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## INFORMATION MANAGEMENT SYSTEMS

An Information Management Systems Department has recently been formed at the University Computer Center. This group offers consulting, teaching, and documentation services related to business and data base products. In order to keep you informed about new developments, we will write a monthly column for this *Newsletter* called "IMS Journal"—it begins this month as part of the *Newsletter's* SYSTEM NEWS/NOTES section. New products, changes in existing products, and application notes will be among the topics included in the column. All suggestions and comments should be directed to:

UCC Information Management Systems  
208 Experimental Engineering  
208 Union Street SE  
Minneapolis, MN 55455

### System 2000

System 2000 is a data base management system with a powerful interactive query system, an English-like query language, and interface capability with COBOL and FORTRAN applications programs. We offer this package on the CDC Cyber 730 and the MERITSS Cyber 172. The various versions and access instructions for System 2000 on the Cyber 730 are listed below.

Version	Immediate Access/SCF	COBOL/FORTRAN Interface
2.60	S2000.	PLIFOR, PLIFORS, PLIFORL PLICOB, PLICOB, PLICOB
2.76	FETCH, S2000. S2000.	NONE
2.80	FUTURE, S2000. S2000.	FUTURE, PLXCOBS. FUTURE, PLXCOB. FUTURE, PLXCOBL. FUTURE, PLXFORS. FUTURE, PLXFOR. FUTURE, PLXFORL.

The only System 2000 available on the MERITSS system is 2.60 Immediate Access. 2.60 IA, PLIFOR, PLICOB are the current production versions of the package. They are stable and have been in use for several years. Version 2.76 is identical to version 2.60 except for the report writer module, which is extended to operate upon disjoint data sets. It should be used only when this feature is required.

The most recent release of System 2000 is version 2.80. In this release the package has been substantially enhanced and includes features such as new item types, security by entry, and new "where clause" syntax. The immediate access feature (called the Self Contained Facility, or SCF) is stable and may be used on current 2.60 data bases. You may then go back to the 2.60 version at will as long as the definition is not altered under 2.80. We encourage you to try the new version and make use of its many new features. At this time, the PLEX interfaces are not stable and we do not recommend using them until the vendor produces a stable product.

Manuals for the 2.80 release are available at the Computer Store. Intel markets the documentation in separate, expensive manuals for each system module. The minimum you will need to make use of the new SCF feature are the *2.80 Newsletter* and the *Define Language Specification Manual*. We are currently working on a users manual for SCF that will be priced between \$15 and \$25. It will be available in about six months; watch the "IMS Journal" in this *Newsletter* for details.

### SIR

SIR (Scientific Information Retrieval) is a database management package designed for the research user. It features a flexible command language, a report writer, and an easy interface to statistical packages such as SPSS and BMDP. Four versions are currently available.

Machine	Command	Version
Cyber 74/730 and Cyber 172 (MERITSS)	PAST, SIR. SIR. SIR.	1.11  1.1J
	FUTURE, SIR. SIR.	1.1K
Shepherd VAX	SIRIA SIRBA	2.05 Interactive mode 2.05 Batch mode

The current version of SIR is 1.1J, which has been in use for about two years. The future version of SIR (1.1K) includes several enhancements and features a better set of diagnostic messages for error processing. Both versions are stable and all version 1 products are upward and downward compatible. We recommend using the future version because of its enhancements.

IMS to page 10

# CONTENTS

INFORMATION MANAGEMENT SYSTEMS ..... 9  
 UCC: Trends, Problems, and Solutions .....11  
 SYSTEM NEWS/NOTES  
   Microcosm  
     XEROX 820 MICROCOMPUTER .....12  
     XEROX 820 SOFTWARE .....12  
     NEW VERSION OF COM .....13  
     RT-11 FOR THE TERA .....13  
   VAX Service  
     UNIX HELP-LINE ..... 13  
   Cray News  
     CRAY DATASET TRANSPARENT MODE ..13  
     CRAY FORTRAN COMPILER .....14  
     IMSL ON THE CRAY .....14

Text Processing  
   VAX TEXT PROCESSING MEETINGS .....15  
   ANDERSON-JACOBSON TO  
   VANISH .....15  
 IMS Journal  
   DYNAMO .....15  
   COBOL CONVERSION .....15  
 MERITSS  
   MERITSS HITS NEW PEAKS .....16  
 All Systems Bulletins  
   UCC SHORT COURSES .....17  
   PRESIDENTS' DAY HOURS .....17  
   FOR SALE .....17  
 INDEX TO VOLUME 15 (1981) .....17  
 PHONES/OPERATING HOURS/LABS .....19

Director: Peter C. Patton  
 Editor: Christine Mack Gordon

Comments about the content of this newsletter, or suggestions for changes may be directed to the editor, 235a Experimental Engineering, or call 612/376-9832.

The University of Minnesota adheres to the principle that all persons shall have equal opportunity and access to facilities in any phase of University activity without regard to race, creed, color, sex, national origin or handicap.

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IMS from page 9

SIR, Incorporated introduced a greatly improved product over a year ago for the IBM and DEC computer market. We have acquired SIR version 2.0 for our Shepherd Labs VAX 11/780 and it is currently callable as specified above. SIR 2.0 is significantly different from previous releases and supercedes version 1.2. Among the new features are structured programming constructs, transaction logging facilities, and multiple "FOR EACH REC" loop capability within a single program. Version 2.0 is not compatible with the other versions. To upgrade your application you must unload schemas and data into flat files and rebuild the data base from these files using the new product.

