

UNIVERSITY OF MINNESOTA COMPUTER CENTER
Deadstart Systems Newsletter

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NOTICE OF CHANGES TO THE SYSTEM

KRONOS Changes

The following changes become effective on Thursday, 9 March.

Tim Salo installed extensive changes to LCD and LIO in order to implement full ASCII print train support. The new capabilities are discussed fully in Tim's article later in this newsletter. Tim also installed a new test option into LPT, the line printer test routine. The new option provides a shifting escape code ASCII pattern test. Additionally, Tim repaired two unspecified bugs in 1SU and in SUPIO.

Don Mears installed his proposed change to BATCHIO which removes all use of buffer pointers and substitutes EST ordinals (see DSN 4, 3 p. 23). OPERATIONS NOTE!

Marisa Riviere installed her proposed scroll option into WRITEUP (see DSN 4, 1 p. 3). The scroll option is invoked with an SR parameter specified after the (/) slash on the WRITEUP command. Marisa also removed interrupt processing from WRITEUP. Users will now be able to interrupt WRITEUP during output and resume with a minimal amount of lost data.

Jeff Drummond installed a new version of SIMTALK with unspecified changes.

Tim Hoffmann installed the following changes.

1. Argument processing by the SUN command was repaired.
2. T and U options were added to the RNH and RUN commands. This change is proposed in this newsletter.

Bill Sackett installed his proposed new disk driver 6DM along with all the requisite plumbing (see DSN 4, 4 p. 32). The new driver supports a single density 844 with double density addressing, a substantial savings in TRT space. Bill also corrected an error in CPUMTR wherein memory was being allocated for a second CPU even if only one was present. Additionally, Bill defined local SRU formula weights in COMSSRU in anticipation of our conversion to SRU accounting and added a counter to the control point area allowing determination of CM and ECS use from SRU's.

Kevin Matthews repaired a small error in SFP processing of the QQP (remember QQP?) monitor function (see DSN 3, 22 p. 3). The bottom three bits of the call were being wrecked in SFP.

NOS Changes

No NOS changes were installed this week.

PROPOSED CHANGES TO THE SYSTEM

ROUTE, DISPOSE and XMIT for Three Machines - by D. W. Mears, et al.

This report discusses the changes to the queue related areas we will be making when we go to NOS. These areas include DISPOSE/ROUTE control cards, inter-machine jobs as they relate to the existing XMIT/SEND mechanism, the proposed TRANSIT mechanism, and shared queues under NOS multimainframe.

Misc. Recommended Changes

We recommend removing the DISPOSE control card from NOS. Installing our KRONOS DISPOSE mods in NOS would be a waste of time because CDC has already provided most of the features we need with the ROUTE control card. If we do not install our mods, and keep the stock NOS DISPOSE, users will be confused by differences in the U of M KRONOS DISPOSE and the CDC stock DISPOSE.

We will have to make some changes to the ROUTE control card to implement existing U of M features. This includes the addition of a "B=" to set the bin number and the extension of "TID" processing to allow the specification of a 2-character site code. We will have to allow a plotter disposition code (DC=PL parameter) as well.

We recommend the elimination of "PLOTS" as a special file name. This would get rid of the problem of users accidentally getting scratch files plotted because they happened to choose "PLOTS" as the name of their file. In NOS it is possible to set deferred routing for a file through a call to the PP program DSP. This capability could be used by PLOT31 to cause plot files generated by PLOT31 to be automatically routed to the plotter at job completion. In this way we can remain compatible with NOS and still provide the same feature we had under KRONOS.

We recommend the elimination of the LFM dispose and QFM submit mechanisms of entering files into the queues. CDC has provided a new program (DSP) which performs both of these functions and much more. We suspect that CDC left in these LFM and QFM functions as an oversight or to remain compatible with KRONOS. Compatibility should not be important to us in this area since very few (if any) user programs use these features. LFM dispose and QFM submit should be removed in order for us to be able to install the U of M queue related mods (delay queue, bin number, terminal id, and intermachine jobs) in a reasonable way.

