TO: Distribution
FROM: Joan Archer
DATE: 1 August 75
RE: Multics Change Requests

Enclosed are copies of Multics Change Requests which were approved from 15 July 75 through 31 July 75.

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MULTICS CHANGE REQUEST

TITLE: Install new program to validate info segments

AUTHOR: VanVleck

Planned for System? not applicable
Fixes Bug Number(s)? not applicable
Documented In MTB? 201
Incompatible Change? no
User/Operations-visible Interface Change? no
Coded Into ( ) PL/I ( ) ALM ( ) other-see below
Performance? ( ) better ( ) same ( ) worse

DOCUMENTATION CHANGES (specify one or more)

HPM (vol, sect) MPAM (sect)
MOSN (sect) MSAM (sect)
PLMs (AN#) ANxxx
Info Segs
Other

HEADINGS AREA
SUMMARY, REASONS, IMPLICATIONS, DETAILED PROPOSAL (optional)

SUMMARY:
Install validate_info_seg, a program which issues diagnostics if the info segment it operates on does not meet certain system standards.

REASONS:
This program will be useful for insuring that info segments to be submitted meet the standards described in ANxxx, System Programming Standards.

In addition, validate_info_seg will be useful for finding those info segments which have not yet been converted to the new standards.

IMPLICATIONS:

none
### SUMMARY:

Install a new version of help with the following features:

1. The star convention is supported.

2. Use of printer-on (006) character is discontinued; instead, help will look for an empty line as a pause delimiter.

3. If a paragraph starts with a phrase followed by a colon, help assumes that this is the title of a section. The section title is used in the query, and can be searched for. An example of the new query format is:

    7 lines titled Arguments follow. More help?

4. The user may request searching for any paragraph containing specified strings. If searching for both paragraphs and strings is requested, paragraph search is done first.

5. When the user is asked "more help?" the reply may be one of:

   - yes
   - no
   - quit
   - rest
The new version of help, together with stricter standards on the content of help segments, should enable the user to obtain the answers to his questions more quickly.

The star convention, together with the list and searching options, eliminate the need for the AML "list_help" command and allow the user to look for information even when he's not sure where it is.

Dividing the contents of info segments into sections allows the user non-sequential access to the information on a topic.

Old format info segments are handled compatibly, since special code checks for any 006 characters and uses 006 as the pause delimiter if any are found.

Installing this command and adopting the standards that go with it does mean that sooner or later, we will have to rewrite almost all of the info segments on the system.
TITLE: Install user command display_pll_file_error

AUTHOR: R. Schoeman

SUMMARY:

Install a command which will diagnose errors raised during PLL I/O.

REASONS:

When an error is detected during PL/1 I/O a condition is signalled but no other information is given to the user. In order to understand the error he must know the description of the I/O operation he requested, the attributes of the file state block, and the specific error detected by iox_. This command looks at the above mentioned sources of information, does some simple analysis, and tells the user sufficient relevant information to understand and correct the error.

DETAILED PROPOSAL:

Three sheets follow showing sample invocations of the command. The information it prints is dependent on the type of error it detects.
There was no error raised during PL/1 I/O in this process.

Error: transmit condition by \texttt{\textgreater udd>\textgreater rhs>\textgreater test>oop1\textgreater \textgreater \textgreater} occurred while doing I/O on file user_input

Data could not be reliably transmitted between file and some values in an I/O statement handler for error returns to command level.

I/O error on file user_input

Title: vfile_ user_input
Attributes: open input notkeyed record sequential
Permanent attributes: input record
Last I/O operation attempted: read into
Last I/O error code for that file: Invalid I/O operation.

Error: undefined file condition by \texttt{\textgreater udd>\textgreater rhs>\textgreater test>oop7\textgreater \textgreater \textgreater} occurred while doing I/O on file file2

I/O error on file file2

Title: vfile_ file2
Attributes: output stream notkeyed sequential
Error in opening or closing file file2
Last I/O error code for that file: Incorrect access on entry.

Error: undefined file condition by \texttt{\textgreater udd>\textgreater rhs>\textgreater test>oop8\textgreater \textgreater \textgreater} occurred while doing I/O on file file3

I/O error on file file3

Title: vfile_ file3
Attributes: input stream notkeyed sequential
Permanent attributes: input
Error in opening or closing file file3
Last I/O error code for that file: Entry not found.
oop3

