DATE: February 20, 1974

TO: Distribution

FROM: M. S. Hodges

SUBJECT: Multics Change Requests

Attached are copies of all Multics Change Requests which were approved from February 1 through February 15, 1974.
MULTICS CHANGE REQUEST

<table>
<thead>
<tr>
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<th>Replaced by proposal MCR</th>
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<tbody>
<tr>
<td>Incompatible</td>
<td>Marketing Requirement</td>
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<td>Change</td>
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<td>X Extension</td>
<td>Increased Consistency</td>
<td>Objections/Comments:</td>
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<td>Restriction</td>
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<td>Reliability</td>
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Use these headings: REASONS, SUMMARY, IMPLICATIONS, DETAILED PROPOSAL (Optional)

REASONS:

In order to facilitate use of ARPA Network "server hosts", a common text editor has been agreed upon for implementation on all interested systems. The common editor is "eds" (MPM, Part I, Chapter 4), under the name "neted". A copy of the draft usage writeup was published in MIB-014; it will be published in the Network Users' Supplement to the MPM and in the Network Resource Notebook.
TITL: Warn users about unexpected disabling of ips interrupts.

AUTHOR: M. Weaver

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 | Message should be more explanatory.

Performance Improvement | Simplification |
Reliability Improvement | Generalization |

x Bug Fix #239 |

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

REASONS: Occasionally a handler for an ips interrupt faults while it has most ips interrupts masked. This usually results in arriving at command level with interrupts disabled.

Summary: The standard system condition handler should detect when the current IPS mask has been recently changed and should warn users about any changes that involve disabling of interrupts. For example, a line might appear at the end of a message saying: quit, alrm, cput disabled.

Implications: This is additional information to users and involves changes only to default error handler.

Detailed Proposal: If the low order bit is on in ips_temp in the machine conditions, that field contains the IPS mask used before being replaced by the auto mask. If this is the case, the appropriate bits in the current IPS mask should be compared with the corresponding bits in ips_temp. If any interrupts are found to be newly disabled, a message should be printed.
MULTICS CHANGE REQUEST

TITLE: Restrict system free area to be 64k.

AUTHOR: E. Stone

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

CLASSIFICATION - JUSTIFICATION

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

REASONS: After 22-0 was installed, allowing the size of a user's system free area to be sys_info$max_seq$ size caused page 65 of this segment to be used. This is turn caused abnormally heavy use of the 256k page table pool. This restriction is a temporary change until a study of the area package can be made.
TITLE: Fix error in bound_debug_

AUTHOR: Barry L. Wolman

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 |
Performance Improvement | Simplification |
Reliability Improvement | Generalization |
Unreported Bug Fix |

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

REASONS:

When the debug command is asked to show or change a variable located in an outer block, it incorrectly walks back using the prev_sp field in the stack frame instead of the display pointer. This causes the wrong location to be found when an internal procedure is called by means of an entry variable.

SUMMARY: Fix procedure db-sym as indicated above.

IMPLICATIONS: none
**MULTICS CHANGE REQUEST**

**TITLE:** Fix to synchronize hangups with answering service

**AUTHOR:** H.B. Snyder

**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 Bug Fix |

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

**REASONS:** If the answering service is running behind, a user can hangup, a new user can dial up, and the new user can get the previous user's logout message.

**SUMMARY:** tty_ctl will be modified so that no more calls will be accepted on a line which has just hungup until the answering service has told it to accept calls again.

**IMPLICATIONS:** Get rid of security hole.
MULTICS CHANGE REQUEST

**TITLE:** 22-0 cleanup

**AUTHOR:** E. Stone

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

**CLASSIFICATION**

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**REASONS:**

Several modules should be changed as a consequence of the installation of system 22-0.

A. Change `delete` and `dl_handler` to eliminate setting W on a segment to delete it and not to expect `error_table` returned from `hcs_dellentry_file` on `hcs_dellentry_seg`.

B. Convert `compare_asc11` to version 2 so it will work on segments greater than 64k.

C. Change `save_air_info` to eliminate listing the CAACL.

D. Make `alm` generate `MSF's` properly. Currently 141k of each component is padded with null characters. This change involves converting 3 modules to version 2 and modifying the `alm` command to call `tssi` rather than calling `msf_manager` directly in creating the listing tile.

E. Convert `sort_file` to version 2 so that it will work on segments larger than 64k. In addition make some improvements in the sorting algorithm to achieve a performance improvement; these enhancements originated with Jerry Stern. This change should not conflict with the work of Hoss Klinger in this area.

