TO: Distribution

FROM: Betsy Kerr

DATE: March 25, 1975

SUBJECT: Multics Change Requests

Attached are copies of Multics Change Requests which were approved
from March 1 - 15, 1975.

Multics Change Request

TITLE:	Change command processor for new argument convention for commands	STATUS	DATE

AUTHOR: Steve Webber

STATUS	DATE
Written	2/4/75
Status	P2 11 75 A 02/04/7
Expires	09 04 15

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

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

DOCUMENTATION CHANGES

Document	Specify One or More
MPM (Vol, Sect.)	
PLMS (AN #)	AN78
MOSN (Sect.)	
MPAM (Sect.)	
MSAM (Sect.)	

Objections/Comments:

Needs elucidation

Info Segs	X
Other (Name)	
None (Reason)	

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

SUMMARY:

Change the command processor to attempt to determine the type of arguments expected by a command and generate the appropriate argument list or issue an error message if it can't.

REASONS:

This creates a more reasonable, consistent, efficient interface for command writers to use.

IMPLICATIONS:

1.   To be done in an efficient way, we should redefine the standard entry sequence (in an upward compatible way) to determine the entry argument types in an efficient way. Currently it is necessary to get the bit count of the command segment in order to do an "object_info_" in order to get a pointer to the definitions. This can all be avoided. The details of this change are being presented in an MTB.

2.   In order to call an inner-ring procedure from command level, some mechanism must be provided to determine the entry descriptor values. They can't be read from the outer ring...

DETAILED PROPOSAL:

    A.   The initial implementation is proposed to work as follows:'

        1.   if a segment has a new entry format, generate the argument list as expected. However, do no conversions - only character string parameters are allowed.

        2.   otherwise, generate an argument list as done today.

Note that this will require setting up a handler for "out_of_read_bracket" for gates which will be treated the old way.

    B.   Eventually the command processor could do conversions that are consistent with, say, PL/I.

Multics Change Request

Introducing Users to IO Daemon request types

AUTHOR: Jerry Stern

Written	03/11/75
Status	A 03/11/75
Expires	03/11/76

-Coded in: ☒PL/I ☐ALM ☐other-
explain in DETAILED PROPOSAL
-Planned for System MR 3.0
-Fixes Bug Number(s) _____
-Documented in MTB 129
-User/Operations-visible
  Interface change? ☒ yes ☐ no
-Incompatible change? ☐ yes ☒ no
-Performance: ☐ Better ☒ Same
  ☐ Worse
-Replaces MCR _____

Category (Check One)

	Lib. Maint. Tools
	Svc. Anal Tools
	Sys. Prog. Tools
	355
	BOS
	Salvager
	Ring Zero
	Ring One
	SysDaemon/Admin.
	Runtime
x	User Cmmd/Subr.

DOCUMENTATION CHANGES

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

Objections/Comments:

Info Segs	
Other (Name)	
None (Reason)	

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

SUMMARY: Replace all instances of the "-device_class" ("-dvc") control
            argument in various user commands by the "-request_type" ("-rqt")
            control argument. Replace the print_io_devices command with a
            new command called "print_request_types" ("prt").

Reasons: Ongoing changes to the IO Daemon have introduced the new queue group
          concept. A queue group is a set of device classes. The device
          classes are now invisible to users, but are still visible to
          operators. Therefore, in order that consistent terminology may be
          used throughout the system, the current "-device_class" control
          argument should be replaced.

          The print_io_devices command prints the devices that can be used for
          each device class, as well as the access name of the driver for each
          device class. The devices are not really of interest to the user.
          What the user really wants to know is the available queue groups, the
          driver access name for each, and the command (e.g., dprint) which is
          used for each. This information will be provided by
          print_request_types.

Implications:
          The -device_class control argument, although obsolete, must still be
          supported for some time.

Detailed Proposal:
          The -request_type control argument will be accepted by the following
          commands:
                              dprint / dpunch
                              list_daemon_requests
                              cancel_daemon_requests
                              pl1_abs/alm_abs/fortran_abs
                              runoff_abs

          See attached write-up of print_request_types

Name: print_request_types, prt

     This command prints a list of all request types handled by

the IO Daemon. For each request type, two items of information
are provided: (1) the access name of the IO Daemon driver
process which performs requests of that type, and (2) the command
which should be used to submit requests of that type. An
asterisk (*) immediately following a command indicates that the

corresponding request type is the default for that command.

Usage
          print_q_groups -control_args-

where control_args can be one or more of the following.

   -brief, -bf   suppresses printing of a heading line.

   -access_name <an>
   -an <an>   specifies that only those queue groups having
                        an access name of <an> are to be listed.
                        <an> should be of the form "person.project".

   -command <c>
   -cm <c>   specifies that only those queue groups used
                        by command <c> are to be listed.

TITLE: New administrative exec_coms

AUTHOR:
    T. Casey

-Coded in: ☐PL/I ☐ALM ☒other-
explain in DETAILED PROPOSAL
-Planned for System MR 2.1
-Fixes Bug Number(s)_____
-Documented in MTB_____
-User/Operations-visible
  Interface change? ☐yes ☒no
-Incompatible change? ☒yes ☐no
-Performance: ☐Better ☒Same
  ☐Worse
-Replaces MCR_____

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

STATUS	DATE
Written	2/26/75
Status	A 3/4/75
Expires	9/4/76

DOCUMENTATION CHANGES

Document	Specify One or More
MPM (Vol, Sect.)	
PLMS (AN #)	72
MOSN (Sect.)	
MPAM (Sect.)	
MSAM (Sect.)	

Objections/Comments:

Info Segs	
Other (Name)	
None (Reason)	

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

SUMMARY:

Install in >tools, new versions of the following exec_coms:

        acct_start_up.ec (asu.ec)
        admin.ec
        biller.ec
        crank.absin
        dds.absin
        err.ec
        master.ec
        system_start_up.ec
        util.ec

Rename the current versions of the above exec_coms to old.<name>.ec and install the renamed versions in >tools. The reason for this is given under IMPLICATIONS.

REASONS

The primary function of asu.ec is to initialize certain parts of the hierarchy, after a cold boot, at a site that is bringing up Multics for the first time. The old version of it did not work, and the initialization of a new site had to be done by hand.

During the debugging of asu.ec, certain changes to the other exec_coms mentioned above had to be made to make them operate more smoothly at a new site. In addition, a survey of the versions of these exec_coms in the tools and system administration directories at MIT and PCO revealed as many as

five different versions of the same exec_com, in various stages of obsolescence, but also containing some interesting modifications and bug fixes. Most of these (except for site-dependent modifications) have been incorporated into the official versions. (The changes involve bug fixes and checks for unusual occurrences, and should not have any compatibility implications.)

IMPLICATIONS

Bringing up a new Multics site should go more smoothly.

Billing and accounting should be more reliable.

Since each Multics site usually modifies the administrative exec_coms to suit their own needs (the modified versions being placed in the system administration directories, where they normally reside and are run from) the procedure for installing and distributing new versions of them must be formalized, and documented somewhere (possibly in SRBs). Modifications to support new features or fix bugs will be made to the official versions in >tools, and submitted for installation in >tools. Local system maintainers will be responsible for merging site-dependent modifications with the ones made to the official versions. To facilitate this, the old official versions will be renamed to old.<name>.ec and distributed along with the new versions. Then, compare_ascii can be used to compare the three versions of a modified exec_com, to determine which version could most conveniently be edited to incorporate the changes contained in the other.

