

UNIVERSITY OF MINNESOTA COMPUTER CENTER  
Deadstart Systems Newsletter

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NOTICE OF CHANGES TO THE SYSTEM

Bill Elliott modified the SUBMIT command to allow a system origin job to submit a system origin job (see DSN 2, 19 p5). Bill also modified RESEX to use the CPAK bit in the access word to validate removable pack usage from TXOT origin. Additionally, Bill added his proposed TAPES functions TEST and CLEAN (see DSN 2, 19 p5) and modified program EXPLIB to:

- 1) Accept the option OP=A for end-of-month tape accounting.
- 2) Accept the option OP=V for producing a listing of user numbers and their corresponding user indices.

With these modifications, most hand accounting procedures for tape storage and cleaning should no longer be necessary.

Tom Lanzatella repaired a bug in DOCUMENT which caused garbage page headers if the DOCUMENTed program contained a TITLE directive with no title text. Tom also fixed the HELP command to ignore any previous PACKNAM commands when attaching the CMDFILE.

Additionally, Tom changed the system procedure K to accept both user indices and user numbers equated to the U parameter. Procedure K is used by staff members to call sundry system related procedure files which must be run from system origin.

Bob Williams reduced the restricted device threshold from 12.5% to 3%. The restricted device threshold refers to the number (%) of free tracks remaining on a device before the system stops allocating tracks for system type files, i.e., queue files or local files. Since the 6400 disks rarely have more than

12.5% free tracks, the 808 was frequently laden with system files thus causing a significant slow down in system through-put. Bob also installed a correction supplied by Don Mears which repairs a hung port problem in TELEX. Additionally, Bob changed MODVAL so that the default file number limit is raised to 14D from 13D. Bob also changed the BARROW translation table name in LTA to a symbol rather than a number.

Kevin Matthews installed a hook into CPUMTR which will cause CPUMTR to hang on any request to update CPTW for control point 0. This request seems to have been responsible for at least two CPUMTR mode errors.

Jeff Drummond contributed several new programs:

- 1) A New common deck COMCCDW. The routine accepts a packed date and converts this to a day-of-week ordinal with Monday corresponding to 0.
2. The famous LEM (Lunar Excursion Module) console game has been converted from MACE and placed on the system along with the PP helper routine LMD.
3. The old PP program EYE which turns the console screens into a pair of roving eyeballs has returned to the system.

Bob Zalusky supplied the following assortment of modifications:

- 1) A repair to DAYFILE in order to output an appropriate message if a misguided user types the command DAYFILE(P=T). The result of this command was a copy of the users dayfile on file P with no error message.
- 2) Bob added the time parameters on the DAYFILE command to the commands AFD, DFD and ELD.
- 3) Program LIMITS was repaired to include all access word bits in the LIMITS report. This repairs a bug which appeared on the last deadstart tape.
- 4) Bob added AUTOROLL to the list of DSD ENABLE/DISABLE functions. These functions are displayed on the E,P display.
- 5) Bob corrected a misleading error message output by SEND when a user neglects to include the UN and PW parameters.
- 6) In response to requests by Help-Line-Consultants, Bob has added a new entry point to his program LISTVAL called HASH. This entry point in LISTVAL replaces the CALLPRG program HASH. The chief advantage of this change is that the HASH command now accepts a parameter JN which, when equated to a four-character user number hash, outputs the corresponding user number. Use of the above form of the command requires CTPC in the access word. Program HASH accepts the following parameters:

UN=ununun  
or UI=uiuiui  
or JN=jnjn.

- 7) Some time ago, we installed the following form of the PASSWOR command:  
PASSWOR (oldpw, newpw/UN=ununun). Presently, if the calling user has CSOJ and is a master over the specified UN, then the command need not contain the old password. Bob changed validation of this command so that the calling user must have CSTF rather than CSOJ.

Tim Salo modified programs LBA and LDS in order to install the new banner page. Tim also changed COMCFQO to use U of M terminal ID's rather than the stock CDC ID's (see DSN 2, 19 p5). Additionally, Tim installed three new SUPIO ports and the proposed changes to the CARDS READ dayfile message (see DSN 2, 19 p6).

E. J. Mundstock corrected a bug in BATCHM which was not checking the COPE (account open) bit correctly. Jim also repaired several small problems in CALLPRG.

