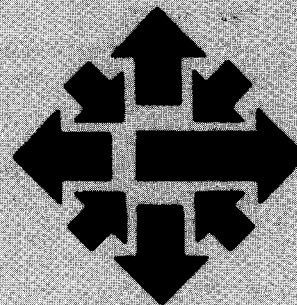


University Computer Center Newsletter

University of Minnesota
Twin Cities

May 1983
Volume 17, Number 5



FOR YOUR INFORMATION: UCC'S REFERENCE ROOM

The UCC Reference Room offers you a wealth of material related to computing in general and the specifics of computing at the University. Everything from documentation of our hardware and software to the latest issue of *Byte* has its place on the Reference Room shelves. If you're looking for information about computing, it's a good place to begin.

The Reference Room began in the early sixties as a eclectic collection of reference manuals, journals, newsletters, and a few books. Tucked away in 229 Experimental Engineering, the tiny room that currently serves as the HELP-line office, the collection was used and managed by Computer Center staff members.

When we established the HELP-line in July 1975 and needed somewhere to put it, the reference collection was moved to what was then a student office in 235a Experimental. Once in this location, the collection was opened to the public as a non-circulating resource library and we hired a professional librarian, Lori Boch, to manage and catalogue the material. She and her successor, Michael Dunham, have kept careful track of this ever-expanding collection.

The collection now includes a full complement of manuals that document UCC hardware and software, as well as an extensive collection of computing journals and newsletters from other computer centers. The book collection, which numbers about 1500, provides a solid core of reference ma-



The Reference Room staff: (from left) Gordon Meyers, Michael Dunham, Cheryl Brama (Photo: Dick Hotchkiss)

terial related to computing.

In fall 1982, the Reference Room made its biggest move yet—to a large work area in 140 Experimental Engineering. This move made it more accessible to users and permitted the entire collection to be available on open shelves. (Because the collection grew too large for room 235a, the librarians had archived many volumes in the Lind Hall basement storage area.) Now the complete library (with the exception of a few ancient manuals and newsletters) is available for your use.

As a departmental resource, the Reference Room is *not* part of the University library system and receives no funds in addition to its Computer Center budget. These

funds are used primarily to purchase manuals that document the hardware and software that are parts of our system. But the collection also expands as a result of donations from staff members and material we receive as a benefit of membership in such organizations as the Association for Computing Machinery. We have recently expanded the collection in two areas we believe to be of special interest to our user community: grants funding and microcomputing (see exhibits 1 and 2).

The Reference Room has both a hard copy and an on-line version of its bibliographic data base that provide title, author, and subject indices. The hard copy is updated

Reference Room to 46

Reference Room from 45

twice yearly, while the on-line version is always current. Anyone with a valid UCC account on the CA system can access the on-line version, although you must have some familiarity with the System 2000 data base management program to use it. If you have questions about or problems with the data base, call Michael Dunham, 373-7744.

Michael and his assistants, Gordon Meyers and Cheryl Brama, are also developing a software data base that will catalogue all UCC's packages, programs, routines, and subroutines. It will include the name, a brief description, and the subject classification of the item in question, the library in which you can find it, where documentation is located, and who to contact about it. When complete, this data base will provide a central place to go to find out what's available on our systems.

The UCC Reference Room is open from 8 a.m. to 4:30 p.m. Monday through Friday and can be used by anyone who needs its specialized material. Although it is a non-circulating collection, we have a few duplicates of various books and manuals (such as the *VMS Primer*) that can be checked out on a short-term basis.

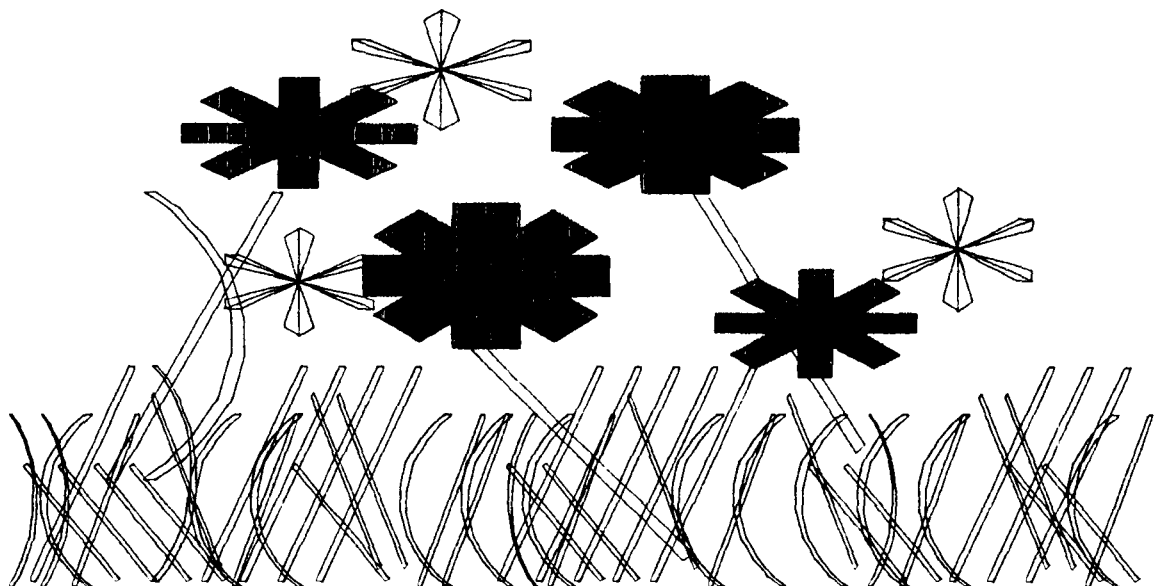
If you are thinking about buying a particular manual, it's a wise

