August CYBER Changes

In the July *Newsletter,* we hastily described the CYBER changes that will occur in late August and late December 1983. We now have more information about the August change.

The performance problems you encountered last year on the CA machine (CYBER170-730, 2 CPUs) were largely due to a lack of sufficient central memory. The 730 executes 3.9 MIPs with both CPUs, but only has 262K words of central memory. The 730 is complemented, of course, by the CB computer (CYBER 74), which executes 3.3 MIPs but has only 131K of central memory. More memory cannot be added to either of the older CYBERs.

We plan to replace both machines with one CYBER 170-845, which executes 5.2 MIPs and has 524K words of central memory. The memory on an 845 can be increased to 2M words if needed.

Unfortunately, Control Data Corporation (CDC) cannot deliver an 845 until late December. It would be easiest to leave the current CYBER situation until then, but the 730 would probably be over-saturated again. We may also have some fall quarter CD/2000 users from Mechanical Engineering on MERITSS. It is convenient to have an additional machine to handle interactive MERITSS users.

CDC has bid a CYBER 170-825 to replace the CYBER 74 until they deliver the 845 in December. The

CYBER 825 has 524K words of memory, but only executes at 1.8 MIPs. The CB computer then, will become a CDC CYBER 825 on August 28. It will contain the CB family of permanent files; all batch jobs will run by default on system CB; interactive access will be available; and ECS (extended core storage) will be available only on system CB.

The CB family will not be shared with the CA computer as it has been in the past, but will be available only on the CB machine. Machines CA and CB will share two disks called SHA and SHB, but these will be less efficient than the shared disks we use now. If you use files on both machines (CA and CB) you must use one of the shared disks to pass files between them. We will transfer your file family from CB to CA at your request. ECS jobs will only run on system CB with the current 230K limit. ECS jobs will be removed entirely from the CYBER on January 1. We will be happy to help you convert programs that use ECS to ones that do not need the facility. Call K. C. Matthews, 376-9720, for more information.

The CB computer will be the default computer for all card decks read in from SUPIO, BATCHIO, and the EXPORT station. The batch jobs that come in through RBF today (certain CRAY users, University of Minnesota-Morris users) run on the CA computer. We will move RBF

itself to run on the CB computer. RBF users who want to run on the CA computer as before should use the ST parameter on their job or SUBMIT statement, specifying MCA as the destination.

> **jobname(Tnn,...,STMCA)** or
>
> **SUBMIT(file,ST = MCA)**

All batch jobs on the CB computer will be given a maximum field length of 375K words. This is the largest available for a CYBER computer.

File routing and the SUBMIT control statement will work as they do now. CRAY jobs can be submitted from CA or CB, but the ACQUIREs and DISPOSEs will not be able to access the CB family, so most CRAY users will probably use the CA computer.

When the CYBER 845 becomes the CA system during the December break, *all* batch jobs will run on the CA system—the 845. The CB file family will be on the CA machine, but will *not* be the default family; the CA family will be default. You can use the CB family by specifying family CB on your USER statement:

> **USER(usernumber,password,CB)**

or in response to the interactive log-on prompt:

> **FAMILY: cb <CR>**

We urge you to begin doing this on August 28.

UCC Network Opens

When we install the new CB system in August, we will implement part of a UCC network to provide you with simplified interactive access to the CA, CB, or ME (MERITSS) systems. When you access the CYBER computers in your usual way (dial-up or hard-wired), the Network system will ask you to select the computer system you want. Your choices will be ME (MERITSS), CA (CYBER 730 until January 1), CB (CYBER 825), or IB (IBM 4341 at the St. Paul Computer Center).

The Network will display a message that looks like this:

UCCNetwork V1.0, Port 1HAB.
To connect to machine xx, type: C xx
xx is CA, CB, ME, or IB
*

V1.0 means version 1.0.
1HAB is an example of a port name. It will change depending on where you log in.
CA, CB, ME, or IB is the list of machines. This list will change as new machines are added.
* is the network front-end (PDP-11) prompt character.

At the asterisk, type a "c" followed by a blank, then the two-character machine code, for example:

c cb

Press RETURN.

On the CYBERs, the next message you'll see is the familiar NOS log-on sequence that asks you for FAMILY:, USER NUMBER:, and PASSWORD: designations. If you have questions about the UCC Network, call the HELP-line, 376-5592.

*P*ROFESSIONAL *S*ERVICES *D*IVISION

Grants Outlook Improved for 1983-84

As a result of legislative funding and the internal reallocation of funds, there has been a significant change in the computing grants policy we announced in the June *Newsletter*. Supply costs (such as those for disk storage, printer and plotter output, connect time, and terminal cluster use) are now included in the grants and the initial fee has been reduced to $30 for both graduate thesis (G-account) and unfunded faculty (R-account) research.

Supply costs average 50% of the CYBER and CRAY SRU and SBU processor costs (grants are not applicable to use of our VAX system), and the average annual faculty or graduate student bill totals less than $500. The new policy means that almost all these users will pay only the initial fee for their 1983-84 computing. Table 1 shows cumulative costs under the previous and new policies for such accounts (with supply costs at a 50% ratio to processor costs).

