University Computer Center newsletter

CONTENTS

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SOME NOTES ON THE LAYOUT OF THIS NEWSLETTER

As this newsletter has grown bulkier, an attempt has been made to organize material and group it logically. For example, columns titled "LIBRARY CHANGES & ADDITIONS", "PUBLICATIONS", "NEWS FROM SYSTEM NOTES", "THE SUGGESTION BOX", AND "SPECIAL LANGUAGE PROCESSORS" have been established to permit readers to choose what they want (or don't want) to read. A table of contents is available in each newsletter to aid in this selection process.

Beginning with this edition, a new feature has been added. The front page will now be dedicated to information that is VITAL to ALL users. Notices of this type will be boxed in dollar signs (since not reading the information will often cost dollars and/or time).

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CHRISTMAS HOLIDAY HOURS

THE CYBER 74 OPERATING HOURS ARE NOT CHANGED DURING THE QUARTER BREAK. HOWEVER, THE SPECIAL OPERATING HOURS FOR CHRISTMAS ARE:

LAUDERDALE: CLOSE AT 6:00 PM ON MONDAY, DECEMBER 23
OPEN AT 8:00 AM ON THURSDAY, DECEMBER 26

ExpEng   : CLOSE AT 4:00 PM ON MONDAY, DECEMBER 23
OPEN AT 8:00 AM ON THURSDAY, DECEMBER 26

NEW YEAR'S HOLIDAY HOURS

LAUDERDALE: CLOSE AT 6:00 PM ON TUESDAY, DECEMBER 31
OPEN AT 8:00 AM ON THURSDAY, JANUARY 2

ExpEng   : CLOSE AT 4:00 PM ON TUESDAY, DECEMBER 31
OPEN AT 8:00 AM ON THURSDAY, JANUARY 2

QUARTER BREAK CONSULTING

FROM DECEMBER 13 THROUGH JANUARY 8, CONSULTING HOURS WILL BE CHANGED, PLEASE SEE THE SCHEDULE POSTED AT EACH SITE. BEGINNING JANUARY 9, NORMAL CONSULTING HOURS WILL BE RESUMED.

SOFTWARE SUPPORT LEVELS

--by R.L. Hotchkiss

In response to user requests and to clarify UCC's position on software maintenance, UCC is now defining software support levels. These levels are numbers that indicate the priorities UCC will assign to software systems, packages, programs, subprograms, macros, etc., that is, all kinds of software. Thus, level 1 will designate software which has our highest priority. If errors are found in level 1 software and in lower level software, we will devote more effort to repairing the level 1 software. Similarly, more effort will be devoted to documentation of high priority software and to improvements in such software. These support levels designate UCC priorities. Software supported by an outside vendor or institution may have a lower support level assigned by UCC even when it is well supported by the vendor.

These support levels will be published in the Index to CYBER 74 User Software, the KRONOS 2.1 Control Card Index, and in individual documents. These levels are defined as follows:

Level 1: Software which has the highest usage and is maintained by UCC.

Level 2: High usage software which is maintained by outside vendors or institutions. Since actual correction of errors at this level is outside of our direct control, speed of error correction will vary from that of level 1 to lower levels.

Level 3: Lower usage software which is maintained by either UCC or outside groups.

Level 4: Experimental or developing software. Use at your own risk. Please report errors via PTR's or to User Services.

Level 5: Completely unsupported software. We will supply source or binary code and whatever documentation we have. You are then on your own. Use at your own risk.

UCC SOFTWARE STABILITY
GUIDELINES FOR FUTURE SOFTWARE CHANGES

--by R.L. Hotchkiss

In order to provide instructional departments with stability in UCC software, we are setting up the following procedures:

1) One quarter in advance, any instructional department may furnish UCC with a list of compilers, assemblers, packages, programs, and, in some cases, subprograms, that they expect to use one quarter hence, along with a rough count of the number of students using each item. Thus, the spring quarter list should be supplied in January; the winter quarter list is already due; etc. This list should be sent to the attention of User Services (T. Hodge, R. Franta) and may be accompanied by documentation of changes desired by the department; such changes being primarily in the area of known errors.

2) UCC will respond to each department in approximately two weeks indicating the software where change is contemplated by the next quarter. These changes will be documented with the response.

3) Upon receiving the UCC response, any department may appeal any planned changes by setting up meetings through User Services.

4) So that all users may know what to expect on support of software, UCC will publish support levels on all software. (See the first article on this page.)

5) UCC will continue its policy of having NEW, "current", and OLD versions of major software and will always consider the opinion of major users before making a version the "current" one. If a "current" version proves unreliable, we will replace it with a back-up OLD version. Instructors should encourage students to use NEW versions of software so that this aging method of testing software will work.

6) Since, despite these procedures, Murphy's law will still prevail and failures will occur, users are reminded that User Services should be their first point of contact when trouble occurs. User Services will centralize complaints, channel communications with the user, and gather data on trouble areas.

CHANGE PROPOSED FOR UCC LIBRARY SUBROUTINES

--by R.L. Hotchkiss

Currently, some UCC library subroutines have a FATAL termination if called with illegal parameters. Some subroutines, particularly the elementary functions SIN, COS, etc., return infinite or indefinite values if called with illegal parameters. They then return to the calling program where computation continues until the infinite or indefinite value is used. When this does not occur immediately, the cause of the error may be difficult to trace, costly computer time may be wasted, and, in some cases, much precious paper wasted. When we last mentioned this problem in this newsletter many months ago and proposed making all of these errors FATAL, there were no objections. We are hereby serving notice that, during spring quarter break, these errors will be made FATAL.

SYSTEM 2000 REPORT WRITER AVAILABLE

--by S.P. Nachtsheim

The University Computer Center has received and validated a special pre-release version of the Report Writer Feature for System 2000. This feature, similar to the COBOL Report Writer, enables the user to generate reports ranging from simple three-up mailing labels to complex multi-page reports from an existing System 2000 data base. Full pagination, formatting, breakpoint and summary total features are available, as well as detail-summary selection and ordering on up to twenty fields and function calculations.

