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Director: Peter C. Patton
Editor : Naomi Miner

Comments about the content of this newsletter, or suggestions for changes may be directed to the editor, 235a Experimental Engineering, or call 612/376-4668.

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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S2000 version 2.80

A preliminary version of System 2000 Version 2.80 is now available via the FUTURE control statement.

This new System 2000 has the large, small, and regular core versions combined into one integrated package. It provides a non-key WHERE clause, text searching, and an enhanced string function capability. In addition there is a new program language interface called PLEX. PLEX provides support for 16 LOCATE files, an extended WHERE clause, aliases, and new item types. PLEX is not downward compatible.

All existing applications using current System 2000 versions will be unaffected by this addition. However, to use the new package, PLI programs must be converted to PLEX and linked with the new PLXLGO binaries. The following products are now available as FUTURE:

	Small	Medium	Large
Natural Language	n/a	S2000	S2000L
PLEX-COBOL	PLXCOBS	PLXCOB	PLXCOBL
PLEX-FORTRAN	PLXFORS	PLXFOR	PLXFORL
PLEX-LGO	PLXLGOS	PLXLGO	PLXLGOL
Report writer	n/a	RWEXIT	RWEXITL

n/a = not available

To use the small core version of PLEX-COBOL, for example, you would use the following control statements:

```
FUTURE(PLXCOBS)
PLXCOBS.
COPYBR(PLXLGOS,LGO)
COBOL(A,I=TAPE3)
COPYBF(PLXLGOS,LGO)
MAP(PART)
LOAD(LGO)
NOGO(SYS)
```

The file SYS will then contain the absolute program. Note that the package names have been changed from the form PLIxxx to PLXxxx. In addition, when accessing either PLEX-COBOL or PLEX-FORTRAN, the associated PLEX-LGO is made available at the same time as a convenience, and you needn't use a separate FUTURE(PLXLGOx) statement.

Our System 2000 short courses are now covering version 2.80, and we will have a special 2.60 to 2.80 conversion class on August 5.

The Computer Store has the new 2.80 manuals on order. For documentation information call them at 373-4877 between 9 AM and 3 PM.

There are some known problems with this release. Most importantly, arrays in PLEX, although documented in the PLEX manuals, are not supported at this time. The other known problems are:

Number	Description
3137	In COBOL PLEX, option LO=G generates a bad COMMON block.
3138	In COBOL PLEX, option LO=G generates a bad SCHEMA block.
3139	Item to item compare does not work.
3140	DISABLE SAME does not work.
3141	SAME IS CONSTANT must precede SCF command to work.
3142	A schema name without components generates a phantom component.
3143	When END SCHEMAS is used instead of \$BLOCK, the data statements appear after the first executable PLEX statement.
3144	Binary data over 14 digits is not processed properly.
3149	System error code 1004 occurs on release when S2000 has DB parameter in effect and the database has been updated.
3151	System 2000 ends abnormally as a result of a PLEX CLEAR. The precompiler does not provide the COMMON block parameter required to obtain status after the command is executed.

All the above problems should be fixed in a release due out within a month. If you have further questions, call our consulting number, 376-4276 from 10-11 AM and 1-2 PM, Monday-Friday.
S. A. Reisman, B. J. Cook, 376-1761

SIR 2.0 seminar

A SIR 2.0 seminar will be given by Professor Gary D. Anderson on August 26, 27 and 28, 1981 at the University of Minnesota in Health Sciences Unit A. If you are interested in this seminar write or phone Mr. Anderson at

P.O. Box 153
Lynden, Ontario CANADA
LOR ITO
phone 519-647-2843

or

Box 1404
Evanston, Illinois 60204
phone 312-475-8332

consulting services

Consulting on our systems for you, our users, is one of our major activities and an important part of every staff member's job. However, formal consulting is not the primary activity of any one group at our Center, but rather is assigned, for some specified and scheduled period of time, to every staff member who qualifies as a programmer. Consequently, we have approximately 50 staff members who serve as consultants for 2 to 6 hours per week. Approximately half of these staff members are part-time graduate or undergraduate students who have gone through an extensive training program developed here over a period of six years; the other half are full-time staff members. We are able to provide both general and special consulting, and both face-to-face and telephone consulting.

The scheduling of general consulting and the training of new staff members is in the hands of our Consulting Supervisor, Sara Kemp Graffunder. She is working toward a graduate degree in English, has taken courses in computer science and has extensive teaching experience. Richard Franta, who holds degrees in mathematics and education and who manages our RJE network, supervises our general consulting HELP-line. Dr. Vicky A. Walsh who has degrees in mathematics and archaeology, supervises the humanities consulting and humanities-related text processing. She is assisted in the arts consulting by Kevin McMahon, physicist, and our resident artist. Shih-Pau Yen, who has degrees in statistics and computer science supervises both statistical package maintenance and consulting. Business data products and data base consulting are supervised by Steven A. Reisman, whose background is in mathematics, and who is pursuing a graduate degree in computer science. Image processing and interactive graphics consulting are handled by staff members of our Image Processing Center. Microcomputer consulting resides in the Interactive Instructional Systems group under Dale Gear whose background is in classical languages.