It is possible for a site to modify these exec_coms and some related data bases in such a way that the official versions of these exec_coms will no longer work correctly at that site. The SRB should emphasize this, and advise against simple replacement of a site-modified version of an exec_com by the new official version of it.

Multics Change Request

TITLE: Defining an Access Class Ceiling

AUTHOR: A. Kobziar

	STATUS	DATE
	Written	2/25/75
	Status	A 3/4/75
	Expires	9/4/75

-Coded in: ☐ PL/I ☒ ALM ☐ other- explain in DETAILED PROPOSAL

-Planned for System MR _____

-Fixes Bug Number(s) _____

-Documented in MTB _____

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

-Incompatible change? ☐ yes ☐ no

-Performance: ☐ Better ☒ Same ☐ Worse

-Replaces MCR _____

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

DOCUMENTATION CHANGES

Document	Specify One or More
MPM (Vol, Sect.)	
PLMS (AN #)	59
MOSN (Sect.)	
MPAM (Sect.)	
MSAM (Sect.)	
Info Segs	
Other (Name)	
None (Reason)	

Objections/Comments:

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

SUMMARY:

Add a static variable, sys_info$access_class_ceiling which defines the maximum access class allowed in the system and defined in the answering service.

REASONS:

Currently, only 18 categories and 7 levels are defined. Since the access class field is 72 bits, a validity check against sys_info$access_class_ceiling will be made in act_proc, reloader, salvager, and reclassify.

Ver. 3 741022	MULTICS CHANGE REQUEST	MCR __1047_____

TITLE: Expand active_all_rings_data; change gm to accept -versid arg		STATUS	DATE

TITLE: Expand active_all_rings_data; change gm
       to accept -versid arg
AUTHOR: F.W. Martinson

	STATUS	DATE
Written	02/18/75
Status	03/04/75
Expires	08/18/75

Planned for System: MR 2.1
Fixes Bug Number(s): not applicable
Documented in MTB: not applicable
Incompatible Change: no
User/Operations-visible Interface Change: no
Coded in: (■)PL/I (■)ALM ( )other-see below
Performance: ( )better (■)same ( )worse

CATEGORY (check one)
(■)Lib. Maint. Tools
( )Sys. Anal. Tools
( )Sys. Prog. Tools
( )355
( )BOS
( )Salvager
( )Ring Zero
( )Ring One
( )SysDaemon/Admin
( )Runtime
( )User Command/Subr

DOCUMENTATION CHANGES (specify one or more)
MPM (vol,sect)   MPAM (sect)
MOSN (sect)   MSAM (sect)
PLMs (AN#) 5| PLM referring to Lib Maint Tools.
Info Segs
Other

OBJECTIONS/COMMENTS:

Headings are: SUMMARY, REASONS, IMPLICATIONS, DETAILED PROPOSAL (optional)

SUMMARY:

An additional field should be added to active_all_rings_data which would
permit developers to have knowledge of both the Honeywell system_id running
(2.1) and the MIT version running (24-7).

REASONS:

Simplifies crash analysis and debugging if developers know which version of
software is running on the system.

IMPLICATIONS:

None.

DETAILED PROPOSAL:

An 8 character aci field with the name version_id will be added to
active_all_rings_data.

The generate_mst command will be changed to accept a -versid control
argument in the same manner as it now accepts the -sysid control argument.
If only a -sysid argument is given the version_id will default to sysid.
If neither a -sysid or a -versid argument are given both sysid and

version_id will default to the system designation given to the generate_mst command. A version_id argument by itself will be valid. No header change will be required for the hardcore header since version_id processing will be set up so as to key on the existing "sysid" keyword.

NOTE: This change has already been made and tested on System M. A copy of the updated version of bound_gm_ exists in a private directory. The version of bound_gm_ under TOOLS has not been changed.

```
| Ver. 3                                                      |  MCR_1048_____ |
| 741022         MULTICS CHANGE REQUEST                       |                    |
|-------------------------------------------------------------|--------------------|
| TITLE:  Move GCOS modules from tools to                     | _STATUS__I_DATE____ |
|         system_library_unbundled                            | _Written_I_02/21/75_ |
| AUTHOR: F.W. Martinson                                      | _Status__I 03/04/75_ |
|                                                             | _Expires_I_08/21/75_ |
|-------------------------------------------------------------|--------------------|
| Planned for  System:   MR 2.1                               |                    |
| Fixes Bug Number(s):   not applicable                       | _CATEGORY_(check_one) |
| Documented  in  MTB:   not applicable                       | ( )Lib. Maint. Tools |
| Incompatible Change:   no                                   | ( )Sys. Anal. Tools |
| User/Operations-visible Interface Change:  no               | ( )Sys. Prog. Tools |
| Coded in: ( )PL/I ( )ALM (X)other-see below                 | ( )355             |
| Performance: ( )better (X)same ( )worse                     | ( )BOS             |
| Replaces_MCR:__Refer_to_MCR_833_____    | ( )Salvager        |
| _DOCUMENTATION_CHANGES_(specify_one_or_more)_____          | ( )Ring Zero       |
| MPM (vol,sect)                   MPAM (sect)                | ( )Ring One        |
| MOSN (sect)                      MSAM (sect)                | ( )SysDaemon/Admin |
| PLMs (AN#)                                                  | ( )Runtime         |
| Info Segs                                                   | (X)User Command/Subr |
| Other                                                       |                    |
| _None_(reason)__not_applicable_____      |                    |
| OBJECTIONS/COMMENTS:                                        |                    |
|                                                             |                    |
|                                                             |                    |
|-------------------------------------------------------------|--------------------|
```

Headings are: SUMMARY, REASONS, IMPLICATIONS, DETAILED PROPOSAL (optional)

SUMMARY: The following modules should be moved from system_library_tools
to system_library_unbundled to complete installation of MCR 833.

bound_gcos_daemon_tls_
bound_gcos_daemon_
bound_gcos_user_
gcos_daemon_stat2_
gcos_daemon_stat_
gcos_abs_control

NOTE: These modules have already been moved to >system_library_unbundled
and tested on system M.

Ver. 3 741022	MULTICS CHANGE REQUEST	MCP 1050

TITLE: Move Language Group Info Segs to >doc>iis. AUTHOR: Bob May (PHX)	STATUS	DATE
	Written	02/19/75
	Status	*02/04/75*
	Expires	08/19/75

Planned for System: MR 2.1
Fixes Bug Number(s):   not applicable
Documented in MTB: not applicable
Incompatible Change: no
User/Operations-visible Interface Change: no
Coded in: ( )PL/I ( )ALM (X)other-see below
Performance: ( )better (X)same ( )worse

__CATEGORY (check one)__
( )Lib. Maint. Tools
( )Sys. Anal. Tools
( )Sys. Prog. Tools
( )355
( )BOS
( )Salvager
( )Ring Zero
( )Ring One
( )SysDaemon/Admin
( )Runtime
( )User Command/Subr
(X)info

__DOCUMENTATION CHANGES (specify one or more)__
MPM (vol,sect)   MPAM (sect)
MOSN (sect)   MSAM (sect)
PLMs (AN#)
Info Segs
Other   motd

OBJECTIONS/COMMENTS:

Headings are: SUMMARY, REASONS, IMPLICATIONS, DETAILED PROPOSAL (optional)

Summary: The info segs in >doc>info that are maintained by the Language Development group reflect the status of the compilers in the exl directory subtree, in addition to the installed compilers. The contents of the >doc>info are shipped to the field as part of the Multics Releases. They should contain only info segs for the installed, supported software.

