines now is: If it's under a megabyte (2000 PRUs) then try **PUNCHC**. If that doesn't work, then split it up or try something else. The sources of the limitations are described below.

PUNCHC now has three new options which are useful when sending files from the Cyber to other computers. They are **/DEST=**, **/NODE=** and **/FOLD**. As was described in the January-February *Off-Line*, with the **/DEST=** and **/NODE=** options one can specify a user's signon on a particular computer that is to receive the files. The file will be sent as mail to the specified user.

The **/FOLD** option allows you to fold lines which are longer than 80 characters into 2 or more lines which are at most 80 characters wide. Most inter-computer mail systems require that the mail messages be at most 80 characters wide. Since **PUNCHC** uses the mail systems (as well as the communication channels which were once used only by card punches), outgoing messages must be at most 80 characters wide.

In general, the PUNCHC command has the following forms:

PUNCHC,*your file*/DEST=*dest login*/NODE=*dest computer*
PUNCHC,*your file*/FOLD/DEST=*dest login*/NODE=*dest computer*

If your file is upper and lower case text, you should include the **/ASCII** option. You can specify more than one file if you desire. All of the files specified on a given **PUNCHC** command will appear as one message to the recipient. All file names are preceded by commas. All options are preceded by slashes.

Remember the restriction on **destination login** and **destination computer** fields: The **destination login** and **destination computer** fields are both limited to a maximum of 20 characters in length. If they contain characters other than letters and numbers, they should be enclosed in dollar signs. For example, **/NODE=$uxh.cso.uiuc.edu$**

If you send the file to our IBM VM machines, the file will appear on the recipient's reader. Unless the **/FOLD** option was use, when the file is RECEIVEd it should arrive as an exact copy of the file sent from the Cyber. If you send it to other computers, it will have placed at the beginning of your file the normal information that is at the beginning of a mail message. (You would expect this because your file is sent through normal mail channels.) In any case, if you used the **/FOLD** option when you sent the file, you will need to unfold the file on the destination computer.

Several utilities are available to perform this unfolding. On our VM/CMS machines, there is an EXEC called **COPYUF**. (It calls a program called **UNFOLDC**.) You can find its documentation by using:

```
HELP CSO COPYUF
```

On our UNIX machines, there is a program called **unfoldc** which can strip off the mail headers and unfold the file to its original form. You can find its documentation by using:

```
man unfoldc
```

Although neither **PUNCHC** nor any version of foldc or **unfoldc** have any inherent limitations on the number of lines that they will process, the intramachine communication channels often do have such limitations. All files that are sent to other machines via **PUNCHC** go through the communication link to VMD. They are then sent to their final destination if it is not VMD, of course. Very large files can be sent across this communications link. Using the approximation that 1 PRU approximately equals one half kilobytes and the limitation on direct files size of around 20,000 PRUs, the largest file that you would likely send across would be about 10 MBytes. This would fill up a 20 cylinder mini-disk. So, if you are sending to the IBM VMD system, you can send individual files which are about as big as you can normally create on the Cyber.

If you are sending to other CSO mainframe computers, you are restricted by lower but still quite liberal limits. Many of the systems (uxe, uxg, and uxh for example) can handle files as large a 5 MBytes. The limitation really lies in how much free space there is in /usr/spool. (The **df** command can be used to ascertain this amount.) Filling up /usr/spool will get you in very bad with the system operators and programmers and is highly discouraged.

If you are sending the file to other machines then other limits begin to apply. If you are sending the file to a machine via BITNET you must keep the file to at most 300 KBytes. (This is about 500 to 600 PRUs.) If you are sending the file to a machine via Internet, which is usually the case if the machine is not on BITNET, you must keep the file to at most 64 KBytes. (This is about 100 to 120 PRUs.)

The source for folding and unfolding on various machines is available. On the Cyber the source is written in Pascal and, alternatively, Compass. On VM/CMS the source is written in Pascal. On UNIX the source is written in C. If you are interested in receiving any of these send mail to DANIEL@vmd.cso.uiuc.edu requesting the specific software source.

EQUIPMENT FOR SALE

The Department of Urban and Regional Planning has the following equipment for sale:

Workstations

1 - 4000S with SS/SD drive Reversible Black/Amber Screen OASys Interface	$1,500
1 - 4000S with DS/DD drive Reversible Black/Amber Screen OASys Interface	$1,600
1 - 4000 with DS/DD drive Reversible Black/Amber Screen OASys Interface	$1,600

Printers

3 - Diablo 630 (35 CPS) Printers OASys Interfaces Single Bin Sheetfeeders Sound Covers	$1,200 each
1 - Diablo 630 (35 CPS) Printer OASys Interface Dual Bin Sheet Feeder Sound Cover	$2,200

ICU -- we have not priced the ICU, if you are interested, make us an offer.

1 - NBI OASys 8
- 8 ports
- 10 MB
- 512 K
- DS/DD Floppy Archiving Drive
- Records Processing
- Spelling
- Comm

Please contact Gracye Baker, 1003 W. Nevada, Urbana, IL 61801; Tel: 244-5400.

DIABLO SUPPLIES FOR SALE

CSO has retired their Diablo service. We have extra supplies and would like to sell these to any department that can use them.

8 boxes of ribbon (12 in each box): Diablo #301980-04, Hytype II, MS Black.

22 Diablo print wheels: Elite 12, 96 character metalized, 9R21138, 311903-01.

19 Diablo print wheels: Titan 10, 96 character metalized, 9R21133, 311900-01.

If interested, please contact Sylvia Hansen, 333-6285.

QUIETWRITER III FOR SALE

The Agricultural Engineering Department has a 9-month old Quietwriter III, in excellent condition, for sale. Central Stores purchase price was $1118 and we will accept any reasonable offer.
If interested, please contact Declan Fleming, 229 Agricultural Engineering Science Building, 333-9408.

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UIUC PC User's Group Members Information Database

Please complete the following information fields to be added to the PC User's Group Database.

Mail this form to: Greg Kesner
150 DCL
Campus

Thanks and welcome to the user's group!

****

First Name: _____

Last Name: _____

E-mail Address
(if any; e.g., KESNER AT UIUCVME): _____

ON-CAMPUS INFORMATION (if applicable):

Campus Address: _____

Campus Phone: _____

Department: _____

Present Position in Department: _____

OFF-CAMPUS INFORMATION (optional, unless you do not have campus address)

Home Address: _____

_____

City: _____ State: _____

Zip Code: _____

Home Phone (optional): _____

Occupation: _____

UIUC PCUG Special Interest Group Registration

Name: _____

Address: _____

Phone: _____

Please Check the boxes on the **left** for the SIG(s) that you would like to join. Check the box on the **right** if you are willing to be the coordinator of the SIG(s).

Join SIG		**Coordinate**
☐	Spreadsheet / Financial	☐
☐	Networking / Communications	☐
☐	Utilities & Public Domain Software	☐
☐	Word Processing / Desktop Publishing / Thesis Production	☐
☐	PCUG Newsletter	☐
☐	Graphics	☐
☐	Scientific / Engineering Applications	☐
☐	Databases / File Management	☐
☐	PC Labs & Their Networks	☐
☐	Hardware Developments	☐
☐	Operating Systems & Environments	☐
☐	Languages	☐
☐	Artificial Intelligence	☐
☐	Electronic BBS	☐
☐	Statistical Packages	☐
☐	Library Applications	☐
☐	Vendor Relations	☐
☐	CD-ROM Applications	☐
☐	Machine-Readable Classics	☐
☐	Brown Bag Forums	☐

Please write on the back your suggestions for any other SIG(s) and if you would like to coordinate that group.

Return to: Greg Kesner
CSO -- 150 DCL
1304 Springfield Ave.
Urbana, IL 61801

Mailer_____(MRC Staff use)

SUGGESTION FORM

Do you think that the Microcomputer Resource Center should acquire some new materials? Give us your suggestions. Please indicate below any package by name or type with price, contact address, and phone number if available, and we will try to acquire it for the center. If you fill in your name and address, we will inform you upon its arrival.

Patron Information:

Name: _____

Dept. or Major: _____

Campus Address: _____

_____

EMail Address: _____

Software, Hardware, or Magazine suggestion (circle one):

Name of Item: _____

Vendor Name: _____

Vendor Address: _____

_____

_____

Phone number: _____

Price of Item: $ _____

Item Description: _____

Date: _____

General Suggestions:

_____

_____

We appreciate your input.
Please return to the MRC by campus mail or type the basic information in electronic mail and send it to MARKZ UIUCVMD.BITNET or MARKZ VMD.CSO.UIUC.EDU

READER FEEDBACK

In our attempt to keep improving ***Off-Line***, and answer your needs and interests, we will be adding this page to each issue. We sincerely hope that many of our readers will take the time to give us this "Feedback". Please fill out, fold in half, and return to address on back. Your reply may be anonymous, or you may add your name and department. Thank you for your comments/suggestions.

1. Please give us comments about articles in this issue. Mention the article by name and be as specific as possible in your comments. For example, did you find the articles informative, of a reasonable length, etc.?

2. What topics would you like to see covered in future issues?

3. What sections would you like to see expanded or added? For example, a question-answer column or articles about other department's computing activities?

4. Additional comments or suggestions:

5. Would you be interested in contributing articles, questions, etc. to *Off-Line*?

Send to:

OFF-LINE
Computing Services Office
150 Digital Computer Laboratory (M/C 256)

University of Illinois at Urbana-Champaign
1304 West Springfield Avenue
Urbana, Illinois 61801

OFF-LINE MAILING LIST

If you wish to be placed on our mailing list, have a change of address, or wish to be deleted, please check the appropriate box and fill in the information below. Please help us keep our mailing list up-to-date by informing us if issues are being sent to someone no longer in your department; fill in the information below and return to us so that his/her name may be removed from the list.

Please check as appropriate:

_____ Please *ADD* my name to the mailing list.

_____ Please *DELETE* my name from the mailing list.

_____ Please *CHANGE* my address (provide old address also).

If you have a campus mailing address:

Name _____

Department _____

Bldg. & Room _____ M/C_____

If you do not have a campus mailing address:

Name _____

Address _____

_____

_____

City, State, Zip _____

If you are requesting a change of address, please indicate your old address:

_____

_____

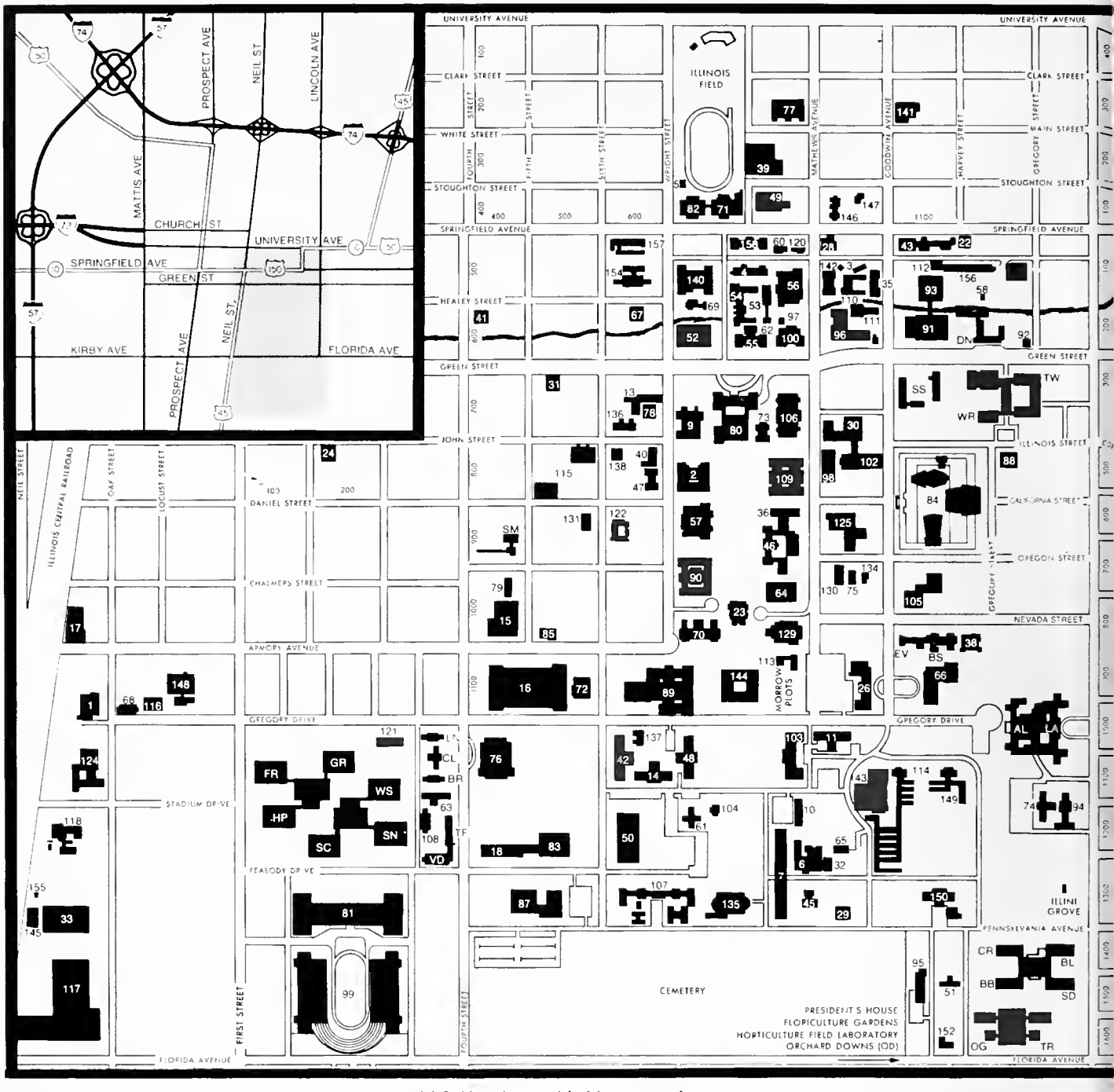
Mail to:

OFF-LINE
Computing Services Office
150 Digital Computer Laboratory (M/C 256)

University of Illinois at Urbana-Champaign
1304 West Springfield Avenue
Urbana, Illinois 61801

CSO SITES

CSO NORTH (DCL)	
14 Digital Computer Lab 333-7685	Monday-Saturday, 24 hours/day Sunday, 12 noon - 12 midnight
CSO SOUTH	
70 Commerce West 333-4500	Monday-Saturday, 8 am - 12 mid. Sunday, 12 noon - 12 midnight
AGRICULTURE	
N-120 Turner Hall 333-8170	Monday-Thursday, 8 am - 10 pm Friday, 8 am - 5 pm Saturday-Sunday, Closed
CHEMISTRY	
150-154 Noyes Lab 333-1728	Monday-Friday, 9 am - 5 pm Saturday-Sunday, Closed
CRH SNACK BAR	
120 Snack Bar 333-1851	Daily, 12 noon - 12 midnight
ELECTRICAL ENGINEERING	
146 Electrical Engineering 333-4936	Monday-Friday, 8 am - 12 mid. Saturday, 8 am - 5 pm Sunday, Closed
FAR	
Florida Avenue Residence Halls 333-2695	Daily, 12 noon - 12 midnight
ISR	
Illinois Street Residence Halls 333-0307	Daily, 12 noon - 12 midnight
MECHANICAL ENGINEERING	
65 Mechanical Engineering 333-1430	Monday-Saturday, 8 am - 12 mid. Sunday, 12 noon - 12 midnight
PSYCHOLOGY	
453 Psychology 333-7815	Monday-Friday, 8 am - 5 pm Saturday-Sunday, Closed
SOCIAL SCIENCE	
202 Lincoln Hall 333-0309	Monday-Friday, 8 am - 12 mid. Saturday, 10 am - 5 pm Sunday, 12 noon - 5 pm



CSO Sites (marked in blue on map)

42 Commerce West
49 Digital Computer Lab
52 Electrical Engineering
90 Lincoln Hall
96 Mechanical Engineering
109 Chemistry - Noyes Lab
121 CRH Snack Bar
122 Psychology
143 Agriculture - Turner Hall
Illinois Street Residence Halls
Florida Avenue Residence Halls
CSO Office Building
(101 South Gregory)

GIFT & EXCHANGE DIV
ROOM 314
MAIN LIBRARY
CAMPUS

l. 16, No. 5: September/October 1988

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STX

off line

iversity of Illinois at Urbana-Champaign

ector: George Badger
itor: Lynn Bilger

CSO
nputing Services Office

CSO DIRECTORY

Departmental Office	150	DCL	333-1637
User Accounting Office	1208	W. Springfield	333-7752
Documentation Center	1208	W. Springfield	333-9230
Systems Consulting	1208	W. Springfield	333-6133
Statistical Consulting	85	Comm West	333-2170
Text Processing Consulting	212	CSOB*	333-7318
Micrococonsulting Hotline	91	Comm West	244-0608
Microcomputer Resource Center	106	CSOB*	244-6261
Maintenance & Repair Service	194	DCL	244-1000
Tape Service, Special Plots, Special Printers.	14	DCL	333-8640

*CSOB is the CSO Office Building, located at 101 South Gregory, Urbana.

DIAL-UP NUMBERS

Cyber 175 (uiucnosa)	300	baud	333-4000
SWITCH	1200	baud	333-4008
	2400	baud	333-4007
TELENET (local no.)			384-6428

LOCALNET CALL NUMBERS

Note: Certain CSO Sites are on a separate channel of LocalNet than the rest of the campus. These are designated below as **A Sites** and include the following CSO Sites: ME, EE, COMM, LH, and AGRIC. All other LocalNet access areas are designated as **B Sites.**

VMD	CALL 4400	(full-screen mode - A Sites)
	CALL 4500	(full-screen mode - B Sites)
VME	CALL 4600	(A Sites)
	CALL 4700	(B Sites)
uxa (Pyramid 90x)	CALL 66DD	(A Sites)
	CALL 66AA	(B Sites)
uxe (Pyramid 90x)	CALL 12FA	(A Sites)
	CALL 12EE	(B Sites)
uxf (Sequent)	CALL 66CC	(A Sites)
	CALL 66BB	(B Sites)
uxg (Gould)	CALL 1000	(B Sites only)
uxh (Convex)	CALL 1850	(A Sites)
	CALL 1800	(B Sites
NOSA	CALL 1650	(A Sites)
	CALL 1750	(B Sites)
LCS	CALL 6400	
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Articles, suggestions, comments and/or subscription requests may be sent to: Lynn Bilger, Off-Line Editor, 150 Digital Computer Lab, University of Illinois, 1304 W. Springfield, Urbana, IL 61801 (telephone: (217) 333-6236; email: bilger@uxe.cso.uiuc.edu).

SANDY MOY ELECTED VICE-PRESIDENT OF SHARE

Sandy Moy, an Associate Director of Computing Services Office, was elected Vice-President of SHARE, the international IBM systems user group. Her election occurred at their meeting held the week of August 8th in New York. Founded in 1955, SHARE was the first organized user group in the computer industry. With over 2,400 member installations spanning six continents, SHARE serves as a major voice for computer user concerns. Sandy has served in SHARE for many years and we congratulate her on this election.

ANNOUNCING AN INGRES SEMINAR

Relational Technology Inc. will present an INGRES seminar at the Chancellor Inn in October.

Place:	Chancellor Inn 1501 South Neil Street Champaign, Illinois
When:	October 19, 1988
Registration:	Required To register, call I-800-4-INGRES

OFFLINE ADDRESS NOW AVAILABLE FOR E-MAIL

A mail address, called **offline**, has now been set up on uxe (uxe.cso.uiuc.edu) so that users may mail requests (1) to be added to the *Off-Line* mailing list, (2) to be deleted from the list, or (3) to notify us of changes of address. Users should send e-mail via the Internet network address:

offline@uxe.cso.uiuc.edu

Users who wish to send comments/suggestions/articles to the editor should send e-mail to:

bilger@uxe.cso.uiuc.edu

NEW ECONOMETRICS CONSULTING HOURS FOR FALL

Fall consulting hours for Pin Ng, the CSO Econometrics Consultant, are:

Tuesdays	3-5 pm
Wednesdays	10-12 noon
Thursdays	3-5 pm

Pin consults in room 73 Commerce West, telephone 244-7189.

AsEasyAs VERSION 3.01 SITE LICENSE

We have received the latest version and 50 manuals for AsEasyAs 3.01, a good Lotus 1-2-3 clone. We have purchased a site license for the software (which is shareware anyhow, but now no one on campus need have a guilty conscience for not registering) and are buying manuals in bulk. The price for the manual and 3.01 update is $14 and these are available at the CSO Accounting Office, 1208 W. Springfield, Urbana.

Two copies have been sent to the Micro Resource Center (MRC) in the north basement of the Illini Union. One copy may be checked out and the other will always be available in the MRC for reference. The disks may be freely copied there. Although versions of AsEasyAs are available on PC-SIG disks 651 and 751, the latest version has been uploaded to the PC-SIG disk on VMD as file ASEZY301 ARC for network and modem access.

HOOPS GRAPHICS SUBROUTINE LIBRARY

HOOPS is a library of 3D graphics subroutines that can be used to create applications for business, science, and engineering. It is an object oriented system that can be called from programs written in C or Fortran languages. Some of its features include: device independence (display and hardcopy); support for logical data organization through the use of segments; wireframe or hidden line/surface display; three color models (i.e., RGB, HLS, HSV); and high level input manager. HOOPS can be installed on a number of computers and associated graphics devices.

Because of a site license agreement, the software may be redistributed by CSO free-of-charge to departments for use on departmental machines. For further information, call Mike Grady (244-1253) or Jim Bozek (333-2048).

RESTRICTED SAS SERVICE ON VME

Several SAS products have been removed from VME. These products include SAS/ETS, SAS/IML, SAS/OR, and SAS/AF. These products are available on VMD if needed. If the removal of these SAS products from VME causes any problems for instructors intending to use SAS on VME for classes, they should contact Greg Kesner, the CSO South (VME) Site Coordinator, at 244-0540.

NEW AND REVISED CSO DOCUMENTATION

Listed below are several new or revised Reference Guides and one new Technical Note that have gone to the printer and that should be available at the sites shortly. (NOTE: Since some of the guides listed below may actually still be at the printers when this issue comes out, please recheck the drawers after a few days if you do not find the revised guides on your first try.)

RF-0.1	Reference Guide List	Revised 9/15/88
RF-0.3	CSO Sites	Revised 9/06/88
RF-0.11	LocalNet	Revised 9/06/88

RF-0.14	Accessing CSO Computer Systems	Revised 9/06/88
RF-0.21	Names for Network Machines	New 9/15/88
RF-0.22	Transferring Files Between Computers on the Network	New 9/15/88
RF-20.14	VM/CMS Specifics for Using FTP	New 9/15/88
RF-20.15	Connecting to Other Network Machines from CSO VM/CMS Machines via Telnet	New 9/15/88
RF-30.5	Standard Terminal Settings for all CSO Computer Systems	revised 9/06/88
RF-40.1	UNIX to UNIX Networking Utilities	New 9/15/88
RF-40.2	UNIX Specifics for Using FTP	New 9/15/88
RF-40.3	Connecting to Other Network Machines from CSO UNIX Machines via Telnet	New 9/15/88
RF-40.4	Connecting to VM/CMS Machines from UNIX Hosts Using the tn3270 Facility	New 9/15/88
RF-41.3	tset Command	Revised 7/07/88
RF-41.8.1	The vi Command	New 7/15/88
RF-41.8.2	vi Editing Commands	New 9/21/88
TN350	Some Notes on How to Use Lotus 1-2-3	New 9/01/88

FREE STUDENT ACCOUNTS ON IBM/CMS AND UNIX SYSTEMS

Greg Kesner
CSO Site Coordinator

CSO is now offering Free Student Accounts on one of its UNIX systems (uxa) located in room 8 English Building and one of its IBM/CMS systems (VME) in room 70 Commerce West. These accounts are available to enrolled undergraduate and graduate students. Our objective is to provide an opportunity for students to experience working with mainframe systems and some of the services they provide (e.g., electronic mail (e-mail), BITNET access, UNIX notesfiles, 4th-generation languages like SAS, access to mainframe-based file archives and software). Probably the most immediate appeal of these accounts is the access to e-mail networks that span the globe and UNIX notesfiles.

The accounts have some limitations and are not meant to replace standard user accounts or class instructional accounts. Students are allowed to have both a UNIX and CMS account if they wish. However, a student may have only one of each. To qualify for an account, you must have a valid university photo-id.

The accounts are renewable each semester; in fact, students are required to renew their accounts during a renewal period at the beginning of each academic session. Files associated with a Free Student Account will be preserved until the renewal period for a given semester ends — after that, the account and files will be deleted from the system. The renewal period will always begin on the first day of classes for a given academic session and extend several weeks. The renewal period termination dates are: October 1st for Fall, February 15th for Spring. There is no renewal required over the summer.

