University Computer Center Newsletter

UNIVERSITY COMPUTER CENTER   UNIVERSITY OF MINNESOTA-TWIN CITIES   MINNEAPOLIS, MINNESOTA 55455

bulletins

	DOWN	UP
Laud:	1715 SAT(5/24)	1800 MON(5/26)
ExpEng:	2400 FRI(5/23)	1800 MON(5/26)

contents

giveaway

We have discovered a box of unclaimed hardware dividends offered to users a year ago. The dividend is a 2 1/4 inch x 2 1/4 inch logic card encased, with a printed message, in a plastic container. The logic card is second generation and consists of individual transistors, diodes and resistors. Since these boards are visible, compared to the LSI and VLSI components of modern computers, we thought that those of you who have used our systems for the past 13 years would want a memento. The cards were taken from two 3256/501 line printers and a CDC 6638 disk system that had finished their life cycle. If we have omitted any deserving user, or you were not on our mailing list last year, or you would like an additional dividend, please send a postcard or note requesting the dividend, along with your name and address to:

    Hardware Dividend
    University Computer Center
    227 Experimental Engineering
    University of Minnesota
    208 Union Street SE
    Minneapolis, Minnesota 55455

State whether you desire one or two of these items and as long as the current supply lasts, we will send a dividend (or two) to you.

UCC newsletter

Comments about the content of this newsletter, or suggestions for changes may be directed to the editor, 235a Experimental Engineering, or call 612/373-7744.

from the director

The mission of the University Computer Center is to provide services to meet the instructional, research, and public service computing needs of the University of Minnesota academic community. To the extent that the public service mission of the University as a whole extends to support of research activities in government, the University Computer Center also is organized to respond to the computing needs of various governmental agencies, particularly those in State government.

This article describes what we predict will be our role in instructional computing, and in University research and State Agency research computing in the coming years.

The use of computers in higher education has become as pervasive and essential as the use of books. Just as universities support libraries, so must they support instructional computing. We expect current users to develop more sophisticated applications. New users will emerge from new curriculum areas. We have seen instructional computing evolve to include the social sciences and the humanities along with its traditional subjects of mathematics and natural sciences.

Graduate students' involvement with .instructional computing is widespread. We must acknowledge thesis computing as an increasingly expensive component of graduate education. We see an increase in the use of microcomputing for undergraduates. The explosive growth of microcomputer technology gives us responsibility to choose quality, state of the art tools well suited to productive and efficient instruction and research in the University community.

The largest computer application area at the University has always been grant and contract supported research. According to a recent EDUCOM benchmark study, the University of Minnesota has the best figure of merit (most computing for the least money) of the 31 major university computer centers surveyed.

We have many public service users from State of Minnesota agencies. We provide major on-line data production services for large agencies, including taxation, driver and vehicle licensing, criminal justice and personnel. We also provide services for agencies having short term information system service needs. These users, who usually employ a varying and short lived data base (3-5 years), have more in common with our typical user than do the major agencies. We expect growth of this public service segment to continue, particularly in collaboration with Agricultural Extension Service and with Continuing Education.

The development of computer technology has been revolutionary, rather than evolutionary over the past twenty-five years. In such an environment planning is very difficult but we introduce new technology as rapidly as possible.

Demand for large scale computing services at the University has been growing at the rate of 30% per year. Each year we have told ourselves that such growth cannot continue, but it has. Clearly the market for large scale computing must eventually be saturated, and we assume for our 1980-90 planning that it will slacken off markedly to approximately 10% per year.

In large computers we see a vastly improved cost to performance ratio due to technological innovation, architectural innovation, and to the classical "economy of scale" of the large computer. The pace of innovation is so rapid in this area that we can no longer risk the purchase of a large machine. We assume that the large scale computers installed at the University during the next decade will be leased on relatively short term leases (3-5 years). We must assume that a very large machine will have to be leased to replace the Cyber 74 for the 1980s. We leased the Cyber 170/720 for 1979-1982 under this premise.

The pace of innovation in computer technology is fastest for small computers. We predict that their use, primarily in instructional applications, will mushroom in the next five years. We expect that a microcomputer with four times the capability of the $5500-$7000 Terak, will be available in 1985 for about twice the cost of a good color television. Such machines will have a large impact on productivity in higher education; we must do research and development with what we have now if we expect to exploit this technology in five years.

We do not expect radical system software changes in the 1980s but rather expect BASIC, COBOL, FORTRAN and Pascal to remain the standard languages for the University community. Pascal has replaced FORTRAN and ALGOL as the standard language for instructional computing at the University.

In applications we expect that the most rapid advances will be made in word processing. New application languages and packages will become commonplace in the next decade and will require special support.

We expect that trained, qualified professional staff will be increasingly difficult to find as industry demand makes University salaries less competitive.

Our goal for this decade is to allow new technology to be integrated into university computing activities in an efficient, effective and economical manner.

field length

This article gives an overview of field length allocation on our Cyber machines.

Cyber 70 machines can have a maximum of 131,072 or 400,000 octal 60-bit central memory words. Cyber 170 machines can have a maximum of 262,144 or 1,000,000 octal 60-bit central memory words. NOS allocates memory unconditionally for central memory residents (CMR); conditionally for timesharing, system tasks, and batch jobs.

The allocations for timesharing and batch spaces are not rigidly fixed under NOS, since the total space required for all memory resident timesharing or batch jobs may extend over the space allocated to a specific service. However if the other service requires space for a job, those job(s) extending beyond the given total space allocation are rolled out to a holding queue to be processed again later.

For our machines, the following spaces are allocated (in 1000 octal units):

Machine	74	172
Physical Memory	400	600
Deduction for CMR, System	-104	- 75
Left for Allocation	274	503
Timesharing Allocation	74	320
Left for Batch Allocation	200	163

User Field Lengths	TS/BATCH	TS/BATCH
Initial Values	61/155	61/155
Non P0 orP1 Requestable	61/245	111/245
P0 or P1 Requestable	61/245	111/371
Special Requestable	61/315	131/371

The Cyber 172 is organized for large field length timesharing during the day and large P1 and P0 jobs at night. The Cyber 74 has short timesharing field lengths mainly for batch job submissions.

