

University Computer Center Newsletter

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227 EXPERIMENTAL ENGINEERING
UNIVERSITY OF MINNESOTA
MINNEAPOLIS, Mn 55455
VOLUME 7 NUMBER 11
NOVEMBER, 1973

CONTENTS

| | |
|---|------|
| Thanksgiving Operating Schedule | p. 1 |
| A Change in the Saturday Operating Schedule | p. 1 |
| All About Printing, Supply Costs, and the Paper Shortage | p. 1 |
| Old & New Versions of MNF | p. 2 |
| LISP, A New Version | p. 2 |
| PASCAL, An Upgraded Version | p. 3 |
| IBM Scientific Subroutine Package (SSP) | p. 3 |
| Library Changes & Additions | p. 4 |
| Brief Notes: BCTRY; A bug found in CBF; Programs available from Mechanical Engineering; Morris Campus short courses; CDC 6600 usage for October; Holiday consulting hours; Those *** Survey cards; A reminder about a writeup on the new common I/O routines; SYSNOTES. | p. 4 |

THANKSGIVING HOLIDAY HOURS

| | |
|--------------|---|
| Lauderdale | Close at 4:00 AM Thursday Nov. 22 Open at 8:00 AM Saturday Nov. 24 |
| Experimental | Close at 12:00 Midnight Wed., Nov. 21 Open at 8:00 AM Saturday, Nov. 24 |
| West Bank | Close at 12:00 Midnight Wed., Nov. 21 Open at 8:00 AM Monday Nov. 26 (Not open on Sat. Nov. 24) |

AN EXTENSION OF SATURDAY OPERATING HOURS

Beginning on Saturday, December 1st, the Lauderdale, Experimental Engineering, and West Bank facilities will be open until 4:00 PM on Saturday.

ALL ABOUT PRINTING, SUPPLY COSTS, AND THE PAPER SHORTAGE

Over the years the computer user has expected that the cost of running the same job or program on a computer would continue to decrease since there were exponential increases in computing power and stable supply costs. However, supply costs are no longer stable. In the last two years a number of factors such as inflation, pollution control for paper mills, depressed profitability in producing computer paper, 1972 tariff increases, and increased demand for business forms have caused the price of printer paper to increase and supply sources to be less reliable. A study by Arthur D. Little, Inc. has predicted a 20% cost increase for fiscal year 73-74 and no significant new plant capacity until late 1976. If we are to be responsible users of our Earth's resources, it makes sense for every computer user to rethink his computer output by considering the following questions:

- 1) Is this listing of the source program different from a previous run? If not, keep control cards in the current deck that do not request a listing.
- 2) If there are errors in the source program, is the problem fully understood before the job is resubmitted? "Haste makes Waste" is an old and sometimes true motto.
- 3) Are the 132 characters per line and 66 lines per printer page fully used? Avoid excessive page ejects and using just the left hand side of the page. Sometimes the page format can be rethought as "2 up" or two square pages of 66 characters and 66 lines.
- 4) Is used computer output put into recycling boxes and barrels at UCC stations? Those who save may use the motto "Waste not, Want not".
- 5) If the computer output consists of many pages that are seldom used or are put into dead storage, has microfilm been considered for the output medium? Then single copies of essential pages can be printed using a reader-printer. Obtain a writeup of MF501 from the UCC library if this idea can be considered for your output applications.

UCC in the next few months plans to investigate every area in which it can help save printer paper and ensure a continuous supply. The following suggestions are being looked at and additional ideas from users [use UCC suggestion cards directed to L. Liddiard] would be appreciated.

- 1) Change Lauderdale printers to put out only one banner page.
- 2) Make "no loader map" the default option.
- 3) Suppress un-needed dumps.

- 4) Convert the CDC 501 printers to print 8 lines to the inch rather than the 6 lines to the inch that they currently print. This will allow UCC to purchase computer forms perforated and folded at 8 1/2 inches rather than 11 inches that will accommodate the 66 lines on a page and require 22% less paper. [We would appreciate your comments on this idea.]
- 5) Keep at least 2 months paper supply on hand. Lauderdale users may notice that this has already been implemented, when they feel hemmed in by that paper.

