TO: Distribution
FROM: M. S. Hodges
DATE: February 6, 1974
SUBJECT: Multics Change Requests

Attached are copies of Multics Change Requests which were approved from January 16 through January 31, 1974.

Multics Project internal working documentation. Not to be reproduced or distributed outside the Multics Project.
**MULTICS CHANGE REQUEST**

**TITLE:** Fix Bug in msf_manager_

**Eleanor Stone**

**AUTHOR:**

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

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

**REASONS:**

There is bug in msf_manager_ $ adjust which causes a reference through a null pointer while saving the bit-count of a component. This occurs commonly when a msf listing segment is truncated and should be fixed quickly.
TITLE: Fix bug in test_faults_(convert to .6180)

AUTHOR: Steve Webber

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

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 test_faults_subroutine used by meter_fim was never converted for the followon. It causes a process termination.

SUMMARY:
Convert it to run on follow on and cleanup the interface to meter_fim.
MULTICS CHANGE REQUEST

TITLE: Add tool "instr_speed" to system.

AUTHOR: Steve Webber

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

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 New Tool | Bug Fix |

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

REASONS: The instr_speed program can be used to measure the speed of the 6180 processors. It has 15 different instruction mixes and can easily be extended to contain others.

SUMMARY: Two new procedures need to be installed, instr_speed and test_speed.
TITLE: Extend page_trace to handle new trace types.

Steve Webber

AUTHOR:

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

CLASSIFICATION

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

REASONS: Several new system functions are being placed in the trace list (MCR 211). The page_trace command should be updated to know of these.

SUMMARY: Extend page_trace command to know of new trace types.
**MULTICS CHANGE REQUEST**

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<tr>
<th>TITLE:</th>
<th>Add new user-settable entry to system trace list</th>
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<tr>
<td>AUTHOR:</td>
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Use these headings: REASONS, SUMMARY, IMPLICATIONS, DETAILED PROPOSAL (Optional)

**REASONS:** It is often useful when trying to trace a user subsystem to gain insight about interaction with the supervisor to be able to tell exactly where in a sequence the traced events occurred. A user callable entry should be provided to allow the user subsystem to place entries in the system trace list.

**SUMMARY:** The entry `hcs_trace_marker` (char(4) aligned) would make it convenient for a user to place a coded entry in the list. This would change

```
hcs_mexp
page_fault alm (trace Program)
```
## MULTICS CHANGE REQUEST

**TITLE:** Additional feature in list_daemon_requests  
**AUTHOR:** Robert S. Coren  
**SOURCE:** (if external) e.g., "User", "Marketing"

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

**REASONS:** Useful information  
**SUMMARY:** Add time submitted to info printed out by "long" form of list_daemon_requests.  
**IMPLICATIONS:** None  
**STATUS:** Trivial addition to code already made.
MULTICS CHANGE REQUEST

TITLE: Install tape metering command

AUTHOR: M. Grady

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

CLASSIFICATION | JUSTIFICATION | Replaced by proposal MCR
--- | --- | ---
Incompatible Change | Marketing Requirement | Implemented in System
Extension | Conformance to Standard | Objections/Comments: Coordinate with new tape DCM and new metering proposal. Install in tools library.
Restriction | Increased Consistency | 
Performance Improvement | Simplification | 
Reliability Improvement | Generalization | 
X Improvement | Bug Fix | 

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

REASONS: Provide a command to display metering data taken by the ring 0 tape DCM.

SUMMARY: Write a command to extract this data from the ring 0 data segment and print it in a form consistent with other metering commands.

IMPLICATIONS: None.
**TITLE:** Bug in Dumper

**AUTHOR:** M. A. Meer

**DATE**
- Written 1/8/74
- Approved 1/8/74
- Rejected

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

**CLASSIFICATION**
- Incompatible Change
- Extension
- Restriction
- Performance Improvement
- Reliability Improvement

**JUSTIFICATION**
- Marketing Requirement
- Conformance to Standard
- Increased Consistency
- Simplification
- Generalization

**IMPLEMENTED IN SYSTEM**
- Implemented in System
- Replaced by proposal MCR

**Bugs Fix**
- #184

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

**REASONS:**
Wakeup_dump does not clear previously set alarms causing multiple cycles

**SUMMARY:**
Create a new entry for internal wakeup and delete and create a new channel for external calls.

**IMPLICATIONS:**
None.
MULTICS CHANGE REQUEST

TITLE: Bug in Backup

AUTHOR: M. A. Meer

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

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

REASONS: Causes linkage error after a cold boot

SUMMARY: Change "print_switch" in reload to disable attempt to print on cold boot.