If you need more than the initial assigned field lengths you may call Jack Schwab, 373-2521 and have the field length raised to the maximum for either timesharing or batch.

Note that if you have a 371K field length validation and if you try to run a job over 245K during the day, your job will abort with an error message. Also, the timesharing service allocation is reduced on the Cyber 172 during delay hours to allow these larger batch jobs to complete without being forced out for exceeding the batch service limit. Finally the 315K batch jobs on the Cyber 74 may cost additional money for operators since they are run at quitting time after several system modules (including timesharing and remote batch) have been dropped from the system.

L. A. Liddiard, 373-5231

technical text

We have been talking for some time about coordinated systems for technical text processing which would accommodate a mathematical character set. One such system is here now but working only on an experimental basis. Other more capable systems are expected in the course of the next year.

Steve Bruell of the Computer Science Department brought part of a system with him from Purdue University and has, with the assistance of Dan Germann and George Gonzales, implemented it here on an experimental basis.

The system's text formatter with its associated conversion and output programs resides on the CDC Cyber computers, and can print 246 different characters on the Varian Statos 42 electrostatic printer plotter. However, only the 95 ASCII standard characters can be printed on other printers such as DECwriter terminals or on the high speed line printers. The standard printers are nevertheless, useful for rough drafts where the special mathematical characters are replaced by blanks. We have decided not to write a program to generate a file from this package for the Printing and Graphic Arts' phototypesetter since the other programs we expect to acquire are better suited to that purpose. The most important feature of this system is its ability to use a Terak microcomputer that can communicate with the Cyber computers as an input device. The Terak can directly display 192 of the 246 characters; the remaining characters are displayed in their coded form. The Terak also has a powerful screen editor which allows you to change, delete, replace, insert, add, and move characters on the screen. All characters are drawn on the Terak in grids of fixed width and height. You can define a character set to draw whatever you want in that area. The character may be placed anywhere in that grid. Superscripts may be displayed higher on the grid, subscripts lower. The display and editing capabilities greatly ease the task of entering and proofreading mathematical text for those willing to work with an experimental product.

Preliminary documentation for this text processing system, adapted from Purdue's documents, is available for reference from the UCC Reference Room, 235a Experimental Engineering. The documentation, the system, and our consulting will no doubt improve with experience. For advice and assistance call Mike Frisch, 376-1636, or

S. Bruell, 376-3958
T. Hodge, 373-4599

penril modem

At some sites the Penril 300/1200 baud modems are exhibiting abnormally high error rates on data received at 1200 baud. Another problem is the occasional printing of left brackets when no data is being received. This fault is somewhat dependent upon the characteristics of the telephone service because a given modem may garble at one site, but not at another.

Penril is preparing an engineering change and will perform the modification without a charge, however they have not announced a schedule yet. In the interim, we have an easy fix that has worked at some sites. If this is of interest to you, call
D. Parkes, 376-7067

statistical packages

The Professional Service Department is available for programming statistical projects using SPSS, BMDP, and a variety of other statistical packages.

Costs for such a project are accrued on a time and materials basis. The minimum cost of any statistical project is $350. Note that $350 is a minimum, but not a base. If a project costs $800, we charge $800, not $1150. This minimum is based on the average cost of such projects in the past. It includes meetings, programming, keypunching, and computer time and supplies.

Inquiries and requests for estimates should be directed to Patrick L. Jarvis, manager of the Professional Service Department.
P. L. Jarvis, 376-1764.

magnetic tapes

If you are having difficulty reading magnetic tapes received from a non-UCC site or are preparing to send tapes to other sites, the Professional Services Department may be able to help you. We are initiating a service to help users read non-CDC magnetic tapes and prepare tapes for processing on non-CDC equipment. The cost of this service is determined on a time and materials basis with a minimum charge of $35.00. If you have an IBM tape that you can't seem to decipher call
P. Jarvis, 376-1764

writeupdate

April has brought us only a few changes in the WRITEUPs available to you on UCC's three computers.

ACCRATE - Gives the new accounting rates for the particular system which you are using.

COSTEST - Goes hand in hand with ACCRATE by providing you with sample job runs and their cost analysis. These may be useful for estimating what your jobs will cost at the curent rates. This will be expanded in the days ahead to provide you with as many useful examples as possible.

LIBNDEX - Provides you with a guide to UCC's subprogram libraries. Also useful, in view of the recent MINNLIB changes (see last month's newsletter). You might prefer to purchase A Guide to User Libraries available at University bookstores.

J. Jaynes, 376-5262.

health science

The Health Science Computer Service Center at the University of Minnesota has a full time staff of keypunch operators available for keypunching, verifying, and data coding services. Located in D385 Mayo Memorial Building, the service is open 8 hours a day, Monday to Friday. For additional information and estimates, call
L. Croatt, 373-7714

permanent files

The response from the permanent file system request called CATLIST will change on 1 September, 1980.

Under NOS 1.2 the entire permanent file catalog entry is returned for certain CATLIST requests. That entry is 8 words long. In NOS 1.3, CDC expanded the permanent file catalog entry from 8 to 16 words. This change to permanent files will be implemented on 1 September. The new 16 word permanent file catalog entry is documented on page 2-5-14 in Revision J of the NOS Reference Manual. A copy of this page may be obtained from the UCC Reference Room or from the author. This will not affect the performance of programs which use this function (e.g., the CATLIST and CATLSYS control statements), because these programs will also be updated on 1 September. User programs which use the CATLIST function (probably in a COMPASS subprogram or via a PROCPAC call) will be affected. Programs which use the SAVE or CHANGE requests to set the timesharing subsystem or ASCII mode flag for a file will also be affected.

