To: Distribution

From: Joan Scott

Date: June 8, 1976

Subject: Approved MCR's from May 16 - 30, 1976

Attached are the MCR's which were approved from May 16 - 30, 1976

```
I Ver. 3                                             I
I 741022          MULTICS CHANGE REQUEST             I  MCR  1844
I------------------------------------------------I-------------------------
I TITLE:  Multics Data Base Manager                 I _STATUS__I_DATE_____
I                                                   I _written_I_05/03/76__
I AUTHOR: O. Friesen                                I _Status__I A 5/17/76
I------------------------------------------------I _Expires__I_11/03/76__
I Planned for  System:    MR 4.0                    I-------------------------
I Fixes Bug Number(s):    not applicable            I _CATEGORY_(check_one)
I Documented  in  MTB:  271,272,273                 I( )Lib. Maint. Tools
I Incompatible Change:  no                          I( )Sys. Anal. Tools
I User/Operations-visible Interface Change:  no     I( )Sys. Prog. Tools
I Coded in: (X)PL/I ( )ALM ( )other-see below       I( )355
I Performance: ( )better (X)same ( )worse           I( )BOS
I------------------------------------------------I( )Salvager
I_DOCUMENTATION_CHANGES_(specify_one_or_more)_____I( )Ring Zero
I MPM (vol,sect) 4/II;3/III MPAM (sect)             I( )Ring One
I MOSN (sect)               MSAM (sect)             I( )SysDaemon/Admin
I PLMs (AN#)                                        I( )Runtime
I Info Segs                                         I(X)User Command/Subr
I Other          MDBM User Supplement (initially    I
I_               all doc. will appear in 4.0 SRB ___I_____
I OBJECTIONS/COMMENTS:                              I
I                                                   I
I                                                   I
I---------------------------------------------------------------------------
Headings are:  SUMMARY, REASONS, IMPLICATIONS, DETAILED PROPOSAL (optional)
```

SUMMARY: Install the initial release of the Multics Data Base Manager.

REASON: To provide Multics with a data base management system.

IMPLICATIONS: None.

Ver. 3 741022	MULTICS CHANGE REQUEST	MCR __1845__

	STATUS	DATE
TITLE: Fix salv_truncate unprotected address bug	Written	05/06/76
AUTHOR: Bernard Greenberg TVV	Status	A 05/18/76
	Expires	11/06/76

Planned for System: MR 4.0
Fixes Bug Number(s): not applicable
Documented in MTB: not applicable
Incompatible Change: no
User/Operations-visible Interface Change: no
Coded in: (X)PL/I ( )ALM ( )other-see below
Performance: ( )better (X)same ( )worse

__CATEGORY (check one)__
( )Lib. Maint. Tools
( )Sys. Anal. Tools
( )Sys. Prog. Tools
( )355
( )BOS
(X)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#)   61
Info Segs
Other

OBJECTIONS/COMMENTS:

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

SUMMARY: In certain circumstances of directory rebuild, a long salvage can
cause directory compaction without removing the deposited addresses from
the compacted directory's VTOC entry. This causes an unprotected address.

        Fix the bug.

REASONS: Unprotected addresses cause reused ones, and reused addresses
cause shared data and crashes.

TITLE: Unlock AST during activation VTOCE read.	**STATUS** **DATE**
	Written 05/06/76
AUTHOR: Andre Bensoussan *TVV*	Status A 05/18/76
	Expires 11/06/76

Planned for System: MR 4.0
Fixes Bug Number(s): not applicable
Documented in MTB: not applicable
Incompatible Change: no
User/Operations-visible Interface Change: no
Coded in: (X)PL/I ( )ALM ( )other-see below
Performance: (X)better ( )same ( )worse

CATEGORY (check one)
( )Lib. Maint. Tools
( )Sys. Anal. Tools
( )Sys. Prog. Tools
( )355
( )BOS
( )Salvager
(X)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#) 61	
Info Segs	
Other	

OBJECTIONS/COMMENTS:

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

SUMMARY: Unlock the AST during the VTOC entry read during segment activation.

REASONS: Improve performance by reducing AST lock contention.

IMPLICATIONS: Slightly more complicated logic in activate needed to revalidate derived AST pointers. Slightly more process time expended in multiple lock calls.

Ver. 3 741022	MULTICS CHANGE REQUEST	MCR **1848**	

TITLE: Privileged gate entry for VTOCE inspection. AUTHOR: Bernard Greenberg *TVV*	STATUS	DATE
	Written	05/06/76
	Status	A 05/18/76
	Expires	11/06/76

Planned for System: MR 4.0
Fixes Bug Number(s): not applicable
Documented in MTB: not applicable
Incompatible Change: no
User/Operations-visible Interface Change: no
Coded in: (X)PL/I ( )ALM ( )other-see below
Performance: ( )better (X)same ( )worse

CATEGORY (check one)
( )Lib. Maint. Tools
(X)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#)   72
Info Segs
Other

OBJECTIONS/COMMENTS:

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

SUMMARY: Create phcs_$get_vtoce, a privileged gate for obtaining t' contents of a VTOC entry in the outer ring.

REASONS: System maintenance and debugging has often found it critical to inspect the contents of VTOC entries, which can only be done now by shutting down, chancy techniques involving VTOC buffer dumping, or risky techniques involving highly privileged access.

IMPLICATIONS: There are many covert and overt information paths through this dumping, but access to phcs_ is limited to trusted system programmers, who could dump passwords out of teletype buffers, etc., with phcs_ as it stands.

Multics Change Request

TITLE: Multics Graphics System update for 4.0

AUTHOR: C. D. Tavares

STATUS	DATE
Written	
Status	A 5/17/76
Expires	11/17/76

-Coded in: [X] PL/I [ ] ALM [X] 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)	
Lib. Maint. Tools	
Sys. Anal. Tools	
Sys. Prog. Tools	
355	
BOS	
Salvager	
Ring Zero	
Ring One	
Sys Daemon/Admin.	
Runtime	
XX	User Cmmd/Subr.

DOCUMENTATION CHANGES

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

Objections/Comments:

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

SUMMARY: Fixes minor bugs and new compiler warning messages
           Adds capability of running Tektronix 4002 and 4002A devices

REASONS: Better service

IMPLICATIONS:
         Although the code for the 4002 should reasonably work, I cannot
guarantee irrevocably that it does. The model is no longer available from
the manufacturer, and a demo model cannot be obtained. However, this was
(and still is) a very popular terminal, and xxxxxxxxxxxxxxxxxx some of our
sites (MIT, System M for two) do have user-owned 4002's. Users using these
devices currently either use the existing 4012 facility, which is not
totally satisfactory; of those at MIT use MIT's own 4002 facility, which
has its own problems (e.g. text not aligned correctly). Users in the
first group will not lose anything by trying the new 4002 package. MIT
might be warned that they should keep their facility around just in case
for a short time. However, note that non-exhaustive user testing at
both sites have indicated that the new 4002 package appears immediately
superior to the 4012 package and MIT's 4002 package. Note that both
the new 4002 package and MIT's can co-exist at the same time on the same
system until they are satisfied that it indeed works.

DETAILED PROPOSAL:
         Fix bug in graphic_editor causing OOB's in new areas.
         Cosmetic internal code changes to graphic_dim_ to suppress
new compiler warning messages for 'char_string = ""b' and
'bit_string = ""' typos that were never previously diagnosed.
         Modify graphic_dim_ to suppress any MCS echo-type modes while
performing graphic input, so that random input from graphic devices does
not mess up the user's screen.
         Add support for Tektronix 4002 and 4002A terminals.
         Delete nonstandard obsolete name "gr_print" from bound seg.

                              OVER

If any questions arise, please CALL 202-695-2478 and I will try to clarify them. Since I am not in Phoenix, it takes too very long to shuffle the forms back and forth, especially when I then have to call anyway to find out exactly what the objections were! My last MCR was submitted 12/03, and took until 04/20 to occur, although it was accepted on 01/19, because kh it was lost in the shuffle.

Also, documentation changed for this MCR was submitted two months ago or better, in anticipation of a slow publication.

Ver. 3 741022	MULTICS CHANGE REQUEST	MCR 1850

TITLE: Fix bug in syserr_log_copy

AUTHOR: L. Scheffler

STATUS	DATE
Written	05/14/76
Status	A 05/18/76
Expires	11/14/76

Planned for System: MR4.0
Fixes Bug Number(s): unreported
Documented in MTB: not applicable
Incompatible Change: no
User/Operations-visible Interface Change: no
Coded in: (X)PL/I ( )ALM ( )other-see below
Performance: ( )better (X)same ( )worse

CATEGORY (check one)
( )Lib. Maint. Tools
( )Sys. Anal. Tools
( )Sys. Prog. Tools
( )355
( )BOS
( )Salvager
(X)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#)
Info Segs
Other
None (reason) None needed

OBJECTIONS/COMMENTS:

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

SUMMARY: Fix attempt to use null pointer in syserr_log_copy$auto_copy_inita that occurs when the paged syserr log in ring 0 does not exist.

REASONS: This bug causes a fault in ring 0 during log copying initialization whenever the PART LOG card is missing from the config deck.

IMPLICATIONS: This case will be handled properly.

DETAILS: The internal subroutine GET_SLOG_PTR in syserr_log_copy returns a null pointer and a non-zero error code if the paged syserr log does not exist. (This is the case if the PART LOG card is missing.) Change the code in syserr_log_copy$audit_copy_inita to not reference through the pointer returned by GET_SLOG_PTR if the returned code is non-zero.

Multics Change Request

TITLE: Install quick edit-directed pl1 output

AUTHOR: R. Schoeman   RAB

STATUS	DATE
Written	05/11/76
Status	A 05/18/76
Expires	11/18/76

-Coded in: [X] PL/I [ ] ALM [ ] other-
explain in DETAILED PROPOSAL

-Planned for System MR 4.0

-Fixes Bug Number(s) 1490, 1486

-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 #)	
MOSN (Sect.)	
MPAM (Sect.)	
MSAM (Sect.)	
Info Segs	
Other (Name)	
None (Reason)	non-visible change

Objections/Comments:

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

SUMMARY: Install a new bound_plio2_ and bound_sss_wired_ which implement
the new pl1 stream output which does edit-directed output in
the operators, rather than in bound_plio2_.

REASONS: Aside from fixing bugs 1490 and 1486, this produces a dramatic
speed-improvement (3-5 times in normal cases, much better in certain
other ones) in the execution of pl1 "put edit" statements.

DETAILED
PROPOSAL: 1)   plio2_put_util_ in bound_plio2_ has been changed to support the
error raising mechanism for quick put edits. plio2_open_ and
display_plio_error have been changed for minor improvements and
bug fixes.

           2)   any_to_any_.alm in bound_sss_wired_ has been changed to
support quick stream i/o and to fix bug 1490.

           3)   put_field_.alm and pl1_operators_.mexp in bound_sss_wired_
have been changed to fix minor bugs in pl1 stream output and to
support quick edit output.

           4)   a new module, put_format_.alm, has been added to bound_sss_wired_
to implement quick edit output.

Changes made:

Installed a new bound_plio2_ in >ldd>exl>o which provides a more complete error diagnostic when display_pllio_error is invoked following an error in opening or closing a stream file. display_pllio_error was changed.

Installed a new bound_plio2_ and oncode_messages_ in >ldd>exl>o which now use the proper referencing_dir search rules to find an i/o module. plio2_open_ and oncode_messages were changed.

Installed a new bound_pll_operators and a new bound_plio2_ which enables stream oriented pll edit-directed output to be done in an operator within the user's s ck frame, resulting in a major speed improvement. plio2_put_util_,put_field_, pll_operators_, and any_to_any_ were changed and a new module, put_format_, was added.

Installed a new bound_pll_operators_ in >ldd>exl>o fixing bug 1486 in which quick put lists in pll io fail if the request requires the outputting of more than 848 chars. put_field_ was changed.

Installed a new bound_pll_operators_ in >ldd>exl>o fixing bug 1490 in which long conversions in any_to_any_ can clobber program storage. any_to_any_ was changed.

TITLE:	Fix new_message_facility		STATUS	DATE	
AUTHOR:	S. Herbst	TVV	Written	II May 76	

		STATUS	DATE
		Status	A 05/18/76
		Expires	II /18/76

-Coded in: [X] PL/I [ ] AIM [ ] other-
explain in DETAILED PROPOSAL
-Planned for System MR **5.0**
-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)

	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)	doc ok

Objections/Comments:

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

SUMMARY:

Make minor fixes to the newly installed new_message_facility:

1.   Write messages interactively on user_io, instead of on user_output which
     can be re-attached.

2.   Perform an iox_$control "start" operation so that wakeups are not lost
     due to the receipt of a message.

Multics Change Request

TITLE: Fix bug in profile command
AUTHOR: R. A. Barnes

STATUS	DATE
Written	7 May 76
Status	A 05/18/76
Expires	11/18/76

-Coded in: [x] PL/I [ ] ALM [ ] other-
 explain in DETAILED PROPOSAL
-Planned for System MR   5.0
-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)	
	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)	bug fix

Objections/Comments:

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

SUMMARY:

    profile incorrectly counts the number of instructions for
    a statement preceding a procedure statement or entry
    statement. The instructions for the latter are errone-
    ously included in the count for the former. Fix the
    bug.

DETAILED PROPOSAL:

    profile estimates the cost of a statement by getting the
    difference between the starting location of this state-
    ment and that of the next statement. The problem lies
    in finding the next statement. Presently, profile uses
    the next profile entry to find the statement_map entry
    for the next statement. Since no profile entries are
    generated for procedure statements and entry statements,
    this can fail to find the next statement. To fix the
    bug we take advantage of the fact that statement_map
    entries are generated sequentially, and simply use the
    next statement_map entry to get the location of the
    next statement. (Statement_map entries _are_ generated
    for procedure statements and entry statements.)

```
I Ver. 3                                            I                          I
I 741022            MULTICS CHANGE REQUEST          I   MCR   1855             I
I_____I_____I
I TITLE!  Show sons volume ID in get_quota         I_STATUS__I_DATE_____     I
I                                                  I_Written_I_02/18/76__I
I AUTHOR: VanVleck                                 I_Status__I AS/18/76 I
I_____I_Expires_I_08/18/76__I
I Planned for  System!      4.0                    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! (B)PL/I ( )ALM ( )other-see below      I( )355               I
I Performance: ( )better (B)same ( )worse          I( )BOS               I
I_____I( )Salvager          I
I_DOCUMENTATION_CHANGES_(specify_one_or_more)___   I( )Ring Zero         I
I MPM (vol,sect) get_quota  MPAM (sect)            I( )Ring One          I
I MOSN (sect)               MSAM (sect)            I( )SysDaemon/Admin   I
I PLMs (AN#)                                       I( )Runtime           I
I Info Segs                                        I(B)User Command/Subr I
I Other                                            I                     I
I_____I_____I
I OBJECTIONS/COMMENTS!                                                   I
I                                                                        I
I    Fix documentation in next MPM update to mention sons' volume ID     I
I_____I
```

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

SUMMARY!