IMPLICATIONS: None.
**MULTICS CHANGE REQUEST**

**TITLE:** Install new PL/I compiler and runtime

**AUTHOR:** R. A. Barnes

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

**CLASSIFICATION** | **JUSTIFICATION** | **Replaced by proposal MCR**
--- | --- | ---
X Incompatible Change | Marketing Requirement | Implemented in System

**REASONS:**
We wish to install this compiler in order to make our PL/I implementation of I/O compatible with iox_.

**SUMMARY:** Besides making PL/I compatible with iox_, the new compiler reimplements many of the math built-in functions as calls to pil operators rather than as external procedure calls for improved performance. This compiler also fixes the bugs marked with a ~ on the accompanying sheet.

**IMPLICATIONS:** iox_ must be installed before this compiler.
Warning: In "make" make will list some dependency rules that are not actual dependencies. See the manual for details.

Also, the "make" command may not be able to handle long file names (more than 255 characters).

If you are using "make" version 3.47 or later, you may see some additional output that is not significant in terms of the build process.

The "make" command is a powerful tool for building complex software projects. It is widely used in the Unix environment and has been adapted to other environments as well.

To use "make", you need to have a build system that supports it. This typically involves creating a directory structure that includes the source code, the makefile, and any other dependencies.

The makefile is a text file that specifies the relationships between files and the actions that need to be taken to build the project.

To use "make", you simply type "make" at the command line. This will trigger the build process, which can take a long time depending on the size of the project.

For more information on using "make" and creating a build system, refer to the documentation for your specific environment.
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Use these headings: REASONS, SUMMARY, IMPLICATIONS, DETAILED PROPOSAL (Optional)

**REASONS:** Want test_timer_manager to be able to set up a call to any program. As of now, it can only call one of 4 routines in test_timer_manager.

**SUMMARY:** Accept a call name for external calls, which can be a pathname or a refname, with or without a $ entry.

**IMPLICATIONS:** Change SPS writeup.
**MULTICS CHANGE REQUEST**

**TITLE:** "abbrev_set_cp" entry in abbrev

**AUTHOR:** S. Herbst

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

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

**REASONS:** Want abbrev to be able to call a command processor of our choosing.

**SUMMARY:** entry "abbrev_set_cp" takes an entry as argument & specified it as the command processor to be called.

**IMPLICATIONS:** None.
MULTICS CHANGE REQUEST

TITLE: Install new BASIC

AUTHOR: B. Wolman

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

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REASONS: Multics product requires a BASIC compiler that is shareable, produces Multics standard object segments.

SUMMARY: Install new BASIC that meets requirements given above. The new BASIC has been available in experimental library for several months. The new BASIC is generally compatible with v6 basic - the few incompatibilities are documented in an info file that is already installed.

IMPLICATIONS: Some users may have to correct their programs.
**MULTICS CHANGE REQUEST**

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<td>X Unreported bugs</td>
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Use these headings: **REASONS, SUMMARY, IMPLICATIONS, DETAILED PROPOSAL (Optional)**

**REASONS:**
This constitutes the "finalized" version of the Multics Fortran compiler. This change will fix most known bugs in the compiler. It will also restrict the use of certain Fortran Y features.

**IMPLICATIONS:**
1. Certain math functions are now in the operator segment rather than in bound_math (cos, sin, sqrt, log, log10, exp, atan, dcos, dsin, dsqrt, dlog, dlog10, dexp, data, data2, atan2, exponentiation).
2. The algorithms used to compute dexp, dlog, dsqrt, exp, log, sin, sqrt, exponentiation have been changed.

**Bug Nos.** 42, 43, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57-60.
MULTICS CHANGE REQUEST

TITLE: bound_Fortran_io

AUTHOR: D. Levin

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

CLASSIFICATION | JUSTIFICATION | Replaced by proposal MCR
-----------------|---------------|-----------------------
X Incompatible Change | Marketing Requirement | Implemented in System
X Extension | Conformance to Standard | Objections/Comments: Depends on prior installation of EIS operator and iox_.
X Restriction | Increased Consistency |
X Performance Improvement | Simplification |
X Reliability Improvement | Generalization |
| #37-39,41,44,46 Bug Fix |
X Unreported bugs |

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

REASONS: This I/O system interfaces with iox_moi_ ios_. It implements direct-access files and changes certain user interface conventions (see implications).