Detailed Description: It is proposed that the (pl1 fortran basic)_(status changes).info segs be moved to >doc>iis. They will be edited at time of Release to create info segs that are appropriate for the customers.

TITLE: Warn of useless control args in dprint

AUTHOR: S. Herbst

STATUS	DATE
Written	2/27/75
Status	A 03/04/75
Expires	09/04/75

-Coded in ☒PL/I ☐AIM ☐other-
 explain in DETAILED PROPOSAL
-Planned for System MR _____
-Fixes Bug Number(s) _____
-Documented in MTB _____
-User/Operations-visible
 Interface change? ☐yes ☒no
-Incompatible change? ☐yes ☒no
-Performance: ☐Better ☒Same
 ☐Worse
-Replaces MCR _____

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

DOCUMENTATION CHANGES

Document	Specify One or More
MPM (Vol, Sect.)	
PLMS (AN #)	
MOSN (Sect.)	
MPAM (Sect.)	
MSAM (Sect.)	
Info Segs	
Other (Name)	
None (Reason)	documentation correct

Objections/Comments:

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

SUMMARY: Modify the dprint command to report an error and not work when a control
            argument follows the last pathname.

REASONS: A control argument applies to all pathnames after it. A user may incorrectl
            assume that the position of control arguments does not matter, as is true
            of many other commands. This change will warn him of control arguments
            that do not apply to any pathname.

Multics Change Request

| TITLE: | Recompile system_daily_report |
| AUTHOR: | T. Casey |

STATUS	DATE
Written	2/26/75
Status	A 03/04/75
Expires	09/14/75

- Coded in: [X] PL/I [ ] ALM [ ] other-
  explain in DETAILED PROPOSAL
- Planned for System MR _____
- Fixes Bug Number(s) see below
- Documented in MTB _____
- User/Operations-visible
  Interface change? [ ] yes [X] no
- Incompatible change? [ ] yes [X] no
- Performance: [ ] Better [X] Same
  [ ] Worse
- Replaces MCR _____

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

DOCUMENTATION CHANGES

Document	Specify One or More
MPM (Vol, Sect.)	
PLMS (AN #)	
MOSN (Sect.)	
MPAM (Sect.)	
MSAM (Sect.)	
Info Segs	
Other (Name)	
None (Reason) no interface change	

Objections/Comments:

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

SUMMARY: CK97 number C-04718 reports a bug in system_daily_report caused by a bug
             in an old compiler. Recompilation fixes the bug. It has been recompiled
             and installed in Phoenix. This MCR is to make it official and install
             it at MIT, too.

             The bug involved incorrect computation of several values printed by the
             program, because a register was assumed to be valid when it no longer
             was.

Multics Change Request

TITLE:	Fix bugs in ed_mgt	STATUS	DATE	
AUTHOR:	T. Casey	Written	2/26/75	

-Coded in: [XX] PL/I [ ] AIM [ ] other-
 explain in DETAILED PROPOSAL
-Planned for System MR _____
-Fixes Bug Number(s) unreported
-Documented in MTB _____
-User/Operations-visible
 Interface change? [ ] yes [X] no
-Incompatible change? [ ] yes [X] no
-Performance: [ ] Better [X] Same
 [ ] Worse
-Replaces MCR _____

Status	A 3/4/75
Expires	9/4/75

DOCUMENTATION CHANGES

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

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

Objections/Comments:

Info Segs	
Other (Name)	
None (Reason)	no interface change

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

SUMMARY: When no pathname argument is given, ed_mgt supplies a default, but it fails to set the length of the supplied string (which cu_$arg_ptr would have set if an argument had been given). This causes intermittent failures. The string length will be set correctly.

TITLE: reload directly to target segment

AUTHOR: R. Mullen

STATUS	DATE
Written	02/28/75
Status	A 03/04/75
Expires	09/04/75

-Coded in: ☒PL/I ☐AIM ☐other- explain in DETAILED PROPOSAL

-Planned for System MR _____

-Fixes Bug Number(s)_____

-Documented in MTB _____

-User/Operations-visible Interface change? ☐yes ☒no

-Incompatible change? ☐yes ☒no

-Performance: ☒Better ☐Same ☐Worse

-Replaces MCR_____

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

DOCUMENTATION CHANGES

Document	Specify One or More
MPM (Vol, Sect.)	
PLMS (AN #)	57
MOSN (Sect.)	
MPAM (Sect.)	
MSAM (Sect.)	
Info Segs	
Other (Name)	
None (Reason)	

Objections/Comments:

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

SUMMARY:

It is proposed that when appropriate the reloader will read segment directly from tape into the proper place in the hierarchy, rather than reading into the process directory and then copying it.

REASONS:

This will be a large performance improvement for the reloader particularly in worst case situations (large segments).

IMPLICATIONS:

Occasionally the reloader will encounter tape errors while reading. In this case the segment will be deleted if at all possible.

DETAILED PROPOSAL:

1. Only to be done if called at "reload" or "iload" entries and if debugsw is off and quota checking is inhibited.

2. All segments will be created with unique names initially. Nothing already in the hierarchy will be deleted until the segment has been successfully read from tape.

Multics Change Request

TITLE: Fix bug in pioi_

AUTHOR: Bill Silver

STATUS	DATE
Written	02/18/75
Status	A 3/4/75
Expires	9/4/75

- Coded in: ☐ PL/I ☐ ALM ☒ other-
  explain in DETAILED PROPOSAL
- Planned for System MR _____
- Fixes Bug Number(s) _____
- Documented in MTB _____
- User/Operations-visible
  Interface change? ☐ yes ☒ no
- Incompatible change? ☐ yes ☒ no
- Performance: ☐ Better ☒ Same
  ☐ Worse
- Replaces MCR _____

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

DOCUMENTATION CHANGES

Document	Specify One or More
MPM (Vol, Sect.)	
PLMS (AN #)	
MOSN (Sect.)	
MPAM (Sect.)	
MSAM (Sect.)	
Info Segs	
Other (Name)	
None (Reason)	Temporary

Objections/Comments:

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

SUMMARY:

Two entries in the gate pioi_ reference nonexistent entries in ring ∅. The correct entry names should be used.

REASONS:

To make these gate entries functional.

IMPLICATIONS:

Operator's console on-line T&D cannot be tested until this change is made. Temporary because pioi_ itself will be deleted when RCP is installed.