Exhibit 1. Reference Room Microcomputer Journals
Access, the Journal of Microcomputer Applications
Byte
Dr. Dobb's Journal
Interface Age
Microcomputing (formerly Kilobaud)
PC, the Magazine for IBM Personal Computers
Personal Computing

Exhibit 2. Grants Material in the Reference Room
Books:
Getting Grants, Craig Smith and Erik Skjei. Harper & Row, 1980.
Grantsmanship, Armand Lauffer. Sage Publications, 1977.
Journals:
Federal Grants & Contracts Weekly
Foundation News
Grants Magazine
Grantsmanship Center News

first step to stop in and look at the Reference Room copy before making your purchase. If you're curious about what's happening at other computer centers around the nation or the world, our newsletter collection can keep you up-to-date. If you ever have any books

or journals related to computing that you no longer need or want, we're happy to accept donations. And if you have questions about what's in the collection or how to use it, Michael, Gordon, and Cheryl will be happy to assist you.
(Christine Mack Gordon)



—Graphic by Harry Hovland

MERITSS—PEAKS AND PROSPECTS

Upgrade for Better Response Time

Once again February proved to be the busiest month for the MERITSS interactive instructional system; poor response time was the result on several days. The current system would have been adequate for typical student jobs two years ago, but microcomputers now handle simpler jobs, and the system does not perform as well at the current maximum user level on jobs that require more resources. Table 1 illustrates the increased resources required per user connect hour over the past three Februaries.

Based on this data, we rated various CYBER configurations for the maximum number of users for each system resource that still provides less than 3/4 second response time for interactive jobs in the 120-150 sector (64 word) program lengths. Table 2 shows formulas that correspond to the current workload for maximum users in five CYBER resource areas: central processor (CP), central memory (CM), channels (CH), disks, and PPU's. The letter *N* in the table always refers to the quantity in parentheses.

When we gave the Computer Advisory Committee this data, they authorized an immediate upgrade from the current system (198K CM, 6 disk and 5 controller on a dual CYBER 172) to a 262K CM, 7 disk and 6 controller CYBER 174 system for the rest of the academic year. In addition, the University has been negotiating with the Minnesota Educational Computing Consortium (MECC) to move their remaining central processor interactive access ports (currently on their CYBER 720) to the MERITSS system for fiscal 1983-84. MECC plans to concentrate on the microprocessor software and hardware that have been very successful for them in the past few years, and to drop central access (as a result of both decreased funding and declining requirements). Because of the addition of these 120 ports to our system, the Computer Advisory

Table 1. Resources required per user connect hour.

System	131K CYBER 720	131K Dual CYBER 172	198K Dual CYBER 172
Month	Feb. 1981	Feb. 1982	Feb. 1983
SRUs	11.5	13.8	16.6
CP Seconds	19.5	23.5	28.6
System Overhead	11.7%	13.1%	12.8%
CYBER Instructions	30.5M	34.6M	41.9M
Disk Sectors			
Transferred	10.2K	11.9K	13.3K
Characters Output	23.0K	25.4K	26.6K
XEDIT Runs	2.9	3.1	3.7
Compilations & Runs	4.6	4.5	4.6
Input Data/Carriage Returns	74.1	81.0	83.4

Table 2. Formulas for Maximum Users in Five CYBER Resource Areas.

	MERITSS Feb. 83	MERITSS 15 Apr. 83	NON-MERITSS EXAMPLE	MERITSS Aug. 83
CYBER CM Processor (MIPS)	198K 172(2.2)	262K 174(3.5)	262K 815(1.06)	524K 835(3.5)
CP: MIPS/.0097	227	361	109	361
CM: (Kwords-32)/.96	173	240	240	513
CH: 40 * N	200(5)	240(6)	120(3)	360(9)
CDC 844-41 disks: N * 237M/5M chars	284(6)	332(7)	142(3)	429(9)
PPUs: 60 * (N-4-CA)	300(14)	300(14)	180(10)	420(20)
System max user = Least figure for five resource areas	173	240	109	360
Limiting Factor(s)	CM	CM + CH	CP	CP + CH

Committee authorized us to go out on bid for a CYBER 170-835 with 524K CM and 20 PPU's for delivery this August. Data on the 835 presented in Table 2 (MERITSS, Aug. 83) show that it should handle the extra 120 ports.

Dial-up Access Will Increase

Another problem facing students has been a lack of dial-up access during non-school hours from personal computers and home terminals. We have provided the hardwired ports to support instructional lab clusters, but were unable to provide additional dial-up access from current funds. Since research interactive access drops off sharply at 5 p.m., we have made plans to allow interactive access to both the research and instructional systems through twin PDP-11/34s with 256 ports on each. Besides lowering our total communication costs, this combi-

nation system will allow users to dial one number and then select the system (CA or ME) on which to run. The algorithm for maximum dial-up ports per system will be changed at 5 p.m. to allow additional access to MERITSS by students. Watch for this increased access in the next two months.