F. Change `set_max_length` to check that the new max length be a multiple of 16 words rather than a multiple of the page size. This removes a restriction which was present due to the presence of append attribute on segments.
MULTICS CHANGE REQUEST

TITLE: Recovery from ITT overflows.

AUTHOR: VanVleck

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

CLASSIFICATION | JUSTIFICATION
-----------------|------------------
Incompatible | Replaced by proposal MCR

REASONS:
The answering service depends on interprocess communication for many of its functions. When interprocess messages are sent so fast that there is temporarily no room for them in the ITT, the message coordinator and the rest of the answering service stop working.

Until a new interprocess communication mechanism can be designed which does not require a wired-down, finite ITT, we will have occasional problems with ITT overflows when software bugs occur.

SUMMARY:
A cell in the header of tc_data will be created which will contain the time of the last ITT overflow. system_control will sample this cell periodically, and if an ITT overflow has occurred since the last look, a restart wakeup will be sent to all device driver channels and to router and typewriter. In addition, a restart entry in the answering service will be called to poll all terminal channels which are not listed as having a logged-in user.

IMPLICATIONS:
ITT overflow will become less fatal. If the process which filled the ITT can be stopped, the system will recover.
MULTICS CHANGE REQUEST

TITLE: Answering Service 7.5

AUTHOR: VanVleck

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

CLASSIFICATION | JUSTIFICATION
| Incompatible | Marketing |
| Change | Requirement | Implemented in System |
| Extension | to Standard | Objections/Comments: |
| Restriction | Consistency | |
| Improvement | Simplification | |
| Reliability | Generalization | |
| Bug Fix | |

CLASSIFICATION JUSTIFICATION

Incompatibility | Marketing
Change | Requirement | Implemented in System
Extension | to Standard | Objections/Comments:
Restriction | Consistency |
Performance | 
Improvement | Simplification |
Reliability | Generalization |
Improvement | Generalization |
Bug Fix |

REASONS:

Changes should be made to the answering service to take advantage of new system features, to keep pace with new requirements, to remove obsolete code, and to fix several minor problems.

SUMMARY:

1. Remove obsolete procedure linkage_trap_now that linkage_error is no longer signalled for trap-before-first-reference.

2. Change as_init_ to return an error code to system_control_ so that initialization failure will prevent execution of system_start_up.ec (usually leads to faults and garbage messages).

3. Change act_ctl_ to not charge consoleless daemon users for connect time. (Currently this requires a manual correction every month for IO.Multics.)

4. Remove "a" access from all ACL entries set by the answering service.

5. Prepare for the EIS compiler, which needs certain declarations modified in case the table exceeds 64K. Re-declare the SAT, PDT, and PNT.

6. Remove all references to the obsolete procedure not_ascii_ and use the verify BIF instead.
7. Upgrade default handlers to ignore "cleanup" and to pass "stack" and "finish" conditions. Use condition_ instead of default_handler_$set.

8. Change all references to check_fs_errcode_ to convert_status_code_.

9. Remove obsolete procedure dhodh_ and call hcs_$get_user_effmode in line.

10. Fix a bug in as_meter_ which sometimes does not read the whole configuration deck.

11. When the user gives an incorrect login word, repeat the word in the error message to aid in debugging terminal problems.

12. Fix a bug in the shutdown sequence (bug 185) which causes a "maxu auto" to restart absentee and then stop it again.

13. Allow specification of terminal restriction code in octal in the "accept" command.

14. Make several messages from text in as_error_table_ rather than implementing them as constants in the program.

15. Remove obsolete daemon accounting code. New I/O daemon will no longer generate "io_accounting" deck.

16. Remove use of reserved segment number option and complicated renaming in up_sysctl_.

17. Respect "nobump" bit in load_ctl_ and act_ctl_.

18. Print system_up message earlier. Do before answering phones, not after.

19. Set ring brackets on whotab to 4,7,7.

20. Make init_ring, user_ring, user_top_ring be parameters in as_data_.


22. Set ring brackets on user dir.

23. Eliminate spurious error msg from dialup.

24. Move checking of special login word to dialup_ from lg_ctl_.

25. Allow specification of login args to daemon login.

26. Modify load control calculation to handle absentee and daemon load correctly. Prevent over-running of max units.

27. Allow project admin name to be "Name.*" as well as ".*Proj". ".*.*" remains illegal.

28. Record process terminations in the log, with their reason.

29. Improve check for garbage data in absentee queues. Use verify DIF.

30. Provide more info on absentee list destruction bug.

31. Allow setting of shutdown time at any valid date/time.

IMPLICATIONS:

Maximum number of users on a project will change to 1019 from 255. Maximum number of registered persons will change from 1364 to 8158.
### Title:
Correct bug in "&if...&then" part of process_input_string

### Author:
Susan Barr

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

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<td>x Bug Fix 144</td>
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Use these headings: REASONS, SUMMARY, IMPLICATIONS, DETAILED PROPOSAL (Optional)

**REASONS:**
If the segment read by exec com contains an "&if...&then" command line that is split over 2 lines with the "&then" on the 2nd line, the line may not be interpreted correctly. Process input string copies only the 1st line to a work area and searches the entire work area (beyond the line) for the "&then" string.

**SUMMARY:**
Process input string was corrected to search only the length of the first line for the "&then" and then get the 2nd line.
TITLE: Extend Arithmetic Active Functions

AUTHOR: Barry L. Wolman

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 |
Performance Improvement | Simplification |
Reliability Improvement | Generalization |

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

REASONS: The arithmetic active functions (plus, minus, times, divide, mod, min, and max) accept only decimal integers as inputs. The error message printed for the use of plus 2.3 4.7 is plus: "2.3" is non-numeric. This error message is incorrect.

SUMMARY:
1. Change arithmetic active functions to deal with any valid PL/I real constant value and operate internally using fixed decimal(59) arithmetic. The result of the function would be in I, F, or E format as appropriate, depending on the value of the function.

2. Add the following functions: quotient, trunc, floor, ceil with the appropriate definitions.

IMPLICATIONS: All correct uses of current versions of these active functions would give same results with new functions.
### MULTICS CHANGE REQUEST

<table>
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<th>TITLE: Correct and Extend Comparison Active Functions</th>
<th>STATUS</th>
<th>DATE</th>
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<tr>
<td>AUTHOR: Barry L. Wolman</td>
<td>Written</td>
<td>7/4/70</td>
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<td>Unreported Bug Fix</td>
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Use these headings: REASONS, SUMMARY, IMPLICATIONS, DETAILED PROPOSAL (Optional)

### REASONS:

The comparison active functions (equal, less, greater) do not operate in a consistent manner. equal does only a string comparison of its two arguments; less and greater do a numeric comparison if both arguments are the character representations of single-precision binary integers and do a string comparison otherwise.

### SUMMARY:

1. Change the less and greater active functions to do only string comparisons.

2. Add three new active functions (nequal, nless, ngreater) that accept as input any valid PL/1 real constant and perform a numeric comparison using float decimal(59) arithmetic.

### IMPLICATIONS:

Some exec_coms may have to be changed to use nless instead of less, etc. This should not be a problem.
MULTICS CHANGE REQUEST

TITLE: Archive component names.

AUTHOR: Steve Herbst

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

CLASSIFICATION | JUSTIFICATION | Replaced by proposal MCR | Objections/Comments:
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Incompatible Change | Marketing Requirement | Implemented in System |
Extension | Conformance to Standard |
Restriction | Increased Consistency |
Performance Improvement | Simplification |
Reliability Improvement | Generalization |
| Bug Fix 247 |

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

REASONS: Archive can only keep track of 32 component names.

SUMMARY: Keep some space in the stack and if more is needed, create a segment in the process directory. Since in the global case no component paths have to be stored, we can put more names in the same space in this case.
**MULTICS CHANGE REQUEST**

**TITLE:** Fix bugs in reprint_error

**AUTHOR:** M. Weaver

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

**STATUS**
- Written: 2/1/74
- Approved: 2/5/74
- Rejected
- Postponed
- Withdrawn
- Expires: 8/5/74

**CLASSIFICATION** | **JUSTIFICATION** | **REPLACED BY PROPOSAL MCR**
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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:**
Reprint_error still refers to default_error_handler_frames when a more correct terminology should be condition frames; it does not recognize the new code return by default_error_handler to indicate no available information about an existing desired condition frame; it prints level n: which is confused with level n in the ready message.

**SUMMARY:**
correct terminology in error messages; do not print further message if condition info is not available (default_error_handler will already have printed a message); print depth n: instead of level n: since _depth_ is a control argument for the command.