At the present time we offer the new version only on the VAX machine. We encourage you to get a VAX account and try it. IMS consultants will assist you in transferring data from the Cybers to the VAX. Manuals for the new version are available from the Computer Store (be sure to specify version 2.0).

### Cyber SORT/MERGE Timings

Many users have had questions about the cost of SORT/MERGE runs on their data sets. We have completed several sample runs to give you a guide and

present figures for the Cyber 730 and the Cyber 74. Note that SORT/MERGE takes advantage of the compare-move unit on the Cyber 730; thus jobs on the 74 will run 15% faster but take 25% more SRUs. The runs were made with record lengths of 80, 150, and 250 characters, and file sizes of 1000, 10,000, and 100,000 records.

#### CYBER 730

	80 char rec	150 char rec	250 char rec
1000 CP (sec)	1.318	1.289	1.392
SRU (unt)	1.433	1.575	1.868
10000 CP	11.555	13.641	14.980
SRU	11.407	16.764	21.365
100000 CP	141.204	152.574	167.270
SRU	158.053	204.393	267.717

#### CYBER 74

1000 CP	1.061	1.079	1.242
SRU	1.696	1.979	2.397
10000 CP	10.503	11.538	12.927
SRU	15.174	20.525	26.405
100000 CP	122.553	132.006	146.840
SRU	195.059	249.091	325.892

(Information Management Systems Group, 376-1761)

# UCC: Trends, Problems, and Solutions

In the past year, the habits of UCC's users have changed significantly. You have turned away from card decks in favor of terminals (a shift that began some years ago, and that has been accelerating). You've been running your terminals at higher baud rates. And you've started to check out large programs on the Cray or test the text processing systems on the VAX/VMS.

The following tables demonstrate some of these trends.

## Remote Job Entry from UNIVAC 1004 Sites

	October 1981	October 1980	% change
1004 RJE Jobs	16,615	31,355	-47%
1004 Cards Read	1,156,090	2,294,965	-50%
1004 Pages Printed	146,471	309,927	-53%
Total UCC Pages Printed	735,397	869,199	-15%

Cyber 74/730 jobs and sessions based on origin for two fairly busy days eight months apart.

JOB ORIGIN	12 November 1981 NUMBER/ % ORIGINS	4 March 1981 NUMBER/ % ORIGINS	% CHANGE
RJE card batch jobs	1814/26%	3630/50%	-50%
Submit batch jobs	3043/44%	1415/19%	+115%
Interactive sessions	2051/30%	2258/31%	-9%
Totals	6908	7303	

Cyber 74/730 SRU Totals Based on the Same Days and Job Origins

	12 November 1981 NUMBER/ % ORIGINS	4 March 1981 NUMBER/ % ORIGINS	% CHANGE
Card Batch SRU's	13146/14%	27575/28%	-52%
Submit Batch SRU's	53547/58%	45612/47%	+17%
Interactive SRU's	25091/27%	23815/25%	+9%
Totals	91784	97002	

Cyber 74/730 Time Sharing (Interactive) Connect Hours

Baud Rate	December 1981	December 1980	% Change
110	899	1248	-28%
300	14261	13150	+8%
1200	4135	3087	+34%
9600	263	0	
Totals	19558	17485	+12%

These trends indicate that we will need fewer RJE stations and more high speed interactive ports available for users. This has been evident for several months and we have initiated the development and placement of "terminal clusters" at several locations on campus. A "terminal cluster" will consist of at least three 1200-baud VT100 CRTs with graphic capabilities connected to a shared hard copy printer that can be switched to any CRT needing printed copy. In addition to the terminal cluster concept, a UCC study group (under the direction of Engineering Services) is examining the complete phase

out of 1004 RJE stations by July 1983. The 1004s will be replaced by better RJE's or by terminal clusters where usage warrants; those 1004 sites with low RJE traffic will be eliminated.

In January we increased the number of interactive ports to the VAX/VMS from 16 to 48, and doubled the number of 9600-baud services to these ports through short haul modems on the east bank. For the Cyber complex at Lauderdale the 30 port Bell and 40 port VADIC 1200 baud rotaries were replaced by a single 40 port rotary with RACAL-VADIC modems that can handle 1200-baud users with either BELL or VADIC modems. This will be upgraded to a 50 port rotary as usage increases.

When we moved the Cyber interactive ports from the 172 and 74 to the Cyber 730, we hoped that those of you who had experienced poor response time on the 74 would be pleased at the extra field length and response time of the 730. You have been pleased in general, with one exception—the poorer response time at peak load hours on the combined system. Let the data from 4 March 1981 and 12 November 1981 tell the story in the following tables.