We do not charge for the consulting described here. However we do place limits on the amount of time and effort we expect to invest in the problems of each user. In a future issue of this newsletter, we will describe the contract (chargeable) consulting activity which resides in our Professional Services Group.

We consider consulting, teaching, and technical documentation to be similar activities in that they provide users with means for helping themselves, although consulting and teaching are more direct and interactive. However, all three activities are of major importance to our Center and involve a large and growing commitment of our resources. Feedback is of great importance to us as we try to improve these services. We look forward to hearing from you.

T. D. Hodges, 373-4599

general consulting sara k. graffunder

The face-to-face consulting service provided at 140 ExpEng and in the Lauderdale Users' Room is intended to help users learn how to solve their own problems with our Center's hardware and software. We have fifty-five general consultants who come from many groups within our Center. They include programmers, administrators, and support staff (such as technical writers).

During the academic year, users of this service are primarily students, but consultants also help many faculty and staff users working on research problems. During a survey last fall, we found that 90% of questions were from students, and the remainder were from faculty, staff, and outside users. Although we find it difficult to keep exact statistics, from spot checks we estimate that general consultants answer at least 15,000 questions per year.

General consultants are given formal training to help them answer the complex problems about tapes, text editors, control language, and the like that student users rarely encounter. Recently, we have been experimenting with including consulting on special topics in the general consulting service at particular times of the day. For example, we have provided consulting on graphics programs for one hour each morning for the last two quarters. This summer, we began humanities consulting for one hour each day. Incorporating such special consulting at set times will enable us to use those consultants as general consultants, provide our other consultants with exposure to special areas as they consult with the specialists, and move more consulting from staff offices to the users' rooms.

Our philosophy about teaching users has for some time been to provide a range of short courses and documentation sufficient to obtain a significant amount of knowledge about our computer systems. The consulting services are intended to back up the courses and documentation, not to parallel them. Therefore, we expect you to take the time to learn how to use the programs you need and then refer to documentation first when you encounter problems. Consultants are happy to look at problems you haven't been able to solve, even when the solutions turn out to be simple. They are less willing to be helpful when you haven't taken the time to try to resolve your own problem.

We often find that users with problems don't know what materials to bring with them when visiting a consultant. We work best with complete documentation of a problem. For example, for a program which has suddenly stopped working, we need a complete listing of the program from the run in which it failed. We need to see the dayfile from the job, a deck or listing of the job as it was submitted, and, preferably, a listing of the previous successful run.

more on consulting

Sometimes we must ask users to run more jobs to help track down a problem. Tape jobs typically require this. For example, if you have trouble reading a tape from another computing center, we will probably ask you to use the EXAMINE program to help determine what is on the tape. Even with that information, it may require more than one run to read the tape successfully. As you return each time, you will probably find a different consultant on duty. For this reason, it is important that you be ready to explain your problem again, from the beginning, and show the new consultant the output from each job you ran.

Most consultants will try to help users by suggesting the tactics they themselves would use to try to analyze their own jobs which fail. We do this both because our programming and consulting skills have resulted from our own debugging experience and because we want you to learn enough about our systems to be able to resolve problems in the future. That is the teaching role of consultants. However, consultants will not attempt to teach students material they are supposed to learn from courses. If our Center did that, we would interfere with the teaching of academic departments. For that reason, it may seem that consultants will point out problems in a fairly elementary way, perhaps suggesting how to get around a single error without suggesting other desirable revisions to the program.

As we acquire new equipment during the next year, the general consulting service will provide help with new kinds of problems. We will take advantage of the summer slack in consulting to train ourselves to use the new machines and services we are acquiring. We will probably conduct staff seminars to acquaint consultants with the new kinds of problems they will encounter. By fall, then, we hope to provide the same level of general consulting about new systems and services as we now do about the ones we presently provide.

One of the consulting services offered by our Center is the HELP-line, a telephone consulting service (376-5592) staffed from 9 AM to 5 PM weekdays. The HELP-line has been in existence for about three and one-half years (we started back in late 1977). Senior staff members are the HELP-line consultants; they know the answers to almost all of the more common types of questions as well as a large number of uncommon questions. In general, the consultants have been employed at our Center for five years or more.



From top to right: S.P. Yen, S.K. Graffunder, V.A. Walsh, T.D. Hodge, M.C. Collins, R.T. Franta, S.A. Reisman. (photo by R. Hotchkiss)

HELP- line

richard a. franta

The HELP-line office has a terminal connected to all our systems which allows the consultant on duty to access every system to look at files and system status, and to try suggested solutions. We also maintain a complete set of manuals and writeup files for reference. If we don't know the answer to your question, we can look it up. Remember that having your own copies of documentation will prevent unnecessary delays and keep phone lines open.

We have four phone lines answered by a call sequencer which gives a recorded message and then puts the caller on hold. The recorded message gives you the present status of the system. The call sequencer lets the consultant know which call has been on hold the longest so that all calls will be answered in the order received. The normal waiting time is generally less than 2 minutes. During non-staffed hours there is a recorded message that gives our hours of operation and other consulting and information telephone numbers.

