

UNIVERSITY OF MINNESOTA COMPUTER CENTER
Deadstart Systems Newsletter

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NOTICE OF CHANGES TO THE SYSTEM

Kevin Matthews repaired a check for empty file in DSP.

Don Mears installed some corrective code from PSR518 which corrects the way
LRO treats interrupt processing.

Tim Hoffmann installed the following changes.

- 1) Tim corrected a situation in Retain processing where a permanent file is purged before the file which is to be made permanent is determined a legal mass-storage file thus leaving the user with no permanent file.
- 2) The ABSY, AESY and ARSY account file messages were changed to include MID and the AESR message was changed to include user number (see DSN 6,7 p. 52).
- 3) Tim's proposed change to ENQUIRE allowing the JN option to specify a full 7-character name was installed. Additionally, users can now watch jobs executing on all computers (see DSN 6,6 p. 45). Tim also installed a new writeup named ENQUIRE detailing the new capabilities.
- 4) Tim repaired a minor error in interrupt processing in RESEX.
- 5) Documentation in RELOAD was updated.

Bill Sackett installed a change to LAJ/LDR to issue ZLLF and ZLSY messages for non-zero level overlays. This feature is controlled by PMS bit 7. Bill changed IUD, the ECS allocation routine, to check for ECS equipment defined in the EST before accessing ECS.

Brad Blasing repaired a minor error in DSD-FIND processing and repaired an awful conversion error in LISTVAL which was allowing anyone with COPE turned on to issue a HASH command. The routine should have been checking CSTF.

Andy Hastings changed TAPES to give the tape librarian master user access to all tapes thus eliminating the need for a special version of TAPES for the tape librarian. The UI-option was also disabled for all but system origin requests. Additionally, Andy added a PN option to SEND (see DSN 6,13 p. 129).

Kevin Fjelsted installed a change to NODROP processing so that non-existent local files cannot be NODROPPed and a message is issued to the user (see DSN 6,8 p. 59).

PROPOSED CHANGES TO THE SYSTEM

Executive Action - by L. A. Liddiard

The Executive Committee needs answers to the following questions with respect to our current CDC system. The answers should address desirability, feasibility, and estimated time to implementation.

- 1) Screen editor for Cyber. Will it go through Telex? We understand that one exists under TAF/NAM using synchronous terminals.
- 2) Priority scheduling such as was suggested when we installed the Cyber 172. By paying a premium rate, can an individual direct his job to a high priority queue and expect that job to finish sooner than if the job were run in the normal priority queue?

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Automatic Facility for Reloading Archived Files - by Mike Frisch

I propose that when a user attempts to reference a permanent file that doesn't exist, the system check to see if the file has been archived during the last twelve months. If so, it should submit a job to automatically reload the latest copy of the file. The time-sharing user should be told there will be a delay while this is done and the user will be allowed to go on with other tasks while the reload is being done. There should be no extra charge for the reload beyond the ordinary charges for SRU's and tape mounts for the submitted job.

SYSTEM MAINTENANCE: People and Procedures

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

A large part of our meeting was spent listening to a presentation made by IBM on SNA. Before the presentation, the following proposals were hastily discussed.

- 1) Bob Williams' proposal to remove the CTPC access word bit was approved (see DSN 6,13 p. 119).
- 2) Bob Williams' proposal to place a subroutine named MINNLIB into the default libraries used by MNF and FTN which simply builds a LDSET table to reference the proper version of MINNLIB was approved (see DSN 6,13 p. 120).
- 3) We were so totally overwhelmed by Jeff Drummond's DAYFILE MADNESS proposal that we couldn't decide anything. We all agreed that something had to be done and we will take up the discussion again at the next meeting (keep reading DSN 6,13 p. 122).
- 4) Andy Hastings' proposal to add a PN-option to SEND was narrowly accepted.
- 5) Mike Frisch's proposal to install package usage statistics was rejected as being too difficult (see DSN 6,13 p. 129). Larry mentioned that a similar scheme will be necessary soon for at least one usage-priced package.
- 6) Mike Frisch's proposal to change addresses in load maps and dumps, etc., to decimal was rejected as being too extensive a change.
- 7) Steve Collins' proposed changes to XEDIT were discussed but not resolved during the meeting. Due to the pressing deadline for publication of XEDIT documentation, a group of us assembled after the meeting and rejected the change to the NOBELLS command but accepted the change to the Z-command and the new E-option (see DSN 6,13 p. 130).