Modify the get_quota command to print the sons volume ID if it is printing
the quota for multiple directories (as a result of the star convention) and
the sons volume ID differs from the parent directory's sons volume ID.

If long mode is requested, do not print the count of inferior quotas (no
longer returned by hcs_$quota_read) but do print the sons volume ID.

REASONS!

The output of get_quota is misleading if no indication of the volume ID is
given, since quota on one volume cannot be transmuted into quota on
another.

Name: get_quota, gq

The get_quota command returns information about the secondary storage quota and pages used for a specified directory.

Usage

get_quota paths -control_arg-

where:

1.   paths   are the names of the directories for which quota information
                     is desired. If one of the paths is -wd or -wdir, the working
                     directory is used.   If no paths are given, the working
                     directory is used. The star convention can be used to obtain
                     quota information about several directories.

2.   control_arg   can be either -long or -lg to specify that the long form of
                     output is to be used; this control_arg may appear anywhere on
                     the command line.

Notes

The short form of output (the default case) prints the number of pages of
quota assigned to the directory and the number of pages used by the segments in
that directory and any inferior directories that are charging against that
quota.   The output is prepared in tabular format, with a total, when more than
one pathname, is specified. When only one pathname is specified, a single line
of output is printed.

The long form of output gives the quota and pages-used information provided
in the short output. In addition, it prints ~~information~~ ~~about~~ ~~the~~ ~~number~~ ~~of~~
~~immediately~~ ~~inferior~~ ~~directories~~ ~~with~~ ~~nonzero~~ ~~quotas.~~ ~~It~~ ~~also~~ ~~shows~~ the
time-~~page~~ product in units of ~~page~~-days, ~~along~~ ~~with~~ the date that this number
was last updated.   Thus, a user can see what secondary storage charges his
accounts are accumulating. If the user has inferior directories with nonzero
quotas, he has to print this product for all these directories in order to
obtain the charge.

record

the sons volume ID, and

Ver. 3 741022	MULTICS CHANGE REQUEST	MCR 1857

		STATUS	DATE
TITLE: Reduce load caused by IO daemon. AUTHOR: VanVleck		Written	05/07/76
		Status	A 05/18/76
		Expires	11/07/76

Planned for System: not applicable
Fixes Bug Number(s): not applicable
Documented in MTB: not applicable
Incompatible Change: no
User/Operations-visible Interface Change: no
Coded in: (X)PL/I ( )ALM ( )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
(X)SysDaemon/Admin
( )Runtime
( )User Command/Subr

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

OBJECTIONS/COMMENTS:

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

SUMMARY: Change IO daemon software to avoid flushing the cache, AST, and paging device, as was done for the dumper.

REASONS: Because the IO daemon makes a single pass through its input segments, the usual Multics optimizations, which assume that the data will be used repeatedly, are not appropriate.

Making the initiated mode be R for segments being printed also protects users from software bugs in the IO daemon which might accidentally write the user's data.

IMPLICATIONS: none

```
: Ver. 3                                              :          1859
: 741022          MULTICS CHANGE REQUEST              : MCR_____
:--------------------------------------------------   :------------------------
: TITLE:  Implement -notify option for dprint.        : STATUS  : DATE
:                                                     : Written : 05/10/76
: AUTHOR: VanVleck                                    : Status  : A 05/18/76
:                                                     : Expires : 11/10/76
:--------------------------------------------------   :------------------------
: Planned for  System:      5.0                       :
: Fixes Bug Number(s):   not applicable               : CATEGORY (check one)
: Documented in MTB:     not applicable               : ( )Lib. Maint. Tools
: Incompatible Change:   yes                          : ( )Sys. Anal. Tools
: User/Operations-visible Interface Change:   yes     : ( )Sys. Prog. Tools
: Coded in: (X)PL/I ( )ALM ( )other-see below         : ( )355
: Performance: ( )better (X)same ( )worse             : ( )BOS
:--------------------------------------------------   : ( )Salvager
: DOCUMENTATION CHANGES (specify one or more)         : ( )Ring Zero
: MPM (vol,sect) dprint     MPAM (sect)               : ( )Ring One
: MOSN (sect)               MSAM (sect)               : ( )SysDaemon/Admin
: PLMs (AN#)                                          : ( )Runtime
: Info Segs                                           : (X)User Command/Subr
: Other                                               :
:--------------------------------------------------   :------------------------
: OBJECTIONS/COMMENTS:
:
:  This will use new send_mail_ ALM feature to be described in future MCR.
:
```

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

SUMMARY: Implement the -notify (-nt) option for dprint and dpunch. If this option is specified, the daemon driver will send a confirming message when the output has been performed which looks like this:

    printed >udd>Multics>Smith>foo.list $1.25 queue 1 prtb 700301

giving the pathname of the object and the charge.

Also change the daemon drivers to send a message if a request cannot be performed, whether or not -notify was specified. This message would look like

    Unable to print PATH. REASON.

REASONS: The confirmation of the completion of daemon processing has been desired for a long time. Now that we have the secure send_message facility, it is safe for the daemons to use it.

IMPLICATIONS: The incompatible change comes from the error messages being sent to the user. Users who do not wish to get these error messages may deny all access or wakeup access on their mailbox to the daemon driver.

(changes to dprint writeup: analogous changes for apunch)

-notify, -nt   Send a confirming message when the requested output has been
                done of the form

                    printed PATH COST   queue N DEVICE REQUEST_NO

                showing the pathname and the charge for output. See the
                writeup of the accept_messages command for more information
                on interuser messages.

(add to Notes)

If a requested output operation cannot be done the daemon process will send
a message to the user of the form

    Unable to print PATH. REASON.

Giving the pathname of the object and the reason it could not be output.
For example, REASON might be "Entry not found."

```
I Ver. 3                                            I
I 741022           MULTICS CHANGE REQUEST           I  MCR___1860_____
I_____I_____
I TITLE:  Make dprint check logical volume.         I_STATUS__I_DATE_____I
I                                                   I Written I 05/09/76  I
I AUTHOR: VanVleck                                  I_Status__A 05/18/76 I
I_____I_Expires_I_11/09/76__I
I Planned for System:        4. O                   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) dprint     MPAM (sect)            I( )Ring One          I
I MOSN (sect)               MSAM (sect)            I( )SysDaemon/Admin   I
I PLMs (AN#)                                        I( )Runtime           I
I Info Segs                                         I(■)User Command/Subr I
I Other                                             I                     I
I_____I_____
I OBJECTIONS/COMMENTS:                              I
I                                                   I
I                                                   I
I_____
```

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

SUMMARY: Change dprint and dpunch to check that the segment to be
processed resides on a public volume and to ask the user if he still wants
the request if it does not.

REASONS: The IO daemon drivers will normally have access only to public
volumes. A user may set a segment RW to IO.SysDaemon but if the segment
resides on a private volume the daemon process will not attach the logical
volume before attempting to print the segment.

IMPLICATIONS: Forestall a common user error.

```
-------------------------------------------------------------------------
I Ver. 3                                              I                     I
I 741022              MULTICS CHANGE REQUEST          I   MCR__1861_____  I
I------------------------------------------------------I---------------------I
I TITLE:  Make dir_info tools handle new              I_SIATUS__I_DAIE_____I
I              attributes.                            I_Wrltten_I_05/09/76__I
I AUTHOR: VanVleck                                    I_Status__IA06/18/76  I
I------------------------------------------------------I_Explres_I_11/09/76__I
I Planned for  System:    MR  4.0                     I_____I
I Fixes Bug Number(s):    not applicable              I_CAIEGCRY_(check_one)I
I Documented  In  MTB:    not applicable              II( )Lib. Maint. Tools I
I Incompatible Change:    no                          II( )Sys. Anal. Tools  I
I User/Operations-visible Interface Change:   no      II(X)Sys. Prog. Tools  I
I Coded In: (B)PL/I ( )ALM ( )other-see below         II( )355               I
I Performance: ( )better (B)same ( )worse             II( )BOS               I
I------------------------------------------------------II( )Salvager          I
I_DOCUMENIAIION_CHANGES_(speclfy_one_or_more)_____II( )Ring Zero         I
I MPM (vol,sect) swg         MPAM (sect)              II( )Ring One          I
I MOSN (sect)                MSAM (sect)              II( )SysDaemon/Admin   I
I PLMs (AN#) 61                                       II( )Runtime           I
I Info Segs                                           II( )User Command/Subr I
I Other                                               I                     I
I------------------------------------------------------I---------------------I
I OBJECTIONS/COMMENTS:                                I                     I
I                                                     I                     I
I                                                     I                     I
I                                                     I                     I
-------------------------------------------------------------------------
```

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

SUMMARY: Modify save_dir_info, comp_dir_info, list_dir_info, and
rebuild_dir to handle the new attributes sons_lvid, master_dir, and tpd.

REASONS: The dir_info tools should report changes in these attributes.

IMPLICATIONS: none

TITLE: Fix bug in dump_segment

AUTHOR: S. Herbst   JWG

		STATUS	DATE
		Written	10 May 76
		Status	A 05/18/76
		Expires	11/18/76

-Coded in: [X] PL/I [ ] ALM [ ] other-
 explain in DETAILED PROPOSAL
-Planned for System MR 5.0
-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
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)	doc ok

Objections/Comments:

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

SUMMARY:

     Fix the dump_segment command to work with no status
     permission on the directory containing the segment.

REASON:

     Currently, it fails obtaining the segment's length,
     which it can get even without status permission.

TITLE: Fix bug in enter_abs_request	STATUS	DATE
AUTHOR: S. Herbst JWG	Written	10 May 76

	STATUS	DATE
	Status	A 05/18/76
	Expires	11/18/76

-Coded in: [X] PL/I [ ] ALM [ ] other-
 explain in DETAILED PROPOSAL
-Planned for System MR **5.0**
-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
X	User Cmmd/Subr.

DOCUMENTATION CHANGES

Document	Specify One or More
MPM (Vol, Sect.)	AG92
PLMS (AN #)	
MOSN (Sect.)	
MPAM (Sect.)	
MSAM (Sect.)	
Info Segs	
Other (Name)	
None (Reason)	

Objections/Comments:

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

SUMMARY:

Change enter_abs_request to test that the absentee user
Person_id.Project_id.m has write access to the absout
segment if it already exists, or append access to the
directory where the absout segment is to be created.

REASONS:

Currently, when Person_id.Project_id.m has null access
on this directory, there is no warning when the request
is submitted and no absout segment is created.

-time dtime,
-tm dtime

indicates that the user wishes to delay creation of the absentee process until a specified time. It must be followed by a character string representing this time. The format of the deferred time is any character string acceptable to the convert_date_to_binary_ subroutine (described in Section II of the MPM Subroutines). If the time string contains blanks, it must be enclosed in quotes.

-brief, -bf

indicates that the message "j already requested." is to be suppressed.

3. -arguments, -ag

is an optional control argument that indicates that the absentee control segment requires arguments. If present, it must be followed by at least one argument. All arguments following -ag on the command line are taken as arguments to the absentee control segment. Thus -ag, if present, must be the last control argument to the enter_abs_request command.

4. optional_args

are arguments to the absentee control segment.

Notes

If the pathname of the output segment is not specified, the output of the absentee process is directed to a segment whose pathname is the same as the absentee control segment, except that it has the suffix absout instead of absin. If the pathname of the output segment is specified, ~~the named segment may or may not already exist and~~ it need not have the suffix absout.

The command checks for the existence of the absentee input segment and rejects a request for an absentee process if it is not present.

The effect of specifying the -time option is as if the enter_abs_request command were issued at the deferred time.

See also the descriptions of the commands list_abs_requests and cancel_abs_request for information on displaying and cancelling outstanding absentee requests.

The named segment may or may not already exist. If the absout segment exists, the absentee user (Person_id.Project_id.m) must have write access to the segment. If the absout segment does not exist, the absentee user requires append permission to the directory in which it is to be created.

TITLE:	Fix bug in process_overseer_		STATUS	DATE
AUTHOR:	T. Casey	JWG	Written	7 May 76

	Category (Check One)	STATUS	DATE
		Status	A 05 /18 /76
		Expires	11 /18 /76

-Coded in: [X] PL/I [ ] ALM [ ] other-
explain in DETAILED PROPOSAL
-Planned for System MR 4.0
-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 _____

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)	no interface change

Objections/Comments:

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

SUMMARY:

Initialize the string containing the initial command
line to ("");

REASONS:

There are paths through the program that neither set it
to an initial command nor initialize it to (""). In
these cases, stack garbage is passed to listen_. Since
it is a varying string, and stack garbage consists mostly
of zeros this early in a process, users hardly ever have
problems because of this. However, there are occasions
when listen_ gets non-zero garbage and tries to execute it.

Multics Change Request

		STATUS	DATE
TITLE: Implement compare active function			
AUTHOR: S. Herbst JWG		Written	11 May 76

TITLE: Implement compare active function

AUTHOR: S. Herbst   JWG

-Coded in: [X]PL/I [ ]ALM [ ]other-
 explain in DETAILED PROPOSAL
-Planned for System MR **5.0**
-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_____

STATUS	DATE
Written	11 May 76
Status	A 05/18/76
Expires	11/18/76

DOCUMENTATION CHANGES

Category (Check One)	Document	Specify One or More
Lib. Maint. Tools		
Sys. Anal. Tools		
Sys. Prog. Tools	MPM (Vol, Sect.)	AG92
355		
BOS	PLMS (AN #)	
Salvager		
Ring Zero	MOSN (Sect.)	
Ring One		
SysDaemon/Admin.	MPAM (Sect.)	
Runtime		
X User Cmmd/Subr.	MSAM (Sect.)	
	Info Segs	
	Other (Name)	
	None (Reason)	

Objections/Comments:

Amend documentation to state that it can compare
equal only if bitcounts are equal

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

SUMMARY:

1. Allow the compare command to be called as an active function.

2. Add the short name cmp.

REASON:

    if [compare a a.old] -then dl a.old

Name: compare, cmp

    This function compares the contents of two segments.