Machine ID's

A machine ID (MID) is a 2 alphanumeric character identifier assigned to each mainframe at deadstart time via the "MID=" CMRDECK directive. Currently at UCC, the MID on the CYBER 74 is AA and the MID on the 6400 is AB. If we follow this precedent, the MID for the CYBER 172 should be AC. However, before we make this assignment we should consider switching to a more meaningful set of MID's. Up to now the MID has been invisible to the user, but as soon as we start running TRANSIT or multimainframe, some users will have to start specifying destination machines on job cards or control cards. The use of mnemonic MID's simplify their use.

The problem in selecting meaningful MID's is to ensure that the MID's will remain meaningful. For example, suppose we assign MID's of 64, 74, and 72 to the 6400, CYBER 74 and the CYBER 172. Then what would we do if the Cyber 172 was upgraded to a CYBER 174 or if the CYBER 74 was replaced with a CYBER 172? If either of these things happened, it would be impossible to maintain a consistent naming policy based on model number. Furthermore, if the upgraded or replaced machines were to retain their original functions (e.g., primarily batch or primarily timesharing), then it would not be reasonable to change the MID just because the model number changed.

A better solution might be to assign MID's based on the function of the machine. For example, the CYBER 74 is primarily a batch machine so it would be called "BC", the CYBER 172 is primarily timesharing, so it would be called "TS", and the 6400 is a MECC machine, so it would be called "ME".

In spite of all the potential problems, we feel that the MID's should be 64, 74, and 72 because these are so meaningful and easy to remember. Any other machine ID's would only be acceptable if UCC is likely to get new or upgraded machines in the new future.

Intermachine Queue Files under NOS Multimainframe

The queue files section of the January 9 memo from the Multimainframe task force to the Steering Committee describes a simple method of moving queue files between the CYBER 74 and the CYBER 172 when they are running multimainframe. The memo suggests that queue files destined for another machine be placed on a shared disk, and the FNT/FST entry and other information for the file be placed in an ECS table. The job scheduler on the receiving machine would then copy the FNT entry from ECS to that machine's FNT.

This design would require modifications in the following areas:

- OBF would have to assign queue files to a shared disk for jobs not running on the originating machine.
- OVJ would have to process the new job card parameter MIDxx. Where xx is the MID of the machine the job is to be run on.
- DSP, LBA, and 1CJ would have to move queue files destined for another machine to the ECS table.
- ROUTE would have to process a MID=xx parameter. (xx is the destination machine ID). ROUTE would also have to copy the routed file to a shared disk if the file was not already on a shared disk.

SUBMIT would have to copy the submit file to a shared disk if the job is destined for another machine. This should be trivial since SUBMIT already copies the file to the equipment specified by the MSAL (mass storage allocation) word for input files.

This solution is efficient and reasonably easy to implement. The problem with it is that it will not be possible for the 6400 to share this mechanism in the near future. This implies that we will continue to have an XMIT/SEND mechanism for moving files to and from the 6400 which is completely separate from the shared file system of the CYBER's running NOS.

Intermachine Transfers between KRONOS CYBER 74 and NOS CYBER 172

We need to be able to move files between the CYBER 74 and the CYBER 172 when the CYBER 172 arrives on April 1. The mechanism we choose has to be fast, efficient, and reliable enough to accommodate large volumes of traffic safely and reliably. The possible alternatives are: extending XMIT/SEND to the new machine installing TRANSIT as described in DSN 12, volume 3 on all three machines, or installing a subset of the TRANSIT proposal to move only jobs between the CYBER 74 and the CYBER 172.

Extending XMIT/SEND to the new machine would entail patching up SUPPIO to treat the CYBER 172 like another 6400 and running ECSXFER on the CYBER 172. This is probably the easiest solution, but it is not acceptable because the ECSXFER/SUPIO transfer rate is too slow, and it would not be possible to send jobs from the CYBER 74 to the CYBER 172.

TRANSIT as described in DSN 12, volume 3 would provide a general solution to moving jobs, queue files and permanent files between all machines. However, there is no way that this could be installed in both NOS and KRONOS by April 7.

This leaves the last alternative: installing just enough of TRANSIT to get jobs to be moved between the machines and leaving XMIT/SEND between the 6400 and the CYBER 74 as it is now. This solution will provide a reliable and fast way of setting intermachine transfers of jobs, queue files (through jobs which do DISPOSEs or ROUTEs), and permanent files (through jobs which do saves and defines). Although this will not be the way jobs are moved between mainframes after we go to multiframe, this is how jobs will be submitted from the 6400 when the full-fledged TRANSIT is installed.