Error: error condition by >udd>m>rhs>test>oop3\{125
Statement conflicts with file attributes.
  r 1233 0.279 13.140 119 level 2, 13

dpfe

I/O error on file afile
  Title: vfile_ afile
  Attributes: open input notkeyed record sequential
  Last i/o operation attempted: write from
  Attempted "write" operation conflicts with file "input" attribute.
  Attempted "from" operation conflicts with file "input" attribute.
  r 1233 0.188 0.561 13 level 2, 13

oop1

Error: key condition by >udd>m>rhs>test>oop1\{115
occurred while doing I/O on file pl
key either does not exist in file
or could not be added because it already exists

system handler for error returns to command level
  r 1233 1.181 22.052 142 level 3, 27

dpfe

I/O error on file pl
  Title: vfile_ pl
  Attributes: open output record sequential keyed
  Last i/o operation attempted: write key from
  Last i/o error code for that file: Key out of order.
  r 1233 0.154 1.830 44 level 3, 27

oop2

Error: undefined file condition by >udd>m>rhs>test>oop2\{105
occurred while doing I/O on file xx

system handler for error returns to command level
  r 1234 0.300 9.506 69 level 4, 41

RL
  r 1234 0.089 0.072 30

dpfe

I/O error on file xx
  Title: vfile_ xx
  Attributes: input notkeyed record sequential
  Permanent attributes: record
  Error in opening or closing file xx
  Last i/o error code for that file: Entry not found.
  r 1234 0.158 0.074 14
Error: undefined file condition by >udd>m>rhs>test>oop5:67 occurred while doing I/O on file file!

system handler for error returns to command level
r 1230 0.988 10.940 106 level 2, 16
RHS>dpfe

I/O error on file file!
  Title : vfile_file!
  Attributes: input stream interactive environment
Error in opening or closing file file!
The interactive attribute conflicts with the input attribute.

r 1230 0.207 2.014 40 level 2, 16
oop4

Error: undefined file condition by >udd>m>rhs>test>oop4:67 occurred while doing I/O on file xxx

system handler for error returns to command level
r 1231 0.258 7.574 61 level 3, 30
dpfe

I/O error on file xxx
  Title : vfile_xxx
  Attributes: input stream record
Permanent attributes: input record
Error in opening or closing file xxx
The record attribute conflicts with the stream attribute.

r 1231 0.147 0.940 37 level 3, 30
oop3

Error: record condition by >udd>m>rhs>test>oop3:140 occurred while doing I/O on file afile

Record read by read statement is not the same size as the target.
 system handler for error returns to command level
r 1232 0.768 15.500 138 level 4, 44
RL
r 1232 0.123 2.450 12
dpfe

I/O error on file afile
  Title : vfile_afile
  Attributes: open input notkeyed record sequential
Last i/o operation attempted : read into
 Last i/o error code for that file : Record is too long.

r 1232 0.217 1.822 77
MPM  

display_pll_file_error

Name:  display_pll_file_error, dpfe

The display_pll_file_error command is intended to be invoked after the user has had an i/o error signalled while performing pll i/o, at which time it displays information about the most recent file on which a pll i/o error was raised and other diagnostic information about that error. The type of information displayed is dependent on the specific kind of error raised.

Usage:

display_pll_file_error

Example:

The command
dpfe

might respond with the following display:

I/O error on file afile
Title:  vfile_afile
Attributes:  open input notkeyed record sequential
Last i/o operation attempted:  write from
Attempted "write" operation conflicts with file "input" attribute.
Attempted "from" operation conflicts with file "input" attribute.
**TITLE:** Install user command display_pll_i_error  
**AUTHOR:** R. Schoeman

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<tr>
<td>Sys. Prog. Tools</td>
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- Coded in [ ] PL/I [ ] AIM [ ] other-  
- Planned for System MR  
- Fixes Bug Number(s)  
- Documented in MTB  
- User/Operations-visible  
- Interface change? [ ] yes [X] no  
- Incompatible change? [ ] yes [X] no  
- Performance: [ ] Better [X] Same  
- Replaces MCR  

- Document Specify One or More  
  - MPM (Vol, Sect.) AG92, Section 3
  - PLMS (AN #)
  - MOSN (Sect.)
  - MPAM (Sect.)
  - MSAM (Sect.)

**Objections/Comments:**  
- Info Segs  
- Other (Name)  
- None (Reason)

Use these headings:  

**SUMMARY:**

Install a command which will diagnose errors raised during PLL i/o.

**REASONS:**

When an error is detected during PL/I i/o a condition is signalled but no other information is given to the user. In order to understand the error he must know the description of the i/o operation he requested, the attributes of the file state block, and the specific error detected by iox_. This command looks at the above mentioned sources of information, does some simple analysis, and tells the user sufficient relevant information to understand and correct the error.

**DETAILED PROPOSAL:**

Two sheets follow showing sample invocations of the command. The information it prints is dependent on the type of error it detects.
There was no error raised during PL/I i/o in this process.

oop6

Error: undefined file condition by >uad>m>rhs>test>oop6:67
occurred while doing I/O on file file1

system handler for error returns to command level

oop7

Error: error condition by >uad>m>rhs>test>oop7:104
Statement conflicts with file attributes.

oop8

Error: undefined file condition by >uad>m>rhs>test>oop8:66
occurred while doing I/O on file file3

system handler for error returns to command level

oop10

Error on file file3, status code: Entry not found.
Title: vfile_file3
Attributes: input stream notkeyed sequential
Permanent attributes: input
Error in opening or closing file3

Error on file p1, status code: Key out of order.