Usage:

    [compare a b]

where a and b are pathnames, return "true" if and and b are identical, "false" otherwise.

TITLE: Implement last_message active functions

AUTHOR: S. Herbst   TVV

	STATUS	DATE
	Written	10 May 76
	Status	A 05 19 76
	Expires	11 18 76

-Coded in: [X] PL/I [ ] ALM [ ] other-
 explain in DETAILED PROPOSAL
-Planned for System MR **5.0**
-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)	
	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.)	AG 92
PLMS (AN #)	
MOSN (Sect.)	
MPAM (Sect.)	
MSAM (Sect.)	
Info Segs	
Other (Name)	
None (Reason)	

Objections/Comments:

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

SUMMARY:

      Implement the active functions last_message, last_message_time,
      and last_message_sender, as documented on the following page.

REASONS:

      Access to message information by abbrev's and exec_coms.
      Allows text of message to be parsed and allows easy way
      to answer a message just received.

Name: last_message, lm

    This active function returns the text of the last message received from the send_message command.

Usage: [last_message]

Name: last_message_time, lmt

    This active function returns the time that the last message was received from the send_message command.

Usage: [last_message_time]

Name: last_message_sender, lms

    This active function returns the sender of the last message received from the send_message command, consisting of the sender's Person_id and Project_id separated by a blank.

Usage: [last_message_sender]

Example: To answer a message that has just been received, type:

    send_message [last_message_sender] I agree.

TITLE: Fix -pvname reloader option.	STATUS	DATE
	Written	05/10/76
AUTHOR: Richard Bratt	Status	R 05/13/76
	Expires	11/10/76

Planned for System: MR 28.5
Fixes Bug Number(s): not applicable
Documented in MTB: not applicable
Incompatible Change: no
User/Operations-visible Interface Change: no
Coded in: (X)PL/I ( )ALM ( )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
(X)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#)	
Info Segs	
Other	
None (reason) bug fix.	

OBJECTIONS/COMMENTS:

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

Summary: The -pvname reloader option works in all cases but one. Unfortunately that one case, the reloading of information from a deleted physical volume, is the major reason for having the -pvname option.

Reason: This sad state of affairs results from backup_load trying to status the branch (and unfortunately the vtoce) of the object it is reloading. This results in its being told that the volume on which the object exists is not mounted. Deeming this to be confusing, the reloader gives up on that object.

Proposal: When invoked with the -pvname option, the reloader will call hphcs_$delentry_file on such an object and then proceed to reload it (the hphcs_ call is needed since delentry dislikes orphaning vtoces). This course of action seems safe for the following reasons: 1.) the volume is not mounted and therefore is probably dead, 2.) since the reloader was invoked with the -pvname option the process is asserting to the system that the volume is dead, and 3.) we have a hot copy of the segment in our hands which is likely to be as good as the unreachable copy.

Multics Change Request

TITLE:	Delete obsolete tape programs		STATUS	DATE

TITLE: Delete obsolete tape programs

AUTHOR: B. Silver   TVV

	STATUS	DATE
Written		10 May 76
Status	A 05/18/76	
Expires	11/18/76	

-Coded in: [X] PL/I [ ] ALM [ ] other-
 explain in DETAILED PROPOSAL
-Planned for System MR 4.0
-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)	
	Lib. Maint. Tools
X	Sys. Anal. Tools
X	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 of Proposal, Reasons for Proposal, Implications,
                        Detailed Proposal.

SUMMARY:

    Delete the obsolete programs: reconfigure_tape and tape_meters.

REASONS:

    The program reconfigure_tape is no longer called. The tape_
    meters command no longer works.

IMPLICATIONS:

    Clean up the system.

DETAILED PROPOSAL:

    Delete reconfigure_tape from bound_reconfigure_. Delete
    tape_meters from bound_misc_metering_.

Multics Change Request

TITLE: RCP Commands

AUTHOR: B. Silver   TVV

STATUS	DATE
Written	10 May 76
Status	A 05/18/76
Expires	11/18/76

-Coded in: [X] PL/I [ ] ALM [ ] other-
 explain in DETAILED PROPOSAL
-Planned for System MR   4.0
-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)	
Lib. Maint. Tools	
Sys. Anal. Tools	
Sys. Prog. Tools	
355	
BOS	
Salvager	
Ring Zero	
Ring One	
SysDaemon/Admin.	
Runtime	
X	User Cmnd/Subr.

DOCUMENTATION CHANGES

Document	Specify One or More
MPM (Vol, Sect.)	AG92 Commands
PLMS (AN #)	
MOSN (Sect.)	
MPAM (Sect.)	
MSAM (Sect.)	
Info Segs	
Other (Name)	
None (Reason)	

Objections/Comments:

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

SUMMARY:

Add two new RCP commands, attach_lv and detach_lv. Add
features to the existing RCP commands, assign_resource,
list_resources, unassign_resource.

REASON:

New commands needed in order to use private logical volumes.
New features added to assign_resource and unassign_resource
commands in order to make them more useful in an absentee
environment. The list_resources command can now list
attached private logical volumes.

IMPLICATIONS:

Increase resource control capability. No existing RCP
command features have been changed.

PROPOSAL:

See attached documentation. Command features relevant to
this MCR are marked in right hand column.

Name: assign_resource, ar

The assign_resource command calls the Resource Control Package (RCP) to assign a resource to the user's process. Currently, only device resources can be assigned. An assigned device still must be attached by a call to some I/O module. If a device is successfully assigned, the name of the device is printed. (If the user requests a specific device that is successfully assigned, the name of the device is not printed unless the user asks for it. See the -device and -long control argument below.)

Usage

        assign_resource resource_type -control_args-

where:

1.   resource_type   specifies the type of resource to
                                      be assigned. Currently, only
                                      device types may be specified. The
                                      "-device" control argument may be
                                      used to name a specific device to
                                      assign or optional control
                                      arguments may be used to specify
                                      characteristics of the device to be
                                      assigned. The following device
                                      type keywords are supported:
                                              "tape"
                                              "disk"
                                              "console"
                                              "printer"
                                              "punch"
                                              "reader"
                                              "special"

2.   control_args   may be chosen from   the   following:

     -device XX, -dv XX   specifies the name   of   the   device
                                    that   is   to of   assigned.   Any
                                    arguments   that   specify   device
                                    characteristics   are   ignored.   If
                                    the -long   control   argument (see
                                    below) is used in conjunction with
                                    this control argument, a message
                                    containing the name of the assigned
                                    device is   printed   on   the user's
                                    terminal, otherwise, no message is
                                    printed.

     -model n   specifies the device   model number
                                    characteristic.   Only a device that
                                    has this model number is assigned.
                                    Its value must be one that is found
                                    in the "model" field of a PRPH
                                    configuration card.

     -track n, -tk n   specifies the track characteristic
                                    of a tape drive. The value may be
                                    either 9 or 7.   If this control
                                    argument and the -volume control
                                    argument are not specified, then a
                                    track value of 9 is used by default
                                    when assigning a tape type device.

     -density n, -den n   specifies   the   density capability
                                    characteristic of a tape drive.
                                    There may be more than one instance
                                    of this argument. A tape drive is
                                    assigned that is capable of being
                                    set to all of   the specified
                                    densities.   This command does not
                                    set the density of the tape drive.
                                    The   acceptable values for this
                                    argument are:
                                         200
                                         556
                                         800
                                        1600

-train n, -tn n   specifies   the   print   train
                               characteristic   of   a   printer.   Its
                               value must be one that is found   in
                               the   "print   train"   field   of   a
                               printer PRPH configuration card.

-line_length n, -ll n   specifies   the   line   length   of   a
                               printer.   Its   value   must   be one
                               that is found in the "line   length"
                               field   of   a   printer   PRPH
                               configuration card.   If this   field
                               is   not   specified   on   a   printer
                               configuration   card,   then   this
                               device   characteristic   will   be
                               ignored for this printer.

-volume XX, -vol XX   specifies the name of a volume.   If
                               possible,   the   device   assigned   is
                               one   on   which   this   volume   has
                               already been placed.

-number n, -nb n   specifies the number   of   resources
                               to   assign.   All   of   the   resources
                               assigned   will   have   the   device
                               characteristics   specified   by   any
                               other   arguments   passed   to   this
                               command.   If   this argument is not
                               specified then one resource will be
                               assigned.

-comment XX, -com XX   is   a   comment   string   that   is
                               displayed   to the operator when the
                               resource is assigned.   If more than
                               one string is required, the   entire
                               string   must   be   in   quotes.   Only
                               printable   ASCII   characters   are
                               allowed.   Any   unprintable
                               characters (also tabs or new lines)
                               found   in   this   string   will   be
                               converted to blanks.

-long, -lg   specifies that all   of   the   device
                               characteristics   of   the   assigned
                               device should be printed.   If   this
                               argument is not supplied, only the
                               name   of   the   assigned   device   is
                               printed.

-system, -sys

specifies that the user wants to be treated as a system process during this assignment. If this argument is not specified or if the user does not have the appropriate access, then RCP assumes that this assignment is for a nonsystem process.

-wait [n], -wt [n]

specifies that the user wants to wait if the assignment cannot be made at this time because the resource(s) are assigned to some other process. The optional value specifies the maximum number of minutes to wait. If no value is specified then it is assumed that the user wants to wait indefinitely.

_____ _____
attach_lv
_____ _____

Name: attach_lv, alv

     The attach_lv command calls the Resource Control Package
(RCP) to attach a logical volume. The attaching of a logical
volume involves telling the storage system that this volume is
attached for this process. A logical volume (unless it is a
public logical volume) must be attached for each process that
wishes to use it. In order for a logical volume to be attached
it must first be physically mounted. The physical mounting of a
logical volume involves mounting all of the physical volumes that
comprise the logical volume. This must be done by operations
before the logical volume may be attached by any process.

     In order to attach a logical volume a user must have "R/W"
access to the logical volume. This access is defined by the
Access Control Segment (ACS) that is associated with this logical
volume.   If there is no ACS for this logical volume, then its
access is defined by the default access that was specified when
the logical volume was registered.

Usage

     attach_lv volume_name

where:

1.   volume_name   specifies the name of the volume to
                               be attached.

Name: detach_lv, dlv

The detach_lv command detachs one or more logical volumes that have been attached for the user's process by the Resource Control Package (RCP). The detaching of a logical volume involves telling the storage system that this logical volume is no longer attached for this process. The detaching of a logical volume does not affect the attached / detached state of the logical volume for any other process.

Usage

    detach_lv   volume

where:

1.   volume   specifies the logical volume or
                                volumes to be detached. A user may
                                detach all logical volumes attached
                                for her/his process by specifying
                                the following keyword:
                                    "all"
                                A user may detach one logical
                                volume by specifying its name.

---
list_resources

Name: list_resources, lr

The   list_resources command lists some or all of the
resources that are currently assigned or attached to the calling
process by the Resource Control Package (RCP).

Usage

list_resources   -control_args-

where:

1. control_args   may be chosen from the following:

     -long, -lg   specifies   that   all   of   the
                              information   known   about   each
                              resource is to be printed. If this
                              argument is not supplied, then only
                              the name is printed.

     -type xx, -tp xx   specifies that only resources of
                              the type XX are to be listed.
                              Currently,   this   argument   must
                              specify a device type.

     -device XX, -dv XX   specifies the name of a device
                              resource to be listed. No other
                              resources are listed.

     -logical_volumes, -lv   specifies that only logical volumes
                              that are currently attached are to
                              be listed.

     -assignments, -asm   specifies   that   only   assigned
                              resources are to be listed.

     -attachments, -atm   specifies   that   only   attached
                              devices are to be listed.

Name: unassign_resource, ur

The unassign_resource command unassigns one or more resources that have been assigned to the user's process by the Resource Control Package (RCP).

<u>Usage</u>

    unassign_resource resource -control_args-

where:

1.   resource   specifies the resource or resources to be unassigned from the user's process. Currently, this means only devices. If a device is attached, it is automatically detached. A user may unassign all devices assigned to his/her process by specifying the following keyword:
           "all"
A user may unassign one device by specifying its name.

2.   control_args   are the following:

    -comment XX, -com XX   is a comment string that is displayed to the operator when the resource is unassigned. This comment will be displayed only once, even if several resources are being unassigned. (See the assign_resource command for details about comment strings.)

    -admin, -am   specifies that a force unassignment is to be done. This argument should be specified by highly privileged users who want to unassign a resource that is assigned to some other process.

		STATUS	DATE
TITLE: Fix linkage_error messages			
AUTHOR: M. Weaver SHW		Written	10 May 76
		Status	A 05/18/76
		Expires	11/18/76

-Coded in: [X] PL/I [ ] ALM [ ] other-
  explain in DETAILED PROPOSAL
-Planned for System MR   4.0
-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)	
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 #)	
MOSN (Sect.)	
MPAM (Sect.)	
MSAM (Sect.)	

Objections/Comments:

Info Segs	
Other (Name)	
None (Reason)	

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

SUMMARY:

Fix appropriate module(s) in bound_error_handlers_ to again
print in linkage_error messages the name being referenced.

REASONS:

Messages now print location of the link itself, which is
not helpful. This appears to be a fairly recent bug.

Ver. 3 741022	MULTICS CHANGE REQUEST	MCR _1847_

TITLE: Await VTOCE I/O for truncations	STATUS	DATE
	Written	05/06/76
AUTHOR: Bernard Greenberg _TVV_	Status	05/18 A 05/25
	Expires	11/06/76

Planned for System: MR 4.0
Fixes Bug Number(s):   not applicable
Documented in MTB: not applicable
Incompatible Change: no
User/Operations-visible Interface Change: no
Coded in: (X)PL/I ( )ALM ( )other-see below
Performance: ( )better ( )same (X)worse

CATEGORY (check one)
( )Lib. Maint. Tools
( )Sys. Anal. Tools
( )Sys. Prog. Tools
( )355
( )BOS
( )Salvager
(X)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#)   61
Info Segs
Other

OBJECTIONS/COMMENTS:

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

SUMMARY: VTOCEs are written out today with the assumption that the write will either complete or a salvage will occur. Therefore, addresses are posited during a truncate operation after the write has started. It is therefore possible for an address to appear on disk in a new VTOCE before it has been removed from the disk copy of the old. Since the VTOC looks completely consistent at this stage, should an unrecoverable crash occur, data is misrouted to the wrong segment.

