TO: Distribution
FROM: Marilyn Hodges
DATE: January 18, 1974
SUBJECT: Multics Change Requests

Attached are copies of Multics Change Requests which were approved from January 1 through January 15, 1974.

Multics Project internal working documentation. Not to be reproduced or distributed outside the Multics Project.
TITLE: Upgrading of Answering Service to support new Network TELNET protocol.

AUTHOR: D. Wells

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:
Restriction | Increased Consistency | Awaiting Design Review.
Performance Improvement | Simplification | Install in Tools Library until policy decision regarding final location.
Reliability Improvement | Generalization | Bug Fix

REASONS: Because the Network is converting to a new TELNET protocol, a new Network typewriter IOSIM is being installed. This MCR is separated from the one proposing the change to the user process IOSIM because a particular sequence of installation is required to avoid the creation of nonviable processes.

SUMMARY: The Network portion of the Answering service will be changed to conform to the Network Standard for conversion to the new protocol. This includes the creation of two additional "ICP" sockets for connection to Multics. These new sockets will assume the only the new protocols (FTP and TELNET) will be used on them. The old sockets will be changed to automatically detect the usage of the new protocols and to then switch to them. At some later time, the support of the old protocols will be removed.

IMPLICATIONS: This is a change in standards. Because the Network community is responsible for insuring proper conversion, all users should be informed via normal Network documentation. However, info files will be installed informing users of this change and possible effects.
MULTICS CHANGE REQUEST

TITLE: Upgrading of user process Network IOSIM to support new TELNET protocol and to add additional functions.

AUTHOR: D. Wells

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

CLASSIFICATION | JUSTIFICATION | Replaced by proposal MCR
--- | --- | ---
X Incompatible Change | Marketing Requirement | Implemented in System
X Extension | X Conformance to Standard | Objections/Comments: Awaiting Design Review.
Restriction | Increased Consistency | Install in Tools Library until policy decision regarding final location.
Performance Improvement | Simplification |
Reliability Improvement | Generalization |
Bug Fix |

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

REASONS: Because the Network is converting to a new TELNET protocol, a new Network IOSIM is being installed. (There is an associated MCR for changes to the Answering Service.) Also, a need has been detected for implementation of full break/read delimiter detection over the Network. In addition, settable (via order call) editing characters are being installed as an experimental feature.

SUMMARY: A new Network IOSIM will be installed. This new IOSIM will support both new and old TELNET protocols. This new IOSIM will support changing break and kill read delimiter characters via standard mechanism (as documented in MPM). This new IOSIM will support changing editing characters via an order call. (This order call will not immediately be documented to users.) This new IOSIM also includes the ios_Order "read_status" order call support for APL and the IO Daemon.

IMPLICATIONS: This is a change in standards. Because the Network community is responsible for insuring proper conversion, all users should be informed via normal Network documentation. However, info files will be installed on Multics informing users of schedules and options chosen for the Multics implementation.

NOTE: At this time also, this new IOSIM will be installed in SSS to avoid problems with the new default search rules. Soon after installation of this IOSIM, the old IOSIM in TOOLS will be deleted.
TITLE: Additions to the ARPA Network Host Table

AUTHOR: Kenneth T. Pogran

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

CLASSIFICATION: Incompatible Change
JUSTIFICATION: Marketing Requirement

CLASSIFICATION: XX Extension
JUSTIFICATION: Conformance to Standard

CLASSIFICATION: Restriction
JUSTIFICATION: Increased Consistency

CLASSIFICATION: Performance Improvement
JUSTIFICATION: Simplification

CLASSIFICATION: Reliability Improvement
JUSTIFICATION: Generalization

CLASSIFICATION: Bug Fix

REASONS: Several hosts have recently come up on the ARPA Network whose names are not contained in the installed host table.

SUMMARY: The segment >tools>host_table is updated to include entries for the following Network hosts:

- Rutgers University TIP
- Rutherford High Energy Laboratory 360/195 (Sussex, England)
- University of Illinois ANTS Mark II
<table>
<thead>
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<th>MULTICS CHANGE REQUEST</th>
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<tr>
<td>TITLE: stop msa_manager_ from storing segment number in bit count of MSA components</td>
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<tr>
<td>AUTHOR: Gary Dixon</td>
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<tr>
<td>SOURCE: (if external: e.g., &quot;User&quot;, &quot;Marketing&quot;) MCR Board</td>
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REASONS:
In most instances, the bit count on a segment indicates how many bits of valid data the segment contains. msa_manager_ uses the bit count of an MSA (Multi-Segment Area) component to hold the segment number by which the MSA component must be initiated in order to maintain the validity of pointers stored in the MSA in another process.

