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NOTICE OF CHANGES TO THE SYSTEM

Paul Thompson resubmitted his mod to QAC which allows queue files with certain
special priorities to be purged by the utility QUEUE. Fixed is a problem
which allowed users to purge a queue file on one mainframe while the same
file is in use on another mainframe.

Last week I reported how Don Mears had changed job card processing to allow
a :READ command to proceed a job card so that SPCC could use RBF to send
jobs to UCC. Don resubmitted his mod to be a little more liberal about
the syntax of the :READ directive.

Bill Sackett corrected an obscure error in sysedit which caused deadstart
to fail for certain LIBDECK's.

VMS Queues, ENQUEUE, and Dequeueing - by John Mulhern

This article serves two purposes: it describes the VMS queueing mechanism as it has been altered for use at Shepherd Labs and it proposes a uniform enqueueing command.

Background on VMS queues

VMS queues as provided 'off-the-shelf' come in two flavors, namely batch queues and print queues. The SUBMIT and PRINT commands respectively are used to enter jobs on these queues. The VMS operating system provides a wide range of operator and user commands to manipulate these two different types of queues. The user commands allow for complete control over one's jobs up to and including the time of processing. They allow users to examine their jobs in a specific queue and, if desired, to remove jobs which belong to them. Users may even alter certain characteristics of a job already in a queue. The operator has a full range of commands for initializing, starting, merging, stopping, and deleting queues.

VMS queues are somewhat unlike Cyber queues in that they do not make copies of the files enqueued to them. Instead, information on an enqueued job, including pointers to the job's files, is stored in the data structure of the system's queues. This information is retrieved by the job controller when it processes the queued job. This aspect of VMS queues has caused some problems with users who enqueue print files and then delete them prior to processing. It does, however, save on disk space and system resources. The /DELETE qualifier is provided for users who wish to delete files immediately after they have been processed.

In general, VMS queues as provided by DEC have been easy to use from both the user's and operator's points of view.

The Drawback

As friendly as the canned VMS queueing mechanism is, it is still canned and hence not immediately extensible. This will be a problem whenever we wish to do anything with VMS which DEC did not foresee. Specifically, the VMS queue facility does not provide for generalized enqueueing and dequeueing of files to the host of special devices currently attached to the Shepherd Labs VAX in one form or another. Essentially, only canned batch and print queues may be created and used.

A Solution

Faced with the inability of VMS to support such devices as the Calcomp plotter and the Dicomed film recorder, we needed to provide a more complete queueing facility for the Shepherd Labs VAX. Two courses of action were considered: we could write a completely separate set of queue programs for these special devices or we could somehow extend VMS's queue capabilities. The first choice had the advantage of being flexible and the disadvantages of being both a lot of work and confusing to users. The second choice uses mo of VMS's queue features but is not as flexible. We chose the second course of action.

Currently, the only way to place a file into a queue is with the PRINT/QUEUE=queue-name command. This places the job into a special type of print queue which is not assigned to any printer. The job sits there until the operator runs a dequeueing program for that queue. A set of library subroutines was written to allow dequeueing programs access to the VMS queue data structures. These subroutines provide easy access to, and control over, the jobs in any specified queue. All dequeueing programs may be written entirely in higher level languages. This scheme, the use of VMS queue structures and commands in an extended fashion, allows us to conform fairly well to the VMS operating system while at the same time it allows us to extend the applicability of VMS queues to the special needs of the Shepherd Labs system.

The Next Drawback

The next drawback is related to the use of the PRINT command as a general purpose enqueueing command. The PRINT command as provided by DEC was designed with printers in mind, not plotters, film recorders, typesetters, or the like. Many of the command qualifiers associated with the PRINT command have no meaning for the devices we wish to queue on the Shepherd Labs VAX. The only extensibility which the PRINT command allows is via the /CHARACTERISTICS and, to a lesser extent, /FORMS qualifiers. There is no provision in the PRINT command for site and bin codes. This problem has been partially circumvented by using (or misusing) the /NAME qualifier to specify site and bin information.

A typical use of the the PRINT command is in enqueueing a Scribe job for printing on the Xerox 9700. The command in this instance would be:

```
PRINT/QUEUE=X9700/CHARACTERISTICS=(SCRIBE,DUPLEX)/NAME=EA-333  MyFile.X97
```

The /CHARACTERISTICS qualifier is being used here to specify options associated with the enqueueing.

