

Send all comments, criticisms and contributions to the editor: T.W. Lanzatella  
University Computer Center, 2520 Broadway Drive, Lauderdale, MN 55113

TABLE OF CONTENTS

NOTICE OF CHANGES TO THE SYSTEM . . . . .	1
PROPOSED CHANGES TO THE SYSTEM. . . . .	2
HELP!!! - J.J. Drummond. . . . .	2
ASSORTED PROPOSALS - T. Salo . . . . .	2
SYSTEM MAINTENANCE. . . . .	3
LAST WEEK'S SYSTEMS GROUP MEETING - T.W. Lanzatella. . . . .	3
ECS TESTS ON THE 6400 - W.T. Sackett . . . . .	3
ECS TRANSFER INTERRUPTIONS ON THE CYBER - T. Salo. . . . .	5
FIELD LENGTH IN CALLPRG OVERLAYS - M. Riviere. . . . .	6
INCOMPLETE SYSTEMS GROUP PROJECTS - T.W. Lanzatella. . . . .	7
SYSTEMS GROUP SUMMER PROJECTS - T.W. Lanzatella. . . . .	9
SUPIO ABORTS - T. Salo . . . . .	12
CYBER 74 DEADSTART DUMP ANALYSIS - K.C. Matthews . . . . .	12
6400 DEADSTART DUMP ANALYSIS - R.A. Williams . . . . .	13

NOTICE OF CHANGES TO THE SYSTEM

E.J. Mundstock changed BATCHM, the MNF batch queue processor, to increase its queue priority. When a large number of batcher jobs had been submitted, BATCHM could not process them in a single time slice thus causing an inordinately large turnaround time for 30 line Fortran programs.

Bob Zalusky repaired a problem in QREC which caused lost delay queue jobs and resulted from the level 13 conversion. We have been running a binary of QREC since the problem was discovered on 12 May.

Bill Elliott contributed the following changes.

1. PFPACK was repaired to properly process files on the 808.
2. EXAMINE was altered to use an OPEN function rather than an RSB request to determine EXAMINE field length requirements. As a consequence, the SSJ= entry point was removed from EXAMINE.
3. Programs EXPLIB, TAPES, COMSEXF and COMCFTE were altered to facilitate damage recovery in the event that the RESEXES file becomes corrupted. In the event of damage, the tape librarian can now set a damage flag for all tapes which are suspect. The intention here is to simply insure that the user finds out about the problem.
4. DSD was altered so that the deck COPYRT could be removed from WPL. This deck was a tremendous source of irritation whenever a deck was edited from WPL in source form.

5. The ability to enter display code data into memory from DSD was removed.
6. Program RESEX was repaired so that TAPE BLOCK DEFINITION error is no longer incorrectly given for some values of FC.
7. Program LMT was altered throughout to use the symbol ZERL to zero out PP memory.
8. The PURGE and SWITCH console commands are now recorded in the error log.

Don Mears installed his proposed extension to time sharing interrupt command processing (see DSN 3, 5 p. 5). Don also repaired MODIFY to pass ECS field length to COMPASS if the X or Q option is used.

Brian Hanson altered LDR error processing of FL too short situations to check whether the call block was overwritten during the load before checking for error processing and does not issue a dump.

Tom Lanzatella changed the system version micro in PPCOM to say KRONOS 2.1.2 rather than KRONOS 2.1.1. This is a change which CDC overlooked at level 10.

#### PROPOSED CHANGES TO THE SYSTEM

HELP!!! - by J.J. Drummond

I would like to propose that the time-sharing HELP utility be modified in the following manner:

- a. The HELP information be brought up to date and maintained via a CCDOC program or variant thereof.
- b. The HELP information file (CMDFILE) be accessed as an indexed writeup and via the HELP control card/command.
- c. CMDFILE be moved to UN=WRITEUP as per the LIBRARY suggestions (see DSN 3, 8 p. 7) and for consistency with other writeups.
- d. Alter the HELP utility to (1) do interrupt processing for TELEX-origin jobs, (2) process parameters (i.e. HELP,cmd would print information on just that command), and (3) respond appropriately when run from non-TXOT jobs.
- e. Notify UCC staff of procedures to update HELP information when system changes altering TELEX commands are made.