DETAILED PROPOSAL:

pioi_$console_detach will be made to reference ocdcm_$detach.
pioi_$console_reattach will be made to reference ocdcm_$reattach.

```
_____
I Ver. 3                                          I                         I
I 741022              MULTICS CHANGE REQUEST       I   MCR__1056_____    I
I_____   I_____I
I TITLE:   Bring ring_zero_meter_limits_ASCII_    I _STATUS_I_DATE_____    I
I          up-to-date.                             I Written I 02/27/75_    I
I AUTHOR: Paul Green                               I_Status_I A 3/4/75      I
I_____   I Expires I 08/27/75_    I
I Planned for  System:   not applicable            I_____I
I Fixes Bug Number(s):   not applicable            I_CATEGORY_(check one)I
I Documented  in  MTB:   not applicable            I( )Lib. Maint. Tools I
I Incompatible Change:   no                        I(■)Sys. Anal. Tools  I
I User/Operations-visible Interface Change:  no    I( )Sys. Prog. Tools  I
I Coded in: ( )PL/I ( )ALM (■)other-see below      I( )355               I
I Performance: ( )better (■)same ( )worse          I( )BOS               I
I_____   I( )Salvager          I
I_DOCUMENTATION_CHANGES_(specify_one_or_more)___   I( )Ring Zero         I
I MPM (vol,sect)          MPAM (sect)              I( )Ring One          I
I MOSN (sect)             MSAM (sect) X            I( )SysDaemon/Admin   I
I PLMs (AN#)52            I( )Runtime           I
I Info Segs               I( )User Command/Subr I
I Other                                            I                     I
I_____   I_____I
I OBJECTIONS/COMMENTS:                             I                     I
I                                                  I                     I
I                                                  I                     I
I_____I
Headings are:  SUMMARY, REASONS, IMPLICATIONS, DETAILED PROPOSAL (optional)
```

SUMMARY:
    Add system_privilege_, lol_, and plol_ to the list of ring 0 gates
accessible through ring_zero_peek_. Delete imp_dim_gate_, as it
disappeared in system 24-8.

REASONS:
    The list has gotten out of date.

IMPLICATIONS:
    The tool meter_gate will work on all ring 0 gates again.

TITLE: Add -total control argument to
          cumulative_page_trace
AUTHOR: J. Gintell

STATUS	DATE
Written	3/4/75
Status	A 03 11 75
Expires	09 11 75

-Coded in: [X] PL/I [ ] AIM [ ] other-
  explain in DETAILED PROPOSAL
-Planned for System MR _____
-Fixes Bug Number(s) _____
-Documented in MTB _____
-User/Operations-visible
  Interface change? [x] yes [ ] no
-Incompatible change? [ ] yes [x] no
-Performance: [ ] Better [x] Same
  [ ] Worse
-Replaces MCR _____

Category (Check One)

	Category
	Lib. Maint. Tools
	Sys. Anal. Tools
	Sys. Prog. Tools
	355
	BOS
	Salvager
	Ring Zero
	Ring One
	SysDaemon/Admin.
	Runtime
X	User Cmmd/Subr.

DOCUMENTATION CHANGES

Document	Specify One or More
MPM (Vol, Sect.)	Commands
PLMS (AN #)	
MOSN (Sect.)	
MPAM (Sect.)	
MSAM (Sect.)	
Info Segs	
Other (Name)	
None (Reason)	

Objections/Comments:

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

SUMMARY: Add -total control argument to cumulative_page_trace to allow
            user to obtain a summary of the number of pages faulted on
            for each segment.

REASONS: Users have to perform this operation manually--the command
            already accumulates the information and merely must print
            it out.

Name: cumulative_page_trace, cpt

The cumulative_page_trace command accumulates page trace data
so that the total set of pages used during the invocation of a
command or subsystem can be determined. The command accumulates data
from one invocation to the next. Output from the command is in tabular
format showing all pages that have been referenced. A trace in the
format of that produced by the page_trace command can also be obtained.

It operates by sampling and reading the system trace array after
invocation of a command and at repeated intervals. Control arguments
are given to specify the detailed operation of cpt.

The command line used to invoke cpt includes the command or subsystem
to be traced as well as optional control arguments.

Usage

    cumulative_page_trace (cpt)   command_line -control arguments-

command_line   is a character string to be interpreted by the
                        command processor as a command line. The procedures
                        invoked by this command line are metered by cpt.
                        If this string contains blanks it must be
                        surrounded by quotes.

At least one of three generic operations must be requested. They may
all be combined and are performed in the following order:
    reset the table of accumulated data,
    call the command to be metered applying the specified options,
    print the results applying the various options specified.

Control Arguments

        -reset, -rs   reset the table of accumulated data

        -flush   flush core before each invocation of the
                           command line
        -loop n   call the command to be metered n times
        -sleep n   sleep for n seconds after each call to the
                           command to be metered
        -interrupt n   interrupt execution every n VCPU milli-seconds
        -int n   for pagefault sampling
        -timers   include all faults between signal and restart
        -trace path   write trace on file path using io_switch
                           named cpt.out; cpt will attach and detach
                           this switch

        -print, -pr   print the accumulated results
        -total, -tt   print total number of faults for each segment only
        -count, -ct   print the accumulated results giving the number
                           of faults for each page
        -long, -lg   produce output in long format, giving full
                           pathnames
        -shortline   format output for a linelength of 80

Notes

The default mode of operation is to take no interrupts for page fault

Multics Change Request

TITLE:	Fix bug in status -mode	STATUS	DATE
AUTHOR:	Steve Herbst	Written	03/05/75

	Category (Check One)	Status	A 03/11/75
-Coded in: [X] PL/I [ ] ALM [ ] other-		Expires	09/11/75

-Coded in: [X] PL/I [ ] ALM [ ] other-
explain in DETAILED PROPOSAL
-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
  [ ] Worse
-Replaces MCR _____

DOCUMENTATION CHANGES

Category (Check One)	Document	Specify One or More
Lib. Maint. Tools		
Sys. Anal. Tools		
Sys. Prog. Tools	Document	Specify One or More
355		
BOS	MPM (Vol, Sect.)	
Salvager		
Ring Zero	PLMS (AN #)	
Ring One		
SysDaemon/Admin.	MOSN (Sect.)	
Runtime	MPAM (Sect.)	
X	User Cmmd/Subr.	
	MSAM (Sect.)	

Objections/Comments:

Info Segs	
Other (Name)	
None (Reason)	no interface chang

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

SUMMARY:

      Fix the status command so that
           status msf -mode
      reports the ring brackets of a
      multisegment file correctly.

Multics Change Request

TITLE:	fix bugs in arc tangent routines	STATUS	DATE
AUTHOR: David Levin		Written	5 March 75

-Coded in: ☐PL/I ☒ALM ☐other- explain in DETAILED PROPOSAL	Category (Check One)	Status	A 03 11 75
		Expires	09 11 75

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

- Planned for System MR _____
- Fixes Bug Number(s) 1326
- Documented in MTB _____
- User/Operations-visible
  Interface change? ☐ yes ☒ no
- Incompatible change? ☐ yes ☒ no
- Performance: ☐ Better ☒ Same
  ☐ Worse
- Replaces MCR _____

DOCUMENTATION CHANGES

Document	Specify One or More
MPM (Vol, Sect.)	
PLMS (AN #)	
MOSN (Sect.)	
MPAM (Sect.)	
MSAM (Sect.)	
Info Segs	
Other (Name)	
None (Reason)	

Objections/Comments:

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

SUMMARY:

The result returned by the arc tangent routines in bound_
pll_operators_ (arc_tangent_ and double_arc_tangent_)
are not always correct when provided two   arguments.
Also, the double precision algorithm can be improved.