**IMPLICATIONS:** None.
# MULTICS CHANGE REQUEST

**TITLE:** Fix bugs in new condition mechanism

**AUTHOR:** M. Weaver

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

**CLASSIFICATION** | **JUSTIFICATION** | **REPLACED BY**
--- | --- | ---
Incompatible Change | Marketing Requirement | Replaced by proposal MCR
Extension | Conformance to Standard | Implemented in System 23.0a
Restriction | Increased Consistency |
Performance Improvement | Simplification |
Reliability Improvement | Generalization |
X | Bug Fix |

**STATUS** | **DATE**
--- | ---
Written | 2/1
Approved | N/A
Rejected | 2/5/74
Postponed |
Withdrawn |
Expires | 8/5/74

**REASONS:**

- Signal sometimes passes out garbage for the system fault conditions pointer on crawlouts.
- The reprint entry of `default_error_handler` does not properly diagnose error situations (such as when there is no condition info to print).

**SUMMARY:**

- Fix `signal` to always set `wc_ptr`
- Fix `default_error_handler`'s `reprint_error_messages` to always properly set its code argument.

**IMPLICATIONS:**

- After the change to `default_error_handler`, the command `reprint_error` will print an additional, slightly confusing message for the very unusual case where the desired condition frame exists but the condition information does not. A change to `reprint_error` has been submitted.

**DETAILED PROPOSAL:**

The changes have been installed.
**MULTICS CHANGE REQUEST**

**TITLE:** Change in the implementation of the Network Host Activation List

**AUTHOR:** Kenneth T. Pogran

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

---

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

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

**REASONS:** The Network host_activation_list is referenced by the program network_exec_executing in the Network Daemon process to obtain the name or number of all the ARPA Network hosts with which Multics is to communicate. network_exec_ then calls an NCP entry point to enable communications with each of these hosts.

In the present implementation, host_activation_list is an ASCII data base, referenced by explicit pathname by network_exec_ and parsed using parse_file_. The disadvantage of using an explicit pathname is obvious; in addition, the host_activation_list now contains approximately 64 entries, and processing it with parse_file_ is extremely inefficient and results in delays in NCP re-initialization when the system is heavily loaded.

**PROPOSAL:** host_activation_list will become an "external static" data base findable via search rules. It will be, very simply, a bit string of 256 bits; if bit i is 1, it is an indication that communications with host i are to be enabled. network_exec_ will be modified to use this new strategy. A new command will be provided so that privileged users (e.g., CompNet system programmers and system maintenance personnel) may easily turn bits in this table on and off as needed (by specifying the name of the host).
**MULTICS CHANGE REQUEST**

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<th>TITLE:</th>
<th>Fix illegal pointers in submission-testing programs</th>
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<tbody>
<tr>
<td>AUTHOR:</td>
<td>Arlene J. Scherer</td>
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**REASON:**

To make source and object tests work again with version two hardcore, and to eliminate calls to old acl primitives; also to add to the condition handler a check for the "finish" condition.

**SUMMARY:**

procedures submission_test, source_test, and object_test stopped working when 22-1 was installed due to the use of pointer registers for all pointer data in the newly converted v2 hardcore segments. There were several assignment statements of pointers to pointers (never to be used in that path) which were uninitialized. These were corrected. To comply with system standards, calls to hcs_sacl_addl were changed. To anticipate the upcoming changes, a check for the "finish" condition was added to the command_error condition handler for the testing programs.
MULTICS CHANGE REQUEST

TITLE: Update approved_routines_table for online installations

AUTHOR: Arlene Scherer

SOURCE: (if external; e.g., "user", "Marketing"

CLASSIFICATION | JUSTIFICATION
-----------------|--------------------------
Incompatible Change | Marketing Requirement
Extension to Standard | Conformance
Restriction | Increased Consistency
Performance Improvement | Simplification
Reliability Improvement | Generalization

REASON:
To delete several obsolete interfaces from the table of approved routines. To add a number of new subroutine calls to the table of approved routines.

