

A REPORT FROM SYSTEMS & OPERATIONS

The delivery of equipment and the NOS software changeover have been slower than scheduled; movement of user jobs from the 74 to the 172 has thus been slower than expected.

A report on the status of the Cyber 172, as of May 24th, follows.

Equipment installed as of May 24, 1978:

- 1 131K Cyber 172 with Compare Move Unit and ECS coupler
- 3 full tracking disk controllers
- 1 9-track tape controller
- 1 7-track tape controller
- 5 double density disk drives (237M characters per drive)
- 1 single density removable disk drive (110M characters per drive)
- 2 7-track tape units
- 1 1200 lines per minute ASCII printer
- 1 1200 cards per minute card reader
- 1 PDP-11 front-end (shared by 74 and 172)
- 14 autobaud (100 to 300 baud) lines
- 4 Bell modem 1200 baud lines
- 2 Vadic 1200 baud lines

Equipment which is being installed as this report is being written:

- 1 2551 with 68 asynchronous ports (110 to 300 baud) and 2 synchronous ports

Equipment which has not yet arrived:

- 2 9-track tape units (scheduled to arrive on June 14)
- 1 CPU (this is the second CPU, scheduled to arrive on June 21)

Distributive Data Path to ECS (late June)

Some problem areas still remaining are the following:

Tapes: the lack of 9-track tape units has slowed staff and user conversion to the Cyber 172; use of 7-track tapes for permanent file dumping has made that service much slower.

Software: the lack of common operating system software (NOS on the 172, KRONOS on the 74) means that common permanent files and other shared features such as I/O queues are not yet possible. The projected date for commonality of systems is August 20, 1978 rather than June 11, 1978. A number of UCC installed features such as DELAY and DIVERT files are not yet available for the NOS operating system.

Control statement changes: SRU limits and jobcard CM being the maximum CM for any job step are changes that have hit most users.

Some successful areas are the following:

Staff use: in order to help alleviate the bottlenecks on the Cyber 74, one-half to two-thirds of all staff use is now on the 172.

Comparison to 74: the estimated CPU ratio of approximately
 $2 * \text{Cyber74 time} = 1 * \text{Cyber172 time}$
(i.e., The Cyber 74 processes a program twice

as fast as the 172) has been demonstrated for a number of data base management and Pascal programs.

Speed of response: those users who could be transferred to the 172 have experienced excellent response time. We have warned them that in the future, response time for large CPU utilization will be slower.

* * * * *

The Cyber 74 continues to run heavily loaded. A status report follows:

In order to ensure ease of translation and stable operating system software, the change to the NOS operating system has been delayed until August 20, 1978 (from June 11, 1978).

The following new equipment has been installed:

Second 9-track tape controller
Dual access disk controller

Equipment still to come is:

- 2 9-track tape units (June 14)
- 5 double density disk drives (June 28)

The following problem areas still exist:

Saturation: several times a month the Cyber 74 achieves 70% to 85% CPU utilization for the entire 20 hour daily shift. This also means that DELAY jobs may not finish by the end of operations; they must be re-run the following night. We suggest that long DELAY jobs be put in on Friday since that DELAY period runs from Midnight until 4PM Saturday; this will ensure that long DELAY jobs will finish executing. We are looking into starting DELAY time a half to a full hour earlier (11:00 to 11:30 PM). In addition, we will try to finish off jobs started before 3:30 AM (the time at which we stop accepting jobs). We apologize to those users who are the victims of our current saturation which seems to be a product of successful operation. The Cyber 74 computer usage increase for the past three years has been 114%; 36%, 21%, and currently 30% for this year. If we continue at this rate, our new Cyber 172 acquisition, which doubles our current computer power, will be saturated in 1981.

On July 2, 1978, the maximum field length for MIRJE will be reduced to 55K from its current 71K. This, in conjunction with total timesharing reduction by those switching to the Cyber 172, will produce an increase in Batch throughput on the Cyber 74 during normal (8:00 AM - 5:00 PM) hours.

Physical plant: On Friday, May 5, 1978, an underground cable disintegrated between the power line and the transformer vault at the Lauderdale site at 4:44 AM. Power was supplied by mid-morning with an emergency power plant to the building and the MECC computer. The underground cable was replaced by 4 PM and the overhead line and building current energized by 10 PM so that the UCC computers were back up by 1 AM Saturday. In

addition, a Cyber 74 computer memory module failed slowly on May 17. As a result, disk pack PF01 had to be reloaded and a certain percentage of the jobs run during that time terminated with false errors. To ensure that users were not charged for bad runs, all computer runs between 1700 and 2200 were not charged.

