

TO: Distribution  
FROM: Betsy  
DATE: February 7, 1975  
SUBJECT: Multics Change Requests

Attached are copies of the Multics Change Requests which were approved from January 15 - 31, 1975.

Multics Change Request

<b>TITLE:</b> Handling of device class arguments by dprint/dpunch <b>AUTHOR:</b> Jerry A. Stern		<b>STATUS</b> Written <b>DATE</b> 01/10/75
-Coded in: <input checked="" type="checkbox"/> PL/I <input type="checkbox"/> ALM <input type="checkbox"/> other- explain in DETAILED PROPOSAL -Planned for System MR 3.0 -Fixes Bug Number(s) _____ -Documented in MTB _____ -User/Operations-visible Interface change? <input checked="" type="checkbox"/> yes <input type="checkbox"/> no -Incompatible change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no -Performance: <input type="checkbox"/> Better <input checked="" type="checkbox"/> Same <input type="checkbox"/> Worse -Replaces MCR _____	<b>Category (Check One)</b> <input type="checkbox"/> Lib. Maint. Tools <input type="checkbox"/> Sys. Anal. Tools <input type="checkbox"/> Sys. Prog. Tools <input type="checkbox"/> 355 <input type="checkbox"/> BOS <input type="checkbox"/> Salvager <input type="checkbox"/> Ring Zero <input type="checkbox"/> Ring One <input type="checkbox"/> SysDaemon/Admin. <input type="checkbox"/> Runtime <input checked="" type="checkbox"/> User Cmnd/Subr.	<b>Status</b> P1/2/75, A 1/28/75 <b>Expires</b> 7/28/75 <b>DOCUMENTATION CHANGES</b> Document Specify One or More MPM (Vol, Sect.) PLMS (AN #) AN58 MOSN (Sect.) 6.4.3.2, Sect. III MPAM (Sect.) MSAM (Sect.) Info Segs Other (Name) None (Reason)
	<b>Objections/Comments:</b>  Awaiting interface documentation	

Use these headings: SUMMARY, REASONS, IMPLICATIONS, DETAILED PROPOSAL (Optional)

**SUMMARY:** The dprint and dpunch commands face two problems with regard to the device class argument. First, if no device class is specified, what is the default device class? And second, if a device class is specified, is it really a device class which this command is intended to use?

The current solution to the first problem is to have the names "default" and "pun\_dflt" known to dprint and dpunch respectively. These are not device class names, but rather additional names placed on the print and punch queues by the create\_daemon\_queues command. It is proposed that this convention be discarded and that the default queues for each command be identified in the IO daemon parms file. A new keyword, "default\_command", would be placed below the "Queue\_group" keyword indicating that the preceding queue group is the default for the specified command.

The second problem is currently solved by having dpunch insist that all its device class names begin with "pu" and by having dprint insist that its device class names not begin with "pu". It is proposed instead that a second new keyword, called "command," be used to identify in the parms file which command is intended to use a given queue group.

Thus, for each queue group, there must appear either a command or default\_command specification. Both of these indicate which command is intended to use a given queue group. The default\_command further indicates that a given queue group is the default for the command.

Reasons: A principal purpose of all the current work on the I/O daemon has been to generalize its structure so that new drivers can be easily added. The current scheme for determining default queues does not generalize. Each time a new driver is added with a new set of queues, the `create_daemon_queues` command must be modified to recognize yet another default queue name. Furthermore, each of these defaults must be explicitly specified as arguments to `create_daemon_queues` which could become cumbersome. Also, it requires the user of `create_daemon_queues` to remember all the device class names which are to receive additional default names. It would be cleaner, simpler, and more general to automate this task by including the information in IO daemon parms.

The convention which requires all punch queues to begin with "pu" is unnecessarily restrictive. Also, the person who prepares the parms file is required to know this obscure fact. As new driver types are added, there will be more such conventions to remember. If even one new driver type is added, e.g., a plotter driver, the `dprint` algorithm will fail since it only knows not to use punch queues.

Implications: Callers of `dprint` may depend on the "default" and "pun\_dflt" convention. Therefore, `dprint` will continue to recognize these names for downwards compatibility.

#### Detailed Proposal:

- 1) Change `iodc_parse_parms` to recognize the new keywords.
- 2) Change `dprint` not to use "default" and "pun\_dflt."
- 3) Discard `get_iod_defaults`.
- 4) Change `dprint` to get defaults from the parms file. (It already must look there.)
- 5) Change `print_io_devices`, which identifies default device classes, to find defaults in the parms file.

Multics Change Request

TITLE: Backup Bug Fixes		STATUS	DATE
AUTHOR: R. Mullen		Written	1/16/75
<input checked="" type="checkbox"/> Coded in: <input checked="" type="checkbox"/> PL/I <input type="checkbox"/> ALM <input type="checkbox"/> other- explain in DETAILED PROPOSAL <input type="checkbox"/> Planned for System MR 2.1 <input type="checkbox"/> Fixes Bug Number(s) 343,349 <input type="checkbox"/> Documented in MTB <input type="checkbox"/> User/Operations-visible Interface change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no <input type="checkbox"/> Incompatible change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no <input type="checkbox"/> Performance: <input type="checkbox"/> Better <input checked="" type="checkbox"/> Same <input type="checkbox"/> Worse <input type="checkbox"/> Replaces MCR		Status	A/1/21/75
		Expires	7/21/75
		DOCUMENTATION CHANGES	
		Document	Specify One or More
		MPM (Vol, Sect.)	
		PLMS (AN #)	
		MOSN (Sect.)	
		MPAM (Sect.)	
		MSAM (Sect.)	
Objections/Comments:		Info Segs	
		Other (Name)	
		None (Reason)	no change

Use these headings: SUMMARY, REASONS, IMPLICATIONS, DETAILED PROPOSAL (Optional)

**SUMMARY:** Backup stops when fault is taken accessing users' segments.

**REASONS:**

- Backup's fault catcher is not enabled while referencing user segments, due to programming error.
- Furthermore, certain oob's can be avoided entirely by not attempting to copy data beyond the max\_length of a user's segment.