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Callprg and Library Tape News - by M. Riviere

On July 10, I inserted an entry on the Cyber 74/172 Callprg Index in order to make FTN5LIB available as a Fetch type package.

FTN5LIB is, as FTN5, a 509 level product and it is associated with a 509 version of SYSLIB. This version of SYSLIB is retrieved with FTN5LIB. The level difference with our current System version of SYSLIB, that is, level 485, can create some run-time conflicts. This fact prohibits FTN5LIB, as well as FTN5, from being installed as System products.

On July 29, M. Frisch will be installing the GRG2 library on the Library Tape as a System Library.

Also on July 29, Steve Reisman will be modifying the Cyber 74/172 Callprg Index in order to install future versions of COBOL, COBOL5, SORTMRG, SMTEXT, SRTLIB, FORM, DDL3, COPYCL, COPY8P, CRM, CRMEP, CSTDMP, ESTMATE, QU, FLBLOK, FLSTAT, IOTEXT, MIPDIS, MIPGEN and SISTAT. All these versions are level 518. All the

entries for these future products include, when applicable, the product's required libraries. Additionally, Steve will be removing unused entries for S2K and S2KIA, the past version of S2000 and BBT06RM. The past version of S2000 will also be removed from the Cyber 720 index. The future products are, for the time being, offered only on the Cybers 74/172. Some of them, such as COBOL and COBOL5 are machine associated products and Steve has installed a different version of them for each computer (Cyber 74, Cyber 172). Other products, such as DDL3 and QU apply only for the Cyber 172.

The next set of Callprg Index and Library Tape modifications will take place on August 19. Modifications for that date should be submitted no later than noon on 7 August.

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Help Us Design a Screen Editor - by Mike Frisch

Mike Collins of the UCC Microcomputer group and I are interested in putting together some proposals for a screen editor that uses a microcomputer to edit a file residing on one of our Cyber computers. Since we're not familiar enough with the inner workings of NOS, we need some help from the Systems group to find feasible and practical ideas (if there are any). The limitations we want to set are that NOS should not be completely rewritten to fit in the screen editor, that the system should not be overloaded when there are a few users of this editor, and that response time should be tolerable. If you would like to participate, please contact me or Mike Collins.

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16 Work PFC (Permanent File Catalog) Test Day - by K. C. Matthews

The last 16 word PFC test day on July 6 went fairly well. Things seem to work as expected. I plan to have only one more 16 word PFC test period before the actual weekend when the conversion takes place. It will probably be Sunday, August 3. This could be delayed by a weekend or two if someone really wants to test something and cannot have it ready by August 3. Please let K. C. Matthews know. Here is how the 16 word PFC time will work.

- 1) Only the Cyber 172 will be in 16 word PFC mode.
- 2) It will have 16 word PFC copies of packs SPL and UCC. These are only copies of the real ones. The copies will be current as of midnight, August 2.
- 3) Any files you change on SPL will be "incrementally" loaded back to the real SPL if you want.

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Systems for the Millions - by T. W. Lanzatella

This article is my entry to the Polishing Our System fray. Andy presented a very provocative article and I was pleased that it appeared chiefly because it spawned a lot of vigerous discussion about fundamental problems with the operating system. This article should not be construed as a rebuttle. My aim is to address some of the problems cited which are not so much related with the system but with our maintenance practices and procedures.

I first want to discuss the rationale behind our system work. Andy's survey of new users brought response like "we should change this" or "we should fix that" for the benefit of user friendliness. The context that a change for usability has in relation to all changes which we make to the system seems to be unclear. This is not hard to understand. Much of what we do with the system is totally invisible except that it gets written down in the DSN, but the DSN does not give an accurate picture of what the system staff is really doing. The NOTICE OF CHANGES section of the DSN gives only a distilled picture of our activities. This section is usually three or four pages long and describes the work of about 15 people on a biweekly basis. Frequently, an individual may work for weeks or months on a change which can be described in a couple sentences. Exactly what is the nature of our system changes and why do we make them?

- 1) We change the system to meet some operational need. Anything which makes the computer easier to operate is usually done unless the change involves an unreasonable amount of work. The Batchio Decwriter is a good example. Many times changes like these are necessary because of a policy mandate like Delayq or Performance Measurement.
- 2) We change the system in order to install new hardware. The PDP-11 front-ends for Supio and Telex and the 885 disks are two examples.
- 3) We change the system in order to make it faster and more efficient. These changes ultimately extend the life of the computer and provide a way of getting better response-time for time-sharing users without spending money.
- 4) We change the system in order to correct CDC errors. These mods are hard to classify as changes since they are usually released by CDC for a subsequent system.
- 5) We change the system to make life easier (and more interesting) for users and ourselves. Consider Tapes, Acquire and Nodrop.