//////////

Assorted Proposals - by T. Salo

#### SUPIO

1. Enable changing the length and origin of the Port Status Table by reassembling SUPIO and 1SU.
2. Add one word to the PST entry.

3. Define a new field in the PST entry which points to the return address within an overlay. This will make possible the moving of additional code to overlays reducing SUPPIO's field length.
4. Rewrite the routines which search for an output file in order to consolidate common code and save CM.
5. Delete several unused words to prevent SUPPIO's FL from increasing.

#### ISU

1. ISU should write a system sector when opening an input file. This will make LWF do less work when LWF is implemented.
2. ISU no longer needs to write a system sector when a file is released to the queue as IBA already does this.

#### QUEUE

Add a utility QUEUE which will enable a user to list the jobs in the DELAY queue. The control card format will be:

QUEUE(OP=LDQ,L=1fn)

where        OP is the option  
               LDQ is list delay queue  
               L is the list file name

#### QFM

Allow SSJ= jobs to execute the QFM functions of attaching and returning the IQFT file.

#### LPT

Renumber the lines on the current version of LPT as requested by operations.

#### SYSTEM MAINTENANCE: People and Procedures

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

1. Incomplete systems group projects and systems group summer projects were discussed at length. The results of that discussion appear later in this newsletter.
2. Copies of the current operating system bug list were distributed.
3. Larry Liddiard previewed briefly his upcoming presentation to the Computer Advisory Committee. A collection of notes and graphs were provided. Contact T.W. Lanzatella for a copy of these.

//////////

ECS Tests on the 6400 - by W. Sackett

Since the 6400 does not have an instruction stack, the restart transfer feature on interrupt of ECS reads was used. A jump to a subroutine instruction was read from

ECS on top of the ECS RE instruction causing an exit on interrupt rather than a restart of the read.

Number of Transfers	Octal Length of Transfer	Per Cent of Transfers Completed without Interrupt		
513	40000 words	73.68	72.12	39.38
2561	10000 words	92.46	92.35	73.02
4097	4000 words	96.31	96.12	81.21
4097	1000 words	99.02	98.93	92.97
4097	400 words	99.46	99.07	96.56
4097	200 words	99.58	99.78	98.95

Configuration (Cyber DDP)

A)\*1,\*2,PR31 B)\*1,\*3,PR31 C)\*1,\*2,PR30

513	40000 words	62.28	18.91	97.86
2561	10000 words	80.63	60.41	93.71
4097	4000 words	84.50	77.79	99.61
4097	1000 words	93.82	93.97	99.85
4097	400 words	97.83	96.36	99.95
4097	200 words	98.76	98.10	99.93

Configuration (Cyber DE)

D)\*1,\*2,PR31 E)\*1,\*5,PR31 F)\*4,\*5,PR31

\*1 = 300 STIMULATED terminals on the 6400.

\*2 = 300 STIMULATED terminals on the Cyber 74.

\*3 = Cyber idle.

\*4 = 6400 idle (ECSTEST program was the only job active).

\*5 = \*2 + a priority 31 program running on the Cyber in a loop writing and then reading 10000B word blocks of ECS.

PR = Priority that ECS test program ran at on the 6400 (TXOT jobs ran at priority 30).

Remarks:

Comparing configurations A) and B) shows that when the Cyber is running with the DDP, a timesharing load on the Cyber does not affect ECS accesses on the 6400. Configuration D) shows however that without the DDP there is an impact.

D) versus E) shows the impact declining for block transfers less than 1000B words long.

Configuration C) represents a hypothetical case of USERECS on the 6400.

Tests similar to these would be helpful in determining the best use of the CMAP feature.

For a typical STIMULATION test on the 6400 4X10\*\*5 blocks of 100B words are storage moved in a 40 minute test. The above tests raise the possibility that larger blocks might be more efficient.

Subsystems should be able to make block ECS transfers of up to 1000 octal words with little detriment to the system.

