MIW
9C931

University Computer Center Newsletter

contents

bulletins

LABOR DAY HOURS

	------DOWN------	-----UP-------
Lauderdale	Sat Sept 1 1800	Mon Sept 3 1800
ExpEng	Fri Aug 31 2400	Tue Sept 4 0800

DON'T FORGET THE SYSTEM CHANGE

SEE WRITEUP,UPGRADE.

UCC newsletter

number crunchers

It is time to report on what appears to be available for "number crunchers" that do not fit comfortably within the constraints of our Cybers. (A number cruncher is a program that requires more than 231K 60-bit CM words, and/or more than 900 CP seconds to compile and execute.) Note: the "231K" mentioned above is octal units. All references to CM in this article should be read as octal units.

These constraints are imposed in part by the hardware configuration of the two Cybers, and in part by UCC policies. These policies, which limit permissible CM during prime time and which give very slow turnaround to very long or very large programs, are based on the precept of "the greatest good for the greatest number." Most of our users run programs requiring up to 55K CM words and up to 60 CP seconds. The "average" job will receive good response time or good turnaround time even during the busy daytime hours. However, the number crunching job will experience lengthy, unpredictable delays. We automatically set 155K CM batch limits to users opening new accounts, but will increase the limit upon request (up to 231K for the Cyber 74 during non-prime hours).

To help users with these large jobs, we are doing and/or proposing the following measures:

Cyber 74 solution:
> For users with special CM needs, we offer block time. During block time, 321K CM words will be available on the Cyber 74. Call the Operations Supervisor, John Sell, 373-4920, to arrange for such special requests. In addition to the normal computing costs, there will be an operator charge. Telex will not be active in order to make as much core available to the user's program as possible.

STAR 100 solution::
> We have arranged with CDC for about one hour of CP time on their STAR 100 system; to be assigned to our users on the basis of need. The STAR 100 array processor performs particularly well on programs which have been rewritten to take advantage of the system vector processing speed.

CRAY 1 solution:
> The CRAY 1 does a very good job on single precision number crunching and apparently does not require rewriting programs. (The CRAY is not as cost effective as the Cyber 74 for double precision.) We will arrange service on the CRAY 1 via the local office of United Computing Services. Their rates are high and must be covered by a user's research contracts.

Cyber 172 solution:
> We plan to make the Cyber 172 available during late night hours for users with large CP and CM requirements. A special priority level will be defined for these jobs and a special low charge (approximately 5.5 cent per PRU) will be made. An addition of 65K to the Cyber 172 in December will allow users to run up to 400K field length problems. The following restrictions are being considered for the use of this priority:

> The job will enter the regular input queue

with a special priority and a CM limit of 201K words (expanded to 400K in December).

> The user must checkpoint the job, i.e., store information at intervals so that the job can be re-started if it is temporarily halted by operator intervention.

> If the job does not complete by the time regular operations must be resumed, the operator will intervene and then re-start the job the following day. No operating time will be lost since the job will re-start at its last completed checkpoint.

> There will be no guaranteed length of turnaround time. The job may complete in one night or it may take several nights. Refunds will not be given for job failures.

> No magnetic tapes should be used, to ensure easy checkpoint/restart.

To illustrate the use of outside vendors, the following is an analysis of a set of test runs. Paul J. Ellis, Department of Physics, and programmer Keith Goetz have run jobs that solve a set of coupled differential equations giving the scattering cross sections for collision of light nuclei. Here are the comparisons of the jobs, run on 4 different machines:

Machine	Language	Execution Time	Expected/ Actual Ratio*	Comments
Cyber 74	ANSI FORTRAN with 15 overlays	400 CP seconds		40 seconds compilation 155K
STAR 100 Machine	ANSI FORTRAN	275 CP seconds	1-6/1.5	OS hard to use
Cyber 203	ANSI FORTRAN	75 CP seconds	8-16/5.3	OS hard to use
CRAY 1	CRAY FORTRAN	67 CP seconds	12-24/6.0	2 seconds compilation

*The expected ratio is taken from the chart published in our June Newsletter; OS stands for Operating System.