Brian Hanson installed the following changes:

- 1) Program LINK now processes USEP requests correctly.
- 2) Brian discovered and repaired a bug where LINK was bashing LWPR in the job communication area. This spot also happens to be where MID is stored.
- 3) Brian's proposed change to LDR which will allow program loading to a subcontrol point (see DSN 2, 19 p4) was installed.
- 4) Brian installed a fix for the recently discovered problem in TELEX where the requested time on a T,nnn command was added to the total session time rather than to the job step time. Brian repaired TELEX so the requested time is again added to the job step time. Brian also changed T command processing so that the user may request time in units of one second rather than 10B seconds.
- 5) The old version of the user callable CYBER loader has been placed back on the system due to an error in the new version with ECS usage.

PROPOSED CHANGES TO THE SYSTEM

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LOADPDP - by T. Salo

Tim Salo suggested the following proposal in regards to the PDP-11 load utility, LOADPDP. The command, LOADPDP, currently loads the PDP-11 with equipment mnemonic PD while the command, LOADPDP(PQ), loads the PDP-11 with equipment mnemonic PQ. Tim proposes to change the command format of LOADPDP to LOADPDP(EQ=nn) where nn is an equipment mnemonic or a EST ordinal. This would allow loading of future PDP-11's.

*OK  
loads  
newest  
if used*

//////////

Direct Access File Size Limits - by K. C. Matthews

CDC provides a limit on direct access file size. This parameter (DS for direct size) shows up as unlimited on the output from a LIMITS control statement. We have set DS to unlimited for all of our users.

The DS limit is very ineffective. It is checked only by PFM. One cannot DEFINE a permanent file if the local file already exists and exceeds the DS limit. This is no real protection since we normally DEFINE a file and then write the data. PFM also checks the DS limit on an attach; one cannot attach a file with more sectors than the limit in WRITE or APPEND mode. One can attach the file in READ, MODIFY, and EXECUTE modes. The intention here is to keep one from making an offending direct access file from becoming even longer.

*OK  
DIFFERENT  
LIMITS  
limits  
used  
time.*

I believe we can make some simple mods in CIO which will allow us to make this a more effective limit. Each time that CIO has to extend the length of a permanent file, it can easily determine the current length of the file. I propose to have CIO check this length when writing to a direct access file. The job can be aborted if the length is exceeded for a particular direct access file. The DS limit will not apply to files on removable devices, but it will apply on auxiliary devices like PN=STF and PN=PF01.

If we decide to allow this mod to CIO, some reasonable limits will have to be determined. The index value for DS is only 3 bits. Zero means "use a value from the job origin control area" and 7 means unlimited. A possible list for other indices is:

- 1 - 5,000 Sectors
- 2 - 10,000 Sectors
- 3 - 20,000 Sectors
- 4 - 50,000 Sectors
- 5,6 - reserved

I suggest such generous limits because many very large permanent files are written by accident. These limits would catch the super large files while leaving most users unaffected.

We propose to let research accounts have a limit of 10,000 or 20,000 sectors. The limits will not go into effect until during the coming quarter break, and will be announced in the December Newsletter. Finally, if this plan is implemented, we will contact those users having files above the limit and possibly arrange a higher limit for them.

#### SYSTEM MAINTENANCE: People and Procedures

##### A Note About SYSPROC - by T. W. Lanzatella

Two major changes were recently installed in the system initialization procedure SYSPROC. The first change is that the portion of SYSPROC which initializes the CALLPRG index and sysedits the library tape has been completely rewritten and is now common between the CYBER 74 and the 6400. The other change is that SYSPROC now performs only one sysedit to install the KLUDGES file and the library tape. This change has the effect of shortening the running time of SYSPROC by several minutes. An unfortunate consequence of this change is that the library tape must be mounted along with the deadstart tape when deadstarting the machine. The binary corrections file KLUDGES will not be sysedited unless the library tape is accessible. This has been somewhat of an inconvenience to system staff members who deadstart the machine frequently and who do not require the libraries and compilers. The inconvenience is offset by two factors: 1) libraries and compilers now reside on 9-track tape and 2) the production system deadstarts several minutes faster.

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##### SECURITY of Files - by S. P. Nachtsheim

###### 1) Access to Account Numbers

Currently the most secure file on the system can be violated by any user who has knowledge of three things:

- 1. User Number
- 2. Account Password
- 3. File Password

In addition, any user may, if the user number and password are known, "account over" to any account number from any job origin and thus, any terminal.