The Free Student Accounts on both systems have some restrictions as compared to standard CMS or UNIX CSO accounts. Both types of accounts are limited to 150KB (Kilo-Bytes) of system disk

space. (Students can clear space on their CMS or UNIX accounts by downloading infrequently used files to a PC floppy or hard disk using communications software like KERMIT, which is free to university students and staff.) On UNIX accounts, home directories are also limited to 60 files.

System "spool" space on both systems is used to store e-mail files. On UNIX accounts, this space is restricted to 50 KB and a maximum of 10 files. On CMS accounts, files in system spool space over a week old will be purged. Also, if the space becomes full earlier, some files less than a week old may have to be purged to allow the system to function. Students will be responsible for the timely processing of their e-mail files.

On free UNIX accounts, students will initially be limited to three hours of connect time per week. On free CMS accounts, the limit will initially be three hours of CPU time. The VME system may also be closed to Free Student Accounts during times of heavy system usage (e.g., when a CS 105 or Econ 173 machine problem is due).

Standard line-printer output on each system is free, though access to high-quality output devices is limited. Laser printer output will be charged at a cost comparable to using a laser printer connected to a PC or Macintosh at a public campus site.

The UNIX and CMS systems are accessible using terminals at their respective sites, or via LocalNet (a campus-wide coaxial cable network), or via dial-up phone lines. Further information regarding system access is available at either the Commerce West or English Building site.

To apply for a Free Student UNIX Account, see the site operator at the CSO site in room 8 English Building. To apply for a Free Student IBM/CMS Account, see the one of the site operators on duty in 70 Commerce West (CSO South). (Note: A limited number of accounts are available for IBM/CMS.) Remember you must present a valid university student photo-id when applying for either account.

This initial offering of Free Student Accounts on both CSO UNIX and CMS systems is something of an experiment. Bob Foertsch (Bob@uxa.cso.uiuc.edu) administrates the UNIX Free Student Accounts while Greg Kesner does the same for the CMS Free Student Accounts (Kesner@vme.cso.uiuc.edu). We welcome your comments and suggestions. Though we may not be able to immediately implement all suggestions, your input will be helpful as we evaluate and plan this service.

UIUC DATABASE TASK FORCE RECOMMENDS RTI'S INGRES

Esther Edwards-Iwe
CSO Systems Consultant

(Editor's Note: Also see the announcement about the seminar that is to be given by RTI.)

The DBMS committee after a thorough investigation of all relevant data needed to determine whether there is a need for another Database Management Package for the campus recommended that CSO purchase RTI's INGRES Database Management System for the Gould computer (uxg).

The Evaluation Process

The acquisition of database management software is an expensive capital venture. Therefore, the need for a careful evaluation of proposed, seemingly competitive, systems cannot be overemphasized. We conducted a pilot telephone survey of DBMS users, and also designed a questionnaire for this phase of the evaluation process. The results of both surveys were published in previous issues of *Off-Line*.

Choosing a DBMS package is a problem of matching much information internal to the organization against possibilities on the market. The requirements of an organization are complex and are only partly expressed through specification. The UIUC computing environment is no exception. The process of analyzing the survey data revealed new unquantifiable specifications that deserved consideration. We met with, and talked to, several campus units regarding their needs for a DBMS package and requirements. Specifically, we wanted to find out:

- the general characteristics of the campus computing environment;
- the type of access desired and the limitations of current access methods; and
- the type(s) of data stored and the medium of the storage.

A summary of our findings follows.

The computing environment is changing rapidly from a centralized computing environment to a distributed processing environment. For example, we have a variety of computer systems ranging from the largest mainframe to the smallest microcomputer in operation. We run a variety of operating systems on different brands of computers. The computing environment includes:

- CSO mainframes and mini computer systems
- several departmental clusters
- Sun, Apollo, and VAX workstations (UNIX and VMS based)
- several stand-alone computer systems

Networking and data communication is another major influence on the UIUC computing environment. Colleges and various campus research units are taking advantage of computer networks for different applications. Some of the uses of computer networks on this campus include:

- electronic mail
- the sharing of remote computer resources, such as the CRAY/XMP (supercomputer)
- electronic file/data transfer

The Selection Process

In selecting a data base system to recommend, it was decided that the software should meet at least the following criteria:

- The software should follow the relational model and support ANSI standard SQL.
- The software should allow for the creation of applications using data that can be distributed over different machines and operating systems.
- The software should be supported in the UNIX environment, the IBM mainframe environment and the personal computer world (including IBM type and Apple PCs.)

There are several vendors of powerful data base software. Most products considered seemed lacking in one or two of the criteria. For example Informix, a formidable UNIX based product, is not supported in the IBM mainframe environment and does not offer a distributed data base solution. Unify, also primarily UNIX based, does not offer a distributed solution and is not fully SQL based. Ramis software, currently supported by AISS, is not SQL based and is not supported in a Unix environment. INGRES (Relational Technologies Inc.) and ORACLE (Oracle Corporation) seem to best meet these minimal needs. INGRES and ORACLE also offer viable solutions to accessing and using popular PC based applications in conjunction with their products. They offer easy access to data created in other systems, including SQL/DS on the mainframe side, and Lotus 1-2-3 on the PC side.

Why INGRES?

While INGRES and ORACLE both met most of the necessary criteria for a campus DBMS, a detailed investigation revealed characteristics that set INGRES apart from ORACLE. ORACLE met most of the necessary criteria but not sufficiently enough for it to be a recommended product for the UIUC computing environment. ORACLE's implementation on any CSO computer system would require additional human and system resources in its administration. INGRES, on the other hand, met all campus requirements and more in the following areas:

1. Resource Sharing — distributed computing is being driven by the concept of resource sharing. The most obvious resource to be shared is data. In the ultimate distributed computing environment, a user will be able to access data residing anywhere in the organization, without regard to what computers, operating systems, networks, database systems, or file systems the data resides in. Data that is actually distributed across multiple remote computers will appear to the user as if it resided in his own computer. Complete distributed relational database management systems (RDBMS) require four elements:

    - portability — INGRES RDBMS is very portable. It allows you to use the same DBMS and tools in different operating systems such as IBM/VM or UNIX. Portability allows you to run applications unchanged on several different platforms, thus reducing program development and training costs.
    - connectivity — INGRES/NET provides network protocol support for DECNET, TCP/IP, SNA and ASYNC. INGRES/NET allows users running an application on one system to access data on another system regardless of differences in hardware or operating systems.

- distributed data management — INGRES/STAR provides distributed data management capability. It gives users the capability to access data stored at several locations simultaneously, and use the data as a unified information resource. (Note: This product will not be available on UNIX systems until early next year.)

- data gateway technology — INGRES Gateway products allow users of INGRES applications to access data residing on other file management systems. This expands the utility of of older generation database management systems. As of this writing, INGRES provides gateways to the following systems (it should be available on UNIX by early next year):

  RMS Gateway — provides access to DEC's RMS files. RMS is the data management standard for basic data storage in the VAX/VMS environment.

  dBase Gateway — provides access to PC-based dBase files. dBase is the de facto standard for data management in the PC world.

  DB2 and SQL/DS Gateways — provides complete access to IBM DB2 and SQL/DS databases from any INGRES application. For example, the application can be resident on the IBM or any computer on the network. Both read and write capabilities are supported.

2. Database administrator's issues — given our diverse computing environment, with possibilities of ad hoc database creation and queries, it is imperative that the database package CSO chooses to support for the campus must have the functionality of allowing local database administrators. This means the database package must allow each database creator to act as his/her own DBA for all practical purposes, with CSO serving as the primary DBA for data and network security and integrity.

3. Dynamic Disk and Resource allocation to INGRES users

4. Ease of use (menu driven)

5. Documentation easier to navigate

6. RTI's University experience

7. Site license possibilities

8. Joint project ventures

9. Available on the Gould computer

10. Impressive research areas as well as high ratings from users

A complete UIUC DBMS Report is available from CSO upon request.

IBM HIGHER EDUCATION SOFTWARE CONSORTIUM

Ahmed Kassem
Assistant Director, CSO

The Computing Services Office (CSO) of the University of Illinois joined the IBM Higher Education Software Consortium in August. This Consortium was designed by IBM to stimulate the use of computer technology in academic instruction and academic research. The main benefit of CSO membership in the consortium is that over 100 IBM software products become available to University departments and personnel at no additional charge.

Each eligible institution joins the consortium by paying a one-time membership fee (based on faculty size) and committing to participate in consortium activities. Additionally, the institution pays an annual fee for each software category it selects. The categories of software programs offered via the consortium are defined by four product groups: System Platform products, Engineering/CIM systems, Business Applications, and Application Business Systems. After payment of an annual fee for each product group selected, consortium members may order ANY licensed IBM program from that product group free of charge. (Some consortium software products are marketed by IBM but not developed by IBM. There are some restrictions when ordering these products.)

Each software product ordered under the Higher Education Software Consortium agreement must be used for academic instruction and/or academic research. For Group II, III, and IV programs, 100% of each program's usage must be for academic instruction and/or research. Group I products must attain an 80% academic usage.

CSO has joined the software consortium for Group I. Any of the IBM software products in Group I can be ordered free of charge through CSO for any campus research or instructional system. CSO may choose to join the software consortium for other Product Groups at a later time if such an addition is justified.

Each Program Group is listed below with a few representative products. Additional products may periodically be added by IBM to these Groups. For a complete list of software products in each category, contact CSO.

I. Selected System Platform - VM/SP, RSCS, PSF/VM, GDDM, MPSX, APL, BASIC, C, COBOL, FORTRAN, LISP, PASCAL, ESSL, RT PC FORTRAN-77, RT PC PASCAL, SQL/RT, Expert Systems Environment, DCF, and many others (approximately 100 software products in this category)

II. Selected Engineering/CIM Systems

III. Selected Business Applications

IV. Selected Application Business Systems

SOFTWARE AVAILABILITY ANNOUNCEMENT

Computer Science Department

The Department of Computer Science and the Graphics Workstation Research Group would like to announce the availability of the XGKS graphics library. At this time it is available only to educational institutions and only for use for internal research and instructional purposes.

XGKS is a full implementation of the ANSI standard Graphical Kernel System for use within the X Window System. XGKS provides for two-dimensional graphics using ANSI standards within the generally accepted standard X Window System. This software has been in use for approximately nine months within the Computer Science Department for both research and instructional purposes and has been rigorously tested.

Highlights:

- Full support of ANSI Standard GKS (level 2C)
- Support for color and monochrome displays
- Runs within the X Window System
- Support for multiple windows and displays
- Efficient implementation
- Rigorously tested
- Hides complexity of window system programming

Output Primitives

- Polylines (control over color, width, and style)
- Markers (color, size, style)
- Text (fully transformable, color, 9 font styles)
- Polygons (application defined color patterns and colors)
- Cell Arrays (transformable pixel arrays)

Input Devices

- Locator (tracking cross, rubberband line or box)
- Choice (menus or function buttons)
- Stroke (point streams)

- Valuator (range indicators)
- Pick (selection of output primitives)
- String (keyboard input)

XGKS supports all six logical input devices through the use of a mouse and keyboard.

Storage

- Segments (runtime storage of output pickable primitives)
- Metafiles (long-term file storage of graphical objects)

In addition to the standard segment facility of GKS, XGKS provides storage of non-segment output primitives. This frees the application from the complexity of window system management.

XGKS has been thoroughly tested on an IBM RT running Berkeley UNIX, and has been ported to the Encore Multimax and SUN workstation. This software is

For additional information contact:

Greg Rogers
grogers@a.cs.uiuc.edu
(217) 333-6174

OR

Prof. William Kubitz
kubitz@a.cs.uiuc.edu
(217) 333-6249

EDUCOM PROJECT PROMOTES ACADEMIC SOFTWARE REVIEW

(Editor's Note: This article has been reprinted from the University of New Mexico CIRT Newsletter, June-July 1988. It is an adaptation of an article appearing in the May 1988 issue of the IRCC Newsletter, published by the Instruction and Research Computer Center at The Ohio State University.

Faculty are invited to participate in a new project aimed at promoting the use of computer technology in the learning process in higher education.

The "Scholarly Reviews of Academic Software" Project, coordinated by Duquesne University under the EDUCOM Software Initiative, is soliciting reviewers and software to review.

The EDUCOM Software Initiative is a consortium of over 500 colleges and universities that serves a diverse constituency of individuals and institutions throughout higher education and the computer-related industries. Its work is done primarily by active volunteers working in coordinated groups.

For 1987-1988, the project's focus will be on reviewing computer-based learning programs in three areas: medicine, languages, and basic skills (pre-college math and English). In addition, non-computer based learning programs will be reviewed, with the focus on authoring systems.

The major requirements or program submission are that the submitted program must be written for use in higher education, have some user documentation, be relatively "bug" free, and be available for distribution.

Potential content reviewers must be teaching or emeritus faculty in the field concerned and must have at least one year experience using academic software in a learning situation in higher education.

Learning/motivation reviewers also are sought. Reviewers must have academic preparation in the fields of learning and motivational theory, be currently teaching (or emeritus) in psychology or related field, and have one year's experience using academic software in support of learning in higher education.

Reviews will be submitted for publication to the professional journals as well as to other relevant publications such as *The Chronicle of Higher Education*, and an anticipated EDUCOM on-line software catalog.

For more information about the computer-based learning programs, contact:

Dr. Jack A. Chambers, Chair
"Scholarly Reviews of Academic Software" Project
EDUCOM Software Initiative
Duquesne University
Pittsburgh, PA 15282
(414) 434-6200

For more information about the non-computer-based learning programs, contact:

Mrs. Mary Jac Reed, Project Coordinator
"Scholarly Reviews of Academic Software" Project
Officer of Instructional Technology
University of Delaware
Newark, Delaware 19716
(302) 451-8161

300 BAUD DIAL-IN SERVICE MAY BE DISCONTINUED

Ed Krol
CSO Networking Group

In the beginning there was 110 baud and one timesharing machine. CSO rented a group of phone lines which rang over from one to the next (a rotary). People did timesharing, and it was good. 300 baud modems became available, so we created another rotary, but had to keep the old one because of the large installed base. Next, 1200 baud equipment became available and every machine did timesharing. We couldn't create a rotary and a modem pool for each timesharing machine, so we bought the Gandalf port selector and had one set of modems and one phone number for all of our machines. We do, however, still offer 300 baud service in the same manner we did originally: one phone number for each machine.

Three things are occurring to make CSO reevaluate this service. One is that technology is changing once again, and most modems now purchased can run at 2400 baud. We would like to allocate more cabinet space and telephone budget to this growing service. The other two occurrences are the removal of the Cyber 175 and the 3705 frontend to the IBM VM machines (equipment that has been around for more than 10 years and that handles the 300 baud telephone lines).

Our hope is that as this hardware is decommissioned, the 300 baud service to that equipment will be decommissioned as well. The service machines in our future run the VM/CMS and the Unix operating systems. These systems are designed for full screen applications which are painful to use at 300 baud. If there is anyone who will not be able to move to at least 1200 baud service by 1 Jan 1989, please call the CSO Hotline 244-1000 and give them your name, phone number, and the machine you will be using.

LINE MODE ACCESS TO VMD WILL BE DISCONTINUED

Becky Wetzel
CSO Systems Consultant

CSO will soon be discontinuing line mode access to VMD. Specifically, this will discontinue access by the 300 baud telephone number 333-4006, by the selection of class DVMD when calling 333-4007 and 333-4008, by the use of the LocalNet call numbers 4000 and 4100, and by the selection of class VMD through the hard-wired Gandalf switch. It will no longer be possible to use DIAL SIM. This change is being made because the 3705 frontend to VMD (the hardware supporting line mode access) is old, and it is no longer feasible to maintain it.

Users of VMD will now need to enter in full screen mode via the 7171 hardware or through dedicated full screen terminals. Full screen access will now be available in the following ways:

- 1200 baud dialup, 333-4008, select class DVMDFS.
- 2400 baud dialup, 333-4007, select class DVMDFS.
- LocalNet, call numbers 4400 and 4500.

- Hard-wired Gandalf switch, select class VMDFS.
- Dedicated IBM terminals available on the UIUC campus in Commerce West and several other CSO sites.

During connection via the 7171 (which will be all connections except the dedicated terminals), you are asked to specify the type of terminal you are using or emulating. It is best to know the types and have directions for the keystrokes on the types beforehand. Such information is available on-line on VMD by typing:

HELP 7171 MENU

A hard copy of help for a particular terminal type is available by typing:

WRITEUP 7171 terminal-type

For example, a hard copy of help for a VT100 terminal would be obtained by typing:

WRITEUP 7171 VT100

A quasi line mode access is available by specifying terminal type TYPETERM during connection to the 7171. TYPETERM is cumbersome to use, and should be used only if absolutely necessary. If you use TYPETERM, you also need to use the option NOSCREEN when you enter Xedit to cause Xedit to function in line mode. Also, under TYPETERM, when the screen is full, you need to type the sequence **escape** followed by a **period** (**esc** then **.**) to continue to the next screen. There is no prompt for this.

If you need help in making the change from line mode to full screen mode or have unusual circumstances, please contact the Systems Consultants at 1208 West Springfield, Urbana (333-6133) or the Statistical Consultants at 85 Commerce West (333-2170).

WHAT'S NEW IN THE MRC?

Bi-Shen Chuang and Mark Zinzow
Microcomputer Resource Center

Microcomputer software applications have been used extensively by the University faculty, staff, and students. At the CSO Microcomputer Resource Center, we assist you in locating appropriate software for your research, teaching, and academic work. The MRC provides a variety of vendor hardware and software especially for MS-DOS and Macintosh applications. At present, we have two major categories of software: (1) commercial packages, and (2) shareware or software in the public domain. Other resources include the Wisc-Ware collection of academic software, site licensed products, demonstration packages, and many valuable diskettes such as Kermit, anti-virus software, a DIRectory Magic disk from PC Computing, and a disk of LISP routines from CADENCE Magazine.

COMMERCIAL SOFTWARE

Many popular software applications such as database managers, spreadsheets, and word processors are available in the commercial market. We solicit or purchase software according to your suggestions, and have recently acquired some of the best, including dBase III Plus, Lotus 1-2-3, and WordPerfect. In the past two months, more than twenty packages requested by our patrons have been donated from vendors; therefore, we encourage you to fill out a suggestion form to let us know your individual interests. Vendors such as Sequiter Software and Advanced Programming Institute have not only contributed their products, but also have offered site licensing, discounted pricing information, and order forms, available in our vendor file.

SHAREWARE AND PUBLIC DOMAIN SOFTWARE

Thousands of public domain programs are available free for you to copy and use, as well as many shareware programs which ask you to make a small donation to the authors. Many of these programs have no parallel in the commercial market. The MRC has in its PC-SIG collection some of the well-known programs: PC-File (a database manager); Galaxy and PC-Write (word processors). The MRC also has software not available in the PC-SIG collections such as LIST (a file viewer), the latest versions of PKPAK and PKUNPAK (formerly PKXARC) for archiving and decompressing data (PK361.EXE), and Directory Scanner version 3.20A on our "favorite utilities" disk. Other sources of free software on which we can provide information are bulletin board systems, the internet (notes comp.binaries, simtel20, etc.), the C Users Group Library, and the Public Brand Software catalog. Similar fine programs also exist in our Amiga and Macintosh collections. Please refer to Shareware Magazine, Amazing Computing, and Macintosh User Group Newsletters for new listings of diskettes and software reviews.

WISC-WARE COLLECTION

Based at the University of Wisconsin, Wisc-Ware is a software distribution network designed to help university faculty authors develop and distribute courseware for instructional and research purposes. In cooperation with IBM, the network brings newly-developed packages into the market as soon as practical, without preventing the developers from publishing elsewhere. The MRC is one of the Wisc-Ware demonstration centers. Currently, we have 64 packages available with more arriving every quarter. Your comments and suggestions will help these authors further improve their software. We also appreciate your filling out a survey form to help us understand the usage and determine whether we should continue to subscribe to Wisc-Ware.

SITE LICENSED PACKAGES

Through site licensing arrangements, the University and CSO have made a variety of packages available at reduced prices or no cost. Most of the site licensed products can be purchased at the CSO Distribution Center, 1208 W. Springfield Av. in Urbana (phone 333-9230). Some of the software may be examined, checked out, or copied for free at the MRC. For example, we have As-Easy-As 3.01, HyperCard 1.2, SAS, SPSS, Systat, STATGRAPHICS, SHAZAM, the Scientific Desk, and many more. A complete listing of site licensed packages and pricing information is available at the MRC. Please express your interest in site licensing arrangements for VersaCAD, BiblioTech, Stella, the Scientific Desk, and KEDIT/REXX by filling out a survey form in our handout rack.

DEMONSTRATION PACKAGES

Some vendors can only offer us the demonstration version of their software products. You may copy or evaluate these demos before making any purchasing decisions.

New Demo Packages:

Title	*Publisher*	*Application*
FOR_C	Cobalt Blue	Fortran to C Translator
FontMax	International Software Systems	Font Generator
MacLab (MAC)	World Precision Instruments, Inc.	Data Acquisition
Network Scheduler 4.0	Sumware Inc.	Time Management Tool
Protex	Keystone Concepts Inc.	WYSIWYG scientific and foreign text and graphics
VersaCAD (MAC)	Versacad Corp.	CAD
WordCruncher	Electronic Text Corp.	text search & viewing

For software and hardware reviews, we recommend our reference publications such as PC Digest, Datapro Reports on Microcomputers, Software Digest Ratings Report, and Software Digest

Macintosh Ratings Reports. Our magazines and weekly newspapers are also valuable sources for review articles.

In the hardware area, we have an IBM PS/2 Model 50Z, which is a new product announced in June, currently on display at the Center. We also expect to have a Model 70 to be in the Center for short term evaluation. Many of our PCs have been connected to UIUCnet, which will help you access uxe and VMD to download public domain software over the network. Our Macintosh computers will also be connected to the campus fiber optic network soon.

The following list will give you an idea of what we have acquired in the past two months. Most of the packages were requested by you. (Products are for the IBM PCs and compatibles if not specified. An asterisk (*) indicates that the package may be checked out.)

New Software Packages

Title	*Publisher*	*Application*
*1 on 1 = 3!!	1 on 1 Computer Solutions, Inc.	DBMS
4th Dimension (MAC)	Acius, Inc.	Relational Database
Acta 2.0 (MAC)	Symmetry Corp.	Outline Processor
*As-Easy-As 3.01	Trius, Inc.	Spreadsheet
(A shareware and also a site licensed package. The diskette is free to copy, but manuals should be purchased for $14.00 at the CSO Distribution Center.)		
*AskSam 4.0	SeaSide Software, Inc.	Text-Based Management System
Back-It 3.1	Gazelle Systems	Hard Disk Backup
Calculus 3.0	True BASIC, Inc.	Calculus
*Code Base	Sequiter Software, Inc.	C Library for Database Management
(This vendor offers a 40% discount on orders of 2 or more copies of Code Base. The retail price is $149.00.)		
Dos 4.00	IBM	Operating System
*Flash	Software Masters, Inc.	Disk Accelerator
HyperDA (MAC)	Symmetry Corp.	HyperCard Desk Accessory
MKS ToolKit 2.3b	Mortice Kern Systems, Inc.	Unix Tools for C
MORE (MAC)	Living Videotext	Idea Processor-Idea Presenter
OverDrive 1.1	TurboSoft	Document Manager
PC-Lint 2.15	Gimpel Software	A Diagnostic Facility for C
*PC-Project 1.1	Big Picture	Project Management
(A shareware package. Diskettes are copyable but not the manual.)		
RefMenu 3.3	Paul Licht	Bibliographic Software
(Diskettes are intended for demonstration and may be freely copied.)		

Think's LightSpeedC (MAC)	Symantec Corp.	C Development Environment Compiler/Debugger/ Linker/Text Editor
True BASIC	Addison-Wesley Publishing Co.	Programming Language
True BASIC 3-D Graphics Toolkit 2.0	True BASIC, Inc.	Graphics
Windows 286	Microsoft	Windowing environment
XVT 1.01 (MAC & IBM)	Advanced Programming Institute, Ltd.	Software Development Tools

The Extensible Virtual Toolkit is a collection of C function libraries that allows programs to be written that are portable across various user interface toolkits, especially those for the Apple Macintosh and for Microsoft Windows. (Retail price for this package is $995.00. Quantity Discounts are: 2-9 30%, 10-19 40%, 20+ 50%.)

Claris Corp. has provided us with five packages for demonstration purposes:

MacDraw	Graphics
MacDraw II	Graphics
MacPaint 2.0	Graphics
MacProject II	Project Management
MacWrite 5.0	Word Processor

The following packages from Intellisance Corp. are on a six-month temporary loan and will not be permanent additions to our collection.