IMPLICATIONS: 1. A file opened as a result of a Fortran read statement is opened for input only. The file must be closed and opened in order to write.

2. A '+' carriage control char is ignored if the target file is the user console.

3. Old unformatted files cannot be read.

4. Each unformatted write creates 1 variable length record.

5. Each unformatted read reads 1 variable length record.

6. Formatted output creates a record of any length (length limited to 1 segment.)

7. When a sequential file is being written, a write redefines the end of file. No information exists beyond the last record written.
## TITLE: Argument descriptors

**AUTHOR:** R. Freiburghouse

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

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**REASONS:** Conformance to Multics Standards.

**SUMMARY:** Change the command processor so that it generates Version II argument descriptors instead of Version I argument descriptors.

**IMPLICATIONS:** Any program that inspects its argument descriptors without using "decode_descriptor" may not function correctly.

All standard PL/I programs will continue to work correctly as well as all programs that inspect their argument descriptors via "decode descriptor".

We must make this change before we get too many users at other installations. We should have done it a year ago!

**DETAILED PROPOSAL:** Implemented with ix0 version of command loop. Documented in pending changes.
**MULTICS CHANGE REQUEST**

**TITLE:** Fix RUNCOM problem in BOS

**AUTHOR:** N. I. Morris

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

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

**REASONS:** A bug in BOS caused RUNCOM to loop occasionally.

**Summary:** The bug was found to be a du modifier that should have been a dl.

**Implications:** The fix was installed as an emergency fix.
TITLE: bugs in walk_subtree

AUTHOR: Steve Herbst

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

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 unreported | 
| Bug Fix | 

REASONS: 1) walk_subtree executes in the subdirectories of a Multi-Segment File.

2) cwd in the command line interferes with the walking.

SUMMARY: 1) Test bit count of directories. If ≠ 0 then don't execute in subdirectories.

2) Store working directory and use concatenation instead of expand_path_ to change it.
MULTICS CHANGE REQUEST

TITLE: Process overseer for card-reading daemon

AUTHOR: Robert S. Coren

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

CLASSIFICATION

Incompatible Change
Extension
Restriction
Performance Improvement
Reliability Improvement

JUSTIFICATION
Marketing Requirement
Conformance to Standard
Increased Consistency
Simplification
Generalization
Bug Fix

REASONS: Card-reading function has been removed from I/O daemon, but some mechanism to allow operations to read in user card decks is needed.

Summary: Supply process overseer for a new daemon (to be called Cards.SysDaemon) which attaches card-reader and establishes itself as condition handler to prevent SysDaemon process from reaching command level.

Implications: No effect on user interface. Operations must be advised of new method for reading cards. (Operator action required is minimal.)

Detailed Proposal: Install cards-overseer_in>tools and register Cards.SysDaemon with process overseer of cards_overseer_, which will call existing read_cards to do actual work.

Note: This MCR has no effect on security violation whereby cards daemon puts link in requestors home directory. Suggest that this be fixed when new secure "mail" facility exists.
TITLE: Reinstall ftp_mail

AUTHOR: A. Kobziar

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

CLASSIFICATION JUSTIFICATION

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

REASONS: A version of ftp_mail which contained errors was installed (as part of MCR096) because I made a typo in updating object archive. This resulted in new source but old object being installed.

Summary: New object has been installed as an emergency fix.
## MULTICS CHANGE REQUEST

**TITLE:** Delete obsolete library procedures

**AUTHOR:** Jordan

**SOURCE:** Honeywell

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

### REASONS:

A number of no-longer used procedures remain in the libraries. Assuming that no one needs them they should be deleted.