The Return of UNIX

A year and a half ago we offered UNIX service on a VAX 11/780 for interactive instructional users. Because of low use and a budget deficit, we had to sell the VAX. Since then, we have restored fiscal order in our accounts and purchased a 16 port SUN workstation that supports UNIX (the 4.2 Berkeley version) for staff use. UNIX is one of the preferred operating systems for a University environment. The CYBER instructional system is still a superb FORTRAN and Pascal number cruncher, but not a great character manipulator. The UNIX

system provides electronic mail and extensive text processing software, including line and screen editors and formatting programs. We plan to fund a SUN workstation instructional lab in 1983-84 with 16 terminals, a 160-M-byte hard disk, a serial dot-matrix

printer, and a floppy disk drive (for individual student data storage). The station will communicate with MERITSS over a 9600 baud line, making it part of the total interactive instructional system.

University departments interested in this UNIX project should contact

Rich Franta (376-3963) about the possibility of locating the lab in their departments (possibly by August 1983). Instructors will be able to check out their curricula on our SUN workstation until the new lab is installed.

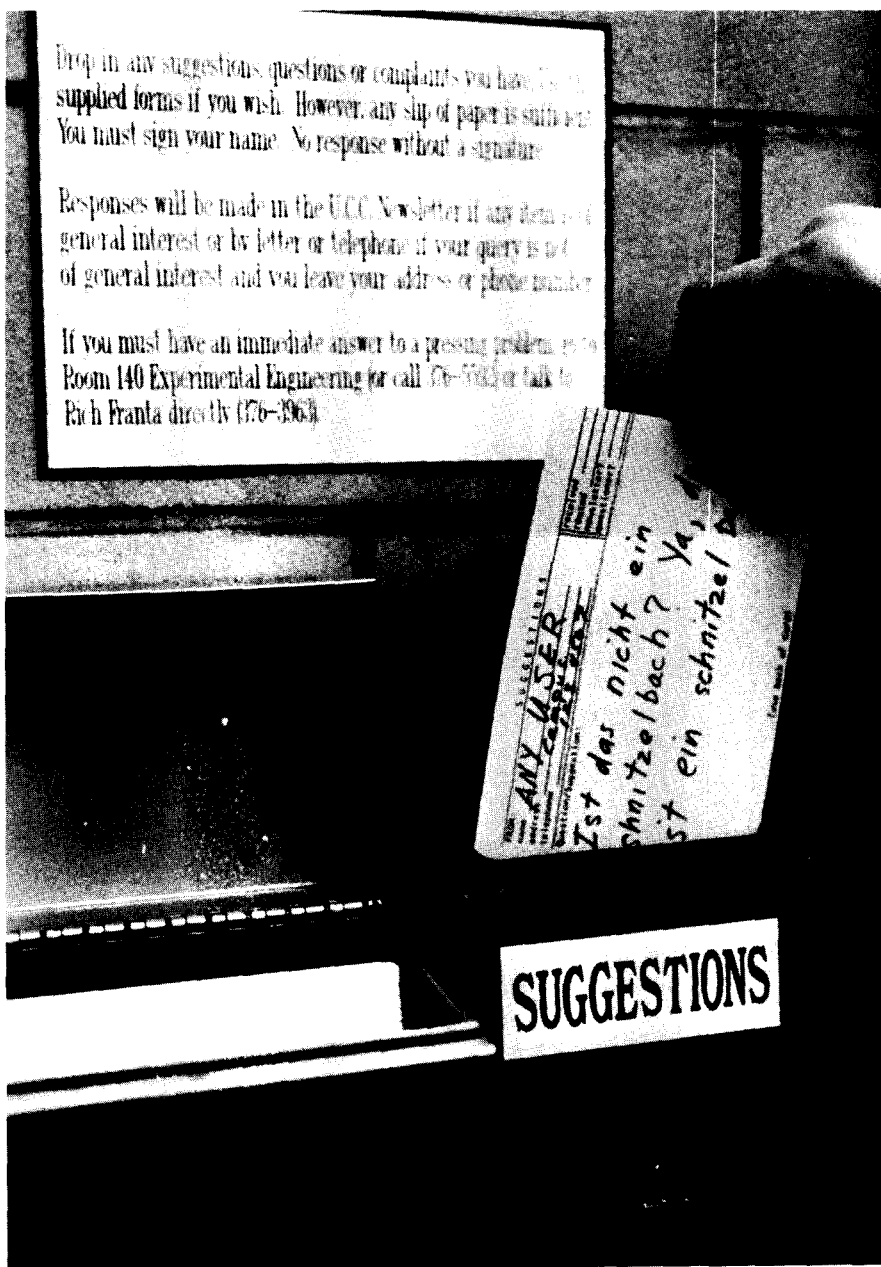
(Lawrence A. Liddiard)

Give Us the Business: Suggestion Boxes Reinstalled

During the course of various remodeling jobs and lab moves, UCC's suggestion boxes disappeared. These boxes were your forum for compliments, complaints, and queries. Boxes have now been installed at four lab locations: 131 Experimental Engineering, the Lauderdale users room, 90 Blegen Hall on the west bank, and 14 Folwell Hall.