Average System Response Time to User Carriage Return (in seconds)

Date/System	Users/Peak Hour	Response Time	
Mar 4 Cyber 74	42	1.2	
Mar 4 Cyber 172	80	.8	
Total	122	Average .94 response time	
Nov 12 Cyber 730	130	1.70	
	Sectors/ Sec	Average Sectors/Roll	Numbered/ Rolls
Mar 4 Cyber 74	168.3	96.2	6320
Mar 4 Cyber 172	501.5	126.9	14270
Total	669.8	Ave 117.5	Total 20590
Nov 12 Cyber 730	756.8	127.7	22009
Increase	13%	9%	7%

The last table shows that for 7% more rolls (a roll is the complete movement of a user's field length between central memory and mass storage) corresponding to the increased number of users, the actual work done (sectors/sec. rolled by the system) increased 13% since the average job length increased 9%. In addition to this increased interactive load, the Cyber 730 was made the front-end station for the Cray, which required 40K octal of memory and a dedicated PPU. Finally RBF/NAM is being incorporated into the system to handle TIELINE and HASP synchronous RJE ports (and that also requires memory and a dedicated PPU). To solve this Cyber 730 response time problem, three additional PPUs and 65K decimal (200K octal) memory were added to the Cyber 730 in January. (Lawrence Liddiard, 373-5239)

# SYSTEM NEWS/NOTES

## Microcosm

### XEROX 820 MICROCOMPUTER

University Computer Services (UCS) and Purchasing at the University of Minnesota have established a master contract with Weldon Electronics Inc., for the purchase or lease/purchase of Xerox 820 microcomputer information processing systems.

The Xerox 820 microcomputer system provides a broad, cost-efficient gateway to computer services: it is particularly well-suited for educational activities or traditional office tasks; it can be used as a stand-alone microcomputer or as an intelligent terminal linked to other computers in the Minnesota network; and it offers the choice of applications software for word processing, financial planning, and data base management activities.

With 64K bytes of main memory, the Xerox 820 system incorporates industry standards in hardware and software. Using the popular Z80 central processing unit, and running a standard CP/M operating system, it can use the largest collection of ready-to-run software on the market today, including everything from simple games to fully-developed, high-level language compilers.

Since the Xerox 820 uses standard communications links, it can be connected to other office products equipment installed at the University, and to other computers and networks that the University may make available in the future. The 820 system will soon be tied to the computing power of the Cyber systems at the University's computer centers. Professional quality output can be obtained from the Scribe formatter on the VAX 11/780 at UCC-Shepherd Labs, and from a Xerox laser printer.

The Xerox 820 system provides a reasonably-priced, capable microcomputer with good word processing functions (using a standard operating system). To get more information about the Xerox 820 system (hardware, software, costs, warranty, service), or to arrange for a hands-on session, call the location nearest you.

Department	Name	Telephone
ADPD	Craig Anderson	376-1245
Health Science C.C.	Lee Croatt	373-7714
UCC	Dale Gear	376-8806
Support Services/ Operations	Julie Douglas	376-2767
West Bank C.C.	Doug Lund	373-3608
St. Paul C.C.	Dave Nelson	376-7003
UM Duluth C.C.	John Skelton	(218) 726-7587
UM Morris C.C.	Andy Lopez	589-2211 x 6390
Waseca C.C.	Marvin Wolthuis	(507) 835-1000 x 304

University departments and individual University faculty and staff can acquire the Xerox 820 system under the master contract for use in connection with their work, as well as for personal applications. The system can be purchased outright by any qualified party; the lease/purchase option under the terms of the master contract is available only to University departments. When you are ready to obtain a Xerox 820 and have decided what applications you will use it for, contact the appropriate source listed below and refer to special #341.

University departments wanting to use a Xerox 820 for word processing and office automation applications should call or see:

Julie Douglas, Business Machine Analyst  
Technical Services  
Support Services and Operations  
2818 Como Avenue SE, Room 207  
Minneapolis, MN 55414  
(612) 376-2767

University departments wanting to use a Xerox 820 as a microcomputer for multipurpose computing activities should call or see:

Dale Gear  
Microcomputer Group  
University Computer Center  
230 Experimental Engineering  
208 Union Street SE  
Minneapolis, MN 55455  
(612) 376-8806

Faculty and staff who can show a valid University of Minnesota staff identification card may purchase a single Xerox 820 system for personal use. Such units must be ordered through and picked up at:

Weldon Electronics, Inc.  
14010 23rd Avenue N  
Plymouth, MN 55441  
(612) 559-1984

(Mary Boyd, 373-4599)

### XEROX 820 SOFTWARE

In the past few weeks we have been testing and evaluating software products for use with the Xerox 820 microcomputer. Since the Xerox uses the CP/M operating system, hundreds of such programs are available, and they run the gamut from simple games to high-level language compilers. Among the products we have tested are two Pascal compilers, a FORTRAN compiler, and a spelling program. These are in addition to the WordStar word processing program, the SuperCalc spread sheet

program, and the DataStar data entry program already available under the University's Xerox 820 contract (see related article elsewhere in this *Newsletter*).

The two Pascal compilers we tested are Pascal/Z by Ithaca InterSystems and Pascal/MT+ by MT MicroSystems. We have chosen Pascal/MT+ because it implements a more standard Pascal than Pascal/Z and its compile times are faster. Each compiler has its own useful features, and these should be taken into consideration before choosing one or the other; both are priced around \$475. Other Pascal compilers are available for CP/M systems, but these two seem to be the most complete.

We also tested the FORTRAN-80 compiler by MicroSoft. Although we have not given it an extensive workout, our limited experience with it, in addition to reviews published in microcomputer journals, lead us to believe it to be a superior product.

Many of you have expressed interest in adding to your word processor the ability to check documents for misspelled words. SpellStar, by MicroPro, provides this feature and is designed to work with your WordStar program. In addition, it counts the words in a document, counts the different words in a document, and then allows you to correct misspellings. The program comes with a 20,000+ word dictionary to which you may make additions. It also allows you to create a personal dictionary to supplement the standard one, in which you may place frequently used names or technical terms that do not appear in the standard dictionary. (*Microcomputer Group, 376-4276*)

### **NEW VERSION OF COM**

As announced in the December *Newsletter*, we are distributing a new release of the Minnesota Microcomputer Operating System. An enhanced version of COM, the terminal communications program for microcomputers, is included in this release, and this article is intended to provide a description of new features and improvements in COM.

