UNIVERSITY OF MINNESOTA COMPUTER CENTER
Deadstart Systems Newsletter

25 July 1978 Vol. 4, No. 14
Send all comments, criticisms and contributions to the editor: T. W. Lanzatella
University Computer Center, 2520 Broadway Drive, Lauderdale, MN 55113
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NOTICE OF CHANGES TO THE SYSTEM

KRONOS Changes

The following changes will be installed on Thursday, 27 July.

Don Mears corrected an error in TELEX processing of initial time limit. The error caused any user whose validated time limit was a multiple of 4096 to end up with an initial time limit of zero. Don also changed the translation of accent grave from 7600 to 7407.

Bill Sackett installed two important changes.

1) Bill installed a critical change to CPUMTR which repairs a bug described in PSR summary 473. Previously, on a MSG request for line 1 only of the B-display, CPUMTR always copied five words to the control point area. If the message address was within five words of the user's FL the copy would go beyond FL. If the request came from the last control point, CPUMTR would mode out.

2) Bill altered the way the local file limit is enforced for SSJ= jobs. Previously, the local file limit was not enforced for SSJ= jobs but muggers discovered this and subsequently filled the FNT on the 6400 by entering hundreds of errent calls to MODVAL. The local file limit is now enforced for SSJ= jobs except that a SSJ= job can exceed the local file limit by ten files. To deal with the situation where a SSJ= job might need more than ten additional files, a new CPM function (73B) was added. This new function clears the local file limit. Anyone who uses this function must be careful to return all files attached after invoking the function.

Tim Hoffmann repaired a critical error in DIVERT. Previously, the program DIVERT was allowing any user to disable autodivert.

NOS Changes

The following changes were installed on Sunday, 23 July.

Kevin Matthews installed his implementation of user access to ECS. Externally, the feature is identical to the KRONOS implementation but, internally, the feature is radically different. A thorough description of the feature eludes this document but may be available soon. Two new common decks were added, COMPEMF and COMPEEA in addition to program MEM.

Don Mears installed the following changes.

1) The translation of accent grave was changed from 7600 to 7407.

2) Program 1CD was repaired so that a feed fail on the card reader does not cause BATCHIO to hang up. This is allegedly a hardware problem caused by the card reader returning feed fail and ready status simultaneously.

3) BATCHIO was repaired to punch and plot PUNCH and PLOT files of all origins.

4) An important fix to COMPRCS which firms up the check for last control statement in a file was finally converted.

5) Don corrected an error in TELEX processing of initial time limit. The error caused any user whose validated time limit was a multiple of 4096 to end up with an initial time limit of zero.

Tim Salo installed the following changes.

1) Page limit processing in 1BA was duplicated in 1SC. This lays the ground work for uniform page limit enforcement.

2) Punched decks will now have the customary three header cards.

3) TID processing for EXPORT sites was repaired. We should be able to ROUTE files to EA, EB or EC now.

Tim Hoffmann installed the following changes.

1) Common deck COMCZAP was repaired to avoid moding out if called when no Z-type parameters were specified.

2) Common deck COMCARG can now distinguish between XX and XXX when cracking non-equivalenced parameters.

The above two errors have been reported to CDC.

3) Tim completed his conversion of our local enhancements to DSDI.

4) TELEX was repaired to print the message NO PRIMARY FILE when a timesharing user enters a SUBMIT command with no file specified and with no primary file. Currently, the user gets the message, ILLEGAL PARAMETER.

5) Tim installed code from PSR summary 422 which ensures that MODIFY always passes at least 50K to COMPASS for X and Q options.

6) Tim repaired a bug in a local feature in LDR which allows overlay loading by name from a local file. Previously, LDR assumed that a four word call block meant load by name but the call could also mean load by level. The program OMNITAB uses just such a call and should now work correctly under NOS.

7) Program ALTER was reinstalled with documentation corrections.

8) Tim completed converting LISTVAL to NOS.

Brian Hanson installed the following changes.

1) The installation of full-track code in modset NOSA3 broke the E,D display. Brian repaired this problem.