SUMMARY:
Change msa_manager_ to set the bit count of new MSA components to \( \text{sys_info\_max\_seg\_size} \times 36 \), the number of valid bits of data in the MSA component. When truncating an MSA to a zero-length SSA (Single-Segment Area), set the bit count of the SSA to 0.

When initiating an MSA in a new process: initiate each MSA component with an arbitrary segment number; find the proper segment number for the MSA component from the base number of a pointer stored in the MSA component's header; terminate the MSA component; and re-initiate the MSA component with the proper segment number.

IMPLICATIONS:
This change will not affect the external interface of msa_manager_.
**MULTICS CHANGE REQUEST**

**TITLE:** edurf reports dates as 01/01/01

**AUTHOR:** Susan Barr

**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 |
| 1150002p (Phoenix) |
| X Bug Fix |

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

**REASONS:** edurf reported dates as 01/01/01

**SUMMARY:** edurf reports the correct date
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Use these headings: REASONS, SUMMARY, IMPLICATIONS, DETAILED PROPOSAL (Optional)

REASONS: print_dump_tape did not check for end of file on 9 track tapes

SUMMARY: program recognizes EOF for 7 and 9 track tapes.
# MULTICS CHANGE REQUEST

**TITLE:** Increase the size of STR-SEG

**AUTHOR:** S. Webber

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

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

**REASONS:** STR SEG (Segment Trailer Segment) is too small. If it overflows the system will crash.

**SUMMARY:** Increase it from 6K to 16K.
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**REASONS:** There is currently a bug in `get_proc_id` that unlocks a lock with a "STZ". It should use "STACQ".

**SUMMARY:** Replace the "stz" with appropriate code.
**MULTICS CHANGE REQUEST**

<table>
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<th>TITILE:</th>
<th>Extend fsm to handle new meters</th>
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| X | Gain Insight |

**REASONS:** Several new page control meters have been added to the system. A means is needed to get and display these. fsm is the obvious place to do this.

**SUMMARY:** Add new output to the "-page" option of fsm.
### MULTICS CHANGE REQUEST

**TITLE:** Fix bug in absentee dim's condition handler

**AUTHOR:** E. Stone

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

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

**REASONS:** The description of the machine conditions in this dim's condition handler describe those of the 645 and should be changed to reflect the machine conditions of the 6180 by means of the standard include file.
## Title: Install update_handler again and change interface

### Author: E. Stone

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

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### Justification

- Marketing Requirement

### Status

- Written: 12/26/71
- Approved: 1/1/72
- Rejected
- Postponed
- Withdrawn
- Expires: 7/2/7?

### Objections/Comments:

- No objections/comments.

### Reasons

**Reasons:** Two programs call update_handler infrequently. This fact was overlooked and it was removed from the system 6 months ago.

### Summary

**Summary:** At the same time the interface to update_handler should be changed to reflect the input required by the new acl primitives. The two callers of update_handler (archive_sort and reorder_archive) will be modified also.

### Implications

**Implications:** No problem results in the interface change since update_handler is an internal interface.
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**REASONS:**
Allow users without access to phcs to use the reloader with the -debug option.

A temporary change was made to the reloader to allow backup of 256K segments. This was done by calling phcs_set_max_length. It was not realized that non-privileged users do make use of the reloader.

**IMPLICATIONS:** This change will be removed when 256K segments are available to users.
TITLE: Allow PL/1_operators_ to be different in outer rings

AUTHOR: Eleanor Stone

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

CLASSIFICATION

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CLASSIFICATION JUSTIFICATION

- Incompatible Change
- Marketing Requirement
- Conformance to Standard
- Increased Consistency
- Performance Improvement
- Simplification
- Reliability Improvement
- Generalization
- Unreported
- X Bug Fix

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

REASONS: The procedure makestack assumed that the PL/1_operators_ used in an outer ring was the same in all rings.

This assumption was made in placing pointers to operators required by allm in the stack header.

These pointers may be derived without using the values in the ring-0 stack header and will permit installation of the EIS operator segment in the on-line library on a trial basis.
MULTICS CHANGE REQUEST

TITLE: Install new LISP subsystem

AUTHOR: David P. Reed, David A. Moon, Alexander Sunguroff

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

Project MAC

CLASSIFICATION | JUSTIFICATION | REPLACED BY PROPOSAL MCR
---|---|---
X Incompatible Change | Marketing Requirement | Implemented in System
X Extension | Conformance to Standard | Objections/Comments: To be installed in Author Maintained Library
X Restriction | Increased Consistency | |
X Performance Improvement | Simplification | |
X Reliability Improvement | Generalization | |
| | Bug Fix | |

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

REASONS: The LISP subsystem allows users to write, debug, execute, and compile programs written in the LISP language as defined by MIT's Project MAC and Artificial Intelligence Laboratory. The dialect of LISP which is implemented is known as MACLISP. Included in the subsystem are a LISP interpreter system, a LISP compiler, a special tracing/debugging package written for LISP (in LISP), and a program which allows formatting of LISP programs and data files (much like indent's operation for PL/I).