Similar tests show that the Cyber running for normal production gives results similar to configuration A).

The original motivation for these tests was to attempt to determine the optimum block length for clearing core with ECS (CSTM in program mode). Until Don Mears suggested using error exit, I had not thought direct tests possible. Since using an illegal ECS address causes a half exit to be taken on completed transfers, it was easy to write a program that took an error exit on interrupted reads and kept a count of the proportion of interrupted to completed reads. (Again the central memory address to read to was the RE instruction address.) The results from this program showed that ECS activity on the Cyber did not influence the clear core program (this was suspected to be the case but the CE's were not certain).

A puzzle to close with: With bits 17 to 21 set in the ECS address (illegal address for 200 to 2000K ECS configurations), the clear core program required that FLX be set greater than or equal to 57010000 (octal). With 57007700 or below, the program modes out rather than returning zeroes with the ECS RE. Why???

//////////

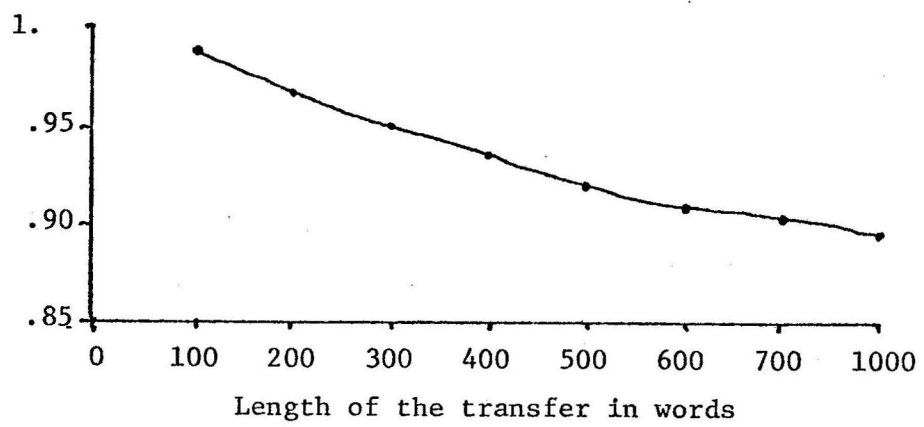
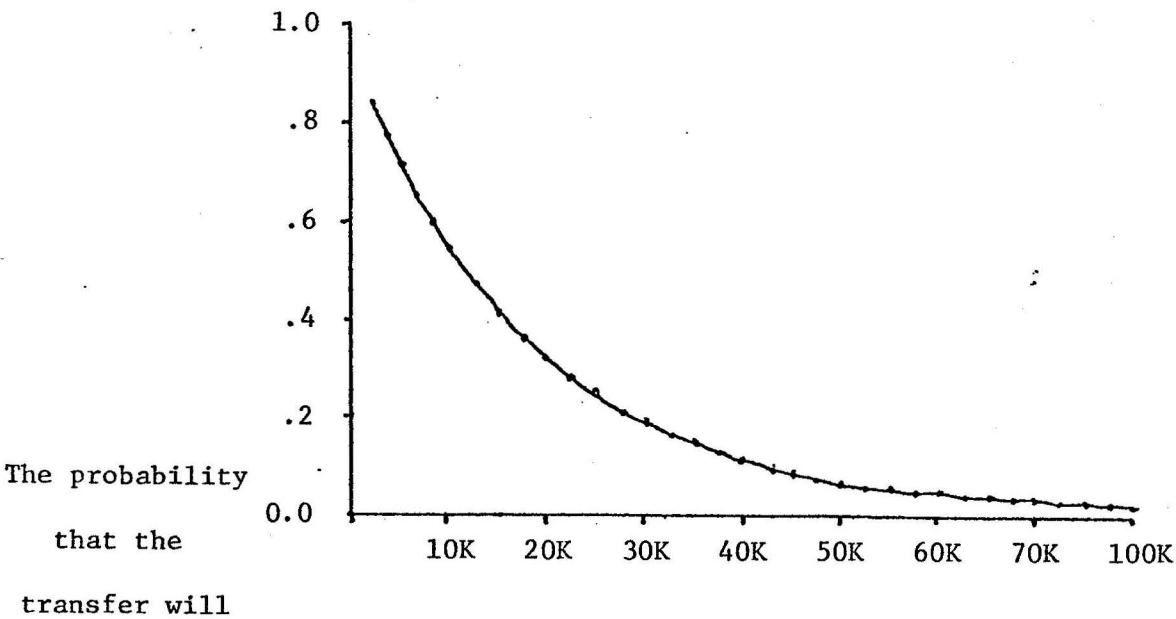
The Effect of Interruptions During ECS Transfers on the Cyber - by T. Salo