2) Brian converted the mod to LIBEDIT which allows an option (the O option) to include overlay level in word 2 of each directory entry. This option is used to achieve random overlay loading.

Marisa Riviere installed MFEBR, a new microfilm program (see DSN 4, 10 p. 79).

Bill Sackett installed a correction to CPUMTR for MSG requests which is similar to the correction installed into KRONOS discussed above. Bill also corrected a notable error in PFM resulting from our installation of protected permanent files. Previously, PFM was allowing users to define permanent files with identical names but with unique passwords--a not altogether undesirable feature.

Jeff Drummond installed the following changes.

1) Jeff modified common deck COMSSCR by attributing names to most of the status/control register bits.

2) Program RESEX was altered to consider downed (off) tape units as part of the resource environment. The effect of this change will be that when a job which requests two 9-track drives is run on a day when only one drive is available, the job will rollout until the extra unit is available. This change was precipitated by a request from Operations.

3) Program EDD was altered to clear the ECS ERROR S/C Register bit after dumping ECS.

4) The TELEX CLEAR command was modified to allow parameters - just like the KRONOS version.

5) Jeff installed some minor changes to CHD the Chess Display Driver.

Brad Blasing installed his proposed CATALOG ST option (see DSN 4, 13 p. 101). Brad also repaired a critical error in BLANK processing of the FI and ID parameters. Previously, BLANK would not allow more than ten characters for the FI or ID. Program BLANK was rewritten by CDC as PSR 439. Our own enhancement to BLANK allowed a FI or ID of any length. BLANK now accepts a FI or ID of precisely 17 characters or less but only displays up to 16 on the E,P - display (a DSD bug).

PROPOSED CHANGES TO THE SYSTEM

A Notice/Notify Proposal - by S. E. Collins

I propose the following enhancements to NOTICE/NOTIFY:

1) Add a non-Telex origin turnoff option. Presently, only Telex origin jobs can be "turned off".

2) Change Telex to automatically call a NOTICE/NOTIFY PROCFIL if the no-recovery option has been selected. Currently, both the no-recovery and autobye must be selected before an automatic call will take place.

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REMNANTS OF A LOST CIVILIZATION - by R. A. Williams

The change in operating system from KRONOS to NOS (who said it can't happen here?) has raised several questions regarding the future of the XMIT/SEND package. It seems that the perennial discussion about XMIT/SEND inefficiency, cleanliness, and lack of security has again surfaced as the time approaches for mods related to the package to be converted. In addition to the technical and aesthetic issues that have been examined in the past, the added problems of external system changes precipitated by NOS are now a factor to be considered.

In view of this I unearthed the most recent published piece on the subject: a Jeff Drummond dissertation in the June 21, 1977 DSN. This proposal was passed in amended form as described in the July 12 DSN. Some aspects of that plan are no longer sensible in light of the design of NOS.

Here we will present an outline of the major facets of the design of a transfer mechanism that are deemed acceptable from the standpoint of the 6400 user as a replacement for XMIT/SEND. These standards are based on the philosophy that no capabilities should be lost in the name of progress (NOS): Add to these the objectives that Jeff suggested and we have the foundation for the structure of the new package:

1) The mechanism should be generalized and should appear identical to users of both machines.

2) Validation files should not be ferried between machines or stored in more than one spot due to security and update problems.

3) The software should be the same on all machines.

4) Users should be able to obtain the status of jobs running on any machine.

First we should deal with XMIT. The input file transfer area of XMIT may still be combined with SUBMIT as proposed with the MI parameter. This adds file editing ability for XMIT/SEND users. Thus the statement SUBMIT,file/MI=74 will validate use with the CXMT access word bit; will return a dayfile, as XMIT does now, to the initiating user number; and will virtually provide a one for one replacement of the present XMIT,file. Of course the added ability to send jobs to the 172 is assumed. SUBMIT,file/MI=64 will only work for 6400 users valid for CNTX; a very few. I will caution that some limit on the number of jobs transit will place in the 6400 input queue is needed as the mere fact someone isn't validated won't stop them from trying to crash the system with "FNT FULL".