For more on consulting, to page 85.

system overview: upgrade and update

upgrade

On June 13th the Cyber 170-720 (98K central memory, 10 PPU's) was upgraded to a Cyber 170-730 (with two central processors, 196K central memory, 14 PPU's) in order to handle the non-instructional interactive processing load. The Cyber 172 became the MERITSS machine on the 20th of June. Like many other computing vendors (our VAX at our Image Processing Center was delivered without the Floating Point Unit), CDC has recently had a difficult time satisfying customer demand for disks and processors; thus a system that was supposed to be delivered in the first quarter of 1981 was finally installed last month. The MERITSS system will have 40% more and the MIRJE interactive system 60% more computational ability than in 1980-81. This switch effectively means a 10% reduction in CPU costs for a comparable job run on the 730 rather than on the 172. The specific details on the upgrade, including accounting ratios and performance statistics, are given in the February 1981 issue of this Newsletter.

update

In April we gave an overview of the system for the next few months and a peek into the future. We are now able to fill you in on more of the details. The diagram near this article outlines the hardware configuration we expect to have in place in October of this year. The diagram shows the Cray-1 (slated for installation in early September), the IPC VAX at Shepherd Laboratories, and what then will be a purely batch Cyber 74. Note that Cyber 74 files are completely accessible by the Cyber 730. Thus you can easily update files on the Cyber 74 from an interactive terminal by using the FAMILY prompt, C74, rather than just a carriage return. See the May Newsletter for more on FAMILY. The results of shifting the interactive load to the 730 will be that resource maximums for a batch job on the Cyber 74 will increase from 230K octal to 310K octal and interactive response time, which often exceeded 5 seconds for large sessions on the Cyber 74, will take less than 1 second on the 730. This will also enable us to remove the Cyber 74 on July 1, 1982 with the expectation that the Cray-1 will easily assume the large FORTRAN processing.

communications

A number of planning committees at other universities have recommended installation of campus-wide communications systems that use broadband coaxial cable of the type used in the cable television industry. Such systems provide many simultaneous television channels, thousands of terminal-to-computer connections, and hundreds of high speed computer-to-computer links. We have recommended, as have outside consultants, that a cable system be installed at the University and that preliminary sections be in place for trial use by late 1981 and early 1982. At some future

time, this University may install a digital system; we will then be able to integrate this broadband cable system with that phone system. The industry standard for communications, X.25 packet switching, and standard industry components will be employed. We expect that the hardware for each terminal connection to the network (transmitting up to 19.2K bits per second) will cost approximately \$600 to \$1000 and that the faster computer-to-computer connections (up to 1.5M bits per second) will each cost \$4000 to \$8000 in the next few years. Some universities, notably the University of Chicago, have gone to integrated digitally-switched phone systems for solving both data transmission and communication problems.