As system programmers we have told users that attempting to transfer "long" blocks of data to or from ECS would seriously degrade the execution of their programs. What constituted a "long" block and how seriously the execution of a program which was transferring data between ECS and CM would be affected were never really specified.

I recently wrote a program which determined the probability that an ECS transfer of a given length would complete without being interrupted by an exchange jump. The program attempted to read a 100K word block from ECS a number of times. By using the look-ahead feature of the Cyber the transfer was not restarted after an exchange jump occurred. The current instruction was changed to a NO in memory immediately before executing the RE instruction which had already been read from memory. The program could then determine the number of words read prior to the ECS transfer being interrupted. These results were obtained at 4:00 p.m. Thursday, April 21.

The shape of the graphs is consistent with the assumption that exchange jumps occur (nearly) randomly (a Poisson distribution). The results indicate that the often recommended transfer length of 100 words will complete without interruption 98% of the time. A 1000 word transfer will complete without interruption 89% of the time or will complete in no more than two attempts 99% of the time.

(See graphs - next page)



The probability that an ECS transfer of a given length will complete without interruption

//////////

Field Length in CALLPRG Overlays - by M. Riviere

As part of the implementation of K.C. Matthews' Field Length proposal (Vol. 3, No. 8, April 26 DSN), I introduced the MF (minimum field length) parameter to be used in the CALLPRG Index cards.

The MF parameter acts as an MFL= entry point, allowed up to now, only to System origin programs. The function of the MF parameter is to increase, when needed, the amount of memory to be used for the execution of a job. The need for a memory increase occurs when the user's field length (job card, TELEX default, or last RFL) is smaller than the MF value. Memory allocation is given, of course, within user's validation. It is important to note that if CALLPRG needs to increase the job's field length according with the MF parameter, the new field length

will be in use only for the first time that the program is executed. If, later on, successive executions are made using the local file already retrieved by CALLPRG, the field length will again be the original user's field length. The programs installed using the MF parameter in the index entry should contain an MFL= entry point to insure that the same memory allocation will take place in successive executions.

The same considerations should be given to the FL parameter. The FL parameter increases (if within user's validation) or decreases the job's field length to the requested FL value. For the time being, the FL parameter provides the required memory allocation only for the first time that the CALLPRG program is executed. An RFL= entry point should be used on CALLPRG programs installed using the FL parameter on the index entry to maintain the field length allocation consistent for successive executions.

The inclusion of MFL= and RFL= entry points on non-System origin programs will be legal after the spring quarter break. MF and FL parameters should not be used in the same index card, since their functions are not compatible. A "CALLPRG FILE FORMAT ERROR" message is given if the two parameters are used in the same entry.

//////////

#### Incomplete Systems Group Projects - by T.W. Lanzatella

The following is a list of uncompleted systems group projects. The list was compiled by 1) cross-referencing the DSN's and extracting approved proposals which have not yet been installed; 2) including suggestions listed on a memo by R.T. Franta (dated 77/02/15) and 3) excerpting a list of features promised to operations which appeared in DSN 3, 6 p. 7. Each item was discussed at the last systems group meeting and the results of that discussion are noted with each item.

