L 12

```
   SSSSSSSSSSSS  YYY         YYY     SSSSSSSSSSSS
   SSSSSSSSSSSS  YYY         YYY     SSSSSSSSSSSS
   SSSSSSSSSSSS  YYY         YYY     SSSSSSSSSSSS
SSS              YYY         YYY  SSS
SSS              YYY         YYY  SSS
SSS              YYY         YYY  SSS
SSS                 YYY   YYY     SSS
SSS                 YYY   YYY     SSS
SSS                 YYY   YYY     SSS
   SSSSSSSSS           YYY           SSSSSSSSS
   SSSSSSSSS           YYY           SSSSSSSSS
   SSSSSSSSS           YYY           SSSSSSSSS
            SSS        YYY                    SSS
            SSS        YYY                    SSS
            SSS        YYY                    SSS
            SSS        YYY                    SSS
            SSS        YYY                    SSS
            SSS        YYY                    SSS
SSSSSSSSSSSS           YYY        SSSSSSSSSSSS
SSSSSSSSSSSS           YYY        SSSSSSSSSSSS
SSSSSSSSSSSS           YYY        SSSSSSSSSSSS
```

```
_$
Ps
--
YZ
Z$
Z$
Z$
Z$
Z$
Z$
Z$
Z$
Z$
Z$
Z$
Z$
```

```
                                                    E 11
**FILE**ID**SHMGSDRTN









  SSSSSSSS  HH      HH  MM      MM    GGGGGGGG    SSSSSSSS  DDDDDDDD    RRRRRRRR    TTTTTTTTTT  NN      NN
  SSSSSSSS  HH      HH  MM      MM    GGGGGGGG    SSSSSSSS  DDDDDDDD    RRRRRRRR    TTTTTTTTTT  NN      NN
SS          HH      HH  MMMM  MMMM  GG          SS          DD      DD  RR      RR      TT      NN      NN
SS          HH      HH  MMMM  MMMM  GG          SS          DD      DD  RR      RR      TT      NN      NN
SS          HH      HH  MM  MM  MM  GG          SS          DD      DD  RR      RR      TT      NNNN    NN
SS          HH      HH  MM  MM  MM  GG          SS          DD      DD  RR      RR      TT      NNNN    NN
  SSSSSS    HHHHHHHHHH  MM      MM  GG            SSSSSS    DD      DD  RRRRRRRR        TT      NN  NN  NN
  SSSSSS    HHHHHHHHHH  MM      MM  GG            SSSSSS    DD      DD  RRRRRRRR        TT      NN  NN  NN
        SS  HH      HH  MM      MM  GG  GGGGGG          SS  DD      DD  RR  RR          TT      NN    NNNN
        SS  HH      HH  MM      MM  GG  GGGGGG          SS  DD      DD  RR  RR          TT      NN    NNNN
        SS  HH      HH  MM      MM  GG      GG          SS  DD      DD  RR    RR        TT      NN      NN      ....
        SS  HH      HH  MM      MM  GG      GG          SS  DD      DD  RR    RR        TT      NN      NN      ....
SSSSSSSS    HH      HH  MM      MM    GGGGGG    SSSSSSSS    DDDDDDDD    RR      RR      TT      NN      NN      ....
SSSSSSSS    HH      HH  MM      MM    GGGGGG    SSSSSSSS    DDDDDDDD    RR      RR      TT      NN      NN      ....


LL              IIIIII      SSSSSSSS
LL              IIIIII      SSSSSSSS
LL                II      SS
LL                II      SS
LL                II      SS
LL                II      SS
LL                II        SSSSSS
LL                II        SSSSSS
LL                II              SS
LL                II              SS
LL                II              SS
LL                II              SS
LLLLLLLLLL      IIIIII    SSSSSSSS
LLLLLLLLLL      IIIIII    SSSSSSSS
```

Table of contents

```
0000            .TITLE  SHMGSDRTN - GLOBAL SECTION DESCRIPTOR ROUTINES FOR SHARED MEMORY
0000            .IDENT  'V04-000'
0000
0000    ;****************************************************************************
0000    ;*                                                                          *
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0000    ;*                                                                          *
0000    ;*                                                                          *
0000    ;****************************************************************************
0000
0000    ;++
0000    ; FACILITY: MEMORY MANAGEMENT
0000    ;
0000    ; ABSTRACT: ROUTINES TO TRANSLATE LOGICAL NAMES FOR GLOBAL SECTION NAMES,
0000    ;           SEARCH ALL GSD LISTS AND TABLES, AND HANDLE SHARED MEMORY
0000    ;           GLOBAL SECTION PAGE AND DESCRIPTOR RESOURCES.
0000    ;
0000    ; ENVIRONMENT: VAX/VMS
0000    ;
0000    ; AUTHOR: KATHLEEN D. MORSE     , CREATION DATE: 15-JAN-1979
0000    ;
0000    ; MODIFIED BY:
0000    ;
0000    ;       V03-009 MSH0042         Michael S. Harvey       4-May-1984
0000    ;               Object name buffer also must be zero filled.
0000    ;
0000    ;               Shared memory name buffer must be zero filled for su.cessful
0000    ;               matching of name as stored in shared memory common data page.
0000    ;               (This was ident V03-008, 3-May-1984).
0000    ;
0000    ;       V03-007 TMK0001         Todd M. Katz            23-Apr-1984
0000    ;               Completely re-write the routines MMG$GSDTRNLOG, MMG$MBXTRNLOG,
0000    ;               and MMG$CEFTRNLOG. The basic changes made include:
0000    ;
0000    ;               1. Use of the fast internal logical name routine LNM$SEARCH_ONE
0000    ;                  to do each iterative translation instead of making iterative
0000    ;                  calls to the old $TRNLOG system service.
0000    ;
0000    ;               2. Extension of the size of logical names from the old 63 byte
0000    ;                  value to LNM$C_NAMLENGTH.
0000    ;
```

```
0000    ;               3. Use of a KRP to provide space for a logical name translation
0000    ;                  work area instead of the kernel stack.
0000    ;
0000    ;               4. Micro-optimiztion and extensive documentation of the
0000    ;                  three routines.
0000    ;
0000    ;       V03-006 MSH0036         Michael S. Harvey       20-Apr-1984
0000    ;               Correct upper bounds check on global section names for
0000    ;               shared memory global sections.
0000    ;
0000    ;       V03-005 MSH0004         Michael S. Harvey       26-Jan-1984
0000    ;               Add support for lengthened global name field in global
0000    ;               section descriptors.
0000    ;
0000    ;       V03-004 DMW4037         DMWalp                  26-May-1983
0000    ;               Intergate new logical name structures.
0000    ;
0000    ;       V03-003 KDM0028         Kathleen D. Morse       10-Nov-1982
0000    ;               Fix demand-zeroing of shared memory global section
0000    ;               that is mapped backwards by reversing the INADR range.
0000    ;
0000    ;--
```

```
0000          .SBTTL  DECLARATIONS
0000
0000  ;
0000  ; MACROS:
0000  ;
0000
0000          $DYNDEF                                         ;DEFINE SYSTEM DATA STRUCTURES
0000          $GSDDEF                                         ;GLOBAL SECTION DESCRIPTOR
0000          $IPLDEF                                         ;INTERRUPT PRIORITY LEVELS
0000          $IRPDEF                                         ;I/O REQUEST PACKET
0000          $LNMDEF                                         ;DEFINE LOGICAL NAME ATTRIBUTES
0000          $LNMSTRDEF                                      ;DEFINE LOGICAL NAME BLOCKS OFFSETS
0000          $PCBDEF                                         ;PROCESS CONTROL BLOCK
0000          $PHDDEF                                         ;PROCESS HEADER
0000          $PRDEF                                          ;PRIVILEGE BITS
0000          $PRIDEF                                         ;PRIORITY LEVELS
0000          $PSLDEF                                         ;PROGRAM STATUS LONGWORD
0000          $PTEDEF                                         ;DEFINE PAGE TABLE ENTRIES
0000          $SECDEF                                         ;SECTION TABLE ENTRY
0000          $SHBDEF                                         ;SHARED MEMORY CONTROL BLOCK
0000          $SHDDEF                                         ;SHARED MEMORY COMMON DATA PAGE
0000          $SSDEF                                          ;SYSTEM STATUS CODES
0000          $STATEDEF                                       ;DEFINE EVENT STATES
0000          $VADEF                                          ;VIRTUAL ADDRESS DEFINITIONS
0000          $WCBDEF                                         ;DEFINE WINDOW CONTROL BLOCK
0000
0000  ;
0000  ; EQUATED SYMBOLS:
0000  ;
0000
0000  ;
0000  ; OWN STORAGE:
0000  ;
0000
```

```
                    0000          .SBTTL CLR/SET_BITMAP - CLEAR/SET BITS IN SHARED MEMORY GBL SEC BITMAP
                    0000  ;++
                    0000  ; FUNCTIONAL DESCRIPTION:
                    0000  ;
                    0000  ;       THIS ROUTINE CLEARS/SETS THE BITS IN THE GLOBAL SECTION BITMAP
                    0000  ;       CORRESPONDING TO SPECIFIC PHYSICAL PAGE FRAME NUMBERS (PFN) ASSOCIATED
                    0000  ;       WITH A GLOBAL SECTION SPECIFIED BY A GSD.  THE GSD CONTAINS UP
                    0000  ;       TO #GSD$C_PFNBASMAX PIECES, EACH PIECE DESCRIBED BY TWO LONGWORDS:
                    0000  ;       THE RELATIVE PFN OF THE FIRST PAGE IN THE PIECE, AND A COUNT OF THE
                    0000  ;       NUMBER OF PAGES IN THE PIECE.  USING THIS INFORMATION, THIS ROUTINE
                    0000  ;       COMPUTES THE ADDRESS OF THE BITS IN THE BITMAP THAT CORRESPOND TO
                    0000  ;       THESE RELATIVE PFN'S.  THESE BITS ARE THEN CLEARED/SET FOR EACH PIECE OF
                    0000  ;       THE GLOBAL SECTION.
                    0000  ;
                    0000  ; CALLING SEQUENCE:
                    0000  ;
                    0000  ;       BSBW    MMG$SET_BITMAP
                    0000  ;       BSBW    MMG$CLR_BITMAP
                    0000  ;
                    0000  ; INPUT PARAMETERS:
                    0000  ;
                    0000  ;       R5 - ADDRESS OF THE SHARED MEMORY COMMON DATA PAGE
                    0000  ;       R6 - ADDRESS OF THE GLOBAL SECTION DESCRIPTOR
                    0000  ;
                    0000  ; IMPLICIT INPUTS:
                    0000  ;
                    0000  ;       THE GLOBAL SECTION DESCRIPTOR HAS BEEN INITIALIZED.
                    0000  ;
                    0000  ; OUTPUT PARAMETERS:
                    0000  ;
                    0000  ;       NONE
                    0000  ;
                    0000  ; IMPLICIT OUTPUTS:
                    0000  ;
                    0000  ;       THE CORRESPONDING BITS IN THE BITMAP ARE CLEARED/SET.
                    0000  ;
                    0000  ; COMPLETION CODES:
                    0000  ;
                    0000  ;       NONE
                    0000  ;
                    0000  ; SIDE EFFECTS:
                    0000  ;
                    0000  ;       NONE
                    0000  ;
                    0000  ;--
                    0000  ; ***********************************************************************
                    0000  ;
                    0000  ; ****************** THE FOLLOWING CODE MAY BE PAGED ******************
                    0000  ;
                00000000          .PSECT  Y$EXEPAGED
                    0000  ;
                    0000  ; ***********************************************************************
                    0000
                    0000          .ENABL  LSB
                    0000  MMG$SET_BITMAP::
  079F 8F   BB      0000          PUSHR   #^M<R0,R1,R2,R3,R4,R7,R8,R9,R10> ;SAVE REGISTERS
    54 00   D2      0004          MCOML   #0,R4                            ;INDICATE BITS ARE TO BE SET
```

```
                06    11  0007         BRB     5$                           ;ENTER COMMON CODE
                          0009
                          0009  MMG$CLR_BITMAP::
            079F 8F   BB  0009         PUSHR   #^M<R0,R1,R2,R3,R4,R7,R8,R9,R10> ;SAVE REGISTERS
                 54   D4  000D         CLRL    R4                           ;INDICATE BITS ARE TO BE CLEARED
  57    0C A5    55   C1  000F  5$:    ADDL3   R5,SHD$L_GSBITMAP(R5),R7     ;GET ADR OF BITMAP
     50    54 A6      9E  0014         MOVAB   GSD$L_BASPFN1(R6),R0         ;GET ADR OF FIRST BASE PFN
            51   04   9A  0018         MOVZBL  #GSD$C_PFNBASMAX,R1          ;GET # OF BASES ALLOWED IN GSD
                          001B
                          001B  FIND_PIECE:
            52   80   D0  001B         MOVL    (R0)+,R2                     ;GET RELATIVE BASE PFN
            53   80   D0  001E         MOVL    (R0)+,R3                     ;GET SIZE OF THIS PIECE
                 40   13  0021         BEQL    ALL_DONE                     ;BR ON NO MORE PIECES OF SECTION
                          0023  ;
                          0023  ; COMPUTE THE BYTE ADDRESS OF THE FIRST BIT TO CLEAR IN THE BITMAP.
                          0023  ;
  5A    52    FD 8F   78  0023         ASHL    #-3,R2,R10                   ;GET # BYTES OFFSET INTO BITMAP
     58    5A    57   C1  0028         ADDL3   R7,R10,R8                    ;BYTE ADR OF FIRST BIT TO CLEAR
     59    5A    03   78  002C         ASHL    #3,R10,R9                    ;GET # OF BITS SKIPPED
     59    52    59   C3  0030         SUBL3   R9,R2,R9                     ;BIT OFFSET FOR FIRST BIT TO CLR
                          0034  ;
                          0034  ; LOOP CLEARING THE REMAINING BITS IN THE FIRST BYTE OF THE BITMAP TO BE
                          0034  ; CHANGED.
                          0034  ;
68   01    59    54   F0  0034  10$:   INSV    R4,R9,#1,(R8)                ;CLEAR/SET ONE BIT OF BITMAP
                 53   D7  0039         DECL    R3                           ;ONE LESS PAGE TO CLR BIT FOR
                 23   13  003B         BEQL    NEXT_PIECE                   ;BR IF NO MORE PAGES IN PIECE
                 59   D6  003D         INCL    R9                           ;POINT TO NEXT BIT OF BYTE
           08    59   91  003F         CMPB    R9,#8                        ;DONE WITH THIS BYTE?
                 F0   19  0042         BLSS    10$                          ;BR ON NO, GO CLEAR ANOTHER BIT
                          0044  ;
                          0044  ; NOW DETERMINE THE NUMBER OF BYTES OF BITMAP THAT ARE TO BE TOTALLY CLEARED.
                          0044  ; CLEAR THESE BYTES WITH CLRB INSTRUCTIONS, THEN LOOP BACK TO CLEAR THE BITS
                          0044  ; AT THE END OF THE PIECE OF BITMAP WHICH DO NOT USE AN ENTIRE BYTE.