Previous releases of COM supported automatic transfer of data between microcomputers and the University Computer Center's Cyber mainframes. Recently, we added two new interactive timesharing machines, one VAX 11/780 using the VMS operating system, and another using the UNIX operating system. The new COM release provides you with the same convenient features as previous versions, and is now available to those who wish to communicate with either VAX machine.

COM's standard features include:

- automatic transfer of disk files from the micro to the mainframe;
- automatic transfer of disk files from the mainframe to the micro;
- recording of interactive terminal sessions;
- programmable function keys.

In addition, the new features include:

- the ability to specify baud rate;
- the ability to specify the operating system with which you are communicating;
- the ability to shift all letters typed on the keyboard to upper case.

Current settings for the various options are kept in a data file which, if not present, will be created by COM with default settings when the program is executed. You may change this data file while in COM by using the Update command to record your current settings. The feature that may prove most useful in the new release is the ability to configure COM to communicate with any interactive system.

All the information COM needs for automatic data transfer is contained in the data file mentioned above. The interactive system must have a special program to transfer data in the form COM expects it. This program is available in Pascal source to anyone who needs it for adding a new system to COM's repertoire. This aspect of COM is discussed more fully in the new COM manual, which will soon be available at the Computer Store.

The Microcomputer Group is currently transferring COM to the Apple and the Xerox 820. We hope to have it ready for distribution by the time you read this article.

*(Microcomputer Group, 376-4276)*

### **RT-11 FOR THE TERAK**

In response to several requests, the Microcomputer Group has obtained documentation for the RT-11 system, and will accept questions on it over the Microcomputer HELP-line. In some cases we may have to consult with other UCC personnel to obtain answers, but we will endeavor to get back to callers with the necessary information within one working day. We hope that you will find this service useful. We have ordered the RT-11 V4.0 update kit for the Terak and, if all goes well, we will have it by the time you read this note. (*Microcomputer Group, 376-4276*)

## **VAX Service**

### **UNIX HELP-LINE**

A HELP-line for the UCC Lauderdale VAX, which runs the Bell Labs/UC-Berkeley enhanced UNIX operating system, has now been established. Call 376-8649 (376-UNIX) from 1-2 p.m. Mondays, Wednesdays, and Fridays with any questions or problems you may have related to UNIX.

## **Cray News**

### **CRAY DATASET TRANSPARENT MODE**

Cray datasets can now be transferred to or from the Cyber front end in transparent mode. Transparent mode means no character or code translation or conversion occurs when the Cray dataset is ACQUIRED from or DISPOSED to the Cyber C172 or C74 permanent file families.

Normally, the Cray dataset format is CB (character/ blocked), the default value. This means that NOS permanent files brought to the Cray from the Cyber are converted to 8-bit ASCII for Cray use with the ACQUIRE command. Conversely, the dataset format default on the DISPOSE command is also CB, so 8-bit ASCII from the Cray is re-converted to 6-bit NOS code with the DISPOSE command. This code conversion was transparent to the user, and had made it impossible to retain or save a Cray relocatable or absolute dataset on the Cyber families.

It is now possible to specify dataset format of transparent mode (DF=TR) on the ACQUIRE and DISPOSE commands. This allows relocatable or absolute Cray modules to be retained as NOS permanent files on the C172 or C74 Cyber families. Such modules can then be sent to the Cray for execution days or weeks later.

Remember to use the parameters WAIT and ID=user-number on your DISPOSE commands and the parameters UQ and ID=user-number on your ACQUIRE commands. The WAIT parameter ensures that your Cray job will be notified by NOS and subsequently aborted if an error occurs in the processing of the TEXT parameter as a job on the Cyber. For your convenience, the following example demonstrates the proper way to retain a Cray absolute dataset named CRABS on the secure Cyber front end, and later return it to the Cray for execution.

Initial Cray run:

```
.
.
.
CFT,I=CFTIN.
LDR,AB=CRABS,NX.
DISPOSE,DN=CRABS,DC=ST,DF=TR,^
WAIT,TEXT='USER,ABC0123,PSWRD.CTASK.
    RETAIN,CRABS.'.
DELETE,DN=CRABS,NA.
```

Subsequent Cray run:

```
.
.
.
ACQUIRE,DN=CRABS,UQ,ID=abc0123,
    DF=TR,^
TEXT='USER,ABC0123,PSWRD.GET,CRABS.
    CTASK.'.
CRABS.
```

This important feature allows the re-use of Cray relocatable and absolute modules without daily recompilation, or re-linkage, while exploiting the excellent security and privacy of the Cyber permanent file systems.

(Tom Kovarik, 376-5608)

## CRAY FORTRAN COMPILER

We currently have three versions of the Cray FORTRAN compiler (CFT) available on the Cray-1. They reflect the development of new features and the correction of previous problems.