REASONS: The above policy was designed so as to not have to await VTOCE I/O completion on every truncation.   Although the possibility of this misrouting is small, it is a possible path for incorrect data.

        Therefore, we propose awaiting the completion of every VTOCE write which involves truncation before depositing.

IMPLICATIONS: Decreased performance of the truncate primitive (when dealing with inactive segments) in real time, although not in virtual time.

DETAILED PROPOSAL: The feature is capable of being inhibited by a highly privileged data base patch.

TITLE: Install Phase I of BASIC Consolidation

AUTHOR: M. Weaver   SHW

-Coded in: [X] PL/I [X] ALM [ ] other-
  explain in DETAILED PROPOSAL
-Planned for System MR   4.0
-Fixes Bug Number(s) see below
-Documented in MTB
-User/Operations-visible
  Interface change? [ ] yes [X] no
-Incompatible change? [ ] yes [X] no
-Performance: [ ] Better [ ] Same
  [X] 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.	

STATUS	DATE
Written	11 May 76
Status	P 5/18 A 05/25/76
Expires	11/25/76

DOCUMENTATION CHANGES

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

Objections/Comments:

Remove MCR 1156 from list of installed
unapproved software.

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

SUMMARY:

Make the standard basic compiler and runtime have both single and double precision
capabilities (although a single program can only have one precision).

Fix basic bugs 060, 061, 062.

REASONS:

Only one basic to maintain. Have figured out a way to make the current ep_basic_
operators more efficient, so single precision performance will be only negligibly
degraded.

SUMMARY:

Rewrite basic_operators_ in mexp, with 2 transfer vectors; during execution,
operator table pointer will point to correct transfer vector. The single and
double precision entry operators are the same (for now) so already compiled
extended precision programs will continue to work. The rest of the compiler and
runtime will consist of what is now bound_ep_basic_ and bound_ep_basic_runtime.

The default mode is single precision. The command use_ep_basic is used to change
the compiler's mode to double precision. The new command use_sp_basic can be used
to change back to single precision mode. use_ep_basic will no longer have to
terminate or initiate. The runtime can always handle either precision, except
that a program may not call a program of a different precision with numeric or
numeric file arguments.

Any performance degradation should be more than made up in the future by optimization
involving moving some string handling from pl1 to alm runtime.
The extended precision features will all be described in an appendix
to the BASIC manual (as well as in ep_basic.info

ep_basic_status.info

06/00/76
This file contains a list of all bugs in the Multics BASIC compiler.
Bugs marked with ! have been fixed in the installed basic.
Bugs marked with * have been fixed in the basic located in >ldd>exl>o.

064 next free number
063 76.05.14   functions which are arguments sometimes
                        blow up, including string functions and functions
                        that reference strings or do I/O
031 74.07.09   basic programs cannot read|write tapes as described
                        in basic manual. basic programs will have to specify
                        the use of the stream_to_record IO module when it becomes
                        available. Tapes are unusable with basic programs until
                        then.
019 74.03.23   rseq option of basic system does not recognize uppercase
                        keywords, keywords with embedded spaces, and requires that all
                        line numbers used in a single program be unique (basic itself
                        requires that line numbers be unique only in single subprogram).

Fixed Bugs
062!76.04.02   after a non-basic program is called with no
                        arguments, the return to the basic program
                        sometimes blows up.
061!75.12.08   gosub returns after on x gosub... cause error
060!75.11.21   sometimes use of complicated expressions in
                        output statements causes succeeding references
                        or functions in the statement to be incorrectly compiled

Multics BASIC status as of April 23, 1976
Reverse chronological list of changes to Multics BASIC.

00 May 1976
All changes listed below have been installed in the >unbundled
version of basic.

23 April 1976
New compiler and runtime were installed in >ldd>exl>o that
fix basic bugs 060, 061, and 062.

26 February 1976

All changes listed below have been installed in the >unbundled
version of basic. These include an incompatible file format
change. The convert_new_basic_file command is no
longer available.

26 February 1976 11:00

Fixed bug in >ldd>exl>o basic that prevented -compile option
from producing usable object segments.

17 February 1976 13:30

Incompatible random file format now used by the runtime in
>ldd>exl>o. For more information type help basic_file_changes.
If there is a problem and you want to use the installed
basic, you can convert your files back to the old format
by typing "convert_new_basic_file filename".
Bug 059 fixed in >ldd>exl>o.

09 September 1975 1445

Bug 058 has been fixed in >ldd>exl>o.

13 August 1975

All runtime changes mentioned below have been installed in the
>unbundled version of basic.

24 July 1975 1345

Parts of the runtime recompiled; no functional changes.

16 July 1975 1445

Bug 057 has been fixed in >ldd>exl>o and the runtime physically
but not logically modified to aid debugging programs

30 May 1975 1200

All changes listed below have been installed in the >unbundled
version of basic.

07 April 1975 1350

Installed basic runtime in >ldd>exl>o that fixes bug 055.
Installed basic compiler in >ldd>exl>o that doesn't call
establish_cleanup_proc_.

BASIC is available in extended as well as single precision,
which is the default. To get extended precision,
type the command "use_ep_basic" with no arguments.
Then use basic or basic_system in the usual way; all programs compiled
after that will use extended precision arithmetic.
To get programs compiled in single precision again,
type "use_sp_basic".

The following section discusses some compatibility issues.
Single and extended precision programs should not be run at
the same time because the numeric arguments and numeric
files are not compatible. The command convert_numeric_file
is available to convert numeric files from single to extended
precision and vice versa.

A new statement type has been added to provide a means of
controlling dynamically the number of digits in a numeric value
that may be printed as output.
 Usage

        setdigits formula

The value expressed by the formula in the statement is
truncated to its integer value. That integer value
represents the number of digits to be printed per number
by all future PRINT statements until another
SETDIGITS statement is executed, or until program
execution terminates. One to 19 digits may be specified.
This statement applies only to nonintegers; integers of 9
digits or less are printed as such. The tab spacing
is adjusted to accomadate the current number length;
however, the spacing will never be less than the default.
(END)

APPENDIX D

EXTENDED PRECISION

BASIC is available in extended as well as single precision, which is the default. Programs compiled in extended precision mode do all numeric processing in double precision. These programs should not call of be called by single precision programs because numeric arguments including rumeric files are not compatible.

To compile in extended precision mode, type the Multics command "use_ep_basic" with no arguments. All BASIC programs compiled after that will use double precision arithmetic. This effect lasts only for the life of the process or until "use_sp_basic" is typed, which returns the compiler to single precision mode. Note that these commands affect only the compiler; programs of either precision can be run at any time.

To convert numeric files from single to double precision or vice versa, the following Multics command is available.

Name: convert_numeric_file

The convert_numeric_file command converts random numeric files used by BASIC programs from single to double precision and vice versa using PL/I conversion rules.

Usage

    convert_numeric_file old_path new_path -control_arg-

where

1) old_path   is the pathname of the file to be converted.

2) new_path   is the pathname of the converted file.

3) control_arg may be one of the following:

    -double_precision, -dp   convert from single to double
                              precision; this is the default.

    -single_precision, -sp   convert from double to single
                              precision.

Multics Change Request

		STATUS	DATE
TITLE: Fix bugs in new message facility.			
AUTHOR: Steve Herbst JWG		Written	5-13-76
		Status	A 5/25/76
		Expires	11/25/76

-Coded in: [X] PL/I [ ] ALM [ ] other-
explain in DETAILED PROPOSAL
-Planned for System MR **4.0**
-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)	
Lib. Maint. Tools	
Sys. Anal. Tools	
Sys. Prog. Tools	
355	
BOS	
Salvager	
Ring Zero	
x 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)	doc OK

Objections/Comments:

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

SUMMARY: Install several changes to the new message facility:

1. Fix bug in mbx_set_max_length that prevents it from
   working.

2. Fix bug in send_mail_ causing the user's working directory
   to end up with internal blanks. (that is, the character
   string pathname of the working directory.)

3. Change send_message in input mode to print a warning when
   the recipient is deferring messages or is not initialized
   for accepting messages, and then type "Input:". Lines are
   then sent a line at a time; no wakeups occur with them.
   Currently, send_message will not go into input mode in
   either case.

4. Change the header line printed with a message to include
   the sender authorization of the message if different from
   the recipient's authorization. Example:

   "From Herbst.Multics at authorization x:"

5. Change send_message not to attempt to acknowledge a message
   from a sender with lower authorization, and to print a
   warning about sending a message to be acknowledged to a
   user with higher authorization.

Ver. 3 741022	MULTICS CHANGE REQUEST	MCR _1874_

TITLE: Make print_aste_ptp more informative	STATUS	DATE
	Written	05/13/76
AUTHOR: Bernard Greenberg *TvV*	Status	A 5/20/76
	Expires	11/13/76

Planned for System: 4.0
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

<table>
<tr><td colspan="2">DOCUMENTATION CHANGES (specify one or more)</td></tr>
<tr><td>MPM (vol,sect)</td><td>MPAM (sect)</td></tr>
<tr><td>MOSN (sect)</td><td>MSAM (sect)</td></tr>
<tr><td>PLMs (AN#)   72</td><td></td></tr>
<tr><td>Info Segs</td><td></td></tr>
<tr><td>Other</td><td></td></tr>
</table>

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

OBJECTIONS/COMMENTS:

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

SUMMARY: The current print_aste_ptp command dumps an Active Segment Table entry in block octal, which is useful, but not as useful as could be to those who have not memorized offsets and lengths of critical fields. Change it to interpret various useful AST fields for such people.

REASONS: Greater utility, and current print_aste_ptp prints a line which always exceeds terminal line length.

IMPLICATIONS: n/a.

```
pap  >udd>m>bsg>s>pap
ASTE for >udd>m>bsg>s>pap at 43060 in sst_seg
 044700044560 053724000000 033674063410 034573442672 377004007073 404000000000 1
 000000000000 000000000000 003000003001 043040000002

uid = 034573442672, vtocx 7073 on pvtx 4
max len 255, 3 recs used, 1 in core, cur len 3 (decimal)
Used 05/12/76  1609.5 edt Wed
Modified 05/12/76  0950.4 edt Wed
Par astep = 63410, Son = 0, brother = 53724
Trailer thread = 33674

Flags: usedf aaon

PAGE        PT          DEVADD     PD COPY

    0   011140401045     34440      2527
    1   000075100041     34442        75
    2   002121100041     34460      2121
    3   377020000001     null
```

Ver. 3 741022	MULTICS CHANGE REQUEST	MCR _1875_

TITLE: Fix 28-5 bugs		STATUS	DATE

TITLE: Fix 28-5 bugs

AUTHOR: Bernard Greenberg   *TVV*

		STATUS	DATE
		Written	05/13/76
		Status	A 05/25/76
		Expires	11/13/76

Planned for System: MR 4.0
Fixes Bug Number(s): not applicable
Documented in MTB: not applicable
Incompatible Change: no
User/Operations-visible Interface Change: no
Coded in: (X)PL/I ( )ALM ( )other-see below
Performance: ( )better (X)same ( )worse

CATEGORY (check one)
( )Lib. Maint. Tools
( )Sys. Anal. Tools
( )Sys. Prog. Tools
( )355
( )BOS
( )Salvager
(X)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#)   61
Info Segs
Other

OBJECTIONS/COMMENTS:

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

SUMMARY: Fix a few oversight bugs in MSS 28.5.

REASONS: Reliability and correct operations.

IMPLICATIONS: See reasons.

DETAILED PROPOSAL: Recognize and fix the following:

1. The segment_mover deposits addresses without waiting for notification of VTOCE write complete.
This could cause misrouted data if ESD failed after a crash in this window. Wait for such notification.

2. pc$truncate and pc$cleanup update quota-used cells in segment ASTE's. Stop them from doing so.

3. pc$get_file_map returns a list of addresses to be deposited, culled from semikilled addresses appearing in PTW's. For prewithdrawn segments, including PDS's, this is incorrect. Stop this reportage if entry-hold and dont-null-zero-page bits are on, covering these cases. This nulling caused addresses to be withdrawn against the RPV free store map when such pages are in fact referenced, causing a page creepage.

4. It was mistakenly thought that 28-5 prewithdrawing would obviate the need for the explicit prewithdrawing of the SST name table done by make_segs_paged. In fact, it did not, for the latter, even with fix (3) above, leaves semikilled addresses in the SST Name Table's ASTE, which BOS is incapable of resurrecting. Put back code into

make_segs_paged to store into the SSTNT, resurrecting the
prewithdrawn addresses.

(Installed as 28.5a at MIT on emergency basis)

TITLE: Post-Crash Paging Device Address Resurrection.	STATUS	DATE
	Written	05/13/76
AUTHOR: Bernard Greenberg TVV	Status	A 05/25/76
	Expires	11/13/76

Planned for System: MR 4.0
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#)   61
Info Segs
Other

OBJECTIONS/COMMENTS:

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

SUMMARY: After a crash where ESD fails, pages on the paging device which
have never been written to disk since assigned to their segment are not
reported to the VTOCE of their segment. This phenomenon manifests itself
as pages of zeros appearing in segments which have resided on the paging
device since truncation/creation. This is particularly bitter in the case
of archives and programs which were truncated. Change ALM page control to
maintain identifying information (Segment Unique ID and page number) in PD
map entries. Change the Physical Volume Salvager to collect pages off of a
crashed paging device on a segment by segment basis, resurrecting any such
addresses so collected. This will replace the current volume-by-volume PD
flush strategy.

REASONS: The increased robustness of data kept by the system which will be
accrued is clear. Such page losses during ESD-failing crashes have been
more than a minor annoyance.