SUMMARY: The change involves deleting the old LISP subsystem, and installing a new one in its place.

IMPLICATIONS: The new LISP system is incompatible with the old one; however, the old one is unused at present, and does not work on the H6180 processor. Will enable a large number of software packages written at Project MAC and the Artificial Intelligence Laboratory to be carried over to and run on Multics. These packages include MACSYMA (a mathematical symbolic manipulation system), CONNIVER (an artificial intelligence language), MICRO-PLANNER (another AI language), and SHRDLU (an English-language understanding system), as well as a DOCTOR (ELIZA).

(see MPM Revision 15 for documentation of the lisp and lisp compiler commands.)
**MULTICS CHANGE REQUEST**

**TITLE:** gcos daemon changes

**AUTHOR:** P. Haber

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

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**REASONS:** See attached
The following changes are needed to fix various bugs in the gcos daemon and to make the daemon conform more closely to actual gcos. Each change discussed will include reasons, summary and implications.

1) Reason
The daemon currently converts gcos priority values to Multics priority values used to queue absentee and printing incorrectly.

Summary
Correct conversion code.

Implications
Daemon will convert priority values correctly.

Detailed Proposal

line 205 of gcos_read_cards_from
urgenty = divide (urgenty, 21, 17, 0);
to
urgenty = divide (64 - urgenty, 21, 17, 0) + 1;
Add above line to gcos_read_tape after line 669.

2) Reason
Requests are "imcv" and "imcv9" where imcv => 7 track tape. Multics tape software uses 9 track as default.

Summary
Change daemon requests to "imcv" and "imcv9", where imcv => 9 track tape. Change gcos daemon document to reflect.

Implications
Increased consistency between Multics and gcos daemon tape conventions.

Detailed Proposal

lines 233-244 of gcos_read_tape_

if arg = "imcv9" => if arg = "imcv9"
then do;
tape_type = ",9track"; => tape_type = "7track";
gcos daemon changes

1 = 6;
else
  if arg = "imcv"
  then do;
    tape_type = ",7track";
    tape_type = ",7track";
    i = 5;
  end;
end;

3) Reason

Gcos daemon should be referred to as "GCOS, SysDaemon" by system rather than "gcos,sysdaemon" for increased consistency with gcos conventions.

Summary

Change process overseer check so daemon can be logged in as GCOS SysDaemon

Implications

Phoenix will have to reregister the gcos daemon.

Detailed Proposal

Line 179 of gcos_daemon_init_from
  if name = "gcos"
  to
  if name = "GCOS"

4) Reason

Entry to set maximum queue priority attempts to set a return argument with which it was not called. Also, does not check validity of priority value.

Summary

Eliminate false argument setting, check priority value.

Implications

Daemon will not get a weird fault if operations attempts to set an invalid priority value.

Detailed Proposal

line 454 of gcos_queue_job_from
  gcos_daemon_stats_max_priority = a_priority;
if a_priority < gcos_daemon_stat_glow_priority | a_priority > gcos_daemon_stat правила_priority
then call com_err_ (0, gcos_queue_job_ "Attempt to set invalid priority: " a_priority);
else
gcos_daemon_stat_max_priority = a_priority;
return;
also add high_priority and low_priority to gcos_daemon_stat_.

5) Reason

Operation of daemon requires that its working directory be as specified in data base gcos_daemon_stat_. But return from admin mode does not check to insure this.

Summary

Insert code to change to appropriate directory after returning from admin mode.

Implications

Will avoid strange behavior if operations should switch working directories while in admin mode.

Detailed Proposal

Add after line 234 of gcos_daemon
input_dir = substr (gcos_daemon_stat_input_dir, 1, gcos_daemon_stat_input_dir_len);
Add after call to listen_admin
call change_wdir_ (input_dir, code);
if code = 0
then call com_err_ (code, "gcos_daemon_ " error changing to a. input_dir);

6) Reason

Gcos daemon should recognize tape options with or without leading hyphens. Gcos does not use hyphens for tape command options; Multics does. Whenever the operator is used to should work.

Summary

Make daemon recognize hyphenated tape options also: change daemon document to reflect this.
Implications

will help avoid operator errors.

