DATE: September 27, 1973

TO: Distribution

FROM: M. S. Hodges

SUBJECT: Multics Change Requests

Attached are copies of Multics Change Requests which were approved
during the month of September.

MULTICS CHANGE REQUEST		Page 1 of 1 Pages

OBJECTIONS RECORDED:	STATUS	DATE	MCR 001
	Written	9/13/73	
	CONDITIONAL Approval *msh*	9/18/73	AUTHOR: Steve Webber
	Initial Rejection		
SOURCE: (if external) e.g., "User", "Marketing"	Postponed		
Local requirement for Version II EIS compiler.	Withdrawn		
	Expiration Date	3/18/74	

CLASSIFICATION		JUSTIFICATION		Replaced by proposal MCR ————
	Incompatible Change		Marketing Requirement	Implemented in System ————
X	Extension	X	Conformance to Standard	Comment: 1) If divide hardware fixed before 12/18/73 don't change software for divide. 2) Will implement HCS call to change PDS flag. 3) Special subsystems must be modified to turn off flag (eg. GCOS).
	Restriction	X	Increased Consistency	
	Performance Improvement		Simplification	
		X	Generalization	
		X	Bug Fix	

Subject	Justification	Summary	(Detailed Proposal)

SUBJECT: Map certain EIS illegal procedure faults so that the faults are effectively ignored.

REASON: Due to design deficiencies in the EIS processor, certain string moves which we would like to consider legal are treated as illegal. Also certain divide instructions fall into the same class.

SUMMARY: The proposed solution is to get control in ring 0 when an illegal procedure fault occurs; see if the fault is one that we would like to ignore and patch the machine conditions to ignore it if so. Other illegal procedure faults will be signalled as they are today.

A flag in the PDS (settable by each user) will control whether or not we ignore the faults of interest so that a user may run on a "raw" machine if he desires.

The change will cause modifications to:

        fim.alm
        fault_error.alm

and the addition of a new procedure:

        illegal_procedure.pl1

which will be called by the fim for all illegal procedure faults which can be caused by EIS instructions.

MULTICS CHANGE REQUEST		Page 1 of 1 Pages

OBJECTIONS RECORDED:	STATUS	DATE	MCR 002
	Written	9/13/73	AUTHOR: R. B. Snyder
	Initial Approval *mah*	9/18/73	
	Initial Rejection		
SOURCE: (if external) e.g., "User", "Marketing"	Postponed		
	Withdrawn		
local	Expiration Date	3/18/74	

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

Subject   Justification   Summary   (Detailed Proposal)

SUBJECT: Enable the BOS 'BLAST' command to send to terminals hooked up to HSLA.

REASON: The current BLAST will only transmit to terminals hooked up to an LSLA.
          Now that the ARDS terminals are connected to Multics, BLAST must be able
          to transmit to them.

SUMMARY: Read HSLA config. cards and transmit messages to all configured lines.

MULTICS CHANGE REQUEST			Page 1 of 1 Pages

OBJECTIONS RECORDED:	STATUS	DATE	MCR 003
	Written	9/13/73	
	Initial Approval *msh*	9/18/73	AUTHOR: R. B. Snyder
	Initial Rejection		
SOURCE: (if external) e.g., "User", "Marketing"	Postponed		
local	Withdrawn		
	Expiration Date	3/18/74	

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

Subject	Justification	Summary	(Detailed Proposal)

SUBJECT: Speed up the processing of 355 fdumps.

REASON: It currently takes 45 cpu seconds to process a 355 fdump. A coding change
and addition of an alm subroutine will cut this to 8 seconds.

SUMMARY: The program online_355_dump_ will be made to call an alm program for
octal to ascii conversion instead of calls to an internal subrative
and ioa_$rsnnl which is quite slow.

MULTICS CHANGE REQUEST		Page 1 of 1 Pages

OBJECTIONS RECORDED:	STATUS	DATE	MCR 004
	Written	9/13/73	
	Initial Approval *mah*	9/25/73	AUTHOR: R. B. Snyder
	Initial Rejection		
SOURCE: (if external) e.g., "User", "Marketing"	Postponed	9/18/73	
External site support	Withdrawn		
	Expiration Date	3/25/74	

CLASSIFICATION		JUSTIFICATION		Replaced by proposal MCR————
	Incompatible Change	X	Marketing Requirement	Implemented in System————
X	Extension		Conformance to Standard	Comment:
	Restriction	X	Increased Consistency	Written description was inadequate. Verbal explanation by the author was required.
	Performance Improvement		Simplification	
		X	Generalization	
			Bug Fix	

Subject	Justification	Summary	(Detailed Proposal)

SUBJECT: To change LD 355 to patch site configuration info. into 355 core image.