### Detail Proposal:

Delete the following from the libraries:
- acm_, ad, adjust_device, bound_force_detach_, changewdir,
- deletedir, force_printer_detach, force_tape_detach, make_obj_map_moveb, phd, pom,
- print_object_map, printhomedir, printwdir, read_list
- sethomedir, shd, write_list
# MULTICS CHANGE REQUEST

**TITLE:** ACI and BCI Pseudo-ops for ALM that can specify character count

**AUTHOR:** John K. Rhodes

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

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<td>Increased Consistency</td>
<td>Note: That ASCII characters NL (012) and;</td>
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<tr>
<td>Performance Improvement</td>
<td>Simplification</td>
<td>(semi-colon) both act as a new-line</td>
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<tr>
<td>Reliability Improvement</td>
<td>Generalization</td>
<td>characters in the current ALM implementation.</td>
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<td>Bug Fix</td>
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Use these headings: REASONS, SUMMARY, IMPLICATIONS, DETAILED PROPOSAL (Optional)

**REASONS:** When typing in either an ASCII or BCI character string in ALM, it becomes difficult to accurately keep track of trailing blanks because of the fact that all characters must be typed in literally. This problem came up during the development of the MULTICS on-line testing system TOLTS. Test pages, written in a test and diagnostic language (TDL) consist of up to 100 lines of ASCII or BCI data with a fixed length (54 or 56 characters). Some of these "lines" contain only two or three non-blank characters at the start of the line. Thus, typing in such a line using the ACI pseudo-op requires typing in 3 non-blank characters followed by perhaps 50 ASCII blanks. It is difficult to accurately count these characters and get them right, not to mention the extra time required and the wasted file space required to store these characters.

**SUMMARY:** An optional format for the ACI, ACC, and BCI pseudo-ops is needed so that trailing blanks might be specified to be appended to the right of the input string.

**IMPLICATIONS:** Considerable wasted file space and operator time can be eliminated by this implementation as well as an improved accuracy in typing in ASCII and BCI strings.
DETAILED PROPOSAL: The ACI, ACC, BCI and BCI by count (if such) pseudo-ops should have an optional format recognizable by the ALM compiler. In example, the present format and the new proposed optional format is given below for what should be two identical lines:

ACI "WTB

ACI 56,WTB

The latter format is the proposed new optional format. It specifies exactly 56 characters should be used as the character string starting with the "W". If a new-line character is encountered before scanning 56 characters, trailing blanks should be added to pad out to 56 characters. If a new-line character is not encountered, the 56 characters so scanned should be used.
TITLE: bugs in timer_manager

AUTHOR: Steve Herbst

CLASSIFICATION

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REASONS: 1) If the stack is unwound or a non-local go to occurs, before returning from a call with interrupts inhibited, the interrupts are never turned back on.

2) When resetting a timer, only the first pointer of each call entry is looked at. Several calls with the right name but different activation pointers may exist, and the latest of these is always the one that gets reset.

SUMMARY: 1) Cleanup handler in timer_manager resets interrupts from ips_temp in the machine conditions.

2) The activation pointer of each call is also looked at. Only when it matches is a timer reset.
TITLE: Modify tape DCM to support 2 channels

AUTHOR: N. I. Morris

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

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 |
| Bug Fix |

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

REASONS: Use of 2 physical channels will allow greater throughout on tapes.

Summary: The database used by the tape DCM will be broken into 3 parts.

1) common
2) per channel data
3) per handler data

The code will be modified to allow running more than one channel simultaneously. Several security holes in the tape DCM will also be plugged. These holes allowed a user to access data from other tape drives.

Entries will be added to tape DCM to dynamically add and remove the second channel.

IMPLICATIONS: 2080 words more wired-down core will be needed to support simultaneous channels. However, if the second channel is not to be used, the unneeded wired-down buffer space will be released during system initialization.
TITLE: Addition of entry tdcm_promote to hcs_

AUTHOR: Dennis Capps

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

CLASSIFICATION JUSTIFICATION

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

REASONS: SUMMARY:

Use of the new tape mount package will be enforced in part by the following mechanism which is already a part of tdcm (MCR-018): When a drive is assigned by tdcm, the validation level of the caller is recorded and no subsequent call is honored from higher numbered rings. The entry tdcm$tdcm_promote allows a caller at or below the recorded validation level to raise or lower the recorded value.

It was originally thought that this entry should be available only in ring1. Thus the gate admin_gate_ has an entry tdcm_promote. But since tdcm is careful to verify the caller's right to promote the drive in question, it is now seen to be simpler and more general to let this be available in all user rings. This would allow, for example, a user to build an environment in which ring4 programs would mount tapes for users running in ring5.