Note that users pay all costs over $1000, and that grants cannot be used for off-line costs such as tapes, disk packs, Computer Store purchases, or short courses.

Vice President for Academic Affairs Kenneth Keller was instrumental in the adoption of this new policy and we are reprinting his memo announcing it to University Provosts, Deans, Directors, and Department Heads (see Exhibit 1).

We implemented the new policy immediately following its approval by the Regents in July; our July billing will reflect it. We encourage all our users to take this new policy into account when you plan and carry out your research and to spread the word to other faculty and students so that they too may take advantage of it.

Our introductory short courses on the CYBER and CRAY systems can assist all those who would like to make 1983-84 the year of research and thesis computing.

(*Lawrence A. Liddiard*)

	Usage	Cumulative Grant	User Cost
Previous Policy	$ 150 (100 of 03)	$ 0	$150
	1000 (666 of 03)	424	576
	1500 (1000 of 03)	675	825
New Policy	150 (100 of 03)	120	30
	1000 (666 of 03)	970	30
	1500 (1000 of 03)	970	530

Table 1. User costs for processor and supply charges.

To: Provosts, Deans, Directors and Department Heads

From: Kenneth H. Keller, Vice President

Subject: Computing Costs Associated with Graduate Thesis Work and Unfunded Faculty Research

For some time, there has been a concern, which I have shared, about the level of funding available to finance the computing costs associated with graduate thesis work and *unfunded* faculty research. Through legislative funding and the internal reallocation of funds, we have developed a pool of money that allows us to make a significant improvement in our computer grant program. In consultation with University Computer Services, the charging schedule which appears below has been developed and will be implemented following Regents' approval in early July and as soon as the computer centers can complete the necessary program modifications, but not later than the Fall Quarter of 1983. I am requesting the directors of the computer centers to inform their users of this new program, which will have the following features:

1. An initial payment of $30 (not refundable) per user will establish an account. Computing costs (03) and on-line computing-related charges (05) will be applied to this amount.

2. Once the accumulated charges exceed $30, all computing costs (03) and on-line computing-related charges (05) up to $1,000 will be covered automatically by a grant.

3. Usage beyond $1,000 will be fully charged. However, grants will be available under the programs presently managed by computer grants committees which will remain in effect.

. . . The same schedule will apply to thesis-related computing by graduate students. We must continue to expect grants and contracts for research projects to include funds for research computing and to pay the full costs of such computing whenever possible, whether the computing is done by faculty members or graduate students. If this practice is not followed, available University funds may not permit continuation of the more generous policy for unfunded research.

This program should go far in meeting the computing needs of the majority of our faculty and graduate students. It must be considered experimental during its first year of operation, however, as we ascertain whether usage patterns follow our previous experience so that the funds we have been able to devote to this purpose are indeed sufficient.

Exhibit 1. Vice-President Keller's computing costs memo

System News/Notes

Terminal Information

NEW RESEARCH CLUSTER

We have installed our third public research cluster and have expanded another. The new cluster is in 69 Physics. This room will be kept locked; to use the facility, go to 148 Physics and sign out the key any time during normal business hours (8 a.m.-5 p.m. Monday through Friday). To use the room on weekends, check out the key after noon on the preceding Friday. This room contains three VT-100 computer terminals hardwired at 1200 baud to the CA/CB network. As soon as phone lines are installed, these terminals will also be connected to our VAX 11/780 at 9600 baud. Each terminal can emulate a Tektronix 4010 series graphics terminal. An Epson MX-100 printer will be installed when our network can handle it, probably late this fall. The MX-100 is a medium speed dot matrix graphics printer. Depending on line length, it can print from 60 to 120 characters/second.

Our other clusters are located in 25 Blegen Hall and 14 Folwell Hall. The Folwell Hall cluster has been expanded from three to six VT-100 terminals. You can access the VAX 11/780 from both clusters (at 9600 baud from Folwell Hall at at 2400 baud from Blegen Hall). We charge an additional $1.55/connect hour for use of these terminals to offset the cost of establishing and maintaining the clusters.

(Joe Cornell, 376-2703)