JUSTIFICATION: Since the communication line config. data is built into the 355 core image, external sites with different configurations than MIT LD 355 will load config. card data into the 355 core image thereby tailoring the 355 at load time.

SUMMARY: LD 355 will read config. cards and alter the config. tree that is in the 355 core image. This config. tree is always in the same place so there will be no problem with changing LD 355 everytime the 355 software changes.

MULTICS CHANGE REQUEST		Page 1 of 1 Pages

OBJECTIONS RECORDED:	STATUS	DATE	MCR 005
	Written	9/14/73	
	Initial Approval *mah*	9/18/73	AUTHOR: N. Morris
	Initial Rejection		
SOURCE: (if external) e.g., "User", "Marketing"	Postponed		
	Withdrawn		
	Expiration Date	3/18/74	

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

Subject   Justification   Summary   (Detailed Proposal)

SUBJECT: Fix the iom-manager not to crash the system when a system fault interrupt
occurs for an unassigned channel.

Module has been checked out. A message is printed on the operator's console
whenever any system fault status is received. System operation will not
be terminated.

	MULTICS CHANGE REQUEST		Page 1 of 1 Pages

OBJECTIONS RECORDED:	STATUS	DATE	MCR 006
	Written	9/14/73	
	Initial Approval *mah*	9/18/73	AUTHOR: N.I. Morris
	Initial Rejection		
SOURCE: (if external) e.g., "User", "Marketing"	Postponed		
	Withdrawn		
Marketing	Expiration Date	3/18/74	

CLASSIFICATION		JUSTIFICATION		Replaced by proposal MCR_____
	Incompatible Change	X	Marketing Requirement	Implemented in System_____
X	Extension		Conformance to Standard	Comment:
	Restriction		Increased Consistency	
X	Performance Improvement		Simplification	
			Generalization	
			Bug Fix	

Subject	Justification	Summary	(Detailed Proposal)

SUBJECT: Modify BOS to run with DSS-191 system.

The problem here is that BOS keeps its disk sector addresses as 18-bit quantities and there are $>2^{18}$ sectors on each DSU-191 unit. This requires an increase of the sector address field width to 24-bits. Virtually all BOS modules are affected.

Most of this work has already been completed.

MULTICS CHANGE REQUEST		Page 1 of 1 Pages	

OBJECTIONS RECORDED:	STATUS	DATE	MCR 010
	Written	9/14/73	AUTHOR: Steve Webber
	Initial Approval *mh*	9/18/73	
	Initial Rejection		
SOURCE: (if external) e.g., "User", "Marketing"	Postponed		
local	Withdrawn		
	Expiration Date	3/18/74	

CLASSIFICATION		JUSTIFICATION		Replaced by proposal MCR _____
	Incompatible Change		Marketing Requirement	Implemented in System _____
X	Extension		Conformance to Standard	Comment:
	Restriction		Increased Consistency	
	Performance Improvement		Simplification	
X	New Feature		Generalization	
		X	More insight ~~Bug Fix~~	

Subject	Justification	Summary	(Detailed Proposal)

SUBJECT: Add new processor time metering for interrupts as a
            function of IOM channel number.

            This additional meter would give us more insight into
            the system overhead caused by interrupts.

MULTICS CHANGE REQUEST	Page 1 of 1 Pages

OBJECTIONS RECORDED:	STATUS	DATE	MCR 011
	Written	9/14/73	
	Initial Approval *mah*	9/18/73	AUTHOR: Steve Webber
	Initial Rejection		
SOURCE: (if external) e.g., "User", "Marketing"	Postponed		
	Withdrawn		
local	Expiration Date	3/18/74	

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

Subject   Justification   Summary   (Detailed Proposal)

SUBJECT: Fix reconfiguration problems with deleting the bootload CPU.

This change is reflected in several programs and fixes several miner bugs with reconfiguration as well.

There will be no operational changes with the new scheme.

MULTICS CHANGE REQUEST		Page 1 of __1__ Pages

OBJECTIONS RECORDED:	STATUS	DATE	MCR___012___
	Written	9/14/73	
	Initial Approval *mah*	9/18/73	AUTHOR: Steve Webber
	Initial Rejection		
SOURCE: (if external) e.g., "User", "Marketing"	Postponed		
	Withdrawn		
Marketing	Expiration Date	9/18/73	

CLASSIFICATION		JUSTIFICATION		Replaced by proposal MCR———————
X	Incompatible Change	X	Marketing Requirement	Implemented in System———————
X	Extension		Conformance to Standard	Comment:
	Restriction		Increased Consistency	1) Will require cold boot at all external sites. 2) Will allow up to 17 190's and 13 191's on a system.
	Performance Improvement		Simplification	
		X	Generalization	
			Bug Fix	

Subject Justification Summary (Detailed Proposal)

SUBJECT: Extend the size of device addresses from 17 to 18 bits.