SUMMARY:
The entries to be deleted are:
alloc_free_free_
default_handler_set
establish_cleanup_proc_
revertCleanup_proc_

The entries to be added are:
convert_date_to_binary_
hcs_add_dir_inac1_entries
hcs_add_inac1_entries
hcs_delete_dir_inac1_entries
hcs_delete_inac1_entries
hcs_get_max_seg_size
hcs_get_link_target
hcs_get_safety_sw_seg
sys_info$default_max_length
sys_info$page_size

hcs_list_dir_inac1
hcs_list_inac1
hcs_replace_dir_inac1
hcs_replace_inac1
set_lock$lock
set_lock$unlock
hcs_get_ring_brackets
hcs_high_low_seg_count
sys_info$max_seg_size
## MULTICS CHANGE REQUEST

**TITLE:** Install new numeric formatting function

**AUTHOR:** Barry L. Wolman

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

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**Objections/Comments:**

- Increased Restriction
- Consistency
- Performance Improvement
- Simplification
- Reliability Improvement
- Generalization
- Bug Fix

## REASONS:

There are a number of inefficient numeric conversion routines installed in Multics. The new routine numeric_to_ascii (see attached description) separates the conversion and formatting operations performed by these routines; the conversion to float dec(59) is performed by the compiler as part of the calling sequence and numeric_to_ascii does only the formatting. numeric_to_ascii is a general routine that can replace the separate integer and floating point conversion routines now used, convert_binary_integer $decimal_string, convert_binary_integer $long_decimal_string, and cases where loa$real is used to convert binary to ascii.
**Name**: numeric_to_ascii_

This procedure formats a decimal floating point number in a manner appropriate to its value; integer, fractional, or exponential format is used, depending on the number being formatted. The value returned by this function is a varying character string that can contain an optional minus sign, from 1 to 59 decimal digits, and, in some cases, an exponent field. The caller can control the number of digits placed in the string.

**Usage**

```pli
dcl numeric_to_ascii_ entry(float dec(59), fixed bin) returns(char(72) varying);
result = numeric_to_ascii_(value),precision);
```

1) **value** is the value to be formatted. The PL/I compiler converts to float dec(59) if the attributes of value are different. The extra pair of parentheses around value suppresses the warning message about the conversion that would normally be generated. (Input)

2) **precision** controls the number of digits placed in the output string. If precision = 0, from 1 to 59 digits are placed in the result string depending on the value being formatted. If precision < 0, the decimal value is truncated to the specified number of digits. If precision > 0, the decimal value is rounded to the specified number of digits. In the cases where precision is non-zero, no more than the specified number of digits are placed in the output string. (Input)

3) **result** is the character string representation of value; it contains no blanks. (Output)

**Note**

If precision = 0, precision = 59 is used. Let P = \( \min(59, \text{precision}) \).

A number in integer format consists of a string of from 1 to \( P \) decimal digits without a decimal point. Integer format is used for integers whose absolute value is less than \( 10^{\ast\ast P} \).

A number in fractional format consists of from 1 to \( P \) decimal digits with a decimal point. Trailing 0's in the fractional part are omitted; a number less than 1 has a 0 to the left of the decimal point. Fractional format is used for nonintegers that can be exactly represented in this format.
A number in exponential format appears as
\[ xe+y \quad \text{or} \quad xe-y \]
where \( x \) is a number greater than 1 and less than 10 in fractional format and \( y \) is a power of 10 such that the numeric value being formatted is \( x \times 10^{y} \). Exponential format is used whenever integer or fractional format cannot be used.
TITLE: Bugs in archive command

AUTHOR: Steve Herbst

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

CLASSIFICATION

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REASONS:

1. Extended star convention is not implemented in the archive name.
2. Archive can replace an archive into itself, and if delete force is in effect, delete it.
3. udf can overflow the archive and delete the segment anyway.
4. In a global replace operation, there is no message printed when user does not have access to an existing segment.

SUMMARY:

1. Use check_star_name_ instead of index (archive_name, "**").
2. If the archive and segment pointers are equal, do nothing but print a message.
3. Fix bug whereby wrong flag was set.
4. After segment is initiated, test for mode error and print message.
TITLE: Fix teco bug

AUTHOR: M. J. Grady

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

CLASSIFICATION

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

REASONS: In conversion to 2 PLl a bug was introduced which caused incorrectly named temporary segments to be created in the process dir.

SUMMARY: 1. Fix bug in call to ioa_$rsnnl.

IMPLICATIONS: None
TITLE: Fix bugs in datmk routines used by linker

AUTHOR: M. Weaver

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

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

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

REASONS: datmk subroutine in ring 0 depend on accuracy of linkage pointer in LOT; i.e., they will write into any segment specified if they can and they don't loop first.