The use of the PRINT command has several disadvantages.

1 - It is a documentaion nightmare. This method would force the HELP documentation for all of the special queues to reside within the PRINT command's HELP documentation. In particular, HELP PRINT/CHARACTERISTICS would contain documentation on all of characteristics associated with all of the special device queues in the system. This could be quite confusing and would make information on access to these queues unreasonably difficult to obtain. In addition, as pointed out above, many of the PRINT command's qualifiers would be meaningless for non-printer queues.

2 - The syntax of the command is unnatural when compared with other VMS commands. Normally, characteristics such as SLIDE, DUPLEX, HIGH_REOLUTION, SCRIBE, etc. would appear qualifiers in their own right. This is not possible with the PRINT command. The use of the /NAME is hardly mnemonic for what ought to be called /SITE and /BIN.

3 - There is no way to cross check characteristics specified in a PRINT command. Thus someone might say

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PRINT/QUEUE=DICOMED/CHARACTERISTICS=DUPLEX MySlide.Plt

and the system would happily accept the job.

4 - There is no way we can check to see whether the file is
at all likely to be of the appropriate format for the
specified queue.

5 - Finally, PRINT is a rotten command verb for what is more
often than not a request to enqueue a plotting job.

The Proposal: Another Solution

In order to rectify the shortcommings inherent in using the PRINT
command as a general purpose enqueueing facility, the following command
is proposed for the Shepherd Labs VMS system:

ENQUEUE queue-option file-spec[,...]

The full specification of the queue options now proposed and their associated
qualifiers follow in the next section of this article. ENQUEUE is a structured
command similar to the VMS SET and SHOW commands in structure. Its benefits
are an orderly and natural method of documenting the special device queues,
a completely consistent VMS command syntax, control over qualifier processing,
the ability to partially check file attributes at enqueueing time, /SITE and
/BIN capabilities, and its name is more closely related to its function.

Adoption of the ENQUEUE command does not mean that PRINT would be
replaced. Instead, PRINT would be used to send jobs to the printer and
ENQUEUE would be used to enqueue jobs on any of the special queues
in the system. Users who place jobs in queues using ENQUEUE will still be
able to invoke such commonly used DCL commands as SHOW QUEUE and DELETE/ENTRY.
ENQUEUE will only affect the method whereby jobs are enqueued to non-printer
devices in the VMS system.

The Gory Details

This section contains the details of the proposed ENQUEUE command.
It should be noted that the VMS command language is abbreviatable to uniqueness
and ENQUEUE follows this convention. ENQUEUE also issues standard VMS error
messages. In what follows, "D" marks the default. Where no "D" appears
the qualifier is not selected by default. All of the subcommands listed
below share a common set of qualifiers. In order to save space, these
qualifiers will be listed first. Many of the ENQUEUE subcommands have
qualifiers other than this common set and these are listed separately.
The "file-spec[,...]" notation is standard VMS notation for indicating that
one or more file specifications must be given.

The Common Qualifiers

/COPIES=n   (D=1)   Number of copies of a file to be
                                      made.

/DELETE /NODELETE (D)	Deletes a queued file after processing.
/BIN=bin-number	Specifies the bin to which the output will be returned.
/SITE=site-code (D=EA)	Specifies the site to which the output will be returned.
/HOLD /NOHOLD (D)	Controls whether the enqueued job is in the active list of jobs to be processed.
/IDENTIFY (D) /NOIDENTIFY	Prints a message on the user's terminal indicating the successful enqueueing of a job.
/AFTER=absolute-time	Holds the enqueued job until the specified time and then releases it for processing.
/PRIORITY=n	Specifies the priority at which a job is to be enqueued.

Details of the Specific Queues

ENQUEUE CALCOMP file-spec[,...]

Places the MNCORE format file(s) specified by file-spec into the CALCOMP queue for plotting. The default file type for this queue is '.PLT'.

Qualifiers

The Common Qualifiers listed above.

ENQUEUE DICOMED file-spec[,...]

Places the MNCORE format file(s) specified by file-spec into the DICOMED queue for recording on either a D47 or D48 film recorder. The default file type for this queue is '.PLT'.

Qualifiers

/D47 (D) /D48	Selects the output device on which jobs in this queue are printed. If /D47 (the default) is selected, the job is recorded on the Dicomed D47 at Shepherd Labs. If /D48 is selected, the job is recorded on a service bureau Dicomed D48. Selecting /D48 forces the the following qualifiers: /SLIDE,

/HIGH_RESOLUTION, /COLOR, and /NOPACK.