Any questions regarding this change may be addressed to
K. C. Matthews, 376-5602

electrostatic plotter

We are planning to improve our electrostatic plotter services by acquiring a new plotter to supplement our 15" Varian Statos 42. We are interested in what you have to say about this upgrade. If you are a current user of our plotter services or anticipate using those services during the coming year please complete the questionnaire below and return it by May 30, 1980. If you have questions or comments related to this questionnaire, call

J. Larson, 373-7538

NAME
PHONE

1. My plotter use status is: current user \\ future user \\

2. I (plan to) plot: \\ less than 10 \\ 10-50 , \\ 51-100 , \\ 101-500 , \\ more than 500 feet per month.

3. Most of my plots are: maps \\ charts or graphs \\ text \\ art \\ other \\

4. Most of my plots make use of (check all applicable items): lines \\ , characters \\ , gray scale \\ , other

5. The following plotter characteristics are critical to my application (check all applicable items):
\\ must be able to plot at 100 dots per inch
\\ must be able to plot at 200 dots per inch
\\ must have a dark black on gray scale
\\ must have uniform contrast
\\ must have accurate stepping
\\ other (please explain)

6. I would prefer a plotter width of: (our current plotter is 15" wide). 11" \\ 22" \\ other \\ (explain)

7. I am interested in using fanfold paper: yes \\ no \\

8. Comments:

Return this questionnaire to:
Jerry Larson
University Computer Center
2520 Broadway Drive
St. Paul, MN 55113

or campus mail to:

University Computer Center
227 Experimental Engineering

1980 survey

For the past 25 years we have strived to provide reliable, state of the art computing to the University of Minnesota and to Minnesota public service agencies. To update our 1979 survey and to get some idea of what you want, we ask everyone at the University involved with computing to fill out this short questionnaire.

L. A. Liddiard, 373-5239

Department
Account Number (optional)
Name (optional)

The following keywords may remind you of some specific aspect that you would care to write about.

Hardware-Software, Maintenance, Documentation, Consulting, Courses, Cybers, Funding, Grants, Graphics, HELP-line, Accounting, Costs, Access -- Interactive or Batch, Writeups, Computer Language or Application, Stability, Reliability.

1. What are your computation needs that should be provided by UCC that are either not currently provided, or only partially provided?

2. What do you particularly like about our services?

3. What do you particularly dislike about our services?

Return this survey to:
1980 UCC Survey
227 Experimental Engineering
University of Minnesota
208 Union St SE
Minneapolis, MN 55455

graphics

The preparation of high quality graphics has always been a tedious process. Well, no more! By teaming up the power of your Apple II or Terak with the Houston Instruments HI PLOT plotter you can make your own plots, in a few minutes, in your own office.

The Houston Instruments plotter is a relatively small desk top unit which accepts 8.5 X 11 inch paper with a 7 X 10 inch plot size. The plotter will draw at up to 2.4 inches per second from input received over EIA RS-232 or 6-Line TTL interfaces. Baud rates of 300 to 9600 baud and plotter step sizes of .01 or .005 inches can be selected.

The plots on the opposing page were drawn in the actual size shown at 4800 baud with a step size of .005 using an Apple II with the California Computer Systems asynchronous serial interface or a Terak with the standard serial interface.

The University of Minnesota HI PLOT graphics library is available on the Apple II using the UCSD Pascal 2.1 system and on the Terak using the UCSD Pascal 1.5e system. The package features real world windowing and the ability to set a viewport on the plotter surface. An upper case character set with numerals and special symbols is a standard part of the plotter library. Plot files may be made and saved on disk and plotted at a later time.

The basic library functions are listed below with a brief description.

PROCEDURE INITGRAPHICS(FILENAME:STRING);
Initializes the plotter library and plot file. The parameter filename specifies where to write the plot file, normally 'REMOTE:' on the Terak and 'REMOUT:' on the Apple II. Filename may also be the name of a disk file.

PROCEDURE FINISGRAPHICS;
Ends plot, closing and locking the file, and places the pen back at the lower left hand corner of the plotter bed.

PROCEDURE INQUIRE(VAR XPOS,YPOS : REAL);
Returns the real world coordinates of the pen.

PROCEDURE SETWINDOW(LEFT,BOTTOM,RIGHT,TOP: REAL);
Set the window to the real world.

PROCEDURE SETVIEWPORT(LEFT,BOTTOM,RIGHT,TOP: REAL);
Sets the area on the plotter bed to plot the area defined in the window.

PROCEDURE SETCHSIZE(X,Y : REAL);
Sets the height and the width of the characters.

PROCEDURE SETCHSPACE(X : REAL);
Sets the width of the space between characters.

PROCEDURE MOVEABS(X,Y : REAL);
Moves to point (X,Y) without drawing a line.

PROCEDURE MOVEREL(DX,DY : REAL);
Moves to the point (X+DX,Y+DY) where X and Y are the current pen position.

PROCEDURE LINEABS(X,Y : REAL);
Draws a line from the current pen position to the point (X,Y).

PROCEDURE LINEREL(DX,DY : REAL);
Draws a line from the current pen position (X,Y) to the point (X+DX,Y+DY).

PROCEDURE DRAWTEXT(S:STRING);
Drawtext places the string S at the current pen position.

More information about the plotter and software library is available from the University Computer Center. Call:
Micro Help Line
227 Experimental Engineering
University of Minnesota
Minneapolis, Minnesota 55455
(612) 376-4276

M. Timmerman, 376-4276

COM

The COM and Prose packages are now available on Apples with Pascal.

COM is the Micro-Cyber communications routine. Documentation is available in the Terak manual on WRITEUP(TERAK). COM will allow the transferring of files between the Apple and the Cyber as well as just using the Apple as an intelligent terminal.

Prose is the text formatter presently available on the Cybers and on the Terak. Documentation is available in Room 140 Experimental Engineering.