Future Cyber 74 changes are the following:

July 2: MIRJE maximum field length goes from 71K to 55K.

July 2: Common Batch and MIRJE numbers under SRU accounting.

July 9,16,23,30, August 6,13 (Sundays): NOS will be run on Sunday for the entire period; the validations for NOS will be that of the previous Saturday termination, but changes to the Sunday validations will not be seen when running again on KRONOS the following Monday. All queue output must be completed on Sunday or it will be lost.

L.A. Liddiard, 373-5239

COMMON MEMORY MANAGER

Control Data Corporation is introducing a package known as Common Memory Manager (CMM) into the latest version of their operating system. Its introduction will affect all Fortran programs that attempt to manage field length dynamically, that is, by asking for more or less memory as needed. Typically, this is done in Fortran by using the area of memory beyond blank common.

The introduction of CMM will mean that user programs doing their own memory management either will have to be rewritten or will have to turn off CMM. It may happen eventually that CMM can't even be turned off so rewriting will then be mandatory.

Since we expect, at some future date, to acquire the latest version of the operating system, we consider it imperative to warn you about this development. CDC is considering ways to allow users to call CMM for memory management. To do so, they need to know how current user programs do this task. If you have Fortran programs that manage their own memory area, it is extremely important that you let us know. Call me to discuss this, and I will pass the information on to CDC.

M.J. Frisch, 376-1636

120 CPS PRINTING TERMINALS

UCC has submitted a bid for the purchase of 120 character per second printer terminals. The due date for this bid is June 12. If other departments are interested in purchasing such terminals, they should contact either Dan Whealdon (373-4877) or Abe Franck (376-7291).

M N F

MNF, Mantrap, and the loader under NOS

The NOS operating system is expected to be introduced on the Cyber 74 on August 20, 1978. NOS contains a different version of FTN from the one in the KRONOS system, and since MNF uses parts of the FTN library, it has been necessary to change MNF to interface to the new FTN library. These changes use advanced features of the Cyber loader and mean that neither FTN nor MNF jobs will be able to use the LINK loader after August 20 on the Cyber machines. Since the Cyber loader is the default loader under NOS, it is not necessary to use a LOADER(CYBER) control statement. Of course, absolute binary overlays can still be loaded with the LINK loader; use a LOADER(LINK) statement if this is desired.

The main deficiency of the current version of Mantrap is that it makes it difficult for the user to obtain a load map. Although my view is that use of Mantrap makes the load map less useful, there are some circumstances where a map is needed by the user. Now that the Cyber loader must be used by MNF jobs, it has been possible to take advantage of special Cyber loader features so that user's MAP or LDSET(MAP=...) control statements are no longer destroyed by Mantrap. The Cyber loader writes a special internal map to file ZZZZ17 which is used by Mantrap. Thus, for normal jobs, any manipulation of the map file ZZZZMP will no longer be needed after 20 August (indeed, that file will no longer exist). This scheme is ideal for most jobs, but will not work for overlay jobs because the loader does not write the ZZZZ17 file for jobs containing overlays. Therefore, Mantrap still uses the ZZZZMP file for overlay jobs. Since MNF will no longer cause the ZZZZMP file to be written automatically, it is necessary for the overlay user to write this file if Mantrap is to be of assistance. Thus, MNF jobs with overlays should contain the control statement LDSET(MAP=B/ZZZZMP). Otherwise, if the job fails in execution, Mantrap will say that no load map is available and will be unable to give any diagnostic information.

These new versions of MNF and Mantrap are already available under FUTURE(MNF). However, until the NOS system is introduced, it will be necessary to include a LOADER(CYBER) control statement in jobs using these new versions so that Mantrap will have the ZZZZ17 file available (or a correct version of ZZZZMP for overlay jobs).

Note that these changes apply only to the Cyber computers. On the 6400, MNF, Mantrap, and the loader will remain essentially as they are now.

C.F. Schofield, 373-5239

COBOL VERSION 5 HAS ARRIVED

UCC is now offering Control Data's latest release of COBOL. This compiler, known as COBOL 5, is one of the many enhancements we get by switching to NOS. COBOL 5 is the follow-on product to present COBOL. The new compiler handles a superset of the language specified in the American National Standard X3.23-1974, COBOL. Many improvements have been made, including better compile time diagnostics and better object code generation.