                          0044  ;
                 58   D6  0044         INCL    R8                           ;POINT TO NEXT BYTE OF BITMAP
                 59   D4  0046         CLRL    R9                           ;INDICATE FIRST BIT OF BYTE
  5A    53    FD 8F   78  0048         ASHL    #-3,R3,R10                   ;COMPUTE # OF BYTES TO CLEAR
     52    5A    03   78  004D         ASHL    #3,R10,R2                    ;COMPUTE # OF BITS CLEARED
                 08   13  0051         BEQL    25$                          ;BR IF NO WHOLE BYTES TO CLR
88   08    59    54   F0  0053  20$:   INSV    R4,R9,#8,(R8)+               ;CLEAR 8 BITS OF BITMAP
              F8 5A   F5  0058         SOBGTR  R10,20$                      ;ONE LESS BYTE TO CLEAR
           53    52   C2  005B  25$:   SUBL2   R2,R3                        ;COMPUTE # OF BITS LEFT TO CLR
                 D4   14  005E         BGTR    10$                          ;BR TO CLEAR REMAINING BITS (<8)
                          0060  ;
                          0060  ; REPEAT CLEARING BITS FOR UP TO #GSD$C_PFNBASMAX PIECES OF SHARED MEMORY.
                          0060  ;
                          0060  NEXT_PIECE:
              B8 51   F5  0060         SOBGTR  R1,FIND_PIECE                ;BR TO GET NEW BASE PFN AND CNT
                          0063
                          0063  ALL_DONE:
            079F 8F   BA  0063         POPR    #^M<R0,R1,R2,R3,R4,R7,R8,R9,R10> ;RESTORE REGISTERS
                      05  0067         RSB
                          0068         .DSABL  LSB
```

```
    0068          .SBTTL  FINDGSDPFN - FIND GSD USING SPECIFIC PFN
    0068    ;++
    0068    ; FUNCTIONAL DESCRIPTION:
    0068    ;
    0068    ;         THIS ROUTINE TAKES A PFN AND SEARCHES THE SHARED MEMORIES TO FIND
    0068    ;         THE GLOBAL SECTION THAT IS MAPPED TO THAT PFN.  IT THEN DECREMENTS THE
    0068    ;         PTE REFERENCE COUNT BY ONE.  THE ROUTINE IS CALLED WHENEVER A PROCESS
    0068    ;         DELETES A VIRTUAL PAGE WHICH IS MAPPED TO A SHARED MEMORY GLOBAL
    0068    ;         SECTION.  NOTE:  ALL PAGES IN SHARED MEMORY ARE ASSUMED TO HAVE PFN'S
    0068    ;         GREATER THAN MMG$GL_MAXPFN (THE MAXIMUM LOCAL MEMORY PFN CONTAINED IN
    0068    ;         THE PFN DATA BASE).
    0068    ;
    0068    ; CALLING SEQUENCE:
    0068    ;
    0068    ;         BSBW    MMG$FINDGSDPFN
    0068    ;
    0068    ; INPUT PARAMETERS:
    0068    ;
    0068    ;         R0 - THE PFN TO BE LOCATED
    0068    ;         R1 - COUNT TO DECREMENT PTE REFERENCE BY
    0068    ;              (0 FROM MMG$PTEPFNMFY)     (1 FROM MMG$DELPAG)
    0068    ;
    0068    ; IMPLICIT INPUTS:
    0068    ;
    0068    ;         THE SHARED MEMORY CONTROL BLOCKS, SHARED MEMORY COMMON DATA PAGES,
    0068    ;         AND THE SHARED MEMORY GLOBAL SECTION DESCRIPTOR TABLES.
    0068    ;
    0068    ; OUTPUT PARAMETERS:
    0068    ;
    0068    ;         R4 - SHARED MEMORY CONTROL BLOCK ADDRESS (SHB)
    0068    ;         R6 - GLOBAL SECTION DESCRIPTOR ADDRESS (GSD)
    0068    ;
    0068    ; IMPLICIT OUTPUTS:
    0068    ;
    0068    ;         THE PROCESSOR REFERENCE COUNT IN THE GSD THAT IS MAPPED TO THIS PFN IS
    0068    ;         DECREMENTED BY ONE, IF THE GSD IS FOUND.
    0068    ;
    0068    ; COMPLETION CODES:
    0068    ;
    0068    ;         SS$_NOSUCHSEC - NO CORRESPONDING GSD FOUND FOR PFN
    0068    ;         SS$_NORMAL - SUCCESSFUL DECREMENT OF GSD REF COUNT
    0068    ;
    0068    ; SIDE EFFECTS:
    0068    ;
    0068    ;         NONE
    0068    ;
    0068    ;--
    0068
    0068    ; ****************************************************************
    0068    ;
    0068    ; ************** THE FOLLOWING CODE MUST BE RESIDENT ******************
    0068    ;
00000000          .PSECT  $MMGCOD
    0000    ;
    0000    ; ****************************************************************
    0000
    0000    MMG$FINDGSDPFN::
```

```
                             0000          .ENABL  LSB
            05AE 8F      BB  0000          PUSHR   #^M<R1,R2,R3,R5,R7,R8,R10>        ;SAVE REGISTERS
                 01      DD  0004          PUSHL   #1                                ;PUSH A POSITIVE VALUE TO
            5A   5E      D0  0006          MOVL    SP,R10                            ;INDICATE TO MMG$VALIDATE AND
                             0009                                                    ;MMG$GETNXTGSD NOT TO USE ALL
                             0009                                                    ;SHARED MEMORIES IN SEARCH
                             0009                                                    ;JUST THE ONE PASSED IN R4,R5
   54    00000000'GF     D0  0009          MOVL    G^EXE$GL_SHBLIST,R4               ;GET FIRST SH MEM CONTROL BLOCK
                 5D      13  0010          BEQL    NOT_FOUND                         ;BR ON NO SH MEMORIES CONNECTED
                             0012  ;
                             0012  ; A SHARED MEMORY MAY HAVE A SHARED MEMORY CONTROL BLOCK (SHB) BUT MAY NOT BE
                             0012  ; CONNECTED (I.E., AVAILABLE FOR USE).  THEREFORE, ONCE AN SHB IS FOUND, THE
                             0012  ; BIT, SHB$V_CONNECT, MUST BE SET FOR IT TO BE USED.
                             0012  ;
     53 0B A4    00      E1  0012  10$:    BBC     #SHB$V_CONNECT,SHB$B_FLAGS(R4),GET_NXT_SHM ;BR ON SHM DISCONCT
        55    04 A4      D0  0017          MOVL    SHB$L_DATAPAGE(R4),R5             ;GET ADR OF COMMON DATA PAGE
   52   50    10 A4      C3  001B          SUBL3   SHB$L_BASGSPFN(R4),R0,R2          ;GET RELATIVE PFN WITHIN MEM
                 48      19  0020          BLSS    GET_NXT_SHM                       ;BR IF PFN NOT IN THIS SH MEM
         10 A5   52      D1  0022          CMPL    R2,SHD$L_GSPAGCNT(R5)             ;IS PFN < MAX REL PFN FOR GS?
                 42      14  0026          BGTR    GET_NXT_SHM                       ;BR IF PFN NOT IN THIS SH MEM
                             0028  ;
                             0028  ; THE SHARED MEMORY CONTAINING THIS PFN HAS BEEN FOUND.  NOW FIND THE GSD
                             0028  ; WHICH IS MAPPED TO THIS PFN.
                             0028  ;
   56   55    04 A5      C1  0028          ADDL3   SHD$L_GSDPTR(R5),R5,R6            ;GET ADR OF FIRST GSD IN SHM TBL
               0068      30  002D          BSBW    MMG$VALIDATEGSD                   ;CHECK THAT GSD IS VALID
                 56      D5  0030  30$:    TSTL    R6                                ;WAS A VALID GSD FOUND?
                 3B      13  0032          BEQL    NOT_FOUND                         ;BR ON GSD FOR PFN NOT FOUND
            53   04      9A  0034          MOVZBL  #GSD$C_PFNBASMAX,R3               ;GET # OF MAX BASE PFN'S IN GSD
        57    54 A6      9E  0037          MOVAB   GSD$L_BASPFN1(R6),R7              ;GET ADR OF FIRST BASE PFN
            67   52      D1  003B  40$:    CMPL    R2,(R7)                           ;IS PFN > BASE PFN?
                 0C      19  003E          BLSS    50$                               ;BR IF PFN IS NOT IN THIS PIECE
   58    04 A7   67      C1  0040          ADDL3   (R7),4(R7),R8                     ;GET PFN OF PAGE BEYOND PIECE
                 0B      13  0045          BEQL    60$                               ;BR IF NO MORE PIECES USED
            58   52      D1  0047          CMPL    R2,R8                             ;IS PFN < LAST PAGE IN PIECE?
                 0B      19  004A          BLSS    FOUND_IT                          ;BR IF PFN IS IN THIS PIECE
            57   08      C0  004C  50$:    ADDL2   #8,R7                             ;POINT TO NEXT BASE PFN
              E9 53      F5  004F          SOBGTR  R3,40$                            ;GO CHECK IF PFN IS IN NXT PIECE
               0047      30  0052  60$:    BSBW    MMG$GETNXTGSD                     ;GET THE NEXT GSD IN SHM TBL
                 D9      11  0055          BRB     30$                               ;GO CHECK IF PFN IS IN THIS GSD
                             0057  ;
                             0057  ; THE GSD MAPPED TO THE SPECIFIC PFN HAS BEEN FOUND.  THE PTE CORRESPONDING
                             0057  ; TO THIS PFN IS BEING DELETED.  THEREFORE, THE PROCESSOR REFERENCE COUNT
                             0057  ; IN THE GSD MUST BE DECREMENTED BY ONE. (IN OTHER WORDS, THERE WILL BE ONE
                             0057  ; LESS PTE MAPPED TO THIS GLOBAL SECTION)
                             0057  ;
                             0057  FOUND_IT:
   50    04 AE   01      C1  0057          ADDL3   #1,4(SP),R0                       ;GET REFCNT + LCK TO DECREMENT
               0017      30  005C          BSBW    MMG$DECSHMREF                     ;ONE LESS REF FOR THIS PTE
            50   01      9A  005F          MOVZBL  #SS$_NORMAL,R0                    ;SET RETURN CODE TO SUCCESS
                             0062  ;
                             0062  ; RETURN SUCCESSFULLY HERE.
                             0062  ;
                             0062  RSB_HERE:
            5E   04      C0  0062          ADDL2   #4,SP                             ;RESTORE STACK POINTER
            05AE 8F      BA  0065          POPR    #^M<R1,R2,R3,R5,R7,R8,R10>        ;RETURN TO CALLER
                         05  0069          RSB                                       ;RETURN TO CALLER
```

```
                            006A
                            006A     ;
                            006A     ; THE PFN WAS NOT WITHIN THE LAST SHARED MEMORY.  CHECK IF THERE IS ANOTHER
                            006A     ; SHARED MEMORY TO SEARCH.
                            006A     ;
                            006A     GET_NXT_SHM:
           54     64    D0  006A             MOVL    SHB$L_LINK(R4),R4               ;GET NEXT SH MEM CONTROL BLK
                  A3    12  006D             BNEQ    10$                             ;BR IF ANOTHER MEM TO SEARCH
                            006F
                            006F     ;
                            006F     ; THE PFN WAS NOT FOUND IN ANY OF THE SHARED MEMORIES.  REPORT FAILURE.
                            006F     ;
                            006F     NOT_FOUND:
                            006F             ASSUME  SS$_NOSUCHSEC LT <^X10000>
     50     0978 8F     3C  006F             MOVZWL  #SS$_NOSUCHSEC,R0               ;REPORT FAILURE TO FIND GSD
                  EC    11  0074             BRB     RSB_HERE                        ;GO RETURN TO CALLER
                            0076
                            0076             .DSABL  LSB
```

```
                     0076               .SBTTL  DECSHMREF/INCSHMREF - MODIFY SHARED MEMORY GSD PTE REF COUNT
                     0076       ;++
                     0076       ; FUNCTIONAL DESCRIPTION:
                     0076       ;
                     0076       ;       THIS ROUTINE MODIFIES THE PTE REFERENCE COUNTS IN A SHARED MEMORY
                     0076       ;       GLOBAL SECTION DESCRIPTOR.  THERE IS ONE REFERENCE COUNT FOR EACH
                     0076       ;       PROCESSOR ON THE SHARED MEMORY.  THE PORT NUMBER OF THE PROCESSOR
                     0076       ;       IS THE INDEX TO THE CORRESPONDING REFERENCE COUNT.  THE FIRST
                     0076       ;       ENTRY POINT, MMG$DECSHMREF, CAUSES THE COUNT TO BE DECREMENTED
                     0076       ;       WHILE THE ENTRY POINT, MMG$INCSHMREF, INCREMENTS THE COUNT.
                     0076       ;
                     0076       ; CALLING SEQUENCE:
                     0076       ;
                     0076       ;       BSBW    MMG$DECSHMREF
                     0076       ;       BSBW    MMG$INCSHMREF
                     0076       ;
                     0076       ; INPUT PARAMETERS:
                     0076       ;
                     0076       ;       R0 - THE NUMBER OF REFERENCES TO BE ADDED OR SUBTRACTED
                     0076       ;       R4 - ADDRESS OF THE SHARED MEMORY CONTROL BLOCK
                     0076       ;       R6 - ADDRESS OF THE GLOBAL SECTION DESCRIPTOR
                     0076       ;
                     0076       ; IMPLICIT INPUTS:
                     0076       ;
                     0076       ;       THE GLOBAL SECTION DESCRIPTOR HAS BEEN INITIALIZED.
                     0076       ;
                     0076       ; OUTPUT PARAMETERS:
                     0076       ;
                     0076       ;       NONE
                     0076       ;
                     0076       ; IMPLICIT OUTPUTS:
                     0076       ;
                     0076       ;       THE REFERENCE COUNT CORRESPONDING TO THIS PROCESSOR IS UPDATED
                     0076       ;       IN THE GSD.
                     0076       ;
                     0076       ; COMPLETION CODES:
                     0076       ;
                     0076       ;       NONE
                     0076       ;
                     0076       ; SIDE EFFECTS:
                     0076       ;
                     0076       ;       NONE
                     0076       ;
                     0076       ;--
                     0076
                     0076       ; ****************************************************************
                     0076       ;
                     0076       ; ************** THE FOLLOWING CODE MUST BE RESIDENT *****************
                     0076       ;
                 00000076               .PSECT  $MMGCOD
                     0076       ;
                     0076       ; ****************************************************************
                     0076
                     0076       MMG$DECSHMREF::
      50    50    CE 0076               MNEGL   R0,R0                           ;NEGATE REFERENCE COUNT
                     0079
                     0079       MMG$INCSHMREF::
```

```
              51   DD  0079            PUSHL   R1                                      ;SAVE REGISTER
      51   15 A4   9A  007B            MOVZBL  SHB$B_PORT(R4),R1                       ;GET PROCESSOR PORT NUMBER
   74 A641    50   C0  007F            ADDL2   R0,GSD$L_PTECNT1(R6)[R1]                ;INCR REF CNT FOR CORRES PROCESSOR
              0A   19  0084            BLSS    10$                                     ;BUGCHK IF NEGATIVE REF COUNT
      0C A4   50   C0  0086            ADDL2   R0,SHB$L_REFCNT(R4)                     ;INCR PORT'S REF COUNT
                       008A      ;     BLSS    20$                                     ;BUGCHK IF NEGATIVE REF COUNT
                   01  008A            NOP                                             ;  (These should be removed
                   01  008B            NOP                                             ;  and the BLSS restored after
                       008C                                                            ;  the refcnt bug is found.)