We will supply forms for your use at these locations, but you can write your suggestions and questions on any slip of paper. You must sign your name, however, or we will not respond. For items of general interest, our responses will be printed in this *Newsletter* (the first suggestion box column appears in this issue). If your query is not of general interest, we will respond personally by mail or phone. Thus, it's a good idea to leave your address and phone number unless you're fairly certain that your concern is a general one.

We hope you will find the suggestion boxes another useful means of communicating your concerns about UCC to us.



—Photo: Dick Hotchkiss

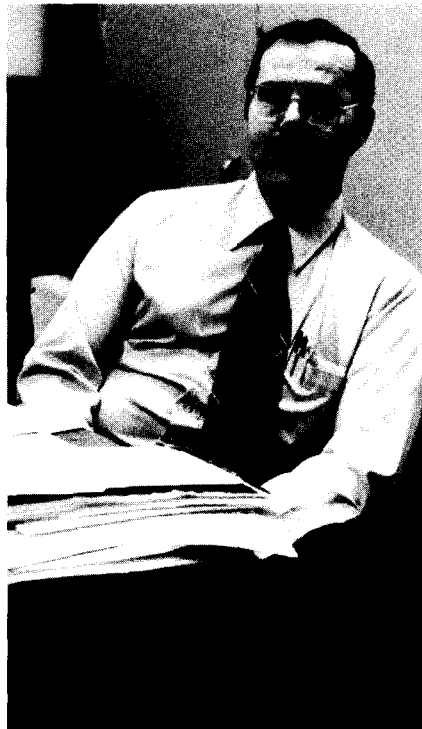
SYSTEM NEWS/NOTES

Author, Author

UCC's own Joe Cornell recently celebrated the publication of his first book, *Computers in Hospital Pharmacy Management*. Joe, who is the coordinator of our public labs, received a Doctor of Pharmacy degree from the University of California-San Francisco and completed his residency at St. Mary's Hospital in Rochester, Minnesota.

Joe then joined the faculty at the University and served on the staff of the American Society of Hospital Pharmacists before assuming his current position. He has published research in systems and computer science and has created hospital pharmacy computer programs.

The book's intended audience is practicing hospital pharmacists. It was written to take them from their current level of computer lit-



Joe Cornell (Photo: Dick Hotchkiss)

eracy, whatever it may be, to a level of knowledge that allows them to participate in the development of systems for hospital pharmacy management.

Individual chapters discuss how computers work, programming and languages, computer components, systems development, and a model hospital pharmacy computer system. Seven detailed appendices include a glossary, sample programs, and other information.

Computers in Hospital Pharmacy Management is published by Aspen Systems Corporations, P.O. Box 6018, Gaithersburg, Maryland 20877. If you would like to see the book, a copy is available in our Reference Room, 140 Experimental Engineering. If you purchase a copy, Joe would be more than happy to autograph it for you.

Documentation

NEW M77 REFERENCE MANUAL AVAILABLE

The first edition of the *M77 Reference Manual* is now available. It replaces the preliminary edition that has been in circulation for several years.

We corrected all known errors in this new edition and rewrote much material to conform to the 1978 ANSI FORTRAN standard. Typesetting the manual allowed us to shade non-standard M77 FORTRAN constructs in a manner similar to Control Data's FTN5 manual. We completely rewrote appendices D (functions) and O (character codes). A new appendix, N, provides sample programs. New appendix X (XOTHER) has examples that show how to implement rational, decimal, and 30-bit floating point arithmetics under M77's XOTHER type, and a new Z appendix (interval library) illustrates the

interval arithmetic library M77 provides under XOTHER.

My thanks to the many users who took the time to complete and return the reader comment sheet in the preliminary edition to our documentation group. Many of your comments and suggestions have been incorporated in the new manual. Thanks also to those who reported M77 compiler and library errors to us for correction; your help has made M77 a robust FORTRAN. The new manual was completed under the direction and management of Amy Koepke of our Publications Group; without her extraordinary efforts, the project would never have been successfully completed. The price of the new edition was not set at this writing, but it should be about \$15. It will be available at our Computer Store, 211 Experimental Engineering.

(L. A. Liddiard)

Microcosm

UNIVERSITY MICROCOMPUTER USERS GROUP

A large crowd of interested and enthusiastic microcomputer users gathered in Nicholson Hall on April 7 to discuss the formation of a University microcomputer users group.

UCC's User Services Assistant Director Rich Franta opened the meeting with a brief look at why such a group could be useful, then turned the meeting over to Michael Collins of our Microcomputer Systems Group who elaborated on UCC's suggestions about what such a group might be and do.

We at UCC would participate in several ways: as a simple member of the group, we would attend meetings and share our knowledge with other members; we will provide initial clerical support to get out notices and information about

meetings; and, if the group is interested, we would provide a dial-in computer bulletin board on one of our mainframe systems.

The computer bulletin board would be an information exchange where members could buy, sell, or trade hardware and software, offer tips to users of similar equipment about bug fixes or program design, and keep their mailing addresses up-to-date.