In general it is easier to run a Cyber 74 job on the CRAY 1 than on the Star 100 or Cyber 203, since they have a very different operating system that requires guidance for a novice user. In addition, to get the best performance from the STAR 100 or Cyber 203 machines, a user should take a STAR FORTRAN course and spend several months converting a particular program to run well in vector mode. We will continue to investigate other University "number cruncher" problems on vector machines, since the results obtained in this problem are not the speed ratios we expected. If you have further interest in these solutions, please call Thea Hodge, 373-4599, and ask to be entered on our list.

T. Hodge, 373-4599
L. Liddiard, 373-5239

meritss expands

During the past two months, two analyses have shown UCC management that the current MERITSS system provides inadequate service for current and future instructional needs at the University. The first analysis, undertaken in June 1979, which compared May to May peak use of the system for the last six years, showed serious degradation of service both by the lengthing of tne average terminal session and by the reduction by the number of central processor seconds delivered per terminal hour. The second analysis was also provided in June by the INSTRUCTION section of the "Report on Usage" by the University Computer Services Advisory Committee's subcommittee on Computer Usage. That section stated:

"Current instructional timesharing facilities are totally inadquate for the desired level of use. We received letters from instructors who do not use the computer as much as they would like in their classes because there are not enough terminals."

In the light of these analyses, UCC has decided that the most economical expansion is to replace the MERITSS CDC 6400 (65K) CPU with a Cyber 170-720 (98K) CPU. This will give us peripheral processors that allow the current disk controllers to roll interactive jobs at approximately twice the rate of the 6400. With the addition of effectively 67% more user memory and 100% faster rolling ability, the new system should support 1.75 times the current number of active ports. These increases will allow University instructional timesharing to be expanded this year to meet the desired growth expressed in the "Report On Usage."

We apologize for the short notice to users on the installation of this new central processor. However, in order to get this installed between the end of 2nd Summer Session and September 1st, (the only time span that will cause the least disruption to MERITSS users), the request for expansion, University Advisory Committee approval, CDC selection, and MECC review had to be condensed into a single month's time.

The current installation date is scheduled for the weekend of August 18 and 19. Initially, MERITSS will continue to use its stable KRONOS operating system to ensure that MERITSS users will not have any unpleasant surprises when they return for the Fall quarter (we hope that they will be pleasantly surprised by the shorter terminal sessions and faster response time). Later, perhaps in late December, NOS 1.3 will become the operating system, after it has been checked out thoroughly on the Cyber 74/172 during Fall quarter. 1200 baud service, requested by instructors who use graphics in their courses, will be added also.

On-line system notes will be provided during the coming weeks to keep all MERITSS users informed about any changes. We do not, at this time, know of any user change that will be required by the installation of this central processor.

M. Skow, 373-7745
L. Liddiard, 373-5239

file archiving

With the advent of NOS 1.3, ARCLIST has been slightly modified, and a new program named RELOAD is now available. These two programs are used in reference to the end of the month archive done on the Cybers. This archive takes disk files that have not been accessed since the first of the previous month, copies them to magnetic tape, and then purges them from the disk.

ARCLIST provides a list of the files that were archived. RELOAD requests that these files be loaded back to disk (there is a charge for reloading archived files).

A writeup that describes end-of-month archiving, and explains how to use ARCLIST and RELOAD can be obtained by:

WRITEUP(RESTORE)
    An index to the writeup and a very brief description of the parameters for ARCLIST and RELOAD.

WRITEUP(RESTORE=INDEX)
    The same as above.

WRITEUP(RESTORE=ARCLIST)
    This is a detailed explanation of tne options in ARCLIST.

WRITEUP(RESTORE=RELOAD)
    This is the details on how RELOAD can be used.

