UNIVERSITY COMPUTER CENTER newsletter

Director: Peter C. Patton

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contents

THE GOOD NEWS; LOWER PRICES FOR MT, MS, AND OFF-HOUR CP.

THE BAD NEWS : MIRJE CONNECT TIME GOES TO $1/HOUR FOR INTERNAL RATE USERS.

The University Computer Center, following the recommendation of the University Advisory Subcommittee on Computer Grants, announces the following changes in computer related costs; these changes will go into effect on July 1, 1976.

(1) An off-hour CP rate will be charged for all jobs starting between Midnight and 4:00 AM on weekdays and for all production hours on Saturday and Sunday. The internal off-hour rate will be $6/minute (the normal rate is $9/minute) and the external off-hour rate will be $12/minute (the normal rate is $16/minute). UCC will implement a job card parameter to permit a job to be held in a delayed job queue until the off-hour rates are in effect. At that time, the delayed job will be entered into the normal input queue. UCC and the Advisory Subcommittee think that this change will allow more computing to be done for the same cost while spreading out the total work load, meaning that normal users will continue to have good turnaround during normal work hours. Full particulars of this service will be given in the July newsletter and in a WRITEUP file to be established by June 20.

(2) As announced on page 2 , all permanent files will be 'secured' at the same cost as previously charged for unsecured files. This will lower the cost to users of secured files to 1/3 of the current charge. Those users with unsecured files will save the cost of tapes and computer time currently required to back up unsecured files. Thus, users pay only for computing services that advance their needs and are not required to do archiving and storage that can be done more economically by the operating system.

(3) Many users have mentioned that UCC's magnetic tape transfer (MT) charge was too high (i.e., at $1.50/KPR for internal tapes, it was approximately twice that of the cost of disk storage transfers (MS)). To bring this charge in line with the MS rate and to reflect the efficiency of the new 9-track drives, the new rate for MT will be $1/KPR. This compares favorably with the MS charge of approximately $.80/KPR(tape), and keeps magnetic tape in a quid-pro-quo arrangement with the reduced cost of mass storage.

(4) Finally, in starting the MIRJE service on the Cyber 74, UCC charged an internal rate of $.25/hour connect time for that service. It has been shown that this rate does not recover the cost of the additional resources used only by MIRJE, but that a $1/hour connect charge will recover such costs. This change in rate should allow all legitimate uses of MIRJE for research purposes whereas the artificially low $.25/hour charge forced us to restrict users to those proving real need for the MIRJE service.

PF's

--by T.D. Hodge

As of July 1, 1976, the concept of unsecured permanent files will disappear from the Cyber 74 system. The option to specify an unsecured file will no longer exist. The FS parameter, which many users have in procedure files, will be ignored so that jobs will not abort; eventually the FS parameter will be removed entirely.

CHARGES

As of July 1, the charge for all permanent files will be at the same rate as is now charged for unsecured permanent files. The lower of the two rates was chosen to have the least impact on user budgets which are already fixed for the next fiscal year. With the new double density disks and the 1600 BPI 9-track tape drives, maintenance and backup of permanent files should be more efficient and less costly. Consequently, we expect to be able to tolerate the substantial reduction in income which will result from this rate change.

BACKUP PROCEDURES

We normally back up secured files with a combination of regular full and incremental dumps so that, in case of a pack loss, we can restore files to their condition within the 12 hours preceding the loss. This policy will be continued. We will publish the schedule of regular dumping times so that users can avoid modifying SAVEd or DEFINEd files during the few minutes when file dumping is being done.

ARCHIVING

If we find that disk space is filling up faster during this next fiscal year, we will shorten the interval between the last access of a permanent file and the date on which we remove that file from disk to archive tapes. At many university centers, files may remain unaccessed on disk for only 3 *days*. We have no such drastic policy in mind but will undoubtedly have to reduce the unaccessed period from the present 3 months. For the sake of all users, keep file space for *only* those files currently being used. We would also remind users that restoration of an archived file from tape to disk is very costly to us; we may have to increase the charge for that service.

SPECIAL PACK FOR LARGE FILES

We will enforce the 20,000 sector limit on individual direct access files on the regular disks. Owners of large files should use the PACKNAM control card or use:

```
DEFINE,fname/PN=PF01,....
```

to place files on the special pack reserved for large files.

TIME CRITICAL DATA

When files are damaged and must be restored, we copy back onto the disk the information copied from that disk during the most recent full dump; then we modify that copy with the information saved from the most recent incremental dump. This procedure may result, as stated earlier, in restoring the files to their state as far back as 12 hours before the damage occurred. As a result, any work done by the user in the interval may be lost. A user collecting 'time critical' data or making file changes of a particularly crucial nature may still feel the need to back up these changes on tape.

Any user who needs to know which version of information is on the disk at any time would be well advised to add a code to the file to reflect, for example, a version number or other informative code. A change to this number would then instantly alert the user to the fact that the file had been restored to a previous state.

A systems note will be generated for everyone to see whenever a pack is restored. This information will appear on the batch header page and in the header during log-in on MIRJE.

Questions or comments about this new policy should be directed to Thea Hodge (373-4599) or Kevin Matthews (376-5605).

MECC

--by T. Hodge

The Minnesota House of Representatives, via the Kahn Subcommittee on Computing, has asked the University to participate in testing of the MECC Univac 1110 system. This testing takes place Monday through Friday, 8 AM to 4 PM. The following information should help those interested in participating. For MECC user numbers, call Mike Skow at 373-7745.

Real-Time BASIC/Real-Time FORTRAN (RTB/RTF)

(1) Dial 636-8600 (10 cps) or 636-9200 (30 cps).
(2) Sign on with a carriage return, CR; the machine will respond with "PLEASE SIGN ON WITH HELLO"
(3) Type HELLO usernumber/password CR; the machine will respond with header information, followed by a > which is the solicit character, indicating readiness for a command.
(4) You are now in BASIC (RTB); from this point, the commands are similar to those on MERITSS except that commas are not used.