This is a temporary change necessary to allow enough
on-line storage until the ultimate extended (30 bit)
device address can be implemented.

The changes to the system are minimal but a special
salvager needs to be run before the change is installed
in Multics.

MULTICS CHANGE REQUEST		Page 1 of 1 Pages

OBJECTIONS RECORDED:	STATUS	DATE	MCR 013
	Written	9/14/73	
	Initial Approval *mah*	9/18/73	AUTHOR: Steve Webber
	Initial Rejection		
SOURCE: (if external) e.g., "User", "Marketing"	Postponed		
	Withdrawn		
local	Expiration Date	3/18/74	

CLASSIFICATION		JUSTIFICATION		
	Incompatible Change		Marketing Requirement	Replaced by proposal MCR————
	Extension		Conformance to Standard	Implemented in System————
	Restriction		Increased Consistency	Comment:
	Performance Improvement		Simplification	Installed as emergency fix in system 20.11f at M.I.T.
			Generalization	
		X	Place trap Bug Fix	

Subject   Justification   Summary   (Detailed Proposal)

SUBJECT: Place traps in the system to search for the
           "reused address" bug.

           Two traps are needed, one in page fault to check that a paging
           device entry is consistent at page fault time, and one
           in PC to check for consistency at activation time.

           If these traps go off they will give us insight into the
           reused address bug.

MULTICS CHANGE REQUEST		Page 1 of __1__ Pages

OBJECTIONS RECORDED:	STATUS	DATE	MCR 014
	Written	9/14/73	
	Initial Approval *msk*	9/18/73	AUTHOR: Steve Webber
	Initial Rejection		
SOURCE: (if external) e.g., "User", "Marketing"	Postponed		
local	Withdrawn		
	Expiration Date	3/18/74	

CLASSIFICATION		JUSTIFICATION		Replaced by proposal MCR_____
	Incompatible Change		Marketing Requirement	Implemented in System_____
	Extension		Conformance to Standard	Comment:
	Restriction		Increased Consistency	
	Performance Improvement		Simplification	
			Generalization	
		X	Bug Fix	

Subject   Justification   Summary   (Detailed Proposal)

SUBJECT: Fix bug in ring_alarm causing extraneous ring_alarm faults.

There currently is a bug in the system which causes
extraneous ring alarm faults to occur if pre-empt
interrupts occur while handling a ring alarm fault.
The fix is needed for reconfiguration of CPU's.

MULTICS CHANGE REQUEST		Page 1 of 1 Pages

OBJECTIONS RECORDED:	STATUS	DATE	MCR 015
	Written	9/14/73	AUTHOR: Steve Webber
	Initial Approval *msh*	9/18/73	
	Initial Rejection		
SOURCE: (if external) e.g., "User", "Marketing"	Postponed		
	Withdrawn		
Local	Expiration Date	3/18/74	

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

Subject	Justification	Summary	(Detailed Proposal)

SUBJECT: Change "change_tuning_parameters" to use com_query_ so that
it can be used in "exec_coms" and with "send_admin_command".

The ability to change tuning parameters from processes
privileged only with the ability to send an admin
command is thought to be needed.

MULTICS CHANGE REQUEST		Page 1 of 1 Pages

OBJECTIONS RECORDED:	STATUS	DATE	MCR 016
	Written	9/13/73	
	Initial Approval *msh*	9/18/73	AUTHOR: B. L. Wolman
	Initial Rejection		
SOURCE: (if external) e.g., "User", "Marketing"	Postponed		
	Withdrawn		
	Expiration Date	3/18/74	

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

Subject	Justification	Summary	(Detailed Proposal)

SUBJECT: Fix alm

1) Change alm to use EIS conversion package when processing "dec" pseudo-ops and literals. This change is required to accurately translate the constants used by math routines. Only minor changes required to program decevl_.

2) Fix bug in processing of termination conditions on rpt and rpd opcode. Requires change to data base eb_data. This fix needed for large DS-190 system project.