/SLIDE (D)
/POLAROID
/70mm

The qualifier /SLIDE specifies that the recording medium is 35mm slide film. /POLAROID specifies 4x5 print film. /70mm specifies 70mm transparency film. Only one of these qualifiers may be selected per job.

/LOW_RESOLUTION
/MEDIUM_RESOLUTION
/HIGH_RESOLUTION (D)

Selects the resolution at which the film recording takes place.

/COLOR (D) /NOCOLOR

By default, all output is in color. Specify /POLAROID/NOCOLOR for black and white polaroid prints. If /SLIDE (the default) or /70mm is selected, /COLOR is also selected.

/PACK /NOPACK (D)

Records four MNCORE pictures on every piece of film for the job.

The Common Qualifiers listed above.

ENQUEUE X9700 file-spec[,...]

Places the file(s) specified by file-spec into the X9700 queue for printing on the Xerox 9700 laser printer. The default file type for this queue is '.X97' for Scribe jobs and '.LIS' for textfiles.

Qualifiers

/TEXTFILE (D)
/SCRIBE_X97

Specifies the data format of file(s) queued in this job. /TEXTFILE (the default) designates the file(s) as ordinary VMS text files. /SCRIBE_X97 designates that the file(s) in the job were produced by the text formatter Scribe for printing on the Xerox 9700. If /SCRIBE_X97 is selected, the qualifiers /COLLATE, /PORTRAIT, and /NOSHIFT are forced. In addition, the /66LINES, /88LINES and /PAGELIMIT qualifiers are ignored.

/SIMPLEX (D)
/DUPLEX

Specify single sided and double sided printing respectively.

/PORTRAIT (D)

/LANDSCAPE   Specify the paper orientation.

/66LINES (D)
/88LINES   The number of lines printed on a page
                                    of output.

/PAGELIMIT=n (D=Infinite)   Limit on the number of pages printed.

/SHIFT /NOSHIFT (D)   Causes the image text to be shifted
                                    before printing for binding purposes.

/THREE_HOLE /NOTHREE_HOLE (D)   If selected, causes files in job to be
                                    printed on three hole paper; /SHIFT is
                                    forced.

/BOND /NOBOND (D)   If /BOND is selected, output is on
                                    thesis quality bond paper.

The Common Qualifiers listed above.

ENQUEUE SPINWRITER file-spec[,...]

Places the file(s) specified by file-spec into the SPINWRITER queue
for printing on the NEC 7715 Spinwriter, a letter quality printer.
The default file type is '.LIS'.

Qualifiers

/BOND
/NOBOND (D)
/COMPUTER   By default, jobs are printed on 16#
                                    8 1/2 x 11 cut sheets. If the
                                    /BOND qualifier is selected, the
                                    job is printed on thesis quality
                                    20# paper. If /COMPUTER is selected,
                                    output is on unlined, wide computer
                                    paper.

/TYPEWHEEL=option (D=TW1)   Selects the typewheel used in printing
                                    a job. The possible options (at least
                                    in the near future) are:

                                        TW1 -- ASCII Roman, 10 pitch
                                        TW2 -- ASCII Italic, 10 pitch
                                        TW3 -- Roman and Math, 10 pitch
                                        TW4 -- Italic and APL, 10 pitch
                                        TW5 -- Full Greek and
                                               Uppercase Roman, 10 pitch

The Common Qualifiers listed above.

ENQUEUE VARIAN file-spec[,...]

>   Places the MNCORE format file(s) specified by file-spec into the
>   VARIAN queue for plotting on the Varian plotter. The default
>   file type is '.PLT'.

Qualifiers

    /LOW_RESOLUTION
    /HIGH_RESOLUTION (D)   Selects the resolution at which the
                                            plotting takes place.

>   The Common Qualifiers listed above.

ENQUEUE   PRINTRONIX file-spec[,...]

>   Places the MNCORE format file(s) specified by file-spec into the
>   PRINTRONIX queue for plotting on the Printronix dot matrix printer.
>   The default file type is '.PLT'.

Qualifiers

>   The Common Qualifiers listed above.