REMOTE JOB ENTRY NETWORK CHANGES

Those venerable workhorses, the Univac 1004s, have been removed. This leaves us with five PDP-11 based Remote Job Entry (RJE) stations running the UT-200 emulator written by UCC. When these are upgraded to 4800 baud later this fall, they will provide throughput approximately equivalent to that of the twelve 1004s if downtime is taken into consideration. The new equipment is much easier and less costly to maintain, and flexible enough to allow us to change communications protocols as older ones become obsolete. Exhibit 1 provides information on our RJE sites, both those now closed and those currently open.
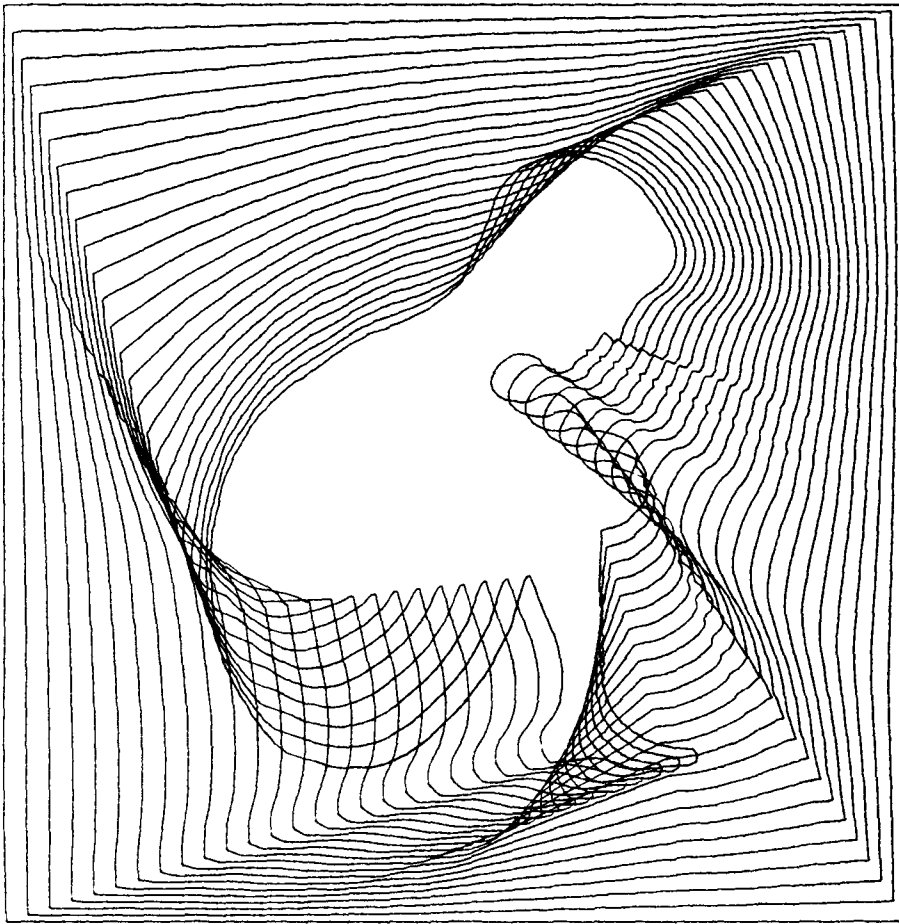
KEYPUNCHES REMOVED

As part of our attempt to modern-ize facilities and reduce costs, we have removed ten keypunches from our open shop keypunch facilities. We will rearrange the remaining keypunches as shown in Exhibit 2.

HOW TO USE THE NEW RJES

A free seminar on how to use our new RJEs will be held at 3:15 p.m. Monday, August 15, 1983, in 647N Elliott Hall. We'll cover the following topics:

Closed RJE sites:		
Room	Closest New Site	Comments
North Hall 24	Classroom Office 125f	Courier service is now to COB 125f also.
Bio Sci 257a	Classroom Office 125f	
McNeil Hall	Classroom Office 125f	
Soc Sci 1009	Blegen 90	Blegen RJE was in Wilson 2B.
Soc Sci 167	Blegen 90	
Elect E 38	Lind 26	
Exp E 130	Lind 26	All three gone now. This RJE is now in Lind 26.
Kolt H S191	Elliot 640N	Folwell 14 is also close.
Mas Can Ctr 39	Lind 26	
Mayo D388	Lind 26	
Min Met 321	Lind 26	
Phys 69	Elliot 640N	Now contains research cluster.
Zoology 314	Lind 26	

Currently open sites:		
Room number	Regular Hours	Summer Hours
90 Blegen (site code 29)	M-Th 8a-MN Fri 8a-10p Sat 10a-5:15p Sun 4p-MN	M-F 8a-10p Sat N-6p Sun Closed
Lind Hall 26 (site code 3L)	M-Th 8a-MN Fri 8a-8p Sat 9a-N Sun 4p-MN	M-Th 8a-11p Fri 8a-8p Sat 10a-6p Sun closed
Folwell 14 (site code 33)	M-F 8a-10p Sat 10a-6p	Same as regular Sun 4p-10p
ClaOff 125f (site code 3F)	M-F 8a-4:30p Sat closed	Same as regular Sun closed
Elliott 640N (site code 3N)	M-F 7:30a-MN Sat closed	Same as regular Sun closed

Exhibit 1. Remote Job Entry (RJE) Network Changes

Room	Number Keypunches	Comments
Elliot Hall 640N	8	Will contain all punches from closed Elect E 38.
Folwell 14	4	Getting three from closed Exp 140B.
Exp 131	4	Limited to 5 minutes.
ClaOff 125	2	
Lauderdale user room	4	
Blegen 90	1	
Total	23	

Exhibit 2. UCC Keypunch Facilities

- How to restart the RJES
- Different configurations and how they're booted
- How to submit files from floppy disks
- How to get status messages and what they mean
- How to abort a bad print file

We welcome any and all questions. No registration is required, but we urge you to get a copy of WRITEUP,NEWRJE to bring to the session. If you have questions or would like to suggest additional topics, call Joe Cornell at 376-2703.