In this implementation, the user would have to create a submit file and SUBMIT that file to the other machine using the new "MID=" parameter on the SUBMIT control card to specify the destination machine. If the user wanted the output and/or dayfile from his job printed on the receiving machine he would have to place a ROUTE or DISPOSE card in the submitted job. If he wanted the output and/or dayfile printed on the originating machine, he would create a job and submit it back to the originating machine and do a DISPOSE or a ROUTE on that machine. Although, this seems very clumsy to use it will only be used for two months (until we go to multiframe). Also, this is all we can be reasonably sure of having ready by April 1.

XMIT/SEND vs TRANSIT

A replacement for the current XMIT/SEND package called TRANSIT was proposed in DSN 12, volume 3, 21 June 77 and approved. The arguments for replacing XMIT/SEND were that the new package would be smaller (fewer total lines of code), more reliable, more efficient and symmetric (i.e., the same package would run on both

machines). Work on TRANSIT was halted after the announcement of the new machine and new operating system.

We are faced again with the question of staying with the current XMIT/SEND or going to TRANSIT. Now, the decision is not as clear cut. Because of the difference in operating systems, we will have to develop separate sets of code for NOS and KRONOS for TRANSIT, TRN (the TRANSIT PP program), SEND, and the system mods. Also, since TRANSIT is not needed to move files between the CYBERs, the control cards used for moving files between the CYBERs will be completely different than those used for moving files between the 6400 and the CYBERs.

If we keep XMIT/SEND, Tim Salo will have to do two to four weeks of work cleaning up SUPPIO to handle XMIT/SEND better. Currently, the XMIT/SEND processing in SUPPIO causes too many SUPPIO aborts, wastes 1000B words of CM and is slower than it should be because it does not use user control word reads and writes.

We suggest that the extra work required to fix up SUPPIO would be better spent installing the TRANSIT package. If TRANSIT is not installed, all the work which has gone into developing TRANSIT so far will have been wasted.

Time Estimates

1. Installing U of M Dispose features into ROUTE will take less than one being-week.
2. Elimination of the LFM dispose and QFM submit functions will take less than one being-week.
3. Installing NOS multimainframe queue processing will take one to two being-months.
4. Installing the full TRANSIT will take two to three being-months.

Installing the temporary CYBER 172/CYBER 74 TRANSIT facility will take four to six being-weeks.

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RNH T and U Options - by T. J. Hoffmann

At the request of a staff member, I am proposing that T and U be added to the RNH/RUN command in the FORTRAN subsystems (MNF, FORTRAN, FTNTS) to perform TRACE and unMANTRAP functions. The operation of T in the EXECUTE subsystem (to pass parameters to binary programs) will remain unchanged.

As an article to this effect is in the UCC Newsletter and the code added into the system, I hope there is no problem.

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Removable Pack Requests - by T. J. Hoffmann

Currently, catlisting a removable pack that is not mounted causes RESEX to issue a request to the console and rolls out the job waiting for the pack to be mounted.

To avoid this sometimes unneeded request to pop up (especially from TELEX jobs), I propose to add a CPM function that checks the MST's and returns the status of a requested device. This would allow CATLIST and CATLSYS to check for the pack's existence without calling RESEX, thus saving a few extraneous pack mount requests.

The format of the call would be:

VFD 24/OLCPMP,12/73B,24/addr
(addr;entry) = VFD 42/DLpackname,18/0
(addr;exit) = VFD 42/OLpackname,18/stat
(stat) = 0 for pack not found.
 = 1 for pack found.
 = 3 for removable pack found.