1. ECS Rollout (EJM) (1, 6 p. 4): The code for this feature has been written and need only be debugged. KCM would prefer to not install the feature until we can charge for ECS usage. To do this we should have some usage statistics which are not currently available. We also must devise a method of enabling or disabling the feature.
2. Password Hashing (KCM) (1, 11 p. 3): Tentatively, we do not really want this feature. ITO may be difficult to alter and MECC may not want the feature. KCM also requires some empirical method of verifying the dependability of his password hashing algorithm.
3. KCL Extensions - multiple arguments for DISPLAY and SET (S. Lenz) (1, 13 p. 2): A subset of this proposal was implemented. We all agreed not to install the remainder.
4. FORMAT command (WJE) (1, 13 p. 1): WJE withdrew this feature.
5. FET Mnemonics (JL) (2, 9 p. 2): A low priority item, not assigned to any individual. If installed, we should invent a new common deck COMSFET.
6. New MF501 (MR) (2, 10 p. 12): A low priority item. The intention is to give 9-track tape capability to MF501 along with a thorough cleanup.

7. New EXPORT (NLR) (2, 10 p. 12): In the works - changed to WTS.
8. Decwriter Software for Operations (NLR) (2, 10 p. 12): Nearly complete.
9. SETVAL (KF) (2, 11 p. 2): In the works. This project has been 85% completed by Bob Zalusky.
10. ACCSTAT (BF) (2, 11 p. 3): This project has been transferred to A. Bremanis. A subset of this utility will be installed over the coming months.
11. NOTICE/NOTIFY (BW) (2, 13 p. 3): This is one of B. Wells' summer projects.
12. Installation Parameter Word (INPW) (KCM) (2, 13 p. 4): We still like this proposal and it will become increasingly more useful after the MECC machine is installed. This is now a KCM summer project.
13. Disallow entering display code data with DSD (WTS) (2, 17 p. 5): In the works.
14. Does 1AJ know about FIT's? (KCM) (2, 18 p. 5): CFS will supply examples where this does not work. A new bug list item.
15. SCRATCH command (WJE) (2, 18 p. 2): Operations would like this utility but it will not be completed until WJE returns from summer vacation.
16. TDUMP(LW=TT or LP) Option (WJE) (2, 19 p. 4): This feature was given to B. Hanson for a summer project.
17. DA File Size Limits (KCM) (2, 20 p. 3): This project has been transferred to WTS and is presently in the design phase.
18. NA Parameter for the SECOND Command (JJD) (2, 22 p. 2): This option was completed several weeks ago.
19. P-Register Sampler (DWM) (2, 23 p. 5): A DWM summer project.
20. LDR Load by Name (BH) (2, 23 p. 5): The original installation of this feature was incompatible with COBOL. This is a BH summer project.
21. CP Buffer for GET, SAVE, REPLACE and APPEND (WJE) (3, 1 p. 4): This proposal was withdrawn by WJE because the code received from another installation was found to be incorrect.
22. XMIT/SEND (non-specific origin) (3, 2 p. 8): JJD is preparing a proposal for a new XMIT/SEND.
23. Interrupt Command Processing (DWM) (3, 5 p. 5): Soon to be completed by DWM.
24. Short PFILES (DWM) (3, 8 p. 3): A DWM summer project.
25. Field Length Study Recommendations (KCM) (3, 6 p. 3): A KCM summer project.
26. ECS Access (KCM) (3, 8 p. 4): Soon to be completed by KCM.
27. Change DVTVAL to DIVERT, Enhance DIVERT (WTS) (3, 2 p. 4): A WTS summer project.
28. Separate DSD Display for ENABLE/DISABLE (WTS) (3, 7 p. 4): A low priority WTS summer project.