REMOTE JOB ENTRY SURVEY

UCC is distributing a survey to help us meet your remote job entry (RJE) needs in the near and distant future. The survey will be mailed to all current RJE site coordinators, but we would also like to solicit information from prospective users. If your organization does not have an RJE at the present time, but may set one up, please contact Joe Cornell (376-2703) for a copy of the survey.

CYBER Notes

PL PARAMETER CHANGE

On August 14, we will change the function of the PL parameter that is used on several CYBER permanent file commands. The parameter will no longer access reference files on the catalog of the LIBRARY account.

Since the PL parameter is used mainly for system maintenance, the change should not affect many users. If you do use it, however, you can replace it with the PN and UN parameters. For example, replace:

GET(FN/PL = 0)

with

GET(FN/PN = 0,UN = LIBRARY)

If you have questions about this change, call Marisa Riviere, 376-9718.

PASCAL VERSIONS WILL CHANGE

We will rotate the versions of Pascal-6000 at the beginning of fall quarter 1983. Future Pascal will become current, and current will become past.

Future Pascal includes the following features:

- it conforms to the ISO standard for Pascal
- it handles automatic field length management
- it uses a new control statement format
- it replaces DYNAMIC array declarations with the syntax adopted by ISO for conformant arrays.

The future version of Pascal is not upward-compatible with the current version, and some changes to user programs may be necessary.

The indexed writeup PASCALF describes the differences between the current and future versions of Pascal-6000. See WRITEUP(PASCALF) for a list of the chapters in the writeup. or WRITEUP(PASCALF = *) for the entire writeup (30+ pages).

(*Dave Bianchi*)

FORTRAN SUBSYSTEM CHANGES

Effective August 28, some changes will occur in two FORTRAN subsystems, MNFTS and FORTRAN, and TSF will be removed.

The MNFTS subsystem currently uses a subset of MNF (TSF) that does not:

- Produce a cross reference map
- List object code
- Optimize DO loops
- Issue compiler DAYFILE messages
- Support DOUBLE PRECISION or COMPLEX numbers

We will remove the TSF control statement and the MNFTS subsystem will use the full MNF compiler. The only user-visible change will be a slight increase in the field length necessary to run a FORTRAN job under MNFTS. The FORTRAN subsystem will call the Minnesota 1977 FORTRAN compiler (M77) rather than MNF. Programs created using the FORTRAN subsystem prior to fall quarter will continue to use the full MNF compiler. Differences between MNF and M77 are documented in WRITEUP(M77).

(*Janet Eberhart*)

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.

WARNING: When the new CYBER 825 replaces the CYBER 74 (system CB) late this month, COBOL 4 will not work correctly. The compiled code from COBOL 4 modifies instructions, then attempts to execute them. This technique can fail on the lower 800-series of Control Data CYBER computers. Any of you with COBOL 4-compiled binary programs will have this problem.

If you have such a program that you still want to run on the CB system, include the control statement:

MACHINE(EP = ON)

This control statement inhibits the instruction look-ahead features in the 800-series hardware and solves the problem described above. It also increases the program execution time by about 50%, however.

If you have questions about this change or need assistance, call our Information Management Systems Group at 376-1761 (from 1 to 3 p.m. weekdays). COBOL 5 documentation is available at the Computer Store. We will also remove CYBER Record Manager Advanced Access Methods Version 1 in the fall.

(Systems Staff)

VAX Service

VMS SYSTEM UPGRADE

We will upgrade the VAX to VMS version 3.3 on August 14. The upgrade consists mainly of bugfixes and maintenance changes with some adjustments to the BACKUP facility. There are no major documentation changes. For more information, see:

usera:[writeups]vms33.lis

Non-Traditional Computing

NEW CONSULTING SERVICES

Beginning in fall quarter 1983, we will offer two new consulting services:

● Our regular consulting in 14 Folwell Hall will be supplemented by extra consultants during midquarter examinations

and during the last week of the term.

● A separate consulting facility for questions on text processing, word processing, and non-traditional computing will be established. This service will be offered throughout the academic year. See the September *Newsletter* for additional details.

(Tom Rindflesch)

Text Processing

TERAK WORD PROCESSING

A Terak disk for word processing *only* is now available at the Computer Store, 211 Experimental Engineering. This disk contains the basic system for file editing, PROSE, and DECLIST. It costs $60, a savings of $40 over buying the MMOS system and utilities disks.

XEROX 9700 SERVICE

Scribe and other Xerox 9700 users who have stayed with us over the past few months have noticed a great improvement in output delivery time. If you have been discouraged by poor service, you might like to try again. All UCC-originated laser printing is now sent to the University's Administrative Data Processing Department facility. You can expect a turnaround time of two days for your printing jobs. For more information about Xerox 9700 jobs, see MOREHELP X9700 TURNAROUND on our VAX system.