Currently UCC uses approximately one million sheets of paper per month or 500 boxes of paper. UCC plans to absorb the 20% increase in cost for this fiscal year, but will have to raise paper rates for any additional increases. The printer paper price increase is the largest of the many increases that UCC has had in card costs, printer ribbons, and microfilm.

OLD & NEW VERSIONS OF MNF

At present the old version of MNF is accessed by using the control card

MNFOLD(parameters).

On December 4, 1973 another method will go into effect and MNFOLD will no longer be available. To access the old version of MNF, insert the following additional control card before the first use of MNF:

OLD,MNF.

The operating system will find the old version and make it a local file for the user. All further MNF control cards will then use this local file.

To access the most recent experimental version of MNF (the version which is in the process of being checked out and may have errors in it), insert the following additional control card before the first use of MNF:

NEW,MNF.

The operating system will find the experimental version of MNF and make it a local file for the user. All further MNF control cards will then use this local file.

A complete example:

```
Jobcard.
OLD,MNF.
MNF(E=2)
MNF(R=7)
Δ (7-8-9 card)
  [First MNF program with no data.]
Δ (7-8-9 card)
  [Second MNF program with no data.]
☐ (6-7-8-9 card)
```

The old version of MNF will be used in both MNF compilations.

CAUTION: A PACK,RELEASE (or P,R) control card may cancel the local file of MNF if OLD,MNF. or NEW,MNF. control cards appear before it. This occurs when the old or new versions of MNF are on pack files. UCC keeps these versions on packs or on magnetic tapes at its discretion depending on level of usage. The user does not need to know where the versions are kept since the operating system will find them properly. (Versions kept on tape have a REQUEST message inserted in the dayfile after the control card calling that version.) If a PACK, RELEASE control card has cancelled the local file, another OLD,MNF. or NEW,MNF. card can be used to get the appropriate version.

A NEW EXTENDED VERSION OF LISP

A new extended version of the MIT list-processing language, LISP, became available on the MOMS system on November 5th. During the past year work was done to upgrade the version of LISP available at UCC from LISP 1.5.6 to the new LISP Version 3 from the University of Texas. Documentation will appear shortly in Room 140 ExpEng for the new LISP system. The writeup will describe differences in UT LISP from the LISP described in LISP 1.5 Programmer's Manual by John McCarthy et al. (available in the Engineering Library).

LISP has applications in symbol manipulation and recursive programming and has been used extensively in artificial intelligence as well as particle physics and natural language analysis.

LISP can be accessed via the control card:

LISP(parameters)

and requires a field length of at least 50000 on the CDC 6600. An example of the deck setup is:

```
Jobcard (with CM50000)
LISP(Q,P,G,Z)
Δ (7-8-9 card)
  [Top level functions for EVALQUOTE (the LISP interpreter).]
☐ (6-7-8-9 card)
```

Also available with the LISP system is a LISP assembler-compiler system utilizing the routines LAP and LCOMP respectively. (These will be described in a later writeup.) They can be used to compile often-used LISP functions. GRASPE, an extension of LISP to process directed graphs, will become available in the near future.

LISP is also available on the MERITSS system on an experimental basis under the BATCH subsystem: use CM50000

and LISP(Q,L,G,Z).

A LISP short course is planned for spring quarter 1974.

Any questions concerning LISP should be directed to Andrew Mickel, 217 ExpEng, 376-7290.

PASCAL HAS BEEN UPGRADED

The December 1972 version of the programming language PASCAL (from E.T.H. in Zurich, Switzerland via the University of Calgary and the University of Colorado) was placed on the MOMS system on November 5th. Because the old (February 1972) version is no longer available the documentation in Room 140 ExpEng is no longer entirely accurate. A new writeup will soon be available.