REASONS:

The code for these routines was transcribed from PL/I
(EPL) programs. A bug was introduced and another
copied from the original. The routines failed for
certain boundary conditions and input arguments indicating
either of two quadrants.

IMPLICATIONS:

The routines will return reasonable approximations for
all input arguments.

DETAILED PROPOSAL:

Correct routines have been written and tested.

Multics Change Request

TITLE: Improved FORTRAN I/O package

AUTHOR: David Levin

STATUS	DATE	
Written	5 March 75	
Status	A 03/11/75	
Expires	09/11/75	

-Coded in: [x] PL/I [ ] ALM [ ] other-
explain in DETAILED PROPOSAL
-Planned for System MR
-Fixes Bug Number(s) 120
-Documented in MTB _____
-User/Operations-visible
  Interface change? [ ] yes [X] no
-Incompatible change? [ ] yes [X] no
-Performance: [x] Better [ ] Same
  [ ] Worse
-Replaces MCR _____

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

DOCUMENTATION CHANGES

Document	Specify One or More
MPM (Vol, Sect.)	
PLMS (AN #)	AN83
MOSN (Sect.)	
MPAM (Sect.)	
MSAM (Sect.)	

Objections/Comments:

Info Segs
Other (Name)
None (Reason)

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

SUMMARY:
1. Fix bug 120 and unreported bugs
2. Eliminate obsolete entries (scc, occ, imag, endfile)
3. Add set_cc to bound_fortran_io_
4. Move exit into fortran_stop_
5. Combine all I/O procedures into a single procedure.
6. Improve runtime error messages
7. Call default_error_handler_$add_finish_handler
   once per process.

REASONS: Item #5 above results in fewer full PL/I calls per I/O
            element. The rest are bug fixes or for consistency with SRB2.0.

IMPLICATIONS: The obsolete programs are no longer available to the
               user. FORTRAN I/O throughput is improved. No user
               interface changes.

TITLE:	Install a new pl1 I/O runtime package.		STATUS	DATE

AUTHOR: R. Schoeman

	Category (Check One)	STATUS	DATE
-Coded in: [X] PL/I [ ] AIM [ ] other- explain in DETAILED PROPOSAL		Written	03/06/75
	Lib. Maint. Tools	Status	A 03/11/75
-Planned for System MR	Sys. Anal. Tools	Expires	09/11/75
	Sys. Prog. Tools	DOCUMENTATION CHANGES	
-Fixes Bug Number(s) PL/I 1296	355		
-~~DOCUMENTED IN MCB~~ 1324	BOS	Document	Specify One or More
-User/Operations-visible	Salvager		
Interface change? [ ] yes [X] no	Ring Zero	MPM (Vol, Sect.)	
-Incompatible change? [ ] yes [X] no	Ring One	PLMS (AN #)	
-Performance: [ ] Better [X] Same	SysDaemon/Admin.	MOSN (Sect.)	
[ ] Worse	[X] Runtime	MPAM (Sect.)	
-Replaces MCR _____	User Cmmd/Subr.		
		MSAM (Sect.)	

Objections/Comments:	Info Segs *pl 1. new*
	Other (Name) AG94 (PL1 Manual)
	None (Reason)

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

SUMMARY:

Install the bound_plio2_ presently in the experimental
library.

REASONS:

To support the new environment (stringvalue) option,
which is described on the following pages.

To support the new faster record i/o, in which the
time taken for read, write, and rewrite operations on
unkeyed files is reduced up to 63%.

To fix pl1 bug 1324, in which the "error" condition
was raised in record_directed i/o instead of the more
appropriate "transmit" condition, and bug 1296, in which
the pl1 onfile() builtin function was inconsistent about
the length of the file name.

This bound_plio2_ must be installed before the new
pl1_operators_ with the faster record i/o is installed.

```
help -pn doc>pl1.new
(6 lines follow)
3/11/75

    This help file contains information on new PL/1 features not documented
in the current edition of the PL/1 Manual  AG94.    The new features are:
(1)          <environment(stringvalue)>

<environment(stringvalue)>
Rest of segment has 24 lines. More help?    yes


    A file may be declared or opened with the environment(stringvalue) option
which then becomes an attribute of the file-state block.  If a file-state block
has the environment(stringvalue) attribute, the execution of read, write, and
rewrite statements is affected as follows:

<read statement>:
                    If there is an <into> option referencing a scalar varying
                    character (or bit) string, the complete record in the file
                    is treated as a fixed character (or bit) string value and
                    is assigned to the variable by a normal string assignment.

<write statement> or
<rewrite statement>:
                    If there is <from> option referencing a scalar varying
                    character (or bit) string, the record placed in the file
                    will be a fixed length character (or bit) string that is
                    equal to the current value of the variable.

    This feature allows one to use record i/o with varying strings using only
the space in the file actually needed to store the current value of the varying
string.
(END)
r 1114 0.640 0.842 43
```

An <entry attribute> of the form "entry()" is equivalent to an
<entry attribute> of the form "entry", except that the former is
a complete <attribute> and the latter is an incomplete
<attribute>. The significance of this difference is shown in
section 5.2.1.2 and section 5.3.2.

A <parameter descriptor list> does not restrict the values that
may be represented by the item. A <parameter descriptor list> is
significant only when an entry value represented by the item is
invoked.

The <parameter descriptor list> must produce a declaration for
each <parameter descriptor> that is equivalent to the actual
declaration of each parameter in the entry invoked by each
invocation of the entry values represented by this item. Such
declarations are equivalent only if they contain exactly the same
<attribute set>s, except that the <parameter descriptor> cannot
have: the <parameter attribute> or <internal attribute>.

An <attribute set> of a <descriptor> must be consistent. An
<attribute set> of a <descriptor> is consistent only if it can be
transformed into a <descriptor set> as described in section 5.5.

A <descriptor> of a structure has exactly the same syntax as a
<defactored declaration> of a structure variable, except that it
has no name. Its members are declared exactly like the members
of a structure variable, except that they have no names.

Example:

    declare F entry(1,2 fixed,2 pointer,1,
        2 bit(1),2 bit(4),(10,10) pointer);

The entry F has three parameters. The first is a structure
containing an integer and a pointer. The second is a structure
containing two bit-strings, and the third is a ten-by-ten array
of pointers.

5.4.18   Environment

Syntax:

    <environment attribute>::= {environment¦env}[(interactive)]

A file constant declared with an <environment attribute> causes
the file-state block that it identifies to be opened with an
<environment attribute>. A file-state block with an <environment
attribute> causes the execution of each <put statement> that
references the file to finish its output by writing a linemark.
The <environment attribute> is normally used when the data stream
attached to the file-state block is an interactive device used
for both input and output.