As a pre-release version (System 2000 2.35) the Report Writer exists separately from normal System 2000. The Report Writer may be obtained by the use of the following control card sequence:

```
job card with CM54200
BIN card
ACCOUNT card
S2000RW.
(7-8-9 card)
    :
    :            System 2000 commands
    :
(6-7-8-9 card)
```

In addition to all of the standard System 2000 Report Writer commands, this version accepts the following normal S2000 commands (and only these commands):

```
USER,<password>:
DATA BASE NAME IS <data base name>:
SHARED DBN IS <data base name>:
REPORT FILE IS <file name>:
COMMAND FILE IS <file name>:
MESSAGE FILE IS <file name>:
SEPARATOR IS <system separator>:
ECHO ON:
ECHO OFF:
ACCESS:
CONTROL:
EXIST:
```

The use of any commands other than those listed will cause a fatal error. Documentation of the Report Writer Feature is available as an additional chapter to the System 2000 Reference Manual in the manual racks at all remote locations or through the UCC Reference Librarian. NOTE: The Report Writer is not available on the MECC/MERITSS system in the pre-release version due to core limitations.

SYSTEM 2000 ON MIRJE

System 2000 is available through MIRJE in interactive mode. Both the Natural Language and Report Writer features may be accessed from a terminal. To access Natural Language System 2000, type:

```
BATCH,44000
S2000
```

To access the Report Writer Features, type:

```
BATCH,54200
S2000RW
```

The programming language interface to System 2000 is not directly available to MIRJE users because of core limitations.

PATTERN RECOGNITION PACKAGE

--by D. Eggers

A new pattern recognition package from the University of Washington is now available. The program is called ARTHUR; from its table you may select a number of techniques.

During unsupervised learning ARTHUR will do hierarchical clustering (with hierarchical dendrogram plot), and compute the Zahn minimal spanning tree.

During supervised learning ARTHUR will find: The K-nearest neighbors, the "best" hyper-plane separation of the data using all of the variables, a stepwise regression hyper-plane which calculates the "best" hyper-plane separation of the data after a step-wise selection of the best variables according to an F-statistic. There is a binary linear learning machine which will separate category pairs, and there is also a multiclass linear learning machine that generates all (m) category versus non-category separations.

ARTHUR also provides means for preprocessing of data such as: autoscaling, linear and nonlinear transformations, weighting, karhunen-Loève transformation of data and means for feature reduction and feature selection.

ARTHUR provides aids for determining interrelationships between variables in the form of correlation and covariance matrices and two dimensional line printer plots.

The UCC Reference Room has documentation on ARTHUR, and sample output is available for inspection. If you are interested, further information can be obtained from Dan Eggers, 223 Experimental Engineering (376-5262).

THE FORTRAN COMPILERS

URGENT WARNING TO FORTRAN USERS --by L.A. Liddiard

A number of users have been caught by the EOF(i) function examples on page I-8-19 of the FORTRAN Extended version 4 Reference Manual and page I-5 of the FORTRAN Extended version 3 Reference Manual. These examples state that the EOF(i) function returns zero if no end-of-file was encountered and non-zero if an end-of-file was encountered; yet the examples show EOF(i) being used in a very non-standard 2-branch arithmetic IF statement which appears to the user to be a logical IF. THIS DOES NOT WORK ON MNF. To be compatible between both compilers, use

        IF(EOF(i))10,20,10

or

        IF(EOF(i).NE.0)10,20

where 10 means an end-of-file [EOF] was found on unit i and 20 means no EOF was found.

MNF -- RELIABILITY AND NEW FEATURES   --by C.F. Schofield

In an attempt to further improve the reliability of the MNF compiler whilst retaining the ability to add new features, we are going to change the way that new versions of MNF are made available to users. After January 1st, 1975, no substantial new features will be added to the compiler as it then exists (it will probably be version PSR4), and three versions of the compiler will be available.

OLD,MNF.

This will be the same as the previous system version of the compiler. Thus, when PSR4 is installed in the system, "OLD,MNF." will access PSR3. This version should only be used if both the system version and the NEW version (see below) fail.

MNF.

This will be the current system version and should be better than OLD. It will eventually be replaced by the NEW version but this will not be done without adequate warning to users.

NEW,MNF.

This will be the latest version and users, especially those with critical or difficult jobs, are urged to try NEW versions as soon as we announce them. These will not contain major new features over the current version. However, errors will be corrected in NEW so that users who find an error in the current version should re-run the job on NEW. If the error persists, then a PTR form should be filled out and sent (with the job) to the Systems Group. When NEW is felt to be significantly more reliable than the current system version we will replace 'current' by NEW and OLD by 'current'. At this time the previous OLD version will be lost.

Thus, it is important that users do not use the OLD version unless there is no alternative. It will greatly accelerate improvement if users try the NEW versions as soon as they are available and, of course, report any errors found. We will not install a NEW version unless our tests show it to be better than the current one. We will never knowingly replace existing bugs by new, different ones.

It may surprise some users that, given the extensive testing we do, we install compilers that contain any errors at all. However, it is generally recognized by compiler writers that the only way to properly test a new compiler is to install it "in the field" and that no amount of pre-release testing will find all of the bugs. This is why we urge you to use NEW versions.

Meanwhile, it sometimes remains necessary to introduce major new features into compilers. These may involve extensive changes, sometimes amounting to thousands of cards, and it would be surprising if such changes did not introduce new errors which are not detected by our own tests. One thing that will make extensive changes to MNF desirable is the new standard FORTRAN currently being designed by the American National Standards Institute (ANSI). Their design, which involves many major extensions to current FORTRAN, is expected to be made public in 1975; and CDC has stated that the FTN compiler will be modified to conform to the new standard. It is clearly in the interest of users that MNF should remain closely compatible with FTN, and one exception that may be made to the rule barring new features in MNF may be the introduction of features currently possessed by FTN version 4.2 (a great improvement over version 3) which has just been installed (see the next article in this newsletter).