The first step is to add the entry tdcm_promote to hcs_. Following that, when programs have been changed, the other entry can be removed from admin_gate_.

IMPLICATIONS: None.

DETAILED PROPOSAL: to add to hcs_ the entry:

hgate tdcm_promote,tdcm,tdcm_promote,4
TITLE: Fix Setacl to work with star convention

AUTHOR: A. Kobziar

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

REASONS: If setacl is given a star pathname, it will perform the requested operation only on the first segment in a directory. This bug was introduced by speed up changes to acl_commands under MCR 230.

Summary: Fix acl_commands to retain number of input names as the procedure processed every star matching name. (The resetting of this number caused setacl to assume no input given.)
**TITLE:** Fix PL/1 Bug in Salv_Rebuild_Directory  

**AUTHOR:** A. Kobziar  

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

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

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

**REASONS:** Use of unspec building on a structure member looses member’s offset at second invocation. This resulted in the tag overwriting the first letter of the bit count author’s name.  

**Summary:** This problem is reportedly fixed in eis compiler. Therefore use temporarily an automatic variable to act as intermediary when copying tag into a structure.  

**Implications:** On-line salvaging will result in erroneous bit-count author names. If a sufficient number of these names require new allocations in the directory, thus causing it to grow across a page boundary than system will crash (syserr a call)
### MULTICS CHANGE REQUEST

**TITLE:** Corrections to nstd_dim  
**AUTHOR:** Susan Barr

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

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**Objections/Comments:**

**Classifications:**
- Incompatible Change
- Extension
- Restriction
- Performance Improvement
- Reliability Improvement

**Reasons:**

a. If an attach request failed, the stream name remained attached.

b. Fixed_record_length option (asynchronous, buffered io) had the following bugs:
   1. It resets the hardware mode to binary.
   2. It initiates the first read when it receives the fixed_record length order. If the access is "rw" it changes the order to synchronous since the user might write first.
   3. If a read was requested and was followed by a write request or write eof request, nstd did not reposition the tape to reflect the actual no. of records the user requested. The tape was left at the end of the next set of records read, but not yet requested by the caller.
   4. The recovery for io error did not work. Instead of backspacing to retry the io, an erase command was given. A character string was used instead of a bit string to cause this error.
   5. Only one file of data could be read. A flag for end of file mark did not get reset.
Summary: A. If attachment fails, the stream name is detached.

B. 1. The default hardware mode is set when the attach call is made.
   2. The first read is made when the first read call is requested. "rw" access does not change the io to syncronous.
   3. The tape is repositioned after the last record the caller requested.
   4. The recovery for io errors was corrected.
   5. One or more files can be read.

Implications: When fixed_record_length option is requested it stays in effect for as long as one type of data io is requested an no irrecoverable io errors occur. Any order request (rewind, status) or a change in type of io (ex, from reading to writing) causes a change to syncronous io.
MULTICS CHANGE REQUEST

TITLE: Creation of New Library for ARPA Network Software

AUTHOR: D. Wells

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

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

REASONS: Because software associated with the ARPA Network interface is currently being maintained by Project MAC (rather than CISL), a desire has been expressed to not ship this software as part of the standard product. In effect, this is a need to be able to distinguish this software from other parts of Multics.

SUMMARY
This MCR proposes the creation of a new library called the "Network Library."
This new library will contain all Network-related software in the Online System. (Those parts of the Network software which are in the hardcore system -- currently the NCP and the IMPDIM -- will not be affected.) For efficiency, this new library will exist in the same directory as the Author Maintained Library.

IMPLICATIONS
Because all installed Network software is either 1) not directly invoked by users, or 2) not documented to users, there are no major changes visible to users. However, a notice should be placed in the pending_changes info file to allow any users who do have links to the affected segments can change them and to allow users to change their search rules if they desire.

DETAILED PROPOSAL
1) The name "system_library_network" will be added to the directory "system_library_auth_maint".
2) A New logical library will be created for use of the installation tools corresponding to the above library.
3) All network-related software will be moved to the new Network Library. Because
DETAILED PROPOSAL (cont.)

this action will require several small changes (particularly to the Answering Service, this movement will be performed by installation submissions and deletions.

MISCELLANEOUS

It is understood that documentation for network-related software will continue to be placed in the SPS when appropriate.

No plan yet exists for changes to the various manuals (such as the Operators' Manual and the System Administrators Manual) where certain sections now refer to operation of the Network.