The versions are as follows:

- CFTPAST-Our "past" version of CFT; it is the CFT compiler we have been using since October, 1981. CFTPAST is CFT level 1.9 Bugfix 4.
- CFT- The current version of CFT available to Cray sites. It has passed rigorous tests at Cray Research and is fully supported by Cray. This version of the compiler, which we received in January, 1982, is CFT level 1.9 Bugfix 5. Bugfix 5 was a set of corrections to problems that some users found in CFT level 1.9 Bugfix 4.
- CFTFUT- Our "future" version of CFT; it includes some corrections and new features that will be included in CFT level 1.10. This version of the CFT compiler has been verified at Cray Research but has not yet been officially released to CRAY sites. CFTFUT contains some modifications that depend on FORTRAN Library (\$FTLIB) routines that we do not have yet; you may have problems trying to use these.

If you have questions about the CFT compiler or would like more detailed information about these versions, please contact Susan Steffen, 376-5602. (Susan Steffen, 376-5602)

## IMSL LIBRARY ON THE CRAY

Edition 8.1 of the IMSL (International Mathematical and Statistical Library) has been installed on the Cray-1B and tested with the IMSL minimal tests. This library can be accessed by adding LIB=IMSL to the LBR control statement:

```
LBR,LIB=IMSL.
```

A machine retrievable writeup is available on the Cybers. To obtain an index of this writeup, execute the following control statement:

```
WRITEUP(IMSL)
```

If you encounter any problems when using IMSL, please call James Wang, 376-5262. (James Wang, 376-5262)

## Text Processing

### VAX TEXT PROCESSING MEETINGS

In the December *Newsletter* we announced a formatting program called Scribe, available on the Shepherd Labs VAX. Because of the number of responses to that article, particularly from students interested in using the VAX and Scribe to produce theses and papers, we will hold regular meetings to discuss questions you may have about text processing on the VAX.

Using a computer system for typing, editing, formatting, and printing dissertations can save you time and money. If this interests you, or if you are already using the computer for text processing but are having difficulty achieving the results you want, come to one of these meetings to discuss problems and share knowledge. Meetings will be held in 105 Shepherd Labs at 10 a.m. the second Wednesday of each month, and at 3 p.m. the fourth Wednesday of each month. Thus we will meet at 10 a.m. Wednesday, February 10; at 3 p.m. Wednesday, February 24; at 10 a.m. Wednesday, March 10; and at 3 p.m. Wednesday, March 24. Use this opportunity to make text processing work for you.

Remember to take advantage of the free text processing short courses still to be offered winter quarter:

Scribe	Feb. 9-25 (TTh),	3:15-4 p.m.,	Arch 50
PROSE	Feb. 17-19 (WF),	3:15-5 p.m.,	Arch 30
Text Processing	Feb. 22-		
on Micros	Mar. 3 (MW),	12:15-2 p.m.,	MechE 102

If you have further questions about text processing, call Renee Holoien or Elaine Collins at 376-2943. (Renee Holoien, 376-2943)

### ANDERSON-JACOBSON TO VANISH

As of March 31, 1982 the Anderson-Jacobson terminal will be removed from the UCC Reference Room and will no longer be available to the public. Those who would otherwise have used this terminal for typewriter-quality output should consider alternative devices. By the end of March we intend to have a letter-quality printer as a queued device on the Shepherd Labs VAX. This means that you can send jobs to be printed on the typewriter printer instead of the line printer. Since this is a receive-only printer, however, you will not have hands-on access to it as you do now with the A-J. Another option is use of the Xerox 9700 printer for high-quality output, via either the Shepherd Labs VAX or the Cyber system. Those currently using the A-J should prepare for its removal by shifting to other output devices. If you have questions, please call Renee Holoien at 376-2943. (Renee Holoien, 376-2943)

## IMS Journal

### DYNAMO

We have recently acquired DYNAMO III/F. DYNAMO is a compiler for translating and running continuous models (models described by a set of differential equations). It was developed by the industrial dynamics group at MIT for simulating dynamic feedback models of business, economic, and social systems, but nothing in its design precludes its use for any continuous system.

DYNAMO has been designed for the person who is problem-oriented rather than computer-oriented. It makes available easy-to-use computing facilities so that you can focus your attention on building a useful model undistracted by complex computer requirements.

To access DYNAMO, you must use the FETCH control statement:

```
FETCH(DYNAMO)
```

FETCH(DYNAMO) obtains the DYNAMO compiler and makes available the run-time support library DYNLIB. DYNAMO processes model definition statements and produces an FTN FORTRAN program that you must compile and execute. This FTN program, plus subroutines from DYNLIB, perform the simulation of the system.

