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University Computer Center newsletter

Director: Peter C. Patton

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CONTENTS

Have You Considered Using Microfilm?	p. 1	IMSL is Upgraded	p. 2
The ROUTE control card -- an amendment to procedures	p. 1	The SNOBOL Corner	p. 3
The CYBER 74 Into The Future	p. 2	Short Courses Offered in May	p. 3
SPSS, A New Version	p. 2	Documentation at UCC	p. 4
		The Suggestion Box	p. 4
		Brief Notes: A new UCC disk pack; Note to statistics programmers; Recycle paper!	p. 8

HAVE YOU CONSIDERED MICROFILM?

--by A. Franck

In view of the increased cost and reduced supply of printer paper (see the UCC newsletter, April, 1974), a review of another printing option available at UCC may be helpful.

The University Computer Center provides a microfilm processing service for computer users. A 3M Electron Beam Recorder (EBR) is used which is capable of printing 132 characters per line. The character set of the CDC 501 printer is a subset of the character set of the EBR. A UCC program, J4 MINN MF501, is available which processes output files for the EBR, simulating the CDC 501 printer. Upper and lower case as well as enlarged bold face for 120 character is provided. The EBR is capable of recording data from a 1/2 inch magnetic tape onto 16mm dry microfilm. The magnetic tape drive can read 7- or 9-track tape with densities of 200, 556, or 800 bpi.

The charges for microfilm printing are reasonable. For those people using the CYBER 74, charges are 2/3¢ per frame and 20¢ per job. For educational and governmental users providing their own formatted magnetic tape (i.e., not using the CYBER 74), the charges are \$10 per hour logged time plus 2/3¢ per frame. For other such users an additional charge of \$10 per hour will be assessed. Return postage will be charged for the tape and processed microfilm if mailing is required.

The UCC can provide computer time at reasonable rates for the purpose of obtaining a tape suitable for processing on the EBR. For those users who have a CDC 6000 series computer with SCOPE 3.2, a utility routine can be provided at no cost for this purpose. For other CDC users a program deck with suitable suggestions for program modification can be provided. For those CDC users who also have IBM series 360/370 equipment, 3M has available a utility program to provide a tape usable with the indicated EBR. A KRONOS 2.1 program deck will be available later this year.

Inquiries concerning this service are welcome and can be made to Dr. Abe Franck, Associate Director, University Computer Center, 227 Experimental Engineering, University of Minnesota, Minneapolis, MN 55455. The telephone number is (612) 376-7291.

AMENDMENT TO THE ROUTE CONTROL CARD DESCRIPTION (SEE THE FEBRUARY 1974 EDITION OF THE UCC NEWSLETTER)

--by R. A. Folden

The Operations, Office Procedures, and Facilities Committee (OOPF) of the University Computer Center is now reviewing the ROUTE feature because of problems encountered with it. Until their recommendations are made and approved, all routed print files arriving at Lauderdale and Experimental Engineering will be placed in one bin even though a specific bin number was designated on the ROUTE card. These bins will be labeled "ROUTED OUTPUT/LD0000" at Lauderdale and "ROUTED OUTPUT/EX0000" at Experimental Engineering.

All punch files, whether routed or not, will be returned to the designated bins at either Lauderdale, Experimental Engineering, or West Bank.

Comments from users regarding the ROUTE feature will be welcomed by this Committee and may be sent to: OOPF Committee, 227 Experimental Engineering, Minneapolis Campus.

THE CYBER 74 AND THE FUTURE

--by L. A. Liddiard

A number of persons have commented on the announcement by CDC on April 11, 1974, of the new CYBER 170 series and the fact that we had the CYBER 74 installed on March 25, 1974. Despite this announcement, UCC is still pleased with the CYBER 74 for the following reasons.

1. UCC needed the additional 32K of memory to process jobs in 1974 and 1975. This memory increase could not be put off to a future date when the CYBER 170 series would be available. There is now a noticeable throughput increase with the CYBER 74-16 as the input queue is usually empty compared to jams that occurred with the CDC 6600.
2. The following table (taken from the April 17th issue of COMPUTERWORLD) shows that the CYBER 74 is lower in processing power only when compared to the CYBER 175 or CYBER 76. Both of these machines cost more than the CYBER 74. (The number in parentheses shows computing power of each machine relative to a CYBER 73.)