The transmission of OUTPUT files will be accomplished with ROUTE to conform with NOS or, alternatively, with AROUTE. Unfortunately, the design of this routine is temporary and not particularly elegant. The essential elements of XMIT output file transfer are available, however. This method actually creates a SUBMIT job which contains a ROUTE request. Therefore, it fails to validate the Cyber user number for any permission other than open (COPE). This isn't really a problem as currently any user can do the same thing AROUTE does. Cyber XMT permission is only checked by XMIT on an output file request. If submit returns a DAYFILE, AROUTE presumably will as well to inform the user of an unopen or incorrect UN/PW combination. Thus AROUTE,file,UN=usernum, PW=passwor, MI=74 (DEFAULT), B=703, DC=LP, S=BC would be equivalent to XMIT, file, PR, UN=usernum, PW=passwor, B=0703. It is strongly suggested that BC be made the default site. Finally, we assume that output files can't be AROUTEd to the 6400.

The send function is all that remains to be examined. The currently available ASEND is tempting but there are a couple of serious drawbacks to this. Jeff suggested an enhanced SEND with parameters from PFILES like CT and M as well as an MI parameter. This is fine except when an invalid UN and PW is used (illegal or without XMIT validation). In this case the file would just be lost with no trace. If some sort of DAYFILE could be returned, as with SUBMIT, users would gain flexibility with minimal loss since only notification of some illegal attempts would be delayed.

The ASEND approach alluded to earlier has several problems. First, it actually creates a job which would run on the 6400 to save the file that was sent. This means either a dummy 6400 account with BATCH (CNTX) permission must be created or each 6400 user must be given this permission. That implies the allowed use of SUBMIT on other machines with 6400 destination for all users. The dummy account method creates other problems since the job to save files would need to account over to the destination user number from the dummy and thus file length and direct access restrictions would not be acknowledged. Further, all users needing send capability would also need the account to (CAC2) permission. Clearly this facet of the package needs the most design attention.

Finally, a word about Jeff's enhanced enquire capability which involves copying "FNT tables and other relevant information into ECS enabling users to enquire about the status of jobs executing on another machine." This sounds excellent! I find it a very worthwhile feature, provided overhead is not prohibitively great. In fact, recently a Help Line caller expressed disgust at the fact that he was being asked to move timesharing from the Cyber 74 while continuing to run batch there when the best way to find out the status of his batch job was by use of timesharing on the Cyber 74.

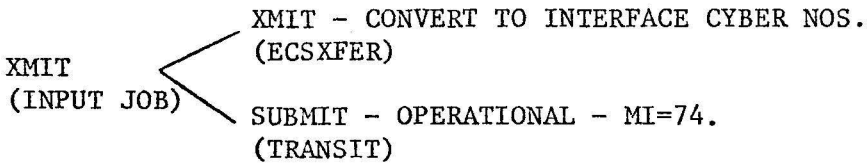
From a practical standpoint, however, this portion of the proposal sounds more difficult and should wait until more crucial, currently existing segments, are ready. (Accounting should note point E. of Jeff's original proposal.)

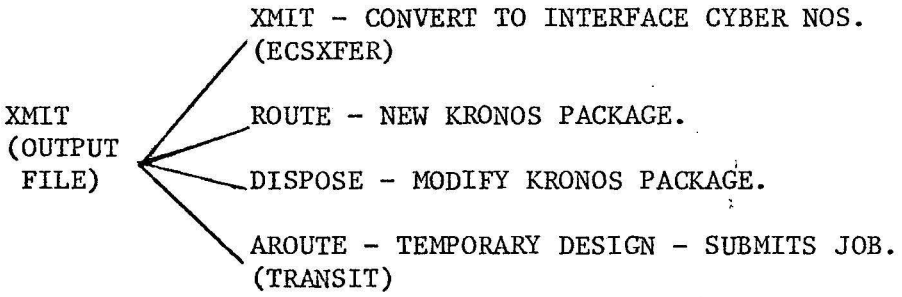
We have analyzed the famous XMIT/SEND problem (which has defied solution for years) from the perspective of a special interest group (the 6400 XMIT users and staff).