      51      8E   D0  008C            MOVL    (SP)+,R1                                ;RESTORE REGISTER
                   05  008F            RSB                                             ;RETURN TO CALLER
                       0090
                       0090      10$:  BUG_CHECK       REFCNTNEG,FATAL                 ;FATAL ERROR
                       0094      20$:  BUG_CHECK       NEGSHBREF,FATAL                 ;FATAL ERROR
```

```
0098          .SBTTL  ALOSHMPAG - ALLOCATE PAGES GLOBAL SECTION PAGES FROM SHARED MEMORY
0098    ;++
0098    ; FUNCTIONAL DESCRIPTION:
0098    ;
0098    ;       THIS ROUTINE ACCEPTS AS INPUT THE SIZE OF THE GLOBAL SECTION TO BE
0098    ;       CREATED AND THE ADDRESS OF THE GSD WHICH DESCRIBES THE NUMBER OF
0098    ;       NON-CONTIGUOUS PIECES THAT MAY BE ALLOCATED FOR THE SECTION.  IT
0098    ;       THEN SEARCHES THE BITMAP IN THE SHARED MEMORY COMMON DATA PAGE
0098    ;       FOR THE NUMBER OF PAGES NEEDED AND STORES THE PAGES ALLOCATED IN
0098    ;       THE GSD, ALSO CLEARING THE CORRESPONDING BIT IN THE BITMAP.
0098    ;
0098    ;       THE BITMAP IS LOCKED AGAINST ACCESS BY ANY OTHER PROCESSOR DURING
0098    ;       THE ALLOCATION.
0098    ;
0098    ; CALLING SEQUENCE:
0098    ;
0098    ;       BSBW    MMG$ALOSHMPAG
0098    ;
0098    ; INPUT PARAMETERS:
0098    ;
0098    ;       R4 - ADDRESS OF THE SHARED MEMORY CONTROL BLOCK
0098    ;       R6 - ADDRESS OF THE GLOBAL SECTION DESCRIPTOR
0098    ;       R7 - COUNT OF PAGES TO BE ALLOCATED
0098    ;
0098    ; IMPLICIT INPUTS:
0098    ;
0098    ;       THE SHAREC MEMORY BITMAP HAS BEEN INITIALIZED.  IT CONTAINS A BIT
0098    ;       FOR EACH PAGE TO BE USED FOR GLOBAL SECTIONS.  IF THE BIT IS SET,
0098    ;       THEN THE PAGE IS AVAILABLE FOR ALLOCATION.  IF THE BIT IS CLEAR, THE
0098    ;       PAGE IS EITHER (1) IN USE BY ANOTHER GLOBAL SECTION OR (2) IS A BAD
0098    ;       PAGE.  THE GLOBAL SECTION DESCRIPTOR CONTAINS THE NUMBER OF
0098    ;       PIECES THAT THE SECTION MAY BE BROKEN INTO.
0098    ;
0098    ; OUTPUT PARAMETERS:
0098    ;
0098    ;       NONE
0098    ;
0098    ; IMPLICIT OUTPUTS:
0098    ;
0098    ;       THE GSD DESCRIBES THE PAGES ALLOCATED FOR THE SECTION AND THE
0098    ;       CORRESPONDING BITS ARE CLEARED IN THE BITMAP.
0098    ;
0098    ; COMPLETION CODES:
0098    ;
0098    ;       SS$_NORMAL - ALL PAGES FOR SECTION SUCCESSFULLY ALLOCATED
0098    ;       SS$_INSFMEM - NOT ENOUGH FREE SHARED MEMORY
0098    ;       SS$_INTERLOCK - UNABLE TO ACQUIRE BITMAP LOCK
0098    ;
0098    ; SIDE EFFECTS:
0098    ;
0098    ;       IF SUFFICIENT PAGES CANNOT BE FOUND, THE ROUTINE TO SCAN AND
009F    ;       FREE GSD'S AND DATA PAGES IS CALLED.
0098    ;
0096    ;--
0098
0098    ; ****************************************************************
0098    ;
```

```
                            0098  ; ****************** THE FOLLOWING CODE MAY BE PAGED ******************
                            0098  ;
                        00000068          .PSECT  Y$EXEPAGED
                            0068  ;
                            0068  ; ******************************************************************
                            0068
                            0068  MMG$ALOSHMPAG::
                            0068          .ENABLE LSB
        0F3E 8F     BB      0068          PUSHR   #^M<R1,R2,R3,R4,R5,R8,R9,R10,R11> ;SAVE REGISTERS
        50   01     9A      006C  3$:     MOVZBL  #SHD$V_BITMAPLCK,R0            ;BIT NUMBER OF LOCK REQUESTED
           06A2     30      006F          BSBW    MMG$SHMTXLK                    ;GET SHM MUTEX AND BIT LOCK
                            0072                                                 ;R5=SHD ADR
          24 50     E9      0072          BLBC    R0,LOCK_ERR                    ;BR IF UNABLE TO GET BITMAP LOCK
009E C5   15 A4     90      0075          MOVB    SHB$B_PORT(R4),SHD$B_BITMAPLCK(R5) ;SET BITMAP LOCK OWNER
       58   57      D0      007B          MOVL    R7,R8                          ;COUNT OF PAGES REQUESTED
       54   04      9A      007E          MOVZBL  #GSD$C_PFNBASMAX,R4            ;COUNT OF PFN BASES ALLOWED
     5B   54 A6     9E      0081          MOVAB   GSD$L_BASPFN1(R6),R11          ;GET ADR OF FIRST BASE IN GSD
51   0C A5   55     C1      0085          ADDL3   R5,SHD$L_GSBITMAP(R5),R1       ;VA OF GS BITMAP
50   10 A5   07     C1      008A          ADDL3   #7,SHD$L_GSPAGCNT(R5),R0       ;COMPUTE # BITMAP BYTES, INCL
50   50    FD 8F    78      008F          ASHL    #-3,R0,R0                      ; THE LAST PARTIALLY USED BYTE
             06     12      0094          BNEQ    NXT_PIECE                      ;BR TO ALLOCATE PAGES
           00BE     31      0096          BRW     INSF_MEM                       ;BR IF NO GS PAGES AVAILABLE
                            0099
                            0099  LOCK_ERR:
           00B6     31      0099          BRW     100$                           ;RETURN TO CALLER
                            009C  ;
                            009C  ; R0 = LENGTH IN BYTES OF BITMAP LEFT TO SEARCH
                            009C  ; R1 = BYTE ADDRESS IN BITMAP TO START SEARCHING
                            009C  ; R2 = BYTE ADDRESS IN BITMAP OF FIRST SET BIT
                            009C  ; R3 = BIT NUMBER OF FIRST SET BIT
                            009C  ; R4 = COUNT OF PFN BASES LEFT TO USE IN GSD
                            009C  ; R5 = SHARED MEMORY DATA PAGE ADDRESS
                            009C  ; R6 = GLOBAL SECTION DESCRIPTOR ADDRESS
                            009C  ; R7 = NUMBER OF PAGES REQUESTED
                            009C  ; R8 = NUMBER OF PAGES MORE NEEDED
                            009C  ; R9 = BYTE ADDRESS IN BITMAP OF FIRST CLEAR BIT
                            009C  ; R10 = BIT NUMBER OF FIRST CLEAR BIT
                            009C  ; R11 = BYTE ADDRESS IN GLOBAL SECTION DESCRIPTOR FOR NEXT PFN BASE
                            009C  ;
                            009C
                            009C  ;
                            009C  ; THE BITMAP CONTAINS ONE BIT FOR EACH PAGE OF SHARED MEMORY ALLOCATED FOR
                            009C  ; GLOBAL SECTION PAGE USAGE.  A SET BIT INDICATES THAT THE PAGE MAY BE
                            009C  ; ALLOCATED FOR USE.  A CLEAR BIT INDICATES THAT THE PAGE IS ALREADY BEING
                            009C  ; USED OR IS A BAD PAGE.
                            009C  ;
                            009C  ; THE BITMAP IS SEARCHED FOR SEGMENTS OF CONTIGUOUS BITS THAT ARE SET.
                            009C  ; EACH PIECE OF BITMAP THAT CONTAINS CONTIGUOUS SET BITS IS DESCRIBED VIA
                            009C  ; FOUR REGISTERS:
                            009C  ;       R2 = ADDRESS OF BITMAP BYTE CONTAINING FIRST SET BIT
                            009C  ;       R3 = BIT NUMBER OF FIRST SET BIT WITHIN THE BYTE
                            009C  ;       R9 = ADDRESS OF BITMAP BYTE CONTAINING FIRST CLEAR BIT
                            009C  ;       R10= BIT NUMBER OF FIRST CLEAR BIT WITHIN THE BYTE
                            009C  ;
                            009C  ; THE SEARCH OF THE BITMAP FOR THESE PIECES WORKS AS FOLLOWS:
                            009C  ;       1. FIND THE FIRST BYTE WITH AT LEAST ONE BIT SET   (SKPC #0)
                            009C  ;       2. FIND THE BIT NUMBER OF THE FIRST SET BIT        (FFS)
```

```
                         009C   ;        3. FIND THE FIRST CLEAR BIT FOLLOWING THE SET BIT
                         0UyC   ;              A. FIRST CHECK IF THE CLEAR BIT IS IN THE
                         009C   ;                 SAME BYTE AS THE SET BIT; IF SO THEN     (FFC)
                         009C   ;                 THE PIECE IS FOUND                       (BRB GOT_PIECE)
                         009C   ;              B. SKIP THE BYTE CONTAINING THE FIRST SET
                         009C   ;                 BIT (BY RESETTING R0 AND R1)
                         009C   ;              C. FIND THE FIRST BYTE THAT HAS AT LEAST
                         009C   ;                 ONE BIT CLEAR                            (SKPC #-1)
                         009C   ;              D. FIND THE BIT NUMBER OF THE FIRST CLEAR
                         009C   ;                 BIT; THE PIECE IS FOUND                  (FFC)
                         009C   ;
                         009C   NXT_PIECE:
      61   50   00   3B  009C           SKPC    #0,R0,(R1)                      ;FIND NEXT BYTE WITH A BIT SET
                68   13  00A0           BEQL    45$                             ;BR ON NO MORE BITS SET
 53   61   08   00   EA  00A2           FFS     #0,#8,(R1),R3                   ;FIND BIT # OF FIRST BIT SET
           52   51   D0  00A7           MOVL    R1,R2                           ;SAVE ADR OF BYTE WITH BIT SET
                         00AA   ;
                         00AA   ; NOW FIND THE FIRST CLEAR BIT WHICH INDICATES THE END OF THIS PIECE.
                         00AA   ;
                         00AA   FIND_PIECE_END:
      5A   08   53   C3  00AA           SUBL3   R3,#8,R10                       ;GET # BITS LEFT IN BYTE
 5A   61   5A   53   EB  00AE           FFC     R3,R10,(R1),R10                 ;IS THERE A BIT CLEAR IN BYTE?
                05   13  00B3           BEQL    15$                             ;BR ON REST OF BITS SET IN BYTE
           59   52   D0  00B5           MOVL    R2,R9                           ;SET ADR OF BYTE W/ NXT CLR BIT
                17   11  00B8           BRB     GOT_PIECE                       ;GO SEE IF CAN USE THIS PIECE
                50   D7  00BA   15$:    DECL    R0                              ;SKIP PAST THE BYTE WHICH
                51   D6  00BC           INCL    R1                              ;CONTAINS THE FIRST SET BIT
   61    50    FF  8F  3B  00BE         SKPC    #-1,R0,(R1)                     ;LOOK FOR NEXT CLR BIT IN BITMAP
                07   13  00C3           BEQL    ALL_REST_SET                    ;BR IF ALL OF BITMAP SET
 5A   61   08   00   EB  00C5           FFC     #0,#8,(R1),R10                  ;FIND BIT # OF FIRST CLR BIT
                02   11  00CA           BRB     20$                             ;GO SET BYTE ADR
                         00CC   ;
                         00CC   ; THIS CODE CAN BE ENHANCED HERE.  IT DOES NOT TAKE INTO ACCOUNT THE LAST
                         00CC   ; BYTE OF BITMAP IF THE ENTIRE BYTE IS NOT USED.  A PIECE THAT EXTENDS TO
                         00CC   ; THE END OF THE BITMAP WILL HAVE POINTERS THAT POINT TO THE NEXT BIT
                         00CC   ; PAST THE END OF THE BITMAP.
                         00CC   ;
                         00CC   ALL_REST_SET:
                5A   D4  00CC           CLRL    R10                             ;SAVE BIT # OF FIRST CLR BIT
           59   51   D0  00CE   20$:    MOVL    R1,R9                           ;SAVE ADR OF BYTE WITH BIT CLR
                         00D1   ;
                         00D1   ; ONCE A CONTIGUOUS PIECE OF BITMAP CONTAINING SET BITS IS FOUND, THE
                         00D1   ; FOLLOWING INFORMATION IS IN THE REGISTERS:
                         00D1   ;       R2 = ADDRESS OF THE BYTE IN THE BITMAP CONTAINING THE FIRST SET BIT
                         00D1   ;       R3 = BIT NUMBER OF THE FIRST SET BIT
                         00D1   ;       R9 = ADDRESS OF THE BYTE IN THE BITMAP CONTAINING THE FIRST CLEAR BIT
                         00D1   ;       R10= BIT NUMBER OF THE FIRST CLEAR BIT
                         00D1   ; THE NEXT STEP IS TO COMPUTE THE NUMBER OF PAGES CONTAINED IN THIS PIECE
                         00D1   ; AND THE RELATIVE PFN OF THE FIRST PAGE.
                         00D1   ;
                         00D1   GOT_PIECE:
      59   59   52   C3  00D1           SUBL3   R2,R9,R9                        ;GET # BYTES WITH ALL BITS SET
                59   D7  00D5           DECL    R9                              ;CORRECT SUBTRACTION CNT
           59   08   C4  00D7           MULL2   #8,R9                           ;GET # PAGES AVAILABLE
           59   5A   C0  00DA           ADDL2   R10,R9                          ;ADD # PAGES BEFORE CLR BIT
      7E   08   53   C3  00DD           SUBL3   R3,#8,-(SP)                     ;GET # PAGES AFTER FIRST SET BIT
           59   8E   C0  00E1           ADDL2   (SP)+,R9                        ;GET TOTAL # PAGES IN PIECE
 52   0C A5   C2  00E4          SUBL2   SHD$L_GSBITMAP(R5),R2         ;GET BYTE OFFSET TO 1ST SET BIT
      52  55  C2  00E8          SUBL2   R5,R2                         ;MINUS GS PTR AND SHD ADR
      52  08  C4  00EB          MULL2   #8,R2                         ;COMPUTE RELATIVE BIT # OF 1ST
      52  53  C0  00EE          ADDL2   R3,R2                         ;SET BIT FROM START OF BITMAP
                  00F1      ;
                  00F1      ; NOW THE REGISTERS CONTAIN:
                  00F1      ;       R2 = RELATIVE PFN OF THE FIRST PAGE IN THIS PIECE (FROM START OF BITMAP)
                  00F1      ;       R7 = TOTAL NUMBER OF PAGES REQUESTED BY CALLER
                  00F1      ;       R8 = NUMBER OF PAGES STILL NEEDED TO FULFILL REQUEST OF CALLER
                  00F1      ;            (THE PIECES ALREADY FOUND HAVE DECREMENTED THIS VALUE FROM THE
                  00F1      ;             VALUE CONTAINED IN R7.  REMEMBER A GLOBAL SECTION MAY BE
                  00F1      ;             ALLOCATED IN UP TO #GSD$C_PFNBASMAX PIECES.)
                  00F1      ;       R9 = NUMBER OF CONTIGUOUS PAGES IN THIS PIECE
                  00F1      ;       R1 = ADDRESS OF BYTE CONTAINING FIRST CLEAR BIT
                  00F1      ;       R10= BIT NUMBER OF FIRST CLEAR BIT
                  00F1      ;
      59  57  D1  00F1          CMPL    R7,R9                         ;DOES ALL GS FIT IN THIS PIECE?