operating systems

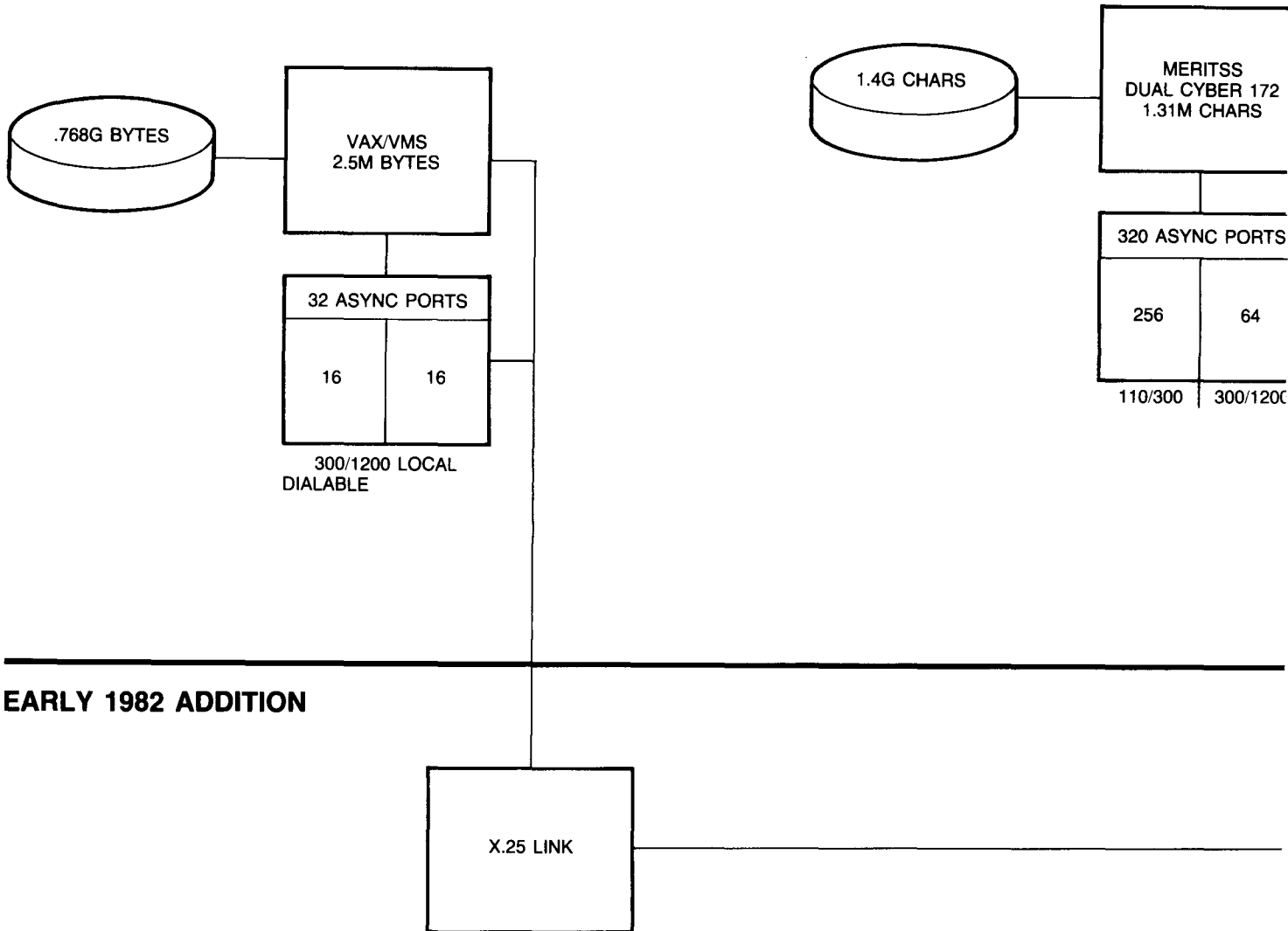
When our task forces, charged to smoothly integrate our new VAX and Cray systems, contemplated the difficulty of implementing service on three additional operating systems over the next six months, we concurred on a general goal. We felt that we should head toward a common operating system and that we should introduce only two new operating systems in the next few months: COS on the Cray and VMS on the VAX. The large amount of production software and graphic packages that currently run only under the VMS operating system influenced our decision to start with the VMS operating system on the VAX-11/780. VMS will be the standard production operating system for the publicly-available VAX for at least one year. However, as explained below, we are committed to an eventual total UNIX environment. Toward this end, a "UNIX under VMS" system, including the C language and the UNIX utilities (NROFF, TROFF, etc.) will be available on the VAX at the Image Processing Center. It is our plan to integrate applications packages which currently run under VMS (and not under UNIX) into the UNIX system.

Our systems group is convinced that the UNIX operating system, which is user friendly and portable to several other computer systems, will be the best operating system to run here in the future. Current reports by specialists in the field state that UNIX is not as practical as VMS in a production environment. The expectation is that the University of California Berkeley Computer Science Division will produce a more practical version. For this reason we will delay public access to our VAX running UNIX at Lauderdale until we have a stable production environment. The VAX at Lauderdale will be used as a UNIX development machine. In addition, as C compilers are made available for the Cybers and for the Cray, more UNIX features will be added to those machines. If, as rumored, a Cyber that can handle more than one operating system is available in a few years, that machine might well replace the Cyber 730. We could then provide UNIX as the main operating system for our machine and yet run NOS for production tasks.