BYE gets you off the system.
NEW SAM specifies SAM as a new program file which will be created.
OLD JOE retrieves JOE from permanent file storage.
SAVE saves the file of the name indicated in the previous NEW command.
Line editing is done the same as on MERITSS.
To delete a simple character just typed, use CTRL Z.
To delete an entire line of type, use CTRL X.
To stop printing, hit the BREAK key.
To go to FORTRAN (RTF), type MODE FORTRAN, or MOD FOR: to return to BASIC, type MODE BASIC, or MOD BAS.

Hints:
a) Enter BASIC or FORTRAN statements by specifying a line number followed by the statement.
b) BASIC uses the ' rather than " for string delimiters.
c) FORTRAN must not have a program card.
d) FORTRAN free-format I/O looks like this:

```
100 PRINT 20,X,I,Y
110 20 FORMAT () [empty parentheses group]
```

DEMAND mode

At step (4) above, type MODE DEMAND: the machine will respond with header information and another > .
(5) Type @RFOR,I CR: the machine will respond with header information and line prompts. After each line prompt, type in FORTRAN statements as though you are punching cards:

```
0001    DIMENSION
```

(6) When finished, type @XQT; this will execute after going through the compiler and then the map collector.
(7) To log off the system, type @@TERM.

To use batch SNOBOL and COBOL, see the appropriate reference manuals. PASCAL is (as yet) unavailable. Questions may be directed to Michael Skow, 373-7745.

SYSLIB

--by M. Riviere

During the quarter break (on June 12), SYSLIB will be replaced in the Cyber 74 system by a completely new version. This new version, now available as FUTURE,SYSLIB, contains relocatable versions of all the common decks included on CPL, and some CDC Loader routines. A description of the common decks section is now available via WRITEUP,SYSLIB. The descriptions of other sections will be added as the library is extended.

This new library is built to contain only binaries that are common to several compilers and to COMPASS. (Routines associated with only one compiler are already available on that compiler's library.)

If SYSLIB now satisfies external references for binaries created by any of the current, PAST, or FUTURE compilers (with the exception of RUN), these externals are only the relocatable versions of common decks and Loader routines and will also be available in the new SYSLIB.

When FUTURE,SYSLIB becomes current, the current version will then be available as PAST,SYSLIB. The PAST version of SYSLIB will automatically be assigned to jobs that use the RUN compiler at compilation time. To load binary decks created by the RUN compiler (if they are not loaded at the same time that compilation takes place), a PAST,SYSLIB card will have to be inserted in the job deck before the loading sequence.

COBOL

--by S.P. Nachtsheim

The University Computer Center will install the CDC COBOL5 compiler in June, 1976. This compiler is designed to conform to the ANSI 1974 COBOL standard; all ANSI 1974 modules are implemented except the communications facility and the high level inter-program communications facility.

Some of the new features available in COBOL 5 are:

The STRING and UNSTRING statements for manipulating character strings.
An extensive DEBUG facility.
The INSPECT statements for checking and/or modifying the contents of items.
A new MERGE operation.
An INITIALIZE verb to preset the contents of items.
Dynamic collating sequences.
A very powerful COPY utility for program library copying.

COBOL 5 is not compatible with COBOL 4. Because of this, a conversion aids program will be available to convert COBOL 4 programs to COBOL 5 and a course on COBOL 4 to COBOL 5 conversion will be offered on June 29 (see page 8).

UCC is cooperating with Control Data in extensive testing of this compiler. UCC and Control Data will provide conversion assistance and computer time this summer to those willing to participate in this testing. Please contact Steve Nachtsheim at 373-7878 if you are interested in working with COBOL 5.

RJE

--by R.T. Franta

The problem that caused cards to be skipped in special languages (PASCAL, SNOBOL, etc.) has been found and the correction will be installed as soon as possible. The 1004 terminals in Experimental Engineering and Physics have already been modified and the other terminals will be corrected as soon as possible.

MNF

--by B. Stahl

During the June quarter break, the current version of MNF will become PAST, and the spring quarter FUTURE,MNF will become current. The following bugs will then be corrected on the current MNF:

1) When an array name and a file name are the same name, a spurious diagnostic is no longer issued.
2) A trailing comma in a complicated statement function call does not cause a "POSSIBLE MACHINE ERROR."
3) Several problems relating to the PARAMETER statement have been corrected.
4) A subprogram having no parameters can now be called from an FTN-compiled program.
5) A user subroutine or function with the same name as a standard one, but with a different number of parameters, is now recognized as a user routine. The use of the EXTERNAL statement is not necessary.
6) A DATA statement of the form n*A with n=0 will not cause a compile-time time limit.
7) When an ASSIGN statement occurs in a DO-loop, the control variable will be reset correctly.
8) The UNLOAD statement works.
9) A map will always be printed when the MAP control card is used before the MNF control card.

BMDP

--by S.P. Yen

The BMDP series of programs will be implemented in dynamic storage. The following BMDP programs are available now; their minimum field lengths are shown in parentheses:

BMDP1D	Simple data description (60000B)
BMDP2D	Frequency count routine (60000B)
BMDP1M	Cluster analysis on variables (70000B)
BMDP3M	Block clustering (65000B)
BMDP4R	Regression on principal components (70000B)
BMDP1V	One-way analysis of variance and covariance (100000B)
BMDP2V	Analysis of variance and covariance, including repeated measures (100000B)

The control card call for these programs is:

```
BMDPxx.
```

where xx is 1D, 2D, ..., or 2V.

CONTROL

A new WRITEUP file called CONTROL has been placed on the System. CONTROL is the first indexed WRITEUP file made available by UCC. Do a

```
WRITEUP,CONTROL.
```

to get a 7-page list of the use and content of this new writeup. CONTROL contains a short (1-2 page) description of each control card (there are 320 available) in use on the Cyber 74 system. These brief descriptions should serve as a quick aid to the user who knows the system but may have forgotten a parameter form, field length, or other such items. To access the individual descriptions of the control statements, do a

```
WRITEUP,CONTROL=name1/name2/.../nameN.
```

The content of CONTROL is up to date and as accurate as possible. If you discover any error or omissions, please call Rich Franta at 376-3963.