One feature that is often found in "secure" on-line systems is the ability to tie a specific terminal to a specific user number. This implies that, assuming an otherwise secure permanent file system, a malicious or curious user would not only have to know the three items mentioned above, but would also have to have physical access to a particular terminal device.

I propose making this type of security possible on the Cyber systems. To accomplish this the following two steps would have to be taken.

1. Test and verify the parts of KRONOS that deals with the answer back (AB) code in the validation file.
2. Add a bit to the Access Word which prevents the user number from being "accounted over" to. (EJ)

By implementing these two items, the user would have to know the user number, user number password, file name, file password and have access to a terminal that generates a valid answer back code in order to gain access to the files on a user number. (Again this assumes a secure permanent file system.) Additional security could also be imposed by tying the terminal to a dedicated line with a unique rotary code.

#### 2) Food for Thought #1 - Removable Packs

Consider that one means of securing data is by restricting physical access. Bill Elliott's TAPES has done a lot in the area of securing physical access for magnetic tapes. However, any user with the proper access word permission can cause any removable pack to be mounted if the packnam is known. Once the pack is mounted, normal permanent file security is the only thing between the unauthorized user and the data on the pack. Perhaps we should consider applying parts of TAPES to removable packs - passwords, permits, etc.

#### 3) Food for Thought #2 - PFM Security

The above proposal assumed that the system permanent file security was absolute. Clearly, given the clever user and enough determination, PFM security could probably be cracked. Another level of security may then be desirable.

Assume a malicious user gains access to a file in an unauthorized manner. the trick then is to make the file unintelligible to that user (while of course making it intelligible to the authorized user). We may want to consider implementing a user selectable encryption algorithm that would encrypt data on our disks (or our tapes?). Perhaps each user number would have its own default encryption hash, somehow derived from the user number. In addition the user would have the option of providing an optional hash, and would have the option of selecting or not selecting encryption.

#### 4) Food for Thought #3 - Physical Security

How do we convince the user that persons having access to the machine room and the console are not browsing thru or copying the users sensitive data?

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Last Week's Systems Group Meeting - by T. W. Lanzatella

1. Kevin Matthews pointed out that if a job transfers more than 99.999 Kilo-PRU's, then the most significant digit of the MS PRU's transferred dayfile message is dropped. This error led to a confusing bout with a user so staff members should be aware of the error. Meanwhile, we'll fix it as soon as possible.
2. A user recently complained of receiving a bill for PF storage charges for a file on PF01 which he didn't even know existed claiming UCC never informed him that we moved his file. The complaint prompted a suggestion that we modify CATLIST or CATLSYS so that PF01 is CATLISTed (CATLSYSed) whenever a CATLIST (or CATLSYS) is requested. This would add quite a load to the system and would be an inconvenience more often than a convenience. We decided that the currently ample disk capacity (which is likely to continue) will decrease the likelihood of moving files to PF01 in order to save space, thus we will simply try harder to keep users informed about moving files.
3. VIM attendees - R. Hotchkiss, A. Franck, C. Schofield, E. J. Mundstock, M. Frisch, S. Nachtsheim and N. L. Reddy are all attending VIM 25 at Chicago.
4. Tim Salo passed out copies of the new banner page. We all approved. The new banner page will be installed with the next tape.
5. The following proposals were accepted, rejected or relegated to the Systems Strategy Committee.
  - a) Bill Elliott's proposal to add a new parameter to TDUMP called DW which causes TDUMP to write full width lines regardless of equipment type associated with the output file was accepted in principle (see DSN 2, 19 p4). The proposal was altered so that a new equivalenced parameter called LW (line width) will be used to specify TDUMP output line width. The following options will be allowed: LW=TT for teletype output or LW=LP for line printer output.
  - b) Brian Hanson's proposal to add a new parameter to the LDR call block which allows program loading to a subcontrol point was approved (see DSN 2, 19 p4).
  - c) Bill Elliott's proposal to add a S parameter to SUBMIT which would allow a system origin job to submit a system origin job was approved (see DSN 2, 19 p5).
  - d) Bill Elliott's proposed additions to the TAPES utility (functions CLEAN and TEST) were accepted (see DSN 2, 19, p5).
  - e) Tim Salo's four proposals regarding COMCFQO, QFM function 17, 1SU/2SU statistics gathering and CARDS READ dayfile messages were approved (see DSN 2, 19 p5,6).
  - f) Kevin Matthew's proposal to install a new UFM function which would facilitate changing the PMS table in low core was approved (see DSN 2, 19, p6).
  - g) Kevin Matthew's proposal to require the FA parameter whenever attaching a fast attach file was relegated to the System Strategy Committee where it was defeated. The System Strategy Committee decided that CALLPRG

(the object of the proposal) could be made secure without changing PFM.