          39  15  00F4          BLEQ    FOUND_1_PIECE                 ;YES, GO USE IT
          58  D5  00F6          TSTL    R8                            ;MORE DISCONTIG PAGES NEEDED?
          0E  15  00F8          BLEQ    40$                           ;BR ON NO
       02 54  F5  00FA          SOBGTR  R4,30$                        ;USE ONLY # OF BASES ALLOWED
          09  11  00FD          BRB     40$                           ;BR IF > MAX BASES ALLOWED
      58  59  C2  00FF      30$:    SUBL2   R9,R8                     ;USE ALL THIS PIECE
      8B  52  D0  0102          MOVL    R2,(R11)+                     ;SET THIS PFN BASE IN GSD
      8B  59  D0  0105          MOVL    R9,(R11)+                     ;SET SIZE OF PIECE IN GSD
                  0108      ;
                  0108      ; NOW FIND THE NEXT PIECE OF THE BITMAP WITH PAGES AVAILABLE FOR ALLOCATION.
                  0108      ; THIS IS DONE BY REPEATING THE SEARCH PROCESS ABOVE.  HOWEVER, THE "FIRST"
                  0108      ; SET BIT MAY BE WITHIN THE BYTE CONTAINING THE "LAST" CLEAR BIT.  CHECK FOR
                  0108      ; THIS FIRST.  IF THE NEW "FIRST" SET BIT IS WITHIN THIS BYTE, THEN CONTINUE
                  0108      ; ISOLATING THE PIECE BY FINDING THE NEXT CLEAR BIT (BRB FIND_PIECE_END).
                  0108      ; IF REST OF BITS IN BYTE ARE ALSO CLEAR, THEN UPDATE THE BITMAP SEARCH
                  0108      ; POINTER AND LENGTH (R1,R0) TO START THE SEARCH PAST THIS BYTE (BRB NO_BIT_SET)
                  0108      ; AND CONTINUE IN THE SEARCH LOOP (BRB NXT_PIECE).
                  0108      ;
          50  D5  0108      40$:    TSTL    R0                        ;ANY MORE BITMAP TO SEARCH?
          19  13  010A      45$:    BEQL    END_OF_BITMAP             ;BR IF NO MORE TO SEARCH
  53  08  5A  C3  010C          SUBL3   R10,#8,R3                     ;GET # BITS AFTER CLR BIT
53  61  53  5A  EA  0110          FFS     R10,R3,(R1),R3                ;IS THERE A SET BIT?
          05  13  0115          BEQL    NO_BIT_SET                    ;BR ON NO, GO USE NEXT BYTE
      52  51  D0  0117          MOVL    R1,R2                         ;SAVE BYTE ADR OF SET BIT
          8E  11  011A          BRB     FIND_PIECE_END                ;GO FIND THE END OF THIS PIECE
                  011C      NO_BIT_SET:
          51  D6  011C          INCL    R1                            ;POINT TO NEXT BYTE OF BITMAP
          50  D7  011E          DECL    R0                            ;ONE LESS BYTE TO SEARCH
          03  15  0120          BLEQ    END_OF_BITMAP                 ;BR ON NO MORE BITMAP TO SEARCH
        FF77  31  0122          BRW     NXT_PIECE                     ;GO FIND NEXT PIECE
                  0125      ;
                  0125      ; NO ONE CONTIGUOUS PIECE WAS LARGE ENOUGH TO HOLD THIS GLOBAL SECTION.
                  0125      ; R8 CONTAINS THE NUMBER OF PAGES STILL NEEDED TO HOLD THE GLOBAL SECTION.  IF
                  0125      ; IT IS EQUAL TO ZERO, THEN THE SECTION WAS EXACTLY CONTAINED IN SOME NUMBER
                  0125      ; OF PIECES OF SHARED MEMORY.  IF IT IS LESS THAN ZERO, THEN THE LAST PIECE OF
                  0125      ; SHARED MEMORY USED, WAS LARGER THAN NEEDED FOR THE SECTION.  IF IT IS GREATER
                  0125      ; THAN ZERO, THEN THE FIRST N PIECES FOUND WERE NOT LARGE ENOUGH TO HOLD ALL OF
                  0125      ; THE GLOBAL SECTION (WHERE N IS THE NUMBER OF PFN BASES IN THE GSD).
                  0125      ;
                  0125      END_OF_BITMAP:
```

```
              58    D5  0125           TSTL    R8                               ;MORE PAGES NEEDED?
              2E    14  0127           BGTR    INSF_MEM                         ;BR ON YES, FRAGMENTED MEMORY
       FC AB  58    C0  0129           ADDL2   R8,-4(R11)                       ;SET ACTUAL SIZE OF PIECE NEEDED
              14    11  012D           BRB     CLR_BITMAP                       ;BR AS GOT PAGES IN PIECES
                        012F  FOUND_1_PIECE:
       50   54 A6   9E  012F           MOVAB   GSD$L_BASPFN1(R6),R0             ;ADR OF FIRST PFN BASE IN GSD
          51   04   9A  0133           MOVZBL  #GSD$C_PFNBASMAX,R1              ;COUNT OF PFN BASES ALLOWED
                        0136
                        0136           ASSUME GSD$L_BASCNT1 EQ <GSD$L_BASPFN1+4>
                        0136
          80   52   D0  0136           MOVL    R2,(R0)+                         ;SET BASE PFN IN GSD
          80   57   D0  0139           MOVL    R7,(R0)+                         ;SET SIZE OF SECTION IN GSD
               51   D7  013C           DECL    R1                               ;ANY MORE BASES TO SET?
               80   7C  013E  50$:     CLRQ    (R0)+                            ;CLEAR BASE AND COUNT
            FB 51   F5  0140           SOBGTR  R1,50$                           ;REPEAT TILL ALL BASES CLEAR
                        0143
                        0143  CLR_BITMAP:
             FEC3   30  0143           BSBW    MMG$CLR_BITMAP                   ;CLEAR CORRESPONDING BITMAP BITS
                        0146           ASSUME  SS$_NORMAL LT <^X100>
          50   01   9A  0146  90$:     MOVZBL  #SS$_NORMAL,R0                   ;REPORT SUCCESS
  00 009F C5   01   E7  0149           BBCCI   #SHD$V_BITMAPLCK,SHD$B_FLAGS(R5),98$ ;RELEASE BITMAP LOCK
             05FF   30  014F  98$:     BSBW    MMG$SHMTXULK                     ;RELEASE SHM MUTEX
          0F3E 8F   BA  0152  100$:    POPR    #^M<R1,R2,R3,R4,R5,R8,R9,R10,R11> ;RESTORE REGISTERS
                    05  0156           RSB
                        0157
                        0157  INSF_MEM:
  00 009F C5   01   E7  0157           BBCCI   #SHD$V_BITMAPLCK,SHD$B_FLAGS(R5),200$ ;RELEASE BITMAP LOCK
             05F1   30  015D  200$:    BSBW    MMG$SHMTXULK                     ;RELEASE SHM MUTEX
        54  0C AE   D0  0160           MOVL    <3*4>(SP),R4                     ;GET ADDRESS OF SHB
             0098   30  0164           BSBW    MMG$FREEGSD                      ;FREE UNOWNED PAGES AND GSD'S
            03 50   E9  0167           BLBC    R0,210$                          ;BR IF NOTHING WAS FREED
             FEFF   31  016A           BRW     3$                               ;TRY AGAIN TO ALLOCATE PAGES
                        016D           ASSUME  SS$_INSFMEM LT <^X10000>
     50   0124 8F   3C  016D  210$:    MOVZWL  #SS$_INSFMEM,R0                  ;REPORT INSUFICIENT MEMORY
               DE   11  0172           BRB     100$                             ;RETURN TO USER
                        0174           .DSABL LSB
```

```
                              0174          .SBTTL  ALOSHMGSD - ALLOCATE SHARED MEMORY GLOBAL SECTION DESCRIPTOR
                              0174     ;++
                              0174     ; FUNCTIONAL DESCRIPTION:
                              0174     ;
                              0174     ;       THIS ROUTINE ALLOCATES A GLOBAL SECTION DESCRIPTOR BLOCK FROM THE
                              0174     ;       TABLE OF GSD'S IN A SPECIFIC SHARED MEMORY.  IT ACCEPTS AS INPUT THE
                              0174     ;       ADDRESS OF THE SHARED MEMORY CONTROL BLOCK.  IT OUTPUTS THE ADDRESS
                              0174     ;       OF THE GSD ALLOCATED AND A SUCCESS CODE OR IF NO GSD IS AVAILABLE,
                              0174     ;       AN ERROR CODE.  THE GSD IS LOCKED FOR MODIFICATION.
                              0174     ;
                              0174     ; CALLING SEQUENCE:
                              0174     ;
                              0174     ;       BSBW    MMG$ALOSHMGSD
                              0174     ;
                              0174     ; INPUT PARAMETERS:
                              0174     ;
                              0174     ;       R4 - ADDRESS OF THE SHARED MEMORY CONTROL BLOCK
                              0174     ;
                              0174     ; IMPLICIT INPUTS:
                              0174     ;
                              0174     ;       THE TABLE OF GLOBAL SECTION DESCRIPTORS IN SHARED MEMORY HAS BEEN
                              0174     ;       INITIALIZED.  THE CONSTANT FIELDS IN THESE DESCRIPTORS ARE ALREADY
                              0174     ;       INITIALIZED, ALSO.  THE SHARED MEMORY CONTROL BLOCK AND COMMON DATA
                              0174     ;       PAGE HAVE BEEN INITIALIZED BY CONNECTING TO THE SHARED MEMORY.
                              0174     ;
                              0174     ; OUTPUT PARAMETERS:
                              0174     ;
                              0174     ;       R0 - RETURN STATUS CODE
                              0174     ;       R6 - ADDRESS OF THE GLOBAL SECTION DESCRIPTOR ALLOCATED, IF SUCCESSFUL
                              0174     ;
                              0174     ; IMPLICIT OUTPUTS:
                              0174     ;
                              0174     ;       THE CONSTANT GSD FIELDS ARE ALREADY INITIALIZED AND THE GSD IS LOCKED
                              0174     ;       BY THE ALLOCATING PROCESSOR.
                              0174     ;
                              0174     ; COMPLETION CODES:
                              0174     ;
                              0174     ;       SS$_NORMAL - ALL PAGES FOR SECTION SUCCESSFULLY ALLOCATED
                              0174     ;       SS$_GSDFULL - NO GSD AVAILABLE FOR ALLOCATION
                              0174     ;       SS$_EXPORTQUOTA - PORT QUOTA EXCEEDED
                              0174     ;
                              0174     ; SIDE EFFECTS:
                              0174     ;
                              0174     ;       THE GSD IS LOCKED AND NO OTHER PROCESS ON ANY PROCESSOR MAY ACCESS IT.
                              0174     ;
                              0174     ;       IF NO GSD CAN BE FOUND, FREEGSD IS CALLED TO SCAN FOR GSD'S AND DATA
                              0174     ;       PAGES THAT CAN BE FREED.
                              0174     ;
                              0174     ;--
                              0174
                              0174     MMG$ALOSHMGSD::
                              0174             .ENABLE LSB
                   26    BB   0174             PUSHR   #^M<R1,R2,R5>                   ;SAVE REGISTERS
          55    04 A4    D0   0176     3$:     MOVL    SHB$L_DATAPAGE(R4),R5           ;GET ADR OF COMMON DATA PAGE
          52    15 A4    9A   017A             MOVZBL  SHB$B_PORT(R4),R2               ;GET PORT NUMBER
  3C A542     FFFF 8F    58   017E             ADAWI   #-1,SHD$W_GSDQUOTA(R5)[R2]      ;ALLOC QUOTA FOR 1 CREATE
                   6C    19   0185             BLSS    NO_QUOTA                        ;BR IF NO QUOTA AVAILABLE
```

```
56   55    04 A5   C1  0187   755          ADDL3   SHD$L_GSDPTR(R5),R5,R6         ;ADR OF FIRST GSD
              23   11  018C   756          BRB     20$                            ;GO SEE IF GSD IS UNUSED
        50    01   9A  018E   757 10$:     MOVZBL  #1,R0                          ;ONE REF COUNT TO LOCK ENTRY
     00000076'EF   16  0191   758          JSB     MMG$DECSHMREF                  ;RELEASE LOCK ON GSD ENTRY
     50    08 A6   3C  0197   759          MOVZWL  GSD$W_SIZE(R6),R0              ;GET SIZE OF ONE GSD
        56    50   C0  019B   760          ADDL2   R0,R6                          ;GET ADR OF NEXT GSD
     51    18 A5   3C  019E   761          MOVZWL  SHD$W_GSDMAX(R5),R1            ;GET MAX # OF GSD'S IN TABLE
        50    51   C4  01A2   762          MULL2   R1,R0                          ;GET SIZE OF GSD TABLE IN BYTES
        50    55   C0  01A5   763          ADDL2   R5,R0                          ;ADD IN BASE VA FOR DATA PAGE
     50    04 A5   C0  01A8   764          ADDL2   SHD$L_GSDPTR(R5),R0            ;ADD ADR OF START OF GSD TABLE
        50    56   D1  01AC   765          CMPL    R6,R0                          ;PAST END OF GSD TABLE?
              37   1E  01AF   766          BGEQU   NO_FREE_GSD                    ;BR IF PAST END OF TABLE
        50    01   9A  01B1   767 20$:     MOVZBL  #1,R0                          ;ONE REF COUNT TO LOCK ENTRY
     00000079'EF   16  01B4   768          JSB     MMG$INCSHMREF                  ;LOCK ENTRY IN SHM GSD TBL
     D0 66    01   E0  01BA   769          BBS     #GSD$V_LOCKED,GSD$L_GSDFL(R6),10$ ;BR IF GSD BEING MODIFIED
     CC 66    00   E0  01BE   770          BBS     #GSD$V_VALID,GSD$L_GSDFL(R6),10$ ;BR IF GSD IS IN USE
     C8 66    01   E6  01C2   771          BBSSI   #GSD$V_LOCKED,GSD$L_GSDFL(R6),10$ ;BR IF GSD BEING MODIFED
           0C A4   D6  01C6   772          INCL    SHB$L_REFCNT(R4)               ;ONE FOR GSD OWNED BY THIS PORT
     50    54 A6   9E  01C9   773          MOVAB   GSD$L_BASPFN1(R6),R0           ;ADR OF 1ST BASE PFN & CNT PAIR
        51    04   9A  01CD   774          MOVZBL  #GSD$C_PFNBASMAX,R1            ;# BASE PFN'S ALLOWED IN GSD
              80   7C  01D0   775 30$:     CLRQ    (R0)+                          ;CLEAR ONE BASE PFN & CNT PAIR
        FB    51   F5  01D2   776          SOBGTR  R1,30$                         ;REPEAT FOR ALL BASES
           53 A6   94  01D5   777          CLRB    GSD$B_DELETPORT(R6)            ;CLEAR THE DELETOR PORT #
   52 A6   15 A4   90  01D8   778          MOVB    SHB$B_PORT(R4),GSD$B_CREATPORT(R6) ;SET CREATOR PROCESSOR PORT #
   50 A6   15 A4   90  01DD   779          MOVB    SHB$B_PORT(R4),GSD$B_LOCK(R6)   ;SET # OF PORT HOLDING GSD LOCK
                       01E2   780          ASSUME  SS$_NORMAL LT <^X100>
        50    01   9A  01E2   781          MOVZBL  #SS$_NORMAL,R0                 ;REPORT SUCCESSFUL ALLOCATION
              26   BA  01E5   782 50$:     POPR    #^M<R1,R2,R5>                  ;RESTORE REGISTERS
              05       01E7   783          RSB
                       01E8   784
                       01E8   785 NO_FREE_GSD:
        15    10       01E8   786          BSBB    MMG$FREEGSD                    ;FREE ABANDONED GSD'S AND PAGES
        89    50   E8  01EA   787          BLBS    R0,3$                          ;BR IF RESOURCES WERE FREED
                       01ED   788          ASSUME  SS$_GSDFULL LT <^X100>
     50    CC 8F   9A  01ED   789          MOVZBL  #SS$_GSDFULL,R0                ;REPORT NO GSD TO BE ALLOCATED
              05   11  01F1   790          BRB     60$                            ;GO RETURN QUOTA ALLOCATED
                       01F3   791
                       01F3   792 NO_QUOTA:
   50    03AC 8F   3C  01F3   793          MOVZWL  #SS$_EXPORTQUOTA,R0            ;REPORT NO QUOTA AVAILABLE
   3C A542    01   58  01F8   794 60$:     ADAWI   #1,SHD$W_GSDQUOTA(R5)[R2]      ;RETURN QUOTA ALLOCATED
              E6   11  01FD   795          BRB     50$                            ;RETURN ERROR CODE TO CALLER
                       01FF   796          .DSABL LSB
```

```
                        01FF          .SBTTL  FREEGSD - FREE LOST SHARED MEMORY GLOBAL SECTION DESCRIPTORS
                        01FF     ;++
                        01FF     ; FUNCTIONAL DESCRIPTION:
                        01FF     ;
                        01FF     ;        THIS ROUTINE SCANS THE GLOBAL SECTION DESCRIPTOR BLOCKS IN THE
                        01FF     ;        TABLE OF GSD'S IN A SPECIFIC SHARED MEMORY.  IT FREES ANY BLOCKS
                        01FF     ;        THAT WERE CREATED BY A PROCESSOR THAT HAS BEEN REBOOTED AND ARE
                        01FF     ;        NO LONGER ACCESSED BY ANY PROCESSOR.