WRITEUP(RESTORE=*)
    This will produce all the sections of the writeup.
                              T.J. Hoffmann, 376-5262

imsl

IMSL (International Mathematical and Statistical Libraries, Inc.) has informed us of a change in the order of arguments for their routine DREBS from the past Edition 6 to the current Edition 7. Programs that ran correctly with the past Edition of DREBS will no longer work. Users who encounter this problem can correct it by simply rearranging the four arguments of the user-supplied subroutine according to the DREBS document in edition 7 of the IMSL Reference Manual.

The reason for tne change is to make the user-supplied subroutine for DREBS be compatible with those required by DVERK and DGEAR. It is now possible to use all three ODE (ordinary differential equation) solvers with the same user-supplied subroutine.

                              M.J. Frisch, 376-1636

linpack

We have installed the LINPACK package of Fortran subroutines that analyze and solve various classes of simultaneous linear algebraic equations on the Cyber 74/172. LINPACK was developed as a research project sponsored by the National Science Foundation and the Department of Energy and has been extensively tested. The package is of high quality and quite efficient. (However, similar assembly language routines written at UCC are more efficient.) LINPACK has been made available in binary form as a user library. Below are sample job decks:

```
    MNF Example          FTN4 Example
    -----------          ------------
    Job card             Job card
    USER card            USER card
    MNF(B)               FTN.
    FETCH(LINPACK)       FETCH(LINPACK)
    LGO.                 LGO.
    7-8-9 card           7-8-9 card
       .                    .
       .                    .
    Fortran program with CALLs
       to LINPACK routines
       .                    .
       .                    .
    END                  END
    7-8-9 card           7-8-9 card
       .                    .
       .                    .
    Data cards, if any
       .                    .
       .                    .
    6-7-8-9 card         6-7-8-9 card
```

The routines were tested by UCC with programs that accompanied the package and the test decks ran satisfactorily. Documentation for LINPACK is contained in the book by J.J. Dongarra, J.R. Bunch, C.B. Moler, and G.W. Stewart, "LINPACK Users' Guide," Society for Industrial and Applied Mathematics (1979).

M.J. Frisch, 376-1636

user program

Occasionally, we hear about user programs that have applicability beyond the developer's department and which are documented and available for other users. A particularly interesting one came to our attention this summer. It is called POLDATA (pollen data); quite appropriate to this August issue!

The program was written by Professor E.J. Cushing, Department of Ecology and Behaviorial Biology, for the use of pollen analysis. It manipulates and plots stratigraphic data and "can be used with any numeric data associated with discrete levels in a core." Documentation is available from either Dr. Cushing or from the UCC Reference Room.

word processing

UCC has appointed a committee to assess the expected growth of word processing as an emerging computer application, and to define UCC's role in providing a word processing service. This committee will study the demand for word processing, will make recommendations on equipment, software, and systems, and will attempt to define how UCC can best work with other departments to provide a viable service.

This committee, chaired by Thea D. Hodge, invites your suggestions and recommendations.

humanities workshop

This fall, the Academic Computer Center, University of Wisconsin-Madison, will be conducting a wwrkshop tentatively called "The Use of Computers For Undergraduate Instruction In The Humanities." They would like to invite teaching faculty from other institutions who have developed and are using instructional programs for the humanities. They would be resource persons for the workshop participants, who would be humanities faculty from the University of Wisconsin system. They would appreciate hearing from interested University of Minnesota faculty members; call Michael Skow, the new University of Minnesota EDUNET liason, 373-7745.

surplus property

UCC now has several 20-drawer card cabinets, three blackboards on stands, old desks, 30x60 tables, and some wooden tables available as surplus property. If any University Department can use these items (for department, not private purposes), call Ron Fleagle at 376-5263.

microfilm printing

MF501, a program used to produce microfilm listings on 7-track tape, will not be available with NOS 1.3.