**IMPLICATIONS:** Backup will be considerably more reliable than at present.

**DETAILED PROPOSAL:**

- enable fault catcher correctly
- copy min (current\_length \* 1024, max\_length) and pad with zeroes as needed.

Multics Change Request

TITLE: Fix bug in BOS RESTOR Command		STATUS	DATE
AUTHOR: Noel I. Morris		Written	1/13/75
-Coded in: <input type="checkbox"/> PL/I <input checked="" type="checkbox"/> ALM <input type="checkbox"/> other- explain in DETAILED PROPOSAL -Planned for System MR 2.1 -Fixes Bug Number(s) _____ -Documented in MTB _____ -User/Operations-visible Interface change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no -Incompatible change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no -Performance: <input type="checkbox"/> Better <input checked="" type="checkbox"/> Same <input type="checkbox"/> Worse -Replaces MCR _____		Status	9/21/75
		Expires	7/21/75
		DOCUMENTATION CHANGES	
Category (Check One) <input type="checkbox"/> Lib. Maint. Tools <input type="checkbox"/> Sys. Anal. Tools <input type="checkbox"/> Sys. Prog. Tools <input type="checkbox"/> 355 <input checked="" type="checkbox"/> BOS <input type="checkbox"/> Salvager <input type="checkbox"/> Ring Zero <input type="checkbox"/> Ring One <input type="checkbox"/> SysDaemon/Admin. <input type="checkbox"/> Runtime <input type="checkbox"/> User Cmmd/Subr.		Document	Specify One or More
Objections/Comments:		MPM (Vol, Sect.)	
		PLMS (AN #)	
		MOSN (Sect.)	
		MPAM (Sect.)	
		MSAM (Sect.)	
		Info Segs	
		Other (Name)	
		X None (Reason)	X

Use these headings: SUMMARY, REASONS, IMPLICATIONS, DETAILED PROPOSAL (Optional)

SUMMARY:

AFDSC reported a problem with the BOS SAVE/RESTOR mechanism which caused problems when trying to restore the disk contents on a 14 disk system. The problem was traced to the RESTOR command which reads only the first 20K(8) words of the fsdct image placed on all SAVE tapes.

Proposal:

RESTOR will be changed to read the entire fsdct image from tape.

Ver. 3  
741022

MULTICS CHANGE REQUEST

MCR 980

TITLE: Move copy entry from syserr\_logger to  
syserr\_log\_copy.

AUTHOR: L. Scheffler

STATUS	DATE
Written	01/14/75
Status	B 1 (21) 75
Expires	07/14/75

Planned for System: not applicable  
Fixes Bug Number(s): not applicable  
Documented in MTB: not applicable  
Incompatible Change: no  
User/Operations-visible Interface Change: no  
Coded in:  PL/I  ALM  other-see below  
Performance:  better  same  worse

CATEGORY (check one)  
 Lib. Maint. Tools  
 Sys. Anal. Tools  
 Sys. Prog. Tools  
 355  
 BOS  
 Salvager  
 Ring Zero  
 Ring One  
 SysDaemon/Admin  
 Runtime  
 User Command/Subr

DOCUMENTATION CHANGES (specify one or more)

MPM (vol,sect)                      MPAM (sect)  
MOSN (sect)                         MSAM (sect)  
PLMs (AN#)                         AN- 65  
Info Segs  
Other

OBJECTIONS/COMMENTS:

Headings are: SUMMARY, REASONS, IMPLICATIONS, DETAILED PROPOSAL (optional)

SUMMARY: Remove "copy" entry from syserr\_logger and replace it with the  
entry "syserr\_log\_copy\$unlocked". (See MCR 820.)

REASONS: syserr\_logger is wired. The code in syserr\_logger\$copy does not  
need to be wired.

IMPLICATIONS: Less wired code.

TITLE: Fix bug in new_user		STATUS	DATE
AUTHOR: T. Casey		Written	1/14/75
-Coded in: <input checked="" type="checkbox"/> PL/I <input type="checkbox"/> ALM <input type="checkbox"/> other-explain in DETAILED PROPOSAL -Planned for System MR 2.1 -Fixes Bug Number(s) ANS-51 -Documented in MIB -User/Operations-visible Interface change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no -Incompatible change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no -Performance: <input type="checkbox"/> Better <input checked="" type="checkbox"/> Same <input type="checkbox"/> Worse -Replaces MCR		Status	A 1/21/75
		Expires	7/21/75
		DOCUMENTATION CHANGES	
		Document	Specify One or More
		MFM (Vol, Sect.)	
		PLMS (AN #)	
		MOSN (Sect.)	
		MPAM (Sect.)	
		MSAM (Sect.)	
Objections/Comments:		Info Segs	
		Other (Name)	
		None (Reason)	

Use these headings: SUMMARY, REASONS, IMPLICATIONS, DETAILED PROPOSAL (Optional)

**SUMMARY:** Fix bug that causes new\_user to reject a default project id of 9 characters (like SysDaemon), claiming it is longer than 9 characters.