Mid-1960 Systems	Early-1970 Systems	Mid-1970 Systems
CDC 6200*	Cyber 72 (0.8)	Cyber 172 (1.2)
6400	Cyber 73 (1.0)	Cyber 173 (1.7)
6600	Cyber 74 (2.3)	Cyber 174 (2.4) Cyber 175 (4.6)
7600	Cyber 76 (12.0)**	No comparable model yet
*The Cyber 70 series was basically the 6000 series with some software improvements, and performance is the same as the 70 series.		
**The Cyber 76 will remain in production as is.		

3. The CYBER 170 series machines continue the same machine architecture as the 6000 and CYBER 70 series. This means that CDC is committed to improving the software for all of these machines through the 1970's. UCC would have been "red faced" only if a completely new machine architecture such as the IBM 370/158 versus the IBM 370/155, the IBM 360 versus the IBM 7094 II, or the CDC 7600 versus the CDC 6600 had been announced. The continuation of this same Seymour Cray design of the early 60's shows how a simple but well thought out instruction set weathers excellently with time.
4. UCC and Control Data were aware of the new series that would be announced and this fact made the exchange cost of the CYBER 74 for the CDC 6600 very reasonable indeed.
5. The current CDC 7054 disk controllers that we have can be upgraded at a nominal cost to handle the new double density disk drives with 2000 million characters that were also announced in April.
6. If there is one thing that long experience in the computing game shows, it is that being on the "cutting edge of technology" can be very painful to computer users. That is, the first few new technology computers from any manufacturer have usually had problems during their initial shakedown period. Thus, the CYBER 74's stability and reliability within three weeks of installation show that UCC is ready for the remaining years of the 70's.

NEW VERSION OF SPSS

--by S. P. Yen

The new update manual for SPSS Version 5.5 is now available in H.D. Smith Bookstore on the West Bank. This manual includes the descriptions of some new features, improvements, field length requirements, and other changes. The price is \$1.70.

The actual implementation date for this new version will be announced in SYSNOTES. As soon as the new SPSS is on the system, the old version of SPSS, Version 5.0, can be accessed using the following control cards

```

                                OLD,SPSS.
or, for the brief version,    SPSS.
or, for the brief version,
                                OLD,SPSS100.
                                SPSS100.
```

IMSL UPGRADED

--by D. R. Lienke

On Monday, April 22, 1974 the IMSL library files IMSL and IMSLFTN were changed to incorporate the latest corrections. A detailed description of changes is available in the UCC document "CDC 6600 Library Programs and FORTRAN Subprograms" (dated December 1973) in the subsection entitled "IMSL FORTRAN Subroutines" (revised, February 1974).

THE SNOBOL CORNER

--by A. B. Michel

Judging efficiency in SNOBOL programs is a hard task, partly because execution times vary among the possible kinds of SNOBOL statements. Also, programs having a fewer number of executed statements are generally faster than equivalent programs having more (in interpretive versions of SNOBOL).

An example can be found in writing the function DUPL. (DUPL is a primitive function in SNOBOL4, version 3, available on our system under the name SNOBOL. DUPL does not exist under CAL SNOBOL, a SNOBOL4, version 2 based system known here as SNOBOLC.)

Below are three definitions of the function DUPL in SNOBOL:

*The iterative (obvious) version:

```

DEFINE("DUPL(String,N)")
DUPL DUPL = GT(N,0) DUPL STRING      :F(RETURN)
N = N - 1      :(DUPL)

```

*The recursive (one-liner) version:

```

DEFINE("DUPL(String,N)")
DUPL DUPL = GT(N,0) STRING DUPL(String,N - 1)      :(RETURN)

```

*The efficient version:

```

DEFINE("DUPL(String,N)DUPLPAT")
DUPL DUPLPAT = GT(N,0) LEN(N * SIZE(String)) . DUPL      :F(RETURN)
DUPLOOP STRING = STRING STRING STRING
STRING DUPLPAT      :S(RETURN)F(DUPLOOP)

```

Running the three versions of DUPL under the latest (November 1973) version of CAL SNOBOL (soon to be released at UCC) we find the following execution times in milliseconds on a CDC 6400 (in each case, DUPL("A",N) and DUPL("ABCDEFGHIJ",N) were called consecutively).