A different utility, MFEBR, should be used as a replacement. MFEBR writes microfilm listings on 9-track tape. Documentation for MFEBR is available from WRITEUP(MFEBR).

M. Riviere, 376-5606

The Cyber 74/172: An Annual Statistical Review for Fiscal Year 1978-1979

	1978-1979	1977-1978	% Change
Batch jobs and MIRJE sessions	1,221,029 (1,360,071)	1,082,200 (1,210,432)	+ 12.8 (+12.4)
Central processor hours inc. DELAY	2332/1051 (2631/2158)	2166/- (2711/-)	+ 7.7 (- 3.0)
MIRJE terminal hours	131,884 (156,415)	93,993 (114,322)	+ 40.3 (+36.8)
Mass storage transfers (KPR)	4,117,700 (5,297,348)	2,987,834 (3,801,477)	+ 37.8 (+39.3)
Magnetic tape transfers (KPR)	79,944 (135,891)	71,801 (98,944)	+ 11.3 (+37.3)
Pages printed, charged from UCC	11,273,400 (12,700,253)	10,230,017 (11,385,499)	+ 10.2 (+11.5)
Cards punched	5,097,124 (6,371,450)	4,977,835 (5,427,040)	+ 2.4 (+17.4)
Microfilm frames produced	334,904 (4,597,319)	267,734 (3,538,966)	+ 25.1 (+29.9)
Statos plotting production (feet)	99,481	87,317	+ 13.9
Tapes mounted	140,946	114,156	+ 23.5
Average file storage (char)	1,978.7 million	1,271.2 million	+ 55.7
Mean time between failures	75.5/134.9 hours	30.2 hours	+250.0
Available during scheduled hours	98.8/99.2 percent	97.5 percent	+ 1.3

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

▷Jobs and central processor hours:

As in previous years the highest percentage increases were related to mass storage, with both transfer and total storage having fairly good increases. The delivery of two Fixed Module Disk (FMD) controllers with four 685 million character FMD units should ensure that this increase can continue.

▷MIRJE terminal hours:

Next to mass storage, our most popular item was interactive terminal hours; more hours were used overall, and we show an increase in the use of the 1200 baud service. (In addition to the 15,000 hours per month supplied on the Cyber systems, another 33,000 hours per month are supplied on the MERITSS instructional system.) The following table shows the number of terminal hours, broken down among baud rates and systems:

	Cyber 74			Cyber 172		totals
baud	110	300	1200	110-300	1200	
hours	340	5,271	451	7,321	1,319	14,702

▷Pages, cards, and plotting:

Again, the number of pages printed increased by a million, which represents a 10% increase over the previous year. We punched a million cards for users when we converted user card decks from 026 to 029; this accounts for most of the increase in cards punched, since we have shown a steady decline in past years.

▷Magnetic tape transfers and mounts:

7-track mounting has continued to decline, while the 9-track load is currently at a level that can be handled with the seven units currently installed. When the additional 9-track units are installed with release 4, our Accounting Group will immediately transfer from 7-track to 9-track usage. (Our Accounting Group does not use 9-track units now, because their additional load would overwhelm the 9-track units). The past trends in magnetic tape use are also reflected in the following table:

	labeled	not labeled	7-track	9-track	totals
June 1976	5,351	3,565	7,264	1,652	8,916
June 1977	6,508	2,953	6,460	3,001	9,461
June 1978	8,001	3,065	5,633	5,403	11,066
June 1979	8,252	3,829	4,398	7,683	12,081

▷Mean time to failure and availability:

The Control Data customer engineers, the UCC Systems staff, and the UCC Operations staff have worked hard to improve their analyses of failures in order to provide longer mean time between failure and total availability. Their work is reflected in the best record that we have achieved for any past year. The Cyber 172 is also proving to be able to sustain a higher mean time to failure than any other mainframe that we have used.