MULTICS CHANGE REQUEST	MCR 017
	Page 1 of 1 Pages

TITLE: **Fix bug causing both the PD hash crashes as well as (possibly all) reused address problems.**

AUTHOR: **Steve Webber**

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

Local

STATUS	DATE
Written	9/17/73
Approved *msh*	9/25/73
Rejected	
Postponed	
Withdrawn	
Expires	3/25/74

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

Replaced by proposal MCR _____

Implemented in System __20.11f__

Objections/Comments:

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

REASONS: **The program pc_abs was not resetting the "incore" bit in a pdme after it removed a page from core. The delete_pd_records code used in Bulk Store reconfiguration needed this flag.**

A simple fix to pc_abs is all that is needed.

MULTICS CHANGE REQUEST

MCR 018
Page 1 of 1 Pages

TITLE: Modification of hardcore programs in preparation for new tape mounting package.	STATUS	DATE
	Written	9/14/73
	Approved *msh*	9/25/73
AUTHOR: Dennis Capps	Rejected	
SOURCE: (if external) e.g., "User", "Marketing"	Postponed	
	Withdrawn	
Staff, users	Expires	3/25/74

CLASSIFICATION		JUSTIFICATION	Replaced by proposal MCR _____
	Incompatible Change	X Marketing Requirement	Implemented in System _____
X Extension		Conformance to Standard	Objections/Comments:
	Restriction	Increased Consistency	1) This is partial implementation of software established in MSB-69.
	Performance Improvement	Simplification	2) This documentation is not self-explanatory nor does it reference necessary supporting information; however, based on detailed description by one of the board members it was approved.
	Reliability Improvement	Generalization	
		Bug Fix	

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

REASONS: I think everyone understands the need for the tape mounting facility.
This installation:
1) Changes tape_init and tdcm to maintain a bit in tape_data to indicate whether the tape mounting package is available. This allows the hardcore change to be made ahead of the ring1 and ring4 installations; and allows tape_ to operate in old mode during reloads (when the mounting protocol will not have been initialized).
2) Changes tape_ to call the tape mounting package whenever it is available.

MULTICS CHANGE REQUEST		MCR 019	
		Page 1 of 1 Pages	
TITLE: Fix bugs in bcpl		STATUS	DATE
		Written	9/18/73
		Approved *msh*	9/25/73
AUTHOR: R. Freiburghouse		Rejected	
SOURCE: (if external) e.g., "User", "Marketing"		Postponed	
Local		Withdrawn	
		Expires	3/25/74

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: bcpl has been recompiled and several bugs have been fixed. This MCR is required for installation.

MULTICS CHANGE REQUEST		MCR 020	
		Page 1 of 1 Pages	

TITLE: Allow the system to utilize $>2^{18}$ records on DSU-190 (Temporary fix)	STATUS	DATE
	Written	9/19/73
AUTHOR: N. I. Morris	Approved *mah*	9/25/73
	Rejected	
SOURCE: (if external) e.g., "User", "Marketing"	Postponed	
	Withdrawn	
Marketing	Expires	3/25/74

CLASSIFICATION		JUSTIFICATION		Replaced by proposal MCR _____
	Incompatible Change	X	Marketing Requirement	Implemented in System _____
	Extension	•	Conformance to Standard	Objections/Comments:
	Restriction		Increased Consistency	**When this is installed operations documentation explaining the spillover problem must be**
X	Performance Improvement		Simplification	**provided.**
	Reliability Improvement		Generalization	
			Bug Fix	

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

REASONS: **The correct solution to this problem requires a page control rewrite. This interim solution involves minor changes to the system, the Salvager, & BOS to make the code for DSU-270's work on an additional DSU-190 controller. Files on this second device will have a device ID as if they were on a DSU-270. Files will be placed on the second DSU-190 subsystem by using the normal spillover threshold algorithm in Multics. Disk errors will be reported as if they were from a DSU-270. Config cards, SAVE's and RESTOR's, etc. for the additional disk subsystem will specify DSU-270's.**

MULTICS CHANGE REQUEST		MCR 022	
		Page 1 of 1 Pages	

TITLE: Set the call limiters on all hardcore gates - in particular on signaller.	STATUS	DATE
	Written	9/18/73
AUTHOR: Steve Webber	Approved msh	9/25/73
	Rejected	
SOURCE: (if external) e.g., "User", "Marketing"	Postponed	
	Withdrawn	
	Expires	3/25/74

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		Generalization	
		X	Bug Fix	

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

REASONS:

Although it may not be possible to violate the system by transferring to arbitrary locations in most of the hardcore gates this probably can't be proven. At any rate, the signaller gate is currently a gaping hole in the security of ring 0 and Multics.

The initialization procedure "init_hardcore_gates" can be changed to place the call limiters into the SDW's

Until the translators (ALM,mainly) provide some way to specify the call limiter and have it placed in the branch for a segment, some kludge will have to be used. The method proposed here is to set a segdef at the first unusable word in a gate and have init_hardcore_gates use this.