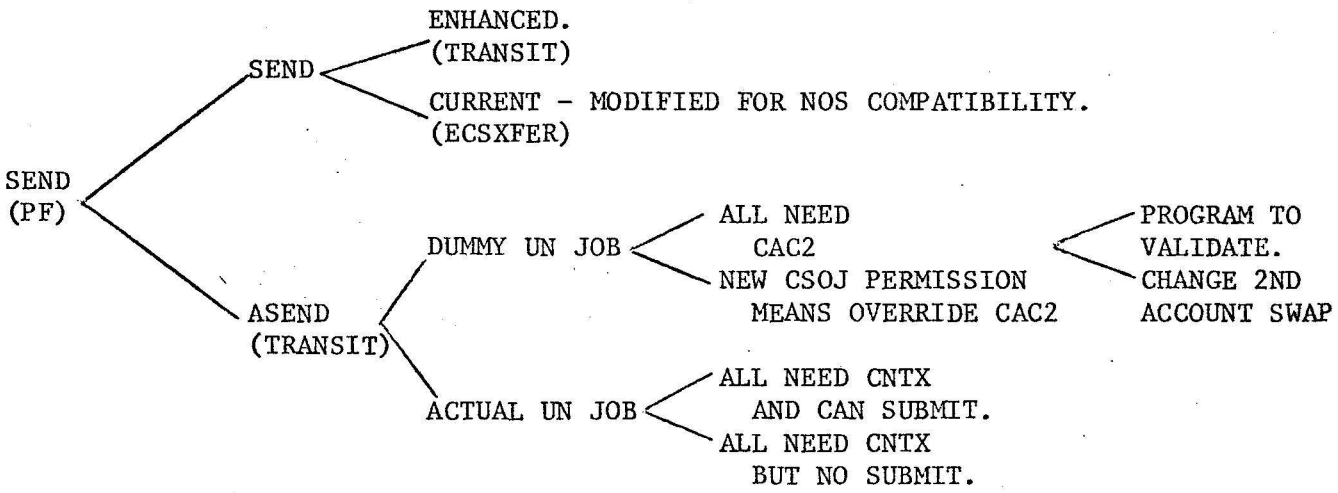
One must keep in mind that this group will see no tangible benefit from the changeover to NOS on August 20. In the long run, when and if the MERITSS users move to NOS, the work now being done will become apparent. Still, it is difficult to explain why some capabilities of a package they have come to know (and love?) suddenly disappear because another machine changes operating systems.

NOTE: The questions of staff assignments to complete the project should also be answered NOW along with the technical issues.

P.S. It is rumored that the collection of articles chronicling the XMIT/SEND debate will be traveling with the King Tut exhibit after the final chapter is written.







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A COMCARG Proposal - by T. J. Hoffmann

To aid in argument processing, I would like to put conditional assembly into COMCARG to allow processing of 3 character options.

If COMCAR3$ is not defined, or equal to 2, ARG would act as it does now. If COMCAR3$ is equal to 3, 2 MX and 1 LX instructions are changed to accommodate the 3 character option table.

This also requires an additional macro *ARG3* that would complement the current ARG macro in COMCMAC. The table format for 3 character options is:

```
TARG    VFD    18/OPT,18/ASV,6ST,18/ADDR
```

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CALLPRG VS. ABS Program - by B. R. Hanson and M. Riviere

Last summer both the Link and Cyber loaders were modified to treat RFL= and MFL= entry points in the same manner as they are treated for system programs. They were also changed to treat the HHA and LWAS fields as RFL= entries in the absence of either a RFL= or MFL= entry point.

Unfortunately, there is a third and very common method of loading ABS programs - namely CALLPRG. Even more unfortunately is that it handles ABS programs differently than either Link or Cyber loader. This has caused problems when the program works when loaded by CALLPRG and not when loaded by the loader or vice versa. To partially remedy the situation, CALLPRG has two options that may be used on an index entry - FL and MF. This is, however, only a partial solution and can itself lead to differences between the way a program will load under CALLPRG and the loaders.