PASCAL is a general purpose programming language with syntax resembling that of ALGOL 60. It is vastly different from ALGOL 60 in that facilities for complex data structuring and character strings exist in the language. Its intended usage is "as a convenient basis to teach programming and as an efficient tool to write large programs" according to its author Niklaus Wirth. PASCAL is an excellent vehicle for "structured programming" [see pp 5-6, letter to the editor from Peter Demming, in the October newsletter of the ACM Special Interest Group in Programming Languages (SIGPLAN)]. The bulk of the PASCAL compiler is written as a 4000-line PASCAL program.

PASCAL can be accessed via the control card:

PASCAL(parameters)

and requires a field length of 50000. A sample deck setup is:

```
Jobcard (with CM50000)
PASCAL.
  Δ (7-8-9 card)
    [Pascal program.]
  Δ (7-8-9 card) ←-----note
    [Data for program.]
  □ (6-7-8-9 card)
```

This new version of PASCAL contains some of the changes described in The Programming Language PASCAL (revised report) [to be published]. See also the new book Systematic Programming: An Introduction, by N. Wirth (Prentiss Hall, 1973) for an elementary description. Soon to be available is the PASCAL Manual by W. Burger, University of Texas, as a machine retrievable writeup.

A PASCAL short course is planned for spring quarter 1974.

Any questions concerning PASCAL should be directed to Andrew Mickel, 217 ExpEng, 376-7290.

IBM SCIENTIFIC SUBROUTINE PACKAGE (SSP)

SSP has been recently obtained and is now available for general use. It was compiled by the FUN compiler so it is only available to MNF, FUN, and RUN users.

MNF example

```
Jobcard.
FETCH,SSP.
MNF(U=SSP)
  Δ (7-8-9 card)
    [FORTRAN program with CALL's TO
  END
  Δ (7-8-9 card)
    [Data cards, if any.]
  □ (6-7-8-9 card)
```

FUN/RUN example

```
Jobcard.
FUN(S)
FETCH,SSP.
LOAD,LGO,SSP.
EXECUTE.
  Δ (7-8-9 card)
    [FORTRAN program with CALL's TO
  END
  Δ (7-8-9 card)
    [Data cards, if any.]
  □ (6-7-8-9 card)
```

Caution: The University Computer Center has no test decks for SSP; the routines are provided 'as is' from IBM. An attempt will be made to correct errors found by users but only on a limited basis.

We would recommend that SSP only be used if a program coming from another installation uses one of the subprograms in SSP or if no other source for a subprogram can be found. Check the UCC library of mathematical subroutines, the IMSL library, and the EISPACK eigenvalue-eigenvector package first. If the subprogram cannot be found in one of these, check with the UCC Program Librarian, Michael Frisch, 235D ExpEng, 373-5907, who has access to the CDC 6000/7000/Cyber series machines user group (VIM) library and other sources.

Documentation for SSP is available in the publication IBM System/360 Scientific Subroutine Package Version III Programmer's Manual, edition GH20-0205-4. UCC has a reference copy available in its library, 229 ExpEng. Single copies of writeups for the routines are also available from the UCC library. Individual copies of this publication can be ordered from:

IBM
5075 Wayzata Blvd.
Minneapolis, Mn 55416

at a cost of approximately \$6.20.

LIBRARY CHANGES & ADDITIONS

In October the following modifications were made to the library:

Changes:

- TINV - Corrected error that had caused infinite loop.
- SCLPLT - Latest version for both RUN/FUN/MNF and FTN; uses PROCER for error checking.
- ISERCH - Latest version for both RUN/FUN/MNF and FTN; uses PROCER for error checking.
- RANF,RANSET- New random number sequence because of new multiplier (see June newsletter for details) for RUN/FUN and FTN.

Additions:

- MASK - Function to generate mask identical to COMPASS MX₁ j instruction. RUN/FUN/MNF and FTN versions.
- FTEST - Function to give F distribution for RUN/FUN/MNF and FTN; faster and more accurate than FVR.