IMPLICATIONS: The checksum field of the PD Map entry will have to be
removed to make room for the segment UID. This will remove the bulk-store
checksumming facility entirely. This facility was introduced in the early
days of debugging the Bulk Store controller, and is now felt to be
unnecessary in light of the successful debugging of this device.

```
------------------------------------------------        -----------------------------
| Ver. 3                                        |       |                             |
| 741022            MULTICS CHANGE REQUEST      |       |  MCR____1878_____        |
|-----------------------------------------------|       |-----------------------------|
| TITLE:  Delete OPTY config card               |       |_STATUS__|_DATE_____       |
|                                               |       | Written |_05/13/76__         |
| AUTHOR: Mike Grady               TVV          |       | Status  |A 05/25/76          |
|-----------------------------------------------|       | Expires |_11/13/76__         |
| Planned for  System:  MR4.0                   |       |-----------------------------|
| Fixes Bug Number(s):  not applicable          |       |_CATEGORY_(check_one)        |
| Documented  in  MTB:  not applicable          |       |( )Lib. Maint. Tools         |
| Incompatible Change:  yes                     |       |( )Sys. Anal. Tools          |
| User/Operations-visible Interface Change: yes |       |( )Sys. Prog. Tools          |
| Coded in: (B)PL/I ( )ALM ( )other-see below   |       |( )355                       |
| Performance: ( )better (B)same ( )worse       |       |( )BOS                       |
|-----------------------------------------------|       |( )Salvager                  |
|_DOCUMENTATION_CHANGES_(specify_one_or_more)   |       |(B)Ring Zero                 |
| MPM (vol,sect)           MPAM (sect)          |       |( )Ring One                  |
| MOSN (sect)              MSAM (sect)          |       |( )SysDaemon/Admin           |
| PLMs (AN#)                                    |       |( )Runtime                   |
| Info Segs                                     |       |( )User Command/Subr         |
| Other          MOH                            |       |                             |
|-----------------------------------------------|       |-----------------------------|
| OBJECTIONS/COMMENTS:                                                                |
|                                                                                    |
|                                                                                    |
|                                                                                    |
--------------------------------------------------------------------------------------
```

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

SUMMARY:

Remove support for the OPTY config card.

REASONS:

When the DataNets are booted by AS initialization, it will be impossible to
provide this function.

IMPLICATIONS:

Few sites (if any) use this feature. If they do, they must convert to use
the message coordinator to switch to the operators terminal.

A survey of Multics sites indicates that GM is the only site currently
using the OPTY card.

DETAILED PROPOSAL:

Modify init_sys_vars to crash the system if it finds an OPTY card, telling
the operator to remove it.

Ver. 3 741022	MULTICS CHANGE REQUEST	MCR 1879

TITLE: Add pointers to special data bases to the SST.	STATUS | DATE
	Written | 05/13/76
AUTHOR: VanVleck	Status | *Ao5/25/76*
	Expires | 11/13/76

Planned for System: MR 4.0	
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 ( ) other-see below	( ) 355
Performance: ( ) better (■) same ( ) worse	( ) BOS
	( ) Salvager
DOCUMENTATION CHANGES (specify one or more)	(■) Ring Zero
MPM (vol,sect) MPAM (sect)	( ) Ring One
MOSN (sect) MSAM (sect)	( ) SysDaemon/Admin
PLMs (AN#) an61	( ) Runtime
Info Segs	( ) User Command/Subr
Other	

OBJECTIONS/COMMENTS:

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

SUMMARY: There are two important storage system tables which reside in
ternal static rather than in their own segments. These are the AST hash
table and the PVTE hold table. Place pointers to these data bases in the
SST header.

REASONS: These pointers will make manual and automatic debugging much
easier.

```
| Ver. 3                                            |    MCR___1880_____ |
| 741022          MULTICS CHANGE REQUEST            |                     |
|---------------------------------------------------|---------------------|
| TITLE:  Fix bug in status_                        | _STATUS__|_DATE____ |
|                                                   | _Written_|_05/13/76_|
| AUTHOR: VanVleck                                  | _Status__|405/25/76 |
|                                                   | _Expires_|_11/13/76_|
|---------------------------------------------------|---------------------|
| Planned for  System:    MR 4.0                    |                     |
| 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: (X)PL/I ( )ALM ( )other-see below       | ( )355              |
| Performance: ( )better (X)same ( )worse           | ( )BOS              |
|                                                   | ( )Salvager         |
|_DOCUMENTATION_CHANGES_(specify_one_or_more)_____| (X)Ring Zero        |
| MPM (vol,sect)          MPAM (sect)               | ( )Ring One         |
| MOSN (sect)             MSAM (sect)               | ( )SysDaemon/Admin  |
| PLMs (AN#)      an61                              | ( )Runtime          |
| Info Segs                                         | ( )User Command/Subr|
| Other                                             |                     |
|---------------------------------------------------|---------------------|
| OBJECTIONS/COMMENTS:                              |                     |
|                                                   |                     |
|                                                   |                     |
|                                                   |                     |
```

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

SUMMARY: The status_ primitive does not return the master_dir attribute.
Cause it to do so.

REASONS: This value is needed by the status command and other system
primitives. It is correctly returned by star_.

Ver. 3		
741022	MULTICS CHANGE REQUEST	MCR_____1881_____

TITLE: Fix bug in star_ and dc_pack.

AUTHOR: VanVleck

STATUS	DATE
Written	05/13/76
Status	B 05/26/76
Expires	11/13/76

Planned for System: MR 4.0
Fixes Bug Number(s): not applicable
Documented in MTB: not applicable
Incompatible Change: no
User/Operations-visible Interface Change: no
Coded in: (X)PL/I ( )ALM ( )other-see below
Performance: ( )better (X)same ( )worse

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

DOCUMENTATION CHANGES (specify one or more)
APM (vol,sect)	MPAM (sect)
MOSN (sect)	MSAM (sect)
PLMs (AN#) an61	
Info Segs	
Other	

OBJECTIONS/COMMENTS:

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

SUMMARY: Both star_ and dc_pack return garbage for the dates of segments whose VTOCEs are unavailable due to I/O error or connection failure.

Return zeroes in this case.

REASONS: This garbage can produce anomalous results for directory listing programs and disk_usage_stat.

```
| Ver. 3                                              |                          |
| 741022         MULTICS CHANGE REQUEST               |  MCR____1882_____       |
|-----------------------------------------------------|--------------------------|
| TITLE:  Make  no default for punching               |  STATUS   | DATE         |
|                                                     |  Written  | 05/13/76     |
| AUTHOR: VanVleck                                    |  Status   | A 05/25/76   |
|                                                     |  Expires  | 11/13/76     |
|-----------------------------------------------------|--------------------------|
| Planned for  System:         5.0                    |                          |
| Fixes Bug Number(s):  not applicable                |  CATEGORY (check one)    |
| Documented in  MTB:  not applicable                 | ( )Lib. Maint. Tools     |
| Incompatible Change:  yes                           | ( )Sys. Anal. Tools      |
| User/Operations-visible Interface Change:  yes      | ( )Sys. Prog. Tools      |
| Coded in: (X)PL/I ( )ALM ( )other-see below         | ( )355                   |
| Performance: ( )better (X)same ( )worse             | ( )BOS                   |
|                                                     | ( )Salvager              |
| DOCUMENTATION CHANGES (specify one or more)         | ( )Ring Zero             |
| MPM (vol,sect) dpunch      MPAM (sect)              | ( )Ring One              |
| MOSN (sect)                MSAM (sect)              | ( )SysDaemon/Admin       |
| PLMs (AN#)                                          | ( )Runtime               |
| Info Segs                                           | (X)User Command/Subr     |
| Other                                               |                          |
|-----------------------------------------------------|--------------------------|
| OBJECTIONS/COMMENTS:                                |                          |
|                                                     |                          |
|                                                     |                          |
```

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

SUMMARY: The default for dpunch is -7punch.

Change it to be none.

REASONS: Seven-punch is not used very often; but a very common error is
to forget to say -mcc.

IMPLICATIONS: Incompatible change. Very few users will be affected, and
most of them will be pleased.

Ver. 3 741022	MULTICS CHANGE REQUEST	MCR 1884

TITLE: Fix bug in ioi_buffer	STATUS | DATE
	Written | 05/14/76
AUTHOR: Larry Johnson NIM	Status | A 05/25/76
	Expires | 11/14/76

Planned for System: MR 4.0
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#)
Info Segs
Other
None (reason)

OBJECTIONS/COMMENTS:

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

Summary

call to ioi_$workspace that reduces the size of the buffer does not always succeed.

Reason

The problem is that ioi_buffer may try to set the max length of the buffer less than the current length.

Detailed Proposal

Truncate the buffer to the new length before setting the max length.

TITLE:	Fix bug in ioi_usurp_channels	STATUS	DATE

AUTHOR: Noel I. Morris

		STATUS	DATE
Written			5/14/76
Status		A 05/25/76
Expires		11/25/76

-Coded in: [X] PL/I [ ] ALM [ ] other- explain in DETAILED PROPOSAL
-Planned for System MR   4.0
-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)

	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 of Proposal, Reasons for Proposal, Implications, Detailed Proposal.

Reasons:
A bug in ioi_usurp_channels causes the system to crash shortly after detaching an I/O disk.

Proposal:
Correct the index supplied to iom_manager$iom_assign when giving the disk channel back to page control.

MULTICS CHANGE REQUEST

MCR____1886_____

TITLE: Fix several auditing inconsistencies	STATUS : DATE
	Written : 05/14/76
AUTHOR: L. Scheffler JCW	Status : B 05/25/76
	Expires : 11/14/76

Planned for System: MR4.0
Fixes Bug Number(s): not applicable
Documented in MTB: not applicable
Incompatible Change: no
User/Operations-visible Interface Change: no
Coded in: (X)PL/I ( )ALM ( )other-see below
Performance: ( )better (X)same ( )worse

CATEGORY (check one)
( )Lib. Maint. Tools
( )Sys. Anal. Tools
( )Sys. Prog. Tools
( )355
( )BOS
( )Salvager
(X)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#)   AN75
Info Segs
Other

OBJECTIONS/COMMENTS:

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

SUMMARY: Make changes to protection_audit_ and dir_control_error to:

1. ignore write faults for segments with copy switches on in their branches (these are copy-on-writes, not access violations);

2. ignore write faults if the process could have had write permission if it wanted it;

3. consistently audit the proper directory for "attributes" operations in directory control;

4. convert unnecessary syserr calls that print messages on the operator's console to simply log them.

REASONS:

1. & 2. These two cases are not auditable access violations.

3. protection_audit_ currently is inconsistent in choosing which branch to audit for "attributes" operations.

4. The operator can do nothing about the events reported by these messages, and they are not vital to continued system operation.

IMPLICATIONS:

1. & 2. Messages for these irrelevant cases will not clutter the audit log.

3. Audit messages for attributes operations will be correct.

4. The operator will not be needlessly disturbed.

DETAILS:

1. & 2. Add code to protection_audit_$fault (called by fim on illegal procedure and access violation faults) to ignore no-write-permit and not-in-write-bracket faults if the segment's copy switch (in its branch) is on, or if the process could have had write access if it wanted it.

3. Add an argument to protection_audit_$access_denied to indicate the type of directory control operation (contents, attributes, or status) being audited. Change the code to audit the parent on attributes or status operations. Change dir_control_error (the only caller of this entry) to pass this information.

4. Change syserr messages for bad calls, and for faults taken in ring 0 with locks locked, to not print on the operator's console.

Ver. 3 741022	MULTICS CHANGE REQUEST	MCR___1887____

	STATUS	DATE
TITLE: Change 0355 config card to FNP	Written	05/11/76
AUTHOR: Robert S. Coren *JWG*	Status	AO5/25/76
	Expires	11/11/76

	CATEGORY (check one)
Planned for System: MR 5.0	
Fixes Bug Number(s): not applicable	( )Lib. Maint. Tools
Documented in MTB: not applicable	( )Sys. Anal. Tools
Incompatible Change: yes	( )Sys. Prog. Tools
User/Operations-visible Interface Change: yes	( )355
Coded in: (■)PL/I (■)ALM ( )other-see below	( )BOS
Performance: ( )better (■)same ( )worse	( )Salvager

DOCUMENTATION CHANGES (specify one or more)

MPM (vol,sect)		MPAM (sect)	( )Ring Zero
MOSN (sect)	config	MSAM (sect)	( )Ring One
PLMs (AN#)			( )SysDaemon/Admin
Info Segs			( )Runtime
Other			( )User Command/Subr
			(■)r0 & bos

OBJECTIONS/COMMENTS:

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

SUMMARY: Change format of config card describing the front-end processor from

        0355 fnp_tag iom_chan iom_tag

to

        FNP fnp_tag iom_tag iom_chan

REASONS: The name 0355 is obsolete. The placement of the IOM channel number before the IOM tag is non-standard and confusing. Since extensive changes are being made to FNP initialization for MR5.0 (in particular bootloading the FNP from Multics instead of from BOS), this seems like a good time to fix these problems.

IMPLICATIONS: When the hardcore and BOS systems that use the new config card are installed, the config deck must be modified, since the d355 card will no longer work.

DETAILED PROPOSAL: Make the new fnp_init module (which will partially replace tty_init) recognize the new card, and change the BOS subroutine conf355 similarly.

```
I Ver. 3                                                I                       I
I 741022           MULTICS CHANGE REQUEST    SHW        I  MCR_____1888____
I_____ I_____I
I TITLE:  Allow the prelinker to abort operation        I_STATUS__I_DATE_____I
I         when any unexpected signal occurs.            I_Written_I_05/12/76__I
I AUTHOR: Richard Bratt                                 I_Status__IB05/25/76I
I_____ I_Expires_I_11/12/76__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(B)Sys. Prog. Tools  I
I Coded In: (B)PL/I ( )ALM ( )other-see below           I( )355               I
I Performance: ( )better (B)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)                  I( )SysDaemon/Admin   I
I PLMs (AN#)      Tools - not yet written.               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_____I
```

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

Summary: Arbitrary unexpected machine faults and hierarchy inconsistancies
can cause signals which are not handled by the current prelinker.   As a
result, answering service startup may fail to complete at sites which
support prelinked subsystems. If the prelinker were to detect unexpected
signals it could abort its operation, report the error, and return. This
would allow the answering service startup to continue. The reason for the
failure could then be ascertained and corrected by site personnel while
unaffected users worked.

Reason: It is a real drag to have the answering service startup fail.

Proposal: Change the prelinker to establish an "any_other" handler which
treats all signals as fatal errors. Provide a new option, "-debug", which
causes the prelinker to behave as it does today by establishing a "cleanup"
handler in place of the "any_other" handler described above.

Multics Change Request

TITLE: Fix debug to recognize the brief table

AUTHOR: S. Barr   RAB

STATUS	DATE
Written	5/12/76
Status	A 05/25/76
Expires	11/05/76

-Coded in: [X] PL/I [ ] AIM [ ] other-
 explain in DETAILED PROPOSAL
-Planned for System MR **40**
-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)	
	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)	

Objections/Comments:

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

SUMMARY:

    Enough information is contained in the brief table to
    print source lines, but debug requires a complete
    symbol table to print source lines.

REASONS:

    This is an unnecessary restriction.

DETAILED PROPOSAL:

    Remove the check for a complete symbol table in the
    debug print routine, db_print.