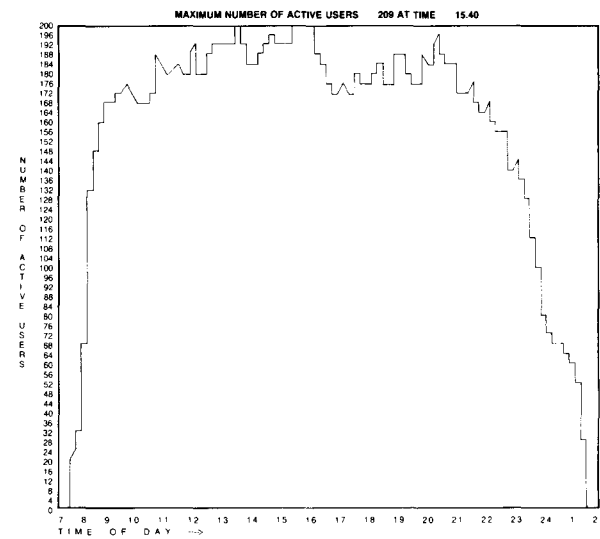
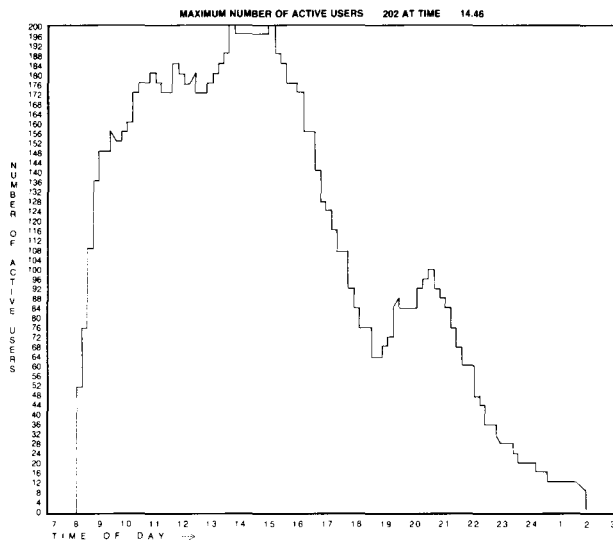
If your problem definition is contained in the file PROBLEM, these are the control statements needed to run DYNAMO:

```
FETCH(DYNAMO)
DYNAMO(PROBLEM)
FTN(I = TAPE22)
LDSET(LIB = DYNLIB)
LGO.
```

Manuals are on order, and they will be available at the UCC Computer Store. If you have further questions on running DYNAMO, or if you would be interested in attending an introductory seminar, contact the IMS consulting line, 376-1761, 1-3 p.m., Monday through Friday. (*Information Management Systems, 376-1761*)

### COBOL CONVERSION

As mentioned in the October 1981 *Newsletter*, we will be removing COBOL 4 from the System in September 1983. It is none too soon to start converting your application programs to COBOL 5. The *COBOL 4 to COBOL 5 Conversion Aids* manual (CDC publication 19265021) is available from the UCC Computer Store. If you are interested in a COBOL conversion seminar, call the IMS consulting line, 376-1761, 1-3 p.m., Monday through Friday. (Steven A. Reisman, 376-1755)



## MERITSS

### MERITSS HITS NEW PEAKS

UCC has made a strong commitment to instructional time sharing since 1971. In September of that year, MERITSS came into being with the lease of a CDC 6400 with 32 ports and 32K (decimal) of memory that allowed a maximum field length of 52400 octal. MERITSS was our first state-wide large scale computer for educational time sharing and had a peak day (202 simultaneous users) on April 29, 1975. Since then, the MECC system has had more simultaneous users (elementary, secondary, vocational, community college, and state university) on its dual processor Cyber 73. But on December 7, 1981 MERITSS had 209 simultaneous users and thus beat its previous peak. We thought it would be interesting to compare these two peak days to see the changes in MERITSS after six and one-half years. The number of active users versus time of day graphs and comparison data follow:

	December 7, 1981	April 29, 1975	% Change
Hours system up	17.7	18	-2%
Number of log-ins	5178	3917	32%
Connect hours	2892	1914	51%
CP time in seconds	67566 (172)	21846 (6400)	209%
K chars input	6833	2563	167%
K chars output	69102	21741	218%
Input responses	222103	93707	137%
Number of times no PPU	1304	36607	-96%
Language runs	December 7 1981	April 29 1975	% Change
ALGOL		30	
APL		9	
BASIC	2673	9650	-72%
COBOL/COBOL5	21	107	-80%
COMPASS	216	58	272%
FORTTRAN (totals)	(6508)	(3463)	88%
MNF/MNFTS	1722	3463	-50%
M77	4786		
Pascal	7678	176	4263%

SNOBOLC	20	205	-69%
System 2000 (52K)	334		
XEDIT	9561	1412	577%
Totals	27011	15110	79%

#### Comparison Ratios

Language runs/ connect hours	9.33	7.89	18%
Output chars/ connect seconds	6.64	3.16	110%
CP seconds/ connect hours	23.4	11.41	105%
Average session in minutes	33.5	29.3	14%
Connect hours/ maximum users	13.8	9.48	46%

An analysis of the time of day graphs shows that elementary and secondary school users would usually finish by 4 or 5 p.m. in 1975 while University users continued until 10 or 11 p.m. both in 1975 and 1981. In 1975 BASIC was the dominant language with FORTRAN usage at 36% of BASIC. Only about 10% of the users corrected or edited their files with a powerful editor (XEDIT); the rest used the simple line editor of TELEX. In 1981 Pascal was the dominant language with FORTRAN usage at 85% and BASIC usage at 35% of Pascal. About half the users correct or edit their files with a powerful editor.