(Elaine Collins)

Documentation News

SPINWRITER TYPEWHEEL BRIEF

Copies of the NEC *Spinwriter Typewheel Brief* are now available in 140 Experimental Engineering at no charge. The Brief contains a character set chart for each of the seven Spinwriter typewheels we currently maintain. It also includes instructions on how to use the typewheels to print your documents.

(Elaine Collins)

Grants for Research

CORPORATION FOR PUBLIC BROADCASTING

The Corporation for Public Broadcasting will award ten million dollars in 1984 to projects that demonstrate the application of telecommunications technologies to higher education.

Grants will be awarded in two program areas: demonstration proposals and materials development proposals. Applications will compete only against proposals in the same category. Demonstration projects should concentrate on the application of instructional methods, course designs, and new technologies to higher education. Materials development proposals should develop college-level materials that will be provided to telecommunications systems.

For additional information, contact:

Annenberg/CPB Project
1111 Sixteenth Street NW
Washington, DC 20036
(202) 293-6160

DEPARTMENT OF EDUCATION

The Department of Education will award ten two-year grants averaging $160,000 each for projects that develop and demonstrate methods to improve educational practices through the use of technology.

They are looking for projects that use technology (microcomputers and other interactive learning systems, interactive broadcast television, and other systems) to enhance elementary and secondary school achievements in science, mathematics, reading, and writing.

For more information, contact:

Ann Erdman, Program Officer
Division of Education Technology
Department of Education
1200 Nineteenth Street NW,
  Room 711
Washington, DC 20208
(202) 254-5856

ALFRED P. SLOAN FOUNDATION

The Alfred P. Sloan Foundation's New Liberal Arts Program funds projects that integrate quantitative

reasoning and applied math and technology courses into college liberal arts programs.

Grants are awarded to nonprofit organizations, primarily institutions of higher education, for the development of instructional programs and research. The Foundation accepts unsolicited proposals in each of these areas. Grants are not awarded to individuals.

For further information, contact:

Alfred P. Sloan Foundation
630 Fifth Avenue
New York, NY 10111
(212) 582-0450

Computer Store

NEW HOURS

On July 18 (the first day of Summer Session II), the Computer Store extended its daytime hours. The Store is now open Monday through Thursday, 9 a.m. to 4:30 p.m. It closes at 3 p.m. on Fridays. The Store will also be open from 5 to 7 p.m. Monday through Thursday during the first week of each quarter *only*. Evening hours have been discontinued for the rest of each quarter.

(Marvin Mohr)

Microcosm

LAB CARDS

Anyone who uses the microcomputer labs in 14 Folwell Hall and 160 Architecture must have a lab card. You can purchase a card at the Computer Store, 211 Experimental Engineering. The charge is $10/quarter.

Because of a change in lab fee policies, anyone with a card from fall quarter 1982 or winter quarter 1983 may exchange it for a card for this fall or winter at no charge.

All Systems Bulletins

FOR SALE

Hewlett Packard 9845B desktop computer (190K RAM; I/O, graphics, assembly ROM; HP BASIC, Pascal), 8" disk drive, thermal printer-plotter, impact printer, digitizer, payroll software. Contact Dr. Pierre Robert, (612) 376-9183.

IMS Journal

SYSTEM 2000 GROUP WILL MEET IN MONTREAL

The Association of System 2000 Users for Technical Exchange (ASTUTE) will hold its fall meeting in Montreal, Quebec October 19-22, 1983. ASTUTE provides an opportunity for System 2000 users and technical staff from Intel Corporation to share information and ideas. Detailed information on the convention program and arrangements is now available. Direct your questions about the organization to Cheryl Vollhaber at UCC (376-1761, 1 to 3 p.m. weekdays) or to ASTUTE President Roberta A. Armstrong (373-2106). If you would like to be on the ASTUTE mailing list, call Dr. Armstrong.

Statistics

SPSS: USING MANOVA FOR CONTRASTS

We caution SPSS users that MANOVA adjusts sums of squares for contrasts in the *opposite* order of that implied by the *SPSS 7-9 Update* manual (blue cover).

Section 1.11 states that the sum of squares for an effect is adjusted for all effects listed to the left of it in the **DESIGN =...** statement. That section applies only to main effects and interactions between main effects, not to contrasts. A sum of squares for a contrast is adjusted for all main effects and interactions listed to the left of it as well as all contrasts in the same factor *not* listed to the left of it.

For example, if **DESIGN = B,A(1),A(2),A BY B** is specified, MANOVA will adjust A(1) for A(2) and B, A(2) for B, and A BY B for A and B. If **METHOD = SSTYPE(UNIQUE)** is also specified, MANOVA will adjust B for A and A BY B, A(1) for B and A BY B, and A BY B for A and B.

This caution is of particular interest to those of you who request **SPECIAL** contrasts that are not orthogonal (usually the case when cell frequencies are unequal). You should either list one contrast of interest *last* among contrasts in the DESIGN statement, or make careful use of the METHOD statement.