TITLE: Fix db parse not to take a fault
        when blanks are encountered.
AUTHOR:
        S. Barr   RAB

STATUS	DATE
Written	14 May 76
Status	A 05/25/76
Expires	11/25/76

-Coded in: [X] PL/I [ ] ALM [ ] other-
 explain in DETAILED PROPOSAL
-Planned for System MR   4.0
-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)

	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 of Proposal, Reasons for Proposal, Implications,
                     Detailed Proposal.

SUMMARY:

    db_parse does a label goto with an illegal value.
    This is the result of PL1 bug 1497.

        (If <expr> then go to <lab> ; fails if <expr>
        contains a function that sets one of its
        arguments that is also used in evaluating
        <lab>.)

PROPOSAL:

    Change db_parse to avoid this construct.

Multics Change Request

TITLE: Fix newline bug in abbrev_

AUTHOR: Steve Herbst   THVV

STATUS	DATE
Written	5/18/76
Status	H 05/25/76
Expires	11/25/76

-Coded in: [X] PL/I [ ] ALM [ ] other-
explain in DETAILED PROPOSAL
-Planned for System MR **5.0**
-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)

	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)	doc OK

Objections/Comments:

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

      SUMMARY: Fix bug in abbrev_$expanded_line causing a trailing
                   newline character in the input line not to appear
                   in the output line.

TITLE: Fix the BOS IF Command

AUTHOR: Noel I. Morris

STATUS	DATE
Written	5/17/76
Status	A 05/25/76
Expires	11/25/76

-Coded in: ☐ PL/I ☒ AIM ☐ other-
  explain in DETAILED PROPOSAL
-Planned for System MR 4.0
-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.)	
MPAM (Sect.)	
MSAM (Sect.)	
Info Segs	
Other (Name)	MOH
None (Reason)	

Objections/Comments:

Check documentation

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

Summary:
The new MOH Section IV (BOS) for release 4.0 describes the
IF FLAG mechanism as taking a bit position as an argument.
The code was implemented to take a mask as an argument, in
a manner similar to the IF SWITCH mechanism.

Proposal:
Change the code to match the documentation.

TITLE: Fix Anomaly in BOS WRITE Command

AUTHOR: Noel I. Morris

	STATUS	DATE
	Written	5/17/76
	Status	A 05/25/76
	Expires	11/25/76

-Coded in: ☐ PL/I ☒ AIM ☐ other-
 explain in DETAILED PROPOSAL
-Planned for System MR 4.0
-Fixes Bug Number(s) TR0432
-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.)	
MPAM (Sect.)	
MSAM (Sect.)	
Info Segs	
Other (Name)	
None (Reason)	X

Objections/Comments:

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

Reason:
The WRITE command, when invoked with no arguments, does not output
a blank line. Instead, it prints "WRITE".

Proposal:
The code in WRITE uses the descriptor for the first argument to
the WRITE command to access the rest of the command line. If no
arguments are given to the command, the descriptor is invalid.
Therefore, it is proposed to change to WRITE command to use the
descriptor for the zeroth argument (the command name), advancing
it by 6 characters to skip "WRITE ".

Ver. 3 741022	MULTICS CHANGE REQUEST	MCR 1894

TITLE: Fix bug in format_line active function	STATUS	DATE
	Written	05/14/76
AUTHOR: Larry Johnson NIM	Status	A 05/25/76
	Expires	11/14/76

Planned for System: MR 4.1
Fixes Bug Number(s): not applicable
Documented in MTB: not applicable
Incompatible Change: no
User/Operations-visible Interface Change: no
Coded in: (X)PL/I ( )ALM ( )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
(X)User Command/Subr

DOCUMENTATION CHANGES (specify one or more)
MPM (vol,sect)   MPAM (sect)
MOSN (sect)   MSAM (sect)
PLMs (AN#)
Info Segs
Other
None (reason)

OBJECTIONS/COMMENTS:

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

Summary

The format_line active function passes an extra null argument to ioa_. This is not correct.

Reasons

This extra argument can cause some kinds of control strings to expand incorrectly. For example:

    [format_line "^(/^a/ ^)" a b c]

will generate:

    /a/ /b/ /c/ //

instead of:

    /a/ /b/ /c/

Detailed Proposal

The problem occurs because format_line passes its argument list pointer to ioa_$general_rs, but an active function contains an extra argument for the return string. The program will be changed to construct a new argument list for the ioa_ call.

Multics Change Request

TITLE: Add feature to compare_command_output

AUTHOR: S. Herbst   JWG

STATUS	DATE
Written	18 May 76
Status	A 05/25/76
Expires	11/25/76

- Coded in: [X] PL/I [ ] ALM [ ] other-
  explain in DETAILED PROPOSAL
- Planned for System MR **5.0**
- 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)

	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 #)	Tools
MOSN (Sect.)	
MPAM (Sect.)	
MSAM (Sect.)	

Objections/Comments:

Info Segs	
Other (Name)	
None (Reason)	

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

SUMMARY:

   Implement -console_input control argument to the compare_
   command_output command.

REASONS:

   Facilitates testing of commands that take input.

   Saves having to type console input twice.

Control argument:

   -console_input, -ci

      Direct the same console input to each version of
the command in turn. This feature is intended for commands
that accept input from the console and saves having to type
the same input twice.

Examples:

      To test the qedx command with an exec_com segment,
use the -console_input control argument:

      &attach input_line
      compare_command_output >sss>qx my_dir>qx -bf -ci
      <qedx commands>
      q

Multics Change Request

TITLE: Implement send_mail_$access_class

AUTHOR:
           S. Herbst   JCW

	Category (Check One)
-Coded in: ⊠PL/I ☐AIM ☐other- explain in DETAILED PROPOSAL	Lib. Maint. Tools
-Planned for System MR **5.0**	Sys. Anal. Tools
-Fixes Bug Number(s)_____	Sys. Prog. Tools
-Documented in MTB_____	355
-User/Operations-visible	BOS
Interface change? ☐yes ☐no	Salvager
-Incompatible change? ☐yes ☐no	Ring Zero
-Performance: ☐Better ☐Same	Ring One
☐ Worse	SysDaemon/Admin.
-Replaces MCR_____	Runtime
	X User Cmmd/Subr.

STATUS	DATE
Written	18 May 76
Status	A 05/25/76
Expires	11/25/76

DOCUMENTATION CHANGES

Document	Specify One or More
MPM (Vol, Sect.)	
PLMS (AN #)	AN69
MOSN (Sect.)	
MPAM (Sect.)	
MSAM (Sect.)	

Objections/Comments:

Info Segs	
Other (Name)	SWG
None (Reason)	

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

SUMMARY:

Implement the new entry point send_mail_$access_class, used to send a
message with an access class different from the authorization of the
sender.

REASON:

Privileged processes, such as the I/O Daemon, need the ability to
send messages to users of lower authorization.

IMPLICATIONS:

New gate entry point mailbox_$wakeup_aim_add_index, also documented.

Name: send_mail_$access_class

    This entry point acts like send_mail_ but allows the caller to
specify the access class of the message.

Usage: dcl send_mail_$access_class
            (char(*),char(*),ptr,bit(72)aligned,fixed bin(35));
         call send_mail_$access_class
            (destination, message, info_ptr, access_class,code);

where:

1.	destination	same as for send_mail_.
2.	message	same as for send_mail_.
3.	info ptr	same as for send_mail_.
4.	access_class	is the desired access class of the message.
5.	code	can be any of the above status codes, or error_table_$wakeup_denied if the caller lacks sufficient privileges to send a wakeup to a process of lower authorization.

Notes

    Special ring 1 system privileges are required to send a message to a lower
or isolated access class.

    Special ipc privileges are required to send a wakeup to a lower or isolated
access class.

Name: mailbox_$wakeup_aim_add_index

    This entry point acts like mailbox_$wakeup_add_index, sending
a message with an optional wakeup, and additionally allows the caller
to specify the access class of the message.

Usage: dcl mailbox_$wakeup_aim_add_index
       (fixed bin, ptr, fixed bin, bit(36),
        bit(72) aligned, bit(72)aligned, fixed bin(35));
      call mailbox_$wakeup_aim_add_index
        (mseg_index, msg_ptr, msg_len, switches, access_class, id, code);

Where:

1.	mseg_index	is the index of a mailbox. (Input)
2.	msg_ptr	is a pointer to the message. (Input)
3.	msg_len	is the length of the message in bits. (Input)
4.	switches are:	(Input)
	wakeup	ON if a wakeup is to be sent.
	mbz	OFF (not used).
	always_add	ON to add the message even if the wakeup could not be sent.
5.	access_class	is the desired access class of the message (Input)
6.	id	is the identifier of the message. (Output)
7.	code	is any status code returned by mailbox_$wakeup_aim_add_index. (output)

Notes: Special ring 1 system privileges are required to send a message
to a lower or isolated access class.

Special ipc privileges are required to send a wakeup to a lower or
isolated access class.

Multics Change Request

TITLE:	Change $messages_off error message	STATUS	DATE
AUTHOR:	S. Herbst JCW	Written	18 May 76
		Status	A 05/25/76
		Expires	11/25/76

-Coded in: ☐ PL/I ☐ ALM ☒ other-
explain in DETAILED PROPOSAL
-Planned for System MR **4.0**
-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.
X	error table

DOCUMENTATION CHANGES

Document	Specify One or More
MPM (Vol, Sect.)	
PLMS (AN #)	
MOSN (Sect.)	
MPAM (Sect.)	
MSAM (Sect.)	
Info Segs	
Other (Name)	AG91
None (Reason)	

Objections/Comments:

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

SUMMARY:

Change the error message produced by error_table_$messages_off from:

"User has not initialized for accepting messages"

to:

"User is not accepting messages."

REASON:

Confusion over the meaning of "initialized".

TITLE: Delete tape_ debug message

AUTHOR: B. Silver

-Coded in: [X] PL/I [ ] AIM [ ] other- explain in DETAILED PROPOSAL
-Planned for System MR 4.0
-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_____

STATUS	DATE
Written	17 May 76
Status	A 05/25/76
Expires	11/25/76

Category (Check One)	
	Lib. Maint. Tools
	Sys. Anal. Tools
	Sys. Prog. Tools
	355
	BOS
	Salvager
	Ring Zero
	Ring One
	SysDaemon/Admin.
	Runtime
X	User Cmnd/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)	Message never documented

Objections/Comments:

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

SUMMARY:

A debugging message was put into tape_ to print IOM status when certain write errors occurred. This message was used to find an MPC firmware error. It is proposed here that this message be deleted.

REASONS:

The MPC firmware error has been fixed. This message, however, is still being generated due to some non-fatal write errors. This is confusing to operators.

IMPLICATIONS:

Eliminate a confusing and useless message.

DETAILS:

Delete the "DEVICE ATTENTION BUG" message from tape_write_.pl1.

Ver. 4
750508

Multics Change Request

NIM

MCR ___1899'

Page __1__ of __1__

TITLE:	Fix Entry Model Console Bugs	STATUS	DATE
AUTHOR:	B. Silver	Written	17 May 76

-Coded in: ☒PL/I ☐ALM ☐other-
 explain in DETAILED PROPOSAL
-Planned for System MR __4.0__
-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)		Status	A 05/25/76
	Lib. Maint. Tools	Expires	11/25/76
	Sys. Anal. Tools		
	Sys. Prog. Tools	DOCUMENTATION CHANGES	
	355	Document	Specify One or More
	BOS		
	Salvager	MPM (Vol, Sect.)	
X	Ring Zero	PLMS (AN #)	
	Ring One		
X	SysDaemon/Admin.	MOSN (Sect.)	
	Runtime	MPAM (Sect.)	
	User Cmmd/Subr.		
		MSAM (Sect.)	

Objections/Comments:	Info Segs
	Other (Name)
	None (Reason) No applicable docume

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

SUMMARY:

Fix operator console bugs that appear when a system uses an
Entry Model Console (EMC). These bugs are:

1. Input line terminated if more than 56 characters are typed.
2. An input sequence "\lower_case_letter" is translated into
   "upper_case_letter". This is necessary on IBM type consoles,
   but is unnecessary on an EMC.

REASONS:

It is annoying for operators to keep their input lines to 56
or less characters. In QEDX, the input sequence "\f" is
translated to "F". Operators have to type "\\f".

IMPLICATIONS:

Have a better operator interface on an EMC.

DETAILS:

Increase size of console input buffer from 14 words to 21 words.
Change oc_trans_input_ to ignore escapes before lower case letters.
An input sequence of "\f" will remain "\f".

Multics Change Request

TITLE: Install vfile_ with 4.0 changes

AUTHOR: M. Asherman   MDM

STATUS	DATE
Written	18 May 76
Status	A 05/25/76
Expires	11/25/76

-Coded in: [X] PL/I [X] ALM [ ] other-
 explain in DETAILED PROPOSAL
-Planned for System MR   4.0
-Fixes Bug Number(s) unreported
-Documented in MTB   269
-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.)	vfile_, iox_,
~~MPOS~~ ~~(AN~~ ~~)~~ vfile_status_, vfile_stat	
MOSN (Sect.)	
MPAM (Sect.)	
MSAM (Sect.)	
Info Segs	
Other (Name)	
None (Reason)	

Objections/Comments:
1. Add examples to appropriate documentation
2. Add more overview info. in Ref. Guide

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

SUMMARY:

Install new version of vfile_, essentially as described in MTB 269. This
implements a number of extensions to indexed files in the areas of synchro-
nization and separate manipulation of keys and records.

REASONS:

The current interface imposes a number of logically unnecessary constraints
on users of indexed files. The proposed extensions are easy to implement
efficiently.

IMPLICATIONS:

Greater flexibility in structure and access of indexed files, potentially
leading to more efficient solutions in many applications. Also more
user convenience.

DETAILED PROPOSAL:

See MTB 269.

MPM subroutines

Name: vfile_

This I/O module supports I/O from/to files in the storage system. All logical file types are supported.

Entry points in this module are not called directly by users; rather, the module is accessed through the I/O system. See "Multics Input/Output System" and "File Input/Output" in Section V of the MPM Reference Guide for a general description of the I/O system and a discussion of files, respectively.

Attach Description

The attach description has the following form:

    vfile_ path -control_args-

where:

1. path   is the absolute or relative pathname of the file.

2. control_args   may be chosen from the following:

   -extend   specifies extension of the file if it already exists. This control argument is only meaningful with openings for output or input_output; otherwise, it is ignored.