I propose that CALLPRG be changed to look at the ABS binary (the first PRU) and look for RFL=/MFL= entry points so it can handle them in the same manner as the loaders do. The code necessary to accomplish this will add about 40B words to the CALLPRG FL and will immensely improve compatibility.

In order to keep the existing purpose of the MF and FL parameters in the CALLPRG index cards compatible with the usage of the field length specified in a program's binary, CALLPRG should be requesting the amount of field length to load a program based on the following table:

If T = 0 and M = 0	use 50000 B
If T ≠ 0 and M = 0	use T
If T = 0 and M ≠ 0	use M
If T ≥ M and T ≤ V	use T
If T ≥ M and T ≥ V	issue error message
If T < M and T = [MFL=]	use M
If T < M and M = $\begin{bmatrix} FL \\ MF \end{bmatrix}$	use M
If T < M and M ≠ $\begin{bmatrix} FL \\ MF \end{bmatrix}$	use T (*)

Where: T = Field length specified in the program's binary (RFL =, MFL =, HHA or LWAS)

M = Last user's requested field length (RFL or job card) or value guided by the FL or MF parameter

V = Maximum field length for job (validation field length or MFL)

[] = Value guided by enclosed expression

Unneeded MF or FL parameters should eventually be removed from the index. Their values will be overriden in most of the cases by the loader's determined value.

The exception is the last case (*) which has to be handled as such for packages that will still need to specify their required field length. In this case, if the values guided with the MF or FL parameters are larger than the ones contained in the program's binary, and not really needed, they will make the utilization of memory inefficient.

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Elimination of Logoff on SYET - by D. W. Mears

Currently, when 1AJ detects a SYET error flag, it empties the user's control statement buffer and, for timesharing users, it attempts to log off the terminal by placing a 0004 byte at the beginning of the MS1W buffer.

The result is that timesharing users who encounter one of the many conditions which cause a SYET error are logged off unexpectedly with no explanation of the reason for the log off and in such a way that they cannot recover.

The reason CDC has done this is to increase the security of the system. By logging off the user when the user appears to do something malicious, the number of malicious things the malicious user can do can be kept lower than if the user was not logged off after each malicious act.

There are two problems with the CDC approach. The CDC code will only log off the non-malicious user who accidentally gets a SYET error. The malicious user who expects to be logged off can prevent it by holding down the BREAK while the system is attempting to send the 0004 byte. The other problem is that the CDC code is unable to distinguish the malicious user from the innocent user. This means that frequently innocent users are logged off without warning or explanation simply because they made a mistake or the system screwed up.

SYET errors are generated in the following conditions:

1. When IDD detects that there are no tracks left to dump the dayfile buffer to,

2. When DSP detects that a job to be submitted has an illegal user card,

3. When QFM detects that a job to be submitted has an illegal user card,

4. When CPM detects that the user card entered is illegal,

5. When CPM detects that the SSJ= block for a job doing a DISSJ is outside the FL of the job,

6. When 1AJ detects the special call package specified in SPCW is not in the CLD,

7. When 1AJ detects that an illegal error flag ($\geq$ MXET) was set and the operator cleared the MXFM monitor function 1AJ had put in its output register,

8. When 1AJ detects that the SSJ= block for an SSJ= job which has ended is outside the field length for the job,

9. When 1RI detects any kind of error in the rollin file, and

10. When 1TA finds a TXOT job running at a control point in SSJ= mode after TELEX has asked 1TA to remove all TXOT jobs from the system.

11. 1MA sets SYET on request from a System Control Point Facility (SCP).

12. 1CK sets SYET for all jobs which are not subsystems and will not rollout during a checkpoint request.

If the user is allowed to remain logged in after any of these errors occurs, there will be no significant loss of system security, for the system will be no less secure than KRONOS was in this respect. We have had many security breaches, and many system crashes caused by users under KRONOS, but I don't believe that the security added by the NOS SYET processing would have prevented any of these KRONOS problems.