Detailed Proposal

line 268 of gcos_read_tape_
  if arg = "all"
  to
    if arg = "all" | arg = "-all"
line 272
  if arg = "take"
  to
    if arg = "take" | arg = "-take"
line 276
  if arg = "start"
  to
    if arg = "start" | arg = "-start"
line 280
  if arg = "delete"
  to
    if arg = "delete" | arg = "-delete"

7) Reason

Gcos daemon does not check access for a given job submitter to needed directories before queueing absentee job in name of submitter.

Summary

Add code to make access check.

Implications:

Jobs with incorrect access will abort when submitted rather than when executed. Daemon will print out a meaningful error message as opposed to absentee being unable to begin execution of a job.

Detailed Proposal

In initialization work for gcos_read_, get internal static pointers to input_dir and pool_dir from hcs_gfs_set_ptr. After user_name is established for a given job, use hcs_gfs_set_mode to make sure user_name has sma access to both directories.

8) Reasons
If more than one invocation of the daemon exists, quitting while in admin mode will cause the daemon to return to the previous invocation of its command processor rather than to pass the quit to Multics.

Summary

Make daemon bypass all established quit handlers when in admin mode.

Implication

Change must await installation of MCR-069 and the PL/I EIS compiler (see Detailed Proposal).

Detailed Proposal

line 399 of gcos_daemon from revert condition (quit) to on condition (quit) system;

Reason

Daemon should return to command level when card hopper is empty and an eof card has just been read.

Summary

Check for eof when reading cards and hopper is empty.

Implications

None that I can think of.

Detailed Proposal

Add an "eof_found" switch argument to gcos_read_cards. Have gcos_daemon check it and go to command level if set.
# MULTICS CHANGE REQUEST

## TITLE: Installation of 355 software tools

### AUTHOR: D. Wells

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

### CLASSIFICATION JUSTIFICATION

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<tr>
<th>Incompatible Change</th>
<th>Extension</th>
<th>Restriction</th>
<th>Performance Improvement</th>
<th>Reliability Improvement</th>
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<tbody>
<tr>
<td>Marketing Requirement</td>
<td>Conformance to Standard</td>
<td>Increased Consistency</td>
<td>Simplification</td>
<td>Generalization</td>
</tr>
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**Replaced by proposal MCR**

**Objections/Comments:**

**CLASSIFICATION**

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

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

### REASONS: Install previously uninstalled tools used in creating DataNet 355 load files.

### SUMMARY: Install two programs (plus supporting subroutines) to

1. assemble a 355 source file;
2. produce a core image file from previous assemblies.

### DETAILED PROPOSAL: Install "map 355" and "build 355". These programs present a user interface very similar to other compilers and loaders/binders. They actually perform the assemblies and loads by creating a gcos job deck and invoking the gcos simulator.
# MULTICS CHANGE REQUEST

**TITLE:** change tape configuration cards  

**AUTHOR:** N. J. Morris  

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

**CLASSIFICATION:** Internal  

<table>
<thead>
<tr>
<th>CLASSIFICATION</th>
<th>JUSTIFICATION</th>
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<tr>
<td>Incompatible Change</td>
<td>Marketing Requirement</td>
<td>Implement in System</td>
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<td>Improvement</td>
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<td>Objections/Comments:</td>
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<td>Reliability Improvement</td>
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<td>Bug Fix</td>
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**Use these headings: REASONS, SUMMARY, IMPLICATIONS, DETAILED PROPOSAL (Optional)**

**REASONS:** In the near future, the tape DCM will be modified to allow the use of more than one physical tape channel. Information will have to be provided as to the number of channels available. The configuration deck should be modified to reflect the need for this additional information.

**SUMMARY:** The PRPH card will be modified to remove the TAP7 and TAP9 items since these items contain redundant information. Instead the card will appear as shown:

```
PRPH TAPE Channel# nchannels
```

The TAPE card will be modified to contain the information formerly on the PRPH card. The new format of the TAPE card will be as shown:

```
TAPE nsysdrives maxdrives f9drive n9drives f7drive n7drives
```
TITLE: Fix to 355 bug

AUTHOR: R.B. Snyder

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

CLASSIFICATION

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<td>X Bug Fix #233</td>
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STATUS DATE

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CLASSIFICATION JUSTIFICATION Replaced by proposal MCR

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

REASONS: Queued status is not being thrown away by tty_inter on a stop_channel operation.

SUMMARY: tty_inter will be changed to search its status queues for status for a line for which a stop_channel is to be performed. These status words will be thrown away.

IMPLICATIONS: none