DUPL version	Values of N			
	1000	100	64	5
<i>iterative</i>	13119	271	145	10
<i>recursive</i>	13663	327	181	10
<i>efficient</i>	435	57	28	10

Not only are the savings using the *efficient* version profound, but note also that recursion does not fare much worse than iteration in this function definition.

For N = 64, 129 SNOBOL statements were executed in the *iterative* version,
65 in the *recursive* version,
7 in the *efficient* version.

SHORT COURSES

The following short courses will be offered in May. See the April newsletter for more detailed descriptions.

*INTERMEDIATE FORTRAN

DAYS : May 13,15,17,20,22,24
 HOURS : 3:00 - 5:00 PM
 ROOM : 18 MechE
 INSTRUCTOR: R. Franta
 REFERENCES: MNF Reference Manual

*SYSTEM 2000

DAYS : May 6,8,10,13,15,17
 HOURS : 1:00 - 3:00 PM
 ROOM : 18 MechE
 INSTRUCTOR: S. Nachtsheim
 REFERENCES: System 2000 Reference Manual,
 System 2000 Users' Guide

*CONVERSION FROM MOMS TO KRONOS 2.1

The general differences between the two systems will be discussed, pointing out why conversion is occurring and what schedule this conversion will follow. Four topics will be covered in detail since most deck and method changes will have to occur in one of these four areas: 1) control cards, 2) tape usage, 3) permanent file usage, and 4) compiler changes.

DAYS : May 20,22,24
 HOURS : 1:00 - 3:00 PM
 ROOM : 18 MechE
 INSTRUCTOR: R. Franta, et alia
 REFERENCES: Materials from instructor

DOCUMENTATION PRODUCED AT UCC

Writeups

reprinted: Plotter Routines for the STATOS 31
 revised : SORT1,SORT2,MERGE2,MERGE4
 Library Systems & FORTRAN Library
 Subprograms (IMSL subsection
 revised)

Reference manuals, conversion guides

SPSS Version 5.5 (available at H.D. Smith Bookstore for
 \$1.70)
 Abridged KRONOS Control Cards Description (available
 from the Reference Room, 235a ExpEng)

THE SUGGESTION BOX

(Unsigned suggestion cards are ignored. Questions may be reworded for clarity.)

Q/S Those who complained before should commend you for excellent service tonight! BUT the man stripped off my 1-12 punches in col. 1 and col. 80 required by your manual for GENREAD! So I lost a run! I told him also, but he didn't believe me.

A Our error. It shouldn't happen again.

(D. Sabre)

Q/S Since the card punch punches a 6-7-8-9 card that has to be thrown away, and since the deck must be identified at the beginning for return to the bin, why not use the 6-7-8-9 white card (with a torn corner to prevent re-use) as the identifier rather than wasting another blank card? This would save a few cards; perhaps not significant, but why waste them?

A These blank cards are the first cards in front of each punch job on the card punch. The hardware of the card punch requires a card in the "punch ready" and "read ready" stations upon completion of the previous job. Since the bin card directly follows, it is convenient to simply flip this blank card over and use it to identify the deck. Most users place these identifier cards in the boxes for recycling. Therefore, the convenience and the recycling ability avoid a complete waste.

(D. Sabre)

Q/S How about placing CATALOG of UCC libraries, OPLs, etc. in the user room?

A It is our current policy to permit users to generate their own catalogs of libraries that interest them. The following control statements show one example that works nicely.

A,IMSL.
 CATALOG,IMSL/RR,N=***.

(T. Hodge)

Q/S Please publish the consultants' schedule by name in the newsletter, since some consultants are more knowledgeable in some areas than the run of the mill.

A We adhere fairly strictly to our posted hours of consulting. However, we never can guarantee that a given consultant will fill a certain spot in the schedule for any long period of time. Staff members and R.A.s who consult also teach and/or attend classes and meetings. This means we must have the freedom to interchange hours with each other. We post schedules in or near the consulting sites (Lauderdale Users' Room and ExpEng 140) but we do not promise a particular consultant at a particular hour.