Title: vfile_p1
Attributes: open output record sequential keyed
Last i/o operation attempted: write key from
r 1524 0.268 5.280 64 level 2, 16

oop2

Error: undefined file condition by &uod>m>rhs>test>oop2:105
occurred while doing I/O on file xx

system handler for error returns to command level
r 1525 0.473 15.765 240 level 3, 30

display_pllio_error

Error on file xx, status code: Entry not found.
Title: vfile_xx
Attributes: input notkeyed record sequential
Permanent attributes: record
Error in opening or closing xx
r 1525 0.187 2.850 69 level 3, 30

oop3

Error: record condition by &uod>m>rhs>test>oop3:140
occurred while doing I/O on file afile

Record read by read statement is not the same size as the target.
system handler for error returns to command level
r 1526 0.679 15.730 228 level 4, 44

display_pllio_error

Error on file afile, status code: Record is too long.
Title: vfile_afile
Attributes: open input notkeyed record sequential
Last i/o operation attempted: read into
r 1526 0.142 2.280 73 level 4, 44

oop3

Error: error condition by &uod>m>rhs>test>oop3:125
Statement conflicts with file attributes.
r 1527 0.369 13.993 164 level 5, 55

dpe

Error on file afile
Title: vfile_afile
Attributes: open input notkeyed record sequential
Last i/o operation attempted: write from
Attempted "write" operation conflicts with
file "input" attribute.
Attempted "from" operation conflicts with
file "input" attribute.
r 1526 0.175 1.002 50 level 5, 55
TITLE: Changes to stu_
AUTHOR: J. M. Broughton

SUMMARY:

1. Modify stu_ to correctly handle variables in separate static.

2. Allow COBOL structure qualified label constants.

3. Use version 2 object_info_ structure.

REASONS:

1. This module is used by debugging routines and language I/O
   routines to access variables at runtime. Currently, the
   assumption is made that static variables reside in the linkage
   section. When separate static is available, this will not be
   true.

2. Currently, it is assumed that label constants have no structure
   qualification, and the code enforces this as a needless restric­
   tion. For debugging routines to properly work with COBOL, this
   restriction must be removed.

3. Conform to standard.

DETAILED PROPOSAL:

1. Modify components get_runtime_address, decode_runtime_value
   and remote_format to access variables in static by fetching
   the static pointer from the ISOT. This works now because the
ISOT pointer presently points at the LOT.

2. Change find_runtime_symbol to remove the restriction.

3. Change find_header to use new format.
SUMMARY:

Supply translation tables in tty DIM for Correspondence 2741 terminal with 015 type ball.

REASONS:

There are such terminals in the field, and Multics does not currently support them.

IMPLICATIONS:

None.

DETAILED PROPOSAL:

Add a set of tables to tty_ctl_mexp to perform translation to/from correspondence code. Invent a new terminal type, "CORR2741", for a 2741 terminal with correspondence code; this replaces the obsolete type "IBM2741", formerly used for "unmodified" 2741 terminals.

Note: A "-type" control argument to login will permit the user to specify terminal type at login time; at the same time a mechanism will be introduced to permit the Answering Service to recognize correspondence-type terminals. These changes are the subject of another MCR.
**set_tty**

**Name:** set_tty, stty

The `set_tty` command may be used to modify the type of the user's terminal and/or the modes associated with terminal I/O. The type as specified by this command is used for determining character conversion and delay timings, and has no effect on communications line control.

**Usage**

```
set_tty -control_args-
```

where `control_args` may be chosen from the following control arguments:

- `-switch XX` specifies that the command is to be applied to the I/O switch whose name is XX. If this control argument is omitted, the user_i/o switch is assumed.

- `-type XX` causes the user's terminal type to be set to device type XX, which can be any one of the following:

  - `1050` device similar to IBM Model 1050
  - `2741` device similar to IBM Model 2741
  - `CORR2741` or `corr2741` device similar to IBM Model 2741 with Correspondence keyboard and type ball
  - `TTY37` or `tty37` device similar to Teletype Model 37
  - `TTY33` or `tty33` device similar to Teletype Models 33 or 35
  - `TTY38` or `tty38` device similar to Teletype Model 38
  - `TN300` or `tn300` device similar to GE Terminal Net 300 or 1200
  - `ARDS` or `ards` device similar to Adage, Inc. Advanced Remote Display Station (ARDS)
  - `ASCII` or `ascii` device similar to a Computer Devices Inc. (CDI) Model 1030 or Texas Instruments (TI) Model 725, or a device with an unrecognized answerback, or a device without an answerback (these devices are collectively termed "ASCII" devices)

The default modes for the new terminal type are turned on.
This I/O module supports I/O from/to devices that can be operated in a typewriter-like manner, e.g., the user's terminal.

info causes information about the device to be returned. The info_ptr should point to the following structure that is filled by the call:

dcl 1 info_structure aligned,
  2 id char(4) unaligned,
  2 reserved char(8) unaligned,
  2 type fixed bin;

where:

1. id is the identifier of the specific device as told to Multics by the device when the device is initialized.