L. Liddiard

SUMMARIES

PRODUCTION USAGE SUMMARIES: Cyber 74/172

	Cyber 74/172 June, 1979	Cyber 74/172 June, 1978
System resource units (SRU)	1,227,144 (1,566,291)	-
Batch jobs and MIRJE sessions	99,958 (110,217)	99,488 (113,497)
Central processor hours inc. DELAY	200/110 (217/212)	238 (277)
DELAY queue processor hours	76/21 (77/37)	78 (81)
MIRJE terminal hours	13,119 (15,101)	10,077 (11,446)
Mass storage transfers (KPR)	354,404 (452,152)	316,622 (423,668)
Magnetic tape transfers (KPR)	7,114 (11,849)	7,324 (10,423)
Pages printed, charged from UCC	964,140 (1,073,054)	1,071,455 (1,188,536)
Cards punched	387,317 (421,777)	572,238 (660,516)
Microfilm frames produced	25,977 (380,668)	30,457 (358,686)
Statos plotting production (feet)	8,170	8,788
Tapes mounted	12,347	11,806
Average file storage (char)	2,085.7 million	1,638.6 million
Mean time between failures	129.0/103.2 hours	67.0 hours
Available during scheduled hours	99.9/99.6 percent	99.0 percent
SUPIO uptime during available hours	98.0 percent	96.4 percent

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

DOWNTIME SUMMARY: July, 1979 (Column 1, Cyber 74 : Column 2, Cyber 172)

	0800-1800 M-F		other		total	
Total possible scheduled uptime hours	210.0	210.0	303.0	303.0	513.0	513.0
Total downtime hours (see Schedule A)	1.7	1.4	2.7	4.0	4.4	5.4
Total uptime hours	208.3	208.6	300.3	299.0	508.6	507.6
Uptime (percent)	99.2	99.3	99.1	98.7	99.1	98.9
Average downtime per occurrence (min)	17.0	28.3	32.4	119.5	24.0	64.8
Mean time between failures (hours)	35.0	70.0	60.6	151.5	46.6	102.6
Subsystem failures						
SUPIO	2	-	0	-	2	-
TELEX	0	0	1	0	1	0
EXPORT	2	-	1	-	3	-

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	2	1	0.2	0.1	7.4	5.0
(3) Hardware related problems	7	3	4.2	5.3	35.7	106.3
(4) Indeterminate problems	0	0	0.0	0.0	0.0	0.0
(5) External Problems	0	0	0.0	0.0	0.0	0.0

PRODUCTION USAGE SUMMARIES: CDC 6400

	June, 1979	June, 1978
Number of jobs run	116,919	107,290
Central processor hours	161.7	177
MERITSS terminal hours	14,993	14,934
Number of terminal sessions	29,152	29,243
Maximum number of simultaneous users	118	113
Average file storage (char)	374.8 million	346.5 million
Mean time between failures	119.9 hours	95.8 hours
Available during scheduled hours	99.0 percent	99.7 percent

CYBER 74/172 OPERATING HOURS

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S|                          |$$$$$$$$$$$$$$$$|
M|*|          |<><><><><><><><><><><><><$$|
T|*******|    |<><><><><><><><><><><><><$$|
W|*******|    |<><><><><><><><><><><><><$$|
T|*******|    |<><><><><><><><><><><><><$$|
F|*******|    |<><><><><><><><><><><><><$$|
S|***************|$$$$$$$$$$$$$$$$$$$$$$|        |
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 ^     ^       ^                    ^            ^
0100  0400    0800                 1715        2400
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<><><><> Lauderdale, ExpEng, NORMAL rate
$$$$$$$$ Lauderdale, ExpEng, DELAY rate
******** Lauderdale only, DELAY rate

See WRITEUP(HOURS) for schedule of batch job pickup/delivery service at Lauderdale and Experimental Engineering.