This list not only reflects the reasons for changing the system but it also reflects the relative priority of our changes. We consider Performance Measurement a much more important area than, say, a NC option on Copy (unless it happens to be broken). A point which I will frequently dwell on is that we have only a finite amount of manpower for system programming. Staff and users can easily gain the mistaken impression that the system staff spends all of its time dreaming up slick new features for the user's (or our own)

benefit. This, I believe, is because a few UCC developed usability enhancements have become very popular. In reality, usability enhancements take up the least amount of our time with items 1, 2, and 3 being our dominant activities. This is not an arbitrary choice, it comes about through necessity. The existence of the system group is justified by our work in the first three areas. One of the biggest reasons why I am vehemently opposed to any kind of effort to make the system more user-friendly is cost. Because we have limited manpower, a broad effort to make the system more usable would draw on resources which would be used for items 1, 2 and 3 and would therefore have a negative cost-benefit.

Andy remarked, quite rightfully, that the justification for many of our system changes is ad-hoc and contradictory. The NOS operating system is a very extensive system. Many people have contributed to its development. Each section of the system bears the style of the individual who worked on it. When we look at a section where a change seems appropriate we have to make the change logically and stylistically mesh with that section. The justification for how a change is made is directly related to the logic and style of the area where the change is being applied. Because style is not consistent across all sections, our changes often appear ad-hoc and having contradictory justification. Our main concern when making a change is portability across CDC releases. If we make major changes in order to gain perfect consistency the amount of work necessary to maintain that consistency becomes unreasonable. Hence, we tolerate a small amount of inconsistency and ad-hocness.

Although not well documented, every system change is subject to a set of rules.

- 1) All system changes must adhere to coding specifications (in deck Coding). This age-old rule is tried and true. We have learned that sticking to coding conventions alone goes a long way toward a clean, reliable modset.
- 2) When possible, we do not add features to or extend the capabilities of the stock system. Instead, we try to keep these extensions confined to locally written programs. This rule is the only one for which we can be accused (by an outsider reading the DSN) of applying in a cyclical fashion. All system staff are aware of this rule. We also consider that every programmer has an individual style and styles are as varied as signatures. What one individual considers impossible to install as an extension to an existing package, another will see as trivial. When this rule is used in conjunction with rules 3 and 4 below we usually end up with an implementation that at least the majority enjoys.
- 3) All system changes have to be proposed in writing, publicly defended at the system group meeting and unanimously voted upon in order to be installed. This process gives every UCC staff member an opportunity to influence the course of our system changes.
- 4) All system changes are reviewed by all system staff members - the so-called Code Review. During Code Review, violations to rules 1, 2 and 3 are pointed out and corrected or mediated. The mediation is steered

by myself and sometimes requires much diplomacy since most people feel very strongly about their style of implementation and criticism can sometimes become harsh.

The rule that has the most relevance to this discussion is rule 3, the proposal. All system changes have to be publicly defended at the system group meeting. During this defence, all aspects of a change can be criticized. The basis for the criticism has always been exactly those proverbs offered by Andy in his article: human-oriented design, ease-of-use, non-overlapping in function, consistent structure, unwanted generality. Each of the undeniably good principles expounded upon in Andy's article is used, if applicable, when criticizing proposals. I can point out countless applications of each proverb simply by paging through old DSNs looking for rejected proposals. In many ways, the democratic, majority-rule process used to decide the fate of our proposals is responsible, at least in part, for a certain extemporaneous quality of the system. Literally any special interest group within UCC (and lately without) can submit a proposal and, assuming the votes are there, get the proposal accepted and slated for installation. Is this bad? I think not and I certainly do not want to change the process considering the alternatives. However, this process will never lead to a consistent rationale for all system changes because everyone applies the system design principles in a different way.

I was most distressed with Andy's lament that installing future CDC releases would contribute to the death of user-friendliness. CDC is a large service oriented (albeit profit motivated) organization. If their systems are not usable they would eventually go out of business. When CDC adds features to the system nowadays, the change is in response to a need which is industry-wide. Whenever we fall very far behind the release schedule set up by CDC, we inevitably have to play catch-up in order to reap the benefit of the added features. We need these added features, they help to keep reasonably standard and compatible with other CDC sites. They also help various segments of the user community and hopefully draw new business. Besides, we pay a lot of money for the support from CDC. Not installing future system releases will not solve any problems. We would end up with an undocumented, non-standard and unfriendly system - like Moms.