L. A. Liddiard, 373-5239

EXPECTED UCC CONFIG

UCC/IPC SHEPHERD LAB



EARLY 1982 ADDITION

X.25 LINK

JULY 1982 REMOVAL OF CYBER 74, BATCH SYNCHRONOUS PORTS TO 170-730; NON-INST

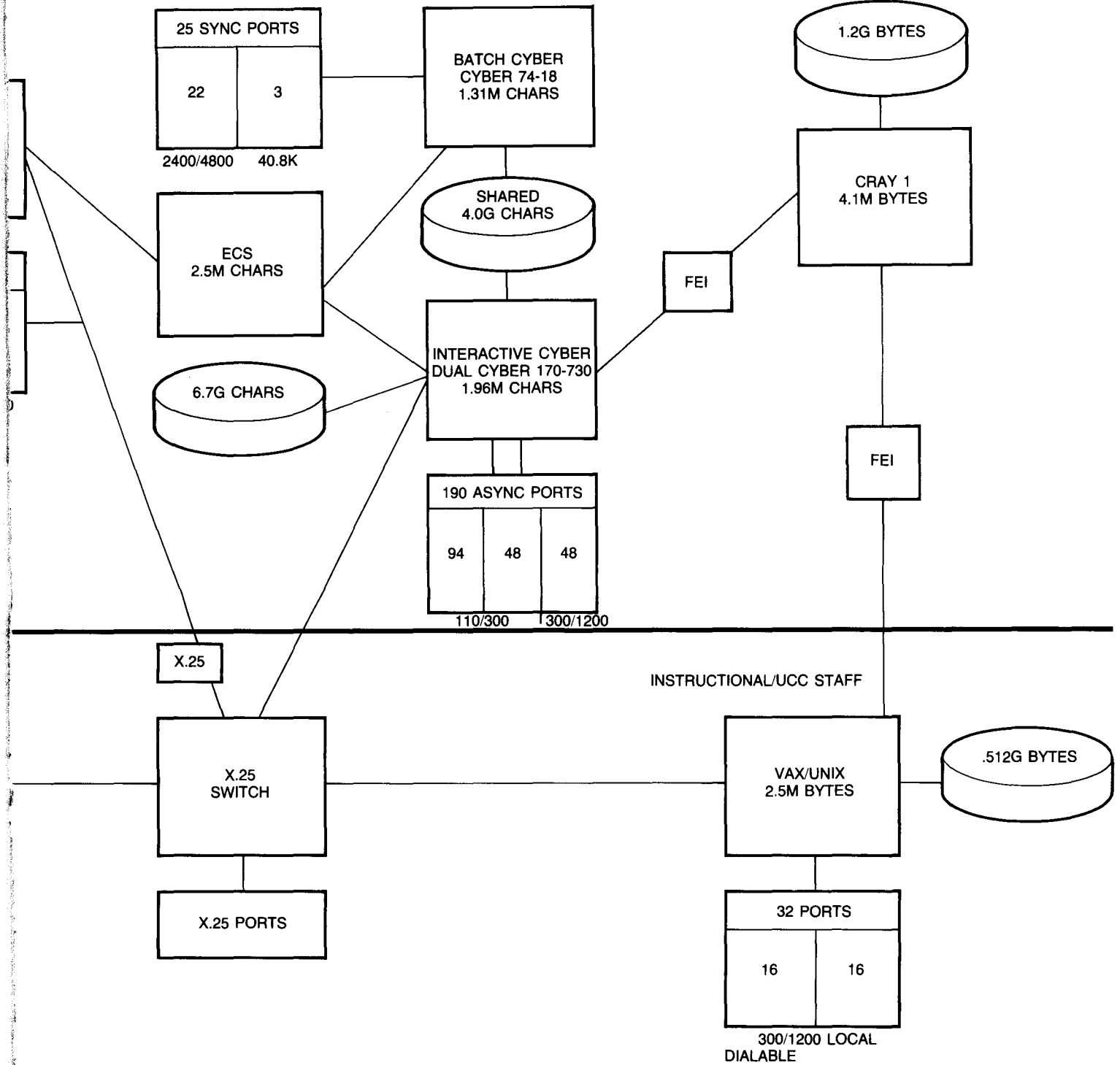
TENTATIVE PLANS

1982—83
1983 OR 84
1982 OR 1983 OR 84

**EXPANSION OF X.25 NETWORK
CYBER 170-730 REPLACED BY A CYBER RUNNING NOS AND UNIX
UNIX ON CRAY**

URATION OCTOBER 1981

UCC/LAUDERDALE



INSTRUCTIONAL/STAFF USE OF VAX/UNIX

VAX service

We plan to make our Digital Equipment Corporation VAX-11/780 available to the public on August 1, 1981. The introduction of this system represents a major new direction for our Center, especially in the areas of text processing and graphics.

The initial hardware configuration will be:

- DEC VAX 11/780 with 2.5 million bytes of storage and a floating point accelerator
- 2 Kennedy tape drives
- 3 256 megabyte disks
- 1 RK05 disk
- 2 Plessey 8 inch floppy disks
- 1 Printronix line printer (600 lpm with graphic capability)
- 1 Calcomp 8 1/2" 4 color pen plotter
- 1 Summagraphics flat bed digitizer
- 32 ports at 300-9600 baud consisting of 16 ports 300/1200 dialable rotary and 16 ports short haul/local to 9600 baud
- 1 Dicomed high resolution film record (35mm, 70mm, 4x5 sheet)
- 1 Dicomed image digitizer

Other equipment, such as a Versatec plotter, may be added as demand dictates.

The software configuration will be:

- VMS operating system (a virtual system)
- SRI UNIX under VMS
- FORTTRAN
- COBOL
- Pascal
- SCSS
- SPSS
- SIR Data Base Management System
- TELL-A-GRAF (an interactive business graphics package)
- DISSPLA (a large graphics subroutine package)
- EDT (a screen-oriented editor)
- NROFF/TROFF, text formatting packages

Other software, such as utilities, electronic mail, and image processing packages are also available.

See WRITEUP(VAX) for complete details of this new service; see WRITEUP(ACCRAVE) for the rate structure for the VAX service.

S. P. Nachtsheim, 373-7878

short courses

^XEDIT: 2:15-4pm, 13 - 17 Jul (mwf), B25 ClaOff
Beginning COBOL: 3:15-5pm, 7 - 30 Jul (tth), Arch 15
Beginning FORTRAN: 3:15-5pm, 20 Jul-7 Aug (mwf), Arch 15
Introduction to DBMS's: 3:15-5pm, 6 Jul (m), HodsonH 495
Introduction to System 2000: 3:15-5pm, 8 - 24 Jul (mwf), HodsonH 495
SIR: 9:15-11am, 21 Jul-6 Aug (tth), Arch 15
SPSS (SPSS basics): 3:15-5pm, 7 - 8 Jul (tw), Arch 40
Introduction to Programming: 9:15-11am, 21 Jul-6 Aug (twth), AldH 310
*PLOTAC: 6:30-9:30pm, 21 - 23 Jul (twth), Laud

NOTE: ^: up-arrow (^) indicates this course is a prerequisite for other, unmarked courses.