While COBOL 5 is new here at the University, it has been in use for several years at other installations. During this time, it has evolved into a very dependable product. Reports from these other sites have been very favorable, and we expect that COBOL users will migrate to COBOL 5.

The COBOL 5 compiler is called with a control statement that conforms to operating system syntax. The control statement cannot be continued. More than one program can be compiled by a single call to the compiler. The programs should follow each other without separation when several programs are to be compiled from one source file. The compiler recognizes the Identifier Division header as the start of a subsequent program, and terminates the program in progress before beginning compilation of the next program.

The name to be used on the compiler call statement is COBOL5. If all default parameters are selected, then a sample job deck is:

```
JOB.  
USER,AAA9999,SECRET.  
COBOL5.  
LGO.  
7=8=9 card (end-of-record)  
    COBOL source program  
6=7=8=9 card (end-of-information)
```

A variety of compilation options can be specified in the parameter list following the compiler call name. These parameters are detailed in the COBOL 5 Reference Manual (CDC publication 60497100) available through the UCC Reference Room.

COBOL 5 object code may be saved for execution by a subsequent job. If this is done, the proper library must be obtained. This is accomplished with a FETCH(CB5LIB) control statement. For example:

```
JOB.  
USER,AAA9999,SECRET.  
GET(LGO)  
FETCH(CB5LIB)  
LGO.  
6=7=8=9 card (end-of-information)
```

To assist the user in upgrading to COBOL 5, Control Data has released a COBOL 4 to COBOL 5 Conversion Aid. In general, the Conversion Aid is designed to perform the maximum possible amount of automatic conversion. This is accomplished by analyzing the form and content of COBOL 4 statements and their relationship between declarative and procedural statements in the program as a whole. The advantage of this approach is the significant reduction in the manual effort required.

A complete description of the Conversion Aids package can be found in the COBOL 4 to COBOL 5 Conversion Aid Reference Manual (CDC publication 19265021), also available through the UCC Reference Room.

To access the Conversion Aids package, the following control statement must be used:

```
FETCH(C4C5)
```

The LCS and CLU processors described in the above manual are thus made available. Any control statement reference to these processors must be preceded by the FETCH statement.

This package requires a field length of 113300 (octal) and has an internal name table size of 3200. This should be sufficient for most conversions. For those users who are converting very large programs, a large-core version is available. This may be obtained via:

```
FETCH(C4C5L)
```

Although this large-core version requires a field length of 144000 (octal), the name table size is 14000.

Finally, a word or two should be said about the status of COBOL 4. We will continue to have COBOL 4 under NOS. The new version will have fixed many of the current bugs. We suggest that you recompile your programs using this new COBOL 4. Also, this will probably be Control Data's last COBOL 4 release. Their programming effort has been directed toward their new COBOL 5. While there appears to be no reason why we can't have COBOL 4 around indefinitely, the new features introduced into COBOL 5, plus the improved diagnostics and object code, should provide plenty of incentive to convert.

If you have any further questions, please direct them to John Cosgrove at 612/376-1761.

S.A. Reisman, 376-1755

TIME SERIES PROCESSOR

TSP (time series processor) is a computer program designed to perform statistical time series processing using ordinary as well as two stage least squares.

To execute the TSP program, place the following control statement within your job stream:

```
TSP.
```

You may obtain a user manual for TSP by writing:

```
Computer Center  
Concordia University  
1455 de Maisonneuve  
Montreal, Quebec H3G 1M8
```

A reference copy of the TSP user manual is available in the UCC Reference Room, 235a ExpEng.

If you have any problems in using TSP, please call
K. Fjelsted, 373-5780

FROM THE ASSISTANT DIRECTOR'S DESK

This is the end of the year issue and time to ask you if you have any suggestions for us that you haven't already spoken to us about. We will be glad to hear from you. Many of our policies and procedures for next year are being established now. Let us have your suggestions.

Looking back over the year, we note that service on the Cyber 74 was good but slower and slower as the load on the system went up and up and up. The Cyber 172 hardware came in during this Spring Quarter but has not yet picked up any significant portion of the load; not all of the hardware is installed and some of the required software modifications are being worked on. We are confident that everything will go better on the Cyber systems when the various components are functioning together.

The Winter Users' Meeting on the West Bank and the Spring Users' Meeting in St. Paul were devoted to descriptions of the upgrading of the system and to progress reports.

As promised, we have put up the indexed WRITEUP file called UPGRADE. WRITEUP(UPGRADE) gets a copy of the index and further instructions for accessing UPGRADE bulletins. Also, hard copy of the file is available at the RJE sites or by calling the UCC Reference Room, 373-7744.