The users group could also serve

as an umbrella organization for smaller special interest groups. These groups would probably come together on the basis of their use of micros, rather than on the type of micro they use. Thus people who do financial planning might form one group, those who do psychological data analysis another. The largest single subgroup at the April 7 meeting was composed of people who use micros as word processors.

The group decided to meet again on April 28. That meeting elected officers, planned the basic structure of the group, and established more firmly what the group's function would be. For more information about the next meeting or to be put on the mailing list, call Michael Collins, 376-2975.

(Christine Mack Gordon)

PROFESSIONAL SERVICES DIVISION

graphics development:	computer graphics for data presentation
statistical analysis:	full range of services available
system analysis and design:	analysis of existing systems; design of new systems
financial analysis:	forecasting, accounting
data base development:	design and implementation using state-of-the-art technology
tape conversion:	conversion of off-site tapes to UCC internal format
customized programming:	COBOL, FORTRAN, Pascal for virtually any application
research applications:	scientific or social research environments



If you qualify for a University Computer Center account, and are interested in our services, please contact us.

376-1764 • 227 Experimental Engineering • 208 Union St. S.E.

CYBER Notes

COBOL 4 TO BE REMOVED IN FALL

We will remove the COBOL 4 compiler from the system at the beginning of fall quarter 1983. You must convert your COBOL 4 programs to COBOL 5 by then. If you have questions about this change or need assistance, call our Information Management Systems Group at 376-1761. COBOL 5 documentation is available at the Computer Store. We will also remove CYBER Record Manager Advanced Access Methods Version 1 in the fall.

(Steve Reisman)

CDC SUPPORT FOR FTN ENDS IN JUNE

Control Data Corporation (CDC) is removing support for FTN, FORTRAN Extended Version 4, on June 30, 1983. This means that no corrections will be made to the FTN compiler after that date. While FTN will still be available at UCC for many years, we cannot guarantee that FTN programs will work on future releases of NOS (the Control Data CYBER Network Operating System).

We strongly recommend that you develop new programs in FTN5 or M77 and convert FTN and MNF programs as time permits. Conversion may be as simple as recompiling your program using one of the compilers that conforms to the new standard and checking for correct results. If, however, you must make some changes to the program, F45, a conversion aid, may prove helpful (especially with long programs). The *F45 Reference Manual* (CDC publication number 60483000) is available for use in our Reference Room, 140 Experimental Engineering, or you can purchase a copy for \$5.30 from the Computer Store, 211 Experimental Engineering. Differences between MNF and M77 are documented in WRITEUP(M77).

While you are converting your programs, you may want to make them conform to ANSI standards. This makes them more portable and makes any future conversions easier. Non-standard statements can be detected by using the EL=0

parameter on the M77 control statement or the ANSI parameter on the FTN5 control statement. For more information or assistance, call Janet Eberhart, 373-5907.
(Janet Eberhart)

Grants for Research

The Agency for International Development (AID) of the United States Department of State supports research in the area of education and human resource development. Such research includes education technology and analysis. For more information, call Dr. David Spague, (202) 235-8980.

AID also sponsors work in technical reviews and information. Research areas include appropriate technology, use of advanced technology, and the exchange of technical information. Call Ruth Zagorin, (202) 235-9044.

New guidelines for grants from the Division of Education, National Endowment for the Humanities, are available from NEH, Washington, D.C. 20506.

An article of particular interest to those at the University who seek research support—"University Independence in an Era of Corporate Support" by W. Stevenson Bacon—appeared in the December, 1982 issue of *Grants Magazine*. The magazine is available in our Reference Room, 140 Experimental Engineering.

The National Science Foundation's Computer Research Grant Program offers funding in a wide variety of areas, including:

- Intelligent systems
- Computer research equipment
- Computer systems design
- Coordinated experimental research
- Software engineering
- Software system science
- Theoretical computer science
- Special projects (including legal and societal issues)

For general information about this program, call (202) 357-9498.

Non-Traditional Computing

COMPUTING AND SOCIOLOGY

The May lecture in our series on non-traditional computing will take place at 3:15 p.m. Wednesday, May 11, in 204 Folwell Hall. Professor Donald McTavish of the Department of Sociology will speak on "Computer-Assisted Content Analysis."

CONFERENCE ON SIMULATION AND GAMING

The Center for Ancient Studies at the University of Minnesota is sponsoring a Conference on Simulation and Gaming in Ancient Studies May 6 and 7 at the Nolte Center. It will include sessions on simulations in ancient history and archaeology. Contact Guy Gibbon, Center for Ancient Studies, 205-1/2 Folwell Hall, for more information.

Suggestion Box

Could you put up simple (yet informative) signs indicating exactly how to use ROUTE? It causes a lot of confusion, and if more people were familiar with it, it would ease up use of the DEC III's. Thanks. (Jack Thompson)

Good idea! We will post a discussion of ROUTE, including the permissions needed to use it from the MERITSS system. You can also type the interactive command

HELP,ROUTE

for an explanation of the ROUTE parameters.

(Rich Franta/Joe Cornell)

CORRECTION

An article on VMS/Xerox 9700 bugs in the April *Newsletter* directed you to a morehelp entry for additional information. The form of that entry was incorrect; the correct form is:

morehelp x9700 special_effects

We apologize for any inconvenience this error may have caused.