- h) D. R. Lienke's proposed enhancements to the CALLPRG FETCH command and to compiler/package organization was approved in principle but further discussion is necessary (see DSN 2, 19 p7).
- i) T. D. Hodge's proposed enhancements to WRITEUP (see DSN 2, 19 p10) were sent to a special WRITEUP committee composed of T. D. Hodge, M. Frisch, E. Mundstock, D. Laliberte and M. Rivere.

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System Strategy Minutes - by T. W. Lanzatella

From the meeting of 76/10/22.

1. Kevin Matthews distributed a draft version of a document detailing the internal workings of ECS usage at UCC. The document was produced as a result of a suggestion at the last Systems Strategy Committee meeting that for large changes, a stand alone document should be written.
2. Last meeting's stabled topic of XMIT/SEND symetry was raised again (because NLR was present) along with an observation by M. Skow that no validation is required for XMITing jobs to the CYBER 74 but XMITing output files is validated. The next 1.5 hours was spent in heated debate over the above issues and resulted in the following recommendations:
  - a) NLR will deliver a proposal for a generalized XMIT/SEND by the first week in January. The generalized XMIT/SEND would be installed over the following 6-9 months.
  - b) NLR will place complete XMIT/SEND writeups on the system as soon as possible.
  - c) If nothing fruitful results from NLR's proposal, then a technical document will be prepared (in the nature of KCM's ECS usage document) detailing the internal workings of XMIT/SEND.
3. NLR assured us that the STIMULATOR will continue to function after the new front-end is installed.
4. NLR has decided not to use Dave Fletcher's LTD code, hence LTD may return to the deadstart tape.
5. At the last Systems Group Meeting, NLR suggested that discussion of KCM's FA file proposal (DSN 2, 19 p6) be postponed until the System Strategy Committee. NLR suggested that instead of changing the FA file attach mechanism, that EJM alter CALLPRG so that SSJ permission is switched off once CALLPRG determines that the requested file is on a local CALLPRG index. EJM consented.

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CALLPRG and Library Tape News - by M. Riviere

On October 19, Dennis Lienke modified the 6400 section of the CALLPRG index to install LPKODE, a linear, integer and mixed integer programming package, as a 6400 file. On October 31, T. Lanzatella replaced the PL1 Compiler on CALLPRG with a reassembled version. On the same date D. Lienke changed the EISPACK libraries, PAST and FETCH types, by new versions (Version 2). An

announcement about this change was made in the October UCC Newsletter.

D. Lienke also changed the index entries for NSAP and SSAP to remove the reference to indirect access files that were supposed to be used for statistics on the usage of those two packages. The CALLPRG program does not retrieve properly files on mixed mediums (tape and pack) for a single entry. Dennis will wait until this is fixed to accomplish his program's usage counting. Sorry, Dennis.

On November 2, FT3LIB on the library tape was changed with modifications submitted by Michael Frisch and James Mundstock. Michael made an extensive modification to the plotting routines. He added the routines SYMBOL, NUMBER, SQALE, LINE and SCALE and modified PLOTPAC, Q92X8J, LYNE and SKALE. SYMBOL and NUMBER are fortran versions compatible with the new version of PLOTPAC and with CALCOMP routines of the same name. SYMBOL and NUMBER were entries on PLOTPAC until now. SQALE is a new routine used now only by SKALE, but in the future may also be used by PLTSCL and SCLPT. LINE and SCALE were added for compatibility with CALCOMP routines and they only contain calls to the already existing routines LYNE and SKALE, respectively.

PLOTPAC was modified: 1) to make the WHERE entry CALCOMP compatible by allowing a FACTOR parameter; 2) to allow the usage of 5 tapes; 3) to remove the entries replaced by the new fortran subroutines already described (SYMBOL and NUMBER); 4) to add two new entries (Q8QCHK and Q8QPAK) to be used by the new routine SYMBOL; 5) to save plotting parameters in Q98X8J for SYMBOL to use later; 6) to change accounting information to agree with PLOTPAC internal documentation; 7) to make Q92X8J handle an accounting file other than OUTPUT; 8) to obtain the correct BIN number; 9) to add a traceback to all calls to the routine FLUSH and to transfer the entry name for traceback information in H format instead of L format. LYNE was modified to change the height of the symbols to be 0.12" instead of 0.14".