29. DMD Report for TS Users (JJD) (3, 7 p. 5): Soon to be completed by JJD.
30. CPMEM Interactive (JJD) (3, 7 p. 5): This project requires further study - a JJD summer project.
31. DELAY Queue User Utilities (RTF): TS will prepare a proposal for this utility - a TS summer project.
32. DAYFILE Purge for Batch Users (RTF): This feature should be proposed and users should be warned that consultants will not look at output in which the dayfile has been purged.
33. Disposed Output File Size (PRU's) in Dayfile (RTF): This is a good suggestion but should be proposed.
34. N.RERUN Does Not Work (3, 6 p. 7): Operations requires this command for Saturday end-of-operations. Most systems staff believe this works OK since the level 13 rewrite. Operations should resume using the command.
35. Users Driving Operators Nuts with Enquiries About AUTODIVERTed Output (3, 6 p. 7): Users are confused because DIVERT documentation mentions DIVERT limits in octal while the banner page gives file lengths in decimal - this should be corrected.
36. N-Display Skip to EOI (3, 6 p. 7): This is a good suggestion and should be proposed.
37. Specify Unit Number on AUTOUNLOAD (3, 6 p. 7): This would be a handy feature but may be difficult to install. The project must wait until WJE returns from summer vacation.
38. IMPORT Needs Work (3, 6 p. 7): This will be difficult since nobody knows IMPORT. Operations at Experimental Engineering needs some kind of queue enquiry mechanism. This could be done by supplying operations at Experimental with a time-sharing terminal and by supplying some DELAY-queue utilities - a TS summer project.
39. LPT Needs Work (3, 6 p. 7): We are resurrecting an old MOMS source of this program - a TS summer project.
40. EOF on EBR Tapes (3, 6 p. 7): This same operation will be required for a) DICOMED tapes, b) CALCOMP tapes and c) FR80 tapes. When we have a SCRATCH command, this operation will be easier. SCRATCH will be completed when WJE returns from summer vacation.

//////////

#### Systems Group On-Going and Summer Projects - by T.W. Lanzatella

Listed alphabetically below are the results from the systems programming project surveys. Three types of projects are listed: on-going (% complete), preferred (P) and recommended. On-going and preferred projects are listed with each individual concerned while recommended projects (and who recommended them) are listed together at the end. Also included are project allocations derived from the discussion of incomplete systems group projects.

H. Byun  
 Maintenance Subsystem (75%)  
 Maintenance Routines (20%)

J.J. Drummond  
 Bug List (10%)  
 HELP-CMDFILE (50%)  
 XMIT/SEND Proposal (25%)  
 DMD Report for TS Users (50%)  
 CPMEM Interactive (study) (25%)

W.J. Elliott  
 Tape System Bug Fixes (95%)  
 Bill will be gone for the summer.

R.T. Franta  
 Indexed Writeup for TELEX Commands (0%)

B. Hanson  
 Add RFL=, MFL= to LDR= (0%)  
 Becoming Expert on Tape (15%)  
 NODROP Documentation (0%)  
 UPWRITE (98%)  
 Multi-File Tape Copy Utility (P)  
 Tapes Consulting (P)  
 TDUMP(LW=TT or LP) Option (0%)  
 LDR Load by Name (95%)

T. Hoffmann  
 Rewrite UNPAGE (20%)  
 Tim will be gone for the summer.

H. Kurs  
 FORM Update (25%)  
 UCC Record Manager Guide (75%)  
 Install and Test New Version of S2K (P)  
 Learn S2K for Programming and Consulting (P)  
 COBOL, Record Manager and SORT/MERGE Installation (P)

T.W. Lanzatella  
 Bug List (33%)  
 Operators' Guide Chapters on Time-Sharing and NOTICE/NOTIFY (0%)  
 Complete NODROP Installation (60%)  
 KRONOS Manual Changes Document (75%)  
 Documentation Review (0%)  
 STIMULATOR Scripts for QA (P)  
 DSN and New Systems (never complete)

K.C. Matthews  
 System Measurement (never complete)  
 ECS Changes (90%)  
 Bug List (10%)  
 Automatic Reloading of Archive Files (P)  
 Move TRT's to ECS (P)  
 Develop STIMULATOR and Batch Job Load (P)  
 Installation Parameter Word (0%)  
 Field Length Study Recommendations (10%)

A. Mickel

PASCAL Compiler Performance Improvements (never complete)  
PASCAL Software Tools (never complete)  
PASCAL Library (never complete)