(T. Hodge)

Q/S I read the complaint about the operators in the newsletter today. In my opinion, it is not justified. It's not that I've never had a criticism of an operator--obviously one who's been around here as long as I have occasionally has a complaint or two. Also, it's not that I've never seen an operator become discourteous, but I think they've been provoked at least 1/2 of the time. I think that the operators are first rate, and there is surprisingly little conflict between them and the users. Both the users and the operators have jobs which occasionally raise their blood pressures and I don't think that the operators overreact nearly as much as some users (sometimes even me)!

A Thank you.

(The Operations Staff)

Q/S Music playing, pretty colored cards.

A ?

Q/S As long as your're going to make changes to KRONOS 2.1, why don't you formally solicit suggestions from the users? Most would probably be impractical but there might be one or two good ones and anyway, it would be easier to include changes from the beginning. Would you add NR parameter (NO RELEASE) to the DISPOSE card in KRONOS 2.1? If you don't think this situation would arise, contact me for one where it would.

A We are always interested in suggestions and will try to have a meeting (or meetings) with the users after they try the KRONOS 2.1 system for the first time. Your suggested NR parameter would be very difficult to implement at this time and thus we currently are rejecting that proposal.

(L. Liddiard)

- Q/S a) Could MNF put out dayfile messages indicating where FORTRAN errors occurred as in FTN?
- b) For MNF, allow D=char to replace \$ in C\$ by char thus facilitating the use of MNF or FTN DEBUG on the same deck.
- c) Why not add an "S" option to MNF (S is short for "stick the compiled program out on a file in overlay format"). Then
 MNF(S)
 LGO.
 LGO.
 would work the same as
 FUN(S)
 LGO.
 LGO.
 and seems more natural than the present OVERLAY(LGO,0,0). I suggest S=FILENAM in general with LGO the default. If done right, then
 COMPASS.
 MNF(S,B=LGO)
 LGO.
 would even work.
- d) The MNF compiler has some great TRACE options. They are extremely helpful in debugging and optimization. How about adding to the trace options one which would tabulate total running time in each subroutine? For every subroutine entry a timer would be initiated, and stopped whenever execution transfers outside the subprogram (e.g., for any non-library subroutine calls, non-library function calls, or returns). Such a tabulation, along with the S+m.No. frequencies already provided, would clearly show where optimization efforts should be concentrated. This would probably best be turned on along with the options activated by the T control card parameter.

A Since there were a number of MNF suggestions, we will try to answer them in one reply and also mention several other MNF projects.

- a) MNF will be made to put out a dayfile message with the number of FATAL level errors for each subprogram having such errors. We realize that for long multiple-subprogram source decks a single FATAL error message can be hard to find.
- b) Since, under KRONOS, we are encouraging MNF and FTN usage, we will implement such an option for the D parameter. Note that D="blank" will mean that most comment cards will become FORTRAN source statements.
- c) Under the version planned for the KRONOS system we are producing relocatable code in the MNF compiler and the B option in that case will produce the relocatable binary that will allow you to do as you requested in your example, i.e.,

```
MNF(B)
LGO.
LGO.
```

This version of MNF can be tested out on MOMS by using the control card NEW,MNF. before the MNF control card.

- d) Your suggestion is being considered for the KRONOS MNF version since MOMS uses MTR recall rather than CEJ/MEJ (this mainly means that there currently would be 4000 microseconds of inaccuracy in each timing call which could completely overwhelm the timing of short subprograms). This option is likely to be TRACE SUBPROGRAM TIME as a FORTRAN source statement. In addition to your suggestion, a TRACE feature will be added that allows a subprogram to be invoked whenever a specific name is stored by using TRACE name/subprogram.

Additional MNF changes that are planned in order to bring MNF closer to what the new FORTRAN and other current compilers do are:

- 1) Allow * to be used for FORMAT FREE (list directed) I/O, i.e., WRITE(6,*) and PRINT*, in addition to the current WRITE(6,) and PRINT,
- 2) Allow seven subscripts.
- 3) Allow variable dimension specifications to be COMMON names besides the current "parameter" names.
- 4) Implement MNF FORTRAN routines SINH, COSH, TAN, and improve ALOG10, ASIN, and ACOS.