2. reserved is space reserved for compatibility purposes.

3. type identifies the type of device:

   1 = device similar to IBM 1050
   2 = device similar to IBM 2741
   3 = device similar to Teletype Model 37
   4 = device similar to TerminiNet 300
   5 = device similar to ARDS
   6 = device similar to IBM 2741 with correspondence keyboard and 015 type ball
   7 = device similar to Teletype Models 33 or 35
   8 = device similar to Teletype Model 38
   9 = unused
   10 = unused
   11 = device similar to a COI!Model!1030 or TITModel!725, or a device with an unrecognized answerback, or a device without an answerback (these devices are collectively termed "ASCII" devices)
# Multics Change Request

**TITLE:** "capo" mode for tty DIM

**AUTHOR:** R. Coren

---

**Category (Check One):**
- Lib. Maint. Tools
- Sys. Anal. Tools
- Sys. Prog. Tools

**PL/I**

**User/Operations-visible Interface change?** 
- yes
- no

**Progr. Tools**

**Incompatible change?** 
- yes
- no

**Document Specified One or More**
- MPM (Vol. Sect.) Sub (tty)
- X Ring Zero
- Ring One
- SysDaemon/Admin.
- MOSN (Sect.)
- Runtime
- MPAM (Sect.)
- User Cmd/Subr.
- MSAM (Sect.)

**Objections/Comments:**
- Info Segs
- Other (Name)
- None (Reason)

---

**SUMMARY:**

Provide "capo" mode for terminal I/O, which will force all output to upper case.

**REASONS:**

FAST requires the capability to output in upper case to provide visual compatibility for users accustomed to seeing FORTRAN programs in caps.

**IMPLICATIONS:**

None.

**DETAILED PROPOSAL:**

In "capo" mode, all lower-case letters will be printed on the user's terminal in upper case. If the user is in "edited" mode as well, upper-case letters will be unaffected; in "edited" mode, upper-case letters will be preceded by an escape character (e.g., \A). Input will not be affected.

Note: A control argument to login, "-capo", which will put the user's terminal in capo mode, is the subject of another MCR.
Modes Operation

The modes operation is supported when the I/O switch is open. The recognized modes are listed below. Some modes have a complement indicated by the circumflex character (^) that turns the mode off (e.g., -erkI). For these modes the complement is displayed along with the mode.

capo, ^capo specifies that all lower-case letters are to be output in upper case. If edited mode is on, upper-case letters will be preceded by an escape (\) character.
SUMMARY:
Fix unreported bug in adjust_cutoff_ causing it to work incorrectly in most cases.

REASONS:
Project Administrators are unable to give cutoff dates to more than one user due to a bug in adjust_cutoff_ that messes up the cutoff dates when called more than once with the same current time (which up PDT_ does).

IMPLICATIONS:
Cutoff dates will work as documented in the Project Administrator's Manual.
**TITLE:** Fix 8-char. bug in abbrev  

**AUTHOR:** S. Herbst  

|---------------------|-------------------|------------------|------------------|-----|---------|----------|---------|-------------------|---------|-------------|---------|---------------------|

- **Planned for System MR**  
- **Fixes Bug Number(s)**  
- **Documented in MTB**  
- **User/Operations-visible Interface change?** X yes no  
- **Incompatible change?** X yes no  
- **Performance:** X Better no Same  
- **Replaces MCR**  

**Objections/Comments:**  

None (Reason) already corrected  

---

**SUMMARY:**  

Fix abbrev to complain if the user tries to define an abbreviation longer than 8 characters.  

**REASONS:**  

Currently, there is no warning and the name of the abbreviation is truncated to 8 characters.
**Title:** Long Names in BOS for DUMP command  
**Author:** B. Greenberg

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<td>Fixes Bug Number(s)</td>
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<td>X BOS</td>
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<td>X Salverger</td>
<td>Interface change? [ ] yes [ ] no</td>
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**Objections/Comments:**

Use these headings: Summary of Proposal, Reasons for Proposal, Implications, Detailed Proposal.

**SUMMARY:** Have BOS SCAN provide EIS descriptors for arbitrary-length alphabetic arguments. Change BOS DUMP to accept segment names for the SEG and STACK subcommands, using these descriptors.

**REASONS:** It is currently impossible to specify to BOS DUMP the name of a segment to be dumped. This means that system-independent RUNCOMS cannot be created to take dumps. Furthermore, much fumbling and potential error is involved in determining segment numbers of segments which one wants to dump.