BRIEF NOTES

BCTRY The BCTRY system for cluster and factor analysis is now available for general use. The control cards are as follows:

```

Jobcard (with CM120000)
Bin card
Δ (7-8-9 card)
/START
:
:
/END
☐ (6-7-8-9 card)

```

For more information on BCTRY and its documentation, contact S.P. Ven, 203 ExpEng, 373-2522.

A BUG IN CBF CBF(IN,OUT,1,NREC) will loop to the time limit if the file IN has an EOR and an EOI but not an EOF at the end.

The Mechanical Engineering Department, Power and Propulsion Division, has available (on UCC101) two NASA programs dealing with chemical equilibrium and chemical kinetics. The equilibrium program is CEC71 as described in NASA SP-273. The kinetics program is called GCKP. Both are under development and should not be considered operational at all times. CONTACT:

Ken Barnes
459 Mechanical Engineering
373-4526

MORRIS CAMPUS SHORT COURSES Three short courses will be taught on the Morris campus on November 28th.

```

SNOBOL          10:00 AM - 12:00 Noon
MODIFY          1:00 PM - 3:00 PM
GENERAL INFORMATION SEMINAR 3:00 PM - 4:00 PM

```

Morris campus users should contact Professor A. Lopez at the Computer Center for more information.

CDC 6600 Usage for October

```

Jobs run:      61,691
from ExpEng    32.0 %
from Lauderdale 12.0 %
from West Bank 19.4 %
from other remotes 32.8 %
for maintenance 3.8 %

Average times:
on input queue 15.8 minutes
at control point 6.9 minutes
on output queue 4.3 minutes
printing       1.5 minutes

```

THOSE PESKY SURVEY FORMS... Users are still being asked to fill out a card whenever they ask a UCC consultant for advice in Room 140 ExpEng or at Lauderdale. This information will help us:

- 1) decide where and when our service needs improvement,
- 2) find out where our problem areas are so we can improve our training for consultants,
- 3) monitor the usefulness of our documentation.

We realize that you do not enjoy filling out forms but please cooperate. The information gathered should help all of us.

REMINDER A revised writeup on the new common I/O routines for all FORTRAN compilers (see the August newsletter) is available either from the librarian in Room 229 ExpEng or in Room 140 ExpEng.

SYSTEM NOTES the following SYSTEM NOTE appeared on Tuesday October 30, 1973 (SYSNOTE # 51).

FORTRAN USERS: The new combined FORTRAN I/O routines have been placed in the system as of 0800 Thursday, 01NOV73. Programs using previously written unblocked binary files will have to call FTNBIN. Programs using S mode tapes written previously under FORTRAN will need to use BUFFIO - e.g., CALL BUFFIO(1,1,5LTAPE2) will allow the old S TAPE2 to be read. Should any users encounter problems, the control cards ATTACH,SYSLIB,OLDSYS. and ATTACH,FT3LIB,OLDFT3. when placed prior to the LOAD/EXECUTE command will cause the old I/O routines to be used instead of the new routines; both files will have to be attached for FT3 and FTN executions.

UPDATE USERS: Program UPDATE now on the system is version 2. UPDATE can now create and manipulate random OLDPLs. However, these random OLDPLs are unique in style and structure to UPDATE and may not be used interchangeably with program MODIFY random OPLs. This capability to process random OLDPLs will probably result in reduced processing time (a preliminary comparison, however, indicated that MODIFY is still the faster of the 2 programs).

One disadvantage of the new capability of UPDATE is that both sequential and random OLDPLs must be well-formed -- specifically, no end-of-files may follow either the sequential (single logical record) or the random (multi-logical record) OLDPLs. This must be enforced since UPDATE seeks a random directory (sometimes called a random index) on every disk-based file (including, of course, disk pack files).

UPDATE can process sequential OLDPLs on any medium (tape, disk, pack, etc.), but random OLDPLs must be disk-based.

UPDATE will process the OLDPLs of the previous version, subject to the constraints imposed on the new-style OLDPLs as described above. Since many existing OLDPLs may have end-of-files or other extraneous (to UPDATE) records on the same file as the OLDPL, users may have to re-copy their OLDPLs as single records, eliminating the confusing information. An alternate method -- discouraging UPDATE from seeking a random directory -- is to specify the option R on the UPDATE control card. This method is not recommended to neophyte users of UPDATE.