Advanced Training for the Lotus 1-2-3 Program
The Expert Series: Training Program for dBase III/III Plus
(For the introductory/intermediate level user)
The Expert Series: Advanced Training Program for dBase III/III Plus
The Expert Series: Training Program for WordPerfect
(For the introductory/intermediate level user)
The Expert Series: Advanced Training Program for WordPerfect
(Covers WordPerfect 5.0)

New Magazines

Title	*Publisher*	*Frequency*
CD-ROM Review	IDG Communications	Monthly

(The Magazine of Optical Publishing. This magazine is highly recommended by our staff as interesting reading and a rich resource for information.)

PC Computing	Ziff-Davis Publishing Co.	Monthly

We would also like to bring to your attention that the MRC has order forms for personal purchases of WordPerfect at $125.00 for version 4.2 and $135.00 for 5.0. (Note these are not limited for use on University machines as the site licensed package requires.) We have two copies of WordPerfect Workbook for IBM Personal Computers (for version 5.0).

The Library Access Disk (LAD) will be available through the Micro Resource Center in the basement of the Illini Union for the next two months. This program assists you in library searches, checkouts, and renewals, as well as the reservation of materials. An MS-DOS machine (not PS/2, yet) and a modem are required (the program will dial Hayes compatibles; you may dial other

modems yourself). The LAD program contains all data to run Library Computer Service (LCS) searches, and will search through the 30 other campuses served by LCS by pressing the plus (+) key after you have searched here. Bring a formatted disk to MRC, along with your SSN, COM port, baud rate, and phone type (be sure to check whether your phone is touchtone or pulse dialed). LAD provides many similar features for the home/office user, as the interface does for those who go to the library in person.

The MRC is open from 10:00 am to 6:00 pm Monday through Friday, phone: 244-6261 or 244-6264.

SAS FOR THE PERSONAL COMPUTER — 1988 NOW AVAILABLE

Vicky Dingler
CSO Statistical Consultant

SAS Institute has recently distributed SAS Version 6.03 for the IBM personal computer and compatibles. There are six products currently licensed by the University of Illinois: BASE, STATS, RTERM, IML, FSP and GRAPH.

The SAS Base product for the PC includes the procedures available in the mainframe version. Additional procedures are available that allow the PC windowing facility to be used to its full extent, as well as mainframe interfacing facilities. The Base product consists of 21 diskettes formatted at 360K, and will occupy 5.5MB of disk storage. There are several changes to the old version (6.02) that are documented in the following manual: *Technical Report: P-171 Changes and Enhancements to Base SAS Software for Personal Computers, Release 6.03.*

SAS STAT for the PC includes almost all of the statistical procedures available for the mainframe. Included in the list are: ACECLUS, ANOVA, CANCORR, CANDISC, CATMOD, CLUSTER, DISCRIM, FACTOR, FASTCLUS, FREQ, GLM, LIFEREG, NESTED, NLIN, NPAR1WAY, ORTHOREG, PLAN, PRINCOMP, REG, RSREG, SCORE, STEPDISC, TREE, VARCLUS, and VARCOMP. The procedures not included in SAS STAT are LIFETEST, NEIGHBOR, PROBIT, RANK, RSQUARE, and STANDARD. The STAT product consists of 15 diskettes formatted at 360K and will occupy 4MB of hard disk storage. The STAT version is documented in the *SAS/STAT Guide for Personal Computers, Version 6 Edition.*

SAS/RTERM is a terminal emulation facility that allows the IBM PC to emulate the Digital Equipment Corporation VT100 terminal for text and the Tektronix 4105 terminal for graphics output. Here at the University of Illinois, it can be used with a 1200 baud SWITCH port or a 9600 baud LOCALNET port with the IBM 7171 to allow full screen text editing to emulate a DEC VT100 terminal. It can also be used with the SWITCH or LOCALNET to emulate a TEKTRONIX 4105 graphics terminal for using SAS/GRAPH on the mainframe to generate graphics. RTERM is one diskette formatted at 360K and will occupy less than 1MB of hard disk storage.

SAS IML for the PC is an interactive data manipulation language that operates on entire matrices of values. IML consists of 4 diskettes and will occupy less than 1MB of hard disk storage. Several changes to the old version (6.02) are documented in the manual: *Technical Report: P-172 Changes and Enhancements to SAS/IML Software for Personal Computers, Release 6.0.*

Two new products for the PC will be available with version 6.03. They are SAS/GRAPH and SAS/FSP. SAS/GRAPH for the PC includes all of the mainframe procedures for producing hard copy color graphics. The product will take 7.2 megabytes of hard disk storage because of the device drivers and map data sets. SAS provides a menu driven installation procedure to allow selective installation. The GRAPH product consists of 28 diskettes formatted at 360K and will occupy 4.5MB without the map data sets (7.2MB with the map data sets). The product is documented in the *SAS/GRAPH Guide for Personal Computers, Version 6 Edition.*

SAS/FSEDIT enables you to design entire screens for interactive data entry or display. For example, a researcher might design a screen as a facsimile of a lab report form and have lab assistants enter the data directly into a SAS data set for subsequent analysis. The screen can be designed in such a way as to have SAS check for the appropriateness of the data entered in the fields. This can help expedite or even eliminate the steps of raw data coding and data cleaning in data processing. SAS/FSLETTER also enables you to store business and form letters in SAS data sets for processing with SAS data sets containing names and addresses from mailing lists. The FSP product consists of 4 diskettes formatted at 360K and will occupy less than 1MB of hard disk storage. The product is documented in the *SAS/FSP Guide for Personal Computers, Version 6 Edition.* SAS/FSCALC, the spreadsheet facility will not be available until version 6.04.

All of these manuals are in the Closed Reserved Section of the Undergraduate Library for review.

SAS Version 6.03 for the IBM XT and IBM AT is called PC DOS SAS and requires at least 20 megabytes of hard disk storage. The IBM PC DOS operating system that is required is release 2.0 or later. The machines that are supported are the IBM PC AT, PC XT and the 3270 PC. There is a minimum of 640K real memory required for all three machines. The control program required for the 3270 PC is release 1.21 or 1.22 only. The control program will consume about 200K of the available 640K in PC DOS. Since SAS requires at least 640K, the control program should be reconfigured to support only one mainframe session and the PC DOS session.

CSO has purchased the licenses for these SAS PC products. There will be an initial fee for each product as well as a yearly renewal fee for each product.

SAS PC DISTRIBUTION

SAS for the PC is distributed through the CSO Distribution Office at 1208 W. Springfield. In keeping with the license agreement the University of Illinois has entered with SAS Institute, a license agreement between the University and the user has been developed that meets various criteria. The license agreement will have the stipulations for compliance. It will also have a form to be filled out with questions pertaining to hardware specifications and its location. The license agreement can be obtained at 1208 W. Springfield or 85 Commerce West. The completed license agreement will be brought to the person(s) managing SAS PC distribution at the CSO Distribution Office at 1208 W. Springfield. A photocopy can be made for personal files.

The license agreement will serve several purposes. First, it will be a means by which the university can uphold the stipulations in the license agreement between itself and SAS Institute. Second, it aids CSO in keeping accurate records. Third, the information will be added to the SAS PC User's Mailing List. The SAS PC products can be purchased at the CSO Distribution Office at 1208 W. Springfield.

The Base product is 22 diskettes and costs $32.00. The Stat product is 15 diskettes and costs $23.00. The RTERM product is one diskette and costs $19.00. The IML product is 4 diskettes and costs $19.00. The FSP product is 4 diskettes and costs $34.00. The GRAPH product is 28 diskettes and costs $49.00. These prices include the yearly license fee, the diskettes and the copying fee. The license fee includes free updates. If there are updates for this version, the cost will include the price of the diskettes.

Those entitled to buy the product are those who are employees of the University. A valid staff ID card will suffice as proper identification when you visit 1208 W. Springfield. A purchase order with the following information and the SAS PC license agreement should be brought to 1208 W. Springfield when purchasing the SAS products and documentation.

Product	*Price*
SAS BASE	$32.00
SAS STAT	$23.00
SAS RTERM	$12.00
SAS IML	$19.00
SAS FSP	$34.00
SAS GRAPH	$49.00
SAS Intro. Guide for Personal Computers	$13.15
SAS Language Guide for Personal Computers	$17.45
SAS Procedures Guide for Personal Computers	$17.45
Technical Report P-171: Changes to Base Product	$15.95
SAS/STAT Guide for Personal Computers	$24.00
SAS/IML Guide for Personal Computers	$17.45
Technical Report P-172: Changes to IML Product	$11.00
SAS/RTERM User's Guide	$ 9.85
SAS/GRAPH Guide for Personal Computers	$30.95
SAS/FSP Guide for Personal Computers	$29.95

SAS-PC DISKETTE REPLACEMENT POLICY

If for any reason a SAS-PC diskette is unusable, a replacement will be made free of charge in room 94 Commerce West.

Please bring the defective diskette to room 94 Commerce West. The PC consultant will replace the defective diskette with a new diskette. The PC Consulting hours are 10:00 am to 5:00 pm Monday through Friday. The phone number is 244-0608.

If there are any questions about this policy, please contact the CSO Statistical Consultants in 85 Commerce West, 333-2170, or Vicky Dingler at 333-4668.

SURVEY OF INTEREST IN SITE-LICENSING 1988 BMDP PC FOR IBM PC, PS/2, OR COMPATIBLES

Anup Roy
CSO Statistical Consultant

The Statistical Services Group at CSO would like to site-license and support the microcomputer version of the comprehensive statistical software package BMDP, if there appears to be a demand for it. Thus, we are conducting a survey to gauge the level of interest in licensing the 1988 release of this package.

Please complete the survey form at the end of this issue of *Off-Line* and send it to us as soon as possible, so that we can act on an informed basis in this matter. You may also send an electronic mail message to anuproy@vmd.cso.uiuc.edu to register your interest.

The rest of this article provides a description of the 1988 release of BMDP PC that should be of help to you in deciding if this package might meet your computing needs.

BMDP PC is a comprehensive statistical analysis package marketed by BMDP Statistical Software, Inc., Los Angeles, CA, for the IBM PC/AT, PC/XT and compatibles. BMDP PC can also be run on the IBM PS/2 and any 80386 machine running PC-DOS or MS-DOS. It is a large collection of separate data analysis programs (modules) that can be used independently of one another. The various programs share a common data entry method and control language, and the data created by one program can be used by another.

A complete version of the 1988 release of BMDP PC includes 41 programs, plus a full-screen data manager. The data manager program, called DATAMAN, provides a full-screen editor/data display manager, and allows the user to match-merge/concatenate datasets and work with hierarchical files. Data from popular spreadsheet systems like Lotus 1-2-3 and database management system packages like dBaseIII can be readily loaded into the system as well, with very little difficulty. (Also see the DATAMAN description below.)

Designed with the professional statistician in mind, BMDP PC covers a broad range of statistical techniques, including several that are rarely found in other microcomputer statistical packages. Some examples of the programs available are: basic descriptive statistics, plots and histograms, t-tests, regression analysis, factor and cluster analyses, survival analysis, Box-Jenkins time series analysis, log-linear modeling, non-linear and stepwise logistic regression, discriminant analysis, repeated measures and multivariate analysis of variance, one-way analysis of variance, missing data interpolation, spectral and cross-spectral analysis, correspondence analysis, and many others.

BMDP PC requires: an IBM PC/XT or IBM PC/AT (or compatible), or an IBM PS/2, or any 80386 machine running PC-DOS or MS-DOS, with at least a 5 megabyte hard disk (however, a 20-30 megabyte hard disk is strongly recommended); a floppy disk drive that can read 5.25" double-sided, double-density diskettes, or 5.25" high density AT diskettes, or 3.5" disks; an 80287/80387 floating-point math coprocessor; at least 640kB RAM of memory; PC-DOS 2.1 (or MS-DOS) or a later version; a graphics monitor (optional); a graphics card for use with the new Plot Enhancer option — CGA, EGA, VGA, or Hercules (optional); and a graphics printer or plotter for hard copies of plot displays (optional). The entire package consists of approximately 90 360kB diskettes; however, only your most-used programs need to be installed on your hard disk. BMDP PC programs can be executed in either batch or interactive mode. The programs are well-tested, reliable, flexible, and convenient to use.

The maximum number of allowable cases and variables varies from program to program. On the IBM PC the number of words of dynamic storage (M) is fixed at 16,000 and **cannot** be increased. The algorithms/formulae to determine the maximum number of variables, cases and groups for a particular application are presented in the *BMDP Statistical Software Manual*, 1988 Edition, Appendix A. All PC versions of 1988 BMDP programs have the same features as mainframe BMDP, with the following exceptions: (1) problem size on the PC **cannot** be increased; (2) user-supplied Fortran subroutines **cannot** be incorporated in a program run on the PC.

A complete version of the 1988 release of BMDP PC (41 programs plus DATAMAN) is sold to an individual for approximately $2,000.00. However, under BMDP's site-licensing arrangement, the University could site-license a fixed number of copies of the product. The price for an individual user would then be set on a volume-discounted sliding scale, which in turn, would depend on the total number of users who wish to purchase the package. For instance, if the University decided to site license 50 copies of the complete 1988 release, the total one-time site fee would be $10,500.00.

Since, unlike PC SAS, SPSS/PC+ and DOS Systat, there is **no renewal fee**, an individual user's average cost would amount to approximately $210.00, plus $100 to $130 (to defray the University's expenses in copying and supplying diskettes, in suitable containers), plus about $60.00 for a complete set of documentation. In other words, **the total cost to each user would be approximately $370 to $400, if there were 50 interested users.**

BMDP releases an update about once every two years. Their most recent version is the 1988 release (available as of September 1988). Future releases are scheduled to be offered at a substantial discount for licensed sites that choose to update.

To help you decide whether this package would be suitable for your needs, we present a brief summary of some points to be considered and a listing of the available programs.

- **Statistical Features.** BMDP PC provides all the common statistical tools — it thus offers a fairly complete set of statistical procedures that one needs to satisfy a diverse group of users. See the description below for a listing of the programs available.

- **Hard-disk Space.** Each BMDP PC program is independent. Therefore, although the entire product would fill up almost all of a 30 megabyte hard-disk, users can conserve space by keeping only their favorite programs on the hard disk, with the rest on floppies. The BMDP system files require about 300k bytes of hard disk space, and each BMDP program/module takes approximately 750k bytes to 1 megabyte of disk space.

- **Data Handling.** BMDP PC reads ASCII files, so users can analyze data input with either a wordprocessing or a spreadsheet package. Data can also be input and edited with either the BMDP PC line editor or the newly introduced full-screen text editor. Moreover, BMDP PC includes a very powerful data manager program for merging files and preparing one's dataset for statistical analysis. There is also a new PORT command to create "portable" ASCII BMDP "SAVE" files that can be transferred across operating systems (e.g., VM/CMS, UNIX, etc.).

- **Accuracy and Mainframe Compatibility.** The 1988 PC release of BMDP is mostly identical to the 1988 mainframe release. This lessens the probability of introducing new bugs, as has been the case with some other microcomputer versions of mainframe statistical packages. Moreover, this ensures that, if you are experienced with using BMDP on one of our mainframe machines, you already know how to use BMDP on a PC.

The 1988 version of BMDP PC also includes a host of new features, ranging from greater control over the format of data listings to newly introduced options for case weights and frequency weights. Case weights are needed in a variety of instances, for example, when error variances are not constant. Frequency weights save time by eliminating the need to reinput data numerous times for cases that may have identical values. Another new feature is the ability to "stack" variables — stacking allows the user to combine the levels of two or more categorical variables to create a new variable with codes for all combinations of levels.

Other substantial enhancements in the 1988 PC release include no copy protection (and hence the need for no key diskette), a master help menu of on-line help, a full-screen text editor, and flexible new capabilities for creating and modifying high resolution graphic plot displays as incorporated into 25 of the programs. The latter, called the High Resolution Plot Enhancer option, comes with the site-licensed product, and adds the ability to display, label, modify, rescale, save and transfer high resolution plots generated by BMDP programs.

Programs Available

An asterisk (*) indicates a newly introduced program in the 1988 release.

Data Description & Descriptive Statistics, etc.

DESCRIBE (1D)	Simple data description & univariate statistics, etc.
DETAIL (2D)	Detailed data description, including frequencies.
COLFREQ (4D)	Single column frequencies (numeric & character variables) — helpful in data screening.

Data in Groups.

TTEST (3D)	Comparison of 2 groups with t-tests.
ANOVA1 (7D)	Description of groups (strata) with histograms & analysis of variance.

Plots & Histograms.

HISTO (5D)	Histograms and univariate plots (normal probability plots, half-normal plots, cumulative frequency distribution plots, and cumulative histograms, etc.).
PLOT (6D)	Bivariate scatter plots with linear regression line, etc.
MULTGRP (9D)	Multiway description of groups.

Frequency Tables - Categorical Data Modeling.

FREQ (4F)	Two-way and multiway frequency tables: measures of association and the classical log-linear model (for both complete and incomplete tables).

Missing Values - Patterns, Estimation & Correlations.

MISSCORR (8D)	Correlations with options for incomplete data.
MISSDATA (AM)	Description & estimation of missing data.

Regression.

MULTREG (1R)	Multiple linear regression.
REGRESS (2R)	Stepwise regression, including very powerful regression diagnostics.
PRINREG (4R)	Regression on principal components (including "stepwise").
POLYREG (5R)	Regression using orthogonal polynomials.
ALLREG (9R)	All possible subsets regression, employing the classical Furnival-Wilson algorithm on criteria like R-squared, adjusted R-squared, and Mallow's C_p.

Nonlinear Regression & Maximum Likelihood Estimation.

NONLIND (3R)	Nonlinear regression.
NONLIN (AR)	Derivative-free nonlinear regression.
LOGISTIC (LR)	Stepwise logistic regression.

Analysis of Variance & Covariance.

ANOVACOV (1V)	One-way analysis of variance & covariance.
REPEATED (2V)	Analysis of variance & covariance, including repeated measures designs.
ANOVAMIX (3V)	General mixed model analysis of variance, using the maximum likelihood (ML) and restricted maximum likelihood (REML) approaches to the fixed & random coefficients model.
ANOVABAL (8V)	General mixed model analysis of variance for complete balanced designs (viz., equal cell sizes).
ANOVAGEN (4V)	General purpose univariate & multivariate analysis of variance & covariance, including repeated measures.
ANOVARM (5V)*	State-of-the-art maximum likelihood methods for analyzing repeated measures data, including the ability to analyze incomplete data. Permits users to specify the within-subjects covariance structure showing how the repeated measures relate to one another, viz., compound symmetry need not be assumed.

Nonparametric Statistics.

NONPARAM (3S)	Nonparametric statistical analysis.

Cluster Analysis.

CLUSTER (KM)	k-means clustering of cases.
CLUSTVAR (1M)	Cluster analysis of variables.
CLUSTCAS (2M)	Cluster analysis of cases.
CLUSTBLK (3M)	Block clustering of cases.

Multivariate Analyses.

FACTOR (4M)	Factor analysis (including principal components analysis, maximum likelihood factor estimation, principal factor or classical common-factor-model analysis, and Kaiser's second generation "little jiffy" analysis (image factoring followed by ortho-oblique rotation)).
CANCORR (6M)	Canonical correlation analysis.
DISCRIM (7M)	Stepwise discriminant analysis, including built-in (jackknife) cross-validation procedures.
PARTCORR (6R)	Partial correlation & multivariate regression.
BOOLEAN (8M)	Boolean factor analysis of dichotomous (binary) data.
PREFPAIR (9M)	Linear scoring for preference pairs.
CORRAN (CA)*	Performs correspondence analysis, a useful exploratory multivariate technique — somewhat similar to principal components analysis — that converts data from a two-dimensional table into a graphical display. The graphs produced by CA help the user examine his/her data by pinpointing similarities and dissimilarities.

Survival Analysis.

LIFE (1L)	Life tables and survival functions analysis.
SURVIVAL (2L)	Survival analysis with covariates - Cox proportional hazards regression models.

Time Series Analysis.

SPECTRAL (1T)	Univariate & bivariate spectral analysis (viz., spectral and cross-spectral analyses).
BOXJENK (2T)	Box-Jenkins time series analysis & forecasting.

Interactive Data Management System & Editor, etc.

DATAMAN (DM)	A powerful interactive data manipulation system designed to facilitate in the organization of data for future analyses, DATAMAN incorporates three procedures to merge files, close to thirty aggregate functions to extract information from sets of records varying in number, procedures for transposing values stored within one record to multiple records (and vice-versa), etc. BMDP can read rectangular, non-rectangular and hierarchical files, and can be utilized to read and/or write either raw-data files or BMDP system files (viz., binary datasets).

Program Documentation

1. Dixon, W.J. (Chief editor), et al., *BMDP Statistical Software Manual*, 1988 Release, Volumes 1 and 2 (1988). University of California Press, Berkeley, California. ($49.90)
2. *BMDP PC Supplement: Installation and Special Features* (1988). BMDP Statistical Software, Inc., Los Angeles, California. ($6.00)
3. *BMDP User's Digest*, 4th Edition (1987). BMDP Statistical Software, Inc., Los Angeles, California. ($8.00)
4. *BMDP Data Manager Manual* (1986). BMDP Statistical Software, Inc., Los Angeles, California. ($7.00)

REMINDER: If you would be interested in CSO obtaining site-licensing for the 1988 release of BMDP PC, please fill out the survey form at the end of this issue and return it to Anup Roy, 150 DCL. You may also send an electronic mail message to anuproy@vmd.cso.uiuc.edu indicating your interest; please include all of the information called for in the survey form/questionnaire.

SITE LICENSING ARRANGEMENT FOR DOS & MAC SYSTAT AT THE UNIVERSITY OF ILLINOIS

Anup Roy
CSO Statistical Consultant

The Statistical Services group at CSO has set up site-licensing arrangements (for UIUC faculty, staff, and students) for a comprehensive statistical software package called SYSTAT for both DOS and Macintosh systems. **Users will have to sign an end-user agreement with the University and they will have to pay an initial royalty/licensing fee (for each copy licensed) as well as a yearly renewal fee.**

SYSTAT (The System for Statistics) is a comprehensive statistical, graphics and data management package. It is available on a variety of machines/operating systems, including IBM PC, PC/XT and PC/AT, PS/2, and PC-compatibles under MS-DOS (or PC-DOS), and the Apple Macintosh. It is marketed by Systat. Inc., Evanston, Illinois.

Systat Version 3.0 on the IBM PC and PS/2 (or compatibles) requires DOS 2.0 (or a later version) on a machine that can read standard 5 1/4" diskettes. It requires 256K RAM of memory, and two double-sided floppy disk drives or a hard disk. Systat operates with or without the 8087/80287/80387 math coprocessor. Compatible machines include, but are not limited to: AT&T, Burroughs, Columbia, Compaq, Corona, HP Vectra, Leading Edge, Sperry, Tandy, Televideo, TI Professional, Wang, and Zenith.

Three flavors of Systat Version 3.1 are available for the Apple Macintosh: (1) a version for 512K machines, (2) a version for machines with 1 megabyte of RAM, and (3) a version for machines with 1 megabyte of RAM memory and the 68020/68881 coprocessor.

Systat Distribution

In keeping with the License Agreement that the University of Illinois at Urbana-Champaign has entered into with Systat, Inc., an agreement/contract between the University and the end-user has been developed. The end-user agreement will have stipulations for compliance. It will contain a form to be filled out with questions pertaining to hardware specifications and the actual location of the hardware. The completed end-user agreement (**including both office & home addresses and phone numbers**) should be brought to the CSO Accounting Office at 1208 W. Springfield. A photocopy may be made for personal files. Please call 333-7752 or 244-1201 if you have any questions.

The end-user agreement will serve several purposes. First, it will be a means by which the University can uphold the stipulations in the License Agreement between Systat, Inc. and itself. Secondly, it will aid CSO in keeping accurate records of who has licensed the software. Third, the information will be added to the Systat User's Mailing List which will be used to inform users about updates, etc.

DOS Systat Version 3.0 consists of five 360K 5 1/4" DS/DD diskettes, numbered 1 through 5, containing all the statistics modules, a DOS Mystat (personal version of Systat) disk, and a "Lazerte editor" disk. The MAC Systat Version 3.1 comes on four 800K 3 1/2" DS/DD disks. Users will have to specify which of the three MAC flavors they are planning on using; viz., 512K MAC, or 1 Meg MAC (i.e., MAC-SE & MAC+), or the 68020/68881 MAC (1 megabyte of RAM memory and a coprocessor -- i.e., a MAC II). **The price for obtaining either one of the Systat versions is $100.00, which includes the initial royalty fee, license fee for the first year, copying fee, and the price of the diskettes.** Please note that the user has to take his/her pick among the four available options; if the user wants more than one version (say, one for a MAC II in the office, and one for a MAC+ for home use), the user will have to pay for multiple versions.