**IMPLICATIONS:**

1. More operational flexibility, fewer operator errors following the current obscure instructions for dumping a given segment by name.
2. No hardcore segment may have capital letters in its name if it is to be dumped in this way. Currently, none do.

**DETAILED PROPOSAL:** Have the SEG and STACK subcommands of DUMP obtain their first argument, if alphabetic from an EIS descriptor provided by BOS SCAN. The name pointed to by this descriptor will be converted to ASCII and searched for in the SLT. If found, the corresponding segment number will be used instead. Otherwise a diagnostic will be printed.

BOS SCAN will provide an array of EIS descriptors for all alphabetic arguments, so that any command can use long names.
SEG s

Dumps segment only, where s is either a segment number or the name of a hardcore segment.

Example: SEG 55
          SEG KST_SEG

STACK seg offset

Dumps segment seg as stack frames (both forwards and backwards) starting from offset, where:

seg is either a segment number (used as a base), or the name of a hardcore segment.

offset is an octal offset (used as a stack pointer).

NOTE: If offset is missing, the location of the first stack frame is used. If no seg is specified, the contents of pointer register 6 in the machine conditions will be used.

Example: STACK 205 1760
          STACK SHUTDOWN_STACK

Alternatively, STACK RING n offset where n is a number from 0 to 7, dumps the ring n stack of the process that entered BOS.

Example: STACK RING 4
TITLE: BOS Stack dump by Ring

AUTHOR: B. Greenberg

SUMMARY:
Modify BOS DUMP to accept the command STACK RING n, where n is a small integer, as equivalent to

STACK (8*dbr.stack + n)

REASON:
The ability to have system-independent RUNCOMS for producing dumps.

IMPLICATIONS: n/a

DETAILED PROPOSAL:
(See "SUMMARY"). Also, refuse to perform this transformation if dbr.stack is 0, indicating that initialization has not yet set up a multi-ring environment.
TITLE: Fix pc_contig out-of-service bug

AUTHOR: B. Greenberg

SUMMARY:

Restore pc_contig's knowledge of his own ability to evict out-of-service and RWS'ing core frames.

REASON:

New conventions in 25-5 changed meaning of zero thread word in core map entry - small, heavily loaded systems can run out of core for I/O Interfacer usage if much core is out of service.

IMPLICATION:

Reliability.
MULTICS Change Request

TTLTE: Implement start_xmit_hd and stop_xmit_hd for ARDS terminals

AUTHOR: R. Coren

-Coded in XPL/I [X] [ALM] [X] other-
-Planned for System MR 3.0
-Fixes Bug Number(s)
-Documented in MTB
-User/Operations-visible Interface change? [X] yes [no]
-Incompatible change? [X] yes [no]
-Performance: [ ] Better [X] Same
-Replaces MCR

Category (Check One)
Lib. Maint. Tools
Sys. Anal. Tools
Sys. Prog. Tools

Document Specified One or More

PLMS (AN #)
MOSN (Sect.)
MPAM (Sect.)
MSAM (Sect.)

SUMMARY: Implement two new control operations for tty_ which permit an ARDS terminal to remain in transmit mode until further notice.

REASONS: With MCS and the new user-ring graphics software, an ARDS which drops out of transmit mode between blocks of graphic output will drop out of graphics mode as well.

IMPLICATIONS: None.

DETAILED PROPOSAL:

Ring Zero tty DIM: Invent two new control operations ("orders") (start_xmit_hd and stop_xmit_hd) to be transmitted to the 355.

355: Set a flag when the start_xmit_hd order is received such that the HSIA subchannel will be held in transmit mode at the completion of output, until a stop_xmit_hd order is received. Once output has started in "xmit_hd" mode, typed input will be ignored until after the stop_xmit_hd order.
start_xmit_hold causes the channel to remain in a transmitting state at the completion of the next block of output, rather than starting to accept input. The line will then remain in a transmitting state until the stop_xmit_hold control operation is requested. This operation is valid only for ARDS-like devices.

stop_xmit_hold causes the channel to resume accepting input from the terminal (after the completion of current output, if any). This operation is only valid for ARDS-like terminals, and is used only to counteract a preceding start_xmit_hold operation.
**TITLE:** Change linker to work with separate static object segments

**AUTHOR:** S. Webber

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- Planned for System MR
- Fixes Bug Number(s) 355
- Documented in MTB
- User/Operations-visible BOS
- Interface change? X yes □ no
- Incompatible change? X yes □ no
- Performance: □ Better X Same □ Worse
- Replaces MCR

**STATUS DATE**

- Written 07.15.75
- Expires 01.22.76

**DOCUMENTATION CHANGES**

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**Objections/Comments:**

- Info Segs
- Other (Name) Not yet written
- None (Reason)

**Use these headings:** Summary of Proposal, Reasons for Proposal, Implications, Detailed Proposal.

**SUMMARY:**

Change linker to work with separate static object segments.