This MCR alters MCRs 226 and 227; this MCR withdraws MCR 225.
### TITLE: Addressing bug in qedx

**AUTHOR:** M.A. Meer

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

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

**REASONS:** 
Qedx addresses lines incorrectly.

**Summary:** 
Qedx addresses bugs incorrectly in the case where a numerical address is followed by a search and another numerical address.  
Cause: A temporary register is not zeroed before processing the second numerical address.

**Implications:** None
**TITLE:** Bug in archive_util

**AUTHOR:** Steve Herbst

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

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<td>x Bug Fix 249</td>
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Use these headings: **REASONS, SUMMARY, IMPLICATIONS, DETAILED PROPOSAL** (Optional)

**REASONS:** Archive_util_$search changes the archive pointer (1st arg.)

**Summary:** Save and restore archive pointer
**MULTICS CHANGE REQUEST**

**TITLE:** Bug fix for tape

**AUTHOR:** Bill Silver

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

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

**REASONS:** Fix bug in tape_ (tape_xmt__). A counter was not reset correctly when writing past the End of Tape reflector.
**TITLE:** Increase size of IOAT  
**AUTHOR:** D.R. Vinograd  
**SOURCE:** (if external) e.g., "User", "Marketing"  

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<td>Bug Fix 224</td>
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**REASONS:** At the present time the I/O Assignment Table (IOAT) has a default size of 4 pages. If more than 75 interactive user try to use the system the table overflows and the system fails.

**Summary:** Increase the size of the IOAT to 16 pages by specifying for the IOAT in the system header file a cur_length of 16.

**Implications:** This change has already been made in the Phoenix system without any problems.
TITLE: Fix bug in update option during system start up.

AUTHOR: D.R. Vinograd

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

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 |
unreported | Bug Fix |

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

REASONS: As part of the update procedure used to install new systems in Phoenix the executable system libraries have in the past been retrieved. This has allowed two copies of the same module to appear in different on-line libraries with very interesting results. This occurred because a newer copy of the module was installed at MIT in a different library and the retrieve function does not operate in "trim" mode. Summary: Modify the update option to perform a reload.

Implications: At any site which uses the update function all files installed by that site in the transmitted libraries will be deleted.
TITLE: BOS command to search for parity errors.

AUTHOR: J. Hannigan

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

CLASSIFICATION

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Objections/Comments:

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

REASONS: Add program to BOS to search memory for parity errors, report same and rewrite bad cell. This is currently done by hand. Justification: Many crashes are caused by memory parity problems. Manual checking is slow and often causes more problems than are cured. With a program the check can be done quickly with no manual intervention.

Summary: Program is in operation on Waltham 645 and will be recoded for 6180 by Waltham. It reads every memory cell and reports the address and contents of those that have parity errors. The contents of such cells are restored to memory to eliminate the parity error. This program is run as the first program of a CRASH RUNCOM.
MULTICS CHANGE REQUEST

TITLE: BOS command to read registers of non-bootload CPU

AUTHOR: J. Hannigan

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

CLASSIFICATION

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<td>Implications include modification of fdump, etc. Discuss implementation with N. Morris and S. Webber.</td>
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Use these headings: REASONS, SUMMARY, IMPLICATIONS, DETAILED PROPOSAL (Optional)

REASONS: Add program to BOS to read DBR and registers from non-bootload processor (dual processor system) for dumping second CPU.
Justification: Current standard way of dumping second CPU in dual CPU configuration is for operator to read DBR off maintenance panel and typing it in. This is slow and often leads to errors. Program would do it without manual intervention.

Summary: Program gets second CPU to store DBR and registers by manipulating fault vector for connect fault in BOS and issuing connect to second CPU. Dump program is modified to accept DBR as an argument.

Status: This is fully implemented on 645 and will be implemented on Waltham 6180 by Waltham. It provides the added advantage of allowing the index registers, associative memory, and base registers to be dumped for second CPU.
**MULTICS CHANGE REQUEST**

**TITLE:** Gate Macro Fix

**AUTHOR:** P. Haber

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

**CLASSIFICATION**

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**REASONS:** The macro for creating a non-hardcore gate creates gate which fetches argument count incorrectly.