We intend to resolve the conflict between new features and reliability by making available a new compiler (whose name has yet to be decided). This new compiler will initially be the same as MNF PSR4 but, as new features are added so will it diverge from MNF. Any (relevant) errors found in the new compiler will also be corrected in MNF (and vice versa) but MNF will not contain the new features demanded by the ANSI standard. Again, users will be encouraged to try the new compiler since it is likely, in time, to replace MNF. The changes demanded by the new standard are not expected to affect currently running programs and we will not knowingly release versions that are less reliable than the current MNF. However, since the new compiler will be subject to constant and extensive change, there are likely to be new errors, introduced from time to time. Only with your cooperation will we be able to find them.

A NEW FTN COMPILER   --by C.F. Schofield

A new version of FTN (version 4.2) is now available via:

                    NEW(FTN)
                    FTN(options, see below)

This new compiler is a considerable advance over the current FTN version 3.0 and will replace it after
adequate user testing.

Apart from being more reliable, the compiler allows new features such as IMPLICIT and LEVEL statements
and list directed (format free) input and output statements. These features are described in the FTN Reference
Manual, revision F. This manual actually describes version 4.3 whereas our compiler is version 4.2 but, with
the exceptions described below, this manual should accurately describe the new compiler.

A major difference introduced by the new compiler is that FTN programs now do input and output by
means of Record Manager. This is a set of CP library subroutines and offers very powerful facilities so that
many different file formats can be read or written. All new CDC products are written to use Record Manager
(sometimes called 6RM), and we will now be able to read tapes written at other CDC installations. The only
serious disadvantage of 6RM is the field length it occupies, since this adds to the CM required in execution
by FTN programs. Thus, whilst programs may run somewhat faster than under FTN 3.0, most will normally require
roughly 5000 octal words more during execution. Since there is no charge for CM usage at UCC, this is not
considered to be a serious disadvantage for users; but some very large jobs that only just fit into the machine
using FTN 3.0 may not fit using version 4.2. If this proves to be the case please let us know.

The main change affecting users is the introduction of new style parameters (options) on the FTN
control card. The options that have been changed are listed below. Whilst the old style G and list options
may still be accepted by version 4.2 their use will cause a (somewhat obscure) dayfile error message to be
printed. It is recommended that the new options be used since FTN version 4.3 (which we hope to get) will
not accept the old options. Whilst this may appear to be an arbitrary change, it is not expected to affect many
users. None of the important default options have been changed and the control card FTN. works as it did
before.

I have had considerable experience on this compiler at the University of London where it is running
over a thousand jobs per day. It is certainly the best FORTRAN compiler yet produced by CDC. It also has
the further advantage of full CDC support whereas FTN 3.0 is no longer supported.

CONTROL CARD CHANGES
[In general, the new style control cards will not be accepted by FTN 3.0.]

1) The concatenated list options are no longer allowed.

      L=file   Selects the file on to which source and object listings, error messages, and reference maps
                  are to be written. Strings such as LRX=OUTPUT are replaced by separate options:
                        SL selects the source listing (on by default)
                        OL selects the object listing (off by default)
                        EL selects the error message level:
                              EL=A for all error messages
                              EL=I for all error messages except non-ANSI usage (default)
                              EL=N for fatal error messages only.
                        Note that the old X option (equivalent to EL=A) now means something quite different.
      EXAMPLES:
                  Old style: FTN(LRX=OUT)   is now: FTN(SL,R,EL=A,L=OUT)
                  Old style: FTN(O=OLIST)   is now: FTN(OL,L=OLIST)

2) The G option is replaced by GO (and G means something else).
   EXAMPLE:
                  Old style: FTN(GB=BINARY)   is now: FTN(GO,B=BINARY)

3) FTN(I) now means FTN(I=COMPILE) rather than FTN(I=INPUT)

4) FTN(V) for short compiler buffers is no longer allowed.

5) FTN(SYSEDIT=FILES or IDENT) is replaced by FTN(SYSEDIT).
   EXAMPLE:
                  Old style: FTN(SYSEDIT=IDENT)   is now: FTN(SYSEDIT)

The following options, which are described in the FTN Reference Manual, revision F, are not accepted by
FTN version 4.2 (they were introduced at level 4.3):
                  a) BL and BL=0
                  b) ML=nnn
                  c) SEQ
                  d) TS
                  e) G=file
                  f) X=file

Finally, a useful new option is available under FTN 4.2:
      PL=n   where n is a decimal (or octal B) number specifying the maximum number of lines which
                  will be printed on the OUTPUT file during execution only (like MNF(P=n)).
Note: Users with tape jobs should defer using FTN 4.2 until we have determined the effects of Record Manager.
It may be true that tapes written using 4.2 under the default file settings will not be readable using other
UCC programs.

WHICH FORTRAN COMPILER SHOULD I USE? --by C. F. Schofield

Several things are involved when one decides upon which FORTRAN compiler to use, such as: reliability of the compiler, language features, ease of debugging, and so on. But one major item influencing the decision should certainly be "which compiler will be the cheapest to use?" It is wrong to assume that all compilers are about the same in this respect. A bad choice of compiler could increase your computing costs by an order of magnitude. For example, we will show that the use of FTN(OPT=0) is a poor choice for all classes of jobs and that it is typically three to four times as expensive as FTN(OPT=2) for long jobs.