Random OLDPLs are automatically written to disk/pack files unless option W is selected. This has little impact on users who keep their files on-line on disk packs (and some advantages of reduced time may be noticed), but those users who intend to transfer NEWPLs to other installations may have to defeat the automatic random file. Users in the latter category should first check with the receiving installation prior to sending tape files of UPDATE OLDPLs. The quasi-informative message * INDEX FULL AT OPEN * does not originate from UPDATE and may be ignored. The actual mode of the file (sequential or random) will be indicated underneath the page count on the output listing.

A description of all the new features of UPDATE (which are abundant) may be found in the SCOPE 3.3 manual, chapter 10.

* * * E N D O F N O T E * * *

6600 OPERATING HOURS

| | 12:01AM | 2AM | 3AM | 4AM | 8AM | 2PM | 4PM | Midnight |
|-----------|---------|-----|-----|-----|-----|-----|-----|----------|
| Sunday | | | | | | | | |
| Monday | | | | | | | | |
| Tuesday | | | | | | | | |
| Wednesday | | | | | | | | |
| Thursday | | | | | | | | |
| Friday | | | | | | | | |
| Saturday | | | | | | | (1) | |

/// (LAD,EXP,WB) (1) change to 4PM on
 ||| (LAD,EXP) 1DEC73.
 ... (LAD only)

MEDIUM SPEED REMOTE TERMINALS

| site | | Supervisor |
|------------|--------|--|
| 38 ElectE | (East) | J. Guentzel/373-5404 M. Cook/373-3895 |
| N640 EltH | (East) | J. DeWitt/376-7377 N. DeWitt/376-7377 |
| 140 ExpEng | (East) | R. Franta/376-3963 |
| S191 KoltH | (East) | T. Faulkner/376-7024 J. Abdullah/373-2348 |
| 321 MinMet | (East) | C. Swanson/373-5475 R. Olfke/373-5680 |
| 69 Physics | (East) | Bob Scarlett/373-0243 Dave Olson/373-0044 |
| 54 BA | (West) | G. Lutgen/373-3608 |
| 415 CofH | (StP) | D. Nelson/376-7003 T. Ehlen/376-7003 |
| 24 No H | (StP) | J. Colton/373-0990 D. Rignell/373-0990 |
| 257 BioSci | (StP) | R. Comstock/373-0928 H. Meyer/373-3067 |
| 384 HortS | (StP) | J. Heinen/373-1086 M. Brenner/373-0949 |
| 125G COB | (StP) | C. Bingham/373-0988 |
| User Room | (Laud) | Shift Sup./373-4940 |

KEYPUNCH LOCATIONS

(number of punches in parentheses)

| East Bank | St. Paul |
|-----------------|-----------------|
| 38 ElectE (2) | 257 BioSci (1) |
| N640 EltH (1) | 125G COB (1) |
| 130 ExpEng (2) | 415 CofH (1) |
| 131 ExpEng (1) | 384 HortS (1) |
| 208 ExpEng (8)* | |
| 223 ExpEng (4) | West Bank |
| S191 KoltH (1) | 90 BlegH (2) |
| 321 MinMet (1) | |
| 69 Physics (1) | Lauderdale |
| | Users Room (4)* |

*includes 1 interpreting card punch.

REFERENCE MANUALS

(see next column for CDC reference manuals)

BMD: Biomedical Computer Programs
 BMDX: Biomedical Computer Programs
 IMSL Library Catalog
 MNF Reference Manual
 OMNITABII Programmers Reference Manual
 OMNITABII, An Introduction to
 SPSS: Statistical Package for the Social Sciences
 SPSS Supplement (version 5.0)
 UMST: UofMinnesota Statistical Programs
 UCC Users Reference Manual