SUMMARY: Fix datmk_util_ to check for loops. Fix rest_of_datmk to add validation level as ring number of linkage pointer before passing it to datmk_util_; this causes datmk_util_ to blow up on segments in lower rings than expected.

IMPLICATIONS: These changes solve only the immediately known problem. A more general solution could not be implemented at this time.

DETAILED PROPOSAL: The changes have already been coded and debugged.
**MULTICS CHANGE REQUEST**

**TITLE:** compare of zero length segments.

**AUTHOR:** Steve Herbst

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

**STATUS**
- Written
- Approved
- Rejected
- Postponed
- Withdrawn
- Expires

**DATE**
- 2/1/74
- 2/12/74
- 8/12/74

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

**REASONS:** compare gives no warning when one or both segments have zero length.

**SUMMARY:** If min (length 1, length 2) = 0, print a warning message.
MULTICS CHANGE REQUEST

TITLE: Changes to handle 1200 baud terminets

AUTHOR: R. B. Snyder

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

CLASSIFICATION | JUSTIFICATION | Replaced by proposal MCR
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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: The tty control tables have to be changed to allow Vadic 1200 baud modems to work.

SUMMARY: The program tty_ctl will be changed to allow it to differentiate between the Vadic modem (used for the Terminet 1200) and the 202C6 modem (used for ADRS).

IMPLICATIONS: None
TITLE: Fix to HSLA software

AUTHOR: R.B. Snyder

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

CLASSIFICATION

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

REASONS: The HSLA software contains bugs causing it to lose output and input.

SUMMARY: These bugs have been found and will be fixed.

IMPLICATIONS: ARDS will work.
MULTICS CHANGE REQUEST

TITLE: bugs in abbrev

AUTHOR: S. Herbst

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

CLASSIFICATION JUSTIFICATION

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Objections/Comments:  

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

REASONS: 1) abbrev does not process characters after balanced quotes.  
2) does not copy check info_time when user's profile is rehashed.  
3) conversion to PL/I VII and assorted small changes.

SUMMARY: 1) at the end of the line, process string even if we are still "inside quotes".  
2) explicitly copy check_info_time from old to new profile.
MULTICS CHANGE REQUEST

MCR 337
Page 1 of 1 Pages

TITLE: Correcting maximum tree depth

AUTHOR: A. Kobziar

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

CLASSIFICATION

Incompatible Change  Marketing Requirement  Replaced by proposal MCR

Extension  Conformance to Standard

Restriction  Increased Consistency

Performance Improvement  Simplification

Reliability Improvement  Generalization

X unreported

Bug Fix

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

REASONS: Currently active_hardcore_data$max_tree_depth is set at 16. Both the system and salvager use the number "0" for the root and thus use numbers 0-15 for a 16 level hierarchy.

SUMMARY: Change max_tree_depth from 16 to 15.
**MULTICS CHANGE REQUEST**

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**Status: Written 2/5/74**
- **Date:** 2/5/74
- **Approved:**
- **Rejected:**
- **Postponed:**
- **Withdrawn:**
- **Expires:** 8/12/74

**Title:** Fix bugs in IOM_manager's handling of overhead channels

**Author:** N. Morris

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

**Classification Justification:** Replaced by proposal MCR

**Reasons:**
- Initialization for the com_manager currently sets up the mailboxes for the system fault and special status channels incorrectly. The receipt of more than 16 status words over either channel could cause a system crash.

**Summary:** The code in iom_data_unit will be fixed to correctly initialize these mailboxes.

**Implications:** These channels are currently not used heavily. The special status channel will get heavy usage with the MTS-500's.
MULTICS CHANGE REQUEST

**TITLE:** Interpret "disposal" properly in "tw_" and "hcs_$tty_detach".

**AUTHOR:** M. G. Smith

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

**CLASSIFICATION**

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

**REASONS:** Procedure "tty_index.PLL" (accessible via the gate "hcs_$tty_detach") does not interpret the "disposal" argument properly: (1) a user cannot detach his own teletype without receiving an error message (see MPRF 4347); and (2) when the boss-process of a teletype (its so-called "hproc") releases it, the teletype can never be attached again till the system is re-booted. Also, "rest_of_ttydim_PLL" (part of "tw_") implements an undocumented "retain" disposal, but passes an incorrect code to the hardcore if it is used.

**SUMMARY:** Change "tty_index.PLL" so that: (1) a user can always detach his own teletype without error—the "disposal" code is ignored in this case; and (2) the boss-process-id is cleared when the boss-process detaches a teletype without retaining it. Remove the undocumented and incorrect code from "rest_of_ttydim_PLL".