Most of the usability problems mentioned by Andy I do not consider as problems but as simple aggravations. These problems seem to fall in two categories: Misleading behavior and misleading terminology. I do not think anyone should try to sit down and use the system without first reading a manual at least once. Even, a small amount of time spent reading the manuals is sufficient to grapple with the situations mentioned. A good example is that of Old and New incideously returning all local files. This fact is mentioned at least three times in the Time-Sharing User's Reference Manual. The other class of problems, misleading terminology, can also be solved by reading the manuals. Much terminology depends upon the user recognizing the context of its use. Users too must strive to gain a whole-view picture of the system. In general I feel that we should rely on the CDC manuals in order to instill understanding in the user community. Maybe we could rely more on CDC User Guides instead of Reference Manuals. These documents are not publicized very much by UCC but are extremely good at providing examples and entry-level terminology.

Misleading or non-specific error messages is an awkward problem. I will admit that in a few circumstances the wording of an error message is debatable. Changing a message would probably invalidate the reference manual. This could be a disservice to those users who have invested in CDC manuals or who rely on CDC manuals. If we decide to change a message to be more meaningful we risk exposing to system problems. Changing a message is a change to the system. All system changes have to be maintained across CDC system releases. The more changes we add to the system the harder the upgrades become.

Another class of problems mentioned relate to fundamental deficiencies. Examples are poor Ascii support and the mishmash of job limit control statements (Resourc, Setjstl etc.). A UCC fix for these problems is out of the question. The fix would involve an unreasonable amount of work and would probably never be very aesthetic. Many of us are in agreement that some things CDC simply does not do very well and never will because of the machine architecture. The best way to solve these problems and at the same time add considerable breadth to the services which UCC provides is to buy more computers. Burroughs, DEC, IBM and Cray all sell computers offering various attributes which CDC cannot offer. If breadth of service is to be the wave of our future, the role of the system group will change considerably. We know that tending to day-to-day maintenance of more than one system is taxing on system group resources. We learned this by having to maintain KRONOS and NOS simultaneously where most differences were minor. Imagine the complexity of keeping three or four different manufacturer's computers running. Our charge will be to provide uniform access to these computers. This activity alone will consume most of our resources. If my scenerio is correct, the opportunity for contradictory and ad-hoc solutions to major problems will be limitless. An ever increasing number of people will be involved in these solutions and the communication between UCC groups will be harder to maintain. Adhering to a list of guidelines will not guarantee a polished system. Whatever polish these systems have will have to be imbued by the manufacturer. We will not have time to add any polish to UNIX, COS or VM/370. The point is that polish in Andy's sense is not something like a coat of paint. It must be present from the onset as a collective attitude.

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Cyber 74/172 Deadstart Dump Analysis from Thursday, 3 July through Thursday, 17 July - by K. C. Matthews

Thursday, 3 July

13:20 (DD2015)

Cyber 172

The 885 disk with temporary files on it seemed to be hung up. So far, this was the last time errors have been detected on that 885 unit. A level 3 recovery deadstart was performed.

Sunday, 6 July

21:17

Cyber 172

IDS hung as the System checkpointed itself. The system checkpoint was due to temperature/humidity problems. A level 3 recovery was needed.

Tuesday, 8 July

19:24 (DD2020) Cyber 74
The screens went blank. Analysis showed that one PP had dumped itself into central memory for no good reason. The PPU should have been idling.

04:00 (DD2007) Both Machines
Both the Cyber 74 and 172 seemed to hang up at end of operations. The 172 was waiting for an interlock from the 74. The 74 was stuck at address 10 in CPUMTR. It may have been caused by some engineering activity at that time.

Wednesday, 9 July

20:56 (DD2005) Both Machines
All three machines went down. Analysis showed junk written in ECS. Perhaps due to incomplete coupler on the 170-720.

Tuesday, 15 July

19:58 All Machines
All three machines went down, possibly due to power problems due to the weather.

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Cyber 170-720 Deadstart Dump Analysis (6/20-7/20) - by R. A. Williams

<u>Date</u>	<u>Description</u>	<u>Tape</u>
800706	The machine came up several hours late due to air conditioning problems.	Fixed
800709	The scopes went blank twice due to a hardware problem with the ECS coupler.	Fixed
800710	The scopes went blank due to a hardware problem with the ECS coupler.	Fixed
800712	The system came up about eight hours late due to a hardware problem with the ECS coupler.	Fixed
800715	A power failure caused the system to go down.	Fixed