Questions? Call,

M. Timmerman, 376-8806

APPLE/TERAK HIPLOT GRAPHICS

F(X)=SIN(X)

APPLE/TERAK HIPLOT GRAPHICS

F(X)=SIN(X)

APPLE/TERAK HIPLOT GRAPHICS

F(X)=SIN(X)
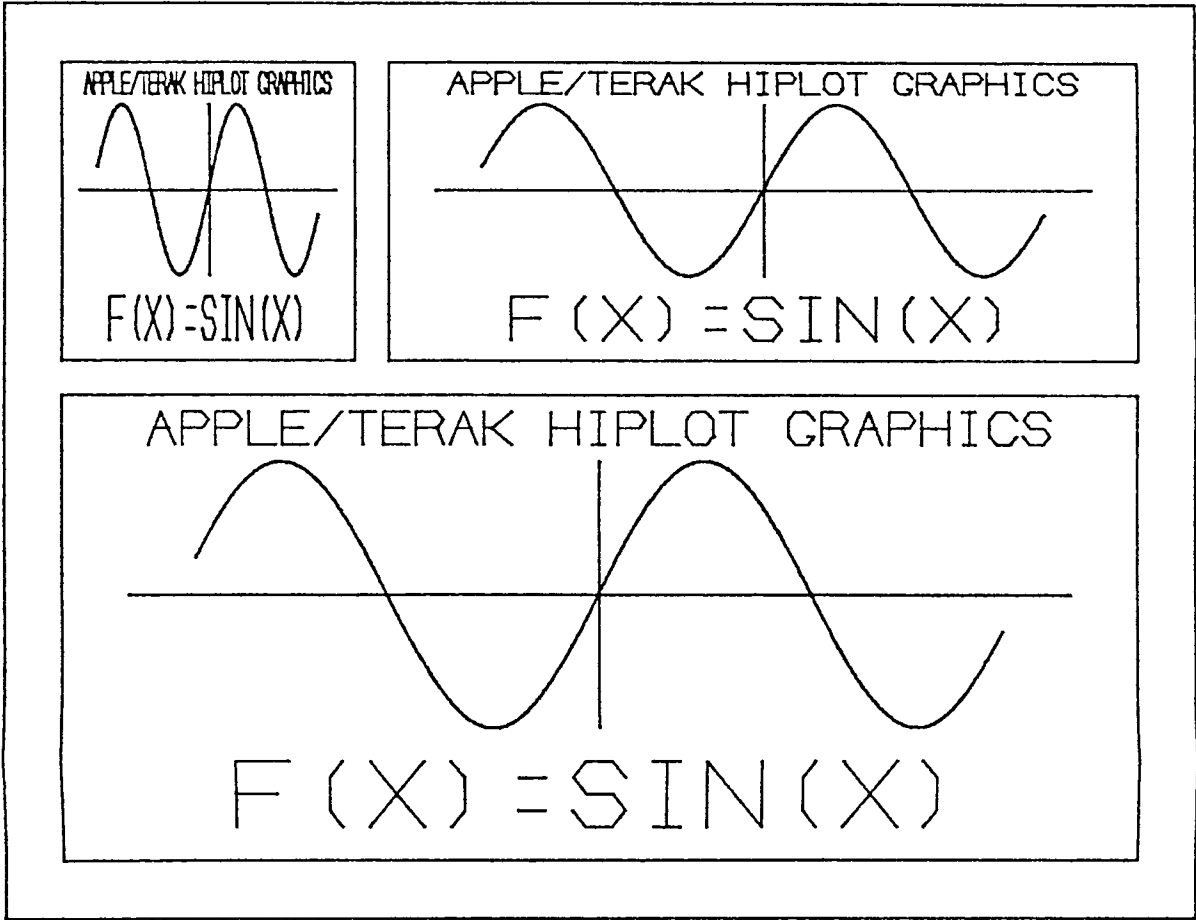
SIERPINSKI CURVES BY TERAK

SQUARES BY APPLE

up and down loaders

A hint for micro users using the up and down loaders: Always put your Cyber job into ASCII mode before up- or down-loading a file. Use the interactive command ASCII anytime after logging on.

Control characters are not transmitted properly by the up- and down-loaders when defined as string variables in BASIC statements like the following:

    100 D$ = '' : REM set D$ to control D

Control characters created by statements like the following are transmitted properly:

    100 D$ = CHR$(4) : REM set D$ to control D.

M. Collins, 373-5754

com-parative shopping

A number of serial input/output boards are available for the Apple computer. I will describe some of the unique features of three of these boards, with some indication of the usefulness of having these features. The three boards, Apple Communications Card, Apple Serial Input/Output, and California Computer Systems Serial Input/Output all have one bi-directional RS-232C serial port onboard. All the boards have the more commonly used baud rates: 110, 300, 1200, 2400, 4800, 9600. Note that + means a pro, - means a con.

Apple Communications Card ($110.00 approx.)

+ Cheapest of the three

+ Simplest to use for simple jobs, does not support full RS 232C communication, only a small subset.

+ Two software selectable baud rates, however not 300 and 1200 without changing switches.

+ Hardware terminal mode, a small program residing in onboard ROM that allows the Apple to be used as a terminal. This very useful feature for communication applications can be invoked or revoked under software control from the Apple or the remote computer.

- Will not generate a line feed with carriage returns, these must be inserted into the data stream by the user program. Not a problem with smart printers and CRTs that have a new line mode and will insert line feeds themselves.

- Some care must be used when using this card as a simple I/O port as a few control characters are not transmitted through the card but rather change the mode of operation of the card.