MULTICS CHANGE REQUEST	MCR 023
	Page 1 of 1 Pages

		STATUS	DATE
TITLE: Change process destruction so that the driving process need not "wait" in ring zero for the target process to be stopped.		Written	9/18/73
		Approved *msh*	9/25/73
AUTHOR: Steve Webber		Rejected	
SOURCE: (if external) e.g., "User", "Marketing"		Postponed	
		Withdrawn	
local		Expires	3/25/74

CLASSIFICATION		JUSTIFICATION		Replaced by proposal MCR _____
	Incompatible Change		Marketing Requirement	Implemented in System 20.11g
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:

   Since "waiting" in ring 0 for a process to stop can tie up the driving process indefinitely, in the case where the process to stop is in trouble and cannot be stopped, it is thought the going "blocked" in the user ring would be better. This would allow the driving process to continue normally in response to "wakeups" from other channels.

   The change can be implemented by adding two new entries to the hardcore program -"deact_proc" which initiates and completes the process destruction respectively. It is designed so the second entry will not be called until a wakeup (in response to the stop request of the first entry) has been received.

   The two entries will be callable thru two new entries in hphcs_.

   The old mechanism will be retained for a while so that a combined hardcore/user ring installation is not necessary.

MULTICS CHANGE REQUEST	MCR 024
	Page 1 of 1 Page

TITLE: Add ptr to operator transfer vector to base of stack	STATUS	DATE
	Written	9/20/73
AUTHOR: Barry Wolman	Approved _msh_	9/25/73
	Rejected	
SOURCE: (if external) e.g., "User", "Marketing"	Postponed	
	Withdrawn	
	Expires	3/25/74

CLASSIFICATION		JUSTIFICATION		Replaced by proposal MCR _____
	Incompatible Change		Marketing Requirement	Implemented in System _____
X	Extension	•	Conformance to Standard	Objections/Comments:
	Restriction	X	Increased Consistency	**Implications:** Be sure that MPM documentation
X	Performance Improvement	X	Simplification	is updated before this is installed.
	Reliability Improvement		Generalization	
			Bug Fix	

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

REASONS:
BASIC and other language processors such as SEAL should be able to obtain a ptr to their run_time operator segment from base of stack. This eliminates the need for links in each object program.

SUMMARY:
Add one new field to base of stack which is a ptr to an array of ptrs to operator segments.

This indirect approach allows for future expansion. The space for this ptr has already been reserved.

MULTICS CHANGE REQUEST		MCR 025
		Page 1 of 1 Pages

TITLE: Recode certain math subroutines in ALM	STATUS	DATE
	Written	9/20/73
AUTHOR: Barry Wolman	Approved _mgh_	9/25/73
	Rejected	
SOURCE: (if external) e.g., "User", "Marketing"	Postponed	
	Withdrawn	
	Expires	3/25/74

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

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

REASONS: Benchmark scripts which use the PL/I and FORTRAN math library
routines have run too slowly because of the large number
of full PL/I calls that are made.

SUMMARY:
   We propose that the GCOS math library which is written in GMAP be
converted to ALM. The math library will be entered via the
pll_operators_ transfer vector.   These math routines will be
also used by BASIC. Savings are very large - e.g. 7 calls can be
eliminated from code required for a**b. The change will require
2 man weeks to convert math routines and less than one man week
to convert FORTRAN and PL/I.

   The algorithms used by GMAP routines are different from those
used by PL/I versions, but appear to be of equal or greater
accuracy. Some existing programs may give slightly different
answers after the change is made.

   The routines to be converted are:

      SIN, COS, TAN, SQRT, LOG, EXP, ATAN, ASIN, ACOS, A**B

MULTICS CHANGE REQUEST	MCR 028
	Page 1 of 2 Pages

TITLE: **two new control arguments added to dump_segment (ds) command**	STATUS	DATE
	Written	9/17/73
AUTHOR: T. Casey	Approved *msh*	9/25/73
	Rejected	
SOURCE: (if external) e.g., "User", "Marketing"	Postponed	
	Withdrawn	
	Expires	3/25/74

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	
			Bug Fix	

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

REASONS:

-bcd: similar to -character, but interprets file content as bcd (e.g. a GCOS file).

- short: shortens its output lines as much as possible, for the benefit of users of
- sh   terminals with narrow carriages.

More details in the attached help file.

These changes are already coded and being used by the author and others.

Two new control arguments have been added to the
dump_segment (ds) command. They are -bcd and -short (-sh).
Neither may be used together with the -long control
argument.