We have run a large number of what appear to be typical FORTRAN jobs in an attempt to aid the user in choosing the best compiler for his programs. None of our jobs used tapes nor did very large amounts of input or output, but we have evidence to show that I/O operations (shown as "KPR" in the job dayfile) are equally efficient on all of the UCC FORTRAN compilers. In addition, the storage used both in compilation and execution is very similar on the various compilers (any remaining problems with excessive compilation core under MNF will be solved by the introduction of PSR4). Thus, the major item contributing to the cost of a job is the CP time it takes, and the cost is about proportional to total CP time for most jobs.

The compilers used in our tests were RUN version 2.3, FTN version 3.0, and MNF PSR3. The results are given in the attached graph, and several things become immediately clear.

1. *The decision to discontinue support for the RUN compiler was justified.*

Apart from other considerations (such as an unnecessary and confusing proliferation of compilers), RUN is worse than FTN(OPT=1) for jobs taking more than 5 seconds, and worse than MNF for jobs taking more than 1/2 a second (about the minimum time for a small job).

2. *FTN(OPT=0) should not be used.*

Even with no debug statements in the programs (OPT=0) was always much slower than MNF, and was better than FTN(OPT=2) only for very short jobs (taking less than 2 seconds). Use of debug statements in FTN "turns on" (OPT=0) resulting in a dramatically poor performance if (say) TRACE ARRAYS (subscripts) is used. FTN with debug turned on will often result in a job cost more than ten (10) times as much as the same job using MNF(T). The times for MNF(T), which are not plotted here, were between 10% and 100% more than the times for MNF. MNF(T) times were nearly always less than those of FTN(OPT=0) even though MNF(T) turns on execution time checking whereas (OPT=0) does not. Conclusion: USE MNF FOR DEBUGGING, NOT FTN.
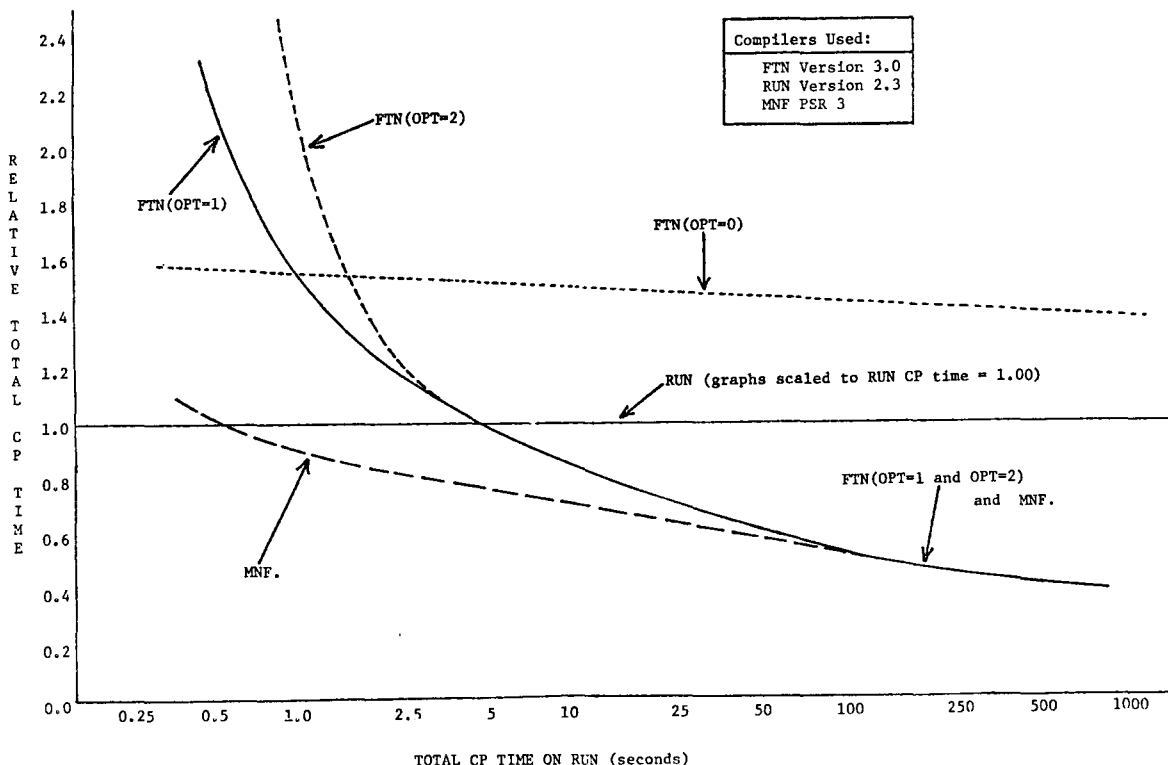
3. *FTN(OPT= 1 or 2) should not be used for jobs taking less than 100 seconds.*

The high compiler costs of FTN are not compensated by the good execution speed of (OPT=2) until about 100 seconds are spent in execution. This is accentuated by the good execution code produced by MNF, particularly for "one statement" DO loops (such as used in matrix inversion routines) whereas (OPT=2) performs more general optimizations.

4. *FTN(OPT=2) should probably be used for jobs taking more than several hundred seconds.*

This is not demonstrated by the graph but other evidence points to FTN(OPT=2) being the cheapest compiler for very long jobs. This will be more significant when newer versions of FTN are installed at UCC since CDC has been improving the optimization done under (OPT=2), and no major execution speed improvements are currently planned for MNF. There would appear to be no point in using FTN(OPT=1) since (for long jobs) the slight increase in compile time under (OPT=2) is always compensated by the better execution speed (and for short jobs MNF should be used). We may summarize the conclusions: FOR JOBS LONGER THAN ABOUT 1000 SECONDS, USE FTN(OPT=2), FOR ALL OTHER JOBS, USE MNF.

Of course there will be exceptions to these rules. No doubt, jobs can be devised which run quicker under FTN(OPT=0) than under MNF, and there will be long jobs than run quicker under MNF than under FTN(OPT=2). However, our results are surprisingly consistent, using a set of jobs which were chosen at random, and it is probable that a large majority of user jobs can benefit from these suggestions.