   -share -wtime-   allows an indexed file to be open in more than one process at the same time, even though not all openings are for input. (See "Multiple Openings" below.) The wtime, if specified, is the maximum time in seconds that this process will wait to perform an operation on the file. A value of -1 means the process may wait indefinitely. If no wtime is given, a default value of 1 is used.

   -blocked -n-   specifies attachment to a blocked file. If a nonempty file exists, n is ignored and may be omitted. Otherwise, n is used to set the maximum record size (bytes).

-no_trunc   indicates that a put_chars operation into
                     the middle of an unstructured file
                     (stream_input_output) is permitted, and no
                     truncation is to occur in such cases. Also
                     prevents the truncation of an existing file
                     at open and in stream_input_output openings
                     causes the next byte position to be
                     initially set to beginning of file.

-append   in input_output openings, this causes
                     put_chars and write_record operations to
                     add to end of file instead of truncating
                     when the file position is not at end of
                     file. Also the position is initially set
                     to beginning of file, and an existing file
                     is not truncated at open.

-header -n-   for use with unstructured files, this
                     control argument indicates that a header is
                     expected in an existing file, or is to be
                     created for a new file. If a header is
                     specified, it contains an optional
                     identifying number, which effectively
                     permits user-defined file types. If n is
                     given and the file exists, the file
                     identifier must be equal to n; a new file
                     takes the value of n, if given, as its
                     identifier. The header is maintained and
                     becomes invisible only with the explicit
                     use of this control argument.

-old   indicates that a new file is not to be
                     created if an attempt is made to open a
                     nonexisting file for output, input_output,
                     or update.

-ssf   restricts the file to a single segment. If
                     specified, an attempt to open a
                     multisegment file or to expand a file
                     beyond a single segment is treated as an
                     error. The file must not be indexed.

-dup_ok   indicates that the creation of duplicate
                     keys is to be permitted. The file must be
                     indexed. (See "Duplicate Keys" below.)

     The -extend, -append, and -no_trunc control arguments
conflict; only one may be specified.

To form the attach description actually used in the attachment, the pathname is expanded to obtain an absolute pathname.

Opening_and_Access_Requirements

All opening modes are supported. For an existing file, the mode must be compatible with the file type. (See "File Input/Output" in Section V of the MPM Reference Guide.) The mode must be compatible with any control arguments given in the attach description.

An existing file is not truncated at open if its safety switch is on and its bit count is nonzero.

If the opening is for input only, only read access is required on the file. In all other cases, rw access is required on the file.

Position_Operation

An additional type of positioning is available with unstructured and blocked files that are open for input, input_output, or update. When the type argument of the iox_$position entry point is 2, this specifies direct positioning to the record or byte whose ordinal position (0, 1, 2, ...) is given. The zero position is just beyond the file header, if a header is present.

Write_Operation

In blocked and sequential files open for update, this operation is supported. Its effect is to append a record to the file or replace the next record, depending on the next record position.

Rewrite_Operation

If the file is a sequential file, the new record must be the same length as the replaced record. If not, the code returned is error_table_$long_record or error_table_$short_record.

In a blocked file, no record may be rewritten with a record whose length exceeds the maximum record length of the file. Attempting to do so causes the code, error_table_$long_record, to be returned.

Delete_Operation

If the file is a sequential file, the record is logically deleted, but the space it occupies is not recovered.

Deletions are not supported in blocked files. If the user attempts to delete a record in a blocked file, the code, error_table_$no_operation is returned.

Modes_Operation

This operation is not supported.

Control_Operation

The following orders are supported by the vfile_ I/O module.

    read_position   add_key
    seek_head   delete_key
    set_wait_time   get_key
    truncate   min_block_size
    max_rec_len   reassign_key
                           record_status
                           set_file_lock

The five orders in the first column are described below. The remaining orders, documented in the vfile_ I/O module in the MPM Subsystem Writers' Guide, implement various features of indexed files that require somewhat more knowledge of internal file structure than is expected of most users.

read_position

The read_position order is accepted when the I/O switch is open and attached to a nonindexed file. The operation returns the ordinal position (0, 1, 2, ...) of the next record (byte for unstructured files), and that of the end of file, relative to the file base. The file base is just beyond the header, if a header is present.

For this order, the info_ptr argument must point to a structure of the following form:


```
dcl 1 info              based (info_ptr),
      2 next_position    fixed(34),   /*output*/
      2 last_position    fixed(34);   /*output*/
```


seek_head

The seek_head order is accepted when the I/O switch is open for keyed_sequential_input or keyed_sequential_update. For this order the info_ptr argument must point to a structure of the following form:


```
dcl  1   info            based (info_ptr),
      2  relation_type fixed,
      2  n             fixed,
      2  search_key    char (0 refer (n));
```


The order locates the first record with a key whose head has the specified relation with the given search_key. The next record position and (for keyed_sequential_update) the current record position are set to the record. If no such record exists, the code error_table_$no_record is returned.

The head of a record's key is the first n characters of the key, the key being extended by blanks if it has fewer than n characters. The allowed values for info.relation_type are:

```
0        head = search_key
1        head >= search_key
2        head > search_key
```

set_wait_time

The set_wait_time order is accepted when the I/O switch is open and attached to an indexed file with the -share control argument. For this order the info_ptr argument must point to a structure of the following form:

```
dcl new_wait_time float based(info_ptr);
```

This order specifies a limit on the time that the user's process will wait to perform an order when the file is locked by another process. The interpretation of new_wait_time is the same as that described earlier for the wtime limit used with the -share control argument.

truncate

The truncate order is accepted when the I/O switch is attached to a nonindexed file open for input_output or update. The operation truncates the file at the next record (byte for unstructured files). If the next position is undefined, the code error_table_$no_record is returned.

No info structure is required for this order.

max_rec_len

The max_rec_len order is accepted when the I/O switch is open and attached to a blocked file. The operation returns the

maximum record length (bytes) of the file. A new maximum length
can be set by specifying a nonzero value for the second argument.
In this case the file must empty and open for modification, or
the code error_table_$no_operation is returned.

     For this order the info_ptr argument must point to a
structure of the following form:


```
dcl 1 info            based (info_ptr),
    2 old_max_recl    fixed(21),   /*output*/
    2 new_max_recl    fixed(21);   /*input*/
```


Duplicate_Keys

     By default, the vfile_ I/O module prevents the user from
associating a single key with more than one record in the same
indexed file. This restriction is removed when the -dup_ok
control argument is used or if the file's statistics indicate
that duplicate keys are already present.

     Duplicate keys can be created via either the write_record
operation or the add_key or record_status control orders. When
duplications are permitted, the key for insertion is defined as
the key of the current record, if it exists.

     With this extension, the notion of an "index entry" becomes
more basic than that of a single key in the index. An index
entry is an association between a string of characters (key) and
a number (record descriptor).

     Index entries are ordered by key. Within multiple
occurrences of the same key, the order is identical to the order
in which the entries were created. A seek_key or seek_head
operation locates the first instance of a set of duplicate keys.
A write_record operation advances the file position beyond the
last instance of the key for insertion, if the key already exists
in the index.

     The next record position is best thought of as corresponding
to the next index entry. Operations that can advance the next
record and position (i.e., read_record; rewrite_record; and
position, with a type argument of 0) permit one to locate
intermediate instances of duplicate keys.

Multiple_Openings

It is possible to have or attempt to have multiple openings of the same file, that is, to have two or more open I/O switches attached to the same file. These switches might be in the same process or in different processes. With respect to the effects of multiple openings, the various opening modes can be divided into four classes (explained below). Multiple openings in which the opening modes are in more than one class are invalid, as are multiple openings within certain classes. The vfile_ I/O module prevents some cases of multiple opening. In these cases, error_table_$file_busy is returned by the open operation. In cases where an invalid multiple opening does occur, I/O operations will cause unpredictable errors in the processes involved, and the contents of the files may be damaged.

The classes of multiple openings are:

1. Openings for input without the -share control argument. Any number of openings in this class are allowed. The existence of an opening in this class never causes damage to the file. When this class of opening is attempted, the existence of all class 2 and 3 openings and some class 4 openings will be detected for structured files.

2. Openings for output or input_output without the -extend control argument.
    Only one opening is allowed. The existence of another opening is never detected when this class of opening is attempted. The file is simply replaced by an empty file of the appropriate type. If the file was already open with an opening of any class except class 1, the contents of the new file will probably be damaged.

3. Openings for update without the -share control argument and for output or input_output without the -share control argument and with the -extend control argument. Only one opening of this class is allowed. For structured files, multiple openings within the class are detected. An invalid multiple opening involving an opening of this class and other openings of class 4 may be detected. If not, the only effect is that the class 3 opening locks the file for the entire opening.

4.   Openings with the -share control argument.
     Any number of openings of this type are allowed. When
     a process performs an update on the file, the file is
     locked. Other processes attempting an operation while
     the file is locked will wait up to the limit specified
     by wtime in the -share control argument or from the
     last set_wait_time order.   If the operation is not
     carried out because of the wtime limit, the code
     error_table_$file_busy is returned.

     There are two codes that pertain only to class 4
     openings: error_table_$asynch_deletion   and
     error_table_$asynch_insertion.   The first is returned
     when there is an attempt to reference a record located
     by the previous operation, but the record has been
     deleted in some other opening. The second is returned
     by write_record when a record with the key for
     insertion (defined by a seek_key operation) has already
     been inserted (by some other opening).

Interrupted_Openings

   If a process opens a file and terminates without closing the
file, the file may be left in an intermediate state that
prohibits normal I/O operations on the file.   The exception is
openings for input only. The details depend on the particular
type of file as follows:

1.   Unstructured file.
     In general, the bit count of the file's last segment
     will   not be properly set.   This condition is not
     detected at subsequent openings, and part of the file's
     contents may be overwritten or ignored.

2.   Sequential file.
     In general, certain descriptors in the file and the bit
     count of the file's last segment will not be properly
     set.   This condition is detected at a subsequent open,
     and either the file is automatically adjusted or (if
     the   opening   is   input   only)   the   code
     error_table_$file_busy is returned.

3.   Blocked file.
     In general, the file's bit count and record count will
     not be correct. This condition is detected at a
     subsequent open, and either the file is automatically
     adjusted or (if the opening is input only) the code
     error_table_$file_busy is returned.

4.   Indexed file.
     In general, the bit counts of the file's segments will
     not be properly set, and the file contents will be in a
     complex intermediate state (e.g., a record, but not its
     key in the index, will be deleted). This situation is
     detected at a subsequent open or at the beginning of
     the next operation, if the file is already open with
     the -share control argument. Unless the opening is for
     input only, the file is automatically adjusted;
     otherwise, the code error_table_$file_busy is returned.

     When an indexed file is adjusted, the interrupted
     operation (write_record, rewrite_record, delete_record,
     etc.), if any, is completed. For rewrite_record,
     however, the bytes of the record may be incorrect.
     (Everything else will be correct.) In this case, an
     error message is printed on the terminal. The user can
     rewrite or delete the record as required. The
     completion of an interrupted write operation may also
     produce an incorrect record, in which case the
     defective record and its key are automatically deleted
     from the file.

     Any type of file may be properly adjusted with the
vfile_adjust command (described in the MPM Commands), if an
interrupted opening has occurred.

Inconsistent_files

     The code error_table_$bad_file (terminal message: "File is
not a structured file or is inconsistent") may be returned by
operations on structured files. It means that an inconsistency
has been detected in the file. Possible causes are:

1.   The file is not a structured file of the required type;

2.   A program accidentally modified some words in the file.

Obtaining_File_Information

The type and various statistics of any of the four vfile_ supported file structures may be obtained with the vfile_status command or vfile_status_ subroutine (described in the MPM Commands and Subroutines respectively).

Name: vfile_

The vfile_ I/O module is documented in this manual and in the MPM Subroutines. The following order calls are for users of indexed files. These orders allow a greater degree of control in the areas of synchronization and separate record/index manipulation. For additional information, see the vfile_ I/O module in the MPM Subroutines.

min_block_size

The min_block_size operation determines the minimum size for blocks of record space that are subsequently allocated by write_record or rewrite_record operations (documented in the iox_ subroutine). The specification remains in effect for the duration of the current opening or until another call to this order is issued. The I/O switch must be attached to an indexed file open for output or update.

For this order the info_ptr argument must point to a structure of the following form:

```
dcl 1 min_blksz_info based(info_ptr),
      2 min_residue    fixed bin(21),
      2 min_capacity   fixed bin(21);
```

where:

1. min_residue   specifies the minimum unused capacity of a
                   record block (bytes); i.e., the difference
                   between the record's length and the maximum
                   length it can attain without requiring
                   reallocation. (Input)

2. min_capacity   specifies the minimum total record capacity
                   (bytes); i.e., the maximum length that the
                   record can attain without requiring
                   reallocation. (Input)

When the I/O switch is initially opened, both these parameters are set to zero.

The current implementation imposes the following constraints on allocated record blocks:

1. the minimum allocation is eight full words, including two header words for the block length and record length. The minimum nonnull record capacity is, therefore, 24 bytes.

2. the size of an allocated block is always an integral number of full words, i.e., a multiple of four bytes.

The formula below gives the allocation size, block_words, used for a write_record or rewrite_record operation with a given buffer length, buff_len:

$$block\_words = 0 \text{ (no allocation if and only if}$$
$$buff\_len = min\_residue = min\_capacity = 0)$$

otherwise,

$$block\_words = max \; (8,(max(buff\_len + min\_residue, min\_capacity) + 3) / 4)$$

record_status

The record_status operation returns information about a specified record in an indexed file, and optionally permits the user to manipulate the record's lock and/or to allocate an empty record.

An argument is provided to permit one to entirely avoid using the index in accessing and creating records (see "Note" below).

The I/O switch must be open and attached to an indexed file. The next record position is not altered or used by this operation. The current record position is always set to the record referenced.

The I/O switch must be open for output or update in order to
lock, unlock or create a record.