Still More About Queues

>   At present we have programs for dequeueing jobs from the DICOMED/D48
>   queue, the DICOMED/D47 queue, the CLACOMP queue, and X9700/SCRIBE queue. Work
>   is currently underway on dequeueing programs for the X9700/TEXTFILE, VARIAN,
>   SPINWRITER, and PRINTRONIX queues. In the future there will undoubtedly be
>   additional queues proposed for typesetters, other fancy printer, and as yet
>   unspecified graphics devices. ENQUEUE could also be used for intermachine
>   batch queues.

>   Work on the existing dequeueing programs has been done by myself,
>   Stuart Levy, Steve Collins, Mike Regan, and Kevin McMahon with help from
>   other members of the graphics and text processing groups and from Harry
>   Hovland.

A Structured VIEW command - by John Mulhern.

One of the principal uses of the VMS system at Shepherd Labs is
graphics and Image Processing. The TELLAGRAF program as well as the
DISSPLA and MNCORE graphics libraries all create a common format output
file. In order to display these output files on a graphics terminal,
the user must run the appropriate viewing program associated with that
terminal type. This method of operation will give rise eventually to a
large number of commands, all with approximately the same function.
A rather simple program has been written to gather all the viewing programs
under a single user interface. The VIEW program provides a uniform and
consistent access method to viewing programs and consolidates documentation
on this aspect of UCC's graphics cpabilities on the VMS system.

The syntax of the VIEW command is:

VIEW   terminal-option   file-spec

A list of terminal options follows. For some terminal types there are
optional model qualifiers.

Terminal Type	Qualifiers	
APPLE	none	
IDS100	none	
RAMTEK	/6211	(D)
	/9100	
TEKTRONIX	/4010	(D)
	/4012	
	/4013	
	/4014	
	/4015	
TERAK	/8510	(D)
	/8600	
VT100G	none	

Many more terminal types will eventually be supported.

The VIEW command will follow all conventions of DCL commands in general
including abbreviation and standard error messages. A HELP module will be
provided for inclusion in the main HELP library.

/////////

A NEW CATLSYS OPTION - by G. Jensen

CATLSYS is a very useful utility which is often used for estimating perm-
anent file charges on the Cybers. CATLSYS, however, estimates these
charges using the internal permanent file rate. Some of our commercial
users have inquired as to whether CATLSYS can be taught to use the commercial
rate so that they can more easily and accurately estimate file charges.

I therefore propose that CATLSYS be modified, so that in the presense
of a parameter, commercial permanent file rates will be used to estimate
the cost. The control statement call would be:

```
CATLSYS(PARAM) where:
PARAM='U' UNIVERSITY(INTERNAL)RATE
        <DEFAULT>
     ='C'COMMERCIAL(EXTERNAL)RATE.
```

'U' and 'C' were chosen because they are meaningful and consistant with
the COST control statement.

SYSTEM MAINTENANCE: People and Procedures

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

The following proposals were discussed.

1) Tom Kovarik's proposed method of charging for Telenet and Research
   Cluster terminal usage was approved (see DSN 8,3 p. 27).

2) Mike Frisch's proposal to install the Box-Jenkins programs as control
   statement callable packages was approved (see DSN 8,3 p. 27).

3) Kevin Matthews' proposal for a new utility called CRAYPW which would
   run on the Cyber and change Cray passwords by constructing a Cray
   job was approved (see DSN 8,3 p. 38).

4) The VMS INFORM proposal (DSN 8,3 p. 28) and the VAX/VMS online docu-
   mentation proposal (DSN 8,3 p. 29) were discussed together since the
   two proposals suggest different means to the same end. After a lengthy
   discussion we chose Linda Merims proposal as the way to go.

Since Andy Hastings published the proceedings of the adhoc committee
on the new Callprg we decided to take action on the proposal (see DSN 8,1 p. 5).
First of all, we were all in favor of converting to the new Callprg.
We decided to install it at the end of spring quarter. Andy Hastings
will take care of informing users. We will wait on the GRAB utility
until we find out how much space will be left on pack SPL after Callprg/Writeup
files are split apart from staff files. The question of what message
to print if a package is not found and USERPROC is on was decided to be:
name NOT IN SYSTEM OR CALLPRG. We will probably write a binary patch

utility for those people who have programs which depend on the MF callprg index entry parameter. The binary patch utility will fix the loader tables so that the program runs at the proper field length.

Don Mears is going to the VIM conference. Bill Sackett is going to the Cray Users Group conference.