TOTAL CP TIME ON RUN (seconds)

BRIEF NOTES

FILE SECURITY *--by T.D. Hodge*
        The file security parameters, "FS=", is not implemented in the FORTRAN subroutines CALL SAVE(...)
and CALL DEFINE(...). If you wish to secure a file, it is necessary to access the file in control language
and use the command CHANGE (see the KRONOS 2.1 Reference Manual, page 5-75) to add the parameter FS=SC to
the file.
        If you are uncertain about the security status of your files, do a CATLIST,LO=F. The secured
files will be listed with an asterisk (*) before the DIR (direct) or IND (indirect) indicator.

TRANSIENT TAPES: NEW PROCEDURES, NEW PAPER LABELS *-- by J. Larson & K. Matthews*
        New paper labels for transient tapes have finally arrived and are now available for use. A
sample label is shown below.


```
                        U.C.C.
                 CUSTOMER OWNED TAPE

    TRANSIENT TAPE VSN_____

    TRANSIENT TAPE ID _____

    USER_____ PHONE _____

    RETURN TO (LOCATION)_____ DATE_____
```

Procedures for using transient tapes have been changed. The transient tape VSN is now TTxxxx where the
xxxx are user-assigned alphanumeric characters. The ID is 1-17 alphanumeric characters (also user-assigned).
        When using labeled transient tapes (those with internal labels), the VSN on the LABEL control card
which requests a tape must match the VSN on the paper label.
        When using unlabeled transient tapes (those with no internal label), the VSN and the ID on the
LABEL control card which requests a tape must match the VSN and ID on the paper label.

        Special request slips should accompany all jobs using transient tapes. In some cases, a user may
wish to use a labeled tape from another site (in which case the VSN on the tape label will not conform to
the above specifications). If this happens, the VSN on the paper label should match the VSN on the LABEL card
which requests the tape and the operator should be alerted to the nonstandard VSN via a special request slip.

A NOTE TO 1004 USERS ABOUT CODE CONVERSION CHANGES *--by R.T. Franta*
        The code conversions used between the CYBER 74 and the Univac 1004 have been altered to make them
more compatable with other uses of the symbols. Also, each code will have a unique print representation to
make print interpretation easier. Please consult the latest Pocket Guide (December, 1974) for a detailed
list of print characters.

MNF (OR ANY OTHER) ERRORS *-- by B. Stahl*
        If you think you have found a bug in MNF which is not on the PTRLIST (posted in Room 140 Experimental
Engineering), call Betty Stahl, 217 ExpEng (376-7290) to see whether it has been reported previously.
        To get your own copy of PTRLIST, use the following deck setup:
                FETCH,PTRLIST.
                COPYBF(PTRLIST,OUTPUT)

TO DEBUG OR NOT DEBUG (WHEN SAVING PAPER IS WASTING PAPER) *-- by T.D. Hodge*
        We have noticed that instructors are advising their students to run MNF programs with the parameter
R=0 which suppresses all of the cross reference information. This is a paper saving procedure and much to
be commended for jobs which are thought to be without error or for very simple short programs. However, the
failure rate on student jobs is very high. Without a cross reference list and a partial load map [MAP(P)]
the student and the consultant together may have difficulty finding the offending code. In this case, the
student may have to re-run the job with at least R=3 (the default setting) or even with R=7 to get a missing
variable cross reference list, thus using up more paper than he originally saved.
        Only the instructor can judge the expected error rate on a particular assignment. If you think that
it will be high, you may wish to suggest that the student request the cross reference list until he knows his
program well enough to debug without the cross references.

DOCUMENTATION/PUBLICATIONS

        The writeup for MF501 has been revised and is now available in 140 ExpEng.
        The writeup for RK has been revised and is now available in 140 ExpEng.
        The writeup for SCLPLT has been revised and is now available in 140 ExpEng.
        A new publication, "Student Guide to Batch Processing", has been published and distributed to
instructors. Reference copies are available at all terminal sites and at the consulting desks.
        The writeup for NONLIN has been revised and is now available in 140 ExpEng.
        The "Pocket Guide to UCC Facilities" is undergoing revision and will be available on
December 31. Copies will be available at all terminal sites and from the Reference Room (235a ExpEng).

*(All free materials which are listed as "available in 140 ExpEng" can also be obtained by writing or
calling the Reference Library, 235a ExpEng, 373-7744.)*

THE SUGGESTION BOX

[Questions may be re-worded for clarity. Unsigned cards are ignored.]

Q/S *Could the dayfile be printed at the start of a job instead of the end? This can save printing a lot of rubbish for long jobs that fail.*

A   Dayfiles can also become very long due to control card errors. We have no plans to change the order of printing now. (K. *Matthews*)

Q/S *Does the cryptic remark 0.044 KPR on the dayfile mean 44/1000 punched records? If so, isn't there an easier way to say it? If not, could the dayfile include an indication that punching has occurred. It's nice to be reminded.*

A   The remark .044 KPR means 44/1000 KPR where KPR is a thousand physical records (or sometimes "primary" records). In this case a physical record refers to a group of 64 words (640 characters). 44 x 64 = the number of words transferred from mass storage (see the September newsletter, page 3). We charge for these transfers instead of the old PP charge.