**IMPLICATIONS:** For users: an annoying error message is suppressed. For system control: system control must be aware that when it detaches a teletype without retention the channel is put up for grabs—since system control apparently never does this, there should be no problem. For other processes attaching to teletype-like devices not in the "lines" file: upon detachment such devices revert to their state prior to attachment, so they can be re-used without another system boot.
TITe: Extend find_operator_name_ procedure

AUTHOR: Barry L. Wolman

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 |
Performance Improvement | Simplification |
Reliability Improvement | Generalization

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

REASONS: The find_operator_name_ subroutine used by debug, trace_stack, default_error_handler_, and profile does not recognize the new math operators used by Version II PL/I.

SUMMARY: Extend find_operator_name_ to recognize math operators, which are entered by the instruction

tsp3  pro0|op
TITLE: Fix bug in initialization tape_reader

AUTHOR: N. Morris

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

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

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

REASONS: A missing line of code in tape_reader will cause the system to die during Multics initialization if a particular sequence of tape error occurs.

SUMMARY: The code will be repaired.
# MULTICS CHANGE REQUEST

**TITLE:** Install indexed-file modules  
**AUTHOR:** M.J.MacLaren  
**SOURCE:** (if external) e.g., "User", "Marketing"

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**REASONS:** Provides indexed sequential files. Provides performance improvement over fm_. (Currently, the improvement is by a factor of about 5, eventually the factor will be 10-20). Required to support keyed files under new I/O system.

**SUMMARY:** Add required procedures to bound_file_.

**IMPLICATIONS:** Users will be able to use indexed-files when 1) the draft MMM documentation is available (it is being written now), or 2) the new PL/I and/or Fortran compilers and runtime routines are installed.
MULTICS CHANGE REQUEST

TITLE: recursion of archive command

AUTHOR: S. Herbst

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

CLASSIFICATION - JUSTIFICATION

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

REASONS: Want archive to be recursively callable.

SUMMARY: Replace "active" flag with level number. Generate a different temporary archive name for each level. The temp.archive for level 1 is truncated rather than deleted, as the only temp.archive used to be.
**MULTICS CHANGE REQUEST**

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

**REASONS:** Allow use of LTS system with various values of sys_info$max_length.

**SUMMARY:** The current LTS system assumes that tapes are written from segments of 64k or smaller. For multi-segment files the format on tape has the number of segments and the size of the last segment. There is neither a total count of words in a file nor the sys_info$max_seg_size at the time the tape was written.

1) On tape, multi-segment files are irrelevant.
2) To use tapes on systems with different sys_info$max_seg_size, either the total number of words in a file or the sys_info$max_seg_size must be present on the tape.

In addition, when an end of reel is encountered while writing, the last write is repeated on the next reel. Accounting for this is the greatest difficulty in converting for use on systems of different max_seg_size.

Changes have been made to lts_file, lts_Dbuild, lts_output, and lts_tape, to keep and use both total count of words in the file being written and max_seg_size at the time of writing.

**IMPLICATIONS:** This is a compatible change.
### MULTICS CHANGE REQUEST

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### REASONS:
A bug was introduced in init_salv_fsdcts which caused the paging device ID in the SST to be set incorrectly.

### IMPLICATIONS:
This change has been submitted with the DSS-191 system.
**MULTICS CHANGE REQUEST**

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**TITLE:** Improve & extend IOM manager

**AUTHOR:** N. Morris

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

**CLASSIFICATION STATUS DATE**

- STATUS: Written 2/6/74
- STATUS: Approved 8/12/74
- STATUS: Rejected
- STATUS: Postponed
- STATUS: Withdrawn
- STATUS: Expires 8/12/74

**CLASSIFICATION JUSTIFICATION**

- Replaced by proposal MCR

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

**REASONS:**
1. Provide new IOM manager entries to allow IOM operation in relative mode for the I/O interfaecer.
2. The `list_connect_pcw` entry of the IOM manager always calls `wire_stack`. This is wasteful if `list_connect_pcw` was called from a wired stack (as in the disk DIM).

**SUMMARY:**
1. New entries will be designed & documented to allow setting the LPW extension offset & bound fields before a connect is performed.
2. A new entry will be provided called `wired_connect_pcw`. At a later time, those programs which can take advantage of this entry can be modified.