(Patricia C. Bland)

## BMD SERIES WILL BE REMOVED THIS MONTH

The forerunner of the present BMDP statistical programs was a series called BMD. Use of BMD has declined steadily since BMDP's implementation several years ago. For that reason, the BMD series will be removed from the system at the end of the second summer session. We recommend that you begin converting your BMD programs to BMDP to accomodate that change. BMDP81, presently available as FUTURE,BMDPxx, will become current at that time. MINITAB81, now available as the future version, will also become current for fall quarter.

(Patricia C. Bland)
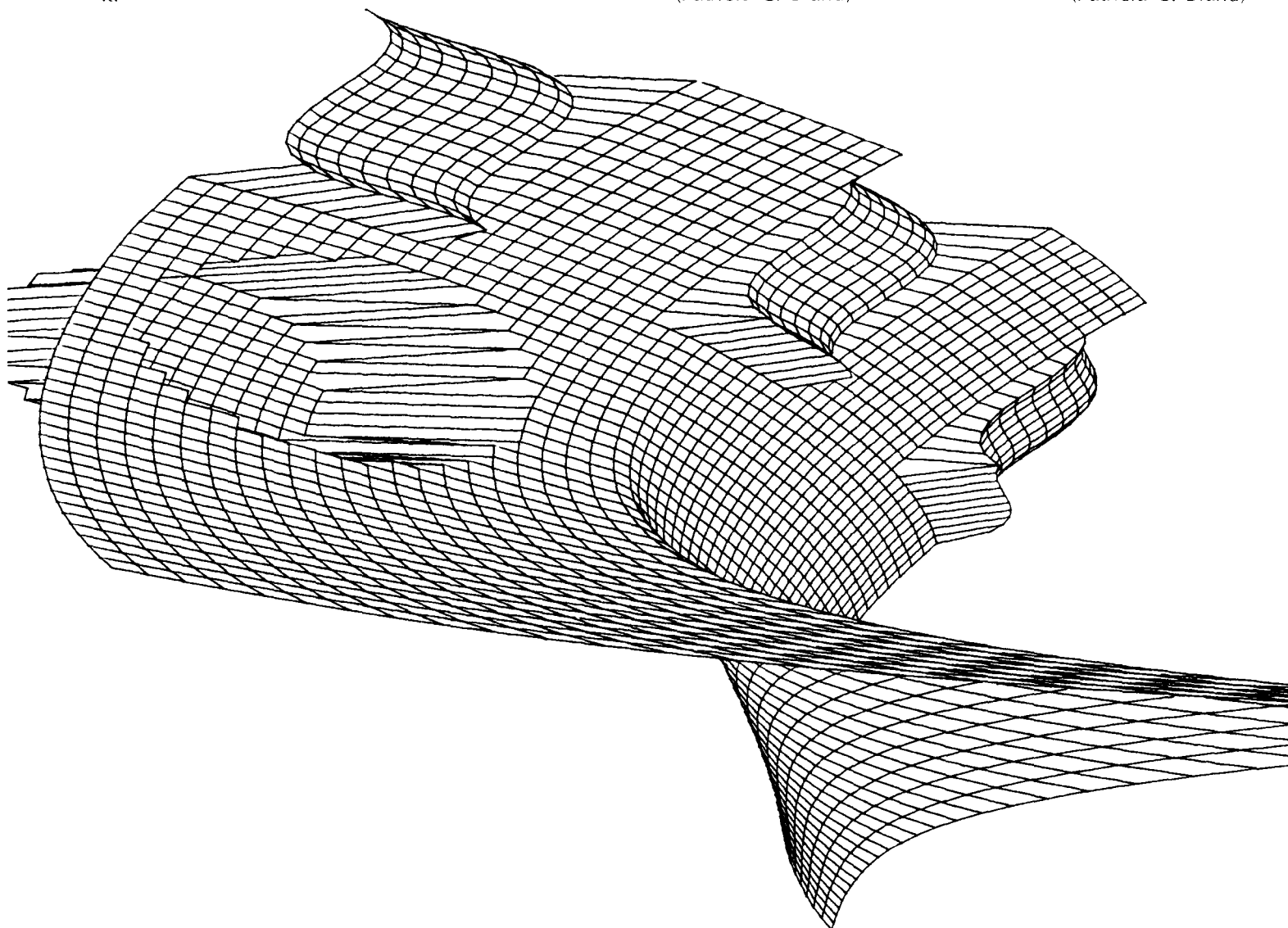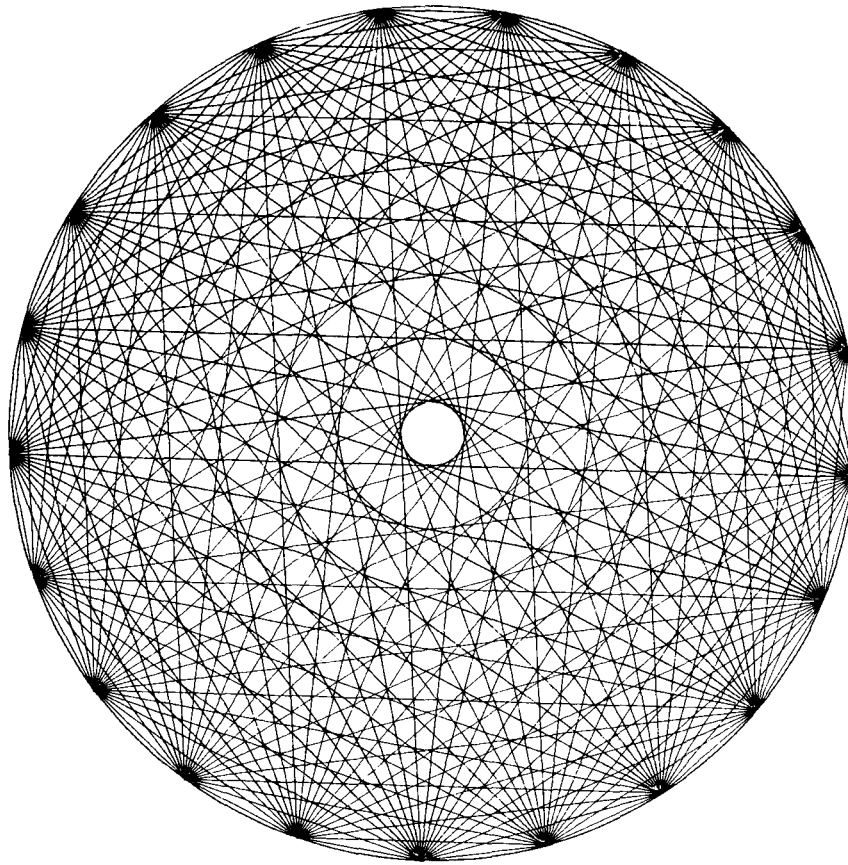
—Graphic by the UCC Graphics Group