     A dayfile message indicating that punching was done will be added by December 1. (T. *Hodge*)

Q/S *I am having trouble reading in binary decks at Experimental Engineering!*

A   Under KRONOS there must be a 6-7-9 card after the last binary deck so that the Loader will work properly and not give the message "UNIDENTIFIED LOADER INPUT". When testing this out we discovered that some old version IMPORT decks (used with the MOMS system) were occasionally read in at Experimental. These caused the 6-7-9 to fail on that day. We have destroyed these old decks.   (L. *Liddiard*)

Q/S *Why is it necessary to use a LIBRARY(FT3LIB) card in order to run binary decks?*

A   Our compilers do not currently write LDSET tables in the binary; the LDSET table is necessary if the LIBRARY card is to be omitted. The LDSET will be produced in the next version of MNF (scheduled to go into the system winter quarter). The LDSET table is produced by FTN version 4 which is now available experimentally.   (K. *Matthews*)

Q/S *The LIMITS routine was put into the system and is now causing problems for users who have jobs with large files that ran previously but don't run now. We were not aware that LIMITS was not working before so if a file was saved we thought it was within the LIMITS but now it appears that the routine is working (with no notice to us) and jobs bomb out with the message "FILE TOO LONG". Why didn't you keep us properly informed?*

A   Mea culpa, mea culpa, mea maxima culpa. PS: the problem was not with the LIMITS control card but with the permanent size limit called FS. This parameter has always been listed correctly by LIMITS and it was this value that was suddenly (and without warning) changed from infinity to 320. We are sorry for any inconvenience we caused and will try to give advance warning on changes such as this. (K. *Matthews*)

Q/S *Can anything be done about the problem where the system crashes and jobs are re-read without any apparent consideration given to the control card SAVE. Three or four times in the last three weeks one of my jobs has had to be re-read for some reason and I've gotten it back with the message "LFN ALREADY PERMANENT".*

A   Our policy must be to encourage users not to write jobs than cannot be re-run. There are two reasons for this:
     1) Many people <u>do</u> want their jobs re-run when the system malfunctions. Having jobs returned to
         the user and not re-run would seriously inconvenience most people and make turnaround time
         much worse when the system goes wrong.
     2) Jobs that were running when the machine goes down are automatically re-run by the system if a
         system recovery is possible.
Therefore we encourage people to set up their jobs defensively. In the example of the SAVE control card, you could either say
     PURGE,FILE/NA.
     SAVE,FILE.
or
     REPLACE,FILE.
in place of the control card
     SAVE,FILE.
In the first example, the PURGE will not abort if the file FILE is not present, since the NA parameter is present. In the second example, a REPLACE on a non-existing file acts as a SAVE.

Other practices that should be avoided are writing upon a direct access file that was an input file for the job. Writing on an input tape causes similar re-run problems.

If you don't want a job re-run in case of system error, the SAVE or DEFINE control cards can be used to accomplish this. For example, a control card setup as follows:
     Job card
     ACCOUNT card
     WRITEF,ERRFLAG.
     SAVE,ERRFLAG.
       :
       :
cannot be re-run until another job is submitted which purges ERRFLAG. Thus, what was your original complaint about SAVE can be a useful feature.   (K. *Matthews*)

Q/S *GTR should be able to get past a file mark on its program library to 'get those records'.*

A   GTR is a standard CDC product and we do not plan to change it. A report will be submitted to Control Data about the fact that GTR was not designed for multiple file records and we will request such a change.   (L. Liddiard)

Q/S *The TIME LIMIT message should give P, or even a complete dump. This would make it possible to locate short infinite loops without always having to read the entire FORTRAN code.*

A   We agreed and changed this in November. A dump is now given for TIME LIMIT and Monitor Call errors.
                                                                                          (K. Matthews)

Q/S *Since the big push is on for FORTRAN users to abandon RUN/FUN (RUN23) in favor of MNF, why not reset the default CM to accommodate MNF?*

A   There are many non-FORTRAN jobs in the system which use neither MNF nor RUN. All jobs had to be considered in setting the default field length to 45000_8.   (K. Matthews)

Q/S *I believe that in FTN 4 the EOF( ) function returns TRUE or FALSE for values. If this is true, shouldn't MNF do the same thing?*

A   The correct way to use the EOF function is described elsewhere in this newsletter. It is true that (in the first place) the EOF function should have been of intrinsic LOGICAL type, but CDC did not do it this way, and even under FTN 4.3, the EOF function is still of type REAL, not TRUE and FALSE as you believed. If MNF were to give type LOGICAL to the EOF function, we would become incompatible with currently working programs using IF(EOF(n).NE.0)GO TO, etc.   (C. Schofield)

Q/S *In reading a stranger tape with 80 column card images, MNF reads the end of file and then loops to a time limit. My tape had 3865 card images and read 3.866 KPR's but the job never terminated either with a 30 second time limit or 100 second time limit.*

A   This suggestion should properly have been a Program Trouble Report (PTR). Your program failed owing to an incorrect use of the EOF function under MNF. A description of the correct way to test for end-of-file under MNF (and FTN) is given elsewhere in this newsletter.   (C. Schofield)

Q/S *1) Make MAP(P) default.*
     2) Explain why MAP(P)
                   MNF.
     doesn't either produce the requested map or generate a message saying it won't!

A   1) MAP(P) is not the default because (a) many student jobs do not need a map, and (b) we are trying to save paper (as you probably know, there is a shortage).
     2) MNF. does an automatic load of the generated code and does not use the full loader facilities. This is efficient, but means that MAP cards are ignored. To get the map under MNF use:
         MNF(B=LGO)
         MAP(P)
         LGO.   (C. Schofield)

Q/S *How is priority determined with regard to printing the output queue?*

A   The KRONOS system has a FIFO (first in, first out) method of printing and we plan to change that in early December to the previous MOMS system criteria of shortest length print file to be printed first. The KRONOS method lets large print jobs slow down the turnaround for everyone.   (L. Liddiard)

Q/S *I just found out (the hard way) that LIBEDIT does an evict on the new file, and if your new file is a tape...! I think this is dumb [to evict the tape]. What's worse, it isn't documented anywhere I I know of (including the external documentation).*

A   We agree that this is an annoying problem in LIBEDIT and it will be corrected.   (K. Matthews)

Q/S *Will LIBEDIT successfully change a deck name in an OPL? (If, of course, I include a *RENAME directive.)*

A   Yes.   (K. Matthews)