FORTRAN

--by L.A. Liddiard

One of the tools used to test software is a group of typical programs called a benchmark. The Federal government uses benchmarks extensively to determine which of several computer systems has the best performance; computer systems are selected to give the best ratio of performance/cost.

The University Computer Center also uses benchmark sets to test our FORTRAN compilers. When the UofM FORTRAN compiler was developed in 1964, we obtained several programs from Wright-Patterson's benchmark as payment for letting CDC test the programs against our compiler. Even though we have since obtained better benchmark sets (30 from the University of London, 95 from the University of Lausanne, several of our own), this benchmark set is the only one that spans a 12 year period in UCC development history and it allows us to show the improvement in FORTRAN performance over that period.

The table below shows the performance of different FORTRAN compilers (at specific times and on specific machines) as they ran seven FORTRAN programs. The times given are for total CP time for a combined compilation, load, and execute run. The first two columns show times from runs on the CDC 1604. FORTRAN 63 (F63) shows the best time for matrix manipulation (problem 1); this is because of the index functions for inner DO-loops. UofM FORTRAN shows the best times on problems 2 and 7 because of the fast compilation rate and the procedure of holding the FORTRAN variables I through N in B registers 1-6.

When the 1604 neared the saturation point in 1965, this same benchmark was used on the machines of those vendors offering bids on the University's new computer system. Although the CDC 6600 had the best performance/cost ratio and thus was selected for installation, we were not satisfied with the FORTRAN performance ratio of the machine; it was only 12.9 times faster than the average performance on the 1604. We were dis-satisfied because the 1604 was rated at 100,000 instructions per second whereas the 6600 was rated at 3,000,000 instructions per second; we considered the basic hardware CP rate on the 6600 to be 20 times that of the 1604 and wanted a FORTRAN compiler to meet this ratio.

Three different compiler groups worked to develop FORTRAN compilers to meet the requirement of faster execution speed. The FUN compiler (a variation of CDC's Chippewa compiler, RUN), was improved to meet the contractual requirements of being 4 times faster than a Philco 2000 on a specific group of FORTRAN programs. The FUN compiler did very well on small blocks of code, IF statements, inner DO-loops, register allocation, and index functions.

(continued on page 5)

Combined compilation, load, and execution: CP times in seconds

	DATE	Sept 1964		1965	Apr68	Nov 1969		Nov 1970		Apr76
	MACHINE	1604		6600	6600	6600		6600		Cyber 74
	COMPILER	UofM	F63	RUN	RUN	FTN2	FUN	MNF	FTN3 OPT=2	FTN4.5 OPT=2
1	Matrix	1897	1011	106.1	104.7	47.1	40.0	37.9	46.3	40.3
2	Curve Fit	26	77	3.8	3.1	5.3	3.2	1.9	5.6	5.7
3	Elementary Functions	1003	1006	54.3	60.5	49.4	59.6	43.9	47.1	40.2
4	Philco Brag	452	462	40.6	43.7	31.1	39.7	34.2	28.1	24.4
5	Runge Kutta Integration	1702	1801	130.2	115.3	117.7	87.8	77.9	116.7	70.5
6	Trapezoidal Integration	593	644	37.9	31.8	28.4	31.7	26.1	28.2	24.9
7	N^2 Bubble Sort	288	423	67.8	67.6	48.3	37.2	54.8	44.6	32.5
	TOTALS	5961	5424	440.7	426.7	327.3	299.2	276.7	316.6	238.5
	1604/6600 RATIO	Average = 5693		12.9	13.3	17.4	19.0	20.6	18.0	23.9
	st/sec COMPILATION RATE	25.5	6.5				160	314	72	81
Compiler characteristics needed to do well on these programs:										
1a	Index functions		X			X	X	X	X	X
1b	Register allocation						X	X		X
2	Fast compilation	X		Z	Z		Z	X		
3	Fast functions	X	X			Y		X	Y	X
4a	IF statement speed							X	X	X
4b	Block code analysis					X			X	X
5	Good subprogram parameter setup	X					X	X		X
6	Fast functions and parameter setup	X	X			Y		X	Y	X
7	Good analysis of IF statement inner DO						X			X

X: Compiler has characteristic.
Y: FTN2 and FTN3 had speed but failed to check for valid function input.
Z: The RUN and FUN compilers had a compilation speed that was fairly good.

At the University of Minnesota, MNF was developed to have excellent error diagnostics, fast compilation, and very good local optimization, including register allocation and index functions in one statement DO-loops. The I/O routines and FORTRAN functions developed for MNF showed that major improvements could also be obtained in these areas; CDC has since used several of the MNF functions for the FTN compiler.

FTN is the compiler developed by CDC to show that they had a compiler that did all the textbook optimizations, i.e., Pert-Time for a block of source statements represented by an R-list, global optimization, index functions, register allocation, and those optimizations matching IBM's FORTRAN H. MNF achieved our requirement of being 20 times faster than FORTRAN on the 1604 in November 1970. The FTN compiler has finally achieved some of its theoretical advantages with the current FTN 4.5; it is 23.9 times faster.

UCC will continue to evaluate our FORTRAN compilers against benchmark sets. However, the benchmark itself should be good. In the 7 programs listed in the preceding table, the matrix, curve fit, elementary functions, and Runge Kutta integration are still valid for a 1976 benchmark but the Philco Brag has code that never gets executed and has useless IF statements for the specific data initializations. The trapezoidal integration depends heavily on the speed of the SIN and COS routines that are already tested in the elementary functions (problem 3). The N^2 Bubble sort shows that, for many problems, the best speed improvement technique can be stated as:

> "The key to optimization in FORTRAN is to understand the problem to be solved and to find the best possible methods (or algorithms) to solve the problem. Coding the best method without attempting to be efficient is almost always better than writing the most efficient code using a poor method."
>
> (MNF Reference Manual, J-1)

If the sort subroutine in the benchmark is replaced by the code on page 6-9 of the MNF manual for a modified Shell sort, the total time for compile, load, and execute under MNF is reduced from 54.8 seconds to 1.1 seconds; a large improvement made by using the best technique.