SPRING QUARTER SHORT COURSES

INTRODUCTORY COURSES

Prices: U. student \$10, U. staff \$20, Non-University \$30

- 055 Interactive System Commands (Rich Franta)
May 3-12 (TTh) 3:15-5 p.m.
- 100 Text Editing at UCC (Simin Hickman)
May 9-23(M) 3:15-5 p.m.
- 150 Introduction to Programming (Rich Franta)
May 16-27 (MWF) 3:15-5 p.m.
- 110 Text Formatting at UCC (Elaine Collins)
May 17-26 (TTh) 3:15-5 p.m.
- 130 XEDIT (Mary Boyd)
May 17-26 (TTh) 2:15-4 p.m.

ADVANCED COURSES

Prices: U. student \$20-30, U. staff \$30-50, Non-University \$50-100

- 510 Introduction to System 2000 (Cheryl Vollhaber)
May 9-25 (MWF) 3:15-5 p.m. \$30-\$40-\$50
- 530 SPSS (statistics package) (Pat Bland)
May 9-12 (MWTh) 2:15-3:30 p.m. \$20-\$30-\$50
- 600 Beginning FORTRAN (Janet Eberhart)
May 9-20 (MWF) 3:15-5 p.m. \$25-\$35-\$60
- 640 Introduction to Pascal (Michael Collins)
May 10-26 (TTh) 3:15-5 p.m. \$20-\$30-\$50
- 520 SIR (data base management) (Brian Cook)
May 16-27 (MWF) 3:15-5 p.m. \$30-\$40-\$60
- 580 Graphics (John Cornelison)
May 17-26 (TTh) 3:15-5 p.m. \$20-\$30-\$60

NOTE: Caret (^) indicates a new course.

HOLIDAY: Monday, May 30 is a University holiday. No classes will be held.

REGISTRATION: Register at the UCC Computer Store, 211 Experimental Engineering; a self-service terminal is located outside the Store. We accept mail registrations for an additional \$1 fee per class. You may pay course fees with cash, check, University journal voucher, or charge them to your non-instructional UCC user account.

REFUND POLICY: No refunds will be made after a class has begun. Refunds are made in the same form as the fee was paid, i.e., check, journal voucher, UCC account credit.

If you have questions about short courses or about registration, call Jerry Stearns, 376-8806, or see WRITEUP(CLASSES) on the MERITSS or CYBER systems.

ADVANCED TELL-A-GRAF SEMINAR

If you're familiar with TELL-A-GRAF basics and would like a guided tour through its options to find out what they can do for you, come to our special Advanced TELL-A-GRAF Seminar. It will meet from 3:15-5 p.m. on Friday May 20, Monday May 23, and Wednesday May 25.

We'll assume you know how to generate a basic graph and go on to explore the possibilities for graph annotation, page layout, and file handling. Advance registration is required. The fee is \$20 for University students, \$30 for University staff and faculty, and \$50 for non-University participants. Mail your registration to:

TELL-A-GRAF Seminar
227 Experimental Engineering
208 Union Street SE
Minneapolis, Minnesota 55455

For more information, call the TELL-A-GRAF/DISPLA HELP-line, 376-2663, from 1-3 p.m. Tuesdays and Thursdays.

ST. PAUL COMPUTER CENTER SHORT COURSES

The St. Paul Computer Center (SPCC) will offer two short courses in May. SAS covers the SAS statistical analysis system, a comprehensive statistical package available on SPCC's IBM 4341. MUSIC introduces the MUSIC interactive operating system, which allows you to edit and save files, submit batch jobs, or run jobs interactively. If you want to access SAS remotely via an interactive terminal, MUSIC allows you to submit jobs to SAS and get the output back on a disk file.

The courses are free and are scheduled to meet as follows:

- SAS May 9-13 (MWF) 3-5:15 p.m. 35B COB (St. Paul campus)
- MUSIC May 16-20 (MWF) 3-5:15 p.m. 35B COB (St. Paul campus)

For more information about these courses or about SPCC, call Ron Schultz, 373-0987.

Table 1. Current and Proposed Rates for Internal Users.

		Current M/Month*	Proposed M/Month*	Change
CYBER	Normal	.17 SRU	.15 SRU	-12%
	Low. PO	.12 SRU	.10 SRU	-17%
CYBER VAX	Mass storage	.02/KSH or \$17.03	.017 or \$14.48	-15%
	Mass storage	.64/KSH or \$16.87	.56 or \$14.76	-13%
CYBER	300 baud	\$1.45/hour	\$1.30/hour	-10%
	1200 baud	\$2.50/hour	\$2.25/hour	-10%
VAX	any baud	\$2.50/hour	\$2.25/hour	-10%
MERITSS	Port charge	\$2400/year	\$2200/year	- 9%
Disk unit rental with disk pack and weekly backup dump (daily incrementals = + 25%)				
	M chars	Current	Proposed	Change
Single density	118	\$1080/month or \$9.15	\$ 975/month or \$8.26	-10%
Double density	237	\$1440/month or \$6.08	\$1350/month or \$5.70	- 9%
Fixed module disk	685		\$2200/month or \$3.21	

*million characters/month

All Systems Bulletins

RATE REDUCTIONS

We have acquired additional large capacity disks for both the CYBERs and the VAX systems that decrease the cost of the total mass storage base. In addition, lower total CYBER costs for next year and more

cost-effective interactive system front-end equipment and modems allow rate reductions in communications charges. We believe that with these new rates a typical bill will decrease by at least six percent (about the amount of proposed University cutbacks, so you may come out even). Table 1 lists

the current and proposed rates for internal users effective July 1, 1983. External users will see similar reductions for the same resource use. All other rates are expected to remain at this year's level.