**REASONS:**

Necessary before any separate static object segments can be installed or any translators that create them can be installed.

**IMPLICATIONS:**

1. The hardcore, initialization prelinker will not accept separate static initially.
2. User documentation on the ISOT should be made available (MPM (SWG) already in the mill).

**DETAILED PROPOSAL:**

Change callers of lot_maintainer to pass virgin static pointers and expect in return a pointer to the copied static if the segment has separate static. The linker will be changed to use the new object_info_structure.

Also change initialization to use same lot_maintainer calls.
**Multics Change Request**

| TITLE: | Change print_gen_info to use new object_info structure. |
| STATUS | Written 07/15/75 |
| DATE | A 07/22/75 |

**AUTHOR:** S. Webber

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### Category (Check One)
- Lib. Maint. Tools
- Sys. Anal. Tools
- X Sys. Prog. Tools

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**USE THESE HEADINGS:** Summary of Proposal, Reasons for Proposal, Implications, Detailed Proposal.

### SUMMARY:

Change print_gen_info to use new object_info structure.

### REASONS:

Part of changeover so the system is fully cognizant of separate static object segments.
**Summary:**

Update all known callers of `object_info` not mentioned in other MCR's to use the version 2 `object_info` structure.

Delete obsolete program `check_object`.

**Reasons:**

To improve system consistency.

**Implications:**

These changes are generally very minor.

**Detailed Proposal:**

The following programs are involved:

- `get_defname`
- `call_finder`
- `upd_doc_task`
- `print_sample_refs`
- `object_test`
- `make_lisp_listing`
- `gcors_gain`
- `lisp_load`
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<th>TITLE: Revise programs that Get Linkage Information for a pointer</th>
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<td>AUTHOR: M. Weaver</td>
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<td>-Coded in [X] PL/I [ ] ALM [ ] other explain in DETAILED PROPOSAL</td>
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Objections/Comments: None (Reason)

Use these headings: Summary of Proposal, Reasons for Proposal, Implications, Detailed Proposal.

SUMMARY:

The following programs are in bound_debug_util_ and bound_trace_stack_.

1. Rename find_ls_owner_ to find_owner_ and change calling sequence to include section info.
2. Rename get_link_entry_name_ to find_nonobject_info_ and change calling sequence to include additional useful output info obtained by the routine anyway.
3. Change interpret_ptr_ to use the version 2 object_info_ structure, and to call find_nonobject_info_, obtaining better names in more nonobject cases.
4. Change get_entry_name_ to call find_nonobject_info_ instead of get_link_entry_name_ even though it doesn't need the extra info.
5. Delete is_cls_ (after default_error_handler_ no longer calls it).

REASONS:

Make the routines work with separate static. Improve interfaces. is_cls_ was needed primarily because of entry sequences in the linkage section.
IMPLICATIONS:

No other programs are known to be affected by the interface changes. Some of trace_stack's output will be slightly different. Information for certain faults by vl,pll programs will be less helpful.

DETAILED PROPOSAL:

See attached writeups of find_owner_ and find_nonobject_info_. find_owner_ will use the linkage and static lengths in the linkage header to determine whether an offset is within a particular linkage or static section. interpret_ptr_ no longer needs to call is_cls_ or find_ls_owner_ directly.
ADDENDUM to MCR 1296

Add a sixth argument to find_owner_

b) ls_ptr is a pointer to the beginning of the owner's linkage section. (Output)

This information is already available to find_owner_ and is needed by its primary caller.
Name: find_owner_

This procedure obtains the segment number of the owner of an active linkage or static section pointed to by a given pointer.

Usage

declare find_owner_ entry (ptr, fixed bin(18),
fixed bin(18), char(8) aligned, fixed bin):
call find_owner_ (p, owner, section_offset, section, class):

1) p points to a nonobject segment. (Input)

2) owner is the segment number of the owner of the active linkage or static section that p points to; is -1 if p does not point to an active linkage or static section. (Output)

3) section_offset is the offset of the beginning of the active linkage or static section that p points to. (Output)

4) section is the symbolic name of the logical section that p points to. It is either "linkage" or "static" or ".". (Output)

5) class is the definition class of the physical section that p points to. It is 1 if owner was found through the LOT and is 4 if owner was found through the ISOT. (Output)
**Name:** find_nonobject_info_

This procedure obtains some object segment related info, if possible, about a pointer that doesn't point to an object segment.