E.J. Mundstock

F77 - New Fortran Standards

Marisa Riviere

Level 13 Product Set Installation (70%)  
MISCPL (50%)  
CALLPRG and Library Tape Maintenance (never complete)  
Enhancements to CALLPRG (90%)  
9-Track Tape Microfilm Program (30%)  
Review CALLPFM Routines (P)  
Enhance Product Set Installation Procedures (P)  
Review CALLPRG File Residency (P)  
Study CALLPRG (P)

W.T. Sackett

DA File Size Limits (0%)  
CIO Speedup (80%)  
PRU Limit Bug in COPY Utilities (30%)  
RMS/REC PF Error Messages (10%)  
Formalize Disk Label Backup Mechanism (10%)  
STIMULATOR Enhancements (never complete)  
DIVERT/DVTVAL Changes (95%)  
EXPORT (0%)  
Dynamic CHKPORT (10%)  
DSD Command for ENABLE/DISABLE (0%)

T. Salo

Speed-Up SUPPIO by Using ECS and New Program 1WF (50%)  
Make SUPPIO Smaller (50%)  
Make SUPPIO Look Nice (50%)  
DELAY Queue User Utilities (0%)  
LPT Revision (15%)

J. Strait

PASCAL: Compiler, Run-Time System, Library, Tools (never complete)  
ARCHIVE 3.0 (P)

B. Wells

XEDIT (95%)  
NOTICE/NOTIFY (60%)  
PP Dump Analyzer (P)  
Interactive Simulator (P)

R.A. Williams

Realistic Simulation Scripts (10%)  
Response Time Estimation (30%)  
Accounting Redesign (10%)  
XMIT Writeup (80%)  
CAI Video Tape (5%)  
Bug List (15%)  
Simulation and Performance Analysis (P)  
QA Procedures and Routines (P)  
ECS Roll-out (Monitor Function) (P)

B. Zalusky  
SETVAL (5%)

Recommended Projects

Move TRT's to ECS (everyone)  
Generalized ECS (JJD/BZ)  
Shared System Routines in ECS (JJD)  
Deadstart from Disk (JJD)  
XMIT/SEND (JJD)  
Complete All Promised Projects (TWL/RTF)  
SUPIO Speedup (RTF)  
Internal System Documentation (RTF/KCM/TWL)  
Fix the Remaining Bugs (everyone)  
Scheduler Enhancements (RAW)  
AMSM Corrections (RAW)  
ECS Roll-out (RAW)

//////////

SUPIO Aborts - by T. Salo

Summary of SUPIO Aborts for January - April, 1977

Reason For Failure	January	February	March	April	Total
Activity of Cyber	1	1	5	3	10
SUPIO Failure	1	1	5	0	7
Frontend Failure	12	17	51	6	86
TOTAL	14	19	61	9	103

These figures reflect the aborts for which a dump is available. There were additional aborts for which no dump is available. The SUPIO aborts due to activity on the Cyber resulted from CM or ECS being destroyed or SUPIO's inability to deal well with the machine being stepped or channels being busy for a long period of time. Of the seven SUPIO aborts due to software failure five occurred on Sunday afternoon test periods.

//////////

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

9 May 1977 - 22 May 1977

Thursday, 12 May

14:50 (DD-1)

The scopes went blank. Bob Williams and Murray DesRosier were present. They discovered that all the PPU's on one bank were hung up on central memory read/write instructions. This hardware problem has not recurred.

Friday, 13 May

09:15 (DD-2)

Tape channel 13 hung full. All PPU's were busy, and the operators were unable to disconnect the channel.

//////////

6400 Deadstart Dump Analysis - by R.A. Williams

<u>Date</u>	<u>Description</u>	<u>Tape</u>
770509	A hardware problem in the CPU memory reading logic caused bit 9 to be set in exchange packages, data, and instructions. This caused four crashes on this day plus many problems over the preceeding weekend but was fixed this afternoon. Fixed by the CE's.	Fixed
770513	844 disk channel 6 hung again on a function time-out. The system need not go down on this anymore as it has been discovered that pushing the controller master clear corrects the error; however, if the CE's are available, they should be allowed to examine it first for clues to the cause.	N.A.
770519	TELEX aborted with a mode 1 error at 5610. Fixed by DWM.	Fixed