In summary, we are committed to improving our FORTRAN compilers since this improvement means lower costs to users and a longer lifetime for the machines. Users, in turn, should be knowledgeable of the literature in their particular problem areas that relate to the best accuracy and execution speed algorithms. UCC augments this knowledge with the IMSL, EISPACK, and other libraries to ensure that the best algorithms are available to FORTRAN users.

imsl

--by D.R. Lienke

The following routines have been corrected for the IMSL library and will replace their previous version on June 12, 1976.

AGBACP	FFTP	FTFFT1	LCSSCU	LIN1PB
MERF1	NRWRST	OFCOMM	OFIMAG	OFPRIN
RLSTEP	RLSUMB	VCVTQF	VCVTFQ	VMULQQ
VSORTM	VSORTZ	VSRTPM	ZPOLR	ZXMIN
ZX3LP				

pascal/lisp

--by A.B. Mickel

P A S C A L

E.T.H, Zurich recently issued the second release of the standard PASCAL compiler and work is underway to install it as a FUTURE version at the University of Minnesota. This compiler features shorter field length (50000) and corrects many bugs that were present in release 1 through update 10. During the summer, UCC will finish implementing a data initialization facility (in the form of a "VALUE initialization part") as an extension to this compiler. Other work planned includes implementing run-time pointer checks, removing the restriction on the length of strings which may be compared, and providing formatted read routines. Additional work is also planned on the PASCAL library of subprograms.

L I S P

UT LISP Version 4, from the University of Texas, has been installed as the current LISP interpreter on both the Cyber 74 and the 6400. Version 4 features new user changeable system atoms (much like SNOBOL4 keywords) and enhanced interactive features. In addition to random I/O for list storage, Version 4 provides disk storage for function definitions as well, thus allowing large LISP programs to run in smaller field lengths. Modifications have been made at the University of Minnesota to allow line numbers on LISP input files and to fix many details for the KRONOS environment.

UT LISP Version 4 came with a large (120 page) and well written machine retrievable manual. However, some information in this manual is dependent on the University of Texas operating system and requires correction for use under KRONOS. Therefore, a 25-page writeup describing the differences between UT LISP and MIT LISP (MIT LISP is described in the LISP 1.5 Programmers Manual.) has been prepared and made available via WRITEUP,LISP. (The library file, LISINFO, contains the same writeup for 6400 users.) The UCC writeup "LISP 1.5 at the University of Minnesota" is undergoing revision and will appear in the 'distant' future.

For those interested in more information about LISP, a new book, LET'S TALK LISP, by Laurent Siklossy, is available in the Engineering Bookstore. This book teaches LISP and presents examples of solved problems.

BASIC

--by M. Riviere

During the June quarter break, XBASIC, an old 6400 product, will be removed from the Cyber 74 system. The CDC level 11 version of BASIC has features that make XBASIC superfluous. At the same time, the old BASIC library (BASLIB), that was used by the old version of BASIC and by XBASIC, will be removed. The library used by the level 11 version of BASIC is SYSMISC.

Level 11 BASIC was installed on the Cyber 74 with the option to read 80 characters from the input line to be compatible with the 6400 BASIC compiler. However, the 80 character option is not CDC standard and, by the end of summer quarter, the 6400 BASIC compiler and the Cyber 74 BASIC will be changed to use the 72 character line standard. An announcement will be made in this newsletter before this change takes place.

PRODUCTION USAGE SUMMARIES

CDC Cyber 74	April, 1976	April, 1975
Number of jobs run	78,881 (88,154)	63,609 (74,453)
Central processor hours	140 (173)	119 (141)
Mass storage transfers (KPR)	129,455 (171,431)	-
Magnetic tape transfers (KPR)	4,781 (6,503)	-
Pages printed	798,414 (898,049)	774,535 (919,976)
Cards punched	444,092 (473,207)	386,166 (424,252)
Microfilm frames produced	19,437 (212,469)	224,452 (400,875)
Tapes mounted	7,944	6,770
Average file storage	596.8 million characters	488.8 million characters
Mean time between failures	19.0 hours	-
Percentage available during scheduled hours	96.5 percent	-

CDC 6400		
Number of jobs run	113,426	326,562
Central processor hours	89	122
Terminal hours	18,338	39,510
Number of terminal sessions	40,423	82,212
Maximum number of simultaneous users	96	202
Average file storage	200.6 million characters	189.9 million characters
Mean time between failures	46.9 hours	27.5 hours
Percentage available during scheduled hours	99.2 percent	98.2 percent

(total including staff development, accounting, and maintenance runs)

CYBER 74 DOWNTIME SUMMARY: APRIL 27 - MAY 31, 1976

	Monday-Friday 0800 - 1800	other	total
Total possible scheduled uptime hours	240	342	582
Total downtime hours (see schedule A)	6.6	1.5	8.1
Total uptime hours	233.4	340.5	573.9
Uptime percentage	97.2 percent	99.6 percent	98.6 percent
Average downtime per occurrence	21 minutes	9.1 minutes	16.9 minutes
Mean time between failures	12.3 hours	34 hours	19.8 hours
Subsystem failures			
SUPIO	25	6	31
TELEX	0	2	2
EXPORT	9	2	11

Schedule A: downtime hours

	Number of occurrences	total hours down	average minutes downtime
1) Preventive maintenance over-runs	0	0	0
2) Software related problems	7	1.3	11.0
3) Hardware related problems	7	4.6	39.4
4) Indeterminate software/hardware problems	13	1.3	6.0
5) External problems	2	1.0	29.5

SUBMISSION SITE USAGE SUMMARY (TELEX EXCLUDED): MAY, 1976

submitted from	total jobs	% of jobs	pages printed	% of pages	cards read	% of cards
Lauderdale	4,917	6.3	266,927	22.4	2,132,875	15.5
ExpEng I/O	12,665	16.2	257,871	21.6	3,434,838	25.0
West Bank	9,334	12.0	175,027	14.7	1,869,631	13.6
6400	787	1.0	-		-	
SUPIO	50,242	64.5	491,275	41.2	6,286,627	45.8
TOTALS	77,945		1,191,100		13,723,971	

SUMMER SESSION SHORT COURSES

The following short courses will be offered during the summer. No registration is required and no credit is given. We suggest that you do some preliminary reading before attending the courses.