                        01FF     ;
                        01FF     ; CALLING SEQUENCE:
                        01FF     ;
                        01FF     ;        BSBW    MMG$FREEGSD
                        01FF     ;
                        01FF     ; INPUT PARAMETERS:
                        01FF     ;
                        01FF     ;        R4 - ADDRESS OF THE SHARED MEMORY CONTROL BLOCK
                        01FF     ;        R5 - ADDRESS OF THE SHARED MEMORY COMMON DATA PAGE
                        01FF     ;
                        01FF     ; IMPLICIT INPUTS:
                        01FF     ;
                        01FF     ;        THE TABLE OF GLOBAL SECTION DESCRIPTORS IN SHARED MEMORY HAS BEEN
                        01FF     ;        INITIALIZED.  THE CONSTANT FIELDS IN THESE DESCRIPTORS ARE ALREADY
                        01FF     ;        INITIALIZED.  THE SHARED MEMORY CONTROL BLOCK AND COMMON DATA
                        01FF     ;        PAGE HAVE BEEN INITIALIZED BY CONNECTING TO THE SHARED MEMORY.
                        01FF     ;
                        01FF     ; OUTPUT PARAMETERS:
                        01FF     ;
                        01FF     ;        NONE
                        01FF     ;
                        01FF     ; IMPLICIT OUTPUTS:
                        01FF     ;
                        01FF     ;        NONE
                        01FF     ;
                        01FF     ; COMPLETION CODES:
                        01FF     ;
                        01FF     ;        R0 - RETURN STATUS CODE
                        01FF     ;                1 IF RESOURCES WERE MADE AVAILABLE
                        01FF     ;                0 OTHERWISE
                        01FF     ;
                        01FF     ; SIDE EFFECTS:
                        01FF     ;
                        01FF     ;        GSD'S MAY BE MADE AVAILABLE.  THE FREE PAGE BITMAP IS UPDATED.
                        01FF     ;        R1,R2,R3 ARE DESTROYED.
                        01FF     ;
                        01FF     ;--
                        01FF
                        01FF     MMG$FREEGSD::
                        01FF             .ENABLE LSB
             56     DD  01FF             PUSHL   R6                              ;SAVE REGISTERS
             7E     D4  0201             CLRL    -(SP)                           ;ANTICIPATE FINDING NOTHING
56    55  04 A5     C1  0203             ADDL3   SHD$L_GSDPTR(R5),R5,R6          ;ADR OF FIRST GSD
      51  18 A5     3C  0208             MOVZWL  SHD$W_GSDMAX(R5),R1             ;GET # OF GSD'S IN TABLE
             55     11  020C             BRB     70$                             ;BEGIN GSD SCAN
   4A 66     00     E1  020E     10$:    BBC     #GSD$V_VALID,GSD$L_GSDFL(R6),60$ ;BR IF GSD IS NOT IN USE
   46 66     01     E0  0212             BBS     #GSD$V_LOCKED,GSD$L_GSDFL(R6),60$ ;BR IF GSD BEING MODIFIED
   42 66     02     E1  0216             BBC     #GSD$V_DELPEND,GSD$L_GSDFL(R6),60$ ;BR IF DELETE NOT PENDING
          52 A6     95  021A             TSTB    GSD$B_CREATPORT(R6)             ;NON-EXISTENT CREATOR?
```

```
             3D  18  021D   855        BGEQ    60$                               ;BR IF CREATOR VALID
       39 66  01  E6  021F   856        BBSSI   #GSD$V_LOCKED,GSD$L_GSDFL(R6),60$ ;BR IF GSD BEING MODIFIED
       52   51 A6  9A  0223   857        MOVZBL  GSD$B_PROCCNT(R6),R2              ;NUMBER OF REF COUNTS TO CHECK
       50   74 A6  DE  0227   858        MOVAL   GSD$L_PTECNT1(R6),R0              ;ADDRESS OF FIRST REF COUNT
             80  D5  022B   859 20$:   TSTL    (R0)+                             ;GSD STILL IN USE?
             29  12  022D   860        BNEQ    40$                               ;BR IF STILL IN USE
          F9 52  F5  022F   861        SOBGTR  R2,20$                            ;ITERATE OVER ALL PORTS
        50   01  9A  0232   862        MOVZBL  #SHD$V_BITMAPLCK,R0               ;NUMBER OF BIT TO LOCK
           04DC  30  0235   863        BSBW    MMG$SHMTXLK                       ;ACQUIRE MUTEX AND LOCK BIT
          1D 50  E9  0238   864        BLBC    R0,40$                            ;BR IF CAN'T LOCK BIT
   009E C5   15 A4  90  023B   865        MOVB    SHB$B_PORT(R4),SHD$B_BITMAPLCK(R5) ;IDENTIFY HOLDER OF LOCK
           FDBC  30  0241   866        BSBW    MMG$SET_BITMAP                    ;FREE THE PAGES OF THE SECTION
00 009F C5    01  E7  0244   867        BBCCI   #SHD$V_BITMAPLCK,SHD$B_FLAGS(R5),30$ ;RELEASE BITMAP LOCK
           0504  30  024A   868 30$:   BSBW    MMG$SHMTXULK                      ;RELEASE MUTEX
       00 66  02  E7  024D   869        BBCCI   #GSD$V_DELPEND,GSD$L_GSDFL(R6),35$ ;CLEAR DELETE PENDING
       00 66  00  E7  0251   870 35$:   BBCCI   #GSD$V_VALID,GSD$L_GSDFL(R6),37$ ;CLEAR VALID BIT
          6E  01  D0  0255   871 37$:   MOVL    #1,(SP)                           ;FREED SOMETHING
       00 66  01  E7  0258   872 40$:   BBCCI   #GSD$V_LOCKED,GSD$L_GSDFL(R6),60$ ;UNLOCK GSD
       50   08 A6  3C  025C   873 60$:   MOVZWL  GSD$W_SIZE(R6),R0                 ;GET SIZE OF ONE GSD
          56  50  C0  0260   874        ADDL2   R0,R6                             ;GET ADR OF NEXT GSD
          A8  51  F4  0263   875 70$:   SOBGEQ  R1,10$                            ;ITERATE OVER ALL GSD'S
        0041 8F  BA  0266   876        POPR    #^M<R0,R6>                        ;RESTORE REGISTERS AND GET STATUS
                 05  026A   877        RSB
                     026B   878        .DSABL LSB
```

```
                              026B   880          .SBTTL  FIND1STGSD - FIND THE FIRST GLOBAL SECTION TO SEARCH
                              026B   881 ;++
                              026B   882 ; FUNCTIONAL DESCRIPTION:
                              026B   883 ;
                              026B   884 ;        THIS ROUTINE TAKES AN INPUT STRING, BREAKS IT INTO SHARED MEMORY
                              026B   885 ;        AND GLOBAL SECTION NAMES WITH THE APPROPRIATE TRANSLATION, AND
                              026B   886 ;        RETURNS THE ADDRESS OF THE FIRST GLOBAL SECTION IN THE SEARCH PATH.
                              026B   887 ;
                              026B   888 ; CALLING SEQUENCE:
                              026B   889 ;
                              026B   890 ;        BSBW    MMG$FIND1STGSD
                              026B   891 ;
                              026B   892 ; INPUT PARAMETERS:
                              026B   893 ;
                              026B   894 ;          R6   - SYSTEM OR GROUP GLOBAL INDICATOR (1=SYSTEM, 0=GROUP)
                              026B   895 ;         (R10) - SIZE OF SHARED MEMORY NAME (0 IF NO SH MEM NAME SPECIFIED)
                              026B   896 ;        4(R10) - ADDRESS OF ASCIC SHARED MEMORY NAME
                              026B   897 ;
                              026B   898 ; IMPLICIT INPUTS:
                              026B   899 ;
                              026B   900 ;        NONE
                              026B   901 ;
                              026B   902 ; OUTPUT PARAMETERS:
                              026B   903 ;
                              026B   904 ;        IF A SHARED MEMORY IS BEING SEARCHED:
                              026B   905 ;                R4 - ADR OF SHARED MEMORY CONTROL BLOCK
                              026B   906 ;                R5 - ADR OF SHARED MEMORY COMMON DATA PAGE
                              026B   907 ;                R6 - ADR OF FIRST GSD OR 0 IF THERE IS NONE
                              026B   908 ;        IF LOCAL MEMORY IS BEING SEARCHED:
                              026B   909 ;                R4 - ADR OF LOCAL MEMORY GSD LISTHEAD
                              026B   910 ;                R6 - ADR OF FIRST LOCAL MEMORY GSD FROM LISTHEAD
                              026B   911 ;
                              026B   912 ; IMPLICIT OUTPUTS:
                              026B   913 ;
                              026B   914 ;        NONE
                              026B   915 ;
                              026B   916 ; COMPLETION CODES:
                              026B   917 ;
                              026B   918 ;        SS$_NORMAL - SUCCESS RETURN CODE
                              026B   919 ;        SS$_SHMNOTCNCT - SHARED MEMORY NOT CONNECTED
                              026B   920 ;
                              026B   921 ; SIDE EFFECTS:
                              026B   922 ;
                              026B   923 ;        NONE
                              026B   924 ;
                              026B   925 ;--
                              026B   926
                              026B   927 MMG$FIND1STGSD::
                 26     10    026B   928          BSBB    MMG$FINDSHB                     ;GET GS AND SHMEM NAMES
              22 50     E9    026D   929          BLBC    R0,20$                          ;BR ON ERROR FINDING SH MEM
                 54     D5    0270   930          TSTL    R4                              ;WAS SH MEM CONTROL BLK FOUND?
                 13     12    0272   931          BNEQ    10$                             ;BR ON YES
   54   00000000'GF46   7E    0274   932          MOVAQ   G^EXE$GL_GSDGRPFL[R6],R4        ;GET LISTHEAD FOR LOCAL MEM
              56   54   D0    027C   933          MOVL    R4,R6                           ;SET UP TO FIND FIRST GSD
         0000009C'EF    16    027F   934          JSB     MMG$GETNXTGSD                   ;GET ADR OF FIRST LOCAL MEM GSD
                 0B     11    0285   935          BRB     20$                             ;RETURN
   56   55    04 A5     C1    0287   936 10$:     ADDL3   SHD$L_GSDPTR(R5),R5,R6          ;GET ADR OF FIRST SH MEM GSD
```

```
        00000098'EF   16  028C    937           JSB      MMG$VALIDATEGSD                  ;CHECK IF GSD IS VALID, IF NOT
                          0292    938                                                     ;RETURN ADDRESS OF FIRST VALID
                          0292    939                                                     ;GSD OR 0 IF NONE IN R6
                      05  0292    940 20$:      RSB
```

```
                          0293          .SBTTL  FINDSHB - FIND SPECIFIC SHARED MEMORY CONTROL BLOCK
                          0293  ;++
                          0293  ; FUNCTIONAL DESCRIPTION:
                          0293  ;
                          0293  ;       THIS ROUTINE SEARCHED THE SHARED MEMORY CONTROL BLOCK LIST FOR
                          0293  ;       A SPECIFIC SHARED MEMORY.  IF FOUND, THE ADDRESSES FOR THE CONTROL
                          0293  ;       BLOCK AND THE COMMON DATA PAGE FOR THAT SHARED MEMORY ARE RETURNED.
                          0293  ;
                          0293  ; CALLING SEQUENCE:
                          0293  ;
                          0293  ;       BSBW    MMG$FINDSHB
                          0293  ;
                          0293  ; INPUT PARAMETERS:
                          0293  ;
                          0293  ;        (R10) - SIZE OF SHARED MEMORY NAME (0 IF NO SH MEM NAME SPECIFIED)
                          0293  ;       4(R10) - ADDRESS OF ASCIC SHARED MEMORY NAME
                          0293  ;
                          0293  ; IMPLICIT INPUTS:
                          0293  ;
                          0293  ;       NONE
                          0293  ;
                          0293  ; OUTPUT PARAMETERS:
                          0293  ;
                          0293  ;       R4 - CONTAINS THE ADR OF THE SHARED MEMORY CONTROL BLOCK OR
                          0293  ;               ZERO IF NONE FOUND
                          0293  ;       R5 - CONTAINS THE ADR OF THE COMMON DATA PAGE FOR THE SHARED
                          0293  ;               MEMORY IF R4 IS NOT ZERO, OTHERWISE JUNK
                          0293  ;
                          0293  ; IMPLICIT OUTPUTS:
                          0293  ;
                          0293  ;       NONE
                          0293  ;
                          0293  ; COMPLETION CODES:
                          0293  ;
                          0293  ;       SS$_NORMAL - SUCCESS RETURN CODE
                          0293  ;       SS$_SHMNOTCNCT - SHARED MEMORY NOT CONNECTED
                          0293  ;
                          0293  ; SIDE EFFECTS:
                          0293  ;
                          0293  ;       NONE
                          0293  ;
                          0293  ;--
                          0293
                          0293  MMG$FINDSHB::
               0E    BB   0293          PUSHR   #^M<R1,R2,R3>                   ;SAVE REGISTERS
                          0295          ASSUME  SS$_NORMAL LT <^X100>
         7E    01    9A   0295          MOVZBL  #SS$_NORMAL,-(SP)               ;ASSUME SUCCESS
               6A    D5   0298          TSTL    (R10)                           ;IS SHARED MEM NAME SPECIFIED?