        -bcd

Interpret and print contents of words as 6 bit bcd
characters. Since all 6 bit combinations have corresponding
bcd interpretations,.there are no non-printable characters;
therefore all dots may be taken literally; they do not
represent non-printable characters, as they do when ascii
characters are being printed.

        -short, -sh

Reduce the number of characters per line as much as
possible, to avoid overruns and line splitting on terminals
with short line lengths. In particular, lines generated by
the -bcd option will be less than 80 characters (a popular
line length for portable terminals). The reduction in length
is accomplished by using one space instead of two between
all fields, and printing only the two low order digits of
the address field on the dump lines, printing the full 6
digit address on a separate line whenever the 4 high order
digits change.

MULTICS CHANGE REQUEST		MCR 030	
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TITLE: **Proposed changes to copy and move commands**		STATUS	DATE
		Written	9/17/73
AUTHOR: T. Casey		Approved _msh_	9/25/73
		Rejected	
SOURCE: (if external) e.g., "User", "Marketing"		Postponed	
		Withdrawn	
		Expires	--

CLASSIFICATION		JUSTIFICATION		Replaced by proposal MCR _____
X	Incompatible Change		Marketing Requirement	Implemented in System _____
	Extension		Conformance to Standard	Objections/Comments:
	Restriction		Increased Consistency	**Approved as study only. Should consider the move_tree and the proposed new I/O system.**
	Performance Improvement		Simplification	
	Reliability Improvement	X	Generalization	
			Bug Fix	

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

REASONS:

The attached proposal describes changes which might be made to the copy and move commands, the subroutines they call (copy_seg_, copy_name_, nd_handler_), and an associated command (names).

New capabilities are added, and the default actions in certain cases are changed to something that seems more reasonable then what is done at present.

No coding, or detailed design, has been done yet.

PROPOSED CHANGES TO COPY AND MOVE COMMANDS

Changes are proposed that will:

1) provide new capabilities for doing things that are presently done inconveniently by other means;

2) prevent these commands from taking certain default actions that may be costly and undesirable, and inconvenient to undo;

3) provide the user with more control over what is done;

4) spare the user from watching long and unnecessary messages or questions being typed on the console.

The current form of the copy command is:

> copy from_path1 to_path1 ... from_pathn to_pathn -ca-cp

where -ca- may be:

-brief, -bf   suppress messages warning of inconsistent length attributes.

-name, -nm   copy any additional names on from_path1

-acl   copy the acl of from_path1

-all, -a   equivalent to -name -acl

The move command has the same format, except that -all is assumed, and -brief is the only optional control argument. The move command is equivalent to:

> copy from_path to_path -all; delete from_path

In the following discussion, the names from_directory and from_entry will be used for the directory and entry portions, respectively, of from_path, and likewise for to_directory and to_entry. The word copy will be used in all the places where "copy or move" would be more correct.

The present commands have the following two disadvantages:

1) since the star convention may be used for from_path, all entries matching the starname become candidates for copying. For each matching directory or multisegment-file, an error message is printed; each matching segment is copied (and deleted, for move); and the target of each matching link is copied (and the link unlinked, for move).

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2)   when name duplications occur in to_directory, nd_handler_ is
     called; it will either delete the duplicate name from a
     multiply named segment, or ask for permission to delete a
     singly named segment, to remove the name duplication.   When
     a multiply named segment is copied to a directory containing
     a segment with the same set of additional names, nd_handler
     will delete the names, one at a time, printing a warning
     message about each, and finally ask for permission to delete
     the segment, when only one name remains. (This is not
     nd_handler_'s fault - it is called once for each name.)

The proposed changes fall into these areas:

1)   ability to copy msfs;

2)   changes to the way that links are handled;

3)   changes to the way that certain name duplication errors are
     handled;

4)   changes to the error messages and questions.

New Control Arguments:

-segment, -sm   copy (and delete, for move) all segments that
                         match any of from_path1

-multisegment_file, -msf   copy (and delete, for move) all
                             msfs that match any of from_path1

-target, -tgt   copy (and delete, for move) the targets of
                         all links that match any of from_path1

-link, -lk   copy (and unlink, for move) all links that
                         match any of from_path1 - that is, create a
                         link in to_directory, having the name
                         to_entry, and pointing to the same target as
                         the link from_path points to

-branch, -br   equivalent to -sm -msf (This is the default.)

-deletename, -dn   enable the deletion of duplicate names and
                         the question about segment deletion - i.e.
                         the call to nd_handler_ - for name
                         duplications that occur while copying
                         additional names. The default will be to
                         inform the user of any names not copied
                         because of duplication, and not attempt to
                         delete anything. (This will not affect name
                         duplications occurring while copying the
                         segment itself - nd_handler_ will be called
                         as at present.)