5-25

If a completed ⟨attribute set⟩ contains an ⟨environment attribute⟩, it
must contain exactly one ⟨environment attribute⟩ with a parenthesized
keyword, which may be "interactive" or "stringvalue"

If a file-state block has an ⟨environment attribute⟩ specifying "string-
value", the execution of a ⟨read statement⟩, ⟨rewrite statement⟩, or
⟨write statement⟩ is affected as follows. If a ⟨read statement⟩ has an
⟨into option⟩ referencing a scalar variable with the ⟨character attribute⟩
and the ⟨varying attribute⟩, the complete record in the file is treated as
a character string value and is assigned to the variable by a normal string
assignment. If a ⟨rewrite statement⟩ or ⟨write statement⟩ has a ⟨from option⟩
referencing a scalar variable with the ⟨character attribute⟩ and the
⟨varying attribute⟩, the record placed in the file will be a character
string that is equal to the current value of the variable. This form of
the ⟨environment⟩ attribute is useful for processing a file containing
character strings of different lengths, especially when the file was not
created by use of PL/I record output.

```
       Required Attributes                    Default

       stream¦record                          stream
       input¦output¦update                    input
       sequential¦direct                      sequential (if record)
```

4. If the filename is "sysprint" and the file control block is
   external and the filedescription contains the <stream
   attribute> and the <output attribute>, augment the
   filedescription with the <print attribute>.

5. The filedescription must now be a set of <attribute>s
   described by the following syntax:

   <consistent file description>::= <stream description>¦
       <record description>

   <stream description>::= stream{input¦output[print]
       [environment(interactive)]}

   <record description>::= record{input¦output¦update}
       {<sequential description>¦<direct description>}
       [environment(string value)]

   <sequential description>::= sequential[keyed]

   <direct description>::= direct keyed

6. If the filedescription contains the <print attribute> and
   the opening is being performed by the execution of an <open
   statement> and the <opening> contains a <pagesize option>,
   pagesize is set to the converted value of the <pagesize
   option>; otherwise, it is set to a default value that
   depends on the device or data set to which the stream is
   attached. If the stream is attached to a console, pagesize
   is set to infinity, thereby preventing an endpage condition
   from occurring; otherwise it is set to 60.

   If the opening is being performed by the execution of an
   <open statement> and the <opening> contains a <pagesize
   option>, the filedescription must contain the <print
   attribute>.

7. If the filedescription contains a <stream attribute> and an
   <output attribute>, and the opening is being performed by
   the execution of an <open statement> and the <opening>
   contains a <linesize option>, linesize is set to the
   converted value of the <linesize option>; otherwise, it is
   set to a default value that depends on the device or data
   set to which the stream is attached. If the stream is
   attached to a console, linesize is set to the current
   linesize of the console; otherwise, it is set to 132.

2. If f is closed, open it as described in section 11.3. After f is open, it must have the <input attribute> or the <update attribute>. If a <key option> is given, f must have the <keyed attribute> and if f has the <direct attribute>, a <key option> must be given.

3. Free any input buffer associated with f. This circumstance occurs when the previous input operation on f was the executiion of a <read statement> containing a <set option>.

4. If an <ignore option> is specified, set currentrecord to designate the (k-1)th record following the record designated by nextrecord. Signal the endfile condition if the value of k would position currentrecord off the end of the data set.

   If a <key option> is specified, set the currentrecord of f to designate the record identified by the converted value of the <expression> in the <key option>. If no such record exists in the data set attached to f, signal the key condition.

   If no <key option> or <ignore option> is specified, set currentrecord to the value of nextrecord. If nextrecord is null, signal the endfile condition.

5. If f has the <sequential attribute>, set nextrecord to designate the record following the new current record. If there is no next record, set nextrecord null.

6. If a <keyto option> is specified, assign the key associated with the current record to the variable identified by the <reference> given in the <keyto option>.

7. If an <into option> is specified, assign a copy of the current record to the variable identified by the <into option> . If the file-state block has an <environment attribute> specifying "stringvalue", and the variable, X, referenced by the <into option> is a scalar variable with the <character attribute> and the <varying attribute> perform the assignment by executing an <assignment statement> of the form

   X = R;

where R is the record treated as character string value. If this assignment would raise the <string size condition>, raise <record condition> instead. Otherwise perform the assignment by executing an <assignment statement> of the form: unspec(X) = unspec(R)
   If length(unspec(R))^=length(unspec(X)), signal the record condition. On return from the <on unit>, complete the assignment as if the length of R and the length of X were the minimum of the lengths of X and R.

8. If a <set option> is specified, allocate a generation of storage of sufficient size to hold a copy of the current record in "system storage" and associate the generation with f as its input buffer. Assign a copy of the current record to this buffer and assign a pointer value identifying the

Constraints:

A <rewrite statement> must contain exactly one <file option> and cannot contain more than one <key option> or more than one <from option>.

Evaluation of the <reference> in the <file option> must yield a scalar file value.

Evaluation of the <key option> must yield a scalar arithmetic or string value.

Evaluation of the <from option> must yield a generation of connected storage.

Semantics:

A <rewrite statement> is executed by performing the following steps in the indicated order:

1. Evaluate the <rewrite option>s in an unspecified order.

   Let f denote the file-state block identified by the value of the <file option>.

   Convert the value of the <expression> in the <key option> to a character-string.

2. If f is closed, open it as described in section 11.3. After f is opened, it must have the <update attribute>. If a <key option> is specified, f must have the <keyed attribute>.

3. If a <key option> is specified, set the currentrecord of f to designate the record identified by the converted value of the <key option>. If no such record exists in the data set attached to f, signal the key condition.

   If a <key option> is specified and f has the <sequential attribute>, set nextrecord to designate the record following the new current record. If there is no next record, set nextrecord null.

   If no <key option> is specified, currentrecord must not be null.

4. If the file-state-block has an <environment attribute> specifying "stringvalue", a <from option> is specified, and the variable, X, referenced by the <from option> is a scalar variable with the <character attribute>, and the <varying attribute> replace the record designated by the current record with a character string equal to the current value of X.

   If a <from option> is specified, and the preceding paragraph does not apply, replace the record designated by currentrecord with a copy of the variable identified by the <reference> in the <from option>.

   If f does not have the <keyed attribute> and the size of the variable is not equal to the size of the record designated

1. Evaluate the <write option>s in an unspecified order.

   Let f denote the file-state block identified by the value of the <file option>.

   Convert the value of the <expression> in the <keyfrom option> to a character-string.

2. If f is closed, open it as described in section 11.3. After f is opened, it must have the <record attribute>. It cannot have the <input attribute>. If it has the <update attribute>, it must also have the <keyed attribute>. If the <keyfrom option> is specified, f must have the <keyed attribute> and if f has the <keyed attribute> the <keyfrom option> must be specified.

3. If there is an output buffer associated with f, create a new record in the data set and write the content of the buffer as the value of the new record. If there is an evaluated key associated with the buffer, associate it with the record as its key. If any record in the data set already has this key, signal the key condition.

   If f has the <keyed attribute> create the new record in its proper position within the data set as determined by its key; otherwise, append the new record to the end of the data set.

   After the record is written, free the output buffer. An output buffer exists when the previous output operation on f was the execution of a <locate statement>.

4. If the <keyfrom option> is specified and the data set already contains a record whose associated key is the converted value of the <keyfrom option>, signal the key condition. If currentrecord is not null, and f has both the <keyed attribute> and the <sequential attribute> , and the converted value of the <keyfrom option> is not greater than the key of the record designated by currentrecord, signal the key condition.

5. If f has the <keyed attribute> create the new record in its proper position within the data set as determined by its key; otherwise, append the new record to the end of the data set. If the variable, X, referenced by the <from option> is a scalar variable with the <character attribute> and the <varying attribute>, and if the file-state-block has an <environment attribute> specifying "stringvalue", the record is a character string equal to the current value of X. Otherwise, the record is a copy of the content of the generation identified by the evaluated <from option>.