James' modifications consisted of the addition of the subroutines AND, OR and XOR to be used by TSF generated binaries and also in a correction made to IOERR to avoid parity error processing which could produce a time limit error.

On November 2, FUTURE, FORTRAN in CALLPRG was changed. The change consisted of the same additions and replacements made by M. Frisch on FT3LIB to the plotting routines. The FUTURE, FTN entry was also modified to retrieve this new version of FORTRAN. Also on November 2, A. Michael added a new LISP overlay to CALLPRG, GRASPE, as a FETCH type file. GRASPE is used for doing directed graph processing.

I will be making a new Library Tape and updating the CALLPRG index on November 23. I will implement by then all the modifications submitted up to November 11, by noon.

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Cyber 74 Deadstart Dump Analysis - by K. C. Matthews

From Friday, October 8 to Thursday, October 28.

Saturday, 9 October

15:26 (DD-13) Export hung at its control point and would not drop or pause for storage move. The dump was given to N. L. Reddy.

Friday, October 15

09:55 (DD-14) The system hung when 026 and DIS were up. Possible 026 or DIS problem, but no resolution yet. The dump is available for volunteers.



Friday, October 22

11:51 (DD-15)

CPUMTR had a mode 1 error exit. Analysis revealed that word 24 in low core was zero, and that this will cause a CPUMTR mode error. This same word contains the recall time which was zero after the recovery, causing the system to be very slow. We had noticed this happening several times during the summer.

A test has been added to CPUMTR to check if it is the one who has been zeroing word 24. If it's not CPUMTR, it has to be an errant PPU program.

Monday, October 25

22:47 (DD-16)

The scopes simply went blank. Nothing looks wrong in the dump. No resolution so far.

Wednesday, October 27

15:35 (DD-1)

The scopes went blank; analysis revealed that all the PPU's on chassis 1 (PPU's 0, 1, 2, 4, 5, 10 and 11) looked bad. The other bank of PPU's looked fine. We suspect that a hardware problem on chassis 1 may have caused this.

Thursday, October 28

16:50 (DD-2) (DD-3)

The system stopped with a CPUMTR mode error. There were two subsequent recoveries; each one was followed by a bad track request on equipment 10. A level 0 deadstart revealed problems on equipment 10 and 13. Somehow in the mess, equipment 0 (DN=20) was destroyed. I think this may have been done afterwards as I attempted to straighten out device 13, but I cannot be sure. The result was that both devices 10 and 20 had to be reloaded. Device 13 had no real damage.

An analysis of the crash showed that all the PPU's were intact except for LHS(Export). Its entire memory had been wiped out by some unit record data. It was also almost certain that an exchange jump had been by a PPU, but not with a real exchange package. Instead, an exchange jump had been performed using one of the TRT's as an exchange package. This is possibly what caused the device to be wrecked. Analysis of this crash is not yet complete, but I would guess that LHS wrecked its memory and then executed an exchange jump instruction from the bad memory.

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6400 DUMP STATUS - by R. A. Williams

<u>DATE</u>	<u>DESCRIPTION</u>	<u>TAPE</u>
76/10/19	The chair bumped into the console, causing memory to be wiped out with garbage. This is probably a hardware problem related to grounding.	DDT-16

<u>DATE</u>	<u>DESCRIPTION</u>	<u>TAPE</u>
76/10/21	The data "5B PUNCH E BPUNCHB E BP8" was written into the message area of the system control point. This did not cause a crash but doesn't seem good.	SEE ME
76/10/24	A metal cart touched the main-frame and the scopes blanked. We again suspect grounding.	DDT-6
76/10/26	Some KLUTZ (R. A. Williams) was trying to stop MAGENT (13.STOP) but stopped TELEX by mistake when the 3 was not entered (1.STOP). We should do something to insure against this (it has happened three times in the past year to someone or other).	N.A.
76/10/28	An oscilloscope was being rolled out of the room and the scopes went blank.	N.A.
76/10/29	The 808 went down and in some way 844 DN41 got wiped out.	DDT-5