Apple Serial Card ($160.00 approx.)
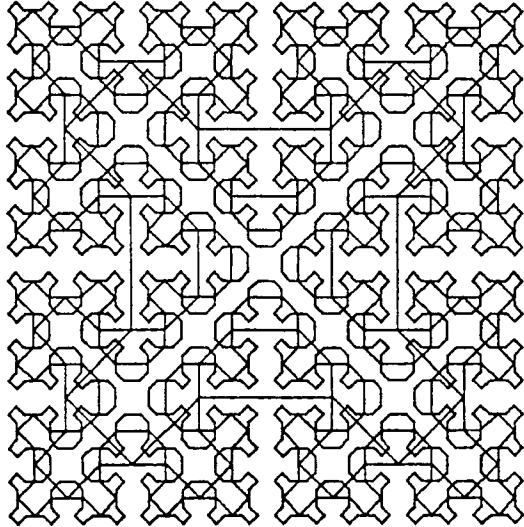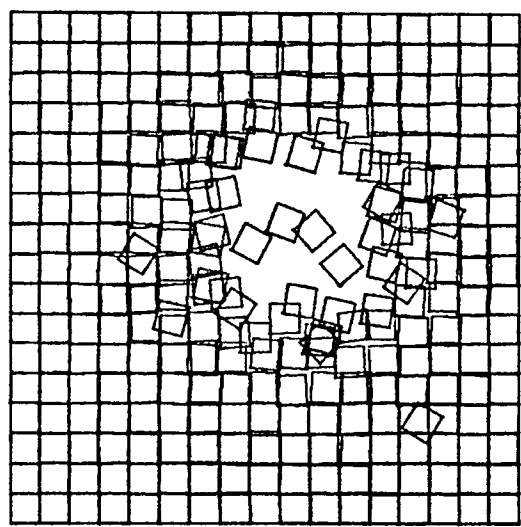
+ Has a block transfer mode to move a whole block of memory out the port by itself. Handy if you do that sort of thing.

+ Can be set to generate a line feed on a carriage return.

- Most expensive

- No terminal mode on the card. If you want to communicate with another computer, you will have to write a program.

- Software clock for transmission rates. Does not give the exact Baud rates that are selected. In many cases this is not a problem (asynchronous communication), but it is something to be aware of.

California Computer Systems Serial I/O ($150.00 approx.)

+ Can select one of three preset baud rates under software control.

+ Can have either line feed on carriage return or not under software control.

+ Supports full RS-232C communication.

- No terminal mode, is strictly an input/output port.

In general, for communications applications the Communications Card is the most sensible answer. If you do not need the terminal mode, the CCS card is more flexible. The Apple Serial Card seems to have a very narrow range of applications.

M. Collins, 373-5754

micro conference

University Computer Services (UCS) and the Advisory Subcommittee on Small Computers have announced the 3rd Annual Conference on Microcomputers. The Conference will be held at the Earl Brown Continuing Education Center, St. Paul Campus on 14 May 1980. Starting time is 9:00 AM; registration is not necessary. The conference day will be divided into two sections: the morning session is a 2-hour lecture providing an "Overview of Microcomputers." A half-hour question and answer session will follow. The afternoon section will consist of four 45-minute sessions of six simultaneous presentations. These presentations will be repeated throughout the course of the afternoon, giving participants the chance to see several demonstrations. Apple Pascal, TEKSIM, Apple color graphics, Terak Prose, drafting, health awareness, up and down loading, and business applications will be topics covered in the afternoon sessions.

The Earl Brown Center is on the MTC 13 bus route. Those driving will find convenient parking in an adjacent lot.

The conference is intended for the University community. All University members who have an active interest in microcomputers are invited to attend.