               24    13   029A          BEQL    30$                             ;BR ON NO NAME
 54   00000000'GF    D0   029C          MOVL    G^EXE$GL_SHBLIST,R4             ;GET FIRST SH MEM CONTROL BLK
               16    13   02A3          BEQL    25$                             ;BR ON NO CONTROL BLK
   0C 0B A4    00    E1   02A5  10$:    BBC     #SHB$V_CONNECT,SHB$B_FLAGS(R4),20$ ;BR ON MEMORY NOT CONNECTED
      55    04 A4    D0   02AA          MOVL    SHB$L_DATAPAGE(R4),R5           ;GET COMMON DATA PAGE ADR
 20 A5    04 BA 10   29   02AE          CMPC3   #16,@4(R10),SHD$T_NAME(R5)      ;IS NAME STRING THE SAME?
               0C    13   02B4          BEQL    40$                             ;RETURN SHB FOUND
         54    64    D0   02B6  20$:    MOVL    SHB$L_LINK(R4),R4               ;GET NEXT SHB
               EA    12   02B9          BNEQ    10$                             ;GO TRY TO MATCH SH MEM NAME
```

```
                    02BB          ASSUME  SS$_SHMNOTCNCT LT <^X10000>
6E    037C 8F   3C  02BB     25$: MOVZWL  #SS$_SHMNOTCNCT,(SP)              ;REPORT SH MEM SHB NOT FOUND
            54  D4  02C0     30$: CLRL    R4                                ;INDICATE SH MEM NOT FOUND
            50 8ED0 02C2     40$: POPL    R0                                ;GET RETURN STATUS CODE
            0E  BA  02C5          POPR    #^M<R1,R2,R3>                     ;RESTORE REGISTERS
                05  02C7          RSB                                       ;RETURN SHB ADR
                    02C8
```

```
02C8        .SBTTL  GETNXT/VALIDATEGSD - GET NEXT VALID GLOBAL SECTION DESCRIPTOR
02C8  ;++
02C8  ; FUNCTIONAL DESCRIPTION:
02C8  ;
02C8  ;       THIS ROUTINE FINDS THE NEXT SEQUENTIAL GLOBAL SECTION DESCRIPTOR.
02C8  ;       IF LOCAL MEMORY GSD'S ARE BEING SEARCHED, THEN THE "NEXT" GSD IS
02C8  ;       FOUND BY THE FORWARD LINK, GSD$L_GSDFL.  IF THERE ARE NO MORE
02C8  ;       LOCAL MEMORY GSD'S, THEN THE SHARED MEMORIES ARE SEARCHED FOR
02C8  ;       THE NEXT GSD.  IF A SPECIFIC SHARED MEMORY IS BEING SEARCHED, I.E.,
02C8  ;       THE SHARED MEMORY NAME DESCRIPTOR HAS A COUNT GREATER THAN ZERO,
02C8  ;       THEN THE NEXT PHYSICALLY CONSECUTIVE GSD IS TESTED TO SEE IF IT
02C8  ;       IS VALID.  IF THERE ARE NO MORE VALID GSD'S IN THE SPECIFIC
02C8  ;       SHARED MEMORY REQUESTED, THE OTHER SHARED MEMORIES ARE NOT SEARCHED.
02C8  ;       INSTEAD, AN ERROR CODE INDICATING NO MORE GSD'S IS RETURNED.
02C8  ;
02C8  ;       THE SHARED MEMORY NAME DESCRIPTOR COUNT IS SET TO MINUS ONE IF
02C8  ;       THE END OF THE GSD LIST IN LOCAL MEMORY WAS REACHED AND THE SEARCH
02C8  ;       IS NOW BEING EXTENDED INTO THE SHARED MEMORIES.
02C8  ;
02C8  ;       THE SECOND ENTRY POINT, MMG$VALIDATEGSD, IS CALLED WHEN THE FIRST
02C8  ;       GSD HAS BEEN LOCATED IN THE SHARED MEMORY GSD TABLE.  IT IS USED
02C8  ;       TO VALIDATE THAT THE GSD "IN HAND" IS A VALID GSD.  IF IT IS NOT
02C8  ;       A VALID GSD, THEN THE ROUTINE PROCEEDS TO FIND THE FIRST VALID
02C8  ;       GSD IN THE SHARED MEMORY TABLE JUST AS DESCRIBED ABOVE.
02C8  ;
02C8  ; CALLING SEQUENCE:
02C8  ;
02C8  ;       BSBW    MMG$GETNXTGSD
02C8  ;       BSBW    MMG$VALIDATEGSD
02C8  ;
02C8  ; INPUT PARAMETERS:
02C8  ;
02C8  ;       R6 - ADR OF LAST GSD FOUND WITH THIS SCAN
02C8  ;       R10 - ADR OF STRING DESCRIPTOR FOR SHARED MEMORY NAME
02C8  ;               STRING SIZE IS ZERO IF NO SHARED MEMORY NAME SPECIFIED
02C8  ;               STRING SIZE IS -1 IF LOCAL MEMORY SEARCH HAS EXTENDED INTO
02C8  ;                       SEARCHING A SHARED MEMORY.
02C8  ;       IF SHARED MEMORY SEARCH:
02C8  ;               R4 - ADR OF SHARED MEMORY CONTROL BLOCK
02C8  ;               R5 - ADR OF SHARED MEMORY COMMON DATA PAGE
02C8  ;       IF LOCAL MEMORY SEARCH:
02C8  ;               R4 - ADR OF LOCAL MEMORY GSD LISTHEAD
02C8  ;
02C8  ; IMPLICIT INPUTS:
02C8  ;
02C8  ;       NONE
02C8  ;
02C8  ; OUTPUT PARAMETERS:
02C8  ;
02C8  ;       R6 - ADR OF NEXT SEQUENTIAL GSD OR ZERO IF NO NEXT GSD
02C8  ;
02C8  ; IMPLICIT OUTPUTS:
02C8  ;
02C8  ;       IF LOCAL MEMORY SEARCH EXTENDS INTO SHARED MEMORY:
02C8  ;               R4 - ADR OF SHARED MEMORY CONTROL BLOCK
02C8  ;               R5 - ADR OF SHARED MEMORY COMMON DATA PAGE
02C8  ;               4(R10) - SHARED MEMORY NAME SIZE IS SET TO -1
```

```
                                  02C8  1064 ;
                                  02C8  1065 ; COMPLETION CODES:
                                  02C8  1066 ;
                                  02C8  1067 ;       NONE
                                  02C8  1068 ;
                                  02C8  1069 ; SIDE EFFECTS:
                                  02C8  1070 ;
                                  02C8  1071 ;       NONE
                                  02C8  1072 ;
                                  02C8  1073 ;--
                                  02C8  1074
                                  02C8  1075 ; ***********************************************************************
                                  02C8  1076 ;
                                  02C8  1077 ; ************** THE FOLLOWING CODE MUST BE RESIDENT *****************
                                  02C8  1078 ;
                              00000098  1079        .PSECT  $MMGCOD
                                  0098  1080 ;
                                  0098  1081 ; ***********************************************************************
                                  0098  1082
                                  0098  1083        .ENABL  LSB
                                  0098  1084 MMG$VALIDATEGSD::
                       03   BB    0098  1085        PUSHR   #^M<R0,R1>                      ;REMEMBER REGISTER
                       28   11    009A  1086        BRB     15$                             ;GO VALIDATE GSD "IN HAND"
                                  009C  1087
                                  009C  1088 MMG$GETNXTGSD::
                       03   BB    009C  1089        PUSHR   #^M<R0,R1>                      ;REMEMBER REGISTER
                       6A   D5    009E  1090        TSTL    (R10)                           ;IS THIS A SHARED MEM SEARCH?
                       28   12    00A0  1091        BNEQ    20$                             ;BR IF SEARCHING SHARED MEMORY
                  56   66   D0    00A2  1092        MOVL    GSD$L_GSDFL(R6),R6              ;GET NEXT LOCAL MEMORY GSD
                  56   54   D1    00A5  1093        CMPL    R4,R6                           ;IS THIS BACK TO LISTHEAD?
                       5D   12    00A8  1094        BNEQ    70$                             ;NO, BR TO RETURN NEXT GSD
                                  00AA  1095
                                  00AA  1096 ;
                                  00AA  1097 ; DEFAULT SEARCH OVERFLOW FROM LOCAL MEMORY INTO SHARED MEMORY.
                                  00AA  1098 ;
     54     00000000'GF   D0    00AA  1099        MOVL    G^EXE$GL_SHBLIST,R4             ;GET PTR TO SH MEM CONTROL BLK
                       52   13    00B1  1100 10$:   BEQL    60$                             ;BR ON NO SHARED MEMORY
          4D 0B A4     00   E1    00B3  1101        BBC     #SHB$V_CONNECT,SHB$B_FLAGS(R4),60$ ;BR IF SH MEM NOT CONNECTED
             55  04 A4      D0    00B8  1102        MOVL    SHB$L_DATAPAGE(R4),R5           ;GET ADR OF COMMON DATA PAGE
                  6A   01   CE    00BC  1103        MNEGL   #1,(R10)                        ;INDICATE DEFAULT SH MEM SEARCH
        56   55  04 A5      C1    00BF  1104        ADDL3   SHD$L_GSDPTR(R5),R5,R6          ;GET FIRST GSD ADR
             50  08 A6      3C    00C4  1105 15$:   MOVZWL  GSD$W_SIZE(R6),R0               ;GET SIZE OF SHMEM GSD
                       0D   11    00C8  1106        BRB     30$                             ;GO CHECK VALIDITY OF GSD
                                  00CA  1107
                                  00CA  1108 ;
                                  00CA  1109 ; FIND NEXT SHARED MEMORY GSD IN TABLE.  SHARED MEMORY GSD'S ARE CONTAINED
                                  00CA  1110 ; IN A TABLE AND ARE NOT LINKED VIA FORWARD AND BACKWARD LINKS.
                                  00CA  1111 ;
                  50   01   9A    00CA  1112 20$:   MOVZBL  #1,R0                           ;ONE REF COUNT FOR A LOCK
                     FFA6   30    00CD  1113        BSBW    MMG$DECSHMREF                   ;RELEASE THE PREVIOUS GSD LOCK
             50  08 A6      3C    00D0  1114        MOVZWL  GSD$W_SIZE(R6),R0               ;GET SIZE OF SHMEM GSD
                  56   50   C0    00D4  1115        ADDL2   R0,R6                           ;POINT TO NEXT GSD
             51  18 A5      3C    00D7  1116 30$:   MOVZWL  SHD$W_GSDMAX(R5),R1             ;GET MAX # GSD'S IN TABLE
                  51   50   C4    00DB  1117        MULL2   R0,R1                           ;FIND SIZE OF GSD TABLE
                  51   55   C0    00DE  1118        ADDL2   R5,R1                           ;ADD IN BASE VA
             51  04 A5      C0    00E1  1119        ADDL2   SHD$L_GSDPTR(R5),R1             ;COMPUTE ADR OF END OF TABLE
                       07   11    00E5  1120        BRB     50$                             ;SKIP OFFSETING TO NEXT GSD
```

```
50   08 A6    3C  00E7   1121 40$:   MOVZWL  GSD$W_SIZE(R6),R0                     ;GET SIZE OF ONE SHMEM GSD
   56   50    C0  00EB   1122        ADDL2   R0,R6                                 ;GET ADR OF NEXT GSD
   51   56    D1  00EE   1123 50$:   CMPL    R6,R1                                 ;PAST END OF GSD TABLE?
        17    1E  00F1   1124        BGEQU   80$                                   ;BR IF YES, PAST LAST GSD
   50   01    9A  00F3   1125        MOVZBL  #1,R0                                 ;ONE REF COUNT FOR A LOCK
      FF80    30  00F6   1126        BSBW    MMG$INCSHMREF                         ;LOCK THE GSD
0A 66   00    E0  00F9   1127        BBS     #GSD$V_VALID,GSD$L_GSDFL(R6),70$ ;BR IF CAN READ GSD, RETURN IT
   50   01    9A  00FD   1128        MOVZBL  #1,R0                                 ;ONE REF COUNT FOR A LOCK
      FF73    30  0100   1129        BSBW    MMG$DECSHMREF                         ;RELEASE THIS GSD LOCK
        E2    11  0103   1130        BRB     40$                                   ;BR TO FIND NEXT GSD
        56    D4  0105   1131 60$:   CLRL    R6                                    ;INDICATE NO MORE GSD'S
        03    BA  0107   1132 70$:   POPR    #^M<R0,R1>                            ;RESTORE REGISTER
              05  0109   1133        RSB                                           ;RETURN WITH NEXT GSD ADR
        6A    D5  010A   1134 80$:   TSTL    (R10)                                 ;SEARCHING SPECIFIC SH MEM?
        F7    18  010C   1135        BGEQ    60$                                   ;BR ON YES, DON'T SEARCH OTHERS
   54   64    D0  010E   1136        MOVL    SHB$L_LINK(R4),R4                     ;GET NEXT SH MEM CONTROL BLK
        9E    11  0111   1137        BRB     10$                                   ;GO SHECK SHB VALIDITY
                  0113   1138
                  0113   1139        .DSABL  LSB
```

```
    0113          .SBTTL  GETGSNAM - GET GLOBAL SECTION NAME AND SHARED MEMORY NAME
    0113    ;++
    0113    ; FUNCTIONAL DESCRIPTION:
    0113    ;
    0113    ; THIS ROUTINE TAKES AN INPUT STRING WHICH MAY BE A GLOBAL SECTION NAME, A
    0113    ; LOGICAL NAME, OR A SHARED MEMORY NAME AND A GLOBAL SECTION NAME.  IF THE
    0113    ; STRING IS SUFFIXED WITH "_nnn" (AN UNDERSCORE FOLLOWED BY THREE DIGITS)
    0113    ; THE SUFFIX IS REMOVED.  THEN THE STRING IS SUBMITTED FOR LOGICAL NAME
    0113    ; TRANSLATION AND SEPARATION INTO GLOBAL SECTION NAME AND SHARED MEMORY NAME.
    0113    ; THE SUFFIX IS APPENDED ONTO THE RESULTANT GLOBAL SECTION NAME.
    0113    ;
    0113    ; CALLING SEQUENCE:
    0113    ;
    0113    ;       BSBW    MMG$GETGSNAM
    0113    ;
    0113    ; INPUT PARAMETERS:
    0113    ;
    0113    ;       R9 - ADR OF STRING DESCRIPTOR FOR INPUT STRING FROM USER
    0113    ;       R10 - ADR OF STRING DESCRIPTOR FOR RETURNED SHARED MEMORY NAME
    0113    ;       R11 - ADR OF STRING DESCRIPTOR FOR RETURNED GLOBAL SECTION NAME
    0113    ;
    0113    ; IMPLICIT INPUTS:
    0113    ;
    0113    ;       THE INPUT STRING DESCRIPTOR POINTS TO THE STRING TO BE TRANSLATED.
    0113    ;       THE OUTPUT STRING DESCRIPTORS ARE SET TO DESCRIBE THE SIZE AND
    0113    ;       ADDRESS OF THE OUTPUT BUFFERS.
    0113    ;
    0113    ; OUTPUT PARAMETERS:
    0113    ;
    0113    ;       R0 CONTAINS THE STATUS CODE FOR THE TRANSLATION.
    0113    ;
    0113    ; IMPLICIT OUTPUTS:
    0113    ;
    0113    ;       THE SHARED MEMORY AND GLOBAL SECTION NAMES ARE ENTERED IN THE
    0113    ;       BUFFERS DESCRIBED BY THE INPUT STRING DESCRIPTORS.  THE DESCRIPTORS
    0113    ;       ARE UPDATED.  IF AN ERROR CODE IS RETURNED, THE DESCRIPTORS ARE
    0113    ;       NOT VALID.