**REASONS:** This bug makes it hard to register the daemons at a new installation.

**IMPLICATIONS:** The daemon will be able to be registered.

Multics Change Request

MCR 984

Page 1 of 1

TITLE: Change link chasing in append		STATUS	DATE	
AUTHOR: S. Herbst		Written	1/15/75	
<input checked="" type="checkbox"/> Coded in PL/I <input type="checkbox"/> ALM <input type="checkbox"/> other- explain in DETAILED PROPOSAL <input type="checkbox"/> Planned for System MR <input type="checkbox"/> Fixes Bug Number(s) _____ <input type="checkbox"/> Documented in MTB _____ <input type="checkbox"/> User/Operations-visible Interface change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no <input type="checkbox"/> Incompatible change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no Performance: <input checked="" type="checkbox"/> Better <input checked="" type="checkbox"/> Same <input type="checkbox"/> Worse <input type="checkbox"/> Replaces MCR _____	Category (Check One)	Status	A 1/21/75	
	<input type="checkbox"/> Lib. Maint. Tools	Expires	7/21/75	
	<input type="checkbox"/> Sys. Anal. Tools	DOCUMENTATION CHANGES		
	<input type="checkbox"/> Sys. Prog. Tools	Document	Specify One or More	
	<input type="checkbox"/> 355	MPM (Vol, Sect.)		
	<input type="checkbox"/> BOS	PLMS (AN #)		
	<input checked="" type="checkbox"/> Salvager	MOSN (Sect.)		
	<input checked="" type="checkbox"/> Ring Zero	MPAM (Sect.)		
	<input type="checkbox"/> Ring One	MSAM (Sect.)		
	<input type="checkbox"/> SysDaemon/Admin.	Info Segs		
<input type="checkbox"/> Runtime	Other (Name)			
<input type="checkbox"/> User Cmmd/Subr.	None (Reason) no interface change			
Objections/Comments:				

Use these headings: SUMMARY, REASONS, IMPLICATIONS, DETAILED PROPOSAL (Optional)

SUMMARY: Make append chase links using an **iterative** loop instead of by recursive calls to the entry append\$branchr, which exists especially for this purpose.

REASONS: This will make creating through a link much faster, make the program simpler and remove an entry.

Multics Change Request

TITLE: Emergency Fix to PL/I I/O to Add a Finish Handler  
AUTHOR: R. Barnes

STATUS	DATE
Written	1/17/75
Status	A 1/21/75
Expires	7/21/75

-Coded in:  PL/I  ALM  other-  
 explain in DETAILED PROPOSAL  
 -Planned for System MR 2.1  
 -Fixes Bug Number(s) \_\_\_\_\_  
 -Documented in MTB \_\_\_\_\_  
 -User/Operations-visible  
 Interface change?  yes  no  
 -Incompatible change?  yes  no  
 -Performance:  Better  Same  
 Worse  
 -Replaces MCR \_\_\_\_\_

Category (Check One)	
<input type="checkbox"/>	Lib. Maint. Tools
<input type="checkbox"/>	Sys. Anal. Tools
<input type="checkbox"/>	Sys. Prog. Tools
<input type="checkbox"/>	355
<input type="checkbox"/>	BOS
<input type="checkbox"/>	Salvager
<input type="checkbox"/>	Ring Zero
<input type="checkbox"/>	Ring One
<input type="checkbox"/>	SysDaemon/Admin.
<input checked="" type="checkbox"/>	Runtime
<input type="checkbox"/>	User Ccmd/Subr.

DOCUMENTATION CHANGES	
Document	Specify One or More
MPM (Vol, Sect.)	
PLMS (AN #)	
MOSN (Sect.)	
MPAM (Sect.)	
MSAM (Sect.)	

Objections/Comments:

Info Segs
Other (Name) SRB for 2.0
None (Reason)

Use these headings: SUMMARY, REASONS, IMPLICATIONS, DETAILED PROPOSAL (Optional)

SUMMARY: A change must be made to PL/I I/O (bound\_plio2\_) so that all PL/I files are properly closed when the finish condition is signalled. Currently iox\_will close the files, but the PL/I buffers are not emptied, therefore creating the possibility that the files will be left in an undefined state.

ETAILED PROPOSAL:

plio2\_open\_ is changed to call default\_error\_handler\_\$add\_finish\_handler with plio2\_open\_\$close\_all\_ as an argument the first time it is invoked.

Multics Change Request

TITLE: Delete hphcs \$star_no_acc_ck		STATUS	DATE	
AUTHOR: Paul Green		Written	750107	
-Coded in: <input checked="" type="checkbox"/> PL/I <input type="checkbox"/> ALM <input type="checkbox"/> other- explain in DETAILED PROPOSAL -Planned for System MR _____ -Fixes Bug Number(s) _____ -Documented in MPB _____ -User/Operations-visible Interface change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no -Incompatible change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no -Performance: <input type="checkbox"/> Better <input checked="" type="checkbox"/> Same <input type="checkbox"/> Worse -Replaces MCR _____	Category (Check One)		Status	
	Lib. Maint. Tools		A 1/2/75	
	Sys. Anal. Tools		Expires	
	Sys. Prog. Tools		7/21/75	
	355		DOCUMENTATION CHANGES	
	POS		Document	Specify One or More
	Salvager		MFM (Vol, Sect.)	
	X Ring Zero		PLMS (AN #)	
	Ring One		MOSN (Sect.)	
	SysDaemon/Admin.		MPAM (Sect.)	
Runtime		MSAM (Sect.)		
User Cmmnd/Subr.		Info Segs		
Objections/Comments:		Other (Name) OLD SFS		
		None (Reason)		

Use these headings: SUMMARY, REASONS, IMPLICATIONS, DETAILED PROPOSAL (Optional)

SUMMARY: Delete gate entry hphcs \$star\_no\_acc\_ck and the code in star\_ which supports it.

REASONS: This entry was formerly used by adjust\_device; a program which disappeared long ago. Further, this entry will list a directory without requiring status permission...effectively coding system-wide access into the access on hphcs\_. (Any program with access to hphcs\_ can force access if it wishes to list a directory; this change doesn't remove a capability, just makes it a little harder to code).

IMPLICATIONS: Currently this entry is unused.

DETAILED PROPOSAL: Edit hphcs\_.mexp and star\_.pll to remove the code.

Multics Change Request

TITLE: New Page Control, Phase I: Continued development  
and ultimate installation thereof.

STATUS

DATE 1/17/75

AUTHOR: Bernard S. Greenberg

Written

1/17/75

-Coded in:  PL/I  ALM  other-  
explain in DETAILED PROPOSAL

Category (Check One)

Status

A 1/21/75

-Planned for System MR 3

Lib. Maint. Tools

Expires

4/21/75

-Fixes Bug Number(s)

Sys. Anal. Tools

DOCUMENTATION CHANGES

-Documented in MTB 105

Sys. Prog. Tools

Document

Specify One or More

-User/Operations-visible

355

MPM (Vol, Sect.)