M. C. Boyd, 373-2522
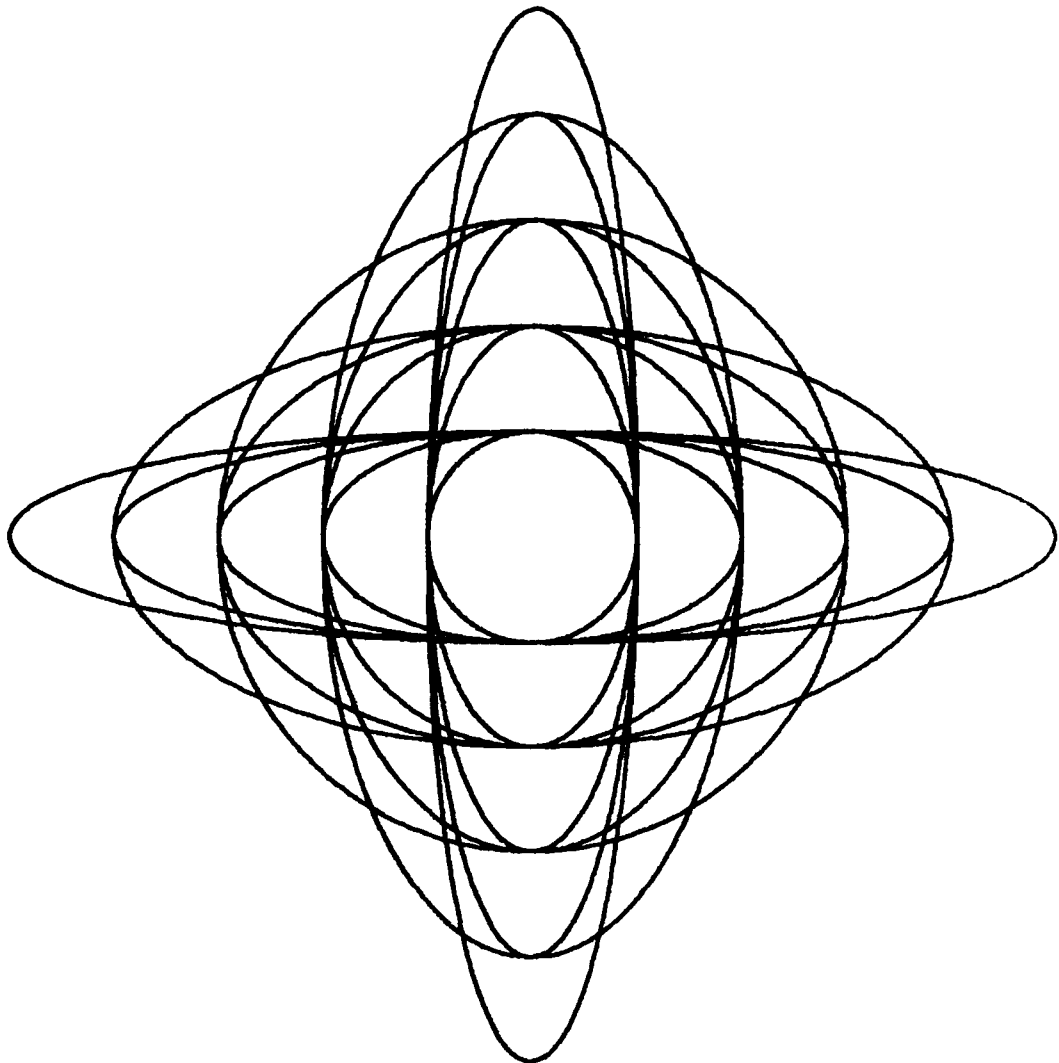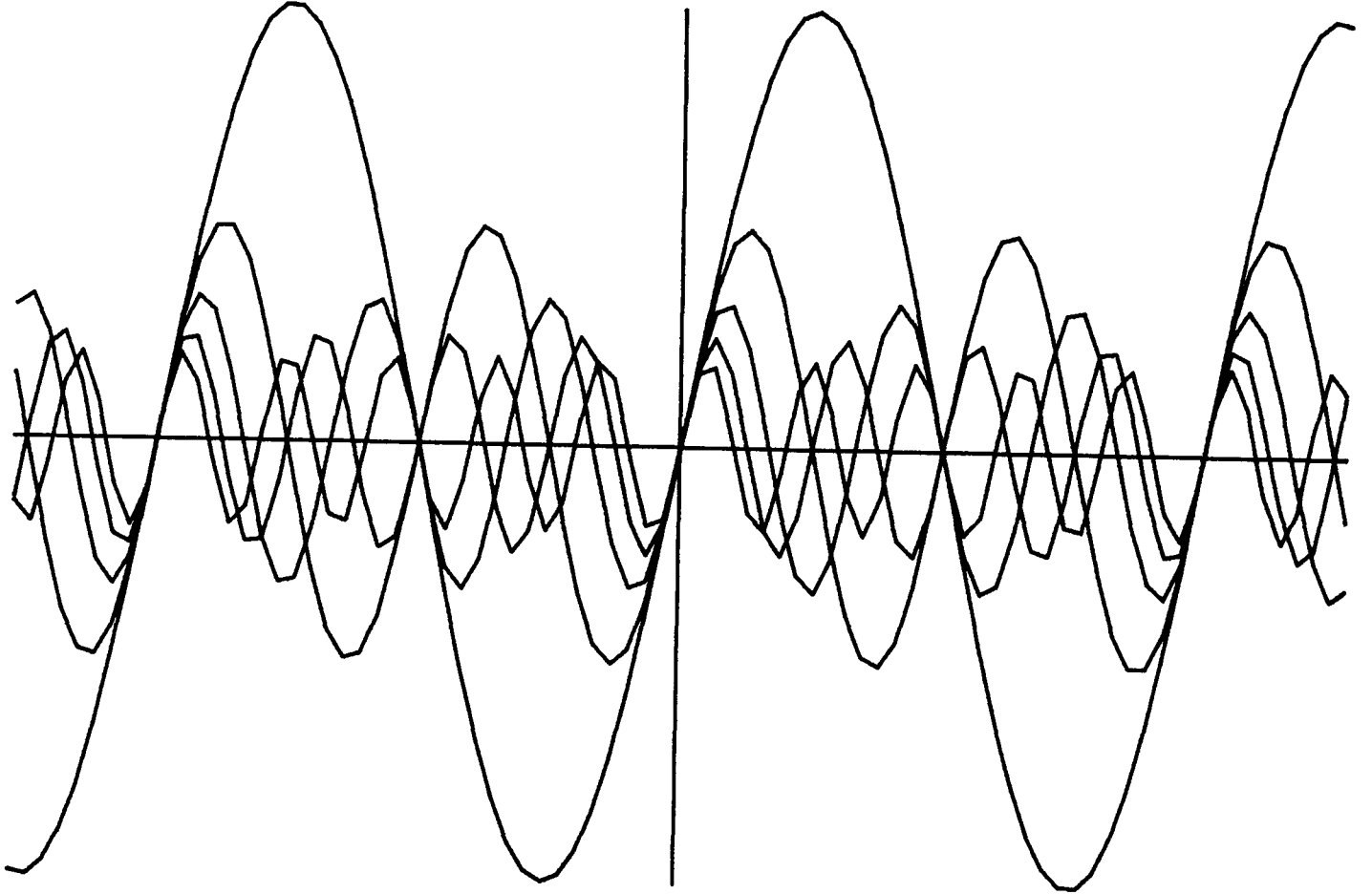
statistics

***PRODUCTION USAGE SUMMARIES: Cyber 74/172

	March, 1980	March, 1979
System resource units (SRU)	1,176,940 (1,468,211)	1,294,788 (1,657,584)
Batch jobs and MIRJE sessions	118,624 (128,679)	113,681 (124,755)
Central processor hours inc. DELAY	141/222 (153/324)	207/109 (235/205)
DELAY queue processor hours	31/41 (33/49)	72/16 (76/28)
MIRJE terminal hours	14,963 (17,258)	12,528 (14,621)
Mass storage transfers (KPR)	434,197 (523,369)	418,478 (510,246)
Magnetic tape transfers (KPR)	9,681 (15,388)	8,640 (13,229)
Pages printed, charged from UCC	1,168,238 (1,289,105)	998,230 (1,117,606)
Cards punched	383,913 (444,326)	391,617 (576,085)
Microfilm frames produced	12,902 (481,231)	24,381 (411,867)
Number of terminal sessions	35,231	28,766
Statos plotting production (feet)	7,605	9,376
Tapes mounted	12,032	13,629
Average file storage (char)	2,789.7 million	2,203.6 million
Mean time between failures	49.8/62.2 hours	107.2/76.6 hours
Available during scheduled hours	97.6/98.0 percent	99.7/99.7 percent

(totals in parentheses include staff development, accounting, and maintenance runs)