New Entry Points:

copy_force, cpf
move_force, mvf

Use of these entry points will imply that the entries to_path1
already exist, and should be deleteforced (or unlinked) before
the copy is attempted. If any of to_path1 does not exist, the
user will be so informed, but the copy will proceed normally.

Strategies for Handling Questions and Errors:

When entries of types not selected are found to match the
starname from_path, they will be passed over without comment.
However, if no entries matching from_path are of selected types,
the user will be so informed. The message will indicate whether
1) no entries matched the starname, or 2) the matching entries
were not of selected types.

If from_path is not a starname, then the user will be asked if
from_path should be copied even though it is not of a selected
type:

          copy: from_path is a (segment/msf/link to pathname);
          do you wish to copy it?

If the user replies "yes" for a link, the response will be:

          Please answer "no" or "target" or "link" for a link.

When -target is given, the type of the target will never be link.
The target will be copied or not, depending on its type (segment
or msf) and the types selected. When -target is given alone, the
default of -branch will remain in effect for target entries (that
is, both target segments and target msfs will be copied.) When
either -segment or -msf is given along with -target, it will
restrict copying to that type of target branch, and also enable
copying of that type of branch from from_directory.

If to_path is a directory, the user will be asked

          copy: to_path is a directory; do you wish to copy
          from_path into it?

If the reply is "yes", then ">==" will be appended to to_path,
and the rest of the operation will proceed as if to_path>== had
been typed in the first place.

Discussion:

-multisegment_file, -msf

The ability to copy msfs is desirable, and not provided at present by any command.

-segment, -sm

The ability to restrict the copying to segments, excluding msfs and links, provides the user with more control over what is done.

-branch, -br

The ability to abbreviate -segment -multisegment_file with one argument is desirable, even though -branch will be the default, since using -link or -target will override the default. Saying

        cp ** -br -lk dir>==

would be a convenient way of creating an exact duplicate of the contents of a directory.

-link, -lk

There is presently no way to "copy" links - that is, to create analogous links in another directory. To be able to do so, without having to type out all the target pathnames again, would be desirable.

-target, -tgt

Allow users to specify that link targets are to be copied, but more important, allow the star convention to be used to copy branches, without having link targets copied also, by default, as is presently done.

Regarding the deletion of targets or unlinking of links, for move, it is not clear that users would usually want to do either - the copy command is more likely to be used for links. The rule of deleting what was copied, for move, was adhered to in order to be consistent. It would probably be a mistake to try to anticipate users desires and do something less general - like always unlinking links and never deleting targets, or vice versa.

-deletename, -dn

The reasoning behind this is a bit complicated. This argument will make copy do what it does now, namely, call nd_handler_ for all name duplications, while the default will be changed to something that seems more reasonable, namely, treating name duplications that occur while copying additional names differently from those that occur while copying the entry itself.

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The assumption is that, by typing the copy command, the user has expressed a clear intention to have the contents of from_path placed in to_directory and given the name to_entry. If to_entry already exists there, nd_handler_ will try to carry out that intention by deleting the name from a multiply named entry, or asking permission to delete a singly named entry. At most, one name will be deleted without the user being asked for permission.

However, it is not so clear that, by typing move (or copy -nm), the user has expressed the intention to delete duplicate names, or delete entries, in to_directory. It is more likely that the user was unaware of the existing entries. Also, there is the possibility that a large number of names could be deleted, with the user having no way to prevent it. There are two possibilities:

1)   an entry with an identical set of names exists in to_directory. The name duplication that occurred when the entry was copied was removed (by nd_handler_) by deleting the duplicate name on the existing entry. Now, (in the current implementation) nd_handler_ will be called for each of the additional names. It will remove the name, and print a message. When there is only one name remaining on the entry, it will ask for permission to delete the entry. Either the user will give permission, in which case it would have been desirable to delete the segment in the first place, and avoid typing the name deletion messages, or else the user will not give permission, in which case it probably would have been desirable to avoid deleting the names. The change to the handling of name duplications will accomplish the latter, while the force entry points (discussed below) will accomplish the former.

2)   several entries exist in to_directory, unrelated to the copy operation, except for the fact that they happen to have names duplicating additional names on from_path. The assumption is that these entries are there for a purpose, and that any additional names on them are there for a purpose, and that the user is unlikely to want the names to be removed, or the entries to be deleted.