6. Associate the converted value of the <keyfrom option> with the new record as its key.

Multics Change Request

TITLE:	New error codes	STATUS	DATE

AUTHOR: R. Bratt

Written	03/07/75	
Status	A 03/11/75	
Expires		

-Coded in: ☐PL/I ☐ALM ☒other-
 explain in DETAILED PROPOSAL
-Planned for System MR_____
-Fixes Bug Number(s)_____
-Documented in MTB_____
-User/Operations-visible
 Interface change? ☒yes ☐no
-Incompatible change? ☐yes ☒no
-Performance: ☐Better ☒Same
 ☐Worse
-Replaces MCR_____

Category (Check One)

	Lib. Maint. Tools
	Sys. Anal. Tools
	Sys. Prog. Tools
	355
	BOS
	Salvager
X	Ring Zero
	Ring One
	SysDaemon/Admin.
	Runtime
	User Cmnd/Subr.

DOCUMENTATION CHANGES

Document	Specify One or More
MPM (Vol, Sect.)	error table
PLMS (AN #)	
MOSN (Sect.)	
MPAM (Sect.)	
MSAM (Sect.)	
Info Segs	
Other (Name)	
None (Reason)	

Objections/Comments:

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

SUMMARY: Two new error codes must be added to error_table_
             for use by new address space management primitives.
             These may as well be added to the system now.

             error_table_$link   link, This operation is not allowed for a link entry

             error_table_$known_in_other_rings kothrngs,
                     The segment number is being used in other rings.

DETAILED PROPOSAL:

             Coded in error table language.

MCR 1067

Page____of____

Multics Change Request

TITLE:	Rewrite find_	STATUS	DATE
AUTHOR:	Richard Bratt	Written	02/25/75

	Category (Check One)		Status	A 03/11/75
		Lib. Maint. Tools	Expires	09/11/75

-Coded in:[X]PL/I [ ]ALM [ ]other-
 explain in DETAILED PROPOSAL
-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: [X]Better[ ]Same
 [ ] Worse
-Replaces MCR_____

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

DOCUMENTATION CHANGES

Document	Specify One or More
MPM (Vol, Sect.)	
PLMS (AN #)	
MOSN (Sect.)	
MPAM (Sect.)	
MSAM (Sect.)	
Info Segs	
Other (Name)	
None (Reason)	

Objections/Comments:

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

SUMMARY:

When the name space management moves out of ring zero,
find_ will have to be split into an outer ring piece
and a ring zero piece. I propose that most of this
split be made now. The proposed find_ will continue
to dissect pathnames and follow links. A new module,
find_entry, will handle directory locking and search-
ing for find_.

MAJOR MODIFICATIONS:

1) Place directory locking and searching code in a
   separate module which will remain in ring zero
   after find_ has been retrieved.

2) Create a (pathname, segno) associative memory for
   find_ and fs_get_pathname's use (the KST will not
   hold pathnames in the future).

3) Eliminate the seg entry points to find_ (and
   change initiate to call find_entry).

4) Remove per_system meters from find_ (they are
   not currently used and cannot be kept when
   find_ moves to the outer ring).

5) Prevent find_ from locking the root when it
   returns error_table_$root (and change the address
   of find_ to take appropriate action).

Multics Change Request	MCR	1068
	Page	1 of 1

TITLE: Potential bugs in hardcore

AUTHOR: R F Mabee

	STATUS	DATE
	Written	12 Feb 75
	Status	A 03 11/75
	Expires	09/11/75

-Coded in: ☒PL/I ☒AIM ☐other-
explain in DETAILED PROPOSAL

-Planned for System MR **N/A**

-Fixes Bug Number(s)_____

-Documented in MTB _____

-User/Operations-visible
 Interface change? ☐yes ☒no

-Incompatible change? ☐yes ☒no

-Performance: ☐Better ☒Same
 ☐Worse

-Replaces MCR _____

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

DOCUMENTATION CHANGES

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

Objections/Comments:

Info Segs	
Other (Name)	
None (Reason)	No change to spec.

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

SUMMARY:

   Certain bugs which make system development more difficult are remedied. Modules affected are bootstrap2, initialize_faults, get_ptrs_, make_sdw, privileged_mode_ut, init_processor, plm, deact_proc, and tc_init.

REASONS:

   1) When bootstrap2 initializes the PDS and PRDS stack headers, it sets the signal_ptr field to -2|-2 because signal_ is not yet read in. Thus the PL/I environment is not entirely set up until much later when initialize_faults happens to set these pointers. If (for example) the stack header were copied in this state, the copies would retain the invalid signal_ptr. To fix this, signal_ should be moved to Collection One; presumably signal_ and condition_ can be put in the non-wired part of bound_sss_wired_.

   2) Some old segment-control modules reference SDW parameters with LDAQ instructions (i.e. fixed binary (71) templates). This not only is incorrect PL/I, but also results in incorrect operation when the caller allocated the SDW by:
   declare 1 my_sdw automatic like sdw aligned;
The PL/I declaration for sdw (in sdw.incl.pl1) contains only bit strings and thus may occur on any word boundary. Those modules mis-referencing their parameters should be fixed.

   3) The traffic-control state meters (tc_data$.stat) are not correctly maintained. tc_init and deact_proc must update the meters. This will also contribute towards fixing the ave-queue meter.

IMPLICATION:

   Part 1 requires a change to the header and two bind files. It adds slightly to the high-water mark.

Multics Change Request

MCR 1069
Page 1 of 1

TITLE: formline_ and imp_dim bug fixes

AUTHOR: Raj Kanodia

STATUS	DATE
Written	3/4/75
Status	H 03/11/75
Expires	09/11/75

-Coded in: [X]PL/I [X]ALM [ ]other-
 explain in DETAILED PROPOSAL
-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
 [ ]Worse
-Replaces MCR _____

Category (Check One)

Category
Lib. Maint. Tools
Sys. Anal. Tools
Sys. Prog. Tools
355
BOS
Salvager
Ring Zero
Ring One
SysDaemon/Admin.
Runtime
User Cmmd/Subr.

DOCUMENTATION CHANGES

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

Objections/Comments:

Info Segs	
Other (Name)	
None (Reason)	

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

SUMMARY:

1- Calling syserr at the interrupt time with a blank string as one of the arguments
caused a system crash.

XX   If the argument is a blank string, formline_ attempts to move into a zero length
      string with the EIS instruction mlr which causes a fault. Since this fault can
      not be handled at the interrupt time, the system crashes.
      A trivial change to formline_ solves the problem. If and when the CPUs are
      modified not to cause this fault, this change may be removed.

2- A locking bug in the IMP DIM such that the interrupt side could get in the IMP DIM
without setting the IMP DIM lock.
      Fixed imp_input_processor to set the lock properly.

3- A bug in the processing of NCP control messages received from other sites caused
hungup network connections and NCP software errors.
      Fixed imp_input_processor.pl1.