For this order the info_ptr argument must point to a
structure of the following form:

```
dcl  1   rs_info            based(info_ptr) aligned,
     2   version            fixed bin,
     2   flags              aligned,
       3 lock_sw            bit(1) unal,
       3 unlock_sw          bit(1) unal,
       3 create_sw          bit(1) unal,
       3 locate_sw          bit(1) unal,
       3 mbz1               bit(32) unal,
     2   record_len         fixed bin(21),
     2   max_rec_len        fixed bin(21),
     2   record_ptr         ptr,
     2   descriptor         fixed bin(35),
     2   mbz2               fixed bin;

     dcl  rs_info_version_1 static internal fixed bin init(1);
```

where:

1. version   is provided for compatibility with possible
                      future versions of this info structure. The
                      user should set this argument to
                      rs_info_version_1. (Input)

2. lock_sw   if set to "1"b, an attempt is made to lock
                      the specified record within the wait time
                      limit given at attachment or subsequently set
                      via the set_wait_time order (documented in
                      the MPM Subroutines). Possible error codes
                      are those returned by set_lock_$lock, as well
                      as the code error_table_$no_room_for_lock,
                      which is returned if the allocated record
                      block is too small to contain a lock. (See
                      "Records Locks" below). (Input)

3. unlock_sw   if set to "1"b, an attempt is made to unlock
                      the record. Possible error codes are those
                      returned by set_lock_$unlock and the code
                      error_table_$no_room_for_lock. If both
                      lock_sw and unlock_sw are set to "1"b, the
                      locking takes place first and determines the
                      resultant error code. (This permits one to
                      clear an invalid lock in a single operation.)

(Input)

4. create_sw   if set to "1"b, allocates a new record using
                  the record_len and max_rec_len arguments as
                  input parameters. The contents of the record
                  are set to zero, and its lock is set in the
                  same operation, if lock_sw equals "1"b.
                  Depending upon the setting of locate_sw, the
                  new record may be entered into the index. If
                  locate_sw equals "0"b the current key for
                  insertion is added to the index as a key for
                  the new record. Otherwise, no index entry is
                  created and the key for insertion becomes
                  undefined. (Input)

5. locate_sw

   "0"b   if create_sw also equals "0"b, this
           indicates that the current record
           position defines the record of
           interest. Otherwise, the current key
           for insertion is used. If the
           relevant position designator is
           undefined, the code
           error_table_$no_record or
           error_table_$no_key is returned,
           whichever is appropriate.

   "1"b   if create_sw equals "0"b, this
           indicates that the descriptor argument
           is an input parameter defining the
           location of the record of interest.
           When such references are permitted in
           a shared file, users must observe
           certain protocols to ensure proper
           synchronization of access at the
           record level. Record locks are
           provided for this purpose. If
           create_sw equals "1"b, this causes the
           new record to be created without a
           key.

6. mbz1 and mbz2 must be set to zero by the user. (Input)

7. record_len   gives the record's length in bytes. (Output)
                  If create_sw equals "1"b this argument is
                  input.

8. max_rec_len   if create_sw equals "1"b this argument is
                  input and overrides any minimum block size

specification that may currently be in effect
(see min_block_size order above). The
returned value gives the maximum length that
the record can attain (bytes) without
requiring reallocation. When this argument
is used as an input parameter, the resultant
maximum record length is the smallest number
greater than or equal to max_rec_len that
corresponds to an implemented (nonzero) block
size. (Output)

9. record_ptr   points to the first byte of the allocated
                      record, or is set to null if no allocated
                      record exists. (Output)

10. descriptor   is a process independent locator for the
                      specified record. This value is used as an
                      input argument when locate_sw equals "1"b and
                      create_sw equals "0"b. (Output) The actual
                      structure of each descriptor is as follows:

                          dcl   1   descrip_struct   based
                      (addr(descriptor)) aligned,
                              2 comp_num   fixed bin(17) unal,
                              2 word_offset   bit(18) unal;

                      where:

                      comp_num   is the msf component number
                                     of the segment containing
                                     the record.

                      word_offset   is the word offset of the
                                     block of storage containing
                                     the allocated record,
                                     relative to the base of its
                                     file component.

                      A zero descriptor designates an unallocated
                      (zero-length) record.

                      Descriptors may also be arguments to the
                      add_key, delete_key, reassign_key, and
                      get_key orders. Notice that at any given
                      time within a single file each record is
                      uniquely located by its descriptor, which
                      remains valid only for the life of a single
                      allocation.

Notes

If locate_sw is set to "1"b, the resultant current record
position moves "outside" of the index in the sense that there is
no key associated with the current record. This situation may
also arise after using the delete_key operation.

When this is the case, a subsequent rewrite_record or
delete_record operation behaves differently from the usual case.
The difference is that no corresponding index entry is changed or
deleted to reflect the change to the record.

Extreme caution must be exercised when using the control
operations that take a descriptor as an input argument,
especially in a shared environment. The user is responsible for
ensuring that previously obtained descriptors and pointers are
still valid when they are used. Also, pains must be taken to
maintain the index in a consistent state, i.e., each index entry
should designate a valid record if a record reference may be
attempted.

get_key

The get_key operation returns both the key and the record
descriptor for the next record in an indexed file.

The I/O switch must be open for keyed_sequential_input or
keyed_sequential_update. If the next record position is at end
of file, the code error_table_$end_of_info is returned. If the
next record position is undefined, the code
error_table_$no_record is returned. The next record position is
unchanged, and the current record position is set to the next
record if the operation is successful; otherwise, the current
record position is set to null.

For this order, the info_ptr argument must point to a
structure of the following form:

```
dcl 1 get_key_info based (info_ptr),
      2 mbz          fixed bin,
      2 descriptor   fixed bin(35),
      2 key_length   fixed bin,
```

```
            2   key_string   char(0  refer(get_key_info.key_length));
```

where:

1.   descriptor   is the record locator for the next record.
                   This value may be used as an input argument to
                   the control operations add_key, delete_key,
                   reassign_key, and record_status (see "Notes"
                   below). (Output)

2.   key_length   is the length of the key at the next record
                   position. (Output)

3.   key_string   is the next record's key. (Output)

4.   mbz   must be set to zero by the user. (Input)

Notes

The interpretation of the descriptor argument as a record
locator is not mandatory, since the add_key and reassign_key
operations permit the user to set the descriptor portion of an
index entry to an arbitrary 36 bit value.

In such cases the descriptor itself may be thought of as a
one-word record that is read by the get_key operation.

add_key

The add_key operation creates a new index entry with a given
key and record descriptor.

The I/O switch must be open for direct_output,
direct_update, keyed_sequential_output, or
keyed_sequential_update. Current and next record positions are
unchanged.

Associations may be formed between any number of keys and a
single record via this operation. Duplicate keys may be added if
the file is attached with the -dup_ok control argument, or if the
file already contains duplications; otherwise, the code
error_table_$key_duplication is returned. (See "Duplicate Keys"

← in MPM subroutines. description of vfile_)

~~below~~.

     This operation, as well as the delete_key, reassign_key, and
get_key orders do not reference the length or contents of a
record. This permits one to avoid the use of actual records
altogether in any given indexed file.

     For this order, the info_ptr argument must point to a
structure of the following form:


```
dcl 1 add_key_info      based(info_ptr),
      2 flags           aligned,
        3 input_key     bit(1) unal,
        3 input_descrip bit(1) unal,
        3 mbz           bit(34) unal, /*must be zero */
      2 descriptor      fixed bin(35),
      2 key_len         fixed bin,
      2 key_string      char(0 refer(add_key_info.key_len));
```


where:
1.   input_key   (Input)
                       "0"b   indicates that the current key for
                              insertion is the new key. If this
                              value is undefined, the code
                              error_table_$no_key is returned.

                       "1"b   indicates that the key to be added is
                              the key_string contained in this info
                              structure.

2.   input_descrip   (Input)
                       "0"b   indicates that the current record
                              defines the new descriptor. If the
                              current record is undefined, the code
                              error_table_$no_record is returned.

                       "1"b   indicates that the user supplied
                              descriptor in this info structure is
                              the new descriptor.

3.   descriptor   is used only if the variable input_descrip is
                       set to "1"b. The descriptor is stored into
                       the index together with its associated key.
                       Any 36-bit quantity may be supplied, although
                       in general this number will have been
                       previously obtained via the record_status or

get_key control operations. Descriptors are
used by operations that reference the
contents of length of a record, in order to
obtain the record's address. (Input)

4. key_len   is the length of the key_string. Keys must
                    be between 0 and 256 characters, inclusive.
                    (Input)

5. key_string   is used only if add_key_info.input_key is set
                    to "1"b. It defines the key to be added to
                    the index with the appropriate record
                    descriptor.

delete_key

     The delete_key operation deletes a specified index entry.

     The I/O switch must be open for direct_update or
keyed_sequential_update. The current and next file positions are
left unchanged, with the following exception: if the deleted
index entry is at the next record position, then the next record
position is advanced to the following index entry, or becomes
undefined in direct openings.

     For this order the info_ptr argument may be null, or may
point to a structure of the following form:

     dcl 1 delete_key_info like add_key_info based (info_ptr);

where:

1. input_key   (Input)
                    "0"b   indicates that the key associated with
                            the current file position defines the
                            key of the index entry that is to be
                            deleted. If current position is
                            undefined or outside the index (e.g.,
                            after deleting the current key of the
                            current record), the code
                            error_table_$no_key is returned.

"1"b   indicates that the user_supplied
        key_string defines the key of the
        entry to be deleted. If no such key
        is found, the code error_table_$no_key
        is returned.

2. input_descrip (Input)
    "0"b   indicates that the index entry to be
            deleted is associated with the current
            record. If the current record is
            undefined, the code
            error_table_$no_record is returned.

    "1"b   indicates that the entry to be deleted
            is associated with the user_supplied
            descriptor. If no such entry exists,
            the code error_table_$no_record is
            returned.

3. descriptior   is used only if delete_key_info.input_descrip
                   equals "1"b. The entry which is deleted is
                   the first whose descriptor matches this
                   value, among those entries with the specified
                   key.

4. key_len   same as in add_key above. (Input)

5. key_string   if delete_key_info.input_key equals "1"b,
                   this argument defines the key for which the
                   index entry with the specified record
                   descriptor is to be deleted. (Input)

        If the info_ptr argument is null, the index entry at the
current file position is deleted, i.e., the effect is the same as
that of setting both arguments, input_key and input_descrip, to
"0"b.

reassign_key

        The reassign_key operation causes the descriptor portion of
a specified index entry to be replaced with a given value.

        The I/O switch must be open for direct_update or
keyed_sequential_update. The file position designators are not
changed.

For this order the info_ptr argument must point to a structure of the following form:

```
dcl 1 reassign_key_info      based(info_ptr),
        2 flags              aligned,
          3 input_key        bit(1) unal,
          3 input_old_descrip bit(1) unal,
          3 input_new_descrip bit(1) unal,
          3 mbz              bit(33) unal,
        2 old_descrip        fixed bin(35),
        2 new_descrip        fixed bin(35),
        2 key_len            fixed bin,
        2 key_string         char(0 refer(reassign_key_info.key_len));
```

where:

1.   input_key   (Input)
                             "0"b indicates that the index entry to
                                   be reassigned has as its key the
                                   current key for insertion.   If
                                   undefined   the   code
                                   error_table_$no_key is returned.

                             "1"b indicates that the key_string
                                   argument defines the key portion
                                   of the index entry to be
                                   reassigned. If the key_string is
                                   not found in the index, the code
                                   error_table_$no_key is returned.

2.   input_old_descrip (Input)
                             "0"b indicates that the entry to be
                                   changed is associated with the
                                   current record. If the current
                                   record is undefined, the code
                                   error_table_$no_record   is
                                   returned.

                             "1"b indicates that the old_descrip
                                   argument defines the descriptor
                                   portion of the index entry to be
                                   changed.

3.   input_new_descrip (Input)

                             "0"b indicates that the specified
                                   index entry is to be reassigned
                                   to the current record.   If the

current record is undefined, the
code error_table_$no_record is
returned.

"1"b indicates that the argument
new_descrip is to supply the new
value for the descriptor portion
of the specified index entry.

4. old_descrip is used only if
reassign_key_info.input_old_descrip
equals "1"b. The entry that is
reassigned is the first whose descriptor
matches this value, among those index
entries with the specified key. (Input)

5. new_descrip is used only if
reassign_key_info.input_new_descrip
equals "1"b. This value replaces the
old descriptor of the specified index
entry. (Input)

6. key_len as in add_key above. (Input)

7. key_string if reassign_key_info.input_key equals
"1"b, this argument defines the key for
which the index entry with the specified
descriptor is to be reassigned. (Input)

set_file_lock

The set_file_lock order is accepted when the I/O switch is open
for output or update and attached to an indexed file with the
-share control argument. For this order, the info_ptr argument
must point to a structure of the following form:

    dcl set_lock_flag bit(2) aligned based(info_ptr);

    This operation causes the file to be locked (if possible
within the wait-time limit) or unlocked, depending on the user's
setting the first bit of info_ptr>set_lock_flag to "1"b or "0"b,
respectively.

The possible error codes are those returned by set_lock_$lock and set_lock_$unlock, excepting the code error_table_$invalid_lock_reset, which is not treated as an error.

The second bit of set_lock_flag indicates the class of operations that are to be excluded by locking the file. If "0"b only operations that alter the file are excluded, passive operations do not detect this state. Otherwise, all index referencing operations are excluded. In any case, the exclusion only applies to operations outside the current opening.

Record_Locks

This feature pertains only to indexed files. Record locks provide a basis for synchronizing concurrent access at the individual record level. The setting and clearing of record locks is explicitly controlled by the user via the record_status order.

When the capacity of an allocated record block exceeds its contents by at least four bytes, the last word of the block is treated as a record lock. A nonzero lock identifies the process that set it. The user can ensure that record allocations leave room for a lock by using the min_block_size order with a residue specification of at least four bytes.

All operations that reference the length or contents of an existing record (e.g., seek_key, but not seek_head) also check the record's lock (if one exists). If the record is not locked, the operation proceeds normally. Otherwise, the returned error code reflects the state of the lock, indicating that the contents of the record may be in an inconsistent state. In this case, if the operation does not explicitly involve changing the file, it proceeds normally and the returned code is: error_table_$record_busy, if the record is locked by another live process; error_table_$lock_is_invalid, if the record's lock is set, but not by an existing process; or error_table_$locked_by_this_process, if the record is locked in the caller's process.

Attempting a rewrite_record or delete_record operation on a record locked by another process has not effect other than to return the code error_table_$record_busy (file is unchanged). If the lock is invalid, these operations return the code

error_table_$invalid_lock_reset and zero the lock. If the lock
was set by the caller, the code returned is
error_table_$locked_by_this_process. In either case the
operation is otherwise successful.

When a record that is locked by the user's process is
rewritten, its lock remains set, as long as the minimum block
size specification currently in effect leaves enough room for a
record_lock.