**Summary:** Correct Macro

**Implications:** None
Currently, access to examine hardcore meters cannot be separated from access to examine such sensitive hardcore data segments as I/O buffers. Thus anyone who wishes to measure system performance must convince the system administrators that he will not misuse his ability to steal other users' passwords.

SUMMARY:
A new gate will be provided, to permit access to only certain data. The old gate can be restricted to system programmers, who are, of course, trusted.

Step I: install ring_zero.peek online (calls whichever gate works and doesn't mind if one is missing).

Step II: change installed metering commands to use ring_zero.peek.

Step III: install gates, data segment, command, and filter program used by this mechanism.

Step IV: add a line to the answering service startup file to initialize filter.

Step V: reduce access to phcs at discretion of IPC.

IMPLICATIONS:
Uninstalled tools using phcs$ring_0.peek may require modification.

DETAILED PROPOSAL was distributed as MTB-030.
### MULTICS CHANGE REQUEST

| TITLE: | Fix bugs in answering service 7.4 |
| STATUS | |
| AUTHOR: VanVlack |
| SOURCE: (i.e. external; e.g., "User", "Marketing") |

### CLASSIFICATION

| Incompatible | Marketing |
| Change | Requirement | Implemented In System |
| Extension | to Standard | Objections/Comments |
| Restriction | Consistency | |
| Improvement | Simulation |
| Reliability | |
| Improvement | Generalization |
| Bug Fix #237 |

### REASONS

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

#### REASONS:

Several bugs were introduced in the version of the answering service which caused the initializer to block instead of waiting during process destruction.

These were:

1. Process terminations printed message and then hung up, leaving user counted as logged in and listed in whotab. (His process was destroyed and accounted for.)

2. When a daemon process issued a new proc, a logout resulted.

3. Absentee users were not being logged out correctly.

#### SUMMARY:

Fixes were made to dialup, absentee_user_manager, and daemon_user_manager. Problem 1 was a ttypical peculiarity with the writing of zero-length messages. Problem 2 was a misplaced label. Problem 3 was a validity check that rejected some valid wakeups coming from the hardcore because the process ID appeared invalid. Code was also added to insure that the system will not be affected if the "process has terminated" signal arrives after the "process destruction complete" signal.

#### IMPLICATIONS:

Process terminations will work correctly, and the login control tables and "who" will be correct. Daemon processes will be able to issue new_proc. Absentee processes will log out correctly.
MULTICS CHANGE REQUEST

TITLE: Message Coordinator Improvements

AUTHOR: T. H. Van Vleck

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

CLASSIFICATION | JUSTIFICATION
| Incompatible | Marketng |
| Change | Requirement | Implemented In System

STATUS | DATE
| Written | 10/27/74 |
| Approved | 12/28/74 |
| Rejected | |
| Postponed | |
| Withdrawn | |
| Expires | 1/2/75 |

CLASSIFICATION | JUSTIFICATION
| Incompatible | Marketng |
| Change | Requirement | Implemented In System

REASONS:

Systems with multiple operator consoles in different locations find that a command input from one terminal may cause output on another terminal with no indication of what command produced the output. Also, such sites may wish to communicate between terminal locations (especially during system startup), and although this facility can be set up by using complicated routings, a simpler method is desirable.

SUMMARY:

Each terminal run by the message coordinator has an entry in the "mc_anstbi" data base. Add to the per-terminal entry a BROADCAST LIST, which other consoles which other terminals will get a copy of this terminal's input. Each command line read by system_control will be reported to a new entry in the message coordinator by a call like

call message_coordinater_note_input (tty_id, lp, li);

Each terminal in the broadcast list for tty_id will have a message formatted and queued for output of the form

1102 from tty1231 r bk inc 004

The "accept" command and its entry in message_coordinater will be modified to
accept an optional list of terminals to broadcast to. The default broadcast list will be all terminals except the IOM console. Input will never be broadcast back to the terminal issuing a command. All input commands will be recorded in the system log.

The modification for inter-terminal communication will use part of the above change. A new command, "intercom" ("ic") will be added to system_control, which will pass the line input to the new entry point message_coordr_intercom. This entry point will work like "reply" in that the target identifier (a terminal name instead of a source id) will be extracted and looked up, and the line formatted and queued.