TWIN CITIES CAMPUS PUBLIC REMOTE JOB ENTRY SITES

SITE	ID	SUPERVISOR	PHONE	*
East Bank				
ElectE 38	4V	J. Guentzel	373-5404	2
EltH N640	4W	D. Anderson	373-5827	2
ExpEng 130	4B	Shift Supervisor	373-4596	1
ExpEng 130	4N	Shift Supervisor	373-4596	1
FrontH	4E	M. Kilbury	373-2740	1
KoltH S191	4Z	G. Schuette	376-7375	4
HS-A 1-752	4C	L. Ellis	373-0331	1
MinMet 321	41	M. Weber	373-2302	3
Physics 69	44	L. Whitney	376-7627	3
SpaSci 134	43	A. Perandi	373-7881	1
TerrH W106	4I	R. Swanson	373-6621	1
V366 VFWCRC	2D	L. Croatt	373-7714	1
V366 VFWCRC	24	L. Croatt	373-7714	1
Zoology 314	4J	E. Cushing	373-2232	1
West Bank				
SocSci 167	4X	R. Dykstra	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		373-1544	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

*additional keypunches in 131 ExpEng, 86 BlegH, 140 ExpEng, and 90 BlegH.

CDC 6400 OPERATING HOURS

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S|                      |<><><><><><>|
M|          |><><><><><><><><><><><><><><>|
T|<>|       |><><><><><><><><><><><><><><>|
W|<>|       |><><><><><><><><><><><><><><>|
T|<>|       |><><><><><><><><><><><><><><>|
F|<>|       |><><><><><><><><><><><><><><>|
S|<>|       |<><><><><><><><>|***************|
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0130  0730/0745    1600  1800      2400
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****** up, not attended
<><><> up, attended

TWIN CITIES INSTRUCTIONAL COMPUTER LABORATORIES

SITE	SUPERVISOR		EQUIPMENT
East Bank			
CentH	R. Rickgarn	3-2289	TTY33(2)
DiehlH 535	N. Sauro	6-7005	CRT(2)
EltH 121, 125	D. Anderson	3-5827	TTY33(6) Hazeltine(3) Teleray(1)
FrontH	M. Kilbury	3-2740	TTY33(1)
HS-A 1-752	L. Ellis	3-0331	TTY33(4) TTY43(2) Teleray(1)
LindH 25	M. Schneider	3-7582	CDC713(6) Decwriter(5) TTY33(5) Tektronix4013(1)
MechE 308	D. Riley	3-0340	TTY33(4) Teleray(3) Decwriter(5)
SanfH	B. Warren	3-3434	TTY33(1)
TerrH	R. Swanson	3-6621	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	R. Dykstra	3-3608	TTY44(3) Teleray(1)
MdbH	R. Baker	3-9822	TTY33(1)
SocSci 167	R. Dykstra	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

security

There are now nearly 150 microcomputer systems on campus and their number is growing. Questions concerning the physical security of these machines have come to our attention, and the purpose of this article is to make some basic security suggestions.

Our suggestions are the following:

1. Do not leave microcomputers unattended.

2. Microcomputers should be locked up overnight. The room should be provided with the usual security measures required for any room housing equipment in this price class.

3. Microcomputer laboratories having 4-10 APPLE II, S100, or TERAK machines should have a solid core door with a deadbolt lock. If the door is hollow core, or if it has a window or air vent through which a thief could pass an arm, the deadbolt should not be a twist lock on the inside, but rather should be keylock only.

4. The machines and accessories should be numbered by property accounting and the numbers should be engraved on the machines, with the serial number.

5. The machine serial number, property numbers, and room location should be recorded and a copy of this record should be sent to:

    a. Ron Fleagle, UCC, 227 ExpEng
    b. Lt. Claude Jarvis, UofM Police Department

If you have special problems, please contact Lt. Jarvis for recommendations.

P.C. Patton

RETURN TO:
USER SERVICES
UNIVERSITY COMPUTER CENTER
227 EXPERIMENTAL ENGINEERING
UNIVERSITY OF MINNESOTA
208 UNION STREET SE
MINNEAPOLIS, MINNESOTA 55455