LABOR DAY HOURS

Monday, September 5, is Labor Day, an official University holiday. The Computer Center operating hours for that weekend are as follows.

	Down	Up
Lauderdale	*1 a.m. Mon. 9/5	6 p.m. Mon. 9/5
Exp. Eng. I/O Room	4 p.m. Sat. 9/3	8 a.m. Tue. 9/6

*MERITSS will go down at midnight as usual. The VAX will run unattended during closed hours.

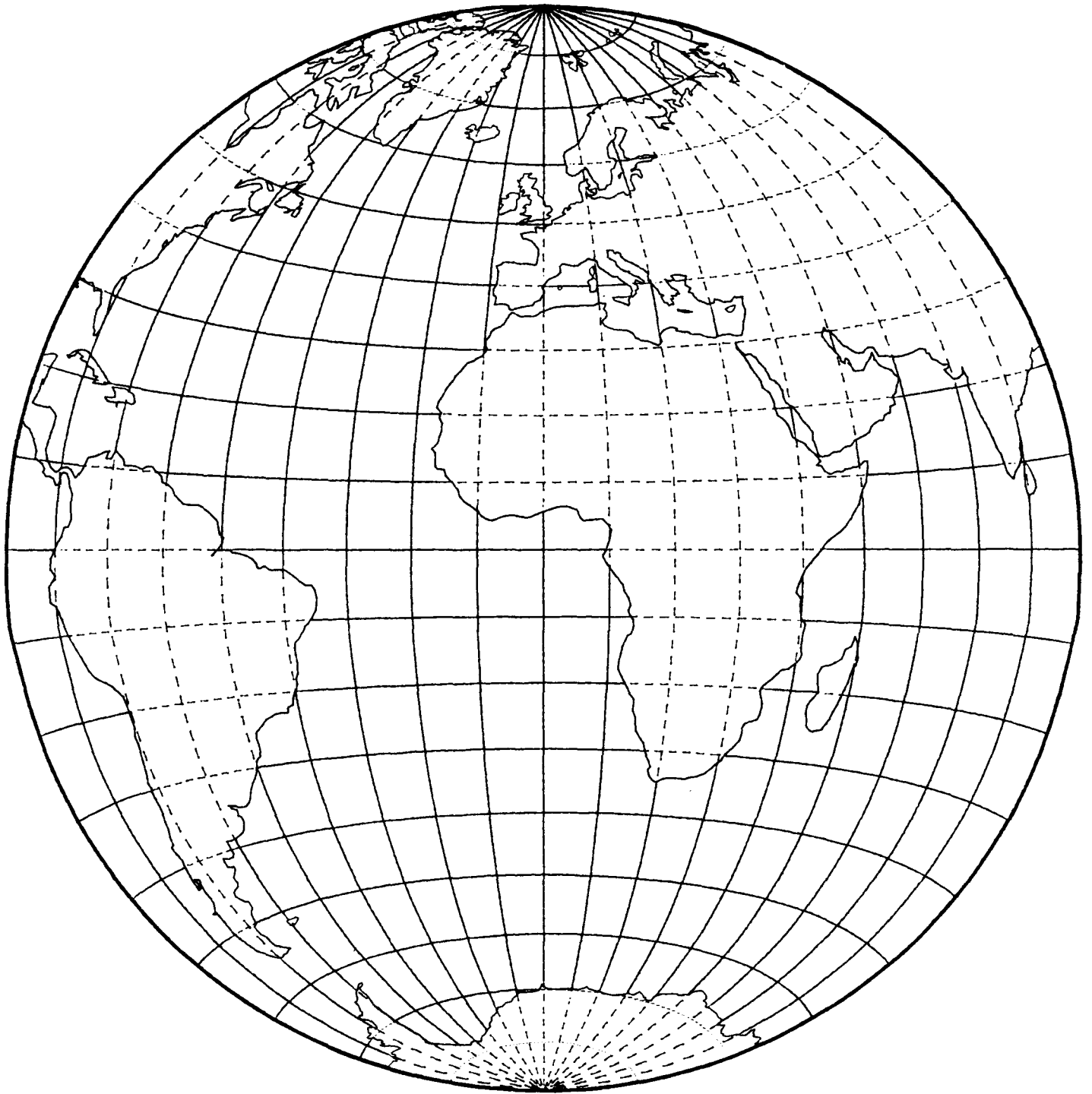# The Last of the Summer Short Courses

INTRODUCTORY COURSES

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

- 180 Introduction to CRAY-1 and COS (Tom Kovarik)
  August 2-4 (TWTh)   3:15-5 p.m.
- 040 Introduction to VAX/VMS (Linda Merims)
  August 11-25 (TTh)   1:15-3 p.m.

REGISTRATION: You can register at the UCC Computer Store, 211 Experimental Engineering (hours: 9 a.m. to 4:30 p.m., Monday through Thursday, and 9 a.m. to 3 p.m., Friday). A self-service terminal for registration is located outside the Store. We accept mail registrations for an additional $1 fee per class. The deadline for registration is Computer Store closing time on the last working day *before* the class begins. 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 are made after the class begins. 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.

—Graphic by the UCC Graphics Group

PHONE NUMBERS

Access:
CYBER(CA)—10, 30 cps 376-5730
            —120 cps 376-5706
MERITSS(ME)—10 cps 376-7710
            —30 cps 376-7730
            —120 cps 376-7120
VAX/VMS(VA)—(autobaud) 376-9770
Budgets 373-2521
Computer-Aided Instruction 376-2975
Computer Hours (recorded message) 373-4927
Computer Store 373-4877
Consulting
HELP-line 376-5592
    9 a.m.-5 p.m., Monday-Friday
Business Data Products 376-1761
    1-3 p.m., Monday-Friday
Statistics Packages 376-5062
    1-2 p.m., Monday-Friday
Data Bases 376-1761
    1-3 p.m., Monday-Friday
Microcomputers 376-4276
    10-12 a.m. and 2-4 p.m., Monday-Friday
Non-Traditional Computing 373-5780