The license fee covers free software updates. Thus, when Systat Version 4.0 is made available, the user will **not** have to pay for the diskettes and the copying fee if he/she desires the updated software. **However, since one is mandated by the License Agreement to purchase the documentation in order to qualify for software licensing, users should be forewarned that they will need to purchase the new, updated documentation to be able to upgrade to Version 4.0 when the latter is made available.**

The license between Systat, Inc. and the University will be renewed on the 1st of July every year. Similarly, **the end-user agreement must also be renewed on each anniversary date in successive years.** Subsequent yearly renewals will cost from $50.00 - $80.00, depending on various factors too complicated to make an accurate forecast as of now.

The software is licensed, in general, for use on a single machine only. Multiple machine use requires the licensing of multiple copies. The only exception to this stipulation is that home use is permitted, provided that the total number of copies in home use does not exceed the total number of copies in use on University premises under the terms and conditions of the pertinent end-user agreement.

Systat may be licensed by any bona fide faculty/staff or student at the University of Illinois (Urbana-Champaign campus only). **A valid University faculty/staff/student ID card (along with a valid picture ID) will suffice as proper identification. Please bring these to the CSO Accounting Office at 1208 W. Springfield when you apply for the package.** A University Stores Voucher with the proper 11-digit University account information can be processed by the people in

CSO's Accounting Office. Individuals may also pay by personal check, made out to the University of Illinois. Cash will **not** be accepted.

Summarized below are the prices for the software and documentation:

Product	Price
Systat initial royalty, 1st year license, diskette and copying fees (per copy)	$100.00
Systat DOS/MAC documentation	$40.00
MAC Systat supplemental documentation (graphics option)	$10.00
Systat yearly renewal fee (estimate only)	$50 - $80

Systat Diskette Replacement Policy

If, for any reason, a Systat diskette is deemed defective and hence unusable, a free replacement will be made. Please call Anup Roy at 244-1201; he will replace the defective diskette with a new one.

Systat Consulting

The CSO Statistical Consultants will provide consulting on Systat. Their office is in 85 Commerce West. Office hours are 9am-1pm Mondays and Wednesdays, 9am-5pm Tuesdays and Thursdays, and 9am-11:45am & 1:15pm-5pm Fridays. The telephone number is 333-2170.

The Statistical Consultants will be able to consult on Systat programming techniques and statistical procedures. They also will be able to consult on any questions regarding installation procedures.

Anup Roy will take ultimate responsibility for all issues concerning Systat. These issues include, but are not limited to, the following: licensing, copying, distribution, installation, consulting, use and training. All questions and/or problems that can not be handled by the Statistical Consultants may be referred to him at 244-1201.

Systat Description

The remainder of this article is an updated version of an article that appeared in the March-April 1988 issue of *Off-Line*. It gives a brief description of Systat to help you decide if this package might be of use to you.

Systat is easy to use, flexible and very powerful. Its broad range of statistical capabilities includes the full array of univariate and multivariate analyses. Extensive graphics and a full-screen editor allow easy visual displays of data. Optional statistical modules offer state-of-the-art procedures not available in most general purpose statistical packages.

Systat was not written for any particular computer. It was designed to provide a modular working environment which can easily adapt to new machine architecture and user interfaces. On MS-DOS machines, Systat takes advantage of coprocessors and RAM-disks as well as code optimizers to achieve extraordinary speed. On the Apple Macintosh, Systat uses windows, scroll bars, menus and dialog boxes to simplify learning. On any given machine, you'll appreciate the tailored feel of the package. If you use more than one machine, you'll avoid having to learn new program syntax.

Systat is highly portable. Special care was taken to ensure that Systat prints exactly the same results regardless of the computer installation. For instance, the random number generator produces the exact same sequence of numbers for the same starting seed on every machine.

Getting started with Systat is easy. The commands are familiar to users of SAS, SPSS-X, and BMDP. Systat uses a combination of commands and menus which allow new users to learn the system in small steps and experienced users to perform complex operations in a few keystrokes. Systat avoids complicated options, semicolons, special symbols and jargon, and rigid command syntax.

Systat allows processing of datasets containing up to 200 variables. Character or alphanumeric variables are allowed. The maximum number of columns permitted for a single variable is 12. Any one data file can contain up to 32,000 cases.

Many companies claim that their programs are interactive. That's because they are comparing the way their programs work on the PC to the rigid way they operate on a mainframe. However, porting a package to a PC and dressing it up with windows and menus does not make it interactive. In a truly interactive program, the order of commands should not matter. An interactive package is not littered with numbered options, duplicated procedures, and error logs. Systat truly operates as an interactive package. When you make an error with Systat, you can correct it immediately and continue with your work. If one doesn't want to work interactively, Systat can be used in a "batch-processing" mode as well.

Systat claims to be the most accurate comprehensive statistical package available on any computer. Numerous academic reviews have demonstrated Systat's regression routine, for instance, to be more accurate than SAS PROC GLM and SPSS-X Regression, and other widely used programs.

Systat is written in Fortran and translated with optimizing compilers. It is optimized to take advantage of numeric coprocessors and other special features of different machines. Systat is alleged to be faster on microcomputer versions than the average mainframe time-sharing system running statistics under moderate loads. On a standard IBM PC, Systat computes a 25 by 25 Pearson product-moment correlation matrix as fast as the data can be read into the system. A multiple regression of a single dependent variable, regressed on these 25 continuous variables, can be computed in less than 15 clock seconds.

Systat has a full-screen editor which looks like a spreadsheet. Unlike most spreadsheets, however, this editor is capable of handling a file as large as one's disk can hold. One can enter data into a Systat file by moving the cursor anywhere on the screen. Cursor controls include up, down, left, right, page-up, page-down, home, and end. Files from mainframe and other microcomputer spreadsheet and database packages can be imported and edited in much the same fashion.

DOS Systat Version 3.0 comes with another high-speed data editor called the "Lazerte editor," which resembles the one in Systat. PC/XT/AT and PS/2 users with numeric coprocessors may want to use this for most of their data editing.

Like most statistical packages, Systat can input new data and transform variables. In addition, Systat includes a comprehensive database manager. Systat's data module can merge files with different numbers of records, match different files on key variables, and select subsets of files for analysis with a single command.

In addition to file management commands, Systat includes simple commands to sort, rank and standardize single variables or whole files. You may create value labels or recode values with a single command. There is even a command to transpose a whole file.

Systat includes an extended precision programming language with advanced statistical functions. Thus, if one needs to program complicated data transformations, one has access to the appropriate programming tools.

The graphics module in Systat (available in the MAC version, but yet to be released for the DOS version — DOS Systat Graphics, also called SYGRAPH, is to be added to the site-license and made available as a separate product module by early November 1988) offers more types of statistical graphics than most mainframe packages. In addition to the usual histograms, bar charts and scatter plots, it produces stem-and-leaf diagrams, single and grouped box plots, detrended probability plots, contour plots and quantile plots. All standard graphics fit on a single screen or 80-column computer printout. These displays will print on any type of system printer — daisy wheel, dot matrix, or laser. On IBM PC-compatible machines, Systat can use the extended graphics character set for continuous lines and special symbols. Graphics can be saved into disk files so that one may use them in concert with word processing and other text documents. The Apple Macintosh version contains high resolution statistical graphics. Two- and three-dimensional plots allow one to display more complex data, and specialized graphics, such as scatterplot matrices, providing unique analytic displays.

Highlighted below are some of the statistical capabilities of Systat:

Basic Statistics

- Descriptive statistics
- t-tests (dependent and independent)
- Bartlett's test for homogeneity of variance
- Duncan, Tukey and Newman-Keuls post-hoc tests for one-way and factorial designs

Tables

- Multiway crosstabulations
- Multinomial confidence intervals
- Hierarchical loglinear modeling (including structural zeros)
- Numerous coefficients/measures of association and their asymptotic standard errors

Correlations

- Pearson; Spearman; Gamma
- Sum of product
- Covariance
- Kendall's tau
- Euclidean distances with pairwise or listwise deletion of missing data
- Saving of output matrices for direct analyses using other statistical modules

Nonparametrics

- Nonparametric coefficients including Spearman's rho, Kendall's tau-b, Goodman-Kruskal's gamma, and Kendall's coefficient of concordance
- Sign test
- Wilcoxon signed ranks test
- Runs test
- Friedman's two-way analysis of variance
- Kruskal-Wallis one-way analysis of variance
- Mann-Whitney U
- Kolmogorov-Smirnov one- and two-sample tests
- Lilliefor's test

Canonical correlation analysis

- Includes ability to save canonical scores into a Systat file

Discriminant analysis

- Fisher's two-group and multi-group discriminant analyses
- Saved discriminant scores
- Classification of new observations into groups
- Rotation of discriminant function axes

Cluster analysis

- Single, complete, average, median and centroid linkage
- Hierarchical clustering
- Labeling of cases on dendrograms/tree displays
- Tukey's gapping method for identifying unidimensional clusters
- k-means clustering

Analysis of variance and covariance

- Factorial designs including fixed and random effects, balanced and unbalanced designs
- True least-squares estimation, with custom selection of error terms
- Repeated measures analysis via univariate and multivariate models
- Analysis of covariance, with homogeneity of slopes test
- MANOVA (including repeated measures)
- True general linear model tests including: arbitrary contrasts on dependent variables, and arbitrary contrasts on independent variables
- More accurate effects matrices than in SAS PROC GLM and other widely-used analysis of variance programs

Multidimensional scaling

- Kruskal or Guttman methods
- Monotonic or linear models in up to 5 dimensions
- Input starting configuration specification
- Minkowski metric
- Saved computed distances, configurations or residuals
- Shepherd diagrams

Time series analysis

- Time domain methods including linear and nonlinear smoothing
- Lowess scatterplot smoothing

- Box-Jenkins seasonal and nonseasonal ARIMA models
- Identification and diagnosis via autocorrelation plots, partial autocorrelation plots, and error correlation plots
- Differencing, logging, squaring, demeaning and detrending
- Cosine tapering transformations
- Frequency domain methods including regular and inverse fast Fourier transform
- Periodograms
- Residuals and forecasts from all routines can be saved into Systat files

Regression

- Simple, multiple linear and polynomial regression
- Stepwise estimation option
- Extensive regression diagnostics including collinearity measures, condition indices, variance proportions, residuals, leverage statistics, Cook's D, externally studentized residuals, Durbin-Watson statistic, Mahalanobis distances, etc.
- Multivariate regression routines including multivariate F-tests, canonical variates
- More accurate regression estimates than other widely-used regression packages

Principal components and factor analyses

- Principal components or classical common factor analyses or image factoring, with optional rotation, factor scores and plots
- Can save loadings, component/factor scores or coefficients into a file
- Three types of rotation: varimax, equimax and quartimax
- Correlation and covariance matrices accepted as input

Systat has additional products available that are not included in the site-licensed package, but may be purchased separately. (These products, therefore, do not call for a yearly renewal fee.) **If you are interested in acquiring copies of any of these supplementary products, please contact Anup Roy through campus mail to 150 DCL, or e-mail to anuproy@vmd.cso.uiuc.edu, or call 244-1201.** Some of these products are listed below:

Acrospin (MS/PC-DOS only: $30.00)

- A dynamic, real-time rotation program for viewing points and surfaces in three dimensions

- Rotate any Sygraph plot — point clouds, smoothed (meshed) plots, contour plots, etc.
- Rotate around any of the 3 axes, and move the plot left/right or up/down on screen
- Can zoom in or out on the object with a scale factor of about 8000
- Available for MS/PC-DOS (with a fully 100% IBM compatible machine), with either a CGA, EGA, MCGA, VGA, or Hercules graphics card

Design (MS/PC-DOS and Macintosh: $90.00)

- Sample size estimation to obtain desired statistical power given an effect size and significance levels (can also be used to estimate statistical power at specific sample sizes)
- Tables of expected mean squares for balanced experiments using the Cornfield and Tukey algorithm (1956)
- Randomization plans generated by specifying details of an experiment through a series of commands

Logit (MS/PC-DOS and Macintosh: $90.00)

- Logistic regression for binary and multinomial dependent variables estimated by the maximum likelihood method
- Interactions entered directly on the model statement
- Dummy variables generated automatically using one command

Probit (MS/PC-DOS and Macintosh: $90.00)

- Method for estimating multiple regression or analysis of covariance model when the dependent variable is categorical (and more specifically binary)
- Produces parameter estimates and standard errors by the method of maximum likelihood; also variance-covariance matrices, z-scores, and Mill's ratios
- Automatic generation of dummy variables and interactions

Signal (MS/PC-DOS only: $140.00)

- Signal detection theory analyses of either binary or multiple-response categorical data
- Normal, logistic, negative exponential, chi-square, Poisson, and gamma distributions
- Non-parametric analyses also available
- Parameters estimates obtained via an iterative maximum likelihood algorithm providing a chi-square goodness-of-fit statistic

Survival (MS/PC-DOS only: $90.00)

- Performs survival, reliability and life tables analyses
- Can be used to explore generally grouped, right-censored and interval-censored survival data; and also to estimate nonparametric, partially parametric and fully parametric models by maximum likelihood methods
- Features either right- or left-sided censoring, optional covariates, and stratification
- Able to handle disjoint and overlapping interval censored data and combinations of interval-censoring, right-censoring, and exact failure times
- Can obtain Kaplan-Meier estimates and Turnbull's generalization of the Kaplan-Meier estimates for interval-censored data, and fit the Cox proportional-hazards regression model with time-constant covariates, or estimate parametric accelerated life models for the Weibull, exponential, log-normal and log-logistic distributions
- Direct, forward selection, backward elimination, and stepwise algorithms
- For parametric models, can obtain approximate confidence intervals for quantiles, reliability confidence intervals, or QQ plots
- Point life tables, and plot the survival function, cumulative hazard function or log-cumulative hazard function
- Save parametric and nonparametric life tables, QQ plot values, quantile, reliability and hazard tables into Systat save-files for future analyses

Testat (MS/PC-DOS and Macintosh: $90.00)

- Provides test summary statistics, reliability coefficients, standard errors of measurement for selected score intervals, and item analysis statistics for multiple item tests
- Summary statistics for individual respondents
- Graphic displays of test and item/scale cumulative histograms

Tobit (MS/PC-DOS only: $90.00)

- Designed for regression analysis with any form of one-sided censored data
- Produces parameter estimates and standard errors by the method of maximum likelihood; also variance-covariance matrices, predicted values, residuals and Mill's ratios

2SLS (MS/PC-DOS only: $90.00)

- Estimates two-stage least-squares regression models

- Computes heteroscedasticity-consistent (robust) standard errors for both OLS and 2SLS
- Can optionally test ordinary regression models for heteroscedasticity and neglected non-linearity

Stat/Transfer (MS/PC-DOS only: $90.00)

- Provides an easy method for transporting data between Systat and Lotus 1-2-3, SPSS/PC+, STATA, Gauss, dBase II and dBase III, and SPSS-X export files (via Kermit)

Mystat (the "personal version" of Systat)

- Mystat is a condensed version of Systat which is designed for educational use on a DOS-based system. It can work with 256K RAM bytes of memory and a system containing two floppy disk drives or a hard disk. Mystat can handle up to 32,000 cases and 50 variables. It provides a full-screen data editor and has extensive statistical capabilities. Mystat enables one to perform full algebraic transformations and to sort and rank variables. The entire program functions under a single menu, with extensive on-line help and an interactive tutorial to demonstrate its use. The manual also comes on the disk.

  Because Mystat is completely self-contained and is a proper subset of Systat (with identical routines as those used in Systat), it is ideal for instructional purposes. There is no charge for the program. Although the disk is copyrighted, it may be duplicated in unlimited quantities for non-commercial teaching purposes. It may not, however, be resold.

  To make a copy of Mystat, bring a formatted 360KB double-sided double-density diskette to the CSO Microcomputer Resource Center in the Illini Union.

Program Documentation

Wilkinson, Leland, *SYSTAT: The System for Statistics (1987)*, Systat, Inc., Evanston, Illinois [$40.00. Must be purchased with the site-licensed version of the product].

Systat, Inc., *SYSTAT Graphics for the Macintosh* (1987), Systat, Inc., Evanston, Illinois [$10.00. Must be purchased with the Macintosh version.]

RELEASE OF SPSS/PC+ VERSION 2.0 AVAILABLE FOR LICENSING

Anup Roy
CSO Statistical Consultant

A new release of SPSS/PC+, Version 2, for IBM PC, PS/2 and compatibles is now available. The Base Product and Advanced Statistics modules are the only two products included in the campus site license. New users of SPSS/PC+ may obtain a copy by signing an end-user license agreement and arranging for a payment of $125.00 (covers the initial royalty/first year licensing/diskette & copying fees). Payments may be made via a University Stores/Service Voucher or Requisition with a valid 11-digit account number, or a personal check. Users should also purchase the *SPSS/PC+ Version 2 Base Manual* ($29.95) and the *SPSS/PC+ Version 2 Advanced Statistics Manual* ($19.95). All of this may be accomplished at the CSO Accounting/Distribution Office at 1208 West

Springfield Avenue, Urbana (Phone: 333-7752). Please note that the annual renewal fees are currently running at $80.00.

SPSS has a streamlined installation procedure for this new release. All products, including separately purchased (non-site-licensed) copies of additional modules (i.e., Data Entry II, Graphics, Tables, Trends, etc.), can be installed using the same identical command. The new installation instructions are included with the software.

The Base Product consists of four 5 1/4" diskettes (numbered B1 through B4), plus a tutorial diskette. (Please note that there is no key diskette.) The Advanced Statistics option comes on three diskettes (numbered A1 through A3). A Kermit diskette is still supplied for micro-mainframe communications. In addition, there are four new diskettes labeled U1 through U4. These are the so-called "universal set" diskettes and contain software and utilities that are required to install or run any part of SPSS/PC+. The "universal set" diskettes are essential if the end-user plans to use any separately-purchased, additional products/options (such as Trends, etc.) with the site-licensed version of the Base Product.

The new Base package has many new features. These include:

- A new menuing and "help" system to help one build unfamiliar commands.
- Major enhancements to Review, the SPSS/PC+ full-screen data editor/display manager.
- A computer-based training tutorial to help new users get started easily and quickly.
- A more flexible report-generator that gives one greater control over the format.
- An on-line statistical glossary to help you interpret your results.
- The ability to drop, reorder, or rename variables during an SPSS/PC+ session.
- An expanded screen for machines with EGA and VGA hardware.
- Access to information in other SPSS/PC+ system files without affecting one's current active file.

SPSS/PC+ Version 2 Advanced Statistics now includes state-of-the-art "reliability analysis" an unusual feature in microcomputer statistical software.

This new site-licensed version is also certified to run on Novell Advanced Netware™ Version 2.0A on fully IBM-compatible equipment.

If you have any general questions about SPSS/PC+, please contact the CSO Statistical Consultants, 85 Commerce West (333-2170). More specific questions about SPSS/PC+ Version 2 may be directed to Anup Roy, UIUC SPSS/PC+ Campus Site License Coordinator, at 244-1201. You may also contact him via e-mail to anuproy@vmd.cso.uiuc.edu.

TERMINAL EMULATORS

Daniel Pommert
CSO Systems Consultant

(Editor's Note: This article was originally written by Daniel for publication in the newsletter of the local Macintosh Group. He has given us permission to reprint it in this issue of Off-Line for Mac users who do not belong to the group.)

The Macintosh is not a terminal. It is a computer which can stand and operate perfectly well by itself. But for all of its virtues, sometimes it is necessary for a user of a Macintosh to use, or just communicate with, another computer. Most mainframe computers communicate with their users through computer terminals. These computer terminals are not as smart as a Macintosh and are designed to display simple text on their screens. (Some of the more sophisticated terminals can also display computer graphics on their screens.) When terminals are displaying text on their screens, they place the characters of the text in regular rows and columns. There are usually 24 lines (rows) and 80 columns of letters displayable on a typical terminal screen. Frequently terminals have several "smart" functions such as the ability to erase all of the text that appears on a given line or to insert a new character in the middle of a line. These various "smart" functions can be requested by the mainframe computer.

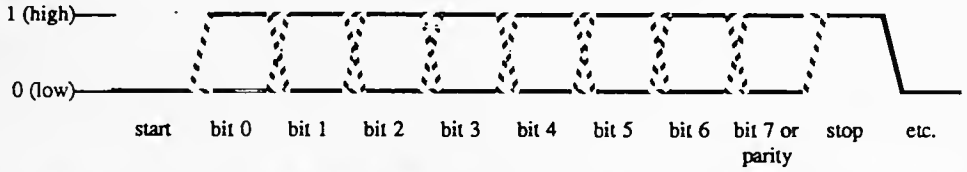
Mainframe computers communicate with their terminals through various sorts of communications lines. Most commonly they communicate with their terminals through a 4 to 10 wire line, referred to as a "terminal line." This terminal line runs directly from the computer to the terminal. Lo and behold, there are plug-ins in the back of all Macintoshes which are designed to connect to one of these terminal lines. On the Macintosh, as with most other microcomputers, the terminal line connector is called a serial port. If the Macintosh user is in the same building and fairly close to the mainframe computer, she can request that a terminal line be strung directly to her Macintosh and she can gleefully ignore the directions in the next paragraph of this article.

Now suppose that she is at home with her beloved Macintosh or in her office across campus from the mainframe computer. She cannot practically request terminal line be strung directly from the mainframe to her Mac. She must communicate through some computer network or through the telephone. Either way, she will need some sort of adapter box or gizmo. The gizmo which allows her Mac to talk over the telephone line to a corresponding gizmo which is connected to the mainframe is called a "modem" (for modulator/demodulator). This turns the electrical pulses running through the terminal wires on each end to and from sounds which can be sent over the telephone line. If she, on the other hand, is able to connect to the mainframe through a "local area network" she would need a network adapter box which would let her Macintosh talk through its terminal line to the network adapter. In general, the network adapter would let her Macintosh communicate with the mainframe at a much higher speed than the terminal line.

Whether through a direct terminal line, local area network, or modem and telephone, she needs to have some sort of connection to the mainframe. After she does, she still cannot use her Macintosh as a terminal until she runs an application which will make her Macintosh "emulate" a computer terminal. This application is called a "terminal emulator." There are many types of computer terminals which, although very similar, differ in their way of receiving instructions to perform various smart functions. The most common terminals to be emulated are the VT-100 (or ANSI), VT-52, ADM3A and Hazeltine 1500. It is important that a terminal emulator and the mainframe agree on which sort of terminal is being emulated. It is more important than which specific terminal they agree upon.

In order to use terminal emulators comfortably, one needs to know a bit of the nitty-gritty of terminal communications. To begin with, mainframes usually only send and receive simple letters, numbers, punctuation marks and spaces with their terminals. They work in just one font and point size. So the font and point size is never specified. There are usually just 94 printable characters, a space and 33 control characters (for a total of 128 possibilities). Characters are sent one at a time across the terminal line. They usually can be sent both directions at once, just as two people can be talking at the same time over a telephone to each other. Each of these 128 characters is assigned a unique number from 0 to 127. This association of character to number is fairly standard, fortunately. (Actually, there are two common associations of characters with numbers: ASCII which is what the Macintosh and most microcomputers use most comfortably, and EBCDIC which some mainframes use internally. Most of these mainframes which use EBCDIC internally are still capable of communicating with a terminal in ASCII.)

When a character is sent across a terminal line, it is expressed as a binary (base 2) number and sent one bit (binary digit) at a time, serially (hence the use of the serial port on a microcomputer to connect to the terminal line). Every bit is either **1** (high) or **0** (low). Characters are either sent "asynchronously" or "synchronously." We will assume that the communication is asynchronous in this article, since it is the most common and few emulators can work in synchronous mode. There is also a special bit just before the character, called a start bit, and an optional parity and a stop bit or two sent after the character. Sometimes just 7 bits are sent to express a character, sometimes 8 are sent. Sometimes there is an extra error detecting bit called a parity bit sent, sometimes not. Sometimes one stop bit is sent, sometimes one and a half are sent and sometimes two are sent. When a terminal communication line is quiet, it is held in a high state; the same state as a start bit. Diagrammatically we have:



The reason why you need to know about how a character is sent over a serial line is because different mainframes and software packages have different conventions and requirements. Unfortunately, they also have different nomenclature. All agree on what is meant by one, one and a half and two stop bits (and almost all computers don't care how many stop bits are received) and baud rate. But the description of parity and number of data bits varies. Some include the parity bit, if it is used in their count of the number of bits in a character. Some do not. On either case, the choices of character length will still be either 7 or 8 bits. The choices of parity may be any or all of the following five possible combinations. None, bit 7 is used as an extra data bit so that characters are expressed by 8 bits instead of the minimal 7 bits. Even, bit 7 is a parity bit and is either high or low so that the total number of bits which are high in the character is an even number. Odd, bit 7 is a parity bit which is high or low so that the number of high bits is odd. Mark, high or 1: bit 7 is always high. Note that this is functionally equivalent to 7 data bits, no parity and two stop bits. Space, low or 0: bit 7 is always low. There are few enough combinations so that one typically can run through all of the combinations to see which one(s) work.