INTRODUCTION TO THE COMPUTER CENTER
A general introduction to the computer center; equipment, terminal locations, account numbers, job submission, keypunch, tape purchase, necessary forms; how to use the center.
DAYS : July 13
HOURS : 2:15-4:00 PM
ROOM : Lind Hall 215
INSTRUCTOR: R. Franta
REFERENCES: from instructor

BEGINNING FORTRAN
A presentation of the basic features of the FORTRAN language. FORTRAN was the first language to be used widely for numeric computations and is used in many other computational areas. We teach a version of FORTRAN IV.
DAYS : June 22,24,29, July 1,6,8
HOURS : 2:15-4:00 PM
ROOM : Lind Hall 217
INSTRUCTOR: R. Franta
REFERENCES: MNF Reference Manual

COBOL4 - COBOL5 CONVERSION
COBOL5 is a new compiler, not compatible with COBOL 4. This 1 session seminar will present the differences and show methods for conversion of programs.
DAYS : June 29
HOURS : 2:15-4:00 PM
ROOM : Lind Hall 215
INSTRUCTOR: S. Nachtsheim
REFERENCES: from instructor

COBOL
An introduction to the COBOL language. COBOL is an English-like language suitable for business data processing problems. Areas covered are mass storage, program libraries, and other facilities.
DAYS : July 26,28,30, August 2,4,6
HOURS : 2:15-4:00 PM
ROOM : MechE 114
INSTRUCTOR: J. Cosgrove
REFERENCES: CDC COBOL Version 4 Reference Manual

SYSTEM 2000 PROGRAMMING LANGUAGE INTERFACE
This course covers the FORTRAN/COBOL programming language interface portions of System 2000.
DAYS : Aug 9,11,13
HOURS : 2:15-4:00 PM
ROOM : Lind Hall 203
INSTRUCTOR: S. Nachtsheim
REFERENCES: System 2000 Reference Manual

INTRODUCTION TO SYSTEM 2000
A beginning level of System 2000; teaching how to use a generalized data base management system.
DAYS : June 21,23,25,28,30, July 2
HOURS : 2:15-4:00 PM
ROOM : Lind Hall 303
INSTRUCTOR: J. Cosgrove
REFERENCES: System 2000 Reference Manual

SPSS
This course introduces and explains the uses and methods of SPSS (Statistical Package for the Social Sciences) and how the system works at UCC.
DAYS : June 29, July 1
HOURS : 2:15-4:00 PM
ROOM : Lind Hall 303
INSTRUCTOR: D. Anderson
REFERENCES: SPSS Edition 2 (Nie, et alia, 1975)
SPSS Version 6.0 (UCC, 1975)

SYSTEM 2000 REPORT WRITER
This courses teaches the student how to use the Report Writer feature of System 2000.
DAYS : July 6,7,9
HOURS : 2:15-4:00 PM
ROOM : Lind Hall 303
INSTRUCTOR: S. Nachtsheim
REFERENCES: System 2000 Reference Manual

ADVANCED FORTRAN
ENCODE/DECODE, use of Hollerith characters, ECS, overlays, COMMON, load maps, debugging, dump reading.
DAYS : July 27,29,Aug 3,5,10,12
HOURS : 2:15-4:00 PM
ROOM : Mech 114
INSTRUCTOR: R. Franta
REFERENCES: MNF Reference Manual

KRONOS CONTROL STATEMENTS
An introduction to the KRONOS operating system and descriptions of the available control statements.
DAYS : Aug 17,19,24,26,31, Sept 2
HOURS : 2:15-4:00 PM
ROOM : Lind Hall 203
INSTRUCTOR: R. Franta
REFERENCES: CDC KRONOS 2.1 Reference Manual, Volume 1

SUMMER SHORT COURSES 1976

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
21 June (SSI) Intro. to System 2000	22 June Beginning FORTRAN	23 June Intro. to System 2000	24 June Beginning FORTRAN	25 June Intro. to System 2000
28 June Intro. to System 2000	29 June SPSS Beginning FORTRAN COBOL4 to COBOL5	30 June Intro. to System 2000	1 July SPSS Beginning FORTRAN	2 July Intro. to System 2000
5 July HOLIDAY	6 July Beginning FORTRAN System 2000/RW	7 July System 2000/RW	8 July Beginning FORTRAN	9 July System 2000/RW
12 July	13 July Intro. to UCC	14 July	15 July	16 July (end SSI)
19 July	20 July (begin SSII)	21 July	22 July	23 July
26 July COBOL	27 July Advanced FORTRAN	28 July COBOL	29 July Advanced FORTRAN	30 July COBOL
2 August COBOL	3 August Advanced FORTRAN	4 August COBOL	5 August Advanced FORTRAN	6 August COBOL
9 August System 2000/PLI	10 August Advanced FORTRAN	11 August System 2000/PLI	12 August Advanced FORTRAN	13 August System 2000/PLI
16 August	17 August KRONOS Control Cards	18 August	19 August KRONOS Control Cards	20 August(end SSII)
23 August	24 August KRONOS Control Cards	25 August	26 August KRONOS Control Cards	27 August
30 August	31 August KRONOS Control Cards	1 September	2 September KRONOS Control Cards	3 September