//////////

Callprg and Library Tape News - by M. Riviere

On March 28, I will place the FTN 4 compiler and its associated library, FORTRAN, on the MERITSS library tape. This change is part of the effort of making most of the Cyber 74/172 products available on the three Cybers. The old FORTRAN library of the MERITSS tape will not be preserved. This library was a dummy library with null contents which was installed only for the purpose of providing a Loader path when handling MNF binaries.

Also on March 28, Janet Eberhart will toggle M77 and its associated libraries. The future version will become current and the current one will then be available as a past Callprg product.

The next set of Callprg indices and library tape changes will take place on April 13. Requests for that date should be submitted before April 1 by noon.

//////////

The Project Oriented Systems Group - by T. W. Lanzatella

We continue this week with a description of current projects in the Systems Group. This week we cover the Accounting Group headed by Greg Jensen.

		GJ	JF	KT	DK
1.	UCC Accounting System	50%	40%		
	Development/Maintenance/ Analysys				
2.	MERITSS Accounting System Maintenance/Analysys		10%		
3.	CRAY,VAX (VMS & UNIX) Accounting Interface Development/Maint/Analysys	20%			
4.	SUPIO/IAF Statistics Dev/Main/Analysys		15%		
5.	Accounting End-of-Month Production/Reporting	5%	15%		

	GJ	JF	KT	DK
6. Accounting Error Resolution	10%	10%		
7. Accounting Conversion	5%	5%	45%	45%
Consulting	5%	5%	5%	5%
Management	5%			

1. Keeping UCCS production accounting system operational, timely and accurate, (enhancements, internal charges, system charges etc.)

2. Keeping the MERITSS accounting system operational, timely and accurate.

3. Maintaining the programs and procedures which form the interface between the CRAY, VAX/VMS, VAX/UNIX and the UCC production accounting system which lives on the Cybers.

4. Maintaining the programs and procedures used in gathering and reporting statistics for these subsystems.

5. Running and distributing various statistical reports which are run in conjuction with end of month accounting.

6. Tracking down possible errors and correcting them. These errors may involve:

> - Programming errors
> - Hardware errors
> - System changes
> - Etc.

on any of the mainframes operated by UCC.

7. Converting the UCC production accounting system from machine dependent MNF to ANSI77 standard FORTRAN.

//////////

Does Anyone Want to Track OSCRL? - by Mike Frisch

I am planning on discontinuing my observer membership in the ANSI X3H1 committee that is standardizing the Operating Systems Command Response Language. If there is anybody else in the Systems group interested in taking this over from me, I will forward my file on the subject to such a person upon request. I'll also pass on anything I receive after sending the committee the notice to delete my name from their list. I'm sure ANSI would be willing to change my name to somebody else's if needed.

////////

A Common CALLPRG and WRITEUP Indices for the Three Cybers? - by M. Riviere

On the weekend of March 20, Kevin Matthews installed all CALLPRG and WRITEUP files on a 844 disk pack. This pack, which continues being called SPL is dedicated mainly to hold CALLPRG, WRITEUP and LIBRARY files. The pack, now available only for the Cybers 72 and 74, will also be accessed in the future by the MERITSS computer. At that time we will have to decide about the merging of the CALLPRG and WRITEUP indices. The merging, if made, does not have to take place right when the pack is connected. The MERITSS computer indices will still be used as default. By acquiring files CALLPRG or WRITEUP from the respective CALLPRG and WRITEUP accounts on the SPL pack, any user on MERITSS will be able to access the former C74/172 packages and documents.

The CALLPRG and WRITEUP utilities will not scan two system indices. If we want to make all packages available by default on the three machines the indices will have to be merged. Most of the MERITSS CALLPRG and WRITEUP products are a sub-set of the 74/172 products, but there may be a few exceptions which will have to be looked at case by case. Please start reviewing your packages in order to have an idea of what shall be done when the decision has to be made.

////////

Cyber Deadstart Dump Analysis 3/8 to 3/21 - by B. E. Blasing

Cyber 730

Fri., 3/12, 10:05   DD2004
The disk controller on channel 32 hung. A level 3 deadstart was required to unhang it.

Tue., 3/16, 10:35   DD2005
Same as above.

Tue., 3/16, 12:30   DD2006
The DDP hung.

Wed., 3/17, 14:54   DD2012
Same as above.

Thur., 3/18, 12:25   DD2011
DN76 (a temporary and rollout device) broke requiring a level 0 to configure it out of the system.