HOLIDAY: 3 July (f) is a University holiday. No classes will be held.

*: Class held at Lauderdale conference room, Lauderdale computer site, 2520 Broadway Drive, Lauderdale, MN.

For more information concerning these short courses, see WRITEUP(CLASSES) or call Lincoln Fetcher at 376-1637.

Prior to the installation of the call sequencer we were processing about 40 calls per 8 hour shift and getting many complaints about busy phones and frustrated users who could not reach the consultant. The consultants also complained about how busy they were and how draining duty was. With the call sequencer we process nearly 100 calls per 8 hour shift, very few busy signals are given, no users have complained and the consultants feel less busy. There are always periods where no calls come in and the consultant can "catch up." We feel that the sequencer was a very worthwhile addition to the HELP-line service. During the past three and one-half years we have answered 57,075 calls, almost half since the call answer device was installed.

During a 4-hour shift we have one primary consultant and up to 4 back-up consultants. When the back-up consultants see calls waiting they will take them in place of the primary consultant. Sometimes all the backup consultants are out or busy so that from time to time the primary consultant must handle all the calls alone. This is when waiting times become lengthy. If you do not wish to wait please hang up and call back later. Unfortunately, we often receive 2 or 3 calls at virtually the same time causing a delay and then the telephone will not ring again for 10 to 15 minutes. Please call back.

In some cases the HELP-line consultant will take your name and telephone number and refer your question to someone more familiar with your particular task. This new person will then call you back when the answer is found. We maintain a record of all referred calls and check on their status from time to time. This ensures that all referred calls do get answered.

We think the best (least busy) times to call are afternoons, lunch time (12-1) and Tuesdays and Thursdays.

statistics packages

s. p. yen

Our statistics packages consultants are Pat Bland, Betty Hinkley, Bruce Holloway, Sung Juhn, Kevin McMahon, Yuan Sung and myself. We will help debug programs and assist with statistical packages after you have submitted a job at least once. We are primarily computer scientists, not statisticians, therefore if you need assistance in the statistical analysis of a University-related experiment you should contact the Statistical Clinic in the Department of Applied Statistics, 376-3845. If you want a program written for you (this service is not free) call our Center's Professional Services Division, 376-1764. We consult from 11-1 Monday through Friday in 140 Experimental Engineering. Our phone consulting hours (376-5062) are 1-2 Monday through Friday.

humanities *vicky a. walsh*

Humanities projects are often very different from the usual computer-assisted research and thus we provide a special consulting service for these researchers. Many of them have no experience with computing and require basic information before they can take advantage of the services the computer offers.

We are available for advising about setting up research projects which use the computer and offer continuing assistance with these projects as necessary. In addition to project consulting, we may assist with various text processing programs and packages.

This consulting service is open to anyone interested in using the computer for text processing or for any project dealing with non-traditional computing needs. Current users include researchers in archaeology, history, art history, classics, French, speech, English, geography and linguistics.

Users must provide the manpower for the projects; the humanities consultants cannot write or run the programs. However they will try to provide all the assistance necessary to help the user become self-sufficient.

Telephone consulting is available MWF 10:30-11:30 by calling 373-5780. My office is 203 ExpEng; call the number given above for an appointment. A humanities consultant is available from 1-2 PM Monday-Friday in 140 ExpEng.

micros *dale gear*

As small computers decrease in price and increase in power, more and more people are finding that many of their data and word processing needs can be satisfied through microcomputers. The Microcomputer Support Group provides advice for the users of university microcomputers (at present approximately 250). A special microcomputer help-line is available along with face-to-face consulting in 210 Experimental Engineering. The consultants are Michael Collins, Dave Larsen, and myself. We are available from 10:00 AM to 12:00 noon and from 2:00 to 4:00 PM, Monday through Friday. We consult on both hardware and software. In addition to consulting, the Microcomputer Support Group is responsible for testing and developing software, and evaluating hardware useful to our community of users.