**Usage**

```c
declare find_nonobject_info_ entry (ptr, char(*),
    fixed bin(18), char(9) aligned,
    fixed bin(18), fixed bin(35));

call find_nonobject_info_ (p, ename, segno, section,
    adjusted_offset, code);
```

1) **p**
   - points to a nonobject segment. (Input)

2) **ename**
   - is the name from the definition if p points to a location that the linker might find. (Output)

3) **segno**
   - is the segment number of the owner of the active linkage of static section that p points to. It is -1 if p does not point to an active linkage or static section. (Output)

4) **section**
   - is the symbolic name of the logical section that p points to. It is either "linkage" or "static" or "text". (Output)

5) **adjusted_offset**
   - is the offset of p relative to the beginning of the section that p points to. (Output)

6) **code**
   - is a standard status code and is nonzero if a name could not be found. (Output)
**TITLE:** Fix pi bug in sending mail  

**AUTHOR:** S. Herbst

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**Objections/Comments:**

Use these headings: Summary of Proposal, Reasons for Proposal, Implications, Detailed Proposal.

**SUMMARY:**

Fix bug in mail that produces a fault when the pi handler is invoked to save partially typed unsent_mail.
TITLE: Fix bug in format_word_list
AUTHOR: Jerry A. Stern

- Coded in: [ ] PL/I [x] AIM [ ] other
- Planned for System MR: 3.0
- Fixes Bug Number(s): 0
- Documented in MTR
- User/Operations-visible: [ ] yes [x] no
- Interface change? [ ] yes [x] no
- Performance: [ ] Better [x] Same
- Replaces MCR

Category (Check One)
- Lib. Maint. Tools
- Sys. Maint. Tools
- Sys. Anal. Tools
- Sys. Prog. Tools
- 355
- BOS
- Salvager
- Ring Zero
- Ring One
- SysDaemon/Admin.
- Runtime
- User Cmd/Subr.

STATUS
- Written: 7/16/75
- Status: A 07/22/75
- Expires: 01/22/76

DATE

DOCUMENTATION CHANGES

- Document
- Specify One or More
- MPM (Vol, Sect.)
- PLMS (AN #)
- MOSN (Sect.)
- MPAM (Sect.)
- MSAM (Sect.)

Objections/Comments:

Use these headings: Summary of Proposal, Reasons for Proposal, Implications, Detailed Proposal.

Summary: Change the format_word_list command to use the get_line_length subroutine to determine the appropriate width for output.

Reasons: The determination of the line length currently made by format_word_list relies on the uniqueness of the substring "ll" within the modes string for user-output. The introduction of "fullduplex" mode will cause this method to fail.

Implications: Once fullduplex mode is introduced, format_word_list will cease to work until this bug is fixed.
SUMMARY:
Some bugs have been discovered in various programs modified for the Access Isolation mechanism. Fix them.

REASONS:
Bug fixes.

IMPlications:
Programs will work as documented.

DETAILED PROPOSAL:
1. cv_pmf will allow dollar-signs in pathnames.
2. get_line_length_ will work properly.
3. dialled terminals will work properly.
4. the authorization of the process will be printed at new_proc time as well as at login time, if is greater than system_low.
5. generated passwords will be exactly 6 chars long, rather than from 6 to 8.
TITLE: Add feature to ioa_ to understand arrays.

AUTHOR: S. Webber

SUMMARY:

Allow ioa_ to accept an array of items as one of the "substituted" arguments.

REASONS:

Useful extension. Permits more efficient coding of several programs.

IMPLICATIONS:

If any programs currently are passing an array and expecting only the first element to be used they will work differently. This was an illegal use of ioa_.

DETAILED PROPOSAL:

See attached MPM documentation.
Array Parameters

The arguments that are edited into the control string by the ioa_ subroutines may be arrays. If this is the case, ioa_ selects elements from the array until all array elements are used up before going on to the next argument in the argument list. All conventions apply to elements of arrays that apply to simple scalar arguments. In particular, the \~s control code will skip the next element of an array if ioa_ is currently in the process of selecting elements from an array. The arrays are scanned in the order that PL/I allocates the elements, i.e., row major order.

Source: dcl a(2,2)fixed bin init(1,2,3,4);  
call ioa_("\~d \~s \~w", a);  
Result: 1 3 000000000004

Source: dcl b(6:9)fixed bin init(6,7,8,9);  
call ioa_("\~v(\~3d \~~",dim(b),1,b);  
Result: 6 7 8 9
**TITLE:** Delete translate_gate program

**AUTHOR:** S. Webber

|---------------------|-------------------|------------------|------------------|-----|

**Status**
- Written: 07/18/75
- Expires: 01/29/76

**REQUEST**
- Planned for System MR
- Fixes Bug Number(s)
- Documented in MTB
- User/Operations-visible Interface change? Yes [X] No
- Performance: Better [X] Same
- Replaces MCR