Therefore, I argue that this feature of logging off users, in fact, provides only an additional annoyance to the user. An annoyance which can cause an accidental mistype to result in hours of lost work at a timesharing terminal. There is no reason to compound the trouble we are causing for the users through the operating system conversion and character set conversion with the NOS logoff.

I propose to change 1AJ so that users won't get logged off when an SYET error is encountered.

SYSTEM MAINTENANCE: People and Procedures

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

1) The following proposals were either accepted or rejected.

   a) Tim Hoffmann's proposal to decrease the default job card time limit to 16D seconds from 100B was rejected. We chose instead to try and work with SRUs (see DSN 4, 13 p. 101).

   b) Don Mears proposal to not log off users who mistype their user commands was rejected as being too non-specific (see DSN 4, 13 p. 101).

   c) Brad Blasing's proposal to install a CATALOG ST option was accepted (see DSN 4, 13 p. 101).

   d) Jeff Drummond's system security proposal was accepted in its entirety (see DSN 4, 13 p. 102).

2) The remainder of the meeting was spent discussing the NOS bugs reported by the Help Line on the first test day - most of which are not serious, the conversion to autobuad - which has already come to pass with few hitches, and the upcoming character set conversion. The problems associated with the character set conversion are principally related to hardware availability. We still have not secured a printer for Experimental Engineering.

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CALLPRG and Library Tape News - by M. Riviere

On July 16, J. Mundstock replaced the current version of MNF, TSF and their libraries in the NOS Library Tape with their future versions. This change made the current MNF libraries compatible with the FORTRAN NOS library. Although this current version of MNF will still be updated with improvements between now and August 21, it solves, by being in the system, the problem with MNF library accessibility. (As a matter of fact MNF, TSF, and their libraries were updated again on July 23.)

On June 16, the routine DMOD in the NOS FORTRAN library was replaced with the KRONOS version. There is an error in the current CDC version of DMOD. This modification was requested by J. Mundstock.

On June 16, I replaced the version of SYSLIB on the NOS Library Tape with a new one created from the latest versions of the common decks. SYSLIB will still be updated between now and August 21. A change to the relocatable version of COMCBKP is already scheduled.

This version of SYSLIB has the relocatable versions of the locally inserted common decks renamed with special characters included in the name's string in order to avoid the routines to be directly FORTRAN callable (e.g., RELARG is now RE.ARG). The CDC stock version of SYSLIB (CPUREL), however, has its routines named using the original CDC suggested names (e.g., RELCCIO is now CPUCIO). All the entry point names of SYSLIB remained as they were.

On July 23, I placed the new versions of BASIC that will be compatible with the future character set as CALLPRG FETCH type packages.

The FETCH type basic for the Cyber 74 and 172 is the CDC stock BASIC 3. The version for the CDC 6400 is the current KRONOS BASIC 2, assembled with the new character set option.

These versions of BASIC will become current on both computers on August 21.

Existing sources of BASIC programs will have to be run through CONVERT to be accepted by the new compilers (CONVERT, P=OLD, N=NEW, TS=TTY). New BASIC source files should be created by using TTY defined type terminals in order to be accepted by the new compilers.

I would appreciate the testing of this product by UCC staff.

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CALLPRG Index and Packages after August 21 - by M. Riviere

The current Cyber 172 CALLPRG Index is the one that will be used on August 21 for the common NOS System on the Cybers 74 and 172. The first section of the index contains the newly introduced NOS CALLPRG packages. The second section contains all the entries that existed on the Cyber 74 at the time the CALLPRG disk files were moved from STF to SPL. The only section that is modified on the

NOS System is the first one. The Modify Program Library for this section is contained on NOS CPOPL (FETCH, CPOPL). As packages from the second section prove to be acceptable in the NOS System, new entries should be included for them in the new section. The old section will eventually be removed after some time.