(L. A. Liddiard)

DEMISE OF THE 1004 RJE STATIONS: A REMINDER

We will remove all remaining Univac 1004 RJE's from service on July 1, 1983. SUPIO, the UCC software required to drive the 1004s, is non-standard and difficult to maintain through system and hardware upgrades. Our records also show that RJE use continues to decrease as interactive use grows. So don't be surprised when the venerable 1004 workhorses are retired in July.

(Richard L. Hotchkiss)

MEMORIAL DAY HOURS

Monday, May 30, is an official University holiday. The CRAY and the CYBERs will go down at 1 a.m. Monday, May 30 and be brought up again at 6 p.m. The VAX will operate throughout the weekend, but it will be unattended from 1 a.m.-6 p.m. Monday; no tapes can be mounted and no output returned during that time. The Experimental Engineering input/output station will be closed from 4 p.m. Saturday, May 28 until 6 p.m. Monday, May 30.

FOR SALE

One DECWRITER II, model LA-36, and one ASTROCOM model 1100 modem. Call Stan Bonnema, Dept. of Chemistry, 373-2324.

COMPUTER STORE

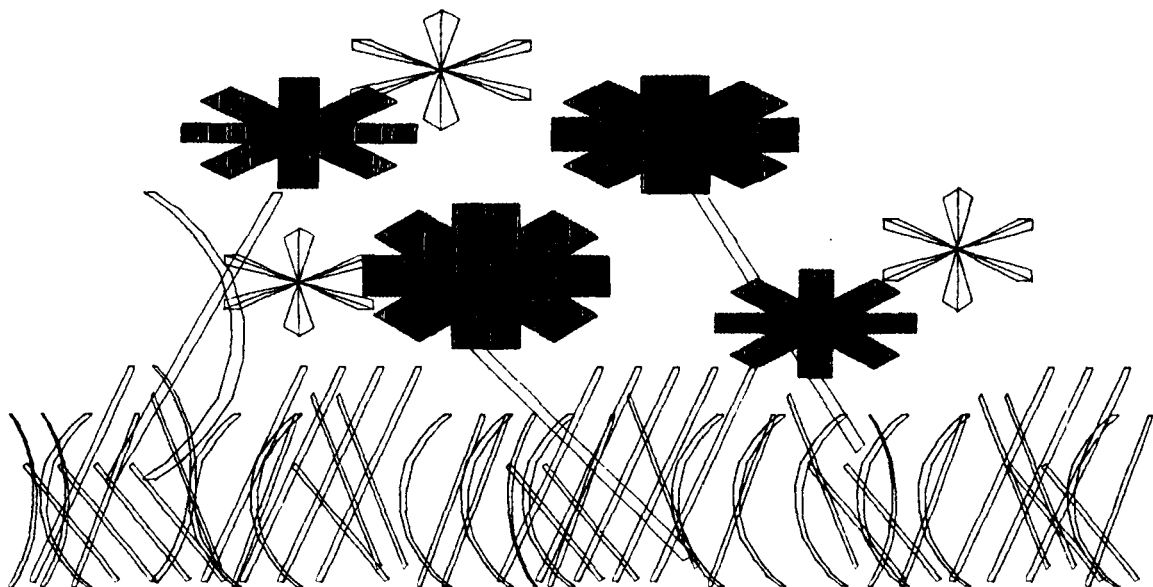
for all your computing needs

- floppy disks, cards, paper
- short course registration
- microcomputer access cards
- software
- documentation



211 Experimental Engineering
East Bank, University of Minnesota
373-4877

SUPPLY CENTER FOR EPSON PRINTERS
Paper and ribbons to fit
Epson 80 and 100 models