The comparison ratio "output characters/connect seconds" shows the change from 10 characters/second terminals in 1975 to 30 characters/second terminals in 1981. The 1981 CP seconds/connect hours have doubled from 1975 as a result of the more difficult problems being run today since, at the University, microcomputers are doing many of the easier computational problems. Note that 23.4 seconds/connect hours times 209 users requires 1.36 processors so that 1981's computational load could not have been done on the single processor CDC 6400 and Cyber 170-720 computers that preceded the current dual processor Cyber 172. The Cyber 172 with PPUs that execute programs and transfer information to and from the disks at twice the speed of the CDC 6400 lowered significantly the number of times there were no PPUs available for user input or output requests in 1981. An



improvement in response time can also be seen on our 1981 MERITSS system. Because system overhead takes approximately 10% of a single processor, MERITSS could handle a peak load of 275 simultaneous users (currently MERITSS has 320 ports, 64 at 110 baud only, 192 at 300 baud and 64 at 300 or 1200 baud). In addition MERITSS users are granted additional field length (65K octal normal) due to today's larger computational problems. UCC expects additional simultaneous users (to 275) to be added in the next two years and the VAX/UNIX system to handle as many as 64 additional simultaneous instructional users. If the computational power required to solve instructional problems goes up by a factor of 1.5 in the next two years, we are prepared to upgrade the Cyber 172 to a Cyber 174 that would have the additional CP power to still handle the peak 275 users. (*Lawrence A. Liddiard, 373-5239*)

## All Systems Bulletins

### UCC SHORT COURSES

The following UCC Short Courses will be offered during the remaining weeks of winter quarter. The courses are free; no registration is necessary. No classes will be held on February 15, an official University holiday. For more information, see WRITEUP(CLASSES) or call Jerry Stearns at 373-4360.

Introduction to Programming Feb 22-Mar 5 (MWF)	3:15-5 p.m.	Phys 210
XEDIT Feb 1-5 (MWF)	2:15-4 p.m. 3:15-5 p.m.	Phys 170 (MW) MechE 108 (F)
Text Editing on VAX/VMS (EDT) Feb 1-10 (MW)	12:15-2 p.m.	MechE 102
Scribe Feb 9-25 (TTh)	3:15-4 p.m.	Arch 50
PROSE Feb 17-19 (WF)	3:15-5 p.m.	Arch 30
Text Processing on Micros Feb 22-Mar 3 (MW)	12:15-2 p.m.	MechE 102

SPSS Feb 8-12 (MTWF)	2:15-3:30 p.m.	Phys 170
SCSS Feb 22-24 (MW)	3:15-5 p.m.	Phys 170
Introduction to DBMS Feb 1 (M)	3:15-5 p.m.	MechE 221
SIR Feb 2-18 (TTh)	3:15-5 <sup>th</sup> p.m.	AkerH 209
Introduction to System 2000 Feb 3-23 (MWFT)	3:15-5 p.m.	Ford 115
Introduction to RIM Feb 22-24 (MW)	3:15-5 p.m.	VinH 20
System 2000 Report Writer Feb 25 (Th)	3:15-5 p.m.	VinH 20
System 2000 PLI Mar 2-4 (TTh)	3:15-5 p.m.	VinH 20
Cray FORTRAN Features Feb 2-11 (TTh)	3:15-5 p.m.	VinH 20

Short courses being offered through Continuing Education and Extension (CEE) include:

UCSD and CP/M Systems on Micros Feb 8, 11 (MTh)	6:15-8 p.m.	Ford 120
Programming Techniques on Micros Feb 22, 25 (MTh)	6:15-8 p.m.	Ford 120

You may obtain more information and registration materials by calling (612) 373-3195 or stopping by 101 Wesbrook Hall, Minneapolis campus. (*Chris Gordon, 376-9832*)

### PRESIDENTS' DAY HOURS

Monday, February 15, is Presidents' Day, an official University holiday. UCC will maintain its regular operating hours.

### FOR SALE

CRT data terminal (Telaray model 10) and Novation CAT modem. Equipment in excellent condition. Contact Andy Pakstis at 376-3104.

# UCC Newsletter Index

## Volume 15 (1981)

### ACCOUNTING

Shared pack purging	14
CPU rates, or is the price right?	93
Price changes	120
VAX charges	128

### CONSULTING SERVICES

CRAY	79
------	----

Cray service	4
Cray to arrive	91
Cray 1B on the job	125
Cray news: Libraries	138
Cray permanent datasets	138

### DATA BASE MANAGEMENT

Business data products	115
Record manager changes	135

### DOCUMENTATION

Documentation menu	50
New and nifty documentation/publications	120
New and improved	138

### ENGINEERING SERVICES

Engineering services feature	61
Terminal maintenance	127

FORTRAN COMPILERS		OPERATING SYSTEMS	
Tests of FORTRAN functions, part three	2	Cyber upgrade	14
Choosing a computer system for FORTRAN jobs	116	System overview: the next few months	42
GENERAL FEATURES		System overview: a look into the future	42
Can we trust the accuracy of computer answers	17	System overview: upgrade and update	81
Interval arithmetic	28	OPERATIONS: New printers	119
Computer store-y	31	PERFORMANCE MONITORING	
Documentation and publications group	47	Cyber CPU utilization	51
Reference room	49	PERMANENT FILES	
Security enhancements	58	Permanent files	3
Engineering services	61	Permanent files on Cyber 74 become shared	119
Consulting services	79	Safety precautions	119
Looking backward	110	PROFESSIONAL SERVICES DIVISION	100
Microcomputing—think small	111	PUBLIC LABS: Micro labs, graphics terminals	118
Choosing a computer system for FORTRAN jobs	116	STATISTICAL PACKAGES	
GRAPHICS		Packages provided by UCC	5
Pretty pictures	115	SCSS	99
Phasing out PLOTPAC and PASPLOT	136	SUGGESTION BOX	
GRIDIT repair	137	March	27
HEALTH SCIENCES DATA SERVICES		June	70
HUMANITIES		September	100
Text formatting, grants	6	TEXT PROCESSING	
Non-traditional computing services	112	Photocomposition	15
Ancient business empire reconstructed	134	University-wide microprocessors	44
INTERACTIVE INFORMATION		New terminal type	44
Family counseling	98	Development and expansion	91
Family problems	139	Services, theses, courses	114
INDEX TO VOLUME 14 (1980)		Formatting with Scribe	137
LIBRARY CHANGES AND ADDITIONS		UNIVERSITY COMPUTER SERVICES (UCS NEWS NOTES)	
MINNLIB, FTN5	5	Introduction to University Computer Services	35
IMSL edition 8	26	Advisory council on network planning	46
SYSLIB restructured	72	The crystal ball: 1981-1986	71
IMSL new edition (8.1)	140	VAX	
MAGNETIC TAPES: Multi-file tapes	119	VAX facts	43
MICROCOSM		VAX service	84
Fair use	7	VAX open for business	90
Micro software	30	VAX charges	128
Terak A system editor, Apple Pascal 1.1, printers	59	The VAX: present and future	133
New bid, micro lab, new plotter library	99	WRITEUPDATE	
Microcomputing—think small	111	CAL, CLASSES, CONTROL, DOCLIST, SWPRICE	5
Apple/Terak speed test	127	ACCRATE, BASIC, LABHOUR, LIBSET, MACRO11	15
Apple Pascal software at computer store	315	ASM11, PDPSIM, PFGUIDE, TSCOBOL	26
Terak/Pascal system update	136	ACCSTAT, STORE, SWPRICE	45