    0113    ;
    0113    ; COMPLETION CODES:
    0113    ;
    0113    ;       SS$_NORMAL - SUCCESSFUL COMPLETION
    0113    ;       SS$_IVLOGNAM - NAME TOO LARGE FOR USER BUFFER
    0113    ;       SS$_TOOMANYLNAM - TOO MANY LOGICAL NAME TRANSLATIONS
    0113    ;
    0113    ; SIDE EFFECTS:
    0113    ;
    0113    ;       NONE
    0113    ;
    0113    ;--
    0113
    0113    ; ************************************************************************
    0113    ;
    0113    ; ****************** THE FOLLOWING CODE MAY BE PAGED ******************
    0113    ;
000002C8          .PSECT  Y$EXEPAGED
    02C8    ;
    02C8    ; ************************************************************************
```

```
                         02C8
                         02C8  MMG$GETGSNAM::
           0202 8F   BB  02C8                PUSHR   #^M<R1,R9>             ;SAVE REGISTERS
             04 A9   DD  02CC                PUSHL   4(R9)                  ;BUILD AN INPUT NAME STRING
             7E  69  3C  02CF                MOVZWL  (R9),-(SP)             ;DESCRIPTOR THAT CAN BE MODIFIED
             59  5E  D0  02D2                MOVL    SP,R9                  ;SET ADR OF INPUT NAME STR DSC
        50   69  04  C3  02D5                SUBL3   #4,(R9),R0             ;GET STR SIZE MINUS SUFFIX
                 23  15  02D9                BLEQ    10$                    ;BR IF STRING HAS NO SUFFIX
         50  04 A9   C1  02DB                ADDL2   4(R9),R0               ;GET ADR OF SUFFIX
         60  5F 8F   91  02DF                CMPB    #^A/_/,(R0)            ;IS THIS A SUFFIX?
                 19  12  02E3                BNEQ    10$                    ;BR ON NO
             51  03  9A  02E5                MOVZBL  #3,R1                  ;SIZE OF SUFFIX
         30    6041  91  02E8  5$:           CMPB    (R0)[R1],#^A/0/        ;IS CHARACTER LESS THAN '0'?
                 10  1F  02EC                BLSSU   10$                    ;BR ON SUFFIX NOT NUMERIC
         39    6041  91  02EE                CMPB    (R0)[R1],#^A/9/        ;IS CHARACTER GREATER THAN '9'?
                 0A  1A  02F2                BGTRU   10$                    ;BR ON SUFFIX NOT NUMERIC
              F1 51  F5  02F4                SOBGTR  R1,5$                  ;REPEAT TO CHECK ALL OF SUFFIX
                 60  DD  02F7                PUSHL   (R0)                   ;REMEMBER THE SUFFIX
             69  04  C2  02F9                SUBL2   #4,(R9)                ;SUBTRACT OFF THE SUFFIX
                 02  11  02FC                BRB     20$                    ;GO TRANSLATE NAME
                 00  DD  02FE  10$:          PUSHL   #0                     ;INDICATE NO SUFFIX
                 6B  DD  0300  20$:          PUSHL   (R11)                  ;REMEMBER SIZE OF GS BUFFER
                 5D  10  0302                BSBB    MMG$GSDTRNLOG          ;TRANSLATE LOGICAL NAME
              2F 50  E9  0304                BLBC    R0,50$                 ;BR IF ERR TRANSLATING NAME
              04 AE  D5  0307                TSTL    4(SP)                  ;WAS THERE A SUFFIX?
                 2A  13  030A                BEQL    50$                    ;BR IF NONE TO APPEND
        51   6B  04  C1  030C                ADDL3   #4,(R11),R1            ;GET NEW SIZE OF GS
             51  8E  D1  0310                CMPL    (SP)+,R1               ;IS BUFFER TOO SMALL FOR SUFFIX?
                 18  19  0313                BLSS    40$                    ;BR ON YES
     51   04 AB  6B  C1  0315                ADDL3   (R11),4(R11),R1        ;GET ADR FOR SUFFIX
             61  8E  D0  031A                MOVL    (SP)+,(R1)             ;PUT SUFFIX ON END OF STRING
                 06  13  031D                BEQL    30$                    ;BR IF NO SUFFIX
             69  04  C0  031F                ADDL2   #4,(R9)                ;ADD IN LENGTH OF SUFFIX
             6B  04  C0  0322                ADDL2   #4,(R11)               ;ADD IN LENGTH OF SUFFIX
             5E  08  C0  0325  30$:          ADDL2   #<4*2>,SP              ;CLEAN STR DSC OFF STACK
           0202 8F   BA  0328                POPR    #^M<R1,R9>             ;RESTORE REGISTERS
                 05      032C                RSB                            ;RETURN
                         032D                ASSUME  SS$_IVLOGNAM LT <^X10000>
        50   0154 8F 3C  032D  40$:          MOVZWL  #SS$_IVLOGNAM,R0       ;REPORT BUFFER TOO SMALL
                 8E  D5  0332                TSTL    (SP)+                  ;CLEAN OFF SUFFIX
                 EF  11  0334                BRB     30$                    ;GO RETURN
             5E  08  C0  0336  50$:          ADDL2   #<4*2>,SP              ;CLEAN SUFFIX AND CNT OFF
                 EA  11  0339                BRB     30$                    ;JOIN COMMON CODE
```

```
033B        .SBTTL  GSDTRNLOG  - GLOBAL SECTION LOGICAL NAME TRANSLATION
033B        .SBTTL  MBXTRNLOG  - MAILBOX LOGICAL NAME TRANSLATION
033B        .SBTTL  CEFTRNLOG  - COMMON EVENT FLAG CLUSTER LOGICAL NAME TRANSLATION
033B
033B  ;++
033B  ; FUNCTIONAL DESCRIPTION:
033B  ;
033B  ; MMG$GSDTRNLOG - TRANSLATE LOGICAL NAMES FOR GLOBAL SECTIONS.
033B  ; MMG$MBXTRNLOG - TRANSLATE LOGICAL NAMES FOR MAILBOXES.
033B  ; MMG$CEFTRNLOG - TRANSLATE LOGICAL NAMES FOR COMMON EVENT FLAG CLUSTERS.
033B  ;
033B  ; THE ONLY DIFFERENCE BETWEEN THESE THREE TRANSLATION ROUTINES IS THE PREFIX
033B  ; ADDED TO THE NAME STRING BEFORE EACH ITERATIVE TRANSLATION.  THE PREFIX FOR
033B  ; GLOBAL SECTIONS IS "GBL$", FOR MAILBOXES IT IS "MBX$", AND FOR COMMON EVENT
033B  ; FLAG CLUSTERS IT IS "CEF$".
033B  ;
033B  ; EACH ROUTINE IS CAPABLE OF ITERATIVELY TRANSLATING NAME STRINGS FOR BOTH
033B  ; SHARED AND LOCAL MEMORY OBJECTS.  SHARED MEMORY OBJECTS HAVE THE FOLLOWING
033B  ; SPECIAL FORMAT:
033B  ;
033B  ;                       SHARED-MEMORY-NAME:OBJECT-NAME
033B  ;
033B  ; AS SOON AS A COLON IS ENCOUNTERED WITHIN ( AND NOT AT THE END OF ) THE CURRENT
033B  ; INPUT STRING THE OBJECT IS ASSUMED TO BE LOCATED IN SHARED MEMORY.  ITERATIVE
033B  ; NAME STRING TRANSLATION FOR SHARED MEMORY OBJECTS PROCEEDS AS FOLLOWS:
033B  ;
033B  ; 1. THE CURRENT INPUT STRING IS SEARCHED FOR A COLON.
033B  ; 2. EVERYTHING TO THE RIGHT OF THE COLON IS PLACED IN THE GLOBAL SECTION /
033B  ;    MAILBOX / COMMON EVENT FLAG CLUSTER NAME BUFFER IN FRONT OF WHATEVER STRING
033B  ;    IS ALREADY PRESENT IN THE BUFFER.
033B  ; 3. EVERYTHING TO THE LEFT OF THE COLON ( OR THE ENTIRE CURRENT INPUT STRING
033B  ;    IF THERE IS NO COLON ) BECOMES THE CURRENT NAME STRING.
033B  ; 4. IF THE CURRENT NAME STRING CONTAINS A LEADING UNDERSCORE THEN THE
033B  ;    UNDERSCORE IS STRIPPED FROM THE CURRENT NAME STRING, ITERATIVE LOGICAL
033B  ;    NAME TRANSLATION TERMINATES, AND THE CURRENT NAME STRING BECOMES THE SHARED
033B  ;    MEMORY NAME.  GO TO STEP 9.
033B  ; 5. IF THE CURRENT NAME STRING IS ITSELF THE RESULTANT OF A LOGICAL NAME
033B  ;    TRANSLATION THEN IT IS CHECKED FOR POSSESSION OF THE "TERMINAL" ATTRIBUTE.
033B  ;    IF THE CURRENT TRANSLATION IS MARKED "TERMINAL" THEN ITERATIVE LOGICAL NAME
033B  ;    TRANSLATION TERMINATES, AND THE CURRENT NAME STRING BECOMES THE SHARED
033B  ;    MEMORY NAME.  GO TO STEP 9.
033B  ; 6. THE CURRENT NAME STRING IS PREFIXED WITH "GBL$" / "MBX$" / "CEF$",
033B  ;    SUBMITTED FOR LOGICAL NAME TRANSLATION, AND THE RESULTANT STRING BECOMES
033B  ;    THE CURRENT INPUT STRING.
033B  ; 7. THESE SIX STEPS ARE REPEATED UP TO LNM$C_MAXDEPTH TIMES.
033B  ; 8. WHEN THE CURRENT LOGICAL NAME TRANSLATION FAILS, THE CURRENT NAME STRING,
033B  ;    THE NAME THAT COULD NOT BE TRANSLATED, MINUS ITS UNIQUE OBJECT PREFIX,
033B  ;    BECOMES THE SHARED MEMORY NAME.
033B  ; 9. THE OBJECT NAME IS THE STRING THAT HAD BEEN CONSTRUCTED DURING STEP 2
033B  ;    OF THE ITERATIVE PROCESS FROM PIECES TO THE RIGHT OF COLONS.
033B  ;
033B  ; LOGICAL NAME TRANSLATION FOR OBJECTS IN LOCAL MEMORY PROCEEDS AS FOLLOWS:
033B  ;
033B  ; 1. IF THE CURRENT NAME STRING CONTAINS A LEADING UNDERSCORE THEN THE
033B  ;    UNDERSCORE IS STRIPPED FROM THE CURRENT NAME STRING AND ITERATIVE LOGICAL
033B  ;    NAME TRANSLATION TERMINATES.  GO TO STEP 5.
033B  ; 2. IF THE CURRENT NAME STRING IS ITSELF THE RESULTANT OF A LOGICAL NA
```

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033B ;    TRANSLATION THEN IT IS CHECKED FOR POSSESSION OF THE "TERMINAL" ATTRIBUTE.
033B ;    IF THE CURRENT TRANSLATION IS MARKED "TERMINAL" THEN ITERATIVE LOGICAL NAME
033B ;    TRANSLATION TERMINATES.  GO TO STEP 5.
033B ; 3. THE CURRENT NAME STRING IS PREFIXED WITH "GBL$" / "MBX$" / "CEF$", D
033B ;    SUBMITTED FOR LOGICAL NAME TRANSLATION, AND THE RESULTANT STRING BECOMES
033B ;    THE CURRENT NAME STRING.
033B ; 4. THESE THREE STEPS ARE REPEATED UP TO LNM$C_MAXDEPTH TIMES OR UNTIL
033B ;    TRANSLATION OF THE CURRENT NAME STRING FAILS.
033B ; 5. WHEN THE ITERATIVE LOGICAL NAME TRANSLATION TERMINATES, THE CURRENT NAME
033B ;    STRING, MINUS ITS UNIQUE OBJECT PREFIX, BECOMES THE OBJECT NAME.
033B ;
033B ; THE UNIQUE OBJECT PREFIX STRING "GBL$" / "MBX$" / "CEF$" IS NEVER RETURNED TO
033B ; THE USER AS PART OF EITHER THE SHARED MEMORY OR OBJECT NAME ALTHOUGH IT IS
033B ; PREFIXED TO EACH STRING SUBMITTED FOR LOGICAL NAME TRANSLATION.
033B ;
033B ;
033B ; CALLING SEQUENCE:
033B ;
033B ;       BSBW    MMG$GSDTRNLOG
033B ;       BSBW    MMG$MBXTRNLOG
033B ;       BSBW    MMG$CEFTRNLOG
033B ;
033B ; INPUT PARAMETERS:
033B ;
033B ;       R9      - ADDRESS OF STRING DESCRIPTOR FOR INPUT STRING FROM USER
033B ;       R10     - ADDRESS OF STRING DESCRIPTOR FOR RETURNED SHARED MEMORY NAME
033B ;       R11     - ADDRESS OF STRING DESCRIPTOR FOR RETURNED OBJECT NAME
033B ;
033B ; IMPLICIT INPUTS:
033B ;
033B ;       THE INPUT STRING DESCRIPTOR POINTS TO THE STRING TO BE TRANSLATED.
033B ;       THE OUTPUT STRING DESCRIPTORS ARE SET TO DESCRIBE THE SIZE AND
033B ;           ADDRESS OF THE OUTPUT BUFFERS.
033B ;
033B ; OUTPUT PARAMETERS:
033B ;       NONE
033B ;
033B ; IMPLICIT OUTPUTS:
033B ;
033B ;       THE SHARED MEMORY AND OBJECT NAMES ARE ENTERED IN THE BUFFERS DESCRIBED
033B ;       BY THE INPUT STRING DESCRIPTORS.  THE DESCRIPTORS ARE UPDATED.  IF AN
033B ;       ERROR CODE IS RETURNED, THE DESCRIPTORS ARE NOT VALID.  IF EITHER NAME
033B ;       IS NOT FOUND, THE APPROPRIATE DESCRIPTOR'S SIZE FIELD  IS SET TO ZERO.
033B ;
033B ; COMPLETION CODES:
033B ;
033B ;       SS$_NORMAL      - SUCCESSFUL COMPLETION OF THE ROUTINE
033B ;       SS$_NOPRIV      - INSUFFICIENT PRIVILEGE TO ACCESS A LOGICAL NAME TABLE
033B ;       SS$_IVLOGNAM    - EITHER THE OBJECT NAME OR SHARED MEMORY BUFFER IS TOO
033B ;                         SMALL TO HOLD THE CORRESPONDING NAME
033B ;                         OR INPUT STRING ITERATIVELY TRANSLATES INTO A ZERO
033B ;                         LENGTH OBJECT NAME
033B ;       SS$_TOOMANYLNAM - ITERATIVE LOGICAL NAME TRANSLATION DEPTH EXCEEDED
033B ;                         LNM$C_MAXDEPTH.
033B ;
033B ; SIDE EFFECTS:
033B ;
```

```
033B  1356 ;       THIS ROUTINE ASSUMES THE UPPER WORD IN RETURN STRING DESCRIPTORS IS 0.
033B  1357 ;
033B  1358 ;--
```

```
                                  033B
                                  033B  ;
                                  033B  ; LOGICAL NAME TRANSLATION WORK AREA OFFSETS INTO KERNEL REQUEST PACKET
                                  033B  ; AND LOGICAL NAME STORAGE.