Introduction to System 2000: 21 June to 2 July (MWF), 2:15-4:00pm, Lind Hall 303.
Beginning FORTRAN: 22 June to 8 July (TTh), 2:15-4:00pm, Lind Hall 217.
SPSS: 29 June, 1 July (TTh), 2:15-4:00pm, Lind Hall 303.
COBOL4 to COBOL5: 29 June, 2:15-4:00pm, Lind Hall 215.
System 2000/Report Writer: 6,7,9 July (TWF), 2:15-4:00pm, Lind Hall 303.
Introduction to UCC: 13 July (T), 2:15-4:00pm, Lind Hall 215.
COBOL: 26 July to 6 August (MWF), 2:15-4:00pm, Mechanical Engineering 114.
Advanced FORTRAN: 27 July to 12 August (TTh), 2:15-4:00pm, Mechanical Engineering 114.
System 2000/Programming Language Interface: 9,11,13 August (MWF), 2:15-4:00pm, Lind Hall 203.
KRONOS Control Cards: 17 August to 2 September (TTh), 2:15-4:00pm, Lind Hall 203.

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? *When reading tapes, the PO=N option is not very useful if the operator drops the job because the system tries to recover parity errors.* (13APR76)

A The PO=N option prevents the system from aborting your job when unrecoverable parity errors are detected. The operator will drop your job if it appears that no progress is being made in reading the tape. This usually amounts to 15 or more minutes of intensive parity recovery action. If you anticipate such a condition, make note on a special request slip submitted with your job. (W. Elliott)

? *Please provide a PO option for tapes (between N and E). 100 re-reads is too many, zero is too few. How about letting the user specify the number of re-reads and the number of unrecoverable errors which will cause the job to abort?* (13APR76)

A The recovery method does not simply re-read the data block 100 times. Changes in read sensitivity, attempted localized cleaning, and read delays are employed to capture data. About 100 operations are performed before an unrecoverable error is declared. Thus it would not make sense to interrupt a recovery cycle after a specified number of operations. We are currently fresh out of room for more status bits with two local additions (PO=X and PO=M): PO=X ignores some errors which are not related to parity error problems (UNEXPIRED LABELS, block sequence errors, and block count errors in trailer labels); PO=M will return all tape error messages to the user's dayfile. Because of the low usage of this option, it may be dropped in the near future with some other means provided to inform the user of how many error re-trys were attempted. (W. Elliott)

? *Modify the CALLPRG utility so it will attempt to attach the directive file from the user's permanent files if none is already present as a local file.* (10MAY76)

A There must be a way for a user to bypass his own directive file. If this suggestion were to be implemented, it would be impossible for a user to bypass his own directive file and also, there would be additional overhead associated with the extra permanent file directory search for each CALLPRG load. (J. Mundstock)

? *There is a J-Bessel function in the user library. It would be very helpful to have a Y-Bessel function there also, especially if you're getting rid of the SSP tape.* (3MAY76)

A We too would like to have a Y-Bessel function in our library. However, although the VIM user group and the IBM SSP package have function versions, we do not trust their accuracy. Instead, we have suggested that IMSL look into the general area of Bessel functions and we hope they can supply us with trustworthy and accurate routines. Until such time, only the VIM or SSP versions are available. Please contact me at 373-5907 if you need further information. (M. Frisch)

? *Can't something be done to enforce neatness at the Physics 1004? The place looks like a pigpen; the problem is almost all due to CICS students from one class. Their programs never work and they just let them fall behind the 1004. Would it be possible to set up some system so that the 1004 site supervisors could deny access to the 1004 when people offend? Also, please ask the instructor of these offending students to come over and clean up the terminal room.* (21APR76)

A The instructor has been notified of this situation and we will try to effect a solution. (R. Franta)

? *I suggest you have the keypunch in 167 SocSci reserved for correction only. There are two machines at that site; one is an interpreter and is always jammed or malfunctioning. I think you can imagine the frustration of walking to another building to correct only 1 card.* (11MAY76)

A We supply one keypunch at each open shop 1004 site. These punches are intended to be used by all users for punching and correcting input decks. The user making corrections only should be given priority on these punches. We do not intend to change this policy. Your problem may be helped by the installation of the new 1004 site in 1009 SocSci. This should spread the load in the building somewhat. (R. Franta)

? *Would it be possible to send an 'alert' message to the remote batch 200 UT's whenever a message is to be displayed (or after the display) on the CRT? This would exclude the sending of any of the special displays from SUPIO and include any from the Cyber 74 operator as well as PM messages generated by a user program. At our terminal, this alert message causes an audible alarm to sound; this would be useful when the terminal is running unattended, to alert the operator that something must be done and might avoid the annoyance of being timed out in the middle of a long print job if the message was not noted by the operator.* (27APR76)

A This is possible but since it is a rather massive change, it must be placed low on our priority list. This means it will not be considered until late in 1976 or early in 1977. (R. Franta)

? *In an MNF program, I used the calling statement*

```
CALL AA(0)
```

to access

```
SUBROUTINE AA(J)
      :
      :
J=1
      :
```

Why was the value of 0 (zero) not changed? Suppose I had called the subroutine with the value 20?

A The MNF manual states, "If an actual parameter corresponds to a formal parameter whose value is defined or changed in the referenced subprogram, the actual parameter must be a variable name, array element name, or array name (i.e., not a constant or expression) and the actual parameter must also not be the same as another actual parameter or an element in common." This is also the way in which FTN and FORTRAN standard handle the same case. If you are running with WARNING or CAUTION messages under MNF, you will receive a message in this instance. (T. Hodge)

ED. NOTE: A very long (4 page) letter was received on 21APRIL76, detailing the deficiencies of the UCC permanent file system and offering suggestions for changes. The letter will not be reprinted here. Would the author please see page 2 of this newsletter for a partial response to his suggestion?