Multics Change Request

TITLE: Change to tty_ctl for MDS 2400	STATUS	DATE

AUTHOR: M. Grady

		STATUS	DATE
		Written	03/04/75
		Status	A 03 11 75
		Expires	09/11/75

-Coded in: ☐ PL/I ☐ AIM ☒ other-
   explain in DETAILED PROPOSAL
-Planned for System MR 2.1
-Fixes Bug Number(s) _____ –
-Documented in MTB _____
-User/Operations-visible
   Interface change? ☐ yes ☒ no
-Incompatible change? ☐ yes ☒ no
-Performance: ☐ Better ☒ Same
   ☐ Worse
-Replaces MCR _____

Category (Check One)

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

DOCUMENTATION CHANGES

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

Objections/Comments:

Info Segs	
Other (Name)	
None (Reason) not required	

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

SUMMARY:

   Certain types of private 4 wire high speed lines
   used by the M S2400 sometimes drop carrier for
   1-3 seconds. This should not be treated as a
   hangup of the line, but as a noise burst and the
   tables should wait for carrier to return.

PROPOSAL:

   Fix tty_ctl to ignore the short drop in carrier
   and wait for its return to normal conditions. The
   standard GRTS error recovery procedures will pre-
   vent any data loss.

IMPLICATIONS:

   None.

DETAILED PROPOSAL:

   Coded in io_compiler language.

Multics Change Request

MCR 1072
Page _1_ of _1_

TITLE:	355 reliability improvement	STATUS	DATE
AUTHOR:	M. Grady	Written	03/04/75

-Coded in: ☐ PL/I ☐ ALM ☒ other- explain in DETAILED PROPOSAL	Category (Check One)	Status	A 03/11/75
		Expires	09/11/75

-Coded in: ☐ PL/I ☐ ALM ☒ other-
explain in DETAILED PROPOSAL
-Planned for System MR **2.1**
-Fixes Bug Number(s) ___-___
-Documented in MTB ___
-User/Operations-visible
  Interface change? ☐ yes ☒ no
-Incompatible change? ☐ yes ☒ no
-Performance: ☒ Better ☐ Same
  ☐ Worse
-Replaces MCR ___

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

DOCUMENTATION CHANGES

Document	Specify One or More
MPM (Vol, Sect.)	
PLMS (AN #)	
MOSN (Sect.)	
MPAM (Sect.)	
MSAM (Sect.)	
Info Segs	
Other (Name)	
None (Reason)	not required

Objections/Comments:

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

SUMMARY:

> The current 355 software is <u>very</u> sensitive to spurious
> line noise from any of the inactive communications
> channels. Any character received on an inactive
> (i.e. not dialed) channel caused 72 bits of status
> to be set to the 6180, which promptly ignores it.
> If too much status is generated at once, the 355
> will crash because it has run out of buffers to
> queue the status.

PROPOSAL:

> Fix glsa; tell LSLA interface routine to ignore
> random characters unless carrier detect is on
> (i.e., the line is dialed up).

IMPLICATIONS:

> The 355 will be less sensitive to noise bursts and
> the 6180 will not waste time processing status it
> will ignore anyway.

DETAILED PROPOSAL:

> Coded in 355 MAP.

TITLE: Provide new functions for BOS SAVE/RESTOR	STATUS	DATE

AUTHOR: Noel I. Morris

	STATUS	DATE
	Written	75.03.07
	Status	A 03|11|75
	Expires	09/11/75

-Coded in: ☐PL/I ☒AIM ☐other-
explain in DETAILED PROPOSAL
-Planned for System MR
-Fixes Bug Number(s)
-Documented in MTB
-User/Operations-visible
  Interface change? ☒yes ☐no
-Incompatible change? ☐yes ☒no
-Performance: ☒Better ☐Same
  ☐Worse
-Replaces MCR

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

DOCUMENTATION CHANGES

Document	Specify One or More
MPM (Vol, Sect.)	
PLMS (AN #)	
MOSN (Sect.)	5.3.3
MPAM (Sect.)	
MSAM (Sect.)	
Info Segs	
Other (Name)	SRB2.1
None (Reason)	

Objections/Comments:

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

SUMMARY:
New functions are provided in the BOS SAVE/RESTOR mechanism to allow
copying the contents of a disk pack to another disk pack, and to allow
performing the normal SAVE and RESTOR of the Multics hierarchy   using
disk instead of tape.

Reasons:
GM wants a facility to copy a disk pack and wants faster crash recovery.

Implications:
The time needed to perform a SAVE of the Multics hierarchy   can be cut
by a factor of about 2.3 by using disk instead of tape.

Proposal:
Please refer to draft ·of MTB-5.3.3

To: Operations

From: Noel I. Morris

Date: March 6, 1975

Subject: Extensions to the BOS SAVE/RESTOR mechanism

Two new features have been added to the BOS SAVE/RESTOR
mechanism. One of these is the ability to copy the contents of a
disk pack to another disk pack. The other feature is the ability
to use disk as an I/O device (instead of tape) for performing
SAVEs and RESTOREs. In both cases, a new configuration card is
required to describe the disks to be used as I/O devices. This
configuration card is described in MOSN 4.3.4.

SAVE copy facility

The copy feature of the SAVE command is designed to copy the
contents of a disk pack to another pack. It can be used to copy
all packs in the MULT partition in order to provide a backup copy
of the disk contents at a particular moment. It can also be used
to copy as much as possible from a defective disk pack onto a
"clean" pack. Each Multics record copied is placed in exactly
the same position on the target pack. There is no copy feature
in the RESTOR command. The restoration function is effected by
simply mounting the copy in place of the original disk pack.

Usage

        SAVE -address extent- COPY -list- -ALL-

This command is similar to the SAVE to tape, except that the list
supplied is of disk drive numbers (not area numbers) instead of
tape drive numbers. If the list is omitted, drives 1 and 2 will
be used. As each disk pack becomes full, it will be stopped to
allow the operator to mount another pack, and the next drive in
the list will be used to continue the SAVE operation. The ALL
option must be given if a successful salvage has not been
performed prior to attempting the SAVE COPY.

SAVE to Disk

This feature of the SAVE and RESTOR commands uses disk instead of
tape for performing the same functions. During the SAVE
operation, Multics disk records are copied and placed in the same
format as when written to tape. Then, they are written out onto

disk. The RESTOR command is able to read this disk and recover
the original Multics records.

Usage

        SAVE -address extent- DISK -list- -ALL-
        RESTOR -address extent- DISK -list-

The disk packs specified by the list are used instead of tape to
perform the SAVE or RESTOR operation.

Timing

The time to SAVE or RESTOR the contents of a single full DSU191
pack is less than 4 minutes. This is in contrast to the 10
minutes (and 2 1/2 reels) required to SAVE or RESTOR the contents
of a full pack using tape.

Note

The SAVE and RESTOR commands will refuse to read or write any
disk pack as an I/O device unless it is described in the PRPH
DISK card. This will prevent performing a SAVE over the contents
of the Multics heirarchy.

Examples

To copy the entire contents of D191 area 3 to a pack mounted on
disk drive 8:

        SAVE D191 AREA 3 AREA COPY 8. ALL

To make copies of all packs in the heirarchy using disk drives 8
and 9:

        SAVE COPY 8. 9.

To save the Multics heirarchy onto disks using drives 8 and 9:

        SAVE DISK 8. 9.

To restore the Multics heirarchy from disk using drives 8 and 9:

        RESTOR DISK 8. 9.