Q/S *Would it be possible to GET and execute a file with one card? Either GET,SAM/DOIT. or -SAM. implying that a search of the user's catalog would be very handy.*

A   You could write your own short procedure file to do this. For example, the procedure DOIT as follows:
         DOIT.
         GET,P.
         P.
     would execute SAM when called as
         CALL(DOIT(P=SAM)
     You would only have to type one card to execute your program; unfortunately it's still a rather long card.   (K. Matthews)

Q/S *Currently, jobs waiting on a LABEL card for a tape to be mounted are charged for CP and MS by the label processor. A three hour delay for a tape mount, not at all uncommon, amounts to about a $1.50 charge. This should be charged to system overhead, not the user.*

A   We agree and plan to make system modifications which will make the LABEL control card accumulate no chargeable CP time or MS transfer. This change will be in by February 1, 1975 or sooner.   (L. Liddiard)

Q/S *I am quite upset about certain problems involving tape and disk storage:*
     1) *The concept of tape labels is nice in theory but poor in practice. We have about 100 tapes stored at Lauderdale. Labeling, copying, and verifying all of these tapes would cost between $1000 to $2000 and would take about a month. Labeling tapes as they come into use would require too much bookkeeping. I find, therefore, the current hour to two hour wait to get an unlabeled tape mounted to be intolerable.*
     2) *The current philosophy of charging the user for the maintenance and the purchase of the 844's is ridiculous. UCC should purchase the disk drives out of its appropriation, not its user's grants. At your rate it would cost about $375 a month to store the amount of information which could be contained on one tape (16 million characters).*

A   1) We are working to get better tape turnaround, but users should be aware of the user-submitted tape job clog in the afternoon hours. We do not expect users to convert their old unlabeled tapes to labeled tapes, but hope they would label any new tapes.
     2) For the past three years the only resource demand that has doubled each year has been the demand for mass storage files. If the economic brake of real money was not applied to the demand for these files, there would be no way to obtain the physical space, let alone the number of disk drives required. UCC supports user disk packs which allow the user to have 107M characters for a storage cost of $80 a quarter and $2 per mount. Our current charges allow the user to select the type and economy of information storage.   (L. Liddiard)

Q/S *Why did the system suddenly start printing the contents of column 1 if it is an asterisk? Is this one of those so called "minor system changes" which did not require notification of users? I will have to overhaul several of my programs to suppress the *. WHY???*

A   The sudden undocumented change in the behavior of your program occurred because you were using a property of the system that was not described nor supported by CDC or UCC. The KRONOS operating system and its associated products form an extremely complex set of programs. Such a system will always have properties which no one knew existed, and are thus liable to sudden change. Control Data's position is that it will support only features which are described in its reference manuals and this must also be the attitude of UCC. Any other scheme would make system development and bug correction impossible.   (C. Schofield)

Q/S *Are jobs submitted with PTR's automatically refunded?*

A   If it is a valid PTR, UCC will refund those costs that were due to errors.   (L. Liddiard)

Q/S *Why not put a card reader so that each user can submit his own job? This would increase [improve] turnaround time.*

A   In this newsletter you will find a list of the medium speed remote sites. These all have card readers and printers. Many of these sites are open shop (user run). One of these sites is in the Lauderdale Users' Room in the small office labelled "1004". Turnaround is much improved for small jobs input at these sites.   (T. Hodge)

Q/S *I've noticed on the 1004's that the left edge of the ribbon is the first to go. Why not move the MNF output over 20 spaces? Since it is used so much on 1004's.*

A   If the output is moved over 20 spaces there would be only 112 characters on a line. Currently, we will have to leave it up to the user to spread his information out over the line to save ribbons.   (L. Liddiard)

Q/S *Please remove the top row of I/O bins in Experimental, or install an elevator for little people (say less than 8 feet).*

A   We have changed the numbering of these bins so that the top bins always have a bin number ending with 1, the next row ending with the digit 2, and so on to the bottom row of bins which have numbers ending with the digit 9. Thus, those wishing lower and less hazardous bins should avoid bin cards ending with small digits.   (L. Liddiard)

Q/S *The telephone situation at Lauderdale is exhausting. I suggest you move it to the Users' Area... [and] The telephone has to be used for not only campus but also off campus calls, please change the Users' Room telephone so we can call off campus...[and] It would be nice if the 5% of the users at Lauderdale who receive 90% of the calls would answer the phone accordingly. It would be even better if the number of incoming calls could be greatly reduced since a jangling phone can be annoying.*

A   There has been a slowdown in telephone installation but the user phone will be moved immediately to the wall in the User Area since we were able to get it classified as a "floor hazard" where it was previously installed. Because of previous abuses with the phone when it had normal dialing capabilities, it will still be a campus only phone (there is a pay phone in the central entry for calling off campus). We agree that the phone can be annoying and suggest that the last user to receive a call should answer the next time the phone rings.   (L. Liddiard)

CYBER 74 OPERATING HOURS

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

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····  (Lauderdale only)

||||||  (Lauderdale, ExpEng)

////  (Lauderdale, ExpEng, West Bank)
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MEDIUM SPEED REMOTE TERMINAL SITES

Site		Supervisor
38	ElectE (East Bank)	J. Guentzel/373-5404
		M. Cook/373-3895
N640	EltH (East Bank)	J. DeWitt/376-7377
		N. DeWitt/376-7377
S191	KoltH (East Bank)	T. Faulkner/376-7024
		J. Duff/373-2348
321	MinMet (East Bank)	C. Swanson/373-5475
		R. Oelfke/373-5680
69	Physics (East Bank)	R. Scarlett/373-0243
		D. Olson/376-7175
167	SocSci (West Bank)	J. Shea/373-3608
257	BioSci (St. Paul)	R. Comstock/373-0979
		R. Cardellino/376-3407
125G	ClaOff (St. Paul)	C. Bingham/373-0988
415	CofH (St. Paul)	D. Nelson/376-7003
		T. Ehlen/376-7003
24	NorH (St. Paul)	J. Colten/373-0990
		D. Rignell/373-0990
Users' Room (Lauderdale)		Shift Supervisor/373-4940

REFERENCE MANUALS

[Copies are available for reference in 140 ExpEng,
Lauderdale Users' Room, West Bank Computer Center,
all the medium speed terminal sites, and in the
Reference Room (235a ExpEng).]