(continued on page 10)

? *I see that the tape user's guide recommends that everyone exercise their tapes at least once every six months. Since I have several tapes stored at Lauderdale, there is no practical way for me to remember which tapes I have used in the last six months. Since you already keep usage statistics to determine express status, why not have messages sent to users twice yearly, reminding them that "tape number xxxxxx has not been used in the last six months." Then, if the user takes no action, automatically schedule the tapes for cleaning.* (19FEB76)

A Tape cleaning is automatically scheduled based on both usage frequency and elapsed time between cleaning. The latter will probably be close to six months. Plans are already afoot to provide tape library information, using a control card. This is scheduled for implementation this summer. (W. Elliott)

? *For MIRJE users, could you have the loader request additional CM, up to the user's validation limit, if needed to load a program. I never can remember how much CM my various routines need and always get kicked off by the loader whereupon I do an RFL,validation limit. Wouldn't it be better for the system if the RFL was for no more than really needed?* (13APR76)

A A very astute observation. All of these features and more are available with the Cyber loader. (T. Lanzatella)

? *Please provide a system to notify MIRJE and 1004 users when a new system note is available. The MIRJE sign-on message rarely gives the correct date and 1004 users never use bin cards. How about providing a dayfile message for every job such as "SYSTEM NOTES CHANGES ON (date)?* (13APR76)

A Over the summer, UCC will be installing several automatic features which will make MIRJE NOTE dates more accurate. These features will likely include some form of dayfile messages. (T. Lanzatella)

? *The situation has arisen more than once where one will hear "GASP, GAG .... " while waiting patiently for one's banner page and dayfile to print out at a 1004 site. This informs everyone in hearing that a job that's printing really should have been disposed. When are you going to cure this problem for us?* (5APR76)

A This situation (which exists at many 1004 sites) will be corrected by the automatic divert feature to be implemented this summer. (N. Reddy)

BRIEFS

CALCOMP PLOTTING CHANGE:

The Hybrid Computer Laboratory has implemented a new Calcomp plotting system utilizing a PDP-11 computer to replace the CDC 160.

As a result of this change, all Cyber 74 users of PLOTPAC should specify D=HI on the LABEL,CALCOM control statement (rather than D=LO). See page 51 of the PLOTPAC writeup.

A REMINDER TO TAPE USERS:

Before requesting another installation to send you data or programs on magnetic tape, call us. We will give you the information to send to the other installation so that the tape they generate will be readable on our computer system. Call the HELP-line, 376-5592, and tell the consultant the kind of computer the other installation has. Within 24 hours you will receive the appropriate information.

PROGRAM TROUBLE REPORTS:

The latest information on currently documented software bugs is available by using the following:

WRITEUP,PTRKR	For operating system bugs.
WRITEUP,PTRFORT	For bugs in the FORTRAN compilers and libraries.
WRITEUP,PTRS2K	For bugs in System 2000.
WRITEUP,PTRSTAT	For bugs in the statistics packages.
WRITEUP,PTRMISC	For bugs in software not included above.

We would like to urge anyone who finds a software bug to fill out a PTR report (orange card available from a consultant or from the I/O stations) and send it to Betty Stahl, 227 Experimental Engineering.

SPRING QUARTER USER'S MEETING:

The Spring Quarter user's meeting was held on Thursday, May 20. UCC staff members reported on these items:

(1) Documentation:
   a) The MNF reference manual is undergoing its last revision and will be available this summer.
   b) New machine retrievable documents have been prepared. These will be available via WRITEUP and will describe all the control statements available on the Cyber 74.
   c) The UCC 'pocket guide' has been rewritten and will be available again in June.

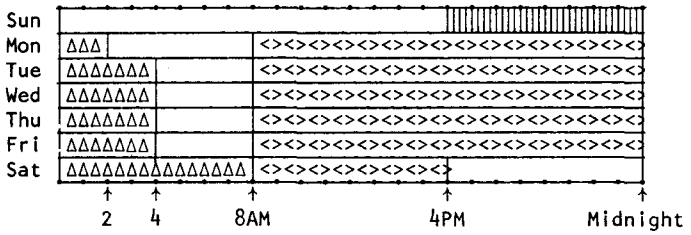
(2) Plotting:
   a) UCC will be testing a Versatec plotter for about one month; during this test period, duplicate plots will be made on both the Versatec and the Varian (at no extra charge to users).
   b) Work is being done to provide software for the Tektronix terminals to enable users to view Calcomp plots and to document TEKLIB, the library of Tektronix plotter routines.

(3) Permanent files:
   a) As of July 1, all permanent files on the Cyber 74 will be 'secured' and will be charged at the current rate for 'unsecured' files. See page for more details.
   b) UCC will enforce more vigorously the large sector limit on public packs.

(4) Timesharing:
   a) MERITSS and MIRJE will be 'merged' in August to be fully compatible.
   b) MERITSS will soon have a version of MNF using the FTN calling sequence.

(continued on page 12)

CYBER 74 OPERATING HOURS*



ΔΔΔΔΔ Lauderdale only
|||||||| Lauderdale, ExpEng
<><>< Lauderdale, ExpEng, West Bank

*These are machine hours. UCC operators stop accepting jobs about 15 minutes before operations end to enable the queues to clear on time.

SUPIO (RJE medium speed terminals) comes up 1/2 hour after operation begins and closes down 1/2 hour before operation ends.

TELEX (MIRJE terminals): the Cyber 74 operator will issue a 10 minute warning before TELEX is dropped.