Terminal serial lines operate at various speeds. They may send from 11 to 1920 characters a second. These speeds are usually expressed as bits per second or, as it is commonly called, baud. It takes about ten bits to communicate a single character when you throw in the start bit, stop bit, and parity. Therefore the common baud rates are from 110 to 19200. Actually the speeds 300, 1200, 2400, 9600 and 19200 are the most common used locally. Currently, if you use a telephone modem, you will need to communicate at 300, 1200 or 2400 baud, 1200 baud still being the most common.

If you are communicating over a computer network you would likely work at 9600 baud or 19.2 K baud, 9600 still being the most common. Higher transmission speeds require synchronous transmission of characters or a special computer network adapter card plugged right into the Macintosh.

Another function that a terminal emulator frequently does, besides mimic a terminal, is allow for files to be sent to and from the mainframe computer. In the simplest case, the mainframe user asks a mainframe file to be displayed on the terminal screen. When it is sent and the Macintosh displays it on the screen, it can also be copied at the same time into a Macintosh file. By this process, the file is "down-loaded" to the Macintosh. A file can be uploaded by a similar process — a process whose commands are dependent on the specific mainframe with which is being communicated and the specific Macintosh application. Sending a file from the Macintosh to a mainframe is called "uploading."

There is a drawback to this form of up-loading and down-loading. There is no guarantee that the file was accurately sent to or from the mainframe. To overcome this problem, various "file transfer protocols" have been developed. The two that are used extensively in the microcomputer world are X-Modem (a.k.a. Christensen protocol) and Kermit protocol. They allow for files to be reliably and accurately sent from one computer to another. At least one of them is built into most all of the terminal emulators. Their drawback is that one needs to have a program on the mainframe as well as the Macintosh which are able to speak the common protocol.

Some terminal emulators get fancy. They may allow the user to write lengthy and sometimes complicated directions telling the emulator how to connect to the mainframe, log on, transfer groups of files, receive mail, fire up applications on the mainframe, aid in text processing and a variety of other functions. There is no standard for how these directions are described to the terminal emulator; they are dependent on the specific system. Other emulators may allow the user to have several windows of communication to the mainframe. Others allow graphics. Still others begin to integrate the Macintosh and the mainframe into a "seamless" environment — one where the distinction between the function and functioning of the Macintosh and that of the mainframe are obscured from the users. It all becomes one powerful, user friendly system.

The final thing that someone wishing to use a terminal emulator needs to concern herself with is how much the terminal emulator costs and where she can get it. Some terminal emulators (e.g., MacKermit) are free whereas others cost over $200 (e.g., VersaTerm Professional). Their capabilities are different and you pay extra for extra flexibility and features. Below is a table comparing common Macintosh terminal emulators.

	Very easy to use	VT-100 emulation	Other emulation	Graphics terminal emulation	File transfer	X-modem	Kermit	Command scripts available	Multiple windows	Free	Over $100	Redefinable Keys	Comments
Hyper Term													Works with Hypercard
MacKermit		•			•		•			•		•	Good, fast VT-100. Best Kermit Xfer
MacTerminal	•	•			•	•					•		Fast VT-100, Keypad & arrows hard
Microphone II		•	•	•	•	•	•	•			•		Extensible terminal emulation
MockTerminal					•	•							Desk accessory. Part of MockPackage
Red Ryder		•			•	•	•	•				•	Good cmd scripts. VT-100 < 4800 baud
Unix Windows			•						•	•			Works mainly with UNIX. Adm31 emul.
VersaTerm Pro		•	•	•	•	•	•	•			•	•	Cadillac. Tekt color 4105 on Mac II

UWRIM, TAGS, AND "HOME-BREWED DBMS" USERS ON THE CYBER MUST CONVERT

The Cyber will be retired December 31, 1988. It is time to convert UWRIM, TAGS, or any other database management applications you have to another system. CSO is currently offering INGRES on the Gould (uxg) and SQL/DS on the IBM (VMD) as alternative database management systems for your applications. Persons that have been using ICE for exceptionally large files are strongly urged to convert now — database packages are good for this. If you have any questions or concerns about conversion, please call the Systems Consultants at 333-6133 or call Esther Edwards-Iwe at 244-1204.

EXTRA CONVERSION CONSULTING AVAILABLE FOR CYBER STATISTICAL PACKAGE USERS

The Cyber 175 computer will be removed from service in December, 1988. To assist Cyber statistical package users in converting their applications to another computer, the CSO Statistical Consultants are offering a special appointment-based consulting service. This service will be available Monday and Wednesday afternoons from 1-5 pm beginning August 22 and continuing through the end of October.

It is anticipated that most users of this service will be Cyber SPSS users, though consultants will assist other Cyber statistical package users as well (for example, those who submit SAS jobs to VMBATCH from the Cyber). Users should bring to their appointments as much information as possible about their program and data files, tape files, etc.

To schedule an appointment of up to one hour in length, phone 333-6630. Please try to schedule your appointments at least a day in advance. Please assess your conversion needs now. If you feel you could benefit from extra conversion consulting assistance, please call for an appointment.

CONVERT YOUR CYBER ARCHIVE TAPES — NOW!

Becky Wetzel
CSO Systems Consultant

The Cyber will leave in December, 1988. Now is the time to convert your Cyber Archive tapes. Archive tapes are written in the Cyber internal tape format (I format) that can only be read on the Cyber and certain other CDC computers. In addition, Archive tapes are written in a form that only the Archive program can understand. Your Archive tapes will not be readable after the Cyber leaves. Therefore, it is imperative that you convert them now to a standard form of tape that can be read by other computers.

(We use the term "a standard form of tape" to mean a fixed block character tape. This is a tape containing character data (as opposed to binary information) written in the EBCDIC or ASCII character code with each line (record) in a file written with the same fixed length and with an integral number of lines (records) written contiguously, one after another, in a block. Records do not span blocks. Such a tape can be read on virtually any computer.)

Here is a brief discussion of the steps involved in converting your Archive tape.

First, determine what is on your Archive tape. You may have a listing from your most recent Archive run that contains this information or you may want to run the EXAMINE or CATALOG program on each of your Archive tapes to see which is the most recent and what it contains.

Next, you must decide which files you can and want to write to a standard form tape. Remember, only character files can be written to a standard tape. If you have binary files, such as unformatted Fortran output files or SPSS system files, that contain information you still need, you must use appropriate Fortran or SPSS programs to read these binary files and write formatted, character files. These character files can then be written to your standard form tape.

Next, estimate the disk space and file count limits you will need to load the desired files from your Archive tape to disk, and have your limits increased, if necessary. The output from your earlier EXAMINE or CATALOG runs will help to make these estimates.

You are now ready to use Archive to load your files from your Archive tape to disk. You can load selected files to disk, or you can load all files to disk. Often people find it desirable to load all files to disk so that they can look at the files or let EXPORT look at the files to help them decide which files to write to a standard form tape.

And now, use the EXPORT program to write your disk files to a standard form tape.

After this, your Archive conversion is complete. But we urge you not to stop here; instead, continue and make a backup copy of your standard form tape. Tape is an excellent medium for transporting files between computers and for holding information not currently needed on-line, but tapes can and do occasionally develop bad or unreadable spots. All important tapes should be backed up on a second tape.

Finally, purge from disk the files that you have written to your standard form tape and that you no longer need on disk.

The document, "Converting Cyber Archive Tapes," explains the conversion process in detail, with examples, and is available free-of-charge in the Systems Consulting Office, 1208 West Springfield, Urbana, and in the Statistical Consulting Office, 85 Commerce West. The EXPORT documentation is available on-line on the Cyber. Type the command: WRITEUP, EXPORT, then PRINT the document received.

As always, if you have questions about converting your Archive tapes, please contact the Systems Consultants or the Statistical Consultants at the addresses just given.

Don't delay. Don't be in the sad situation of encountering a last minute conversion crunch or of finding an unconverted, important Archive tape in January.

CONVERT YOUR CYBER I FORMAT TAPES — NOW!

Becky Wetzel
CSO Systems Consultant

The Cyber will be leaving in December, 1988. Some of you still have Cyber I format tapes, and they will not be readable after the Cyber leaves. I format has been the default tape format on the Cyber since the Cyber arrived in 1976. If you have used LABEL statements of the following forms to write your tapes, you have I format tapes.

LABEL(TAPE,VSN=MYTAPE-TEMP,PO=W,SI=MYTAPE,FI=BREAD,QN=1,W)

LABEL(TAPE,VSN=MYTAPE-TEMP,PO=W,F=I,SI=MYTAPE,FI=BUTTER,QN=9999)

In the first case, no F= (Format=) was specified, so I format was the default. In the second case, F=I (Format=I) was explicitly specified.

You must use the Cyber to convert your I format tapes to standard form tapes before the Cyber leaves. (See the previous article, "Convert Your Cyber Archive Tapes -- Now!," for a definition of "standard form tapes.")

Several techniques are available to handle the conversion of your I format tapes, depending in part on the number of tape files involved and in part on how much you know about the characteristics of those files.

(The following discussion assumes that your I format tape is a labeled tape, as that is the default and has been the recommended form. It also assumes the usual case that one tape file is the equivalent of one disk file. If your tape is different than this, you may need to make some changes in these procedures.)

Let's start by deciding if you want to write the files to a standard form tape or if there are only a relatively few files and you want to use PUNCHC to send them to another computer (UIUCVMD, uiucuxh, uiucuxg, etc.). (In either case, remember that only character files can be written to a standard form tape or PUNCHC'ed to another computer. Any binary files must be converted to character files on the Cyber before they are eligible to be transmitted elsewhere.)

If you have only a few tape files to save and want to PUNCHC them elsewhere, simply use the combination of a LABEL statement and a COPYEI statement once for each file to move it from your I format tape to disk, then use PUNCHC, preferably once per file, to transmit a copy of the disk file to another computer. Documentation on the use of PUNCHC is in *Off-Line* of July/August, 1988, pages 39-40, and is also available in the Systems Consulting Office, 1208 W. Springfield, Urbana.

(Alternatively, instead of using PUNCHC to send the files to another computer, you might elect to download the files from the Cyber disk to a microcomputer, depending on how you have chosen to handle your Cyber conversion. Information on downloading files from the Cyber to a microcomputer is available from the Microcomputer Consulting Office, 94 Commerce West.)

If you have only a few files and want to write them to a standard form tape and you know the line lengths of the files, you can write the files directly from your I format tape to a standard form tape using the utility TBLOCK (for upper case files) or the utility COPYCH (for upper/lower case files). Or you can use a COPYEI statement for each file to copy it from your I format tape to disk, then use TBLOCK or COPYCH to write the files from disk to your standard form tape. Either case will

require a TBLOCK or COPYCH command for each file to be written to the standard form tape, but this is not burdensome if the number of files involved is relatively small. (The TBLOCK reference guide, RF-7.25, is available free at each CSO site. The COPYCH document is available free at 1208 West Springfield, Urbana. Using TBLOCK and COPYCH to write files from disk to a standard form tape is also discussed in TN-152, "Taking Cyber Files on Magnetic Tape to Another Computer," available at most CSO sites and in the Systems Consulting Office.)

If you have many files to move to a standard form tape or you are not sure about appropriate line lengths for writing the files to a standard form tape, you will want to COPYEI each file from the I format tape to disk, then use EXPORT to write the files from disk to a standard form tape. While it still requires a set of commands for each file to be copied from the I format tape to disk, they are straightforward and brief commands and do not require a priori knowledge of the particular file being moved. EXPORT will then help you decide which files can be written to a standard form tape and will help you choose appropriate line lengths for these files, and EXPORT will generate the TBLOCK and COPYCH commands necessary to write the disk files to the standard form tape.

The EXPORT document is available on-line by typing: WRITEUP,EXPORT. An old and worn, but still viable, document telling how to copy files from an I format tape to disk is available at the Systems Consulting Office, 1208 West Springfield, Urbana.

Go through your tapes carefully and decide which need to be converted. Remember, your I format tapes will not be readable after December. It is better to convert a tape containing information you later find you don't need, than to miss a tape containing information you do need.

Finally, if the new standard form tape is important, back it up on a second tape. The document, "Converting Cyber Archive Tapes," available in the Consulting Offices, has clear directions on how to write a backup copy of your standard form tape.

If you have questions about converting your I format tapes or want to discuss various options, please contact the Systems Consultants, 1208 West Springfield, Urbana, or the Statistical Consultants, 85 Commerce West.

SQL/DS VERSION 2.1 INSTALLED ON IBM/CMS (VMD)

Esther Edwards-Iwe
CSO Systems Consultant

CSO has recently installed the Structured Query Language/Data System (SQL/DS) Version 2.1 on the IBM 3081 (VMD). SQL/DS is a relational database management system developed by IBM for the VM/SP environment. SQL/DS and DB2 (which operates in a Multiple Virtual Storage (MVS) environment) are broadly compatible. They both use the Structured Query Language (SQL) — pronounced 'sequel'.

SQL allows you to retrieve, insert, update and delete data; add new tables to the database, protect private data, and more. SQL is an easy-to-learn, non-procedural language. Non-procedural language means you can use the SQL language to interact with your data by telling it what you want, rather than how to do it. For example:

```
select * from inventory where description='bolts'
select count(distinct partno) from quotations
delete from inventory where description='bolt'
```

SQL can be used through an interactive interface or by embedding statements in a procedural language such as FORTRAN, COBOL or PL/I.

To use SQL/DS, you must do the following:

- Obtain a logon on the IBM 3081(Gx) (VMD)
- Register your logon to use SQL/DS by calling the Systems Consulting Office at 333-6133 (or call Esther Edwards-Iwe at 244-1204).

PRODUCTION RELEASE OF SAS INSTALLED

Vicky Dingler
CSO Statistical Consultant

Version 5.18 of SAS has been installed on VMD. This production release of SAS is an enhancement of Version 5.16 and includes new procedures.

To use SAS Version 5.18, use the LINKTO command as follows:

LINKTO SAS (F

The parameter (**F** indicates that the future version of SAS, that is version 5.18, will be linked. The current version of SAS is still version 5.16. Version 5.18 will become the default (current) version on November 14th, 1988.

There are a number of new features in version 5.18. The TAPECOPY procedure can be used with 3480 tape cartridges. The Micro-to-Host Link downloads Version 5 SAS catalogs and uses the IBM 7171 protocol converter. SAS/GRAPH has new options in the GOPTIONS statement, two new map data sets, new fonts and new device drivers.

Several new procedures have been included in the Base product. CATOUT writes information about the SAS catalog directory to a SAS data set or to an external file. This is useful for data base managers to document the contents of their SAS data sets. The CPORT procedure is used to create a transport-format file that contains a SAS catalog or catalogs. This file can be transported to another system to be read by the CIMPORT procedure. The transport file can be written to tape or downloaded to a PC.

On October 24th, the current version of SAS (Version 5.16) will become the PAST version of SAS, available through the command: **LINKTO SAS (PAST**. Previous versions of SAS will be removed on October 24th. The versions in question are SAS 82.3 (**LINKTO SAS823**), SAS 5.08 (**LINKTO SAS(PAST**), and SASBMDP PAST. If there are any problems with this, please contact the consultants at the CSO South Statistical Consulting Office.

If there are any questions about any of the above features or about SAS version 5.18, please refer them to the CSO South Statistical consultants in 85 Commerce West, 333-2170.

NEEDED — A USED QMS LASER PRINTER

We are looking for a used QMS laser printer. If you have, or know of someone who has, a used QMS printer for sale, please contact Virginia Metze, Manager, MRL Center for Computation, Room 244 MRL, 3-6665.

FOR SALE — LISA SYSTEM

The Department of Political Science has a used Lisa system for sale. The system includes:

- Computer with 10 Mb Internal Hard Disk
- 1 Mb RAM
- Keyboard
- Mouse
- Software: Lisa 7/7 Office System

We are asking only $1,200.00 for the entire package. Note: A University Account Number is required.

Please contact Janie Carroll at 333-3881 for further information.

ENGINEER/PROGRAMMER WANTED

Seeking graduate (or possibly an experienced undegraduate) with extensive background in UNIX, C, and use of SUN Workstation. Possibility of ongoing 50% Research Assistentship. Research involves on-line experimentation in visual perception, and estimation of parameters in relevant models. Candidates should be able to install and configure newly purchased SUN Workstation and make it operational.

Contact Professor Ehtibar Dzhafarov at 333-6768 (messages: 333-0631), or by e-mail at E-DZHAFAROV@H.PSYCH.UIUC.EDU

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SURVEY OF INTEREST IN "BMDP PC (1988)".

If you are interested in obtaining a site-license for BMDP PC (1988 release) on your PC, please complete the survey below :

Name : _____

Campus Address : _____

Telephone : _____-_____ *(Office)* _____-_____ *(Home)*

My affiliation with the University is:

_____*Faculty* _____*Staff* _____*Student* *Other:*_____

I own an IBM PC or compatible: ___*No* ___*Yes*

My PC is a:

__*PC/XT* __*PC/AT* __*XT or AT/370* __*PS/2* __*Other:*_____

I would like to get BMDP PC on a site-license basis: ___*No* ___*Yes*

I already have a user site-license for the following:

_____*PC SAS* _____*SPSS/PC+* _____*DOS Systat*

I will use the above product(s) for the following:

___*Research* ___*Class* ___*Both* ___*Other:*_____

What types of analysis are you most interested in carrying out? Please check all applicable categories:

___*ANOVA/Analysis of Covariance* ___*Regression* ___*Categorical Data Analysis*

___*Multivariate Analyses* ___*Time Series Analysis* ___*Non-Parametric Statistics*

___*Graphics* ___*Other:*_____

Please return survey to:

Anup K. Roy
BMDP Coordinator @ UIUC
CSO - 150 DCL
1304 W. Springfield Avenue
Urbana, Illinois 61801.

OFF-LINE MAILING LIST

If you wish to be placed on our mailing list, have a change of address, or wish to be deleted, please check the appropriate box and fill in the information below. Please help us keep our mailing list up-to-date by informing us if issues are being sent to someone no longer in your department; fill in the information below and return to us so that his/her name may be removed from the list.

Please check as appropriate:

_____ Please *ADD* my name to the mailing list.

_____ Please *DELETE* my name from the mailing list.

_____ Please *CHANGE* my address (provide old address also).

If you have a campus mailing address:

Name _____

Department _____

Room & Bldg _____ M/C_____

If you do not have a campus mailing address:

Name _____

Address _____

_____

_____

City, State, Zip _____

If you are requesting a change of address, please indicate your old address:

_____

_____

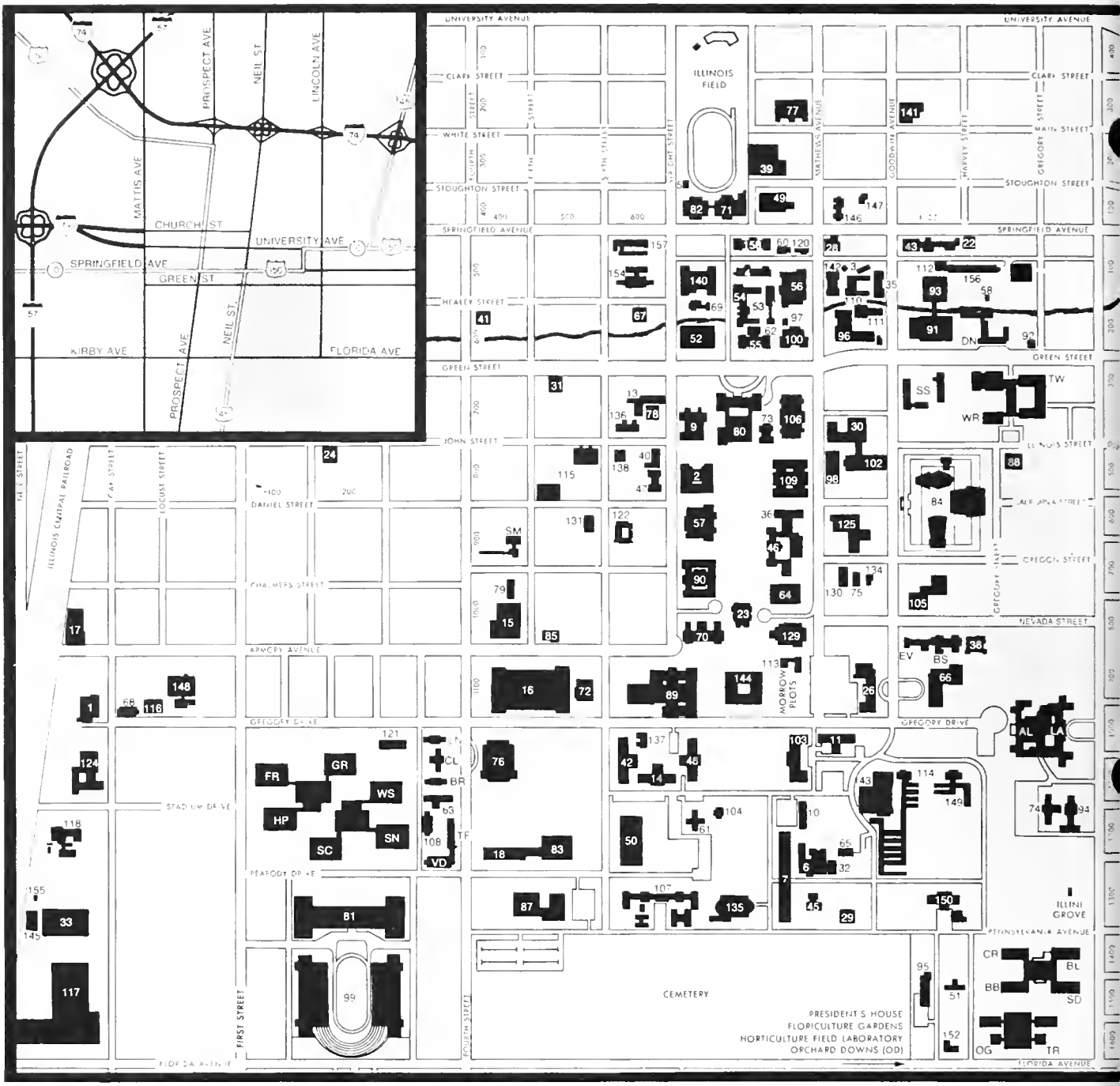
Mail to:

OFF-LINE
Computing Services Office
150 Digital Computer Laboratory (M/C 256)

University of Illinois at Urbana-Champaign
1304 West Springfield Avenue
Urbana, Illinois 61801

CSO SITES

CSO NORTH	
14 Digital Computer Lab 333-7685	Monday-Friday, 6 am - 12 mid. Saturday-Sunday, 8 am - 12 midnight
CSO SOUTH	
70 Commerce West 333-4500	Monday-Thursday, 8 am - 12 mid. Friday-Saturday, 8 am - 10 pm Sunday, 12 noon - 10 pm
AGRICULTURE	
N-120 Turner Hall 333-8170	Monday-Thursday, 8 am - 10 pm Friday, 8 am - 5 pm Saturday, 9 am - 12 noon Sunday, Closed
CHEMISTRY	
154 Noyes Lab 333-1728	Monday-Friday, 9 am - 5 pm Saturday-Sunday, Closed
CRH SNACK BAR	
120 Snack Bar 333-1851	Sunday-Thursday, 12 noon - 12 midnight Friday, 12 noon - 5 pm Saturday, Closed
ELECTRICAL ENGINEERING	
146 Electrical Engineering 333-4936	Monday-Thursday, 8 am - 8 pm Friday, 8 am - 5 pm Saturday, 12 noon - 5 pm Sunday, Closed
ENGLISH BUILDING	
8 English Building 244-0386	Monday-Thursday, 8 am - 12 mid Friday, 8 am - 6 pm Saturday, 12 noon - 6 pm Sunday, 1 pm - 12 mid
FAR	
Florida Avenue Residence Halls 333-2695	Saturday-Thursday, 12 noon - 12 mid Friday, 12 noon - 5 pm
ISR	
Illinois Street Residence Halls 333-0307	Saturday-Thursday, 12 noon - 12 mid Friday, 12 noon - 5 pm
MECHANICAL ENGINEERING	
65 Mechanical Engineering 333-1430	Monday-Friday, 8 am - 12 mid. Saturday-Sunday, 12 noon - 12 midnight
PSYCHOLOGY	
453 Psychology 333-7815	Monday-Friday, 8 am - 5 pm Saturday-Sunday, Closed
SOCIAL SCIENCE	
202 Lincoln Hall 333-0309	Monday-Thursday, 8 am - 10 pm Friday, 8 am - 5 pm Saturday-Sunday, 12 noon - 5 pm
ILLINI UNION MICROCOMPUTER SITE	
244-7935	Monday-Thursday, 8 am - 12 midnight Friday, 8 am - 10 pm Saturday, 10 am - 10 pm Sunday, 12 noon - 12 midnight
MEDIA CENTER -- UNDERGRADUATE LIBRARY	
333-2667	Monday-Thursday, 8 am - 1 am Friday, 8 am - 12 mid Saturday, 9 am - 12 mid Sunday, 12 noon - 1 am



CSO Sites (marked in blue on map)

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52 Electrical Engineering
90 Lincoln Hall
96 Mechanical Engineering
109 Chemistry - Noyes Lab
121 CRH Snack Bar
122 Psychology
143 Agriculture - Turner Hall
Illinois Street Residence Halls
Florida Avenue Residence Halls
CSO Office Building
(101 South Gregory)

GIFT & EXCHANGE DIV
ROOM 314
MAIN LIBRARY
CAMPUS

l. 16, No. 6: November/December 1988

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off line

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tor: Lynn Bilger

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AT URBANA-CHAMPAIGN

CSO

puting Services Office

CSO DIRECTORY

Departmental Office	150	DCL	333-1637
User Accounting Office	1208	W. Springfield	333-7752
Documentation Center	1208	W. Springfield	333-9230
Systems Consulting	1208	W. Springfield	333-6133
Statistical Consulting	85	Comm West	333-2170
Microcomputer Consulting	91	Comm West	244-0608
Microcomputer Resource Center	106	CSOB*	244-6261
Text Processing Consulting	212	CSOB*	333-7318
Maintenance & Repair Service	194	DCL	333-0969
Tape Service, Special Plots, Special Printers.	14	DCL	333-8640

*CSOB is the CSO Office Building, located at 101 South Gregory, Urbana.