(L. Liddiard)

Q/S Hoping to shorten the waiting periods and discourage users of the 1004 with long printouts, I wonder if it is possible to automatically re-route such printouts to the fast printers, provided that a simple message is given to the concerned user to that effect. Thanks.

A Yes, this is possible, but the local supervisor who is in control of a particular Remote Batch Entry (RJE) station must invoke the automatic re-routing. Currently, it is very difficult to get those outputs that would be printed at Lauderdale back to the originating site if the supervisor does elect to divert long printouts. We suggest that those persons with long printouts try to run at "uncongested" hours or late in the evening as a courtesy to their fellow users. UCC plans to report soon on its investigations into faster throughput for RJE terminals. The Lauderdale site which is currently using 4800 bps (bits per second) modems is an example of what is possible.

(L. Liddiard)

CYBER 74 OPERATING HOURS

	12:01AM	2AM	3AM	4AM	8AM	4PM	Midnight	
Sunday								
Monday							
Tuesday							
Wednesday							
Thursday							
Friday							
Saturday							

..... (Lauderdale only)
 ||||| (Lauderdale, ExpEng)
 //// (Lauderdale, ExpEng, West Bank)

MEDIUM SPEED REMOTE TERMINALS

(Hours will vary from site to site.)

site	Supervisor
38 ElectE (East)	J. Guentzel/373-5404 M. Cook/373-3895
N640 EltH (East)	J. DeWitt/376-7377 N. DeWitt/376-7377
S191 KoltH (East)	T. Faulkner/376-7024 J. Abdallah/373-2348
321 MinMet (East)	C. Swanson/373-5475 R. Oelfke/373-5680
69 Physics (East)	Bob Scarlett/373-0243 Dave Olson/376-7175
167 SocSci (West)	G. Lutgen/373-3608
257 BioSci (StP)	R. Comstock/373-0928 H. Meyer/373-3067
125G ClaOff (StP)	C. Bingham/373-0988
415 CofH (StP)	D. Nelson/376-7003 T. Ehlen/376-7003
24 NorH (StP)	J. Colten/373-0990 D. Rignell/373-0990
Users Room (Laud)	Shift Supervisor/373-4940

TELEPHONE NUMBERS

373-4548	Account Clerk, CYBER 74
373-7753	Account Clerk, 6400 (MERITSS)
373-4596	ExpEng I/O
376-7067	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

KEYPUNCH LOCATIONS

(number of keypunches is in parentheses)

East Bank		St. Paul	West Bank
38 ElectE (1)	321 MinMet (1)	257 BioSci (1)	90 BlegH (1)
N640 EltH (1)	69 Physics (1)	125G ClaOff (1)	167 SocSci (1)
130 ExpEng (2)		415 CofH (1)	
131 ExpEng (1)		24 NorH (1)	
208 ExpEng (8)*			<u>Lauderdale</u>
223 ExpEng (4)			Users' Room (4)*
S191 KoltH (1)			

*includes 1 interpreting card punch.

CONSULTING SCHEDULE

EAST BANK	GENERAL COMPUTING	STATISTICAL COMPUTING
140 ExpEng	Mon- 9AM-5PM Thurs : 7PM-9PM Fri : 9AM-5PM Sat : 12 N-2PM Sun : 7PM-9PM	Mon : 1:00PM- 3:00PM Tues : 8:30AM- 1:30PM Wed : 10:00AM-12:00 P 1:00PM- 3:00PM Thurs: 9:00AM- 2:00PM Fri : 8:00AM-10:00AM
ST. PAUL	GENERAL COMPUTING	STATISTICAL COMPUTING
125E ClaOff & 125C ClaOff	Mon : 8:00AM- 1:00PM 1:30PM- 6:00PM Tues : 8:30AM- 1:00PM 2:00PM- 6:00PM Wed : 8:00AM-12:30PM 1:30PM- 8:00PM Thurs:8:30AM- 1:00PM 2:00PM- 6:00PM Fri : 8:00AM-12:30PM 1:30PM- 6:00PM Sat : 9:00AM-12:00 N	Tues : 9:00AM-12:00 P 12:30PM- 3:30PM Wed : 3:00PM- 5:00PM Thurs: 9:00AM-12:00 P 12:30PM- 3:30PM Fri : 1:00PM- 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 : 9:00AM-12:30PM Wed : 2:30PM- 5:30PM Thurs: 9:30AM-12:30PM
LAUDERDALE	GENERAL COMPUTING	STATISTICAL COMPUTING
	Mon- Thurs: 1:30PM-3:30PM 7:30PM-9:30PM Fri : 1:30PM-3:30PM	Mon: 1:30PM-3:30PM

*Social science computing only.