***DOWNTIME SUMMARY: April, 1980 (Column 1, Cyber 74 : Column 2, Cyber 172)

	0800-1800 M-F		other		total	
Total possible scheduled uptime hours	220.0	220.0	309.0	309.0	529.0	529.0
Total downtime hours (see Schedule A)	2.2	2.6	5.0	.6	7.2	3.2
Total uptime hours	217.8	217.4	304.0	308.4	521.8	525.8
Uptime (percent)	99.0	98.8	98.4	99.8	98.6	99.4
Average downtime per occurrence (min)	22.6	26.3	50.0	12.3	36.2	21.7
Mean time between failures (hours)	36.7	36.7	51.5	103.0	42.4	56.6
Subsystem failures						
SUPIO	2	-	1	-	3	-
TELEX	0	4	2	2	2	6
EXPORT	1	-	3	-	4	-

Schedule A: downtime hours

	Number		Total hours		Average minutes	
(1) Preventive maintenance over-runs	0	0	0.0	0.0	0.0	0.0
(2) Software related problems	6	5	0.6	0.5	6.0	5.4
(3) Hardware related problems	4	2	6.3	2.3	94.0	67.0
(4) Indeterminate problems	1	1	0.1	0.1	2.0	3.0
(5) External Problems	1	1	0.3	0.5	20.0	31.0

***PRODUCTION USAGE SUMMARIES: Cyber 170-720 (MERITSS)

	March, 1980	March, 1979
Number of compilations or executions	209,034	192,115
Central processor hours	181	193
MERITSS terminal hours	28,956	24,293
Number of MERITSS terminal sessions	51,444	44,296
Maximum number of simultaneous users	140	129
Average file storage (char)	477.6 million	353.6 million
Mean time between failures	95.3 hours	123.9 hours
Available during scheduled hours	99.2 percent	99.7 percent

short courses

UCC Short Course Schedule for Spring 1980

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  System 2000/PLI.............; 3:15-5pm, May 12-16 (mwf), Arch 30, JCC
  FORM......................; 3:15-5pm, May 12-16 (mwf), Arch 60, SAR
$ SPSS (procedures)...........; 2:15-3:30, May 12-14 (mw), MinMet 116, BH
$ SPSS (On-Line)..............; 2:15-3:30, May 16 (f), MinMet 116, BH
  Intermediate FORTRAN........; 6:15-8pm, May 13-Jun 5 (tth), MinMet 124, RTF
$ Pascal Data Structures......; 3:15-5pm, May 20 - 29 (tth), ForH 130, LF
  SIR.......................; 3:15-5pm, May 20-29 (tth), ForH 150, JCC
  Intro to Microcomputers.....; 3:15-5pm, May 27-28 (tw), BlegH 150, GG
  Using Micros (TERAK)........; 3:15-5pm, May 29-30 (thf), BlegH 150, GG
  Using Micros (AppleII)......; 3:15-5pm, Jun 2-4 (mw), BlegH 150, MT
  DMS - 170...................; 3:15-5pm, Jun 2-3 (mt), Ph 166, JCC
  Query/Update................; 3:15-5pm, Jun 4-5 (wth), Ph 166, JCC
$ Comparative DBMS............; 3:15-5pm, Jun 6 (f), Ph 166, JCC
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    * Lauderdale Conference Room, Lauderdale Computer Site, 2520 Broadway Dr.,
                    Lauderdale, Mn

UCC Short Course Schedule for Summer 1980

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  Introduction to UCC.........; 3:15-5pm, 19 Jun (th), Arch 15, RTF
  Apple Pascal (UCSD Pascal)
      UCC Special Summer Course: Registration required (no fee).
      Call 376-4276 (or 37 MICRO).
    Lecture; 9am-12noon, 23 Jun - 2 July (mwf), Ag Eng 103 (StP), ABM/MT
    Lab    ; 9am-12noon, 24 Jun - 3 July (tth), Ag Eng 306 (StP), LF/MC
  NOS (system configuration)..; 3:15-5pm, 23 Jun (m), Arch 30, RTF
  NOS (files/jobs)............; 3:15-5pm, 24-25 Jun (tw), Arch 30, RTF
  NOS (permanent files).......; 3:15-5pm, 26 Jun (th), Arch 30, RTF
  NOS (program execution).....; 3:15-5pm, 27 Jun (f), Arch 30, RTF
  NOS (special topics)........; 3:15-5pm, 30 Jun-2 July (mw), Arch 30, RTF
  Interactive System Commands.; 3:15-5pm, 1-3 Jul (tth), Arch 30, RTF
  Batch Introduction..........; 2:15-4pm, 1 Jul (t), Arch 40, MB
  COBOL.......................; 3:15-5pm, 7-30 Jul (mw), Arch 30, DR
  Checkpoint-Restart..........; 3:15-5pm, 8 Jul (t), Arch 15, TH
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BASIC courses for the Apple microcomputer will be given in June by MECC. For
        more information and registration forms, call 376-1122.

For any more information concerning these short courses, see "WRITEUP,CLASSES."
        or call Lincoln Fetcher at 376-1637.
    NOTE: dollar sign ($) indicates change since first publication.

operations

CYBER 74/172 OPERATING HOURS   CYBER 170-720 OPERATING HOURS

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---------------------------------------------    ---------------------------------------------
S|                        |$$$$$$$$$$$$$$$$|      S|                        |<><><><><><>|
M|*|            |<><><><><><><><><><><><><><<$$|  M|            |><><><><><><><><><><><><><><><|
T|******|       |<><><><><><><><><><><><><><<$$|  T|<>|         |><><><><><><><><><><><><><><><|
W|******|       |<><><><><><><><><><><><><><<$$|  W|<>|         |><><><><><><><><><><><><><><><|
T|******|       |<><><><><><><><><><><><><><<$$|  T|<>|         |><><><><><><><><><><><><><><><|
F|******|       |<><><><><><><><><><><><><><<$$|  F|<>|         |><><><><><><><><><><><><><><><|
S|**************|$$$$$$$$$$$$$$$$$$|        |      S|<>|         |<><><><><><><><>|**************|
---------------------------------------------    ---------------------------------------------
 ^    ^      ^                    ^        ^        ^       ^^              ^    ^         ^
0100 0400   0800                1715     2400      0130   0730/0745      1600 1800       2400
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<><><><> Lauderdale, ExpEng, NORMAL rate   ****** up, not attended
$$$$$$$$ Lauderdale, ExpEng, DELAY rate   <><><> up, attended
******* Lauderdale only, DELAY rate

See WRITEUP(HOURS) for schedule of batch job   See WRITEUP(LABHOUR) for a schedule of open hours
pickup/delivery service.   in the student computer laboratories.