CONSULTING SCHEDULE

FALL QUARTER (revision 1)

| EAST BANK | GENERAL COMPUTING | STATISTICAL COMPUTING |
|------------|--|--|
| 140 ExpEng | Mon- : 9AM-5PM Thurs : 7PM-9PM Fri : 9AM-5PM Sat : 12 N-2PM Sun : 7PM-9PM | |
| 205 ExpEng | | Mon : 1:00PM- 5PM Tues : 10:30AM- 1PM Wed : 11:00AM- 3PM Thurs: 10:30AM- 1PM 2:00PM- 4PM Fri : 9:00AM-12 N |
| ST. PAUL | GENERAL COMPUTING | STATISTICAL COMPUTING |
| 125C COB | Mon : 8:30AM-6PM Tues : 8:30AM-6PM Wed : 8:30AM-6PM Thurs: 8:30AM-6PM Fri : 8:30AM-6PM | Mon : 11:00AM- 5:00PM Tues : 10:00AM-12:00 N Wed : 11:00AM- 5:00PM Thurs: 10:00AM-12:00 N Fri : 9:00AM-11:30AM 1:30PM- 5:00PM |
| WEST BANK | GENERAL COMPUTING | STATISTICAL COMPUTING |
| 25 BlegH* | Mon-Fri: 9AM-12 N 1PM- 4PM | Mon-Fri: 9AM-12 N 1PM- 4PM |
| 167 SocSci | | Mon: 2:30PM-5:30PM Wed: 10:00AM-1:30PM Fri: 11:30AM-3:00PM |
| LAUDERDALE | GENERAL COMPUTING | STATISTICAL COMPUTING |
| | Mon- Thurs: 1:30PM-3:30PM 7:30PM-9:30PM Fri : 1:30PM-3:30PM | Thurs: 1:30PM-3:30PM |

*Social Science computing only.

TELEPHONES

373-4548 Account Clerk, 6600
 373-7753 Account Clerk, 6400
 373-4596 ExpEng I/O
 373-7584 Field Engineering
 373-2521 Keypunch Supervisor
 373-4940 Lauderdale Shift Supervisor
 373-4995 Microfilm Operator (leave a message)
 373-4876 Operations (R. Folden)
 373-4994 Recorded Message
 373-7744 Reference Librarian
 376-3963 Remote Job Entry Coordinator
 373-4995 Tape Librarian (leave a message)
 373-4360 UCC Office
 373-4599 User Services (T. Hodge)
 373-4921 Users' Room (Lauderdale)
 373-3608 West Bank I/O

REFERENCE MANUALS

CDC Reference Manuals

| | |
|-------------------------------|-----------|
| APEX | 86615300B |
| ALGOL Version 2 | 60306100D |
| COBOL Version 3 | 60253000E |
| COMPASS Version 2 | 60279900D |
| FORTRAN EXTENDED Version 3 | 60176600K |
| FTN DEBUG Users Guide | 60329400B |
| FORTRAN (RUN/FUN) Version 2.3 | 60174900F |
| MIMIC Simulation Language | 44610400E |
| MODIFY | 60281700C |
| PERT/TIME | 60133600C |
| SCOPE Version 3.2 | 60189400L |
| SIMSCRIPT Version 2 | 60178300C |
| SIMULA | 60234800E |
| SORT/MERGE Version 3 | 60252600D |
| 6000/7000 Computer Systems | 60100000W |

INPUT / OUTPUT

USERS WHO WISH TO EXCHANGE INFORMATION ON PROGRAMS, EQUIPMENT, ETC.
WITH OTHER UCC USERS MAY USE THIS FORM TO SUBMIT THE INFORMATION.

TO: EDITOR, NEWSLETTER
UNIVERSITY COMPUTER CENTER
ROOM 227 EXPERIMENTAL ENGINEERING
UNIVERSITY OF MINNESOTA
MINNEAPOLIS, MN 55455

PLEASE PUBLISH THE FOLLOWING MESSAGE IN THE INPUT/OUTPUT SECTION OF THE
NEXT UCC NEWSLETTER:

MESSAGE: _____

CONTACT:
NAME _____
ADDRESS _____

TELEPHONE _____