DIAL-UP NUMBERS

IBM 3081 GX (uiucvmd)	300	baud	333-4006
Cyber 175 (uiucnosa)	300	baud	333-4000
SWITCH	1200	baud	333-4008
	2400	baud	333-4007
TELENET (local no.)			384-6428

LOCALNET CALL NUMBERS

Note: Certain CSO Sites are on a separate channel of LocalNet than the rest of the campus. These are designated below as **A Sites** and include the following CSO Sites: ME, EE, COMM, LH, and AGRIC. All other LocalNet access areas are designated as **B Sites**.

VMD	CALL 4000	(line mode - A Sites)
	CALL 4100	(line mode - B Sites)
	CALL 4400	(full-screen mode - A Sites)
	CALL 4500	(full-screen mode - B Sites)
VME	CALL 4600	(A Sites)
	CALL 4700	(B Sites)
uxa (Pyramid 90x)	CALL 66AC	(A Sites)
	CALL 66AA	(B Sites)
uxe (Pyramid 90x)	CALL 12FA	(A Sites)
	CALL 12EE	(B Sites)
uxf (Sequent)	CALL 66C0	(A Sites)
	CALL 66BB	(B Sites)
uxg (Gould)	CALL 1000	(B Sites only)
uxh (Convex)	CALL 1850	(A Sites)
	CALL 1800	(B Sites
NOSA	CALL 1650	(A Sites)
	CALL 1750	(B Sites)
LCS	CALL 6400	
TELENET	CALL 1550	

*** LAST WARNING! ***

CYBER TO BE UNPLUGGED

DECEMBER 31, 1988

DON'T WAIT UNTIL IT IS TOO LATE: ALL PROGRAMS, TAPES, ARCHIVE TAPES, ETC. MUST BE CONVERTED NOW!

SEE THE CONSULTANTS
IF YOU NEED HELP.

Volume 16
Number 6
November/December 1988

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Articles, suggestions, comments and/or subscription requests may be sent to: Lynn Bilger, Off-Line Editor, 150 Digital Computer Lab, University of Illinois, 1304 W. Springfield, Urbana, IL 61801 (telephone: (217) 333-6236; email: bilger@uxe.cso.uiuc.edu).

CYBER STATISTICAL PACKAGE USERS: EXTRA CONVERSION CONSULTING HAS BEEN EXTENDED

The Cyber 175 computer will be removed from service in December, 1988. To assist Cyber statistical package users in converting their applications to another computer, the CSO Statistical Consultants have been offering a special appointment-based consulting service. This service is available Monday and Wednesday afternoons from 1-5 pm and was due to be available only through October. Because the service has been well received, it has been extended and will be offered as long as demand warrants, or until the Cyber is removed.

Most users of this service have been Cyber SPSS users, though consultants also assist other Cyber statistical package users (for example, those who submit SAS jobs to VMBATCH from the Cyber). Users should bring to their appointments as much information as possible about their program and data files, tape files, etc.

To schedule an appointment of up to one hour in length, phone 333-6630. Please try to schedule appointments at least a day in advance.

Assess your conversion needs now. If you could benefit from extra conversion consulting assistance, please call for an appointment.

SQL/DS SUPPORT CHANGES

Support for SQL/DS has changed hands from Esther Edwards-Iwe to Vicky Dingler, 333-4668. As printed in the September/October 1988 issue of *Off-Line*, SQL/DS is available on VMD. SQL/DS is a relational data base management system which allows large-scale data manipulation.

Anyone interested in using SQL/DS must obtain a Research Board Account or a hard money account. An SQL/DS signon and password will be assigned to each user by Vicky Dingler. Classes can also use SQL/DS.

A short course will be offered next semester on the basics of using SQL/DS. Topics will include accessing SQL/DS, using the example data files, creating new tables, reading and writing external data files, and producing printed output. (Note: The Short Course announcement for next semester [when printed] will automatically be sent to everyone on the *Off-Line* mailing list.)

CSO also supports Ingres, a relational data base on uxg and microcomputers. An introductory short course on Ingres also will be offered next semester.

REMINDER: OFFLINE ADDRESS NOW AVAILABLE FOR E-MAIL

A mail address, called **offline**, has now been set up on uxe (uxe.cso.uiuc.edu) so that users may mail requests (1) to be added to the *Off-Line* mailing list, (2) to be deleted from the list, or (3) to notify us of changes of address. Users should send e-mail via the Internet network address:

offline@uxe.cso.uiuc.edu

Users who wish to send comments/suggestions/articles to the editor should send e-mail to:

bilger@uxe.cso.uiuc.edu

ANNOUNCING A NEW COURIER SERVICE AT CSO SOUTH

On Monday, October 3, CSO began a Courier Service between CSO North (DCL) and CSO South in Commerce West. This service is available on a trial basis this semester. Afterwards, its continuation will be evaluated.

Presently, 3800 printer output and LABELS output are eligible for courier delivery. Our objective is to save you the trouble of having to pick up this output from DCL (especially with the current construction around DCL!).

All output printed to special bin numbers before 4:00 pm will be transported between 4:00 - 5:00 pm from DCL to Commerce West every Monday through Friday.

To have your labels or 3800 printer output delivered to CSO South (70 Commerce West), specify a special bin number in the range:

BIN C0, BIN C1, ...to... BIN C9

If you have questions contact the CSO South operator at 333-4500.

ANNOUNCEMENTS OF NEW PC SOFTWARE AVAILABLE VIA PDUSIG

Announcements of new PC software, as well as announcements and updates on viruses and virus protection/repair programs, are available via the PDUSIG mailing list. For example, an announcement that appeared in the PDUSIG mailing list recently is that PC-Write Version 3.0 (a good shareware word processor) is available from uxe in **/micro/pc/exec-pc** in the files **pcw30a.arc** (program), pcw30b.arc (utilities), and **pcw30c.arc** (documentation).

Users on an IBM system can subscribe to PDUSIG with the command

TELL LISTSERV AT UIUCVME SUB PDUSIG (yourname)

where **(yourname)** is your real name spelled out, capitalized and in parentheses.

Users on any system can access PDUSIG via mail by entering

mail listserv@vme.cso.uiuc.edu

and then entering **SUB PDUSIG (yourname)** as the first line of the message.

Users should also be aware that the PC-SIG CD-ROM Library (a collection of public domain and shareware programs for micros) is now available on uxa and uxe in addition to VMD. Announcements describing newly available PC-SIG disks have also been sent to PDUSIG.
Once you have subscribed, you may request logs of old mail with commands like TELL LISTSERV AT UIUCVME GET PDUSIG LOG8811. An article on how to access this library on VMD appeared in the July/August issue of *Off-Line*.

WHAT'S NEW IN THE MRC?

Bi-Shen Chuang and Mark Zinzow
Microcomputer Resource Center

Since the CSO Microcomputer Resource Center moved to the Federal Room in the north basement of the Illini Union, its usage has significantly increased. We hope this is because of our convenient location, articles and flyers, and, most importantly, because satisfied patrons are telling their friends. The MRC is a library and information center which provides multifaceted service to the campus microcomputing community. University faculty, staff, and students are familiar with the Center's function as a major hardware/software evaluation center. We would like you to further take advantage of the Center's information services.

At the MRC, we aim to provide fast and effective information services. We are devoted to looking for up-to-date, accurate, and complete answers to your inquires; our staff is trained to answer your questions from general to specific. By telephoning the Center (244-6264 or 244-6261), or just walking in, you can find, for example, where there are scanners on campus, which site-licensed packages the University has, or what terminal emulators are available. At the MRC, you will also find information on modems, external disk drives, microcomputers, printers, etc., as well as learning ways to fight viruses. Our staff members are constantly developing their specialties and are supported by the various CSO service groups, including microcomputing, networking, systems, consulting, etc.

The Center's file contents, printed indexes, magazines, and reference publications are available for your use. You may locate, for example, literature on the NeXT computers, or the Apple Macintosh IIx computer. To simplify the search process, we are looking into the possibility of subscribing to a CD-ROM index for searching the contents of magazines simply by entering a keyword or phrase.

Our hardware and software collections continue to grow. In the past two months, we have added an external drive to our Amiga 500 and expanded its memory to one megabyte. An Apple Macintosh IIx computer, which enhances the performance of the Macintosh II and provides more storage capacity and improved MS-DOS and OS/2 integration, has been added to our hardware family. In the software area, we have acquired additional commercial software, demo packages, updates, and 22 new packages from Wisc-Ware.

An Atari computer with the MagicSac+ software package has been provided to the MRC by One Stop. Other software provided with the Atari includes: CyberPaint; CAD-3D 2.0; two games — DungeonMaster and OIDS; and a cartridge that allows the Atari to emulate a MAC. One Stop also plans to provide an IBM emulator, some public domain software, and a hard disk in the near future.

The MRC can introduce you to many of the collections of software available via the campus network, such as the BBS downloads of interesting programs available on uxe, including all the programs from recent issues of PC Magazine. Also available are many anti-virus programs, and several laptop-to-PC file transfer programs like ZIP121.ARC, and PDREMOTE.ARC. Here also is the world's first entirely shareware book!

New Commercial Software

Title	*Publisher*	*Application*
INGRES	Relational Technology Inc.	SQL Relational DBMS
Microsoft Excel 2.10	Microsoft Corp.	Spreadsheet
Microsoft PowerPoint 2.0(MAC)	Microsoft Corp.	Presentation Graphics
The MPW System(MAC)	APDA	

(The entire Macintosh Programmer's Workshop system includes MPW: Macintosh Programmer's Workshop 2.0.2, MPW C: Macintosh Programmer's Workshop C 2.0.2, MPW Pascal: Macintosh Programmer's Workshop Pascal 2.0.2, and MacAPP: The Expandable Macintosh Application 1.1.1.)

New Demonstration Package

PlanPerfect 3.0 (This demo disk may be freely copied.)	WordPerfect Corp.	Spreadsheet

Updates

FoxBASE+/Mac 1.10	Fox Software, Inc.	Relational DBMS
Macintosh System Software Update 6.0.2(MAC)	Apple Computer, Inc.	System Software

(This update contains four disks which are free for you to copy but it requires users to obtain a copy of the site license agreement at the MRC.)

MacTerminal 2.2 Update Disk (MAC)	Apple Computer, Inc.	Communications
SuperPaint 1.1 Update Disk (MAC)	Silicon Beach Software, Inc.	Graphics

Wisc-Ware New Additions

The latest distribution of software from Wisc-Ware brings 22 new packages and updates for two previously published packages. Fifteen of the new packages require Microsoft Windows Presentation Manager version 2.03 (Packages 72, 75, 76 and 78-89.). Effective with this release, five packages (Packages 45-49) have been withdrawn from distribution and returned to Wisc-Ware.

Updates:

Package 31. PCWAVE 1.1 from UCLA.

Package 55. MEKA/MEKAEDIT 1.2 from the University of California, Berkeley.

New Packages:

69. Texas Census Data System 1.0 University of Texas, Austin
A package of database programs designed to simplify the use of the United States Manuscript Census Returns for teaching and research. These programs are specially designed so that a group of students or members of a research project team can work together sharing the tasks of data entry and management for Census Data from 1850, 1860, 1870, 1880, 1900, and 1910.

70. SONNET 1.0 UCLA
An easy to use introduction to the structural elements of the English sonnet.

71. GLOSSA 1.0 University of North Carolina, Chapel Hill
A software system designed to give students help in reading texts in a variety of foreign languages. The system consists of two parts: (a) the reading program, which selects and presents the text and notes; (b) the study units -- each made up of its own text and note files. Units for Catullus and Cicero in Latin and Goethe in German are currently being written.

72. QLPWIN 1.0 University of Texas, Austin
A set of programs for solving quadratic-linear deterministic optimal control problems in the windows environment. Two programs are in the set. QLP is the solver and QLPPLOT provides plotted output on the display of the optimal control and state variables.

73. TRANSLIT 1.0 University of North Carolina, ECS
Translit is a text filter which performs transliteration of character strings. (Software is free with own disk at the MRC.)

74. PC-Cube 1.0 California Institute of Technology
PC-Cube creates an inexpensive real parallel system for hands-on learning of concurrent (parallel) computing and for the development of parallel applications.

75. Physics Demos 1.0 (Windows Version) University of Wisconsin, Madison
A package of ten demonstrations covering the physics of motion and sound. The educational programs are designed to accompany the book "Physics Demonstration," which is currently under development, and a series of video tapes, "The Wonders of Physics." The level is secondary school and beginning college. A MS-DOS version of this program is offered as package# 77.

76. PREDCALC 3.0 University of Wisconsin, Madison
A program designed as a supplement to an advanced undergraduate course in mathematical logic. It demonstrates the rules of formation for formulas of first order predicate logic, and the corresponding inductive definition of the truth value of a formula. (Software is free with own disk at the the MRC.)

77. Physics Demos 1.0 (MS-DOS) University of Wisconsin, Madison
Please see package #75 for a description.

78. LNS 1.0 University of Wisconsin, Madison
Logic Network Systems is a software environment for simulating networks of logic gates, flip-flops and programmable logic blocks. It consists of an editor for writing and changing descriptions of networks, an event-driven simulator that rapidly turns descriptions into results, and a means for viewing and printing those results.

79. EPIGRAPH 2.0 University of Wisconsin, Madison
An interactive instructional program to teach students some basic concepts in plant disease epidemiology. It introduces students to simple mathematical models used by epidemiologists to describe the progress of plant disease. (Software is free with own disk at the MRC.)

80. CRYSTALLAB 1.0 University of Wisconsin, Madison
This program is intended to provide rapid graphical solutions of important crystallographic information to students and researchers in the field of transmission electron microscopy.

81. FLINCOR 1.0 University of Wisconsin, Madison
FLINCOR is designed to calculate P-T isochores for geologically important fluids composed of H2O, CO2 and NaCl.

82. PCT 1.0 University of Wisconsin, Madison
The Principal Component Transformation enhances a set of images of the same scene taken simultaneously in different wavelengths. The images might be from different wavelength sensors on a satellite, from different color separations of a photograph, or from red, green and blue components of a color video camera.

83. CIRC 1.0 University of Wisconsin, Madison
A tutorial in electronic circuit behavior. It allows the students to study the frequency response of various electronic circuits, including inverting op amps, passive filters, and simple impedances.

84. ASA 1.0 University of Wisconsin, Madison
Analysis and Simulation of Assembly Systems provides analysis, simulation and design optimization for medium to small asynchronous automatic assembly systems (AAS). (Software is free with own disk at the MRC.)

85. POPSIM 1.0 University of Texas, Austin
POPSIM uses a heuristic approach to teaching plant population dynamics. (Software is free with own disk at the Center.)

86. VAL 0.9 University of Wisconsin, Madison
VAL, the Security Valuation Package, allows users to analyze a security using any one of a number of valuation models.

87. MAPDATA 1.0 University of Pennsylvania
A data mapping application for Microsoft Windows. The program brings together two basic types of files, the boundary file and the data file, to create an image. MAPDATA automatically matches data files with the boundary files in the workspace so that only the relevant data is displayed.

88. Differential Equations and Surfaces for Windows 1.0 University of Illinois, Urbana-Champaign
This program uses computer graphics to make complicated concepts in differential equations easier to understand. It also demonstrates three-dimensional rotations, a new parser, the power of numerical methods, and the graphical capabilities of Microsoft Windows.

89. ANTS 1.0 University of Wisconsin, Madison
An interactive program to study the system reliability of different ant foraging strategies.

90. U.S. History 1.0 Johnson Community College
This program consists of nine units. Each unit has 20-25 questions (multiple choice) which focus only on the part of history that is described in the unit name.

Please note that the MRC is seriously evaluating its continued membership in Wisc-Ware, so if you value this service, please fill out our Wisc-Ware survey to let us know.

The Resource Center has also acquired a copy of Inside Macintosh, Vol. IV, which is a companion to the first three-volume set already in the Center. Vol. IV provides information on writing software for the Macintosh Plus and 512k enhanced.

LIVING VIDEOTEXT'S MORE™ AVAILABLE IN THE MRC

David Long
Microcomputer Resource Center

MORE™ is a new Macintosh package in the Micro Resource Center that is being billed as "The productivity tool for the successful manager." It includes a number of outlining features, along with automatic presentation chart generation, and runs on any Macintosh with at least 512k.

The outlining features include hoisting, cloning, finding and changing, marking and gathering, 'graphic' and 'document' windows. Hoisting allows you to zoom in on one section of the outline, which is helpful with large outlines. Cloning allows you to make an automatically updated duplicate of part of an outline. The finding and changing features are case sensitive and include a number of wildcard searches. Marking 'tags' a particular line in an outline, and gathering makes copies of marked lines and puts them together in a group under one sub-heading. The finding and changing features can be used to automatically mark all occurrences of any word or string, which can then be gathered together. Pictures and larger documents can be included in 'graphic' or 'document' windows under any line. Tree charts created by MORE can be pasted in these windows, or pictures may be imported from the scrapbook. There are, however, no provisions for modifying graphics once imported. Document windows may contain longer, more extensive text under a particular topic.

Moving items around can be accomplished using keyboard, menu, or mouse commands. Outlines may be exported in Microsoft Word 1.1, MacWrite, or text formats, and printouts can include a table of contents, the degree of detail of which can be specified from a dialog box.

MORE also features automatic bullet chart and tree chart generation for 'instant' presentations. Both types of charts are prepared from the currently selected level of the outline, and many aspects may be modified by the user. Both may also be exported to MacDraw format for more extensive changes.

MORE has a number of features it labels "productivity" features. Among these is the Calendar command. It creates an outline for any day, week, or year specified by the user, with a line for each hour, half hour, or whatever division of time desired under each day. Another of these features is phone dialing. For users who have modems, MORE will dial any phone number in an outline when the line containing the number is selected. On a Mac II with color, MORE allows different colors to be specified for nearly every part of a window, outline, tree or bullet chart.

In addition, the current version of MORE is shipped with a copy of the desk accessory outliner Acta. Acta reads and writes MORE files, making it possible to work with MORE outlines from within other programs.

Strengths

The outlining features of this package appear to work well. Nearly all of the commands are accessible from either the menus or the keyboard, making operation of the program smooth. The tree and bullet chart generation is impressive, making presentation-quality materials almost instantly, and with the proper output hardware, color presentation materials can be made. In addition, MORE looks absolutely beautiful on a color Mac II.

Weaknesses

This program definitely needs a spelling checker for error-checking of presentation materials, and for ensuring that the search and replace features function properly. It is easy to create a large document with this program in which small errors could hide in a document window or lower subheading.

Another problem I noticed regards the keyboard command for expanding the 'document' windows, which is to press the Enter key. This could be awkward, especially on an extended keyboard, where the Enter key is on the rightmost end of the keyboard. (Incidentally, finding out what the keyboard command was drove me to the manual!)

MORE does not wrap text within the document window, which can be a problem on a small screen. It does follow the cursor, automatically shifting the view of the text, but this can be annoying, making the screen flicker around a lot. I found this lack of text wrapping to be the program's most annoying feature, especially in light of the fact that the document windows, within which text does wrap, are not easily available from the keyboard. I did notice that Acta handles text wrapping within the window automatically, even when it is resized to be rather small.

Conclusions

All in all, MORE appears to be a good package for organizing your work, and then making quick presentations of it. It gives you the tools to arrange and rearrange your ideas so that they flow together smoothly and logically, and it makes printed output that looks good, so that you can spend your time concentrating on the subject matter at hand rather than fiddling about trying to make your presentation materials look right. I think this would be a good package for professors for organizing and preparing lecture notes and for making good quality overheads. We now have an evaluation copy of MORE in the MRC, so please feel free to come in and take a look for yourself.

REVIEW OF THINK'S LIGHTSPEEDC™ VERSION 3.0

Brad Morris
Microcomputer Resource Center

(Editor's note: This article reflects the opinion of the author and does not necessarily constitute an endorsement or recommendation by CSO or the U of I. This package is available in the MRC for evaluation. Our copy was provided by Edutech and is available through them with both educational and quantity discounts.)

Think's latest version of their popular C compiler has added new features including automatic headers, a debugger, and full compatibility with the Mac SE and Mac II, sending this already fast package into light speed. That's right, crank up the warp engines, Scotty, because this package is so full of bells and whistles that it takes two megs of memory and a hard disk to fully use all the features. LightspeedC™ of old has been used to create applications such as PageMaker 2.0, and now the speed and power have been increased in Version 3.0.

For those that have never used LightspeedC, you will be delighted at the ease of use. Gone are the hassles of compiling, linking and keeping track of file names. Instead, LightspeedC uses a project manager which keeps track of all the files in your program, links them flawlessly, and lets you run them without wasting time with making applications every time you want to change the program. The manager is even smart enough to know if you have changed some parts of your code and not others, so that it will only compile what it has to.

Their approach makes it easy if you just want to get simple programs up and running, and the manual gives an example for those who want to generate standard C code. For compatibility's sake, they have included many of the popular UNIX libraries. They have even included a program segment which allows you to use a UNIX command line, along with redirection.

For those that want to develop Mac applications, Lightspeed includes full implementation of all toolbox routines. If you have not worked with Mac programming before, the manual does not help very much in getting started. As it suggests, pick up a copy of Inside Macintosh (Volumes I-III are a must) and look through the samples included with the package for the specifics of implementing the routines in LightspeedC. The manual also includes no tutorial on C, so brush up if you are rusty.

For those that have used LightspeedC before, you will be pleased with the improvements in the program. These come in two basic areas, the source level debugger and precompiled headers. The debugger comes complete with steps, trace, data windows and other goodies. The problem is that it requires two meg of ram to run the debugger. The precompiled headers can save you time because they contain most of the declarations you would make for a standard Macintosh program, and are in a form which quickly compiles so your waiting is reduced to a minimum.

All in all, Think's latest offering lives up to the program's reputation of being a fast C workhorse. Those that have never used C on the Mac will be pleasantly surprised at the ease of use and the speed of it. Those that have used LightspeedC in its earlier incarnations will be pleased with the new features that keep LightspeedC light years ahead of its competitors.

BRAIN VIRUS UPDATE

Lynn Bilger, Editor
Mark Zinzow, MRC

On Thursday, October 20, 1988, the BRAIN virus was discovered by the PC Consultants on a student's disk that had been used at the Foreign Language lab. It was estimated that the infection had spread for at least three weeks undetected. As soon as the BRAIN virus was detected, CSO made a concerted effort to gather information about this virus and its mutant strains, along with information about detection and removal programs, from various sources such as Lehigh University, NBBS, Bitnic, etc.

Samples of "our" BRAIN virus were compared with the "original" version written by two Pakistani brothers. Since our version had a different message at the beginning, we thought we had a mutant version that might have behaved differently than the original, and that might have been potentially more dangerous. One difference was the string "VIRUS_SHOE RECORD v9.0" which appeared shortly after the "Welcome to the Dungeon" message in the boot sector. After further investigation, we decided that although we did seem to have a mutant version, it behaved basically in the same manner as the original — just had a different message.

Since the BRAIN virus is still appearing at various places around campus, we have decided to publish this update, explaining how the virus works and what you can do if you find your computer has been infected. We have also included a section reminding users how to protect themselves against virus attacks.