If there is anything in the conversion process from the Cyber 74 to the Cyber 172 that affects you unfavorably, please call us.

Users who are now running on the 172 and helping us test it are finding the most awkward differences are the changes in the meaning of the T and CM parameters on the job card and the associated changes in memory management. WRITEUP(UPGRADE) is being updated to explain these differences.

As noted in Larry Liddiard's report in this newsletter, we will run NOS on the Cyber 74 on six Sundays in July and August. The HELP=Line will be staffed from 4:00-8:00 PM on these Sundays.

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About once per quarter we have an article in this newsletter about the EDUNET network. We are not trying to push away our users or reduce our services to you. However, there are occasional requests to which we cannot respond locally. Where this is true, we certainly would cooperate in helping you to find what you need elsewhere. It is also quite possible that you would discover, in a search of the network data base, a program or a system for which you have an undefined, potential need. In either case, we will be glad to help. Call me at 373-4599.

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Please note that our proposed differential priority and charging classifications will not be implemented for NOS in the immediate future. This is an active study project now. Watch WRITEUP(NOTE) for announcements.

T.D. Hodge, 373-4599

SPRING QUARTER USER'S MEETING

The users' meeting this quarter was held on May 17, on the St. Paul Campus. Approximately 50 people came to hear UCC staff presentations.

Thea Hodge, who chaired the meeting, began by reminding users of the indexed UPGRADE document, available as a machine retrievable WRITEUP. UPGRADE contains information about the changes from KRONOS to NOS, and information about the Cyber 172.

Larry Liddiard presented data that showed the poor utilization of the Cyber 74 when it carries a heavy timesharing load. Timesharing users will be encouraged to move over to the Cyber 172 when it is ready. Liddiard also mentioned that the Cyber 172 is running well, although all the new equipment has not yet arrived.

Tom Lanzatella talked about differences between KRONOS and NOS control statements. Most differences will cause users little or no trouble; see WRITEUP(UPGRADE=CONTROL).

Rich Franta outlined policies for the use of the Cyber 172; large timesharing and data base management system users will find the Cyber 172 more suitable for their use. Franta also discussed the upcoming character set conversion; its costs and benefits, special problems, conversion assistance, and the keypunch modification time schedule. Some problems with 200 UT and U1004s will be addressed in future UCC newsletters.

Mike Frisch reported on recent applications packages activity; there are new statistics and graphics packages as well as several miscellaneous package revisions.

Amy Koepke announced the availability of the new XEDIT User's Guide.

Steve Reisman discussed data base management systems, namely System 2000, SIR, and DMS-170. SIR deals with numeric data and System 2000 deals with non-numeric data. DMS-170 is Control Data's system that will be available on the Cyber 172. Its usage may eventually surpass System 2000's usage. Reisman also mentioned improvements in Record Manager and an improved COBOL (Version 5) that will be available under NOS on the Cyber 172.

The new accounting procedure that uses the System Resource Unit (SRU) was discussed by Quentin Roggenbuck. He also talked about the changes in paper charges and in internal and commercial rates.

Kevin Matthews spoke about the multi-mainframe facility (MMF) that will be available under NOS. Also, since CDC is two years away from providing a shared I/O queue capability, UCC is writing its own.

Mike Skow discussed expansions to the MERITSS system and increases in communications costs. He also explained the MERITSS commitment to KRONOS; MERITSS and MECC may consider moving to NOS only when it is stabilized.

In the discussion period following the staff presentations, the predominant question concerned the West Bank Center. What is going to happen to it and how will that affect West Bank Computing? Professor Tom Hoffmann responded to the question: the CDC 3200 is being phased out and will probably be replaced by a PDP-11/40 with good I/O devices, utilizing the full ASCII character set. As an interim solution, the West Bank will operate a closed shop with a 1004 and a Data 100 terminal, both operating at 2400 baud. West Bank does not expect any degradation in service.