IMPLICATIONS:

Operational smoothness should be improved.
**MULTICS CHANGE REQUEST**

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<th>TITLE</th>
<th>Change entry definition in object segment.</th>
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<tr>
<td>AUTHOR</td>
<td>T. H. Van Vleck, R. A. Barnes</td>
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<td>SOURCE</td>
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**CLASSIFICATION | JUSTIFICATION**

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**REASONS:**

The standard object segment, described in MPM SWG section 11.3, is supposed to have a flag which says whether an entry point has an associated list of descriptors for the input arguments expected. These descriptors were provided for the use of the binder and the debugging tools. The version 2 PL/I compiler set this flag and produced the descriptors in the object segment, but it produced garbage in the list of pointers to the descriptors in the entry definition for every parameter with a star extent. Since this garbage looks like a valid pointer to a descriptor (and indeed may sometimes point to a descriptor), the effect of this bug is to make the entire list of descriptors useless.

The bug has been corrected in the EIS compiler, but no program can trust a descriptor list in the object segment.

**SUMMARY:**

There is some extra space in the word which contains the "has descriptors" bit. Define one of these bits as the "has valid descriptors" bit, and rename the old "has descriptors" flag to "has argument count". Modify the compilers which produce valid descriptor pointers to set this new bit on.

Install a new library program in `bound_debug_util` called "get_entry_arg_descs", which, given an entry pointer, returns an array of
Change entry definition in object segment.

01/18/74

Pointers to the descriptors and the count of arguments, if the entry point has valid descriptors; if the program was compiled by the old version 2 PL/I, return null pointers but a correct argument count.

IMPLICATIONS

The bind*, trace_stack, and debug can be modified to access this information when it is available. Warning messages can be produced for mismatches in the number or attributes of arguments. A simple command can be written for users which lists the attributes of the arguments to any subroutine entrypoint.
MULTICS CHANGE REQUEST

TITLE: Fix bugs in memo command.

AUTHOR: Paul A. Green

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

CLASSIFICATION | JUSTIFICATION | REPLACED BY
-----------------|---------------|------------------------
Incompatible | Marketing Requirement | Implemented In System
Change | Requirement Conformance | Objections/Comments:
Extension | to Standard Increased Consistency
Restriction | Performance Improvement Simplification
Improvement | Reliability Improvement Generalization
#244, 245, 246
Bug Fix

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

REASONS:
Several bugs have been reported by users of memo. Memo did not:
1. diagnose non-existence of memo #11 in "memo -dl 5 11", when memo 5 existed and memo 11 didn't. (mprf 6374 & 6015, bug 246).
2. properly handle memos with both the -call and -alarm attributes (it called them twice). (mprf 6129, bug 245).
3. properly handle more than 20 memos (it only selected the first 20).
4. define the setting of alarms in a very consistent manner (it caused alarms to be turned on with any invocation except "memo -off"! thus, an absentee job could not set a memo without risking turning on alarm memos).
5. did not allow selection of -call memos (only -alarms).
6. did not give very good diagnostics for various Illegal combinations of arguments. (mprf 6389, bug 244).

SUMMARY
These changes will fix the above bugs in memo. An updated Info file has also been prepared, and the MPM documentation has been modified appropriately.

IMPLICATIONS
Points 1, 2, 3, and 6 are bug fixes, and are compatible. Point 5 is a new feature, and is compatible. The solution to point 4 defines "turning on alarm memos" in the following manner:
Alarms are either on or off, ("memo -on" and "memo -off", resp.)
A normal memo print turns alarms on. ("memo" and "memo -bf").
Everything else leaves the state alone. (setting, selecting via
"memo -print", "memo -list", or "memo -delete").
Thus, the normal interactive start_up.ec action will cause alarms to be
activated, and the -on and -off arguments may be used to effect velv
tool control alarms. This change is upwards compatible.

DETAILED PROPOSAL
  Coded, tested, and ready for submission.
TITLE: Fix bugs in fault info routines

AUTHOR: M. Weaver

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

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

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

REASONS: Among other bugs, incorrect information is often returned when a condition is signalled from PLL_operators_ and nine-bit rather than ten-bit opcodes are used.

Summary: Fix interpret_op_ptr_ to be more knowlegeable about stack frames involved when PLL_operators_ has signalled a condition. Fix get_link_ptr_ and find operator_name_ to use ten-bit opcodes. Fix find_condition_frame_ to avoid loop. Fix find_condition_info_ to return exact length for condition name.

Implications: None