Many files about viruses, protection software, etc. are available on uxe in **micro/pc/virus** (or **pc/virus** from **anonymous ftp**). We recommend that users peruse these files periodically for the latest information on the above subjects. A partial listing of these files will be presented at the end of this article.

How the BRAIN Virus Behaves

The BRAIN virus is a type of virus called a "boot infector." This means that it writes itself to the Boot Record section (sector 0) of a disk. Initially, it is transmitted to a system when that system is booted from an infected disk. It then remains in the system's memory and, from there, spreads to other disks as it comes into contact with them. The original version only infects 360K disks.

The BRAIN virus damages a disk it comes into contact with by overwriting some sectors of data with its own code and by rendering other sectors unusable, and marking all of these sectors as bad sectors. Obviously, this causes some loss of data.

A common misconception is that the BRAIN virus infects systems only via system disks with executable files (e.g., .COM, .EXE, SYS). However, since it resides in the boot sector of a disk, and all disks have a boot sector, it can infect any system booted from either an infected system disk or an infected non-system (data) disk. Note that once the virus infects a system, it can spread to any disk used in that system; however, the only way it can spread to another system is by booting the other system with an infected disk. **The important point to make here is that you should never boot from any system disk you are not sure about or try to boot from a data disk.**

Another important point to make here is that you should never use the keyboard reset (Ctrl-Alt-Del) to reboot any machine that you believe has been infected — this will **not** erase the virus from

memory. You **MUST** turn the machine off and then reboot from your original DOS distribution disk (or a back-up copy you have previously made of this disk). (We recommend that you make back-up copies of all original program disks when you first get them and store in a safe place (along with your original disks). Then, when it becomes necessary to reboot your system from the "originals", you can use the back-up copies some of the time so that you do not "wear out" the originals.)

How to Check a Disk for Infection

If you suspect you may have an infected disk, there are several methods recommended for checking the disk. Before using any of these methods, you **must** turn your machine off and reboot from an original DOS distribution disk or a clean back-up copy of the original.

On campus, we recommend that you make a copy of the DEBRAIN.EXE program at the Microcomputing Resource Center (MRC - in the Federal room of the Illini Union), and use this program to check your disk(s). This program can also be downloaded from /micro/pc/virus/debrain.exe on uxe (or pc/virus/debrain.exe via anonymous ftp). DEBRAIN.EXE will check disks for the BRAIN virus and will also remove it if found.

For those users who do not wish to get the above program, or are off-campus, an easy method is to use the DIR command. If you have not assigned a volume label to your disk, DIR may say

```
Volume in drive x is (c) Brain
```

instead of the normal

```
Volume in drive x has no label
```

If DIR displays the first message above, this means that your disk has been damaged. (Note: If you have labeled your disk, this virus may not change the volume label although it will still damage your disk.) Also be aware that this check is not conclusive.

A second method is to use a utility program, such as Norton Utilities, to examine the Boot Record section (sector 0) of your disk. If the virus is present, it will have written "(c) Brain" in this area and/or "Welcome to the Dungeon," along with some other messages.

A third method is to use the DOS DEBUG program, which can be found on your DOS supplemental program disk. After you have entered the command DEBUG and received the prompt, enter

L ds:0a80 x 00 01

where **x** is the number of the drive you are examining (e.g., drive A: = 0, drive B: = 1, drive C: = 2, etc.). Then enter

D ds:0a80

This will display the contents of the Boot Record on your screen. You will probably need to enter **D** a second time to see all of the Boot Record since it normally takes more than one screen to see. When you have seen all of the Boot Record contents, enter **Q** to quit DEBUG. DEBUG presents data in hexadecimal format on the left and in text form on the far right. The words "Welcome to

the Dungeon'' and the authors' names will appear in the text portion if your disk is infected with the BRAIN virus.

How to Attempt to Recover Data

If your disk has been infected and/or damaged by the BRAIN virus, you may be able to recover some of your affected data. Once again, you should turn off your computer and reboot from an ''original'' before doing this.

The DEBRAIN.EXE program works well for recovering data from damaged disks and is recommended.

If you do not have this program, you can use the following method. Start by formatting a new disk (do not use the /v option) for each disk that has been damaged. Then use the DOS COPY command to transfer your files from the damaged disk to the new disk. You will probably encounter some ''Abort, Retry, Ignore?'' or ''Abort, Retry, Fail?'' error messages. Enter R (for Retry). If the message is repeated, try entering I (for Ignore) or F (for Fail). Continue doing this until you once again get the DOS prompt. You new disk should now contain the usable portions of your files which you can examine to determine the extent of the damage. At this point you can reformat the damaged disk, which will destroy the BRAIN virus; however, some people would recommend that you destroy and discard the damaged disk on the off-chance that you may have encountered a mutant.

If you need more information than we have provided in this article, we recommend that you look through the files on uxe, which are listed at the end of this article, or that you talk to the people at the MRC.

General Rules to Follow to Protect Yourself

The UIUC campus has been ''hit'' by a number of viruses, none of which have been especially destructive. However, there are some general rules that you can follow to protect yourself as much as possible from viruses. These rules are as follows:

- Write-protect all your original program and system disks and store in a safe place. We also recommend that you make a back-up set of these disks and then write-protect and store both sets in a safe place. Also write-protect DOS and other program files by setting the DOS read-only file attribute.

- **Never** boot your machine from a floppy other than the original write-protected distribution disk (or back-up copy mentioned above). If you have a hard disk system, **never** boot from a floppy (except when you suspect a hard disk infection or need to boot from a floppy in order to run copy-protected software).

- Back up your files regularly. Back up data on data-only disks. Do not back up program files on the same disks as data.

- Do not use software or programs on floppies from other people (or let them put their floppies into your computer) unless you know the floppies are ''clean.'' Viruses have been spread by persons inadvertently using infected floppies in other persons' machines.

- Be cautious about downloading and using public domain and shareware programs, particularly from Bulletin Boards. If you use such programs on a hard disk system, keep them in a special subdirectory since viruses normally limit their replication activities to the same directory that the infected program is in. **Never** put such programs in a root directory!

- Periodically check your directories for unexplained files that "mysteriously appear", or for changes in size or last-modified date of program files. (Many programs are available to do this automatically.)

- Watch for other possible signs of troubles such as: an unexplained decrease in free disk space; a slow down in activities such as program loading, printing, etc.; unexplained disk activity such as lights going on when they shouldn't, etc.; unusual occurrences of error messages; etc. Any of these things may indicate infection by a virus — or they may be due to other causes so do not panic.

If you suspect a virus, contact the Microcomputing Resource Center for information and programs you can use to detect and/or get rid of a virus. If you do find a virus, notify CSO via the MRC or the CSO Consultants immediately, so that steps can be taken to avoid the spread of the virus on campus.

Files Available on uxe That We Recommend You Read

Many files are available on uxe in **/micro/pc/virus** or in **pc/virus** via anonymous ftp that we recommend to persons seeking more information on viruses. We have listed only a few of the files here, and recommend two files in particular to our users — BRAIN.MCPART_T and virdoc2.txt.

Files	*Description*	*Source*
VIRUS-L.FILELIST	List of files available from Lehigh U.	ListServ@LEHIIBM1
VIRUS-L.LOG88*	Logs of Bitnet virus discussion list	ListServ@LEHIIBM1
b88*	Excerpts from above for quick reading	MARKZ@vmd.cso.uiuc.edu
BRAIN.MCPART_T	Good article on the first Brain virus	ListServ@BITNIC
debrain.exe	Program to check for and remove Brain	sherk@umd5.UMD.EDU
virdoc2.txt	General virus documentation	Homebase BBS
review.pro	A review of protection software	VIRUS-L.LOG8806
README.virus	This file	zinzow@uxe.cso.uiuc.edu

Many interesting files are in /micro/pc/exec-pc or pc/exec-pc, but we have listed only the one of primary interest. See the files **xfer*.arc** for complete descriptions of all Exec-PC files through Oct. 17, 1988 including those kept here. (Note: Files from Exec-PC are put first in the new directory on uxe, then moved to exec-pc when the next batch is added.)

Files	*Description*	*Source*
fsp_14.arc	Flushot Plus 1.4	Exec-PC BBS, Milw. WI

Files available on uxe in /micro/pc/mac/virus or pc/mac/virus:

Files	*Description*	*Source*
DUKVACC.TXT	Vaccine for "Dukakis" HyperCard virus	ListServ@SCFVM (NASA)
NVIRVACC.SITHQX	Vaccine for nVIR virus	ListServ@SCFVM (NASA)

Also available on uxe in /micro/pc/simtel20 or pc/simtel20 via anonymous ftp:

Files	*Description*	*Source*
protect.asm	Source code for write protecting hard disk	Simtel20.arpa
protect.com	Compiled version	

SAS/GRAPH WITH KERMIT

Vicky Dingler
CSO Statistical Consultant

SAS/GRAPH on VMD can be used on a Personal Computer with Kermit Version 2.31 and its Tektronix 4010 emulation. Kermit Version 2.31 is available free from the Microcomputer Consultants in 94 Commerce West (244-0608), or from the Microcomputer Resource Center in the Federal Room of the Illini Union (244-6261). Kermit can be used with either a modem or the SYTEK connections on campus. Kermit can be installed on a hard disk, or used in a floppy drive. At the appropriate DOS prompt, issue the KERMIT command:

C> kermit

At the Kermit prompt, enter the "c" command which will connect your personal computer to the SYTEK or telephone line:

KERMIT-MS> c

Use your modem or SYTEK logon procedure at this point. When using a modem, please use 333-4008 for 1200 baud, or 333-4007 for 2400 baud. When prompted by the system for the class, use: **DVMDFS**. This will give access to the IBM mainframes through a terminal emulator called the 7171. When using SYTEK, the command to be used at the prompt is: **CALL 4500**.

When using either a modem or SYTEK, the system will ask for the type of terminal you are using with the following prompt: ENTER TERMINAL TYPE. If you respond with the terminal type of **KERMIT**, your terminal will be able to display colors if your terminal has color capability. If you respond with the terminal type of **VT100**, your terminal will be able to display grey scales only. When the proper terminal type is entered, the VMD logo will appear on the screen. Press the ENTER key to clear the logo and use your logon sequence. The clear sequence is the CTRL key and the HOME key: **CTRL-HOME**.

Any SAS/GRAPH output can be displayed on your PC screen with the following GOPTIONS statement:

GOPTIONS DEVICE=TEK4010 GPROTOCOL=GSAS7171;

Kermit can emulate a Tektronix 4010, and hence the device specification. The GPROTOCOL specification is used to allow graphics stream data to be displayed through the IBM 7171 terminal emulator. An example program called DEMOSASG SAS, which is available on SAS's 192 disk called STATS, follows.

```
GOPTIONS DEVICE=TEK4010 GPROTOCOL=GSAS7171;
DATA ONE;
INPUT A B ; -
CARDS;
1 2
2 3
3 4
;
PROC GPLOT ;
PLOT A * B;
SYMBOL1 C=BLACK V=STAR I=SPLINE;
TITLE1 C=BLACK F=XSWISS H=2 'TEST';
```

Notice that the color specifications in the SYMBOL and TITLE statements are black. The Tektronix 4010 terminal is a monochrome terminal.

The program should be executed in the CMS Ready Message environment. At the CMS Ready Message (R;), use the LINKTO command to link to the SAS disks. If you are already linked to the SAS disks, this command is unnecessary.

LINKTO SAS

Then, execute the SAS program using the SAS command:

SAS DEMOSASG

The system will display the following message:

PRESS RETURN AFTER EACH BELL

Press the RETURN key. At this time, the plot will be displayed on the screen. To clear the screen, use the ALT key and the minus key: **ALT −**. The message PRESS RETURN... will appear on the screen again. Press the RETURN key. The terminal will display the CMS Ready Message.

If there are any questions regarding Kermit, please refer them to the Microcomputer Consulting Office, 244-0608. If there are questions regarding CMS, SAS or SAS/GRAPH, please direct them to the Statistical Consultants in 85 Commerce West, 333-2170.

IMSL SITE LICENSE FOR PC'S AND WORKSTATIONS

Stan Kerr
CSO Systems Consultant

The IMSL Subroutine Library has been a major software offering on CSO mainframe systems for a number of years, from its advent on the IBM system in the early 1970's to its current offering on the IBM VMD system and the Convex. It consists of several hundred Fortran subroutines covering a broad range of abilities in numerical and statistical algorithms, including computation of a number of special functions. The Library has been available for some time on IBM PCs and various kinds of workstations, and there is interest within the University in acquiring a site license for the Library to allow a large number of people access to it on their own systems. Since the price the University must pay is directly related to the degree of interest, CSO must have some idea who is interested in getting the Library, and on what machines.

The rest of this article describes the current terms for site licenses with IMSL, in order to inform our readers of the issues involved. Some may, on the basis of this information, decide to get their own licenses or departmental licenses now, and some may wish to wait for a decision from CSO.

At the end of this issue of *Off-Line* is a tear-out survey which you are invited to complete and return to CSO. A future issue of *Off-Line* will inform our readers whether a site license will be purchased, and for which machines.

Components of the Library

The IMSL Library is actually licensed and distributed as three separate libraries, MATH/LIBRARY (comprising the mathematical and numerical abilities), STAT/LIBRARY (comprising statistical abilities) and SFUN/LIBRARY (special functions). On the IBM VMD system and the Convex, CSO has installed all 3 parts and called them the IMSL Library together. An individual wishing to acquire the Library for their own system could get a license for 1, 2 or all 3 parts. The phrase 'Complete Libraries Group' refers to the combined set of the 3 libraries; IMSL's site license pricing is done only for the Complete Libraries Group, not for individual components.

Environments Supported

The IMSL subroutine library is currently supported in the following microcomputer and workstation environments:

IBM PC, PC/XT, PC/AT

Apollo Domain running AEGIS or DOMAIN/IX

Bull SPS7 (DPX 2000) running SPIX

Bull SPS9 (DPX 5000) running SPIX/930

Concurrent 3203/3205 running OS/32

Data General MV/2000, MV/7800, DS/7500, MV1400DC running AOS/VS

Digital Equipment (DEC) MicroVAX I and II, VAX Station running MicroVMS or ULTRIX-32

Hewlett Packard 9000, Series 500 running HP-UX

Hewlett Packard 9000 (Models 825S, 825SRX, 835S, 835SRX) running HP-UX

IBM RT PC (6150/6151) running AIX

Prime 2250/2350/2450/2455 running PRIMOS

Sun Microsystems Sun-3 and Sun-4 running SunOS

Availability of Source Code

Source code for IMSL subroutines is not available with a site license agreement. IMSL distributes only object code. Source code is available with a regular IMSL license for the Library. As an example (to parallel the examples below), a single regular license for the complete Library for an IBM PC with 3 years of support costs (for an educational institution) $925 for the initial year plus $725 per year renewal, for a total of $2375.

LIMITED and UNLIMITED Site Licenses

IMSL offers two types of site licenses for the Complete Libraries Group : LIMITED and UNLIMITED.

A LIMITED site license for the PC version permits distribution of up to 100 copies of the library (or a component thereof, if we choose to acquire separate site licenses for the 3 parts of the Library).

A LIMITED site license for workstations can be of type A, B, C, depending on the number of copies desired and number of different types of workstations to be supported. The tables below explain this further.

An UNLIMITED site license permits distribution of an unlimited number of copies of the Library within the institution owning the license.

Pricing for IBM PC Version

Complete Libraries Group	+1 year of support	+2 years of support	+3 years of support
LIMITED site license	$6000	$7500	$9000
Second compiler version	$3000	$4500	$6000
UNLIMITED site license	$18000	$22500	$27000
Second compiler version	$3000	$4500	$6000

Pricing for Workstation Versions

License type	Max copies	Max environs	1st environment initial fee	1st environment renewal fee	Each added environment initial fee	Each added environment renewal fee
LIMITED - A	10	2	$7500	$1125	$1000	$150
LIMITED - B	25	3	$15000	$2250	$1500	$225
LIMITED - C	50	4	$25000	$3750	$2000	$300
UNLIMITED	--	5	$50000	$7500	$2500	$375

Examples

For example, suppose CSO decides to get a limited license for the PC version with 3 years of support, and to support both popular compiler environments (IBM Professional Fortran and Microsoft Fortran). This will cost $15000. Given that we have 100 copies to distribute, we would have to charge $150 per copy to recover costs. The user would thus have to pay only $150 for the complete Library with 3 guaranteed years of support. Please note that this is the cost of the Library alone; documentation must be paid for in addition.

On the workstation side, suppose CSO decides that Suns, Apollo's and Vaxstations should be supported, with a LIMITED license of type C, including 3 years of support. This would cost $37700 for the 3 selected environments. Since a type C license permits 50 copies to be distributed, the cost per copy would be $754 (which, remember, includes 3 years of support).

These examples should illustrate why CSO must see some demonstration of interest before money can be committed to acquiring the licenses. They also demonstrate the very reasonable prices possible with a site license.

WORDPERFECT 4.2 AND THE HP LASERJET SERIES II

Tony Aimone
CSO PC Consultant

(Editor's note: Since many people on campus still use WordPerfect 4.2 and have difficulty printing to a HP Laserjet Series II printer, Tony has written this article containing information that should be helpful.)

At four CSO sites HP Laserjet Series II printers are available for use. The procedure for using the Laserjet is different than the procedure for a dot matrix printer. To obtain the desired results, the printer and WordPerfect must be communicating properly.

Step 1. The character set used in the document must match the character set the printer is using. For most text documents, ones using only the standard ASCII characters (ASCII code 1-128), the Roman 8 and extended ASCII characters are the same. Problems in printing occur when foreign language characters, math symbols, or extended characters (ASCII code 129-255) are used in the document. If you have characters mapped onto Alt- or Control- you must match the code sent to the printer with the printer's character table. Printing WordPerfect **fnt.tst** (font test) file will provide you with a hard copy of all characters available for the specified printer driver.

Step 2. You must make sure that the font and pitch specified in the document and the font and pitch the cartridge supports are the same. Font and pitch in WordPerfect is selected by Control-F8, then 1. Table 1 lists cartridge font and pitch availability.

Cart.	Font	Typestyle	Pitch	Character Set
P&L	1	Courier Port	10	ASCII
P&L	2	Courier Port	10	ASCII
P&L	3	Courier Land	10	ASCII
P&L	4	Courier Land	10	ASCII
P&L	5	Line Printer Port	17	ASCII
P&L	6	Line Printer Land	17	ASCII
P&L	7	ND		
P&L	8	ND		
CART D	1	Prestige Elite Port	12	Roman-8
CART D	2	Pr Elite Ital Port	12	Roman-8
CART D	3	Courier Port	10	Roman-8
CART D	4	Courier Land	10	Roman-8
CART D	5	ND	ND	Roman-8
CART D	6	ND	ND	Roman-8
CART D	7	ND	ND	Roman-8
CART D	8	ND	ND	Roman-8
CART E	1	Letter Gothic Port	12	Roman-8
CART E	2	Ltr Goth Ital Port	12	Roman-8
CART E	3	Courier Port	10	Roman-8
CART E	4	Courier Land	10	Roman-8
CART E	5	ND	ND	Roman-8
CART E	6	ND	ND	Roman-8
CART E	7	Line Draw	12	Roman-8
CART E	8	ND	ND	Roman-8
CART J	1	Prestige Elite Port	12	Roman-8
CART J	2	Pr Elite Ital Port	12	Roman-8
CART J	3	Prestige Elite Port	17	Roman-8
CART J	4	Math 7 Elite Port	12	Roman-8
CART J	5	Math 8 Elite Port	12	Roman-8
CART J	6	Math 8 Elite Port	17	Roman-8
CART J	7	Line Draw	12	Roman-8
CART J	8	Courier Port	10	Roman-8
COURIER	1	Courier Port	10	Roman-8
COURIER	2	Courier Port	10	Roman-8
COURIER	3	Line Printer Land	17	Roman-8
COURIER	4	Courier Land	10	Roman-8
COURIER	5	ND	ND	Roman-8
COURIER	6	ND	ND	Roman-8

COURIER	7	ND	ND	Roman-8
COURIER	8	Single Line Draw	ND	Roman-8

Step 3. The final step is to make sure that Printer 1 is using the correct printer definition. To determine what definition the printer is using, type **Shift-F7**. Then choose printer controls (**4**). From the menu choose **3** (Select Printer). Change the definition that Printer 1 is using to the one that corresponds to the cartridge you are using, and press **F-7** to exit.

The HP Laserjet is now ready to print your document the way you want. If these steps are followed both in document creation and before you print, you will save many wasted clicks.

COMPUTER GRAPHICS AND IMAGING SERVICES

Jim Bozek, Randy Cetin, Michael Grady
CSO Graphics Group

The CSO Graphics Group provides consulting on issues concerning graphics and imaging on Personal Computers and Workstations. This includes:

- pre-purchase system analysis and recommendations with respect to requirements and cost;
- individual consulting over the phone or, when necessary, at the user's location;
- assistance with individual projects at the CSO Graphics and Imaging Lab;
- questions related to computer graphics output and input;
- application specific graphics and imaging questions; and
- general graphics and imaging questions.

In addition, the CSO Graphics Group provides a variety of specific services at the CSO Graphics and Imaging Lab. These services include:

- Image Acquisition — capture (digitize) computer images from printed material, or other external sources, for the purpose of image processing or computer output
- Image Processing — use of the computer to enhance the visual quality of computer images or to assist in interpreting the information contained in a computer image
- Video Recording — sequentially record computer images onto video tape for the purpose of creating computer animation
- Film Recording — record static computer images onto 35mm slides, prints, or Polaroid film
- Hardcopy Output — create, from computer images, color hardcopy in the form of thermal transfer prints onto paper or overhead transparencies

A number of widely used PC-based products (e.g., VISTA, Number Nine, TIPS, Image-Pro, AutoCAD, Cadkey, etc.) and image formats (e.g., TARGA, HPGL, Lasergraphics) are supported and used.

The CSO Graphics and Imaging Lab is located in Room 117 CSOB and the Graphics Group personnel are located in Room 109 CSOB. CSOB (the CSO Office Building) is located at 101 South Gregory in Urbana (i.e., the gray building on the south side of the B13 parking lot at Springfield and Gregory). Questions, inquiries, and more detailed information may be obtained by contacting any of the following personnel: Jim Bozek (333-2048), Randy Cetin (244-3224), or Michael Grady (244-1253). The telephone number of the lab is 244-5157.

HOOPS GRAPHICS SUBROUTINE LIBRARY

Jim Bozek, Randy Cetin, Michael Grady
CSO Graphics Group

HOOPS is a library of 3D graphics subroutines that can be used to create applications for business, science, and engineering. It is an object oriented system that can be called from programs written in the C or Fortran languages. Its features include:

- device independence (display and hardcopy)
- support for logical data organization through the use of segments
- wireframe or hidden line/surface display
- three color models (i.e., RGB, HLS, HSV)
- high level input manager

The HOOPS Graphics Subroutine Library, along with support for HPGL, PostScript and Tektronix 4105 output, has been installed on CSO's Convex C210 (uxh). If you have an account on the Convex (uxh), type the command **man hoops** for more information. Local user support for HOOPS on the Convex is handled by the Systems Consultants, 1208 W. Springfield, Urbana (333-6133).

In addition, the Computing Services Office has obtained a site license that enables CSO to redistribute the HOOPS Graphics Subroutine Library. According to the license agreement, the product is licensed to the University of Illinois for redistribution of object code (i.e., library) and source code (i.e., example programs and demos). CSO is redistributing the software free-of-charge to departments for use on departmental machines. (Note that the product cannot be redistributed by departments.) User support for the product within departments will be handled by the vendor at the location shown below:

Ithaca Software
The Clinton House
Ithaca, New York 14850
(607) 273-3690

HOOPS can be used on computers hosting the graphics devices listed below:

Computer System	*Display Device*
IBM PC/AT or compatible (512K)	EGA
DOS 3.2 or later	Number Nine Prol 1280 or SGT
Microsoft C (5.0 or later)	Pixelworks Clipper or Microclipper
Microsoft Fortran (4.01 or later)	HPGL device
(Hard disk recommended)	PostScript device

Sun Workstations 3/60 and 3/260 (3.2)	Sunview Display System PostScript device HPGL device
Silicon Graphics Workstations 8 or more bitplanes (GL2-W3.5)	IRIS Graphics System PostScript device
DEC Micro Vax-II Ultrix (1.2) or VMS (4.5)	PostScript device Xwindows
IBM VM/CMS	IBM 5080 Display PostScript device

For further information, contact one of the following personnel: Jim Bozek (333-2048), Randy Cetin (244-3224), or Michael Grady (244-1253).