M.C. Boyd, 373-2522

PRODUCTION USAGE SUMMARIES

	<u>April, 1978</u>	<u>April, 1977</u>
CDC Cyber 74		
Number of Batch jobs and MIRJE sessions	96,192 (107,548)	84,955 (98,630)
Total Central processor hours inc. DELAY	192 (262)	162 (222)
DELAY queue processor hours	62 (74)	-
MIRJE terminal hours	8,516 (10,485)	-
Mass storage transfers (KPR)	257,013 (349,037)	205,038 (278,977)
Magnetic tape transfers (KPR)	6,194 (8,969)	6,423 (8,406)
Pages printed, charged from UCC	903,435 (1,022,793)	763,045 (862,491)
Cards punched	402,196 (410,291)	436,448 (481,029)
Microfilm frames produced	22,378 (308,442)	28,182 (278,433)
Status plotting production (feet)	6,148	4,525
Tapes mounted	9,631	8,696
Average file storage (2347M available)	1,507.3 million char	1,076.1 million char
Mean time between failures	45.8 hours	34.5 hours
Available during scheduled hours	96.5 percent	99.5 percent
SUPIO uptime during available hours	98.0 percent	98.5
(totals in parentheses include staff development, accounting, and maintenance runs)		
CDC 6400		
Number of jobs run	158,088	133,358
Central processor hours	171	103
MERITSS terminal hours	23,133	20,691
Number of terminal sessions	50,397	41,961
Maximum number of simultaneous users	114	109
Average file storage	255.9 million char	203.7 million char
Mean time between failures	35.2 hours	67.0 hours
Available during scheduled hours	97.9 percent	99.5 percent

CYBER 74 DOWNTIME SUMMARY : May, 1978

	<u>Monday-Friday</u> <u>0800-1800</u>	<u>other</u>	<u>total</u>
Total possible scheduled uptime hours	220.	301.	521.
Total downtime hours (see Schedule A)	12.2	12.2	24.4
Total uptime hours	207.8	288.8	496.6
Uptime percentage	94.5 percent	95.9 percent	95.3 percent
Average downtime per occurrence	73.1 minutes	122.3 minutes	91.6 minutes
Mean time between failures	24.4 hours	60.2 hours	37.2 hours
Subsystem failures			
SUPIO	3	7	10
TELEX	1	1	2
EXPORT	9	1	10

Schedule A: downtime hours

	<u>Number</u>	<u>Total hours</u>	<u>Average minutes</u>
(1) Preventive maintenance over-runs	1	0.1	5.0
(2) Software related problems	4	0.3	3.8
(3) Hardware related problems	6	6.3	63.2
(4) Indeterminate software/hardware problems	2	0.8	25.0
(5) External Problems	2	16.9	508.0

Of the 24.4 hours of downtime this month, 3 failures accounted for 21.9 hours: power outage (16 hr,49 min), exchange jump failure (3 hr,9 min), memory failure (1 hr,59 min).

SUBMISSION SITE USAGE SUMMARY: TELEX EXCLUDED : May, 1978

submitted from	total jobs	%	pages printed	%	cards read	%
Lauderdale	3,665	4.4	398,364	26.2	1,547,181	11.8
ExpEng	8,736	10.5	270,420	17.8	2,377,375	18.1
West Bank	11,280	13.5	167,577	11.0	1,809,674	13.8
6400	1,922	2.3				
SUPIO	57,958	69.4	684,041	45.0	7,417,605	56.4
TOTALS	83,561		1,520,402		13,151,835	

**** NOTE: No classes will be held on Monday, Tuesday, 3 - 4 July. ****

Beginning FORTRAN.....: 2:15-4pm, 19 Jun - 7 Jul (mwf), Lind H 54, RTF
Introduction to UCC.....: 2:15-4pm, 20 Jun (t), Mech E 221, RTF
Advanced FORTRAN.....: 6:15-8pm, 20 June - 13 Jul (tth), Lind H 54, RTF
PLOTAC.....: 7:30-9:30pm, 20-22 Jun (twth), Laud Conf Rm, KM
Introduction to SYSTEM 2000..: 2:15-4pm, 26 Jun - 7 Jul (mwf), Lind H 315, JC
NOS Control Statements.....: 2:15-4pm, 27 Jun - 11 Jul (tth), Lind H 54, RTF
SPSS.....: 2:15-4pm, 10-12 Jul (mtw), Arch 45, SPY
NOS Control Language.....: 2:15-4pm, 13 Jul (th), Lind H 54, RTF
SYSTEM 2000/PLI.....: 2:15-4pm, 24-28 Jul (mwf), Lind H 54, JC
SYSTEM 2000/Report Writer....: 2:15-4pm, 31 Jul - 4 Aug (mwf), Lind H 54, SPN
Introduction to Timesharing..: 2:15-4pm, 8-10 Aug (tth), Lind H 54, RTF

RETURN TO:

UNIVERSITY COMPUTER CENTER
227 EXPERIMENTAL ENGINEERING
UNIVERSITY OF MINNESOTA
208 UNION STREET SE
MINNEAPOLIS, MINNESOTA 55455

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