Interface change?  yes  no

BOS

PLMS (AN #) 60

-Incompatible change?  yes  no

Salvager

MOSN (Sect.)

-Performance:  Better  Same

x Ring Zero

MPAM (Sect.)

Worse

Ring One

MSAM (Sect.)

-Replaces MCR

SysDaemon/Admin.

Runtime

User Cmnd/Subr.

Objections/Comments:

Info Segs

Other (Name)

None (Reason)

Use these headings: SUMMARY, REASONS, IMPLICATIONS, DETAILED PROPOSAL (Optional)

SUMMARY: Continue development of so-called 'new' page control. Install a version of same when in a consistent state.

REASONS: MTB 105 proposed a large number of radical changes to the operation of the current page/core control subsystem. The nature of system performance in this area is such that the only reasonable way to determine the benefits or losses of a proposed change, for a large class of changes, is to implement it, and measure it. All of the proposed changes (other than core accounting), and others being proposed, are entirely for performance improvement, not for change in functionality.

Hence, this MCR seeks to authorize further development and coding of performance-oriented changes, which may even be discarded if not worthwhile. The installation of some form of this page control, at a state where reasonable performance benefits have been observed, is proposed.

DETAILED PROPOSAL:

The current experimental page control contains the following features:

- 1) Overlapped bulk store operation. The full power of the Controller's hardware queuing facility is utilized, at the expense of a complex DIM. The current page control loops awaiting I/O completion, and cannot overlap.
- 2) Seek-then read-then housekeep strategy. The find-core algorithm is trivialized, without modifying the replacement strategy. Hence, page reading is started as soon as possible in the page fault cycle. Write queuing and zero-checking is done during the read transfer. Clearly, this is only possible with improvement 1).
- 3) Internal protocols simplified. Previously unused space in core map entries is used to save AST entry pointers, eliminating the expensive

and common `get_astept_givertp` operation, performed at interrupt time. A redefinition of the protocol defining the meaning of a PTW address ~~trivializes~~ an expensive operation at boundfault time, at almost no expense.

- 4) Overlapped paging device update. In order to allow `find_core` to operate at maximum speed, decisions concerning the update-write of pure pages to the paging device cannot be made at `find_core_time`. The overlapped Bulk Store Dim allows pages to be written to the paging device while they are in use, without tying up page control. Hence, writing all pages to the PD as soon as they are read in from disk greatly simplifies the cost of replacing pages in core, while fully overlapping use of the page with PD update.
- 5) Miscellaneous cleanups and bug fixes.

It is felt that the protocol cleanups and bulk store dim are essential to any of the more sophisticated proposals stated in the MTB. The ideas presented in this MCR are conservative in comparison, and represent performance improvements. This page control should be installed when sufficient confidence <sup>in it</sup> is reached.

Multics Change Request

TITLE: Emergency fix to Fortran I/O to Add a finish Handler	STATUS	DATE
AUTHOR: D. Levin	Written	1/17/75
	Status	A/2/75
	Expires	7/21/75

- Coded in:  PL/I  ALM  other- explain in DETAILED PROPOSAL
- Planned for System MR 2.1
- Fixes Bug Number(s) \_\_\_\_\_
- Documented in MTB \_\_\_\_\_
- User/Operations-visible
- Interface change?  yes  no
- Incompatible change?  yes  no
- Performance:  Better  Same  Worse
- Replaces MCR \_\_\_\_\_

Category (Check One)	
<input type="checkbox"/>	Lib. Maint. Tools
<input type="checkbox"/>	Sys. Anal. Tools
<input type="checkbox"/>	Sys. Prog. Tools
<input type="checkbox"/>	355
<input type="checkbox"/>	BOS
<input type="checkbox"/>	Salvager
<input type="checkbox"/>	Ring Zero
<input type="checkbox"/>	Ring One
<input type="checkbox"/>	SysDaemon/Admin.
<input checked="" type="checkbox"/>	Runtime
<input type="checkbox"/>	User Cmnd/Subr.

DOCUMENTATION CHANGES	
Document	Specify One or More
MPM (Vol, Sect.)	
PLMS (AN #)	
MOSN (Sect.)	
MPAM (Sect.)	
MSAM (Sect.)	
Info Segs	
Other (Name)	
None (Reason)	

Objections/Comments:

Use these headings: SUMMARY, REASONS, IMPLICATIONS, DETAILED PROPOSAL (Optional)

SUMMARY: A change must be made to Fortran I/O (bound fortran\_io) so that all Fortran files are properly closed when the finish condition is signalled. Currently iox will close the files, but the Fortran buffers are not emptied, therefore creating the possibility that the files will be left in an undefined state.

DETAILED PROPOSAL: ftn\_io control is changed to call default\_error\_handler \$add\_finish\_handler with finish\_handler as an argument the first time it is called.

Multics Change Request

TITLE: Modify tape attachment module to rotate assignment AUTHOR: of tape drives Noel I. Morris		STATUS	DATE
		Written	1/17/75
		Status	A 1/21/75
		Expires	7/21/75
-Coded in: <input checked="" type="checkbox"/> PL/I <input type="checkbox"/> ALM <input type="checkbox"/> other- explain in DETAILED PROPOSAL		Category (Check One)	
-Planned for System MR 2.1		<input type="checkbox"/> Lib. Maint. Tools	
-Fixes Bug Number(s) _____		<input type="checkbox"/> Sys. Anal. Tools	
-Documented in MFB _____		<input type="checkbox"/> Sys. Prog. Tools	
-User/Operations-visible		355	
Interface change? <input checked="" type="checkbox"/> yes <input type="checkbox"/> no		BOS	
-Incompatible change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no		Salvager	
-Performance: <input type="checkbox"/> Better <input checked="" type="checkbox"/> Same		<input checked="" type="checkbox"/> Ring Zero	
<input type="checkbox"/> Worse		Ring One	
-Replaces MCR _____		SysDaemon/Admin.	
		Runtime	
		User Cmmd/Subr.	
		MPAM (Sect.)	
		MSAM (Sect.)	
Objections/Comments:		DOCUMENTATION CHANGES	
		Document Specify One or More	
		MPM (Vol, Sect.)	
		PLMS (AN #)	
		MOSN (Sect.)	
		MPAM (Sect.)	
		MSAM (Sect.)	
		Info Segs	
		Other (Name)	
		None (Reason)	

Use these headings: SUMMARY, REASONS, IMPLICATIONS, DETAILED PROPOSAL (Optional)

SUMMARY:

In certain cases, especially when performing a reload, it is desirable to assign a tape drive which is guaranteed to be different from the last tape drive assigned. This will remove the necessity of having to wait for a tape to rewind and unload before proceeding with the next tape of a multi-reel sequence.

Proposal:

"tape\_attach", the hardcore tape assignment module, will be modified. A new entry will be provided through hphcs\_ to set tape assignment on a rotational basis. The normal mode will be to assign tapes in the manner in which they are currently assigned.

```
declare hphcs_$rotate_tape_drives entry (bit (1)aligned);
call hphcs_$rotate_tape_drives (rotate_sw);
```

If "rotate\_sw" is "1", assignment of tape drives will be rotated. If it is "0", tape drive assignment will not be rotated.

The reloader will be modified to set tape assignment rotation when it commences operation and to reset it at the end of a reloader.

Implications:

This facility is temporary and will be removed when peripheral resource allocation mechanism is implemented.

Multics Change Request

TITLE: New default Multics standard tape record size.

AUTHOR: B. Silver

STATUS	DATE
Written	01/21/75
Status	A 1/28/75
Expires	7/28/75

- Coded in:  PL/I  ALM  other-  
explain in DETAILED PROPOSAL
- Planned for System MR 2.1
- Fixes Bug Number(s) \_\_\_\_\_
- Documented in MTB \_\_\_\_\_
- User/Operations-visible
- Interface change?  yes  no
- Incompatible change?  yes  no
- Performance:  Better  Same  
 Worse
- Replaces MCR \_\_\_\_\_

Category (Check One)

- Lib. Maint. Tools
- Sys. Anal. Tools
- Sys. Prog. Tools
- 355
- BOS
- Salvager
- Ring Zero
- Ring One
- SysDaemon/Admin.
- Runtime
- User Cmmd/Subr.

DOCUMENTATION CHANGES

Document	Specify One or More
MPM (Vol, Sect.)	
PLMS (AN #)	
MOSN (Sect.)	
MPAM (Sect.)	
MSAM (Sect.)	

Objections/Comments:

Info Segs	mstrds.info; pending.changes.info
Other (Name)	
None (Reason)	

Use these headings: SUMMARY, REASONS, IMPLICATIONS, DETAILED PROPOSAL (Optional)

SUMMARY: Change the default Multics standard tape record size from 256 words to 1024 words.

REASONS: The longer record size will make tape processing more efficient. (See MTB-003.)

IMPLICATIONS: To the average tape user this change involves no implications. However, anyone who wants small Multics standard tape records (256 words) will have to use the mstrds command. Note that this change will affect any existing procedures (depending upon default 256 word length) for transferring Multics files to other (foreign) computers.

DETAILED PROPOSAL: The size of Multics standard records is maintained on a per process basis in the program tape\_dim\_data. This program will be changed so that the initial value for this record size will be 1024 rather than 256.

Multics Change Request

TITLE: Implement "-long" option for initiate		STATUS	DATE
AUTHOR: S. Herbst		Written	1/17/75
-Coded in: <input checked="" type="checkbox"/> PL/I <input type="checkbox"/> ALM <input type="checkbox"/> other- explain in DETAILED PROPOSAL -Planned for System MR _____ -Fixes Bug Number(s) _____ -Documented in MTB _____ -User/Operations-visible Interface change? <input checked="" type="checkbox"/> yes <input type="checkbox"/> no -Incompatible change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no -Performance: <input type="checkbox"/> Better <input checked="" type="checkbox"/> Same <input type="checkbox"/> Worse -Replaces MCR _____	Category (Check One)		
	Lib. Maint. Tools		DOCUMENTATION CHANGES
	Sys. Anal. Tools		
	Sys. Prog. Tools		
355			
BOS		Document	Specify One or More
Salvager		MPM (Vol, Sect.)	
Ring Zero		PLMS (AN #)	
Ring One		MOSN (Sect.)	
SysDaemon/Admin.		MPAM (Sect.)	
Runtime		MSAM (Sect.)	
<input checked="" type="checkbox"/> User Cmnd/Subr.		Info Segs	
Objections/Comments:		Other (Name)	
		None (Reason) MPM OK	

Use these headings: SUMMARY, REASONS, IMPLICATIONS, DETAILED PROPOSAL (Optional)

SUMMARY: Make the initiate command accept "-long" and "-lg" as synonymous control arguments to "-s".

REASON: The documentation says it does.

Ver. 3  
741022

MULTICS CHANGE REQUEST

MCR 994

TITLE: Remove un-documented special characters  
from TTY and printer dims.  
AUTHOR: VanVleck

STATUS	DATE
Written	01/30/75
Status	A \128/75
Expires	07/30/75

Planned for System: not applicable  
Fixes Bug Number(s): not applicable  
Documented in MTB: not applicable  
Incompatible Change: no  
User/Operations-visible Interface Change: no  
Coded in: ()PL/I ( )ALM ( )other-see below  
Performance: ( )better ()same ( )worse

CATEGORY (check one)  
( ) Lib. Maint. Tools  
( ) Sys. Anal. Tools  
( ) Sys. Prog. Tools  
( ) 355  
( ) BOS  
( ) Salvager  
() Ring Zero  
( ) Ring One  
( ) SysDaemon/Admin  
( ) Runtime  
( ) User Command/Subr

DOCUMENTATION CHANGES (specify one or more)

MPM (vol,sect)                   MPAM (sect)  
MOSN (sect)                    MSAM (sect)  
PLMs (AN#)  
Info Segs            news, pending\_changes  
Other

OBJECTIONS/COMMENTS:

Headings are: SUMMARY, REASONS, IMPLICATIONS, DETAILED PROPOSAL (optional)

SUMMARY:

Remove the two-character escape sequences \f, \b, \c, and \r from the input translation side of the TTY dim. Typing escape and one of these letters will result in two characters being placed in the user's input, instead of mapping the two-character sequence into a control character. Modify other system programs to make this change transparent to almost all users.

Change the output conversion side of the TTY dim and the printer conversion package at the same time as the input side.

No modifications are needed to qedx or to the network software.

REASONS:

These "escape" sequences were put into the system during its early development to support the old BCPL-coded qed. User documentation has never mentioned these translations because we have always intended to remove the feature.

IMPLICATIONS:

FORTRAN I/O has a facility which allows the user to cause an end-of-file to be simulated from terminal files by typing \f. The fortran\_io programs will have to be modified to accept the two-character form.

Users who have qedx macros containing the control characters will find that they still work fine.

All qedx macros and exec\_coms which run qedx suddenly print out differently.

Ver. 3 741022	MULTICS CHANGE REQUEST	MCR 995
TITLE: Minor fix to indent		STATUS
AUTHOR: VanVleck		DATE
Planned for System: not applicable		Written 01/17/75
Fixes Bug Number(s): not applicable		Status A 1/28/76
Documented in MTB: not applicable		Expires 07/17/75
Incompatible Change: no		CATEGORY (check one)
User/Operations-visible Interface Change: no		( ) Lib. Maint. Tools
Coded in: (X) PL/I ( ) ALM ( ) other-see below		( ) Sys. Anal. Tools
Performance: ( ) better (X) same ( ) worse		( ) Sys. Prog. Tools
DOCUMENTATION CHANGES (specify one or more)		( ) 355
MPM (vol,sect) indent MPAM (sect)		( ) BOS
MOSN (sect) MSAM (sect)		( ) Salvager
PLMs (AN#)		( ) Ring Zero
Info Segs		( ) Ring One
Other		( ) SysDaemon/Admin
		( ) Runtime
		(X) User Command/Subr
OBJECTIONS/COMMENTS:		

Headings are: SUMMARY, REASONS, IMPLICATIONS, DETAILED PROPOSAL (optional)

SUMMARY:

Change indent so that the indentation of IF-statements is more sensible. Delay the extra five spaces of indentation until the THEN is seen: this will cause corresponding IF, THEN, and ELSE statements which begin a line to indent to the same column.

For example,

```

if a
then do;
    aa = 1;
end;

```

instead of

```

if a
    then do;
    aa = 1;
end;

```

REASONS:

This change will make a certain set of users happier with what indent does to their programs. The convention of delaying the indentation for IF-statements until the THEN makes more sense, and was figured out by examining user programs which indent seemed to mess up.

IMPLICATIONS:

Some programs will indent differently. These should all improve in appearance and understandability.

Ver. 3 741022	MULTICS CHANGE REQUEST	MCR <u>997</u>											
TITLE: Describe printed output modes on tail sheet.	AUTHOR: VanVleck	<table border="1"> <tr> <th>STATUS</th> <th>DATE</th> </tr> <tr> <td>Written</td> <td>01/17/75</td> </tr> <tr> <td>Status</td> <td>A 1/28/75</td> </tr> <tr> <td>Expires</td> <td>07/17/75</td> </tr> </table>	STATUS	DATE	Written	01/17/75	Status	A 1/28/75	Expires	07/17/75			
STATUS	DATE												
Written	01/17/75												
Status	A 1/28/75												
Expires	07/17/75												
Planned for System: not applicable Fixes Bug Number(s): not applicable Documented in MTB: not applicable Incompatible Change: no User/Operations-visible Interface Change: no Coded in: ( <input checked="" type="checkbox"/> )PL/I ( <input type="checkbox"/> )ALM ( <input type="checkbox"/> )other-see below Performance: ( <input type="checkbox"/> )better ( <input checked="" type="checkbox"/> )same ( <input type="checkbox"/> )worse	<table border="1"> <tr> <th>CATEGORY (check one)</th> </tr> <tr> <td>(<input type="checkbox"/>) Lib. Maint. Tools</td> </tr> <tr> <td>(<input type="checkbox"/>) Sys. Anal. Tools</td> </tr> <tr> <td>(<input type="checkbox"/>) Sys. Prog. Tools</td> </tr> <tr> <td>(<input type="checkbox"/>) 355</td> </tr> <tr> <td>(<input type="checkbox"/>) BOS</td> </tr> <tr> <td>(<input type="checkbox"/>) Salvager</td> </tr> <tr> <td>(<input type="checkbox"/>) Ring Zero</td> </tr> <tr> <td>(<input type="checkbox"/>) Ring One</td> </tr> <tr> <td>(<input checked="" type="checkbox"/>) SysDaemon/Admin</td> </tr> <tr> <td>(<input type="checkbox"/>) Runtime</td> </tr> <tr> <td>(<input type="checkbox"/>) User Command/Subr</td> </tr> </table>	CATEGORY (check one)	( <input type="checkbox"/> ) Lib. Maint. Tools	( <input type="checkbox"/> ) Sys. Anal. Tools	( <input type="checkbox"/> ) Sys. Prog. Tools	( <input type="checkbox"/> ) 355	( <input type="checkbox"/> ) BOS	( <input type="checkbox"/> ) Salvager	( <input type="checkbox"/> ) Ring Zero	( <input type="checkbox"/> ) Ring One	( <input checked="" type="checkbox"/> ) SysDaemon/Admin	( <input type="checkbox"/> ) Runtime	( <input type="checkbox"/> ) User Command/Subr
CATEGORY (check one)													
( <input type="checkbox"/> ) Lib. Maint. Tools													
( <input type="checkbox"/> ) Sys. Anal. Tools													
( <input type="checkbox"/> ) Sys. Prog. Tools													
( <input type="checkbox"/> ) 355													
( <input type="checkbox"/> ) BOS													
( <input type="checkbox"/> ) Salvager													
( <input type="checkbox"/> ) Ring Zero													
( <input type="checkbox"/> ) Ring One													
( <input checked="" type="checkbox"/> ) SysDaemon/Admin													
( <input type="checkbox"/> ) Runtime													
( <input type="checkbox"/> ) User Command/Subr													
DOCUMENTATION CHANGES (specify one or more)													
MPM (vol,sect)	MPAM (sect)												
MOSN (sect)	MSAM (sect)												
PLMs (AN#)	io daemon												
Info Segs													
Other													
OBJECTIONS/COMMENTS:													

Headings are: SUMMARY, REASONS, IMPLICATIONS, DETAILED PROPOSAL (optional)

SUMMARY:

Add a representation of any non-default printing modes used to print an output file to the tail sheet.

REASONS-

Multics Change Request

TITLE: Extension to user_info_	STATUS	DATE
THOR: F. C. Smith	Written	1/22/75

-Coded in: <input checked="" type="checkbox"/> PL/I <input type="checkbox"/> ALM <input type="checkbox"/> other- explain in DETAILED PROPOSAL -Planned for System MR NA -Fixes Bug Number(s) _____ -Documented in MTB _____ -User/Operations-visible Interface change? <input checked="" type="checkbox"/> yes <input type="checkbox"/> no -Incompatible change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no -Performance: <input type="checkbox"/> Better <input checked="" type="checkbox"/> Same <input type="checkbox"/> Worse -Replaces MCR _____	Category (Check One) <input type="checkbox"/> Lib. Maint. Tools <input type="checkbox"/> Sys. Anal. Tools <input type="checkbox"/> Sys. Prog. Tools <input type="checkbox"/> 355 <input type="checkbox"/> BOS <input type="checkbox"/> Salvager <input type="checkbox"/> Ring Zero <input type="checkbox"/> Ring One <input type="checkbox"/> SysDaemon/Admin. <input type="checkbox"/> Runtime <input checked="" type="checkbox"/> User Cmnd/Subr.	Status A 1/28/75 Expires 7/28/75 DOCUMENTATION CHANGES Document Specify One or More MPM (Vol, Sect.) Vol 2, Sect. 10 PLMS (AN #) MOSN (Sect.) MPAM (Sect.) MSAM (Sect.)
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Objections/Comments:	Info Segs
	Other (Name)
	None (Reason)

Use these headings: SUMMARY, REASONS, IMPLICATIONS, DETAILED PROPOSAL (Optional)

**SUMMARY:** Modify user\_info\_usage\_data to return the memory units and terminal i/o operations from previous processes in the current login session, in addition to the information it now returns. Memory units and terminal i/o will soon be added to the PIT. (MCR 935)

**Reasons:** Procedures which obtain information about resources used by previous processes in the current session can obtain only the figure for CPU time. Multics also charges for memory units and will soon start to charge for terminal i/o.

**Implications:** Users will be able to obtain accurate figures for resource consumption during a login session. Existing programs will continue to work as they do at present, as user\_info\_counts its arguments and does not attempt to return more values than there are arguments.

Multics Change Request

TITLE: Remove page control from ring 0.		STATUS	DATE
AUTHOR: S. Webber		Written	1/24/75
-Coded in: <input checked="" type="checkbox"/> PL/I <input checked="" type="checkbox"/> ALM <input type="checkbox"/> other- explain in DETAILED PROPOSAL		Status	A 1/28/75
-Planned for System MR 3.0		Expires	4/01/75
-Fixes Bug Number(s)		DOCUMENTATION CHANGES	
-Documented in MTB		Document	Specify One or More
-User/Operations-visible Interface change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no		MPM (Vol, Sect.)	
-Incompatible change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no		PLMS (AN #)	AN60
-Performance: <input type="checkbox"/> Better <input type="checkbox"/> Same <input checked="" type="checkbox"/> Worse		MOSN (Sect.)	
-Replaces MCR		MPAM (Sect.)	
		MSAM (Sect.)	

Objections/Comments:	Info Segs
	Other (Name)
	None (Reason)

Use these headings: SUMMARY, REASONS, IMPLICATIONS, DETAILED PROPOSAL (Optional)

SUMMARY: Remove the functionality of paging from ring 0.

- REASONS:
1. paging has a direct bearing on resource utilization and should, therefore, be under immediate control of user ring algorithms.
  2. In removing the paging function from ring 0 we will convert it to PL/I and, therefore, make the algorithms much more readable.
  3. In addition, the user will now have the capability of trying new and different removal algorithms for the paging device and main memory as well as new allocation mechanism for disks.
  4. Since most files are shared anyway the problems of reused addresses and the like are only of marginal interest since it won't matter that much if a little more data is shared. In fact, sharing should be encouraged to minimize working sets.
  5. By allowing user ring (replaceable) code new meters can be easily inserted as anomalous behavior is noted.

IMPLICATIONS: Very few, since the paging interface is completely invisible to users today, they need not be warned of the pending change. There will, however, likely be a performance degradation as PL/I code is introduced and an increased number of calls to ring 0 is required to start and stop I/O. New hcs\_ interfaces will be provided so users can have the most freedom.

DETAILED PROPOSAL: See MTB-324.

Multics Change Request

TITLE: Fix bugs in print\_disk and disklow STATUS DATE

AUTHOR: T. Casey Written 1/23/75

-Coded in:  PL/I  ALM  other- explain in DETAILED PROPOSAL Status A 1/28/75

-Planned for System MR 2.1 Expires 7/28/75

-Fixes Bug Number(s) unreported DOCUMENTATION CHANGES

-Documented in MTB Document Specify One or More

-User/Operations-visible Interface change?  yes  no MPM (Vol, Sect.)

-Incompatible change?  yes  no PLMS (AN #)

-Performance:  Better  Same  Worse MOSN (Sect.)

-Replaces MCR Runtime MPAM (Sect.)

Category (Check One) User Cmmnd/Subr. MSAM (Sect.)

Lib. Maint. Tools Info Segs

Sys. Anal. Tools Other (Name)

Sys. Prog. Tools None (Reason)

355

BOS

Salvager

Ring Zero

Ring One

X SysDaemon/Admin.

Runtime

User Cmmnd/Subr.

Objections/Comments:

Use these headings: SUMMARY, REASONS, IMPLICATIONS, DETAILED PROPOSAL (Optional)

SUMMARY: Certain temporary variables in print\_disk and disklow are declared with too small a precision to hold the large disk usage values that are sometimes found in proj file. The large values overflow into the sign bit and cause large negative numbers to be printed for disk usage values. This bug will be fixed.

Multics Change Request

<b>TITLE:</b> Prevent an attempt to free non-allocated storage in check_info_segs <b>AUTHOR:</b> S. Barr		<b>STATUS</b> Written 1/14/75 Status A 1/28/75 Expires 3/28/75	<b>DATE</b> 
<input checked="" type="checkbox"/> PL/I <input type="checkbox"/> ALM <input type="checkbox"/> other- explain in DETAILED PROPOSAL -Planned for System MR _____ -Fixes Bug Number(s) _____ -Documented in MTB _____ -User/Operations-visible Interface change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no -Incompatible change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no -Performance: <input type="checkbox"/> Better <input checked="" type="checkbox"/> Same <input type="checkbox"/> Worse -Replaces MCR _____	<b>Category (Check One)</b> <input type="checkbox"/> Lib. Maint. Tools <input type="checkbox"/> Sys. Anal. Tools <input type="checkbox"/> Sys. Prog. Tools <input type="checkbox"/> 355 <input type="checkbox"/> BOS <input type="checkbox"/> Salvager <input type="checkbox"/> Ring Zero <input type="checkbox"/> Ring One <input type="checkbox"/> SysDaemon/Admin. <input type="checkbox"/> Runtime <input checked="" type="checkbox"/> User Cmnd/Subr.	<b>DOCUMENTATION CHANGES</b> Document                      Specify One or More MPM (Vol, Sect.) none PLMS (AN #) MOSN (Sect.) MPAM (Sect.) MSAM (Sect.)	
<b>Objections/Comments:</b>		Info Segs Other (Name) None (Reason)	

Use these headings: SUMMARY, REASONS, IMPLICATIONS, DETAILED PROPOSAL (Optional)

**SUMMARY:**            check\_info\_segs has a cleanup handler that attempts to free storage that may or may not have been allocated by a call to hcs\_\$star\_list\_.

**PROPOSAL:**            The pointers that will be used for the storage allocation should be set to null initially. Then the cleanup handler can check the pointers before attempting to free the storage.

**IMPLICATIONS:**    none

Ver. 3  
741022

MULTICS CHANGE REQUEST

MCR 1006

TITLE: Fix bugs in trace\_stack

AUTHOR: VanVleck

STATUS	DATE
Written	01/23/75
Status	A 1/28/75
Expires	07/23/75

Planned for System: not applicable  
Fixes Bug Number(s): not applicable  
Documented in MTB: not applicable  
Incompatible Change: no  
User/Operations-visible Interface Change: no  
Coded in: ()PL/I ()ALM ()other-see below  
Performance: ()better ()same ()worse

CATEGORY (check one)

- Lib. Maint. Tools
- Sys. Anal. Tools
- Sys. Prog. Tools
- 355
- BOS
- Salvager
- Ring Zero
- Ring One
- SysDaemon/Admin
- Runtime
- User Command/Subr

DOCUMENTATION CHANGES (specify one or more)

MPM (vol,sect)                   MPAM (sect)  
MOSN (sect)                    MSAM (sect)  
PLMs (AN#)  
Info Segs  
Other  
None (reason) NC

OBJECTIONS/COMMENTS:

Headings are: SUMMARY, REASONS, IMPLICATIONS, DETAILED PROPOSAL (optional)

SUMMARY:

Modify trace\_stack to handle the PL/I condition "error" in a special fashion in order to get a more sensible error message.

REASONS:

The trace\_stack command now determines where to start its trace by scanning the stack backwards until it finds the most recent signal frame. If this frame is for the "error" condition signalled as a result of some other condition, such as "subscriptrange", trace\_stack prints a nonsense explanation for the fault and lists four system-machinery frames before it lists the first frame of interest to the user.

The command already attempts to conceal the details of how the system gets back to command level; this policy should be implemented consistently.

IMPLICATIONS:

The output of trace\_stack will be more understandable for those conditions which cause "error" to be raised.

DETAILED PROPOSAL:

Modify the scan for the frame to start from so that

1. If the top condition frame is for "error" and the info pointer is null, go back to the previous condition frame.
2. If the condition was signalled from a procedure with the "support" flag on in its stack frame, like `pl1_signal_from_ops_`, search backward for the nearest non-support procedure.
3. Use `reinterpret_condition_` instead of `condition_interpreter_` for printing the error message. The difference is that `reinterpret_condition_` accepts a stack frame pointer which will point to the frame owned by the non-support procedure. (Must change bindfile for `bound_error_handlers_` to retain entrypoint.)
4. Also fix unrelated bug in `list_frame_args_` which causes garbage message about argument mismatch when a program which expects char (\*) arguments is called with descriptors.
5. Improve output from `interpret_ptr_` for the case where the pointer points into the combined linkage of a bound segment: extract the component name from the bindmap and show the name and relative offset in parentheses.

Users who wish to see the mechanism used to get to command level may hit QUIT and then use `trace_stack`, since this change affects only the search for the starting point of the trace.