    10:30-11:30 a.m., Monday, Wednesday, Friday
TELL-A-GRAF/DISSPLA 376-2663
    1-3 p.m. Tuesday, Thursday
Text Processing 376-2943
    1:30-4:30 p.m. Tuesday-Thursday
Contract Programming 376-1764
Data Base Applications 376-1764
Educational Services 376-3963
EDUNET Liaison 373-7745
Engineering Services 376-1023, 376-8153

Equipment Purchase/Information 376-8153
Experimental Engineering I/O 373-4596
Field Engineering 376-7584
Graphics Software 376-5592
HELP-line 376-5592
    9 a.m.-5 p.m., Monday-Friday
HOURS-line (recorded message) 373-4927
Image Processing 376-2895
Information, Experimental Engineering 373-4360
Information, Lauderdale 373-4912
Information Systems 376-1764
Instructional Labs 376-2703
Lauderdale Computer Room 373-4940
Lauderdale Services 373-4995
Lauderdale Services Manager 373-7538
Lauderdale Users' Room 373-4921
MECC Liaison 373-7745
Newsletter Subscription 373-4912
Permanent File Restoration 376-5605
Professional Services Division (PSD) 376-1764
Project Assistance 376-1764
Program Librarian 376-1636
Programming Languages 376-7290
Reference Room 373-7744
Remote Batch (RJE) Services 376-2703
Short Courses 376-8806
Shuttle Bus Service 376-3068
System Status (recorded message) 373-4927
Tape Librarian: see Lauderdale Services
Text Processing Services 376-2943
User Accounts 373-4548
User Services 376-3963

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.	7 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.	7 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
East Bank				West Bank			
				BlegH 25		*	
Arch 160		X	X	BlegH 90	X		
CentH		X		BlegH 93T			X
ComH		X		BlegH 140		X	
DiehlH 270, 207		X		MdbH		X	
EltH 121, 125		X		OMWL 2		X	
EltH N640	X						
FolH 14, 14a	X	X*	X				
LindH 26		X		St. Paul			
MechE 308		X					
Physics 69		*		BaH		X	
SanfH		X		ClaOff 125	X	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

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