Therefore, the default should be to refrain from copying any names that cause name duplications. The user will be informed of names not copied, by a short message:

        copy: name duplication; names not copied to to_path:

Then, unless -brief was given, the names will be listed, on one line, via ioa_$nnl calls, followed by a newline at the end. For move, where the segment having some uncopied names is about to be deleted, the user will be asked:

move: some names not copied from from_path; do you
still wish to delete it?

allowing the user to say no, remove the duplicate names, use the
names command to copy the names, and then delete to_path. (The
names command should have the -deletename and -brief arguments,
with the same affect as they have on move and copy.)

Users who are aware of all the above possibilities, and still
wish to have nd_handler_ called for all name duplications, may
use the -deletename control argument. One situation where this
would be useful, and where copy_force would not work, is copying
a multiply named bound segment into a directory that presently
contains the unbound object components, where the intention is to
replace the unbound components with the bound segment. The
command:

answer yes -brief copy bound_seg_ dir>== -all -deletename

would accomplish this.

The copy_force and move_force entries are provided for two
reasons:

1)   as a convenience, so users do not have to type to_path twice
      (in a delete and a copy command);

2)   to avoid use of "answer yes" for this purpose, since there
      are many questions that copy can ask, and an unintended yes
      answer to an unanticipated question will probably have been
      acted upon before it is printed, so it will be too late to
      hit quit to prevent some damage.

PROPOSED CHANGES TO nd_handler_

Described as in an info file, for users already familiar with the
questions that nd_handler_ asks:

nd_handler_ has been changed so that, whenever the question

to_path already exists; do you wish to delete it?

is asked, you may answer "rename" as well as "yes" or "no". The
existing entry will be renamed to a name composed of a 15
character unique name, followed by a period, followed by as much
of the existing name as will fit into the 32 character limit on
entry names. If this result happens to end in a period, it will
be removed. Then, nd_handler_ will return, indicating that the
name duplication has been resolved. This will allow the caller to
continue with whatever operation had been started, without
forcing the deletion of a segment in order to allow it to
continue.

Note: the possibility was considered of allowing "rename
<newname>" to be the reply, but this was rejected because of the
possibility of introducing another name duplication with the new,
user-chosen name, causing nd_handler_ to call itself recursively.
(This would be no problem for nd_handler_, but users would
probably get confused.)

MULTICS CHANGE REQUEST

MCR 031
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TITLE: Allow printing through perforations on output, and permit IO daemon to produce separator bar on perforation to aid the operator in output separation.

AUTHOR: T. H. VanVleck

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

local & user

STATUS	
Written	9/18/73
Approved *mal*	9/25/73
Rejected	
Postponed	
Withdrawn	
Expired	3/25/74

Replaced by proposal MCP _____

Implemented in System _____

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

Objections/Comments:

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

REASONS:

Users have requested the ability to print through perforation, for output of graphs, etc. Separator bars will reduce the amount of lost output and speed up print output separation.

Printer DIM
Functional improvement: allow printing through perforations on output, and permit IO daemon to produce separator bars.
Steps:
Key point is that the carriage tape must be changed to eliminate the unconditional automatic skip over the perf. To preserve good-looking output, the software must be modified to count lines.

1) Modify ccnv to return an argument which tells what slew was performed.
2) Modify prt dcm to keep static counter in per-printer structure showing number of lines on page. insert slew to channel 1 as needed.
3) Add per-printer modes & control
                noskip
                pl66   page length
                lm0   left margin
                ll132   line length
4) Add order calls to prtdcm
                modes
                separator
5) Add changemode & order call to prtdim_
6) Modify IO daemon to issue separator order at foot of each breaker page.
   Modify dprint and IO daemon to pass and respect
                noskip, pl, lm, ll arguments.
7) Support for a double-length carriage tape which is synchronized with even-odd page so that can skip to an outside page for breaker.
8) Modify BOS to keep working.
9) Modify Salvager to keep working.

MULTICS CHANGE REQUEST	MCR 032
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TITLE: Fix bug in get_defname	STATUS	DATE
	Written	9/17/73
	Approved *mw*	9/25/73
AUTHOR: Melanie Weaver	Rejected	
SOURCE: (if external) e.g., "User", "Marketing"	Postponed	
	Withdrawn	
	Expires	3/25/74

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		Generalization	
		X	Bug Fix	

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

REASONS: get_defname now behaves eratically when asked about a ring 0
  seg that it will examine at all, i.e. one whose third ringbracket **>** =
  validation level. If this works correctly it can eventually
  eliminate some special casing by debugging tools.

 SUMMARY: Fix it to get the extra information it needs and to use it
  correctly. No one will call hcs_$get_defname_ until it is working
  properly.

 PROPOSAL: The fix has been implemented.