UofM-Twin Cities RJE sites

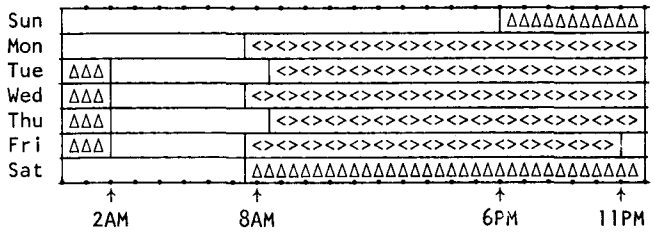
site	ID	supervisor(s)
East Bank		
ElectE 38	4V	J. Guentzel 373-5404 M. Cook 373-3985
EltH N640	4W	J. DeWitt 376-7377 D. Anderson 373-5456
ExpEng 130	4B	Shift supervisor 373-4596
KoltH S191	4Z	G. Jensen/373-5754
MasonH M39	4C	L. Croatt 373-7714
MinMet 321	41	C. Swanson 373-5475 R. Brown 373-2308
Physics 69	44	R. Scarlett 373-0243 D. Olson 376-7175 R. Hendrickson 373-3361
SpaSci 134	43	R. Weinberg 373-7881
TerrH W106	41	R. Baker 373-3567
West Bank		
SocSci 167	4X	J. Shea 373-3608
St. Paul		
BioSci 257	47	R. Comstock 373-0979
ClaOff 125G	48	C. Bingham 373-0988 S. Weisberg 373-1068 Consultant 373-0829 Consultant 376-3846
CofH 415	21	D. Nelson 376-7003 T. Ehlen 376-7003
NorH 24	40	J. Colten 373-0990
Lauderdale		
User's Room	49	Shift Coordinator 373-4940

CONSULTING SITES

General Consulting:
User's Room (Lauderdale)
ElectE 38 (East Bank)
ExpEng 140 (East Bank)
KoltH S191 (East Bank)
MinMet 321 (East Bank)
Physics 69 (East Bank)
BlegH 25 (West Bank)

Statistics packages:
ExpEng 140 (East Bank)
SocSci 167 (West Bank)
ClaOff 125 (St. Paul)

CDC 6400 (MERITSS) OPERATING HOURS



<><>< up, attended
ΔΔΔΔΔ up, not attended

UofM-Twin Cities Instructional Timesharing Labs

site	supervisor
East Bank	
CentH Computer Room	R. Richgarn 373-2289
EltH 121 & 124	D. Anderson 373-5456
ExpEng 140	T. Hodge 373-4599
HealthSciA 1-752	L. Ellis 373-0331
LindH 136A	G. Schneider 373-7582
MechE 308	A. Erdman 373-2977
TerrH Computer Room	R. Baker 373-3567
Vincent H 4	W. Stenberg 373-2586
WaLib 204	R. Estelle 373-5195
West Bank	
MdbhH Computer Room	P. Johnston 376-6561
SocSci 167	J. Shea 373-3608
St. Paul	
ClaOff 125	S. Weisberg 373-1068

TELEPHONE NUMBERS

373-4548 Account Clerk
373-4360 Administrative Offices
376-3963 Educational Services (R. Franta)
373-4596 ExpEng I/O Station
376-7067 Field Engineering
373-2521 Keypunch Supervisor
373-4940 Lauderdale Shift Coordinator
373-4995 Microfilm Operator
373-5907 Program Librarian (M. Frisch)
373-4994 Recorded message: ExpEng I/O jobs
373-1798 Recorded message: MERITSS status
373-7744 Reference Library
376-3963 RJE Services (R. Franta)
373-9751 Secretary - Hybrid Lab
373-4912 Secretary - Lauderdale
373-4995 Tape Librarian
376-5592 Telephone consulting: Cyber 74
373-5753 Telephone consulting: MERITSS
373-4599 User Services (T. Hodge)
373-4921 User's Room (Lauderdale)
373-3608 West Bank Computer Center

KEYPUNCH SITES

East Bank	*West Bank*	*St. Paul*	*Lauderdale*
ElectE 38(1)	BlegH 86(11)	ClaOff 125(1)	User's Room (5)*†
EltH N640(2)	BlegH 90(1)	CofH 415(1)	
ExpEng 130(2)	SocSci 167(2)*	NorH 24(2)	
ExpEng 131(1)			
ExpEng 208(14)*†			
KoltH S191(1)			
MinMet 321(2)			
Physics 69(1)			
TerrH W106(1)			

†includes 029 keypunch
*includes interpreting card punch

(5) APL:
UCC plans to support APLUM as the standard APL interpreter, replacing APL*CYBER. Dissenting opinions should be forwarded to the UCC Systems Group.

(6) COBOL:
COBOL 5 will be installed in June and tested over the summer. See page of this newsletter for more details.

(7) SUPIO:
a) "Time out" scheduling has been changed in an attempt to have ports available; scheduling is more flexible and is dependent on the number of ports up at one time.
b) Work is being planned for the summer on communication protocols, an improved banner page, and better throughput.

(8) New equipment:
a) A new terminal, to produce upper/lower case "camera ready" printed copy has been ordered.
b) A preliminary report on network systems was presented. Equipment is on order; further reports will be made when appropriate.

(9) Accounting:
a) Accounting information, updated 5 days per week, will be available as a System 2000 data base after July 1, 1976.
b) ACCSTAT, a user callable control card will be made available after the data base is installed. ACCSTAT permits users to access this accounting data base.
c) PROFILE, a system program for subaccounting, will appear after the installation of the accounting data base; it will be experimental at first to permit checking out the program and the effects upon the size and efficiency of the data base. After the initial checkout, individual departments may contact UCC Accounting about possible use. Further details will be published in future newsletters.

DON'T FORGET: JUNE 30 IS THE END OF OUR FISCAL YEAR -- ACCOUNTING PROCEDURES WILL NECESSITATE A CHANGE IN SCHEDULING -- THE CYBER 74 WILL CLOSE DOWN AT MIDNIGHT ON WEDNESDAY, JUNE 30. WE WILL STOP READING JOBS AT 11 PM AND WILL DROP EXPORT, SUPIO, AND TELEX AT 11:30 PM.

RETURN TO:
UNIVERSITY COMPUTER CENTER
227 EXPERIMENTAL ENGINEERING
UNIVERSITY OF MINNESOTA
MINNEAPOLIS, MN 55455