                                  033B  ;
                                  033B
                                  033B          ASSUME  LNMX$T_XLATION+1,GE,4
                                  033B
                        00000000  033B  LWA_PREFIX      =   0                   ;LOGICAL NAME PREFIX
                        00000004  033B  LWA_INPUT_DESC  =   4                   ;CURRENT INPUT STRING DESCRIPTOR
                        0000000C  033B  LWA_COLON       =  12                   ;COLON INDICATOR CELL
                        0000000D  033B  LWA_XLATION     =  13                   ;BUFFER TO HOLD TRANSLATION BLOCKS
                        00000012  033B  LWA_INPUT       =  13+LNMX$T_XLATION+1  ;CURRENT INPUT STRING ADDRESS
                        00000111  033B  LWA_END         =  LWA_INPUT+LNM$C_NAMLENGTH
                                  033B
                                  033B          ASSUME  LWA_END,LE,512
                                  033B
                                  033B  FILE_DEV_DESC:                          ;DESCRIPTOR OF LOGICAL NAME TABLE NAME
                        0000000C' 033B          .LONG   FILE_DEV_SIZE
                        00000343' 033F          .ADDRESS FILE_DEV
                                  0343
                                  0343  FILE_DEV:                               ;LOGICAL NAME TABLE NAME BUFFER
56 45 44 5F 45 4C 49 46 24 4D 4E 4C  0343          .ASCII  /LNM$FILE_DEV/
                        0000000C  034F  FILE_DEV_SIZE = . - FILE_DEV
                                  034F
                                  034F          .ENABLE LSB
                                  034F  MMG$CEFTRNLOG::
         50   24464543 8F    D0   034F          MOVL    #^A/CEF$/,R0            ;SET INDICATOR TO USE "CEF$"
                    10       11   0356          BRB     10$                     ;SKIP OTHER PREFIXE.
                                  0358
                                  0358  MMG$MBXTRNLOG::
         50   2458424D 8F    D0   0358          MOVL    #^A/MBX$/,R0            ;SET INDICATOR TO USE "MBX$"
                    07       11   035F          BRB     10$                     ;SKIP OTHER PREFIXES
                                  0361
                                  0361  MMG$GSDTRNLOG::
         50   244C4247 8F    D0   0361          MOVL    #^A/GBL$/,R0            ;SET INDICATOR TO USE "GBL$"
                                  0368
                  0FFE 8F    BB   0368  10$:    PUSHR   #^M<R1,R2,R3,R4,R5,R6,R7,R8,R9,R10,R11> ;SAVE REGISTERS
                                  036C
                                  036C  ;
                                  036C  ; ALLOCATE AND INITIALIZE A KERNEL REQUEST PACKET TO PROVIDE A W.RK AREA.
                                  036C  ;
                                  036C
         57   00000000'GF    9E   036C          MOVAB   G^CTL$GL_KRPFL,R7       ;RETRIEVE ADDRESS OF KRP QUEUE LISTHEAD
            57   04 B7       0F   0373          REMQUE  @4(R7),R7               ;RETRIEVE KRP FROM LIST
                    04       1C   0377          BVC     20$                     ;CONTINUE IF GOT ONE
                                  0379          BUG_CHECK       KRPEMPTY,FATAL  ;OTHERWISE BUGCHECK
                                  037D
               67   50       D0   037D  20$:    MOVL    R0,LWA_PREFIX(R7)       ;STORE UNIQUE PREFIX IN WORD AREA
                                  0380
               50   69       3C   0380          MOVZWL  (R9),R0                 ;RETRIEVE SIZE OF INPUT STRING FROM USER
         50   000000FF 8F    D1   0383          CMPL    #LNM$C_NAMLENGTH,R0     ;IS INPUT STRING OF VALID SIZE?
                    03       1E   038A          BGEQU   25$                     ;CONTINUE IF IT IS; ELSE,
                  0104       31   038C          BRW     INVALID_LOGNAM          ;RETURN ERROR IF INPUT STRING TOO LARGE
                                  038F
                                  038F          ASSUME  LNMX$T_XLATION,LE,8
               0D A7         7C   038F  25$:    CLRQ    LWA_XLATION(R7)         ;CREATE "TRANSLATION BLOCK" FOR USER
```

```
                11 A7    50   90  0392   1417          MOVB    R0,LWA_INPUT-1(R7)       ;SUPPLIED INPUT STRING
        12 A7   04 B9    50   28  0396   1418          MOVC3   R0,@4(R9),LWA_INPUT(R7)
                                  039C   1419
                   12 A7      9E  039C   1420          MOVAB   LWA_INPUT(R7),-          ;INITIALIZE CURRENT INPUT STRING
                   08 A7          039F   1421                  LWA_INPUT_DESC+4(R7)     ;DESCRIPTOR BUFFER ADDRESS
```

```
                           03A1
                           03A1      ;
                           03A1      ; SETUP TO PERFORM THE ITERATIVE LOGICAL NAME TRANSLATIONS, AND THEN BEGIN BY
                           03A1      ; PROCESSING THE USER SUPPLIED INPUT STRING AS IF IT WERE THE RESULT OF A
                           03A1      ; LOGICAL NAME TRANSLATION.  IN OTHER WORDS, CHECK THE INPUT STRING FOR A COLON
                           03A1      ; INDICATIVE OF A SHARED MEMORY OBJECT, AND THEN DETERMINE WHETHER OR NOT THE
                           03A1      ; ITERATIVE LOGICAL NAME TRANSLATIONS SHOULD BE TERMINATED.
                           03A1      ;
                           03A1      ; R6  - ADDRESS OF BUFFER TO RECEIVE RESULTANT TRANSLATION BLOCKS
                           03A1      ; R7  - ADDRESS OF KRP
                           03A1      ; R8  - SIZE OF OBJECT NAME BUFFER REMAINING
                           03A1      ; R9  - ITERATIVE LOGICAL NAME TRANSLATION COUNTER
                           03A1      ; R10 - ADDRESS OF RETURNED SHARED NAME BUFFER DESCRIPTOR
                           03A1      ; R11 - ADDRESS OF RETURNED OBJECT NAME BUFFER DESCRIPTOR
                           03A1      ;
                           03A1
        56   0D A7    9E   03A1              MOVAB   LWA_XLATION(R7),R6       ;RETRIEVE ADDRESS OF XLATION BUFFER
             58 6B    D0   03A5              MOVL    (R11),R8                 ;RETRIEVE OBJECT NAME BUFFER SIZE
                6B    D4   03A8              CLRL    (R11)                    ;ZERO CURRENT OBJECT NAME SIZE
04 BB  58   00   6B   00   2C   03AA         MOVC5   #0,(R11),#0,R8,@4(R11)   ;ZERO BUFFER (SOURCE SPEC IS MEANINGLESS)
             59 0A    D0   03B1              MOVL    #LNM$C_MAXDEPTH,R9       ;MAXIMUM NUMBER TRANSLATION ITERATIONS
                3A    11   03B4              BRB     CHECK_XLATION            ;GO CHECK USERS INPUT STRING FOR COLON
                           03B6                                               ;AND WHETHER ITERATIONS SHOULD TERMINATE
                           03B6
                           03B6      ;
                           03B6      ; APPEND THE CURRENT NAME STRING TO THE OBJECT'S UNIQUE PREFIX AND THEN
                           03B6      ; TRANSLATE THE RESULTING NAME STRING UTILIZING A FAST INTERNAL INTERFACE.
                           03B6      ; NOTE THAT THE ROUTINE LNM$SEARCH_ONE WILL ONLY RETURN THE TRANSLATION BLOCKS
                           03B6      ; FOR TRANSLATIONS WITH INDEXES OF 0; OTHERWISE, AN ERROR OF SS$_NOLOGNAM IS
                           03B6      ; RETURNED.  THIS ROUTINE EXPECTS THE FOLLOWING REGISTERS AS INPUT:
                           03B6      ;
                           03B6      ; R0  - SIZE OF NAME STRING TO BE TRANSLATED
                           03B6      ; R1  - ADDRESS OF NAME STRING TO BE TRANSLATED
                           03B6      ; R2  - SIZE OF TABLE NAME STRING
                           03B6      ; R3  - ADDRESS OF TABLE NAME STRING
                           03B6      ; R4  - ADDRESS OF PCB
                           03B6      ; R5  - HIGH-ORDER WORD 0; CASE-INSENSITIVE FLAG; ACCESS MODE OF TRANSLATION
                           03B6      ; R6  - ADDRESS OF BUFFER TO RECEIVE RESULTANT TRANSLATION BLOCKS
                           03B6      ;
                           03B6      ; IF THE LOGICAL NAME TOGETHER WITH ITS PREFIX EXCEEDS THE MAXIMUM SIZE OF A
                           03B6      ; LOGICAL NAME THEN IMMEDIATELY TERMINATE THE ITERATIVE TRANSLATIONS.
                           03B6      ;
                           03B6
                           03B6      TRANSLATE_LOOP:                          ;LOOP TO PERFORM ITERATIVE TRANSLATIONS
                04    C3   03B6              SUBL3   #4,-                     ;SETUP DESCRIPTOR OF LOGICAL NAME TO
        51   08 A7         03B8                      LWA_INPUT_DESC+4(R7),R1  ;BE TRANSLATED
     50   04 A7   04  C1   03BB              ADDL3   #4,LWA_INPUT_DESC(R7),R0
   000000FF 8F    50  D1   03C0              CMPL    R0,#LNM$C_NAMLENGTH      ;IS RESULTING NAME TOO LARGE?
                03    1B   03C7              BLEQU   27$                      ;IF SO THEN TERMINATE TRANSLATIONS
              0094    31   03C9              BRW     STOP_TRANSLATION
                           03CC
             61   67  D0   03CC      27$:    MOVL    LWA_PREFIX(R7),(R1)      ;PREFIX CURRENT INPUT STRING WITH
                           03CF                                               ;OBJECT'S UNIQUE PREFIX
        52   FF68 CF  7D   03CF              MOVQ    FILE_DEV_DESC,R2         ;LOGICAL NAME TABLE NAME DESCRIPTOR
     54   00000000'9F D0   03D4              MOVL    @#CTL$GL_PCB,R4          ;RETRIEVE PCB ADDRESS
        55   0103 8F  3C   03DB              MOVZWL  #<1@8 + PSL$C_USER>,R5   ;ALL TRANSLATIONS ARE DONE CASE
                           03E0                                               ;INSENSITIVE AND FROM USER MODE
```

```
          FC1D'  30  03E0  1480          BSBW    LNM$SEARCH_ONE          ;TRANSLATE THE CURRENT NAME STRING
          0A 50  F8  03E3  1481          BLBS    R0,CHECK_XLATION        ;GO CHECK TRANSLATION IF SUCCESSFUL
  50   01BC 8F   81  03E6  1482          CMPW    #SS$_NOLOGNAM,R0        ;IF FAILED TO TRANSLATE CURRENT NAME
             73  13  03EB  1483          BEQL    STOP_TRANSLATION        ;STRING THEN TERMINATE TRANSLATIONS
           00A8  31  03ED  1484          BRW     RETURN                  ;OTHERWISE GO RETURN AN ERROR
```

```
                        03F0
                        03F0    ;
                        03F0    ; DETERMINE WHETHER OR NOT THE CURRENT INPUT STRING CONTAINS A COLON.  IF SO
                        03F0    ; THEN EVERYTHING TO THE RIGHT OF THE COLON BECOMES THE CURRENT OBJECT NAME
                        03F0    ; PIECE.  IF THE COLON IS THE FIRST CHARACTER IN THE CURRENT INPUT STRING THEN
                        03F0    ; THE COLON IS INCLUDED AS THE FIRST CHARACTER WITHIN THE CURRENT OBJECT NAME
                        03F0    ; PIECE.  EVERYTHING TO THE LEFT OF THE COLON BECOMES THE CURRENT NAME STRING.
                        03F0    ;
                        03F0    ; THE CURRENT OBJECT NAME PIECE IS MOVED INTO THE OBJECT NAME BUFFER IN FRONT OF
                        03F0    ; ANY PART OF THE OBJECT NAME UNDER CONSTRUCTION WHICH ALREADY RESIDES THERE.
                        03F0    ; THE CURRENT NAME STRING IS SUBJECTED TO A SET OF TESTS TO DETERMINE WHETHER OR
                        03F0    ; NOT ANOTHER ROUND OF LOGICAL NAME TRANSLATION IS REQUIRED.
                        03F0    ;
                        03F0
                        03F0    CHECK_XLATION:
                  9A    03F0            MOVZBL  LNMX$T_XLATION+-        ;INITIALIZE CURRENT INPUT STRING
                        03F1                    LWA_XLATION(R7),-       ;DESCRIPTOR LENGTH FIELD
    04 A7    11 A7      03F1                    LWA_INPUT_DESC(R7)
          3A      3A    03F5            LOCC    #^A7:/,-                ;IS THERE A COLON PRESENT IN THE
          04 A7         03F7                    LWA_INPUT_DESC(R7),-    ;CURRENT INPUT STRING?
          12 A7         03F9                    LWA_INPUT(R7)
       0C A7    50  90  03FB            MOVB    R0,[WA_COLON(R7)                ;SAVE WHETHER OR NOT A COLON WAS FOU
                        03FF                                            ;DURING THIS ITERATION AND
                30  13  03FF            BEQL    40$                     ;BRANCH IF NO COLON WAS FOUND
       04 A7    50  C2  0401            SUBL2   R0,LWA_INPUT_DESC(R7)   ;ELSE COMPUTE SIZE OF REMAINING NAME
                04  12  0405            BNEQ    30$                     ;IF THE VERY FIRST CHARACTER IS A COLON
                50  D6  0407            INCL    R0                      ;THEN SETUP SO THAT THE COLON WILL BE
                51  D7  0409            DECL    R1                      ;TREATED AS PART OF THE NEW OBJECT NAME
                        040B                                            ;PIECE
                        040B
                50  D7  040B    30$:    DECL    R0                      ;COMPUTE SIZE OF NEW OBJECT NAME PIECE
                22  13  040D            BEQL    40$                     ;NO NEED TO MOVE IT IF SIZE IS ZERO
            58  50  C2  040F            SUBL2   R0,R8                   ;IS OBJECT NAME BUFFER LARGE ENOUGH?
                7F  19  0412            BLSS    INVALID_LOGNAM          ;RETURN AN ERROR IF IT ISN'T
                        0414
                6B  D5  0414            TSTL    (R11)                   ;ANY PART OF THE OBJECT NAME TO MOVE?
                10  13  0416            BEQL    35$                     ;BRANCH IF NOTHING TO MOVE
  52    50    04 AB C1  0418            ADDL3   4(R11),R0,R2            ;COMPUTE ADDRESS OF WHERE TO MOVE
                        041D                                            ;CURRENT OBJECT NAME TO
            7E  50  7D  041D            MOVQ    R0,-(SP)                ;SAVE SIZE OF NEW OBJECT NAME PIECE
                        0420                                            ;AND ADDRESS OF COLON
  62    04 BB   50  28  0420            MOVC3   R0,@4(R11),(R2)         ;SHIFT CURRENT OBJECT NAME TO MAKE ROOM
            50  8E  7D  0425            MOVQ    (SP)+,R0                ;RESTORE SAVED INFORMATION
                        0428
            6B  50  C0  0428    35$:    ADDL2   R0,(R11)                ;UPDATE CURRENT OBJECT NAME SIZE
04 BB   01 A1   50  28  042B            MOVC3   R0,1(R1),@4(R11)        ;MOVE NEW OBJECT NAME PIECE INTO BUFFER
```

```
                          0431
                          0431       ;
                          0431       ; WHEN ONE OF THE FOLLOWING CONDITIONS IS MET, ITERATIVE LOGICAL NAME
                          0431       ; TRANSLATION IS TERMINATED WITHOUT ATTEMPTING TO PERFORM ANOTHER TRANSLATION.
                          0431       ;
                          0431       ; 1. THE SIZE OF THE CURRENT RESULTANT STRING, AFTER REMOVAL OF THE CURRENT
                          0431       ;    OBJECT NAME PIