DATE: May 6, 1974

TO: Distribution

FROM: M. S. Hodges

SUBJECT: Multics Change Requests

Attached are copies of Multics Change Requests which
were approved from April 16 - April 30, 1974.

MULTICS CHANGE REQUEST		MCR 373	
		Page 1 of 1 Pages	
TITLE: Cache Multics, single-cpu version.		STATUS	DATE
		Written	2/21
AUTHOR: Bernard S. Greenberg		Approved	H 4/23/74
		Rejected	
SOURCE: (if external) e.g., "User", "Marketing"		Postponed	2/26/74
		Withdrawn	
		Expires	10/23/74

CLASSIFICATION		JUSTIFICATION		Replaced by proposal MCR _____
	Incompatible Change	X	Marketing Requirement	Implemented in System _____
X	Extension		Conformance to Standard	Objections/Comments:
	Restriction		Increased Consistency	**Awaiting MTB and design review.**
X	Performance Improvement		Simplification	
	Reliability Improvement		Generalization	
			Bug Fix	

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

REASONS: A processor cache is now available for the 6000 line, which has several features specifically included for Multics. Multics should use this hardware.

The software which is necessary to run the cache under Multics is not incompatible with the current software, and should be installed before the arrival in Cambridge of the cache, in order to simplify the process of debugging the cache and its supporting software here and in Phoenix.

This software will be implemented in two phases, a one-cpu version and a multiple-cpu version.

SUMMARY: Code is added to page control to selectively clear cache when paging i/o will change contents of core. A new SLT attribute is defined to determine whether hardcore segments can go in the cache (see MCR 374), and code to incorporate this information in SDW's is added. Code to disable and enable the cache at various points is added. In this first version, all SDW's created by segfaults allow their segments in the cache. Some code which will be used by the second version is added, including a redefinition of the meaning of a connect fault. Bos "PROC" package must be modified to not interpret the "bos dump bit" of SDW's, which is now the "cache" bit, and the bos "dump" program must be modified to print out the "cache" bit. (See MCR 375). A separate bos program is being written to dump the cache.

MULTICS CHANGE REQUEST	MCR 374 Page 1 of 1 Pages

TITLE: MST Generator and Checker changes for Cache	STATUS	DATE
	Written	2/21/74
AUTHOR: Bernard S. Greenberg	Approved	4/23/74
	Rejected	
SOURCE: (if external) e.g., "User", "Marketing"	Postponed	2/26/74
	Withdrawn	
	Expires	10/23/74

CLASSIFICATION		JUSTIFICATION		Replaced by proposal MCR _____
	Incompatible Change	.	Marketing Requirement	Implemented in System _____
X	Extension		Conformance to Standard	Objections/Comments:
	Restriction		Increased Consistency	
	Performance Improvement		Simplification	Awaiting MTB and Design Review
	Reliability Improvement		Generalization	
			Bug Fix	
		X	Needed for MCR 373	

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

REASONS: The use of the 6180 Cache on Multics requires a new SLT attribute which tells whether or not the words of a given hardcore segment are to be allowed in the cache. The MST generator and checker must be modified to process this attribute.
        These tools should be installed before the arrival in Cambridge of the cache, in order to reduce the number of non-installed tools which will be necessary to debug the cache and its support software in Phoenix.

SUMMARY: Change SLTE include file for new bit (slte.cache), modify generate_mst and gm_util_ to process "cache" attribute (default is "on"), and modify loading_summary_ subroutine of checker to print an "A" in the "SWITCHES" field if a segment is allowed in the cache.

IMPLICATIONS: None. New slt bit is not used elsewhere or ever assumed to be zero.

MULTICS CHANGE REQUEST	MCR 375
	Page 1 of 1 Pages

			STATUS	DATE
TITLE: Bos Compatibility changes for 6180 Cache			Written	2/21/
			Approved #	4/23/74
AUTHOR: Bernard Greenberg			Rejected	
SOURCE: (if external) e.g., "User", "Marketing"			Postponed	2/26/74
			Withdrawn	
			Expires	10/23/74

CLASSIFICATION		JUSTIFICATION	Replaced by proposal MCR _____
	Incompatible Change		Marketing Requirement	Implemented in System _____
X	Extension		Conformance to Standard	Objections/Comments:
	Restriction	X	Increased Consistency	**Awaiting MTB and design review.**
	Performance Improvement		Simplification	
	Reliability Improvement		Generalization	
			Bug Fix	

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

REASONS: The new cache software (see MCR 373) redefines the meaning of SDW bit 57. In a previous version of Multics, this bit had been used to force BOS dumping of directories. As this is no longer necessary, this bit being on would force dumping of all segments which would be allowed in the cache. This feature should thus be removed from BOS.

The BOS dumping package should be modified to print out this new bit.

SUMMARY: Modify "proc.incl.alm" to ignore "sdw.dump". Modify "dump.alm" to print out a flag indicating the status of the cache bit.

IMPLICATIONS: The version of "sdw.incl.alm" which defines the cache bit must be installed. No Multics programs would be affected.

MULTICS CHANGE REQUEST	MCR 452
	Page 1 of 1 Pages

TITLE: install BOS ABS command	STATUS	DATE
	Written	2/8/74
AUTHOR: Bernard S. Greenberg	Approved	4/16/74
	Rejected	
SOURCE: (if external) e.g., "User", "Marketing"	Postponed	
	Withdrawn	
	Expires	10/16/74

CLASSIFICATION		JUSTIFICATION		Replaced by proposal MCR _____
	Incompatible Change		Marketing Requirement	
x	Extension		Conformance to Standard	Implemented in System _____
	Restriction	x	Increased Consistency	Objections/Comments:
	Performance Improvement		Simplification	
	Reliability Improvement		Generalization	
			Bug Fix	

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

REASONS: There are currently no tools to analyze the contents of core after a crash.

SUMMARY: Install a BOS program which analyzes the contents of core after a crash.

IMPLICATIONS: Greater ease in analyzing various natures of page control failures.

DETAILED PROPOSAL: The ABS command prints a dump of core by absolute core address, describing the contents of each page of core. It also answers inquiries about the contents of any specific location in core, directed from the Operator's console. It also analyzes the contents of the 6180 cache, if one is present. This program uses information not available in FDUMP images, and thus must run at crash time.   Perhaps the information currently printed by this program will be added to the FDUMP image at some later date.

An MOSN will be written describing the use of this program.

MULTICS CHANGE REQUEST

TITLE:

New abs_usable-abs_wired mechanism

AUTHOR: Bernard S. Greenberg

SOURCE: (if external) e.g., "User", "Marketing"

STATUS	DATE
Written	4/8/
Approved #	4/16/74
Rejected	
Postponed	
Withdrawn	
Expires	10/16/74

CLASSIFICATION		JUSTIFICATION		
	Incompatible Change	☒	Marketing Requirement	Replaced by proposal MCR _____
☒	Extension		Conformance to Standard	Implemented in System _____
	Restriction		Increased Consistency	Objections/Comments:
	Performance Improvement	☒	Simplification	
	Reliability Improvement	☒	Generalization	
			Bug Fix	

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

REASONS: The new I/O interfacer (MCR 05C) requires the ability to restrict pages of any arbitrary segment to abs_usable (non-reconfigurable memory.

SUMMARY: A new bit in the AST entry of a segment (aste.abs_wireable) is defined. A page fault (or forced read) taken on a segment with this bit turned on is always resolved in abs_usable core. Entries to abs-wire pages will be removed, and programs calling them modified to use the new mechanism.

IMPLICATIONS: All programs requiring segments in abs-usable memory will have to use this new mechanism.

MULTICS CHANGE REQUEST	MCR 454
	Page 1 of 1 Pages

TITLE: Fix 2 CPU bug in operator's console software	STATUS	DATE
	Written *H*	4/8/74
AUTHOR: ___ Noel I. Morris ___	Approved *H*	4/16/74
	Rejected	
SOURCE: (if external) e.g., "User", "Marketing"	Postponed	
	Withdrawn	
Internal	Expires	10/16/74

CLASSIFICATION		JUSTIFICATION	
	Incompatible Change		Marketing Requirement
	Extension	•	Conformance to Standard
	Restriction		Increased Consistency
	Performance Improvement		Simplification
	Reliability Improvement		Generalization
		☒	Unreported Bug Fix

Replaced by proposal MCR _____

Implemented in System _____

Objections/Comments: .

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

REASONS:

A "deadly embrace" condition could result where one processor was trying to
pickup IOM status while the other processor was trying to deliver the status.

Summary:

The method of status delivery will be changed to resemble that of the disk DIM
(which once suffered from the same problem). The processor waiting for status
will be able to pick up the status which the other processor is trying to
deliver.

MULTICS CHANGE REQUEST

MCR 455
Page 1 of 1 Pages

TITLE: Fix bug in BOS command LD355

AUTHOR: Noel I. Morris

SOURCE: (if external) e.g., "User", "Marketing"
          Internal

STATUS	DATE
Written	4/8/
Approved	4/16/74
Rejected	
Postponed	
Withdrawn	
Expires	10/16/74

CLASSIFICATION	JUSTIFICATION	
Incompatible Change	Marketing Requirement	Replaced by proposal MCR _____
Extension	Conformance to Standard	Implemented in System _____
Restriction	Increased Consistency	Objections/Comments:
Performance Improvement	Simplification	
Reliability Improvement	Generalization	
	☒ Unreported Bug Fix	

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

REASONS:

LD355 fails to call the operator's console initialization subroutine. This
causes a problem when an operator's console channel number other than 20_8.
is used.

Summary:

Fix LD355 to call 'ttyinit' in BOS.

MULTICS CHANGE REQUEST	MCR 456
	Page 1 of 1 Pages

TITLE: Fix bug in operator's console software when not using log.	STATUS	DATE
	Written	4/8/74
AUTHOR: Noel I. Morris	Approved	4/16/74
	Rejected	
SOURCE: (if external) e.g., "User", "Marketing" Internal	Postponed	
	Withdrawn	
	Expires	10/16/74

Replaced by proposal MCR _____

Implemented in System _____

Objections/Comments:

CLASSIFICATION		JUSTIFICATION	
	Incompatible Change		Marketing Requirement
	Extension		Conformance to Standard
	Restriction		Increased Consistency
	Performance Improvement		Simplification
	Reliability Improvement		Generalization
		☒	Unreported Bug Fix

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

REASONS:

If the "PART LOG" card is omitted from the configuration deck, logging by the operator's console software should be turned off. Instead, the system will crash during initialization.

Summary:

Repair the software so that an uninitialized data base is not refdrenced when logging is not in use.

MULTICS CHANGE REQUEST	MCR 457	
	Page 1 of 1 Pages	

TITLE: Implement I/O Interfacer	STATUS	DATE
	Written	4/11,
	Approved H	4/16/74
AUTHOR: __Noel I. Morris__	Rejected	
SOURCE: (if external) e.g., "User", "Marketing"	Postponed	
	Withdrawn	
Internal	Expires	10/16/74

CLASSIFICATION		JUSTIFICATION		Replaced by proposal MCR _____
	Incompatible Change	X	Marketing Requirement	Implemented in System _____
X	Extension	X	Conformance to Standard	Objections/Comments: .
	Restriction	X	Increased Consistency	
X	Performance Improvement	X	Simplification	
X	Reliability Improvement	X	Generalization	
			Bug Fix	

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

REASONS:

See MTB-028 and MTB-056.

MULTICS CHANGE REQUEST		MCR 458
		Page 1 of 1 Pages

TITLE: Fix bugs in BASIC	STATUS	DATE
	Written	4/9/74
AUTHOR: Barry L. Wolman	Approved #	4/16/74
	Rejected	
SOURCE: (if external) e.g., "User", "Marketing"	Postponed	
	Withdrawn	
	Expires	10/16/74

CLASSIFICATION		JUSTIFICATION	Replaced by proposal MCR _____
	Incompatible Change		Marketing Requirement	Implemented in System _____
	Extension		Conformance to Standard	Objections/Comments:
	Restriction		Increased Consistency	
	Performance Improvement		Simplification	
	Reliability Improvement		Generalization	
		X	Bug Fix	

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

REASONS: BASIC currently installed in Phoenix (release 1.0) has a number of bugs that should be fixed.

PROPOSAL: Install new BASIC that fixes following bugs:
#18 Bug in string operation
#20 No message for runtime error 97
#21 abs (cos(x)) can return negative result
#22 let a$ = a$ sets a$ = ""
#23 x^ -k is parsed incorrectly
#24 mat a = b + c fails (caused by bug in Pl/1)
#25 usr$ function returns string with trailing blank

SUMMARY: These bugs are fixed in experimental version of BASIC

IMPLICATIONS: None

MULTICS CHANGE REQUEST	MCR 459
	Page 1 of 1 Pages

TITLE: The Phonetic Underscore

AUTHOR: M.D. MacLaren

SOURCE: (if external) e.g., "User", "Marketing"

STATUS	DATE
Written	4/9/7~
Approved #	4/16/74
Rejected	
Postponed	
Withdrawn	
Expires	10/16/74

CLASSIFICATION		JUSTIFICATION	
	Incompatible Change		Marketing Requirement
X	Extension		Conformance to Standard
	Restriction	X	Increased Consistency
	Performance Improvement		Simplification
	Reliability Improvement		Generalization
			Bug Fix

Replaced by proposal MCR _____

Implemented in System _____

Objections/Comments:

Obsolete names section to MPM should be created to contain old names.

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

REASONS: There is an annoying inconsistency in the spelling of command names: a few of them do not have underscores between distinct words e.g. "addname". This is a pointless annoyance for the casual user. Even the experienced user may have trouble when he wants to look the commands up in the MPM.

SUMMARY: Add the name shown below in the left column to the command in the right column. Make the new name the official one as far as MPM documentation is concerned, demoting the old name to the status of an abbreviation.

```
add_name               addname
delete_acl             deleteacl
delete_force           deleteforce
delete_name            deletename
get_quota              getquota
list_acl               listacl
list_names             listnames
list_totals            listotals
move_quota             movequota
 set_acl                set acl
create_dir             createdir
```

Version 2
730919-

MULTICS CHANGE REQUEST	MCR 460
	Page 1 of 1 Pages

TITLE: Install compiler tools tmg and compile_messages

AUTHOR: R.A. Barnes

SOURCE: (if external) e.g., "User", "Marketing"

STATUS	DATE
Written	4/10/74
Approved	✗ 4/16/74
Rejected	
Postponed	
Withdrawn	
Expires	10/16/74

CLASSIFICATION		JUSTIFICATION	
	Incompatible Change	x	Marketing Requirement
	Extension		Conformance to Standard
	Restriction		Increased Consistency
	Performance Improvement		Simplification
	Reliability Improvement		Generalization
			Bug Fix

Replaced by proposal MCR _____

Implemented in System _____

Objections/Comments:

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

REASONS: Our contract with the U.S.A.F. requires that they be able to reproduce the entire system from the source level.

SUMMARY: tmg (table) is a macro expander that is used to preprocess the compiler macro tables before assembling them. Compile_messages compiles an ASCII file of error messages into an error message table.

MULTICS CHANGE REQUEST		MCR 461	
		Page 1 of 1 Pages	
TITLE: Fix bug in illegal_procedure's attempted simulation of the MVT instruction to zero length target strings. Steve Webber		STATUS	DATE
		Written	4/10/
		Approved *4/16/74*	
AUTHOR:		Rejected	
SOURCE: (if external) e.g., "User", "Marketing"		Postponed	
		Withdrawn	
		Expires	*10/16/74*

CLASSIFICATION		JUSTIFICATION		Replaced by proposal MCR _____
	Incompatible Change		Marketing Requirement	Implemented in System _____
	Extension		Conformance to Standard	Objections/Comments:
	Restriction	x	Increased Consistency	
	Performance Improvement		Simplification	
x	Reliability Improvement		Generalization	
			unreported	
		x	Bug Fix	

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

REASONS: The MVT instruction is not handled correctly by the procedure illegal_procedure when it attempts to ignore the illegal procedure fault that results from a zero length target string.

SUMMARY: Fix the program to change the ILC by 4 rather than 3 for the MVT instruction.

MULTICS CHANGE REQUEST	MCR 462
	Page 1 of 1 Pages

TITLE: Add "report_reset" control argument to tty_meters	STATUS	DATE
	Written	4/10/74
AUTHOR: R.B. Snyder	Approved ✠	4/16/74
	Rejected	
SOURCE: (if external) e.g., "User", "Marketing"	Postponed	
	Withdrawn	
	Expires	10/16/74

CLASSIFICATION		JUSTIFICATION		
	Incompatible Change		Marketing Requirement	Replaced by proposal MCR _____
x	Extension	x	Conformance to Standard	Implemented in System _____
	Restriction		Increased Consistency	Objections/Comments:
	Performance Improvement		Simplification	
	Reliability Improvement	x	Generalization	
			Bug Fix	

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

REASONS: To conform to the metering command standards, tty_meters will be modified to accept the "report_reset" control argument. It will also be modified to use the ring_zero_peek_ subroutine.

   IMPLICATIONS: None

MULTICS CHANGE REQUEST		MCR 463	
		Page 1 of 1 Pages	
TITLE: Fix to meter_gate_ subroutine		STATUS	DATE
		Written	4/10/
AUTHOR: R.B. Snyder		Approved #	4/16/74
		Rejected	
SOURCE: (if external) e.g., "User", "Marketing"		Postponed	
local		Withdrawn	
		Expires	10/16/74

CLASSIFICATION		JUSTIFICATION		Replaced by proposal MCR _____
	Incompatible Change		Marketing Requirement	Implemented in System _____
	Extension		Conformance to Standard	Objections/Comments:
	Restriction		Increased Consistency	
	Performance Improvement		Simplification	
x	Reliability Improvement		Generalization	
		X	Unreported Bug Fix	

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

REASONS: The meter_gate_ subroutine returns the total cpu time used by gate entry as fixed bin (35). This should be fixed bin (52).

SUMMARY: meter_gate_ and tty_meters (the only program that calls meter_gate_) will be modified.

IMPLICATIONS: None

MULTICS CHANGE REQUEST

MCR 464
Page 1 of 1 Pages

TITLE: TTYDIM change for online T&D

AUTHOR: R.B. Snyder

SOURCE: (if external) e.g., "User", "Marketing"
        local

STATUS	DATE
Written	4/10/74
Approved	# 4/16/74
Rejected	
Postponed	
Withdrawn	
Expires	10/16/74

CLASSIFICATION		JUSTIFICATION	
	Incompatible Change		Marketing Requirement
x	Extension		Conformance to Standard
	Restriction		Increased Consistency
	Performance Improvement		Simplification
	Reliability Improvement	x	Generalization
			Bug Fix

Replaced by proposal MCR _____

Implemented in System _____

Objections/Comments:

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

REASONS: The online T&D folks want to know when a message has actually been written at a terminal.

SUMMARY: A new mode will be added to (if the mode is on) cause the ttydim to send a wakeup to a user's process after a message has been written to a terminal.

IMPLICATIONS: None except document change (MPM, PLM)

MULTICS CHANGE REQUEST

MCR 466
Page 1 of 1 Pages

TITLE: Locking strategy in I/O Daemon

AUTHOR: Robert S. Coren

SOURCE: (if external) e.g., "User", "Marketing"

Operations

STATUS	DATE
Written	4/11/
Approved	4/23/74
Rejected	
Postponed	
Withdrawn	
Expires	10/23/74

CLASSIFICATION		JUSTIFICATION	
	Incompatible Change		Marketing Requirement
	Extension		Conformance to Standard
	Restriction	x	Increased Consistency
	Performance Improvement		Simplification
x	Reliability Improvement		Generalization
			Bug Fix
		x	cleaner operational interface

Replaced by proposal MCR _____

Implemented in System _____

Objections/Comments:

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

REASONS: Determination by device drivers at initialization of whether an I/O Coordinator is running is not completely reliable.

SUMMARY: Device driver when logging in will check for existence of Coordinator and wait 60 seconds if there is none.

IMPLICATIONS: 1. Error message about missing coordinator will only occur after one-minute wait.
2. System exec_coms which log in coordinator and then driver immediately should work better.

DETAILED PROPOSAL: Supplement existing lock (used by coordinator to ensure that another coordinator is not already running) with a secondary lock indicating that coordinator lock is being tested. For a driver iod_overseer_ locks secondary lock, attempts to lock coordinator lock. If it succeeds, unlocks both, waits 60 seconds, and tries again; if it again succeeds in locking coordinator lock, assumes coordinator wasn't logged in, prints error message and logs out.

MULTICS CHANGE REQUEST	MCR 467
	Page 1 of 1 Pages

TITLE: Improve access checking in dprint_

AUTHOR: Robert S. Coren

SOURCE: (if external) e.g., "User", "Marketing"

STATUS	DATE
Written	4/11/74
Approved	4/23/74
Rejected	
Postponed	
Withdrawn	
Expires	10/23/74

CLASSIFICATION		JUSTIFICATION		
	Incompatible Change		Marketing Requirement	
x	Extension		Conformance to Standard	
	Restriction	x	Increased Consistency	
x	Performance Improvement		Simplification	
	Reliability Improvement	x	Generalizaticn	
			Bug Fix	

Replaced by proposal MCR _____

Implemented in System _____

Objections/Comments:

Solution to A.2 will be implemented.

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

REASONS:
1. First invocation of dprint_ in a process currently requires call to iodc_parse_parms in order to get daemon's access id for specified device class.
2. Access checking assumes daemon's person_name to be IO, which makes life difficult for users of private remote devices.

SUMMARY: a. Change get_iod_defaults_ to use device class table set up by I/O coordinator, instead of getting its own version from iodc_parse_parms_
           b. Add "Person" keyword to io_daemon_parms and corresponding item in device class table entry, which is person id of device driver for the class. If not supplied, defaults to "IO".

IMPLICATIONS:
A. 1. Use of dprint will no longer involve invocation of the iodc_parse_parms_. This will save considerable time in initial invocation, and will enable iodc_parse_parms_ to be taken out of bound_io_commands_ and put in bound_iodc_ where it belongs.
    2. If dprint is invoked when IO coordinator is not up, or has not yet initialized device class table, values left over from previous coordinator session will be used. On rare occasions, dprint user may pick up inconsistent device class table if first dprint is issued while coordinator is parsing io_daemon_parms.
B. 1. User may request dprints by device classes whose drivers have a person id other than "IO", and the check for the driver's access to the segment will be correct.
    2. Format of device class table must change, which will involve recompilation of many I/O daemon modules.

MULTICS CHANGE REQUEST	MCR 468
	Page 1 of 1 Pages

TITLE: Gcos Daemon and Gcos User changes	STATUS	DATE
	Written	4/11/7
AUTHOR: Peter Haber	Approved	4/23/74
	Rejected	
SOURCE: (if external) e.g., "User", "Marketing"	Postponed	
	Withdrawn	
	Expires	10/23/74

CLASSIFICATION		JUSTIFICATION		Replaced by proposal MCR _____
	Incompatible Change		Marketing Requirement	Implemented in System _____
	Extension	x	Conformance to Standard	Objections/Comments:
	Restriction		Increased Consistency	Replace "epa number" with "account id"
	Performance Improvement		Simplification	
	Reliability Improvement		Generalization	
			MTB #57	
		x	Bug Fix	

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

REASONS: Implements changes to gcos daemon outlined in MTB-057, bug fixes to
gcos_user code.

SUMMARY: This update represents the following changes to the gcos daemon
1. The use of the obsolete command "set_homedir" has been replaced with use of the
"set_default_wdir" command.
2. The daemon will obtain the Multics person and project combination by verifying
the EPA number on the IDENT card rather than the project password   combination from a
possible USERID card.
3. The instance tag of all gcos absentee jobs queued by the gcos daemon will have
the instance tag ".g" instead of ".*".
4. The default name of an absentee job will be "Anonymous.GCOS.g" instead of
"Anonymous.Gcos.*"
5. The gcos user table procedures have been modified to use an epa number instead
of a gcos userid-password combination. (The documentation of "gcos_user" and
"gcos_user_" must be changed to reflect this.).
These changes also fix a number of bugs in the gcos user table code which prevented
the gcos daemon from processing USERID cards correctly.
6. The gcos user table procedures have been modified to use a gcos user table in the
gcos daemon's home directory.

IMPLICATIONS: gcos_user code will work.

MULTICS CHANGE REQUEST	MCR 469
	Page 1 of 1 Pages

TITLE: **Version 2 Message Segment Bug Fixes**	STATUS	DATE
	Written	4/17/74
	Approved	4/23/74
AUTHOR: Peter Haber	Rejected	
SOURCE: (if external) e.g., "User", "Marketing"	Postponed	
	Withdrawn	
	Expires	10/23/74

CLASSIFICATION		JUSTIFICATION	
x	Incompatible Change		Marketing Requirement
	Extension		Conformance to Standard
	Restriction		Increased Consistency
	Performance Improvement		Simplification
	Reliability Improvement		Generalization
		x	unreported Bug Fix

Replaced by proposal MCR _____

Implemented in System _____

Objections/Comments:

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

REASONS: Bug in message_segment_addname primitive causes error to be returned when called.

Bug in message_segment conversion primitive causes oob error on version 1 message segments which are empty but have non-null headers.

SUMMARY: Fix bugs

IMPLICATIONS: None: submitted in MIT System. Bugs are unreported.

MULTICS CHANGE REQUEST

MCR 470
Page 1 of 1 Pages

TITLE: New GCOS Simulator

AUTHOR: T. Casey

SOURCE: (if external) e.g., "User", "Marketing"

STATUS	DATE
Written	4/17/
Approved	4/23/74
Rejected	
Postponed	
Withdrawn	
Expires	10/23/74

CLASSIFICATION		JUSTIFICATION	
x	Incompatible Change	x	Marketing Requirement
x	Extension	x	Conformance to Standard
x	Restriction	x	Increased Consistency
x	Performance Improvement	x	Simplification
x	Reliability Improvement	x	Generalization
		x	See below Bug Fix

Replaced by proposal MCR _____

Implemented in System _____

Objections/Comments:

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

REASONS: The currently installed GCOS simulator contains many bugs, and simulates ma~
GCOS features incorrectly.

SUMMARY: Install new bound_gcos_ and bound_gcos_utilities, containing a large number of
bug fixes and improvements, including the following:

1. Complete rewrite of the simulation of I/O, supporting many more functions than
before.
2. Implement cards: $BREAK, $DAC, $GOTO,$IF, $Label, $TAPE7, $TAPE9, $WHEN, and MMEs:
GELOOP, GEROUT, GESNAP.
3. Handle activity aborts correctly.
4. Set PSW bits and slave prefix locations correctly, including the storing of correct
information when a fault occurs.
5. Make execution report format and content, and the sorting of sysout, more like
real GCOS.
6. Accept job limits and negative loader space on $LIMITS card.
7. Accept GCOS file string on $PRMFL and $SELECT cards.
8. Use pool directories for temporary and output files, if user so specifies.
9. Improved several simulator debugging facilities.
10. Cleaned up code, made more efficient, fixed many unreported bugs.

IMPLICATIONS: The incompatible change to the handling of $SELECT and $SELECTD cards,
warned of in MCR 184, takes effect with this installation.

DETAILED PROPOSAL: The detailed list of changes made since the last installation is
15 pages long. Copies may be obtained from the author.

GCOS BUG NOS.: 1,2,4,6,10,12,14,18,22,28,31,32,37,42,44, 46 (partially),
48,49,51,52,53,54.

MULTICS CHANGE REQUEST	MCR 471

	STATUS	DATE
TITLE: Fix bug in cv_dir_acl_.		
	Written	04/17/74
AUTHOR: P. Kelley	Approved #	4/23/74
	Rejected	
SOURCE: (if external: e.g., "User", "Marketing")	Postponed	
local	Withdrawn	
	Expires	10/28/74

CLASSIFICATION	JUSTIFICATION	
		Replaced by proposal MCR
_ Incompatible	_ Marketing	
Change	Requirement	Implemented in System
	Conformance	
_ Extension	_ to Standard	Objections/Comments:
	Increased	
_ Restriction	_ Consistency	Internal tool interface.
Performance		
_ Improvement	_ Simplification	
X Reliability		
_ Improvement	_ Generalization	
	X (Unreported)	
_	Bug Fix	

Use these headings: REASONS, SUMMARY, IMPLICATIONS, and optionally
DETAILED PROPOSAL

Subject:
Modify cv_dir_acl_ (entry point in cv_acl_) to fix bug which
incorrectly formats directory ACL entries for printing.

Implications:
Modification necessary for correct performance of program.

MULTICS CHANGE REQUEST

MCR __472__
Page _1_ of _1_ Pages

TITLE: **Fix Bug in bootstrapl**

AUTHOR: _____**Noel I. Morris**_____

SOURCE: (if external) e.g., "User", "Marketing"

Internal

STATUS	DATE
Written	4/18
Approved	✗ 4/23/74
Rejected	
Postponed	
Withdrawn	
Expires	10/23/74

CLASSIFICATION		JUSTIFICATION	
	Incompatible Change		Marketing Requirement
	Extension		Conformance to Standard
	Restriction		Increased Consistency
	Performance Improvement		Simplification
	Reliability Improvement		Generalization
		☒	**Unreported** Bug Fix

Replaced by proposal MCR _____

Implemented in System _____

Objections/Comments:

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

REASONS:
When bootstrapl reads the rest of itself into core from tape, it expects to find MST records with no flag bits set. The new tape DIM causes the last record of bootstrapl to be written onto the tape with padding bits in the tape record (during MST generation). bootstrapl is unable to read this record.

Summary:
bootstrapl will be changed to ignore the flag bits which indicate that a record was padded. It is already capable of handling records which contain fewer than the maximum possible number of data bits.

Implications:
This change must be installed before any system tapes are generated using the new tape DIM.

MULTICS CHANGE REQUEST		MCR 473
		Page 1 of 1 Pages

TITLE: **Modify BOS CORE command**	STATUS	DATE
	Written	4/18/74
AUTHOR: Noel I. Morris	Approved ♯	4/23/74
	Rejected	
SOURCE: (if external) e.g., "User", "Marketing"	Postponed	
Internal	Withdrawn	
	Expires	10/23/74

CLASSIFICATION		JUSTIFICATION		Replaced by proposal MCR _____
☒	Incompatible Change		Marketing Requirement	Implemented in System _____
	Extension		Conformance to Standard	Objections/Comments:
	Restriction	X	Increased Consistency	
	Performance Improvement		Simplification	
	Reliability Improvement		Generalization	
			Bug Fix	

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

REASONS:

The BOS CORE command, when used to restore the contents of core, does an automatic GO unless the WAIT argument is supplied. Most of the time, the CORE command is used by programming staff, and in most of the instances of use, the programmer does not want to restart the core image after restoring it. Thus, the CORE command should be modified to just restore the contents of core, unless the GO argument is supplied.

Implications:

The Operator's Guide to BOS must be changed. This change will prevent programmers and operations from accidentally restarting a core image.

MULTICS CHANGE REQUEST

| MCR | 474 |
| Page 1 of 1 Pages | |

TITLE: Fix handling of special interrupts in BOS	STATUS	DATE
	Written	4/18
AUTHOR: Noel I. Morris	Approved H	4/23/74
	Rejected	
SOURCE: (if external) e.g., "User", "Marketing"	Postponed	
	Withdrawn	
Internal	Expires	10/23/74

CLASSIFICATION		JUSTIFICATION		Replaced by proposal MCR _____
	Incompatible Change		Marketing Requirement	Implemented in System _____
	Extension		Conformance to Standard	Objections/Comments:
	Restriction		Increased Consistency	
	Performance Improvement		Simplification	
	Reliability Improvement		Generalization	
		X	Unreported Bug Fix	

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

REASONS:
The special status channel (channel #6) in the IOM looks at its DCW in an unexpected way. A list service to fetch a new DCW is initiated when the DCW tally goes from 2 to 1, not from 1 to 0 as in all other channels. Programs in BOS which set up control words for the special status channel have thus been incorrectly designed.

Summary:
The DCW tally will always be set to a number greater than 1.

Implications:
The BOS iom_manager (include file bos_iom_manager.incl.alm) and the BOS 5-card loader must be modified.
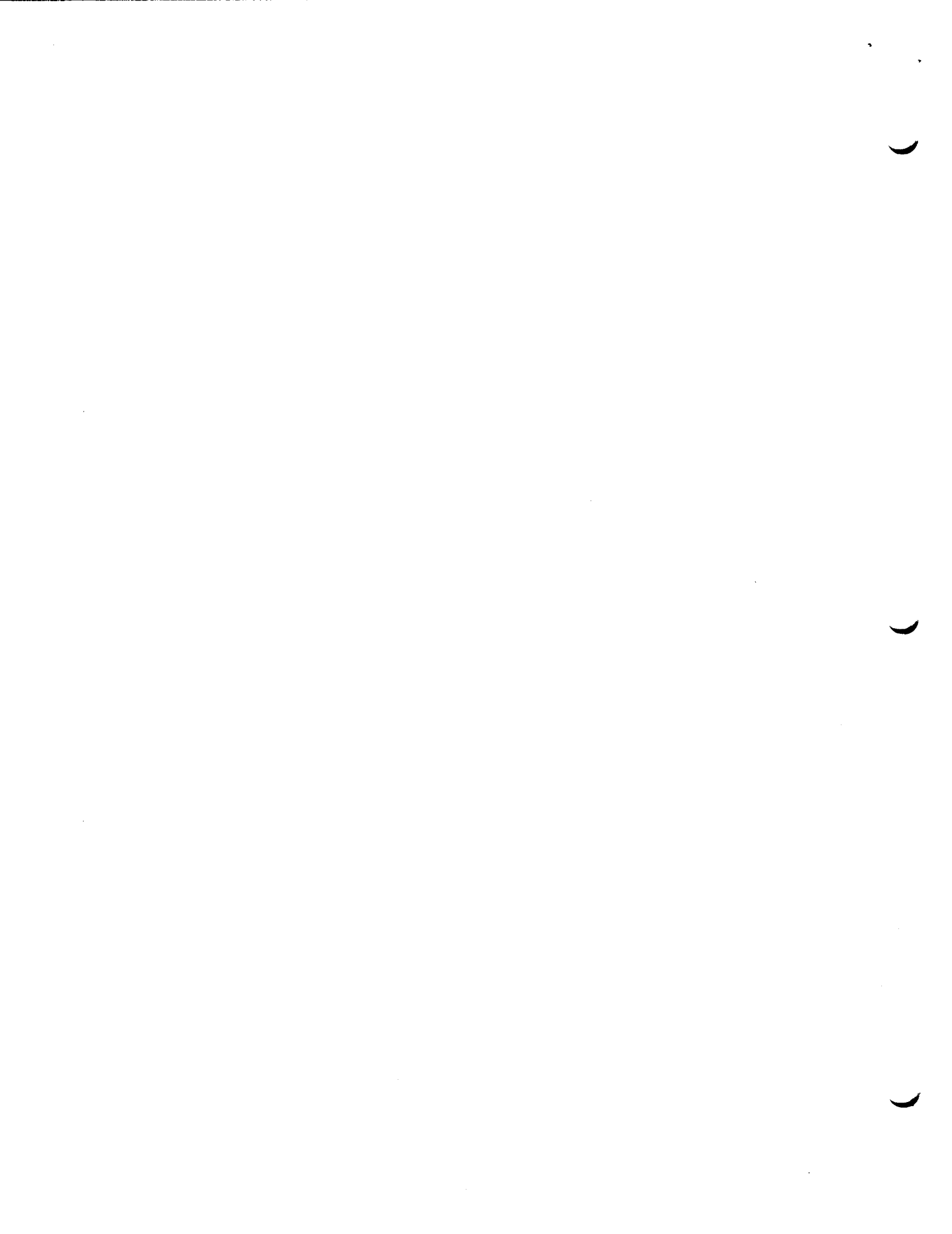
MULTICS CHANGE REQUEST	MCR 475
	Page 1 of 1 Pages

TITLE:	STATUS	DATE
Fix bug in procedure "get_device_status"	Written	74.04.16
	Approved ⫽	4/23/74
AUTHOR: ___ D. Wells ___	Rejected	
SOURCE: (if external) e.g., "User", "Marketing"	Postponed	
	Withdrawn	
	Expires	10/23/74

CLASSIFICATION		JUSTIFICATION		Replaced by proposal MCR _____
	Incompatible Change		Marketing Requirement	Implemented in System _____
	Extension		Conformance to Standard	Objections/Comments:
	Restriction		Increased Consistency	
	Performance Improvement		Simplification	
X	Reliability Improvement		Generalization	
		X	Unreported Bug Fix	

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

REASONS: The "list_assigned_devices" entry point in the procedure "get_device_status" will attempt to free a structure which was never allocated if the calling process had no assigned devices. This bug primarily affects users logged in from the ARPA Network because locally dialed users have at least one assigned device (the "tty" login device).

SUMMARY: Fix bug in "get_device_status". Also, convert module to Version II PL/I.

Version 2
730919.

MULTICS CHANGE REQUEST	MCR 476
	Page 1 of 2 Pages

TITLE: Changes to User Ring Link Unsnapping	STATUS	DATE
	Written	74.04.17
AUTHOR: D. Wells	Approved #	4/23/74
	Rejected	
SOURCE: (if external) e.g., "User", "Marketing"	Postponed	
	Withdrawn	
	Expires	10/23/74

CLASSIFICATION		JUSTIFICATION		Replaced by proposal MCR _____
	Incompatible Change		Marketing Requirement	Implemented in System _____
	Extension		Conformance to Standard	Objections/Comments:
	Restriction		Increased Consistency	
	Performance Improvement		Simplification	
X	Reliability Improvement	X	Generalization	
		X	Unreported Bug Fix	

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

REASONS: There are currently several problems/bugs associated with the unsnapping of intersegment links in the user ring:

1) The term_$single_refname entry point discards the linkage section of the segment having the designated reference name. This has the undesirable side effect of reinitializing the segment's internal static storage.

2) The entry points in the module "term_" declare all character strings arguments to be char (*) aligned, rather than char (*). This causes all calling programs to have to copy their character strings which have been used with hcs_ entries into aligned strings. (It should be noted that term_ is an illegal PL/I program in that it misdeclares hcs_ entries as requiring char (*) **aligned arguments.**

3) There is currently a bug in the Hardcore Linker such that a pointer in a linkage section is invalid if the linkage template was a ".link" segment rather than a section of the original object segment. This causes the procedure "link_unsnap_" to incorrectly unsnap links from segments which have ".link" linkage template segments.

SUMMARY:
1) Alter the term_$single_refname entry point to not discard the linkage section of the referenced segment. (This is done by moving the procedure "unsnap_service" to the user ring from hardcore.

2) Change the declarations of all character strings in "term_" to be unaligned. (Note that because these character strings are never examined in term_, this should cause no performance degradation.

3) Place a check into link_unsnap_ to check (and correct) any linkage template pointers from segments with separate linkage template segments. This check may be removed if/when the linker bug is fixed.

IMPLICATIONS:

2) The documentation for term_ should be corrected to declare all character
   string arguments as unaligned. Because of the structure of the Multics PL/I
   compiler, all user programs will continue to function correctly. (In fact,
   it is only due to thès implementation of the compiler that the current term_
   functions correctly.)

3) There will be a slight performance degradation each time that a link is unsnapped
   (on the order of 4 instructions). There will be a slight performance degradation
   for each link from which a link is unsnapped which had a ".link" segment (appx.
   one call to hcs_$initiate). There will be no performance degradation for any links
   which are left unchanged.

   It is assumed that no user could be relying on this bug as a feature.

1) The alteration of the function of the term_$single_refname entry point could
   affect some users (though none are known to exist). These users could use
   this entry point and rely on the current action of reinitializing the segment's
   internal static.

   In moving the procedure "unsnap_service" to the user ring, the method of finding
   the proper LOT has been changed. When this procedure was in Hardcore, the
   lot array was used to find it. The new unsnap_service uses the LOT pointer at
   the base of the appropriate stack. While no user is known to patch the LOT
   pointer at the base of the stack, this is still a different mechanism. (This
   is the same mechanism used by the User Ring Linker being developed at MACµ)

   Because of the above changes, this installation will be preceeded by an info
   file describing these changes.

MULTICS CHANGE REQUEST		MCR 477 Page 1 of 1 Pages	
TITLE: Fix bug in Interprocess Communication Interface		STATUS	DATE
		Written	74.04.16
		Approved //	4/23/74
AUTHOR: D. Wells		Rejected	
SOURCE: (if external) e.g., "User", "Marketing"		Postponed	
		Withdrawn	
		Expires	10/23/74

CLASSIFICATION		JUSTIFICATION		Replaced by proposal MCR _____
	Incompatible Change		Marketing Requirement	
	Extension		Conformance to Standard	Implemented in System _____
	Restriction		Increased Consistency	Objections/Comments:
	Performance Improvement		Simplification	
X	Reliability Improvement		Generalization	
		X	Unreported Bug Fix	

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

REASONS:
   The entry point "ipc_$read_ev_chn" neglects to fill in the message portion
of the event message structure. Instead, any old data which occupied that portion
of the structure will be returned to the caller as the message. This action is
inconsistent with the desired action of being analogous to the "ipc_$block" entry
point with regard to returned information.

SUMMARY: Fix bug in procedure "full_ipc_" -- assign message bits into users structure.

MULTICS CHANGE REQUEST

MCR 478

Page 1 of 1 Pages

TITLE:	STATUS	DATE
Change LOADDM to accept command name arguments	Written	1/1/74
	Approved ∦	4/23/74
AUTHOR: Bernard Greenberg	Rejected	
SOURCE: (if external) e.g., "User", "Marketing"	Postponed	
	Withdrawn	
	Expires	10/23/74

CLASSIFICATION		JUSTIFICATION		Replaced by proposal MCR _____
	Incompatible Change		Marketing Requirement	Implemented in System _____
X	Extension		Conformance to Standard	Objections/Comments:
	Restriction	X	Increased Consistency	
	Performance Improvement		Simplification	
	Reliability Improvement	X	Generalization	
			Bug Fix	

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

REASONS: It would be quite useful to selectively load programs from a full or partial BOS tape into the BOS environment. Currently, we can only load an entire tape. I have felt this need many times.

SUMMARY: LOADDM, the BOS loader, when invoked from BOS command level, currently takes an optional argument which is a tape drive number. Add further optional arguments, specifying which segments are to be loaded from this tape. If none are specified, the entire tape will be loaded as now. Operation of LOADDM as invoked by the IOM loader deck is not affected.

IMPLICATIONS: n/a

| MULTICS CHANGE REQUEST | MCR 479 |
| | Page 1 of 1 Pages |

TITLE:	STATUS	DATE
Shutdown/Startup reused address bug	Written	4/16/74
	Approved ᴴ	4/23/74
AUTHOR: ~~Bernard Greenberg~~	Rejected	
SOURCE: (if external) e.g., "User", "Marketing"	Postponed	
	Withdrawn	
	Expires	10/23/74

CLASSIFICATION		JUSTIFICATION		Replaced by proposal MCR _____
	Incompatible Change		Marketing Requirement	Implemented in System _____
	Extension		Conformance to Standard	Objections/Comments:
	Restriction		Increased Consistency	
	Performance Improvement		Simplification	
X	Reliability Improvement		Generalization	
		X	Bug Fix **HRD 0011P**	

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

REASONS: Bringing the system up and down and up and down several times causes the message "page: unprotected or reused address" to appear and crash the system. Phoenix reports that this frequently causes crashes after shutdowns.

SUMMARY: At least one bug leading to this symptom has been isolated from an analysis of two Phoenix crashes. The depositing of disk storage for pages discovered to be zero after their branches are updated by shutdown causes these addresses to be unprotected in the FSDCT. Subsequent deletion of that branch (e.g., the deletion of >pdd by init_branches at boot time) causes an unprotected address to be discovered. Hence, we will inhibit all zero-page depositing during shutdown.

IMPLICATIONS: Some pages of zero contents may exist on disk as a result of this policy. As long as such pages are not modified, they will stay this way.

MULTICS CHANGE REQUEST	MCR 480
	Page___ of ___ Pages

TITLE: Delete pll_operators_ from lang library	STATUS	DATE
	Written	7404
AUTHOR: Barry L. Wolman	Approved H	4/23/74
	Rejected	
SOURCE: (if external) e.g., "User", "Marketing"	Postponed	
	Withdrawn	
	Expires	10/23/74

CLASSIFICATION		JUSTIFICATION		Replaced by proposal MCR _____
	Incompatible Change		Marketing Requirement	Implemented in System _____
	Extension		Conformance to Standard	Objections/Comments:
	Restriction	x	Increased Consistency	
x	Performance Improvement	x	Simplification	
	Reliability Improvement		Generalization	
			Bug Fix	

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

REASONS: Now that pll_operators_ is installed in ring 0, there is no
reason to have a duplicate copy in the languages library. Indeed,
as long as the pll_operators_ in the languages library remains in
the standard search path, the pll_operators_ in hardcore will not
get used by ring 4 programs.

SUMMARY: Delete pll_operators_ from lang library. Ring 4 programs
will start using the wired-down version of the operators in hardcore.

IMPLICATIONS: None

MULTICS CHANGE REQUEST	MCR 481
	Page 1 of 1 Pages

TITLE: Study new scheduler and paging algorithms	STATUS	DATE
	Written	4/23/74
	Approved ##	4/30/74
AUTHOR: Steve Webber	Rejected	
SOURCE: (if external) e.g., "User", "Marketing"	Postponed	
	Withdrawn	
	Expires	10/30/74

CLASSIFICATION		JUSTIFICATION		Replaced by proposal MCR _____
	Incompatible Change	X	Marketing Requirement	Implemented in System _____
X	Extension		Conformance to Standard	Objections/Comments:
	Restriction		Increased Consistency	
X	Performance Improvement		Simplification	
	Reliability Improvement	X	Generalization	
			Bug Fix	

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

REASONS: As part of the performance improvement task a new scheduler and page removal algorithm are very improtant. This MCR requests the study of these functions be approved. Note there is only one MCR because it is believed that the result of the study will show a need for a close cooperation between the scheduler and page control.

SUMMARY: Two MTB's have already been prepared in anticipation of the study.

MULTICS CHANGE REQUEST		MCR 482	
		Page 1 of 1 Pages	
TITLE: Change error_table_ messages		STATUS	DATE
		Written	4/23/
		Approved #	4/30/74
AUTHOR: T. Casey		Rejected	
SOURCE: (if external) e.g., "User", "Marketing"		Postponed	
		Withdrawn	
		Expires	10/30/74

CLASSIFICATION		JUSTIFICATION		Replaced by proposal MCR _____
	Incompatible Change	x	Marketing Requirement	Implemented in System _____
x	Extension	x	Conformance to Standard	Objections/Comments:
	Restriction		Increased Consistency	
	Performance Improvement		Simplification	
	Reliability Improvement	x	Generalization	
			Bug Fix	

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

REASONS: Two error_table_ codes, formerly used only by the obsolete procedure fm_, and no longer documented in the MPM, are now being used by the GCOS environment simulator. Their use is necessary since subroutine interfaces for reading and writing GCOS files must be available to users, as promised in marketing specifications.
       These existing error_table_ entries were chosen (rather than adding new ones), first, so that they could be used immediately, and second, because their names, and the messages they contain, are most appropriate to describe the conditions for which they are returned.

SUMMARY: This MCR is to request:
       1. that the descriptions of these two entries be put back into the MPM;
       2. a change to the wording of the messages, making them consistent in form
          with each other, and removing the error_table_ entry name from the messages.

IMPLICATIONS: The change in wording will not affect users in any significant way.

DETAILED PROPOSAL: Change the messages to the following:

       error_table_$file_already_opened:
              A file is already open under this reference name.

       error_table_$file_not_opened:
              No file is open under this reference name.

MULTICS CHANGE REQUEST

MCR 483
Page 1 of 1 Pages

TITLE: Fix to message segment pointer validator

AUTHOR: Peter Haber

SOURCE: (if external) e.g., "User", "Marketing"

STATUS	DATE
Written	4/24/74
Approved	4/30/74
Rejected	
Postponed	
Withdrawn	
Expires	10/30/74

CLASSIFICATION		JUSTIFICATION	
x	Incompatible Change		Marketing Requirement
	Extension		Conformance to Standard
	Restriction		Increased Consistency
	Performance Improvement		Simplification
	Reliability Improvement		Generalization
		x	Bug Fix #264

Replaced by proposal MCR _____

Implemented in System _____

Objections/Comments:

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

REASONS: Bug fix to pointer validating procedures which caused this procedure to reject valid pointers.

MULTICS CHANGE REQUEST

MCR 484
Page 1 of 1 Pages

TITLE: Fix error handling in GCOS Daemon and I/O Subroutines

AUTHOR: T. Casey & P. Haber

SOURCE: (if external) e.g., "User", "Marketing"

Internal

STATUS	DATE
Written	4/25
Approved	4/30/74
Rejected	
Postponed	
Withdrawn	
Expires	10/30/74

CLASSIFICATION		JUSTIFICATION		Replaced by proposal MCR _____
x	Incompatible Change	x	Marketing Requirement	Implemented in System _____
	Extension	x	Conformance to Standard	Objections/Comments:
	Restriction		Increased Consistency	
	Performance Improvement		Simplification	
	Reliability Improvement	x	Generalization	
			Bug Fix	

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

REASONS: The subroutines gcos_gsr_read_ and gcos_gsr_write_ are to be made available to users, as promised in marketing specifications. They present call com_err_ and then return nonstandard error codes (1 & 2), which the daemon looks for, when any error occurs.

SUMMARY: Change the subroutines to return error_table_ codes, and change the daemon to call com_err_ whenever appropriate.

IMPLICATIONS: The changed subroutines and the daemon must be installed at the same time (they are in different bound segments).

DETAILED PROPOSAL: Changes will be made to gcos_gsr_read_, gcos_gsr_write_, and to the following daemon procedures:

gcos_convert_sst, gcos_print_file.

MULTICS CHANGE REQUEST		MCR 485	
		Page of Pages	
TITLE: Allow B, D, E, F, and I in numeric input fields		STATUS	DATE
		Written	740425
AUTHOR: Barry L. Wolman		Approved	# 4/30/74
		Rejected	
SOURCE: (if external) e.g., "User", "Marketing"		Postponed	
		Withdrawn	
		Expires	10/30/74

CLASSIFICATION		JUSTIFICATION		Replaced by proposal MCR _____
	Incompatible Change		Marketing Requirement	Implemented in System _____
x	Extension		Conformance to Standard	Objections/Comments:
	Restriction		Increased Consistency	
	Performance Improvement		Simplification	
	Reliability Improvement	x	Generalization	
			Unreported Bug Fix	

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

REASONS: The BASIC compiler and runtime use the any_to_any_ conversion program
for all conversions from string to numeric. The characters b, d, e, f, and i
are recognized by any_to_any_ as having special meaning in strings representing
numeric values. BASIC uses the format
        1.23 E+23
when printing numeric values in exponential format. In order to read such values
from ASCII files previously written by BASIC programs, we propose to change
any_to_any_ so that E is treated as equivalent to e. For the sake of uniformity,
we propose treating the uppercase of all special characters (b, d, e, f, and i)
as equivalent to the lowercase version.

IMPLICATIONS: Some PL/I and FORTRAN programs may start accepting strings that they
currently would reject.