Cyber 74

Tue., 3/16, 17:08   DD2010
The scopes blanked while DDF was being used to rewrite a bad spot on pack UCC. It is not known why DDF did not handle the error correctly.

Cyber 172 - MERITSS

<u>Thur., 3/18, 18:07</u>   DD11
CPUMTR did a mode 1. The only explanation is several bits got dropped
from register B4.

<u>Sun., 3/21, 20:01</u>   No Dump
The system had to be taken down so that disk DN42 could be reloaded.
The cause for its being destroyed is not known.

//////////

UM/UNIX Down Time Summary - 3/8 - 3/7 - by C. Boylan

<u>Tues., 3/9, 1350-1400</u>
System was rebooted to correct a file system problem. This problem seems
to have been fixed as of 3/20. No Dump.

<u>Tues., 3/9, 2008-2015, 2145-2310</u>
System hung both times while doing lots of file I/O. The second time
drive 0 (left) was logging errors. It was removed from the system to
check it out. No Dump.

<u>Wed., 3/10, 2325-2345</u>
The other drive hung same as drive 0 (left) on previous day. Drive
diagnostic "HP0: Not ready" showed up. No dump.

<u>Wed., 3/17, 1739-1805</u>
System was taken down to repair damage to file system. Save as 3/9. No Dump.

<u>Wed., 3/17, 1805-1837</u>
System was taken down for CMI to removed and repair tape controller.

<u>Wed., 3/17, 1840-1949</u>
System started logging UBA errors, apparently CMI had goofed when rewiring
the UBA after taking the tape controller out. System was down until
CMI returned with (fixed) controller. No dump.

//////////

VAX-VMS Down Time Summary 10/30/81-3/17/82 - by M. Riviere

Thursday 10/30/81, 10:30 to 12:00
DECOMET connection

Friday 11/13/81, 15:00 to 15:10
Fatal controller error, problem cleared by booting.

Tuesday 11/17/81, 12:00 to 18:00
The system was up, but printer queues where not working, probably due
to corrupted files on DRA1.

Wednesday 11/25/81, 8:00 to 9:00
Delay on software maintenance (DRA1 VFY).

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Tuesday 12/14/81 1:00 to 10:30
Hardware error on system pack driver.

Monday 12/21/81, 8:00 to 9:15
Delay on RAMTEC connection.

Monday 01/04/82, 14:58
Fatal bug check. System auto rebooted.

Wednesday 01/06/82, 11:45 to 16:34
Hardware error on CPU board.

Wednesday 01/20/82, 11:45
Fatal bug check. Auto re-boot. (A EUNICE job attempted to dismount a tape at the time of the crash).

Thursday 01/21/82, 8:44 to 16:34
Hardware error on CPU board.

Friday 01/22/82, 8:00 to 8:52
Delay on software maintenance (DSC2 of system pack).

Monday 02/01/82, 17:05
Console halted, problem cleared with booting.

     21:11 to 23:40
Fatal bug check and printer I/O error. System booted automatically at 23:40, but it went down again.

Tuesday 02/02/82, since previous day to 12:00 . System went up and down several times. Neither hardware nor software problems were detected.

Wednesday 02/03/82, 8:25-8:30
Console halt. Problem cleared by booting.

Wednesday 02/17/82, 9:45
All terminals hung. Problem cleared by booting.

Thursday 02/18/82, 19:45
System up but all DH terminals hung. Problem cleared by booting.

Friday 02/19/82, 7:00-7:55 (system time) I/O error on system pack.
System was booted for operations with backup pack.

Saturday 02/20/82, 17:20
Fatal bug check. System auto re-booted.

Monday 02/22/82, 12:45
Fatal bug check. System auto re-booted.

Fatal bug check. System auto re-booted. (The crash was at the time the CPU cabinet door was opened).

Wednesday 02/24/82, 18:45
All terminals but console were hung. Bringing the system down and
booting again cleared the problem. (At this time a EUNICE batch
job was running, but we did not find a direct correlation).

Monday 03/01/82, 02:00 to Tuesday 03/02/82, 20:40
The maincircuit breaker tripped for no apparent reason. The power
stortage damaged two CPU boards. The maintenance service had a
long delay on getting parts.

Sunday 03/07/82, 18:00 to Midnight
Software maintenance time schedule for afternoon was extended due to
damaged files on DRA1.

Thursday 03/11/82, 10:20
Fatal bug check. System auto re-booted.

Wednesday 03/17/82, 16:45-17:00
Hardware problem.