***PRODUCTION USAGE SUMMARIES: Cyber 74+172

	May, 1981	May, 1980	% Change
System resource units (SRU)	1,399,998 (1,775,388)	1,415,103 (1,733,073)	-1.1 (2.4)
Batch jobs and MIRJE sessions	125,380 (136,585)	139,270 (149,743)	-10.0 (-8.8)
Total central processor (CP hours)	164/224 (186/337)	167/214 (191/299)	-1.8 /- 4.7
DELAY queue CP hours	51/ 51 (58/ 77)	38/ 30 (40/ 39)	(45.0 / 97.4)
NO FRILLS queue CP hours	22/ 13 (22/ 14)	17/ 18 (18/ 18)	(22.2 /-22.3)
Mass storage transfers (KPR)	450,166 (560,392)	478,346 (565,180)	-5.9 (-0.8)
Magnetic tape transfers (KPR)	9,778 (13,783)	12,494 (18,184)	-21.5 (-24.2)
Pages printed, charged from UCC	959,531 (1,075,966)	1,223,083 (1,358,461)	-21.5 (-20.8)
Cards punched	206,955 (217,968)	249,871 (282,304)	-17.2 (-22.8)
Microfilm frames produced	15,033 (532,229)	32,714 (540,204)	-54.0 (-1.5)
MIRJE terminal hours	16,624 (19,093)	15,810 (18,348)	5.1 (4.1)
Number of terminal sessions	43,946	37,323	17.7
Status plotting production (feet)	7,287	7,757	-6.1
Tapes mounted	10,720	12,574	-14.7
Average file storage (char)	3,801.6 million	3,041.0 million	25.0
Mean time between failures	74.5/86.9 hours	40.6/ 52.7	83.5 / 64.9
Available during scheduled hours	99.8/99.6 percent	97.3/ 99.2 percent	2.5 / 0.4

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

DOWNTIME SUMMARY: June 1981 (Column 1, Cyber 74 : Column 2, Cyber 730)

	0800-1800 M-F		other		total	
Total possible scheduled uptime hours*	220.0	220.0	304.5	299.2	524.5	519.2
Total downtime hours (see Schedule A)	3.3	3.7	0.1	0.1	3.4	3.8
Total uptime hours	216.7	216.3	304.3	299.1	521.0	515.4
Uptime (percent)	98.5	98.3	99.9	99.9	99.4	99.3
Average downtime per occurrence (min)	49.7	44.2	3.5	7.0	34.3	38.0
Mean time between failures (hours)	55.0	44.0	152.2	149.6	87.4	86.5
Subsystem failures						
SUPIO	3	-	0	-	3	-
TELEX	2	2	0	0	2	2
EXPORT	5	-	0	-	5	-

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	1	1	0.1	0.1	4.0	7.0
(3) Hardware related problems	2	3	0.3	0.6	10.0	11.3
(4) Indeterminate problems	1	1	0.1	0.3	6.0	17.0
(5) External Problems	2	1	2.9	2.8	88.0	170.0

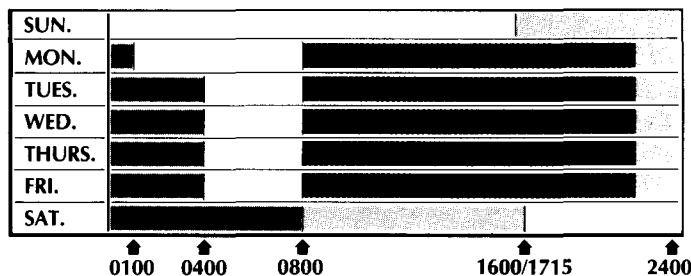
***PRODUCTION USAGE SUMMARIES: Cyber 170-720 (MERITSS)

	May, 1981	May, 1980	% Change
Number of jobs run	313,706	261,870	19.8
Central processor hours	237	161	47.2
MERITSS terminal hours	37,088	33,598	10.4
Number of terminal sessions	79,123	66,855	18.4
Maximum number of simultaneous users	187	145	29.0
Average file storage (char)	514.7 million	471.7 million	9.1
Mean time between failures	166.9 hours	52.8 hours	216.1
Available during scheduled hours	99.9 percent	98.9 percent	1.0

*Total possible scheduled uptime hours do not include scheduled downtime for end-of-year accounting on 6/30 and for the conversion of the Cyber 172 to 730 on 6/20.

operations

CYBER 74 + 172 OPERATING HOURS



Lauderdale, ExpEng, NORMAL rate
 Lauderdale, ExpEng, DELAY rate
 Lauderdale only, DELAY rate

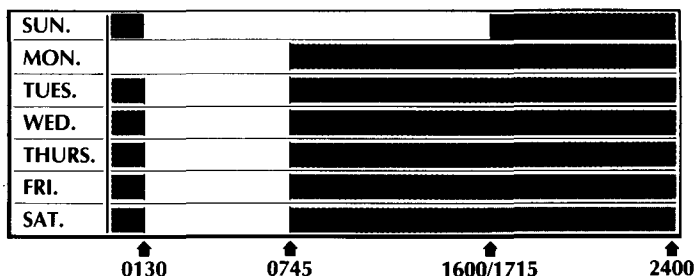
See WRITEUP(HOURS) for schedule of batch job pickup/delivery service.