SYSTEM MAINTENANCE: People and Procedures

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

1. The following proposals were rejected or accepted.
 - a. Jeff Drummond's proposal to install an ACQUIRE PFM function was approved (see DSN 4, 4 p. 32).
 - b. Bill Sackett's proposal to install a new disk driver 6DM was approved (see DSN 4, 4 p. 32).
 - c. Tim Hoffmann's proposal to remove the FILEB macro from COMCZAP and substitute CON statement instead was approved (see DSN 4, 3 p. 22).
2. We agreed to remove the SNAPE macro from CPCOM.
3. Larry Liddiard discussed the following items of new business:
 - a. Slugs for the full ASCII train have arrived.
 - b. We will be borrowing a 405 card reader from Duluth to be used on the 172.
 - c. Duluth is anticipating a CYBER 171 for July 1.
 - d. Modifications to BASIC for the CYBER 172 bid include: 1) Binary file generation, 2) size reduction, and 3) object code improvement.
 - e. We are purchasing a 60-cycle 512 for Experimental Engineering.

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Callprg and Library Tape News - by M. Riviere

On March 14, Kevin Fjelsted will be introducing two new Callprg packages, SURFACE and SYMAP. SURFACE is a geological survey program and SYMAP a line printer map generator. SURFACE and SYMAP will be installed as control card callable packages and their documentation will be available from the UCC reference room. On the same date, Kevin will also be changing the location of the past version of IMSL from the disk pack to a Callprg library tape.

Also on March 14, the future versions of FORTRAN and MNFCLIB will be changed by request of Michael Frisch. Michael is making a correction to the routine NORMAL in both libraries in order to remove an error that was causing the overrunning of an array and removing the relocatable version of the COMCCPM common deck, CPUCPM. The entries on RELCCPM will be the ones used from then on.

The next Callprg and library tape modifications will be taking place on March 28. Modifications for that date should be requested before noon March 16.

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Full ASCII Print Train Support - by T. J. Salo

The 595-6 (full ASCII) print train is now fully supported by software available both under NOS and KRONOS. The user may route a file to be printed using the 64-character set ASCII conversion by using a ROUTE(lfn,EC=A6) or DISPOSE(lfn=A6) control card. Likewise, the 96-character set ASCII conversion may be selected by using a ROUTE(lfn,EC=A9) or DISPOSE(lfn=A9) control card. In both cases the code conversion is the character set for time-sharing terminals as specified on pages 6-4, 6-5 of the NOS Version 1 Applications Programmer's Instant manual. This character set is also known as the NOS TERM,TTY character set. All null and control characters are deleted (not changed to blank). In particular, the ASCII carriage return, line feed, form feed and tab characters are not processed. Rather, lines must be terminated by NOS end of lines. Additionally, the character in column 1 is processed as a carriage control character in a manner identical with the processing of display code files. However, lower case carriage control characters are not recognized. Binary ASCII files are not processed as there is no more room in 1CD.

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Cyber 74 Deadstart Dump Analysis - K. C. Matthews

From Sunday, 19 February through Sunday, 5 March.

Monday, Feb. 20: This was the day we were down the most. The system problems from the previous weeks seemed to peak. There were lots of system hangs and scope blankings. As usual, the dumps were pretty unintelligible. The engineers made some adjustments in the mainframe but still do not feel that the problem is under control.

Tuesday, Feb. 21: 13:48(DD-6) The scopes went blank. Analysis showed that one bank of PPU's had stopped on central read instructions.

Friday, Feb. 24: 1712(DD-7) The scopes went blank. The dump showed a disk error was being processed at the same time. This one should still be investigated further.

Saturday, Feb. 25: 15:22(DD-10) The system hung up. The dump revealed that the PP programs MTR and DSD were wrecked inside. During the deadstart recovery, the scopes went blank. After that, everything worked again.

Sunday, Feb. 26: 21:45(DD-12) The system hung up again. The dump showed that PP25 had stopped executing its idle loop and thus did not process the CIO request assigned by the system.

Monday, Feb. 27: 16:27 1CJ hung when SUPIO was dropped. This happened while trying to get the system going after the FNT filled up. 17:55(DD-13) The scopes blanked. PPI(DSD) was full of junk inside.

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6400 Deadstart Dump Analysis (2/20 - 3/5) - by R. A. Williams

<u>Date</u>	<u>Description</u>	<u>Tape</u>
780220	An early morning power failure left the 844 disk controller memory with parity errors and it had to be cleared before the system could come up.	N.A.
780226	The system came up late because a disk error caused permanent file maintenance to take longer than expected.	N.A.