PVI GRAPHICS SOFTWARE

Jim Bozek, Randy Cetin, Michael Grady
CSO Graphics Group

Graphics Software from Precision Visuals, Inc. is an integrated system of software tools based upon the ACM/SIGGRAPH CORE graphics system. It consists of a group of libraries, executable programs, and data files that can be used to display user data primarily in science and engineering applications. It is written in Fortran and callable from Fortran user programs. Its features include:

- 2D and 3D graphics primitives
- device independence (display and hardcopy)
- high level graphing routines
- contouring of data represented in regular grids
- support for a self-contained metafile system using CGM or a proprietary format

Several PVI packages, along with support for HPGL, PostScript and Tektronix output, have been installed on CSO's Convex C210 (uxh):

DI3000	- graphics subroutines
CONTOUR	-contouring subroutines, which in turn, call DI3000
METAFILE SYSTEM	-a system for device independent display of data

In addition, BLAZE, a subroutine package for fast and simple construction and display of graphs is available. BLAZE works with, but at a higher level than, DI3000.

If you have an account on the Convex (uxh), type the following commands for more information:

man di3000
man di3load
man blaze

User support for these products will be handled by the Systems Consultants, 1208 W. Springfield, Urbana (333-6133).

Some time ago, the University of Illinois obtained a site license that enables CSO to redistribute the following PVI products for departmental use on DEC (VMS), UNIX, IBM (VM/CMS), or what is referred to by PVI as "General ASCII" machines:

- DI-3000
- GRAPHMAKER
- GK-2000
- METAFILE SYSTEM
- DI-TEXTPRO
- CONTOUR SYSTEM

For further information on issues concerning purchase of the PVI software under the current site license agreement, contact one of the following personnel: Jim Bozek (333-2048), Randy Cetin (244-3224), or Michael Grady (244-1253).

NCAR GRAPHICS PACKAGE

Jim Bozek, Randy Cetin, Michael Grady
CSO Graphics Group

The NCAR Graphics Package is a group of libraries, executable programs, and data files that can be used to display user data primarily in science and engineering applications. It is written in Fortran and callable from user programs written in Fortran or C. Its features include:

- device independence (display and hardcopy)
- high level graphing routines
- contouring of data represented in regular or irregular grids
- support for a self-contained metafile system using CGM

- wireframe or hidden line/surface display of 3D data
- a world map database

Version 2.0 of the NCAR Graphics Package, along with support for HPGL, PostScript and Tektronix output, has been installed on CSO's Convex C210 (uxh). If you have an account on the Convex, type the command

man ncar

for more information.

User support for the product will be handled by the Systems Consultants, 1208 W. Springfield, Urbana (333-6133).

In addition, the Computing Services Office has obtained a site license that enables CSO to redistribute Version 2.0 of the NCAR Graphics Package. According to the license agreement, the product is licensed to the University of Illinois for full redistribution of source code. CSO is redistributing the software free-of-charge to departments for use on departmental machines. (Note that the product cannot be redistributed by departments.)

The NCAR Graphics Package has been obtained from NCAR in the form of a UNIX TAR(1) tape containing a UNIX distribution. Those wishing to install NCAR Graphics on their system can check out a copy of the magnetic tape and one copy of the documentation. Note that individual copies of the documentation must be purchased from NCAR, since the license agreement forbids additional copies to be made.

For further information on how to obtain a copy of the tape, contact one of the following personnel: Jim Bozek (333-2048), Randy Cetin (244-3224), or Michael Grady (244-1253).

AUTOCAD RELEASE 10

Randy Cetin
CSO Graphics Group

Near the end of October, AutoDesk Inc. of Sausalito, California announced that AutoCAD Release 10 was available and ready for shipment. The Release 10 software has been heralded as being a "true" 3D drafting/design package. Currently, Release 10 is available only on 5 1/4" diskettes for the IBM AT and AT clones. AutoDesk indicated that versions running on the Macintosh, as well as other computer platforms, would be supported soon; however, no release dates have been announced.

Along with the release of their latest drafting/design software, AutoDesk also announced that it was discontinuing the educational consortium of which the University of Illinois is a member. The elimination of the consortium will alter some of the purchase prices, as well as upgrade policies, for AutoDesk products. There is also some preliminary discussion between AutoDesk and the University of Illinois regarding future site licensing agreements. As of this printing, AutoDesk has neither issued a new price list for their product line nor have they formally specified any new policies. However, in a recent telephone conversation, the AutoDesk educational representative was able to pass along the following purchase and upgrade information.

AutoCAD Release 10 Purchase

University department purchases available for IBM PC AT, 5 1/4" diskettes, at $900.00.

Upgrade AutoCAD Release 9 to Release 10

The price of the upgrade will be $100.00 plus a $20.00 handling charge for a total of $120.00. Interested persons should contact:

Dennis Hagerman
Hagerman Assoc.
Broadway & Sunset Ct.
Mt. Zion, IL 62549
(217) 864-2326

Additional pricing and policy information is expected soon and will appear either in *Off-Line* or an *Off-Line Newsbrief* when it is available.

For current prices on other AutoDesk products, call the AutoDesk educational representative Sue Pittman at (415) 332-2344, ext 4255.

For additional ordering information contact Randy Cetin at 244-3224.

ACSL SIMULATION PACKAGE INSTALLED ON CONVEX

Stan Kerr
CSO Systems Consultant

The ACSL simulation package, which currently exists on the Cyber and the IBM VMD systems, has now been installed on the Convex (uxh) system. Information on running ACSL on the Convex can be obtained from the on-line man page:

man acsl

This man page is rather long; it can be printed using the **pman** command:

pman -d 3800 -b 67 acsl

This **pman** command prints the man page on the 3800 laser printer at DCL, and requests the output be filed in bin 67.

ACSL is a continuous simulation language, primarily used in modeling systems defined by continuous functions or by ordinary differential equations whose initial conditions are completely known. It can be used for simple design problems by interactively (or automatically) varying problem parameters and rerunning a simulation. Simulation variables can be graphed on either Tektronix (or Tektronix compatible) terminals, or on the Zeta plotters. Hewlett-Packard HPGL graphics files can be produced, although CSO has no equipment to draw such files; the user with an attached Hewlett Packard plotter can use it to produce plots from ACSL.

A detailed manual for ACSL , the *ACSL User's Guide*, can be purchased at the CSO Distribution Center at 1208 W. Springfield, Urbana. (Instructors who wish to use ACSL in a class should make arrangements to stock the manual at the local bookstores, as CSO cannot handle large orders.)

To run ACSL, a model description must first be prepared using the ACSL language. This is placed in a file whose name ends in **.acsl**. For example, file car.acsl might be such a file. The ACSL command is used to invoke ACSL to first translate this model into appropriate Fortran statements, then link it with the ACSL system routines, then run it. The run phase is controlled by an interactive executive which prompts the user for commands to control the simulation run. The user can interactively change model parameters and then request that the simulation be run from start to finish; it can be rerun as many times as desired before ending the ACSL session. When ACSL is invoked, the user can tell it which plotting device is to be used to produce graphic images during the session; data can be saved during a simulation and then graphed later in the session using the ACSL **plot** command.

For example, the following command invokes ACSL for the model described in file car.acsl and requests the use of the Zeta plot device. (CSO supports the Zeta and Tektronix plot drivers for ACSL currently.)

```
acsl car -plt zet
```

Note that, although the model file is named **car.acsl**, only the name **car** appears on the **acsl** command. This is required by ACSL as installed on the Convex (uxh).

In this case, the user sees the following on the screen:

```
***** Translate Model *****
***** Compile Model *****
***** Link Model with Zeta *****
acsl>
```

The last line above is the runtime prompt. One can then enter commands to control the session; the command **stop** stops the session. For example, the following shows the results of a short session:

```
acsl>prepar t,x
acsl>output t,x,"nciout"=10
acsl>start
           T 0.                  X 0.
           T 0.20000000          X 0.55429085
           T 0.40000000          X 1.52486284
           T 0.60000000          X 1.80905002
           T 0.80000000          X 1.18166762
           T 1.00000000          X 0.43312849
           T 1.20000000          X 0.38969003
           T 1.40000000          X 1.01323951
           T 1.60000000          X 1.54707775
           T 1.80000000          X 1.42322367
           T 2.00000000          X 0.85545031
           T 2.20000000          X 0.51302281
           T 2.40000000          X 0.73999060
           T 2.60000000          X 1.22144865
           T 2.80000000          X 1.40461313
           T 3.00000000          X 1.12693385
           T 3.20000000          X 0.74518210
           T 3.40000000          X 0.68585554
           T 3.60000000          X 0.97431479
           T 3.80000000          X 1.25576327
           T 3.99200000          X 1.23345847
acsl>plot x
acsl>stop
     2 words table space used
```

At the end of this session, there is a Zeta plot file named plot.zet in the current directory. This can be sent to a CSO plotter with the **nplot** command, or viewed on a Tektronix-compatible terminal using the **zetavu** program. For example, the command

```
nplot -b 67 plot.zet
```

will send the plot file to the 3800 laser printer at DCL, and the plot output will be filed in bin 67. The command

```
nplot -d me -b 67 -dev normal plot.zet
```

sends the plot file to the normal Zeta plotter in Room 65 Mechanical Engineering.

MINPACK INSTALLED ON VMD AND CONVEX

Stan Kerr
CSO System Consultant

The MINPACK package of Fortran subroutines for solution of nonlinear least squares problems and simultaneous nonlinear equations has been installed on the IBM VMD system and on the Convex (uxh).

MINPACK is in the public domain. If you would like to acquire it to use on your own system, please contact Stan Kerr of CSO (phone 333-4715, electronic mail address stankerr@vmd.cso.uiuc.edu).

MINPACK is accessed on VMD by the command

LINKTO MINPACK

Following this, one can compile and run a Fortran program which calls the MINPACK routines. There are detailed descriptions of the MINPACK routines available on-line as help files. There is a menu for these help files, accessible by the command

HELP MINPACK MENU

Besides this menu, there is also a general help file available under

HELP CSO MINPACK

On the Convex (uxh), the library is used on an **fc** or **cc** command when compiling and loading a program to create an executable file, e.g.,

fc prog.f -lminpack

There is a man page on MINPACK, which can be viewed by entering the command

man minpack

Writeups on individual MINPACK routines can be found in the directory

/usr/local/doc/minpack

under files named 'routine.doc'; e.g., lmdif.doc is the writeup for subroutine LMDIF. For example, to print the writeup for routine LMDIF, you would enter

```
ibmprint -b nn /usr/local/doc/minpack/lmdif.doc
```

This would print in bin 'nn' at DCL (nn is your bin number). To print all the writeups together, you can use the following

```
pr -f /usr/local/doc/minpack/*.doc | ibmprint -b nn -cc a
```

MPOS OPTIMIZATION SOFTWARE ON VMD AND CONVEX

Stan Kerr
CSO System Consultant

The MPOS optimization package, which has existed for some years on the Cyber system, has now been installed on the IBM VMD system and on the Convex (uxh). This was done with the permission and cooperation of Vogelback Computing Center at Northwestern University.

On VMD, MPOS is accessed by the command

LINKTO MPOS

It is then used by entering commands like the following:

FI 5 DISK fn ft fm
FI 6 DISK outfn outft outfm
MPOS

where **fn ft fm** is the filename, filetype and filemode of the input file which describes the problem to MPOS, and **outfn outft outfm** is the filename, filetype and filemode of the output file which MPOS should produce.

The default version of MPOS installed on VMD can solve problems of several dozens of variables and constraints. There is a larger version, called MPOSBIG, for bigger problems. The larger version requires that one first increase the memory size to 4 megabytes.

For more help on using MPOS on VMD, see the help file

HELP CSO MPOS

MPOS is described more fully in the *MPOS User's Guide* from Northwestern University, which CSO plans to stock in the Accounting and Distribution Center at 1208 W. Springfield, Urbana.

MPOS can be used on the Convex (uxh) by entering the command

mpos < infile > outfile

where **infile** designates the MPOS input file and **outfile** designates the MPOS output file. MPOS as installed on the Convex will handle several hundred variables and constraints. For more information on the Convex version of MPOS, see the on-line man page:

man mpos

TOMS ALGORITHMS CURRENT THROUGH JUNE 1988

Stan Kerr
CSO Systems Consultant

CSO regularly orders the algorithms published in the quarterly journal "Transactions on Mathematical Software, " and adds the algorithms to a public tape when they arrive. CSO now has all algorithms published through June 1988; the oldest is algorithm 493, dating from the inception of TOMS in 1975. The TOMS algorithm collection is a continuation of the former Algorithms section of "Communications of the ACM"; algorithms before number 493 have been published in printed form by the Association for Computing Machinery but are not available in machine readable form. The CSO Systems Consulting Office has a copy of the books in which the older algorithms were published.

The tape on which the TOMS algorithms are stored is TOMS-A006 in the CSO tape library. All users are welcome to access this tape. It's characteristics are as follows: it is 6250 bpi, unlabeled, recorded in the EBCDIC code. All files on the tape consist of fixed-length records, with a record length of 80 and a block size of 32000.

On VMD, there is a help file containing detailed information on how to access the tape, plus an index of all algorithms on the tape. This help file can be viewed with the command

HELP CSO TOMS

UNIX users (and other campus users who do not have CSO logons) can access this help file using the **ftp** file transfer program, as follows (assuming your system is on the campus UIUCnet):

1. Enter the command: **ftp vmd**
   (If you are accessing it from a non-CSO system, use the command **ftp vmd.cso.uiuc.edu**)
2. When prompted for a logon, enter: **public**
3. When prompted for a password, enter: **nolog**
4. Enter the command: **get toms.helpcso**
5. When prompted again, enter the command: **quit**

ftp should create a file named **toms.helpcso** in your current directory which contains the contents of the VMD help file.

LINDO LINEAR PROGRAMMING PACKAGE ON VMD

Stan Kerr
CSO Systems Consultant

The LINDO optimization package has been installed on VMD. LINDO allows one to do interactive linear, integer and quadratic programming. Problems can be input in a simple algebraic form, or in a standard format for linear programming data called 'MPS format'. The version installed on VMD can handle several hundred variables and constraints, and is also user-tailorable, i.e., a Fortran programmer can build an application around LINDO using special interface routines which allow a Fortran program to access the LINDO data structure and initiate problem solution.

LINDO is accessed on VMD by the command

LINKTO LINDO

Once it has been accessed, it is started by the command

LINDO

LINDO then prompts the user for input. There is internal help within LINDO which can be obtained by typing the command **HELP** while in LINDO. There is also a CSO help file which can be viewed by the command

HELP CSO LINDO

As an example, the user might enter the following problem description to LINDO

```
MAX 2X + 3Y
ST
4X + 5Y < 9
7X + 6Y < 13
END
GO
```

LINDO is documented more completely in the *LINDO User's Guide*, which is available for inspection at the CSO Systems Consulting Office at 1208 W. Springfield, Urbana, and which can be ordered from Scientific Press.

SAS VERSION 5.18 NOW DEFAULT ON VMD

Vicky Dingler
CSO Statistical Consultant

Version 5.18 of SAS became the default version of SAS on VMD on November 16th. This production release of SAS is an enhancement of Version 5.16 and includes new features.

The TAPECOPY procedure can be used with 3480 tape cartriges. The Micro-to-Host Link downloads Version 5 SAS catalogs and uses the IBM 7171 protocol converter. SAS/GRAPH has new options in the GOPTIONS statement, two new map data sets, new fonts and new device drivers.

Several new procedures have been included in the Base product. CATOUT writes information about the SAS catalog directory to a SAS data set or to an external file. This is useful for data base managers to document the contents of their SAS data sets. The CPORT procedure is used to create a transport-format file that contains a SAS catalog or catalogs. This file can be transported to another system to be read by the CIMPORT procedure. The transport file can be written to tape or downloaded to a PC.

Additional information about these changes and enhancements may be found in *Technical Report: P-175; Changes and Enhancements to the SAS System, Release 5.18, Under OS and CMS*, which is available for inspection in the CSO Statistical Consulting Office, 85 Commerce West.

On November 16th, the SAS Version 5.16 became the PAST version of SAS, available through the command: **LINKTO SAS (PAST.** Previous versions of SAS were removed on November 16th. The versions removed were SAS 82.3 [LINKTO SAS823], SAS 5.08 [LINKTO SAS(PAST], and SASBMDP PAST. If there are any problems with this, please contact the consultants at the CSO South Statistical Consulting Office.

If there are any questions about any of the above features or about SAS Version 5.18, please refer them to the CSO Statistical Consultants in 85 Commerce West, 333-2170.

WANTED: PEOPLE INTERESTED IN SPREADSHEETS AND DECISION-AIDING SOFTWARE

If you are interested in decision-aiding software and have a reasonably good knowledge of macro writing for such spreadsheet systems as Excel, Quattro, SuperCalc, Framework, or other spreadsheets, please phone or write Stuart Nagel in the Political Science Department, 361 Lincoln Hall, 359-8541. We are especially interested in translating Plato and Lotus versions of spreadsheet-based decision-aiding software into other spreadsheet systems.

WANTED: OLD DEC RX01 FLOPPY DISK UNIT

If you have a DEC 8.5" floppy disk unit that you would like to get rid of, please contact Dr. Ron Larkin, 333-7513. I can supply a University account number if the unit is of value.

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Survey of Interest in The IMSL Subroutine Library

If you are interested in obtaining a site-license for the IMSL Subroutine Library on your PC or workstation, please complete the survey below . Please note that only machines involved in University work are eligible for a site license.

Name: _____

Campus Address: _____

Telephone: _____-_____ (Office) _____-_____ (Home)

My affiliation with the University is:

_____Faculty _____Staff _____Student Other:_____

I own an IBM PC or compatible: ___No ___Yes Model:_____

I own a Sun workstation: ___No ___Yes Model:_____

I own an Apollo workstation: ___No ___Yes Model:_____

I own a Dec Vax workstation: ___No ___Yes Model:_____

I would like to get IMSL on a site-license basis: ___No ___Yes

Number of copies my department or research group might get: _____

The amount I can afford to spend per copy of IMSL is:

___$0-$100 __$100-200 __$200-300 __$300-400 __$400-500 __$500-600

___$600-700 __$700-800 __$800-900

I will use the IMSL Library for the following:

___Research ___Class ___Both ___Other:_____

Please return survey to: Stan Kerr
CSO User Services
CSO - 150 DCL
1304 W. Springfield Avenue
Urbana, Illinois 61801.

OFF-LINE MAILING LIST

If you wish to be placed on our mailing list, have a change of address, or wish to be deleted, please check the appropriate box and fill in the information below. Please help us keep our mailing list up-to-date by informing us if issues are being sent to someone no longer in your department; fill in the information below and return to us so that his/her name may be removed from the list.

Please check as appropriate:

_____ Please *ADD* my name to the mailing list.

_____ Please *DELETE* my name from the mailing list.

_____ Please *CHANGE* my address (provide old address also).

If you have a campus mailing address:

Name _____

Department _____

Room & Bldg _____ M/C_____

If you do not have a campus mailing address:

Name _____

Address _____

_____

_____

City, State, Zip _____

If you are requesting a change of address, please indicate your old address:

_____

_____

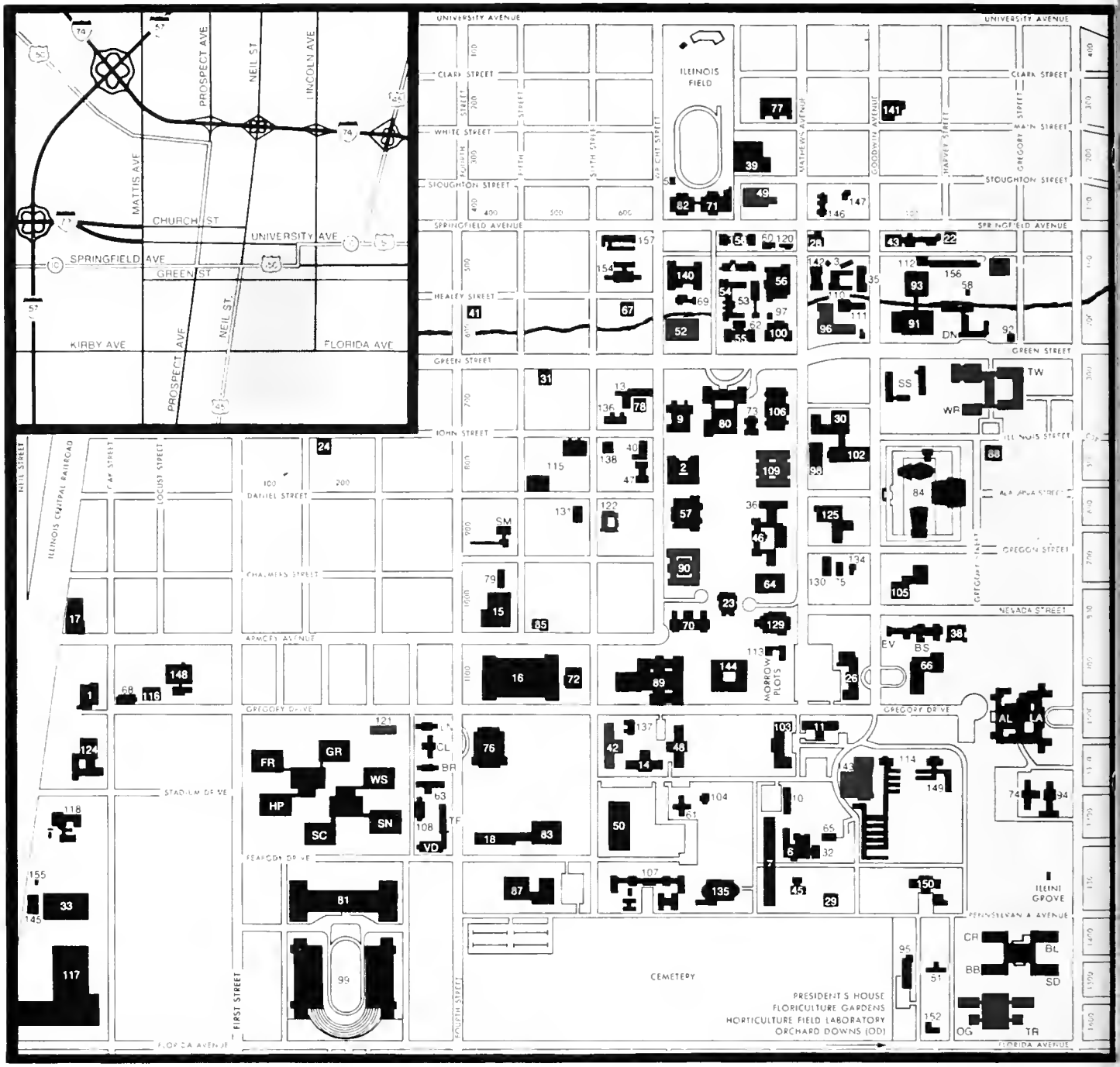
Mail to:

OFF-LINE
Computing Services Office
150 Digital Computer Laboratory (M/C 256)

University of Illinois at Urbana-Champaign
1304 West Springfield Avenue
Urbana, Illinois 61801

CSO SITES

CSO NORTH (DCL)	
14 Digital Computer Lab	Monday-Saturday, 24 hours/day
333-7685	Sunday, 12 noon - 12 midnight
CSO SOUTH	
70 Commerce West	Monday-Saturday, 8 am - 12 mid.
333-4500	Sunday, 12 noon - 12 midnight
AGRICULTURE	
N-120 Turner Hall	Monday-Thursday, 8 am - 10 pm
333-8170	Friday, 8 am - 5 pm
	Saturday-Sunday, Closed
CHEMISTRY	
150-154 Noyes Lab	Monday-Friday, 9 am - 5 pm
333-1728	Saturday-Sunday, Closed
CRH SNACK BAR	
120 Snack Bar	Daily, 12 noon - 12 midnight
333-1851	
ELECTRICAL ENGINEERING	
146 Electrical Engineering	Monday-Friday, 8 am - 12 mid.
333-4936	Saturday, 8 am - 5 pm
	Sunday, Closed
FAR	
Florida Avenue Residence Halls	Daily, 12 noon - 12 midnight
333-2695	
ISR	
Illinois Street Residence Halls	Daily, 12 noon - 12 midnight
333-0307	
MECHANICAL ENGINEERING	
65 Mechanical Engineering	Monday-Saturday, 8 am - 12 mid.
333-1430	Sunday, 12 noon - 12 midnight
PSYCHOLOGY	
453 Psychology	Monday-Friday, 8 am - 5 pm
333-7815	Saturday-Sunday, Closed
SOCIAL SCIENCE	
202 Lincoln Hall	Monday-Friday, 8 am - 12 mid.
333-0309	Saturday, 10 am - 5 pm
	Sunday, 12 noon - 5 pm



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Illinois Street Residence Halls
Florida Avenue Residence Halls
CSO Office Building
(101 South Gregory)

NELLY S GONZALEZ
320 LIBRARY
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CAMPUS IL 00522

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