TWIN CITIES CAMPUS PUBLIC REMOTE JOB ENTRY SITES TWIN CITIES INSTRUCTIONAL COMPUTER LABORATORIES

SITE	ID	SUPERVISOR	PHONE	*
>>>East Bank<<<				
ElectE 38	4V	V. Zahhos	373-5346	2
EltH N640	4W	D. Anderson	373-5827	2
ExpEng 130	4B	I/O Coordinator	373-4596	1
ExpEng 130	4N	I/O Coordinator	373-4596	1
FrontH	4E	D. Schumacher	373-2740	1
KoltH S191	4Z			4
HS-A 1-752	4C	L. Ellis	373-0331	1
MinMet 321	41	R. Larson	376-2668	3
Physics 69	44	L. Whitney	376-7627	3
SpaSci 134	43	A. Perandi	373-7881	1
TerrH W106	4I	B. Hackett	373-6621	1
D388 Mayo	24	L. Croatt	373-7714	1
M39 MasonH	2D	L. Croatt	373-7714	1
Zoology 314	4J	E. Cushing	373-2232	1
>>>West Bank<<<				
SocSci 167	4X	D. Lund	373-3608	2
SocSci 1009	4K	T. Kroening	373-0168	1
>>>St. Paul<<<				
BioSci 257A	47	M. Simmons	373-1961	1
ClaOff 125G	48	C. Bingham	373-0988	3
McN H	42	G. Wahlert	373-0939	1
NorH 24	4G	J. Colten	373-0990	1
NorH 24	40	J. Colten	373-0990	1
>>>Lauderdale<<<				
User's Room	49	Secretary	373-4912	5

*--indicates keypunches at each site. Additional keypunches in 131 ExpEng, 86 BlegH, 140 ExpEng, and 90 BlegH.

SITE	SUPERVISOR	PHONE	EQUIPMENT
>>>East Bank<<<			
CentH	R. Rickgarn	3-2289	TTY33(2)
ComH	C. Youngdale	3-2453	TTY43(1)
DiehlH 535	N. Sauro	6-7005	CRT(2)
EltH 121, 125	D. Anderson	3-5827	TTY33(6)
			Hazeltine(3)
			Teleray(1)
FrontH	D. Schumacher	3-2740	TTY33(1)
HS-A 1-752	L. Ellis	3-0331	TTY33(4)
			TTY43(2)
			Teleray(1)
LindH 25	M. Schneider	3-0137	CDC713(6)
			Decwriter(5)
			Tektronix4013(1)
			Teleray(1)
			TTY43(11)
MechE 308	D. Riley	3-0340	TTY33(4)
			Teleray(3)
			Decwriter(5)
SanfH	M. Kilbury	3-3434	TTY33(1)
TerrH	B. Hackett	3-3567	TTY33(1)
VincentH 4	W. Stenberg	3-2538	TTY33(2)
			CDC713(2)
			Decwriter(7)
			Teleray(2)
WaLib 204*	R. Estelle	3-2538	TTY43(10)
			CRT(2)
>>>West Bank<<<			
BlegH 140	D. Lund	3-3608	TTY43(13)
			Teleray(1)
MdbH	R. Baker	3-9818	TTY33(1)
SocSci 167	D. Lund	3-3608	TTY33(5)
			Teleray(3)
			Decwriter(2)
>>>St. Paul<<<			
ClaOff 125	C. Bingham	3-0988	TTY33(6)
			Hazeltine(2)
			Decwriter(4)

*for CAI use only

phone numbers

Accounting 373-4548, 373-2521	Information, SICL 373-9751
Computer-Aided Instruction 376-2975	Information Systems 373-7878
Computer Hours (recorded message) 373-4927	Instructional Labs 373-5754
Computer Store 373-4877	Job Status, ExpEng (recorded message) 373-4994
Consulting	Lauderdale Operations 373-4920
HELP-line 376-5592	Lauderdale Services 373-7538
9 AM - 5 PM, Monday - Friday	Lauderdale Users' Room 373-4921
Business Data Products 376-1761	MECC, University 373-4573
10-11 AM and 1-2 PM, Monday - Friday	Microcomputers 376-4276
Statistics Packages 376-5062	Microfilm Operator 373-4995
1-2 PM, Monday - Friday	Newsletter Subscription 373-7744
System 2000 376-1761	Permanent File Restoration 376-5605
10-11 AM and 1-2 PM, Monday - Friday	Professional Services Division (PSD) 376-1764
Microcomputers 376-4276	Project Assistance 376-1764
10-12 AM and 2-4 PM, Monday - Friday	Program Librarian 376-1636
Contract Programming 376-1764	Programming Languages 376-7290
Data Base Applications 373-7878	Reference Room 373-7744
Educational Services 376-3963	Remote Batch (RJE) Services 373-5754
EDUNET Interface 373-7745	Short Courses 376-1637
Equipment Purchase or Lease 376-8153	Shuttle Bus Service 376-3068
Experimental Engineering I/O 373-4596	Tape Librarian and EBR Operator 373-4995
Field Engineering 376-7584	System Status (recorded message) 373-4927
Graphics Software 376-1636	Technical Writing 373-2522
HELP-line 376-5592	User Numbers
9 AM - 5 PM, Monday - Friday	Instructional Batch 373-2521
HOURS-line (recorded message) 373-4927	Instructional Timesharing 373-7745
Information, Experimental Engineering 373-4360	Research Batch 373-2521
Information, Lauderdale 373-4912	Research Timesharing 373-2521
	User Services 373-4599

RETURN TO:
    User Services
    University Computer Center
    227 Experimental Engineering
    University of Minnesota
    208 Union Street SE
    Minneapolis, Minnesota 55455