—Graphic by Harry Hovland

PHONE NUMBERS

<p>Access:</p> <p>CYBER(CA)—10, 30 cps 376-5730</p> <p> —120 cps 376-5706</p> <p>MERITSS(ME)—10 cps 376-7710</p> <p> —30 cps 376-7730</p> <p> —120 cps 376-7120</p> <p>VAX/VMS(VA)—(autobaud) 376-9770</p> <p>Budgets 373-2521</p> <p>Computer-Aided Instruction 376-2975</p> <p>Computer Hours (recorded message) 373-4927</p> <p>Computer Store 373-4877</p> <p>Consulting</p> <p> HELP-line 376-5592</p> <p> 9 a.m.-5 p.m., Monday-Friday</p> <p> Business Data Products 376-1761</p> <p> 1-3 p.m., Monday-Friday</p> <p> Statistics Packages 376-5062</p> <p> 1-2 p.m., Monday-Friday</p> <p> Data Bases 376-1761</p> <p> 1-3 p.m., Monday-Friday</p> <p> Microcomputers 376-4276</p> <p> 10-12 a.m. and 2-4 p.m., Monday-Friday</p> <p> Non-Traditional Computing 373-5780</p> <p> 10:30-11:30 a.m., Monday, Wednesday, Friday</p> <p> TELL-A-GRAF/DISSPLA 376-2663</p> <p> 1-3 p.m. Tuesday, Thursday</p> <p>Text Processing 376-2943</p> <p> 9 a.m.-noon Tuesday-Thursday</p> <p>Contract Programming 376-1764</p> <p>Data Base Applications 376-1764</p> <p>Educational Services 376-3963</p> <p>EDUNET Liaison 373-7745</p> <p>Engineering Services 376-1023, 376-8153</p>	<p>Equipment Purchase/Information 376-8153</p> <p>Experimental Engineering I/O 373-4596</p> <p>Field Engineering 376-7584</p> <p>Graphics Software 376-5592</p> <p>HELP-line 376-5592</p> <p> 9 a.m.-5 p.m., Monday-Friday</p> <p>HOURS-line (recorded message) 373-4927</p> <p>Image Processing 376-2895</p> <p>Information, Experimental Engineering 373-4360</p> <p>Information, Lauderdale 373-4912</p> <p>Information Systems 376-1764</p> <p>Instructional Labs 376-2703</p> <p>Lauderdale Computer Room 373-4940</p> <p>Lauderdale Services 373-4995</p> <p>Lauderdale Services Manager 373-7538</p> <p>Lauderdale Users' Room 373-4921</p> <p>MECC Liaison 373-7745</p> <p>Newsletter Subscription 373-4912</p> <p>Permanent File Restoration 376-5605</p> <p>Professional Services Division (PSD) 376-1764</p> <p>Project Assistance 376-1764</p> <p>Program Librarian 376-1636</p> <p>Programming Languages 376-7290</p> <p>Reference Room 373-7744</p> <p>Remote Batch (RJE) Services 376-2703</p> <p>Short Courses 376-8806</p> <p>Shuttle Bus Service 376-3068</p> <p>System Status (recorded message) 373-4927</p> <p>Tape Librarian: see Lauderdale Services</p> <p>Text Processing Services 376-2943</p> <p>User Accounts 373-4548</p> <p>User Services 376-3963</p>
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OPERATING HOURS

	Cyber CA/CB	Low rate	Cray (CR)	MERITSS (ME)	VAX (VA)
M-F	7 a.m. - 4 a.m.	8 p.m. - 4 a.m.	8 a.m. - midnight	7:45 a.m. - 1:30 a.m.	8 a.m. - 6 a.m.
Sat	4 a.m. - 5:15 p.m.	4 a.m. - 5:15 p.m.	8 a.m. - 5 p.m.	7:45 a.m. - 1:30 a.m.	24 hours
Sun	4 p.m. - 1 a.m.	4 p.m. - 1 a.m.	4 p.m. - midnight	4 p.m. - midnight	24 hours

PUBLIC LABS—TWIN CITIES CAMPUS

Location	Batch	Interactive	Micro	Location	Batch	Interactive	Micro
<i>East Bank</i>				<i>West Bank</i>			
Arch 160		X	X	BlegH 25		*	
CentH		X		BlegH 90	X		
ComH		X		BlegH 91T			X
DiehH 270, 207		X		BlegH 140		X	
EltH 121, 125		X		MdbH		X	
EltH N640	X			OMWL 2		X	
ExpE 130	?			<i>St. Paul</i>			
FolH 14, 14a	X	X*	X	BaH		X	
LindH 25, 26	?	X		ClaOff 125	X	X	
MasCan 39	X			NorH 24	X		
MechE 308		X					
Physics 69		*?					
SanfH		X					
TerrH		X					
VincH 4		X					
WaLib 204		X					

* Research cluster; access to Cyber 730 and VAX/VMS

X in interactive column indicates access to MERITSS

? Unknown at the present time

Contents

For Your Information: UCC's Reference Room	45
MERITSS—Peaks and Prospects	
UPGRADE FOR BETTER RESPONSE TIME	47
DIAL-UP ACCESS WILL INCREASE	47
THE RETURN OF UNIX	47
Give Us the Business: Suggestion Boxes	
Reinstalled	48
Author, Author	49
SYSTEM NEWS/NOTES	
Documentation	
NEW M77 REFERENCE MANUAL AVAILABLE	49
Microcosm	
UNIVERSITY MICROCOMPUTER USERS	
GROUP	49

CYBER Notes	
COBOL 4 TO BE REMOVED IN FALL	51
CDC SUPPORT FOR FTN ENDS IN JUNE	51
Grants for Research	51
Non-Traditional Computing	
COMPUTING AND SOCIOLOGY	51
CONFERENCE ON SIMULATION AND	
GAMING	51
Suggestion Box	51
All Systems Bulletins	
RATE REDUCTIONS	53
DEMISE OF THE 1004 RJE STATIONS:	
A REMINDER	53
MEMORIAL DAY HOURS	53
SPRING SHORT COURSES	52

University Computer Center Newsletter

User Services
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