It is important to note that if an old Cyber 74 package is not meant to be offered in the NOS System, a message type entry for that package should be placed in the new section in order to stop CALLPRG from continuing the search into the old section. It is also important to note that files modified on the Cyber 74 since the file transfer took place may also be needing a modification on the Cyber 172.

Considerations about the CALLPRG Index and packages also have to be discussed with respect to the CDC 6400. The CALLPRG XMIT features will not be included in the NOS System and therefore any Cyber 74 CALLPRG package that is needed on the 6400 computer and retrieved now by CALLPRG from the Cyber 74 will have to be placed as a 6400 file and have an entry included in the 6400 section of the KRONOS Index. The Cyber 74 section of the 6400 CALLPRG index will be dropped at the time that the NOS System will be running on the Cybers 74 and 172.

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Cyber 74 Deadstart Dump Analysis from Monday, 10 July, through Sunday, 23 July - by K. C. Matthews

Note: In general, KRONOS crashes have not been analyzed well since we have been a little pressed for time.

Monday, 10 July

09:28 Cyber 74

Problems appeared at the beginning of operations. ECS was not initialized as it normally is at deadstart time, because the ECS entry was changed not to use the DDP. Attempts to initialize on line didn't work for some reason, and a level 0 was performed.

09:50 Cyber 74

Several copies of PFM hung while accessing permanent file device 11. DN1 was wrecked and had to be reloaded. The device was wrecked during part of the ECS operation above.

Tuesday, 11 July

10:20 (DD23) Cyber 74

The Plotter channel hung. A level 3 deadstart was required.

Wednesday, 12 July

10:14 Cyber 74

Errors on device DN14 prevented the system from reading the label on that device. In the resulting confusion, we think that a "GO." was given to an initialize of ECS that went wild. This was probably due to the fact that the permanent file system was still incomplete - DN14 has to be there. Anyway, all the direct access files in the system were lost and had to be reloaded, which took until 13:00.

14:53 (DD24) Cyber 74

Channel 32 (the unit record equipment) hung full. A level 3 deadstart was required.

Thursday, 13 July

18:13 (DD4) Cyber 172

The system hung and operators could not make entries. Unfortunately, the tape was written on before it could be analyzed.

Sunday, 16 July

16:37 Cyber 74

The system was up a little late because corrections were needed for the Sunday NOS ISF procedures.

Tuesday, 18 July

15:46 (DD-25) Cyber 74

The system hung while most PP's were waiting (DSWM monitor function) for one disk channel. A level 3 was performed.

19:29 (DD-1) Cyber 74

Lots of low core was wrecked by something unknown. CPUMTR was wrecked as a result, and a level 0 deadstart was required. The dump has not been thoroughly analyzed.

08:54 Cyber 172

A level 3 recovery was performed in an attempt to clear a message from the E, M display for ECS.

17:52 (DD31) Cyber 172

Errors on disk 0 occurred all day. An unrecoverable error at this time occurred in a permanent file catalog track. There were hardware problems with channel 6 on that drive, which caused the disk errors all day.

Wednesday, 19 July

20:40 (DD2) Cyber 74

Export hung and would not drop. A level 3 deadstart was required.

Thursday, 20 July

14:28 (DD-32) Cyber 172

CIO hung because two bits were inconsistent in the MST for pack UCC. This was because the UCC drive had been down, and we changed a removable pack to a non-removable by changing one (but unfortunately not both) of the required bits in the MST.

Friday, 21 July

14:36 Both Machines

The power failed for a few seconds, which caused all the computers in the building to go down. We were up around 17:20.

Sunday, 23 July

NOS running in MMF mode on both machines.

We were late coming up because one disk drive was down. We made numerous errors in trying to get the CMRDECK entries correct. There is also one bug in MMF CMRDECK processing (I think) which slowed us down a little. Then we found that the NOS VALIDUM file was one week old. A current version was brought over. Then Export had to be replaced by last week's version since this week's version caused TELEX to die. By 17:30, everything was finally up and running smoothly.

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6400 Deadstart Dump Analysis (7/10 - 7/23) - by R. A. Williams

There were no system malfunctions during the period, except for a power failure on 7/21.