## PHONE NUMBERS

Budgets .....	373-2521	HOURS-line (recorded message) .....	373-4927
Computer-Aided Instruction .....	376-2975	Image Processing .....	376-2895
Computer Hours (recorded message) .....	373-4927	Information, Experimental Engineering .....	373-4360
Computer Store .....	373-4877	Information, Lauderdale .....	373-4912
Consulting		Information Systems .....	376-1764
HELP-line .....	376-5592	Instructional Labs .....	376-3963
9 a.m.-5 p.m., Monday-Friday		Job Status, ExpEng (recorded message) .....	373-4994
Business Data Products .....	376-1761	Lauderdale Computer Room .....	373-4940
1-3 p.m., Monday-Friday		Lauderdale Operations Manager .....	373-4920
Statistics Packages .....	376-5062	Lauderdale Services .....	373-4995
1-2 p.m., Monday-Friday		Lauderdale Services Manager .....	373-7538
Data Bases .....	376-1761	Lauderdale Users' Room .....	373-4921
1-3 p.m., Monday-Friday		MECC Liaison .....	373-4573
Microcomputers .....	376-4276	Newsletter Subscription .....	376-4668
10-12 a.m. and 2-4 p.m., Monday-Friday		Permanent File Restoration .....	376-5605
Humanities .....	373-5780	Professional Services Division (PSD) .....	376-1764
10:30-11:30 a.m., Monday, Wednesday, Friday		Project Assistance .....	376-1764
UNIX .....	376-8649	Program Librarian .....	376-1636
1-2 p.m., Monday, Wednesday, Friday		Programming Languages .....	376-7290
Contract Programming .....	376-1764	Reference Room .....	373-7744
Data Base Applications .....	376-1764	Remote Batch (RJE) Services .....	376-3963
Educational Services .....	376-3963	Short Courses .....	373-4360
EDUNET Liaison .....	373-7745	Shuttle Bus Service .....	376-3068
Engineering Services .....	376-8153, 376-1023	System Status (recorded message) .....	373-4927
Engineering Services—Service Contracts .....	376-8153	Tape Librarian: see Lauderdale Services	
Equipment Purchase .....	376-8153	Text Processing Services .....	376-2943
Experimental Engineering I/O .....	373-4596	User Accounts .....	373-4548
Graphics Software .....	376-1849	User Services .....	376-3963
HELP-line .....	376-5592		
9 a.m.-5 p.m., Monday-Friday			

## OPERATING HOURS

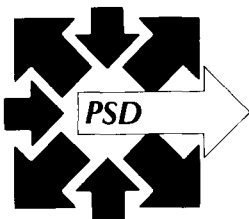
	Cyber 74/730	Cray	MERITSS (Cyber 172)	VAX
M-F	8 a.m. - 4 a.m.	8 a.m. - midnight	7:45 a.m. - 1:30 a.m.	8 a.m. - 6 a.m.
Sat	4 a.m. - 5:15 p.m.	8 a.m. - 5 p.m.	7:45 a.m. - 1:30 a.m.	24 hours
Sun	4 p.m. - 1 a.m.	4 p.m. - midnight	4 p.m. - midnight	24 hours

## 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 140		X	
CentH		X		MdbH		X	
ComH		X		OMWL 2	X	X	
DiehH 270		X		SocSci 167, 1009	X	X	
ElecE 38	X			<i>St. Paul</i>			
EltH 121, 125		X		BaH		X	
EltH N640	X			BioSci 257	X		
ExpE 130	X			ClaOff 125	X	X	
FolH 304a		X	X	McN	X		
FrontH		X		NorH 24	X		
KoltH S191	X			<i>Lauderdale</i>			
LindH		X		Users Room	X		
MasCan 39	X						
Mayo D388	X						
MechE 308		X					
MinMet 325	X						
Physics 69	X						
SanfH		X					
TerrH	X	X					
VincH 4		X					
WaLib 204		X					
Zoology	X						

# P ROFESSIONAL S ERVICES D IVISION

statistical analysis: full range of services available  
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data base development: design and implementation using state-of-the-art technology  
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