REFERENCE MANUALS

[Copies are available for reference in 140 ExpEng, Lauderdale Users' Room, West Bank Computer Center, and at the medium speed terminal sites.]

APEX I	86615300C
ALGOL version 2	60306100D
COBOL version 3	60253000E
COMPASS version 2	60279900D
CYBER 74, volume 1	60347400
CYBER 74, volume 2	60347300
CYBER 74, volume 3	60347100
FORTRAN EXTENDED version 3	60329100D
FTN DEBUG users' guide	60329400C
FORTRAN (RUN/FUN) version 2.3	60174900F
MIMIC simulation language	44610400E
MODIFY	60281700D
PERT/TIME	60133600C
SCOPE version 3.2	60189400L
SIMSRIPT version 2	60178300C
SIMULA	60234800E
SORT/MERGE version 3	60252600E
6000/7000 computer systems	60100000W
BMD & BMDX: Biomedical Computer Programs	
IMSL library catalog (library 3, edition 3)	
MNF reference manual	
OMNITAB II programmers reference manual	
OMNITAB II, an introduction to	
SPSS: Statistical Package for the Social Sciences	
SPSS version 5.5 (CYBER 74 implementation)	
System 2000 reference manual	
System 2000 users' guide	
UMST: University of Minnesota statistical programs	
UCC Users' reference manual	

The Subcommittee on Statistical Packages and Support Services is making an inventory of existing statistical programs or packages which have been implemented on the 6600 or 6400. If you possess any statistical programs or packages which have the potential for general use, whether written by you or obtained from elsewhere, please complete the form below. We are interested in making an inventory of all statistical programs whether or not you would be willing to document or maintain them.

NAME _____
ADDRESS _____
TELEPHONE NUMBER _____

I have the following statistical programs:

	<u>Name of Program</u>	<u>Documentation Available?</u>	<u>Willing to Maintain?</u>
1.	_____	_____	_____
	_____	_____	_____
2.	_____	_____	_____
	_____	_____	_____
3.	_____	_____	_____
	_____	_____	_____
4.	_____	_____	_____
	_____	_____	_____
5.	_____	_____	_____
	_____	_____	_____

Please return this form to:

John Neter
715 Business Administration Tower
West Bank, Minneapolis Campus

Q/S Why doesn't DUMPSD/LOADSD work? The sequence

P,A,.....
DUMPSD(SD=ONCXRAH,.....
P,R.
P,A,.....
DUMPSD(SD=HISTORY,.....
P,R.
P,C,JOE,.....
REWIND,DUMP.
LOADSD(SD=JOE,.....

loads the dumped files from both ONCXRAH and HISTORY into JOE.

A To have this work successfully you must use the EF parameter to put an end-of-file after each dumped subdirectory. See the disk pack writeup, page 5.

(E.J. Mundstock)

BRIEF NOTES

A New Permanent File Device will be added on May 5th to satisfy the increased demand for permanent file disk space. This pack will be UCC105.

Used Listings of 100 or More Pages will be happily accepted by UCC. We will use the back sides for printing on systems time to conserve paper. Please return paper to Experimental Engineering or Lauderdale.

To Those of You Who Use Statistical Packages or Programs...please read page 7 of this newsletter carefully. The Subcommittee on Statistical Packages & Support Services will very much appreciate your assistance. If you have programs you would like to have included in this inventory, just tear off this page and send the completed form to Professor Neter.

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

IF YOU WISH TO HAVE YOUR NAME
REMOVED FROM THIS MAILING LIST,

WRITE TO:
EDITOR
UCC NEWSLETTER

AT THE ABOVE ADDRESS, OR CALL
373-7744.

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ROOM 11 WA LIP
MINNEAPOLIS CAMPUS