**DOCUMENTATION CHANGES**
- Document: Specifying one or more

**Objections/Comments:**
- Info Segs
- Other (Name)
- None (Reason) undocumented

**Use these headings:** Summary of Proposal, Reasons for Proposal, Implications, Detailed Proposal.

**SUMMARY:**
Delete obsolete, unused program translate_gate from system.

**REASON:**
Not used anymore. mexp has been used for years to create gate segments.
**TITLE:** Fix bug in record_stream

**AUTHOR:** M. Asherman

- **Category:** Lib. Maint. Tools
- **Date:** Written 07.18.75
- **Status:** Written 07/19/75
- **Expires:** 01/29/76

**DOCUMENTATION CHANGES**

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**User/Operations-visible**
- Interface change? □ yes □ no
- Incompatible change? □ yes □ no

**Performance:**
- Better □  Same ❑  Worse □
- Replaces MCR □

**Objections/Comments:**
- Problem caused by "padded reference" bug in Pll compiler
- None (Reason)

**SUMMARY:**

Fix bug causing spurious long records on sequential input through record_stream when record length is equal to input buffer in length.
SUMMARY:

Prelinking changes, improvements and user interface changes to ALM.

DETAILED PROPOSAL:

Implement and install the following changes to alm, the standard Multics assembler:

1) Prelinking Changes
   
   a. The assembler will generate standard object segments with the new object map and optionally separate static sections.
   
   b. The "join" pseudo-op will recognize "/static/".
   
   c. The self-referencing symbol "*static" will be recognized by alm.

2) Improvements

Add new pseudo-op "entrybound" to enable a simpler generation of entry bounds on gate segments.
3) **user interface changes**

   a) Change the "-quiet" control argument to "-brief" and remove the following four obsolete control arguments: new_call, followon, new_object and check_code.

   b) Remove all opcodes of the 645- instructions no longer applicable to the 6180 hardware and the following three obsolete pseudo-ops: mastermode, executeonly and altreturn.

   c) Fix bugs: #1.

**REASONS:**

1) **prelinking changes:**

Currently both the nonsharable internal static storage area and the shareable data, the links, are put in the linkage section.

By allowing alm (and other translators) to generate object segments with separate static sections we can enable the different processes to share the invariant data in the (various) object segment(s).

2) **improvements:**

Presently the entry bounds on gate segments are generated in a rather unnatural way by the use of "segdef end_of_gates" type statements.

The new object map structure contains a field for the entry-bound, which the assembler will generate and put in the field upon encountering the new "entrybound" pseudo-op.

3) **user interface changes:**

The "-quiet" control argument to the assembler makes alm incompatible (in naming the same type of control arguments) with the rest of the translators which use "-brief".

All the control argument, 645- opcodes and pseudo-ops being removed are obsolete.
IMPLICATIONS:

1) prelinking changes

   a) In the case of separate static two different pointer registers will be needed, one for the static and the other for the links, as opposed to one being used now.

   Since as far as the assembler is concerned the programmer is responsible for the management of registers, this will require a reprogramming of all alm programs for the cases where object segments with separate static will be desirable.

   For the case of separate static:

   b) Changing all statements of the type:

      \texttt{join /link/ \{list of location counters' names\} to join /static/ \{list of location counters' names\}}

   c) changing some statements with references to the self-referencing symbol \texttt{*link} to the self-referencing symbol \texttt{*static}.

2) improvements

   Changing statements of the type: "segdef end_of_gates" to "entrybound" at appropriate location.

3) user interface changes

   Using "-brief" instead of "-quiet" control argument.
TITLE: fix get_password

AUTHOR: M. Grady

-Coded in XPL/I X AIM □ other

-Planned for System MR 3.0

-Fixes Bug Number(s) 355

-Documented in MTR

-User/Operations-visible

-Interface change? □ yes X no

-Incompatible change? □ yes X no

-Performance: □ Better X Same □ Worse

-Replaces MCR

SUMMARY:

Fix bug in get_password_. It used \006 and \025 to turn printer on and off.

REASONS:

This system-tool should work correctly.

IMPLICATIONS:

None.
**Title:** Update interpret_link_ for revised section type

**Author:** M. Weaver

**Summary:**

Change interpret_link_ to recognize 4 rather than 3 as the static section indicator for types 1 and 5 links.

**Reasons:**

This will make object segments more consistent since the definition class for static is 4.

**Implications:**

None. Only pre-experimental versions of translators generate links to "static."
TITLE: Update combined linkage section information command

AUTHOR: M. Weaver

MCR 1310

VER. 4

Multics Change Request

Use these headings: Summary of Proposal, Reasons for Proposal, Implications, Detailed Proposal.

SUMMARY:

Change dump ls and print linkage usage to merge the ISOT indices with the LOT indices. The output will change slightly to accommodate separate static sections.

REASONS:

When separate static sections are used, the LOT will no longer describe the entire combined linkage section and will not always lead to accurate static information.

DETAILED PROPOSAL:

The new header will contain:

```
segment_name  linkage  size  static  size
```

thus providing for the static offset as well as size. The lines for the linkage and static of a segment may be completely independent.