ALGOL Version 3	BMD Reference (1973)
APL*CYBER	IMSL Library 3, Edition 3
BASIC	MNF Reference Manual
COBOL Version 3	OMNITAB II Programmers' Reference
COMPASS Version 3	SPSS: Statistical Package for
FORTRAN 2.3 (RUN23)	the Social Sciences
FTN Version 3	SPSS Version 5.5
FTN DEBUG Users' Guide	SYSTEM 2000 Reference Manual
KRONOS 2.1 Reference Manual	SYSTEM 2000 Users' Guide
MODIFY	UCC Users' Manual, Part 1
SIMSCRIPT Version 2	UMST Programs Reference Manual
SORT/MERGE Version 4	
T/S USERS' Reference	
TEXT EDITOR (EDIT)	
UPDATE	

TELEPHONE NUMBERS

373-4548	Account Clerk, CYBER 74
376-3963	Educational Services (R. Franta)
373-4596	ExpEng I/O
376-7067	Field Engineering
373-2521	Keypunch Supervisor
373-4940	Lauderdale Shift Supervisor
373-4995	Microfilm Operator
373-4876	Operations (R. Folden)
373-4994	Recorded Message
373-7744	Reference Librarian
376-3963	Remote Job Entry Services (R. Franta)
373-4995	Tape Librarian
373-4360	UCC Main Office
373-4599	User Services (T. Hodge)
373-4921	Users' Room (Lauderdale)
373-3608	West Bank I/O

CONSULTING SCHEDULES

LAUDERDALE USERS ROOM (general)*
Mon – Fri	1:30 PM – 3:30 PM
Mon – Thurs	7:30 PM – 9:30 PM

EXP ENG 140 (general)*
Mon – Fri	9:00 AM – 5:00 PM
Mon – Thurs	7:00 PM – 9:00 PM
Sat	10:00 AM – 2:00 PM
Sun	7:00 PM – 9:00 PM

EXP ENG 140 (statistical packages)
Mon – Fri	12:00 N – 4:00 PM

SOC SCI 167 (statistical packages)
Mon	11:00 AM – 2:00 PM
Tues	12:30 PM – 2:30 PM
Wed	2:30 PM – 5:30 PM
Thurs	10:00 AM – 12:00 Noon

CLA OFF 125
Mon,Wed	8:00 AM – 10:45 AM
	1:00 PM – 8:00 PM
Tues	8:30 AM – 11:30 AM
	1:00 PM – 6:00 PM
Thurs	8:30 AM – 11:30 AM
	1:00 PM – 8:00 PM
Fri	8:00 AM – 10:45 AM
	1:00 PM – 6:00 PM
Sat	9:00 AM – 12:00 Noon

*These general consultants can also answer
questions on stat pkgs: Hinkley, Yen, Eggers.

KEYPUNCH LOCATIONS

(number of keypunches is in parentheses)

East Bank		St. Paul	
38 ElectE	(1)	257 BioSci	(1)
N640 EltH	(1)	125G ClaOff	(1)
130 ExpEng	(2)	415 CofH	(1)
131 ExpEng	(1)	24 NorH	(1)
208 ExpEng	(14)*		
S191 KoltH	(1)		
321 MinMet	(1)		
69 Physics	(1)		

West Bank		Lauderdale	
90 BlegH	(1)	Users' Room	(5)*
167 SocSci	(1)		

*includes 1 interpreting card punch

Q/S *A change machine (at Lauderdale) would be a welcome additon to the vending area.*

A   Your suggestion will be forwarded to Vending Services. In the past, they have felt that the low
     volume of sales at Lauderdale did not warrant a change machine.

Q/S *How about giving the date each question or suggestion was received, along with the UCC response,
     in the newsletter? Better yet, give everyone who has a two month delay in getting a response to
     his question/suggestion a cash prize of $25.00.*

A   We do not respond to each suggestion in this newsletter. Some suggestions may be answered very simply
     by taking action (for example, the easiest way to respond to a request for a clock is to hang up a
     clock). We can print the date received, that's no problem. However, the two month delay may be
     unavoidable simply because answers to suggestion box cards must reach the editor's desk before the
     deadline established each month. If, for example, you drop a card in the box on the 20th of November,
     your suggestion (and the reply) will not be printed until January; a two month delay since our news-
     letter deadline for December was the 22nd of November.

N E W S   F R O M   S Y S T E M   N O T E S

ECS USERS--Due to a slight shortcoming in the Extended Core Storage resource allocation mechanism, users who
     execute ECS control cards prior to LABELing a tape have their entire ECS field length reserved until their
     tape is mounted. This severely degrades turnaround for other ECS users. We ask that users please make
     ECS requests last among all resource requests. UCC will repair the ECS allocation problem as soon as
     possible. (dated October 31, 1974)
ALL USERS--A new control card is available which provides the current job cost incurred by the user as a
     message to the dayfile. The format of the control card is:
          COST.   or   COST,param.
     The COST. card uses the University rate for computing job cost. The COST,param. card uses the commercial
     rate. Param is any legal parameter and has no significance other than indicating the charging rate.
     (dated November 18, 1974)
PASCAL USERS--A revised version of the new PASCAL compiler is now available. Many bugs have been corrected,
     and the REDUCE(-) card is no longer necessary. To use this version of PASCAL:
          NEW(PASCAL)
          RFL(54000)
          PASCAL.
          LGO.
     (dated November 26, 1974)

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.