TWIN CITIES CAMPUS PUBLIC REMOTE JOB ENTRY SITES

SITE	ID	SUPERVISOR	PHONE
East Bank			
ElectE 38	4V	V. Zahhos	373-5346
Elth N640	4W	D. Anderson	373-5827
ExpEng 130	3L	I/O Coordinator	373-4596
ExpEng 130	4B	I/O Coordinator	373-4596
ExpEng 130	4N	I/O Coordinator	373-4596
FrontH	4E	D. Schumacher	373-2740
HSUnitA	4C	L. Croatt	373-7714
KoltH S191	4Z		
MinMet 321	4I	R. Larson	376-2668
102 OMWL	29	H. Young	373-5370
Physics 69	44	L. Whitney	376-7627
TerrH W106	41	B. Hackett	373-6621
D388 Mayo	24	L. Croatt	373-7714
Zoology 314	4J	E. Cushing	373-2232
West Bank			
SocSci 167	4X	D. Lund	373-3608
SocSci 1009	4K	M. Mongiat	373-0168
St. Paul			
BioSci 257A	47	M. Simmons	373-1961
ClaOff 125G	48	C. Bingham	373-0988
McN H	42	G. Wahlert	373-0939
NorH 24	4G	J. Colten	373-0990
NorH 24	40	J. Colten	373-0990
Lauderdale			
User's Room	49	Secretary	373-4912
User's Room	3F	Secretary	373-4912

Keypunches provided at each site.

CYBER 720 OPERATING HOURS



Up, not attended
 Up, attended

See WRITEUP(LABHOUR) for a schedule of open hours in the student computer laboratories.

TWIN CITIES INSTRUCTIONAL COMPUTER LABORATORIES

SITE	SUPERVISOR	PHONE	EQUIPMENT
East Bank			
CentH	R. Rickgarn	3-2289	TTY33(2)
ComH	C. Youngdale	3-2453	TTY43(1)
DiehH 535	N. Sauro	6-7005	CRT(2)
Elth 121, 125	D. Anderson	3-5827	TTY33(6) Hazeltime(3) Telera(2)
FrontH	D. Schumacher	3-2740	TTY33(1)
HS-A 1-752	L. Ellis	3-0331	TTY33(3) TTY43(3) Telera(1)
LindH 25	T. Chan	3-7580	Decwriter III(1) Decwriter(1) CDC713(6) Decwriter (5) Decwriter III(1) Telera(1) TTY43(16) TTY33(2) Telera(4) Decwriter(7) Decwriter III(1)
MechE 308	E. Riley	3-0340	TTY33(2) Telera(4) Decwriter(7) Decwriter III(1)
SanfH	M. Kilbury	3-3434	TTY33(1)
TerrH	B. Hackett	3-3567	TTY33(1)
VincentH 4	W. Stenberg	3-2586	TTY33(2) CDC713(2) Decwriter III(1) Decwriter(7) Telera(2) TTY43(9) CRT(2)
Walib 204	R. Estelle	3-2538	
West Bank			
BlegH 140	D. Lund	3-3608	TTY43(13) Telera(1)
MdbH	R. Baker	3-9818	TTY33(1)
SocSci 167	D. Lund	3-3608	TTY33(2) Telera(1) Decwriter(2)
St. Paul			
ClaOff 125	C. Bingham	3-0988	TTY33(6) Hazeltime(2) Decwriter III(1) Decwriter(4)

phone numbers

Accounting	373-4548	Information, Experimental Engineering	373-4360
Computer-Aided Instruction	376-2975	Information, Lauderdale	373-4912
Computer Hours (recorded message)	373-4927	Information Systems	373-7878
Computer Store	373-4877	Instructional Labs	373-5754
Consulting		Job Status, ExpEng (recorded message)	373-4994
HELP-line	376-5592	Lauderdale Operations	373-4920
9 AM—5 PM, Monday—Friday		Lauderdale Services	373-7538
Business Data Products	376-1761	Lauderdale Users Room	373-4921
10-11 AM and 1-3 PM, Monday—Friday		MECC Interface	373-4573
Statistics Packages	376-5062	Microcomputers	376-8806
1-2 PM, Monday—Friday		Microfilm Operator	373-4995
Data Bases	376-1761	Newsletter Subscription	376-4668
10-11 AM and 1-2 PM, Monday—Friday		Permanent File Restoration	376-5605
Microcomputers	376-4276	Professional Services Division (PSD)	376-1764
10-12 AM and 2-4 PM, Monday—Friday		Project Assistance	376-1764
Humanities	373-5780	Program Librarian	376-1636
10:30-11:30 AM, Monday, Wednesday, Friday		Programming Languages	376-7290
Contract Programming	376-1764	Reference Room	373-7744
Data Base Applications	373-7878	Remote Batch (RJE) Services	373-5754
Educational Services	376-3963	Short Courses	376-1637
EDUNET Interface	373-7745	Shuttle Bus Service	376-3068
Equipment Purchase or Lease	376-8153	System Status (recorded message)	373-4927
Experimental Engineering I/O	373-4596	Tape Librarian and EBR Operator	373-4995
Field Engineering	376-7584	Technical Writing	373-2522
Graphics Software	376-1636	User Numbers	
HELP-line	376-5592	Instructional Batch	373-2521
9 AM—5 PM, Monday—Friday		Instructional Timesharing	373-7745
HOURS-line (recorded message)	373-4927	Research Batch	373-2521
Image Processing Center	373-7878	Research Timesharing	373-2521
		User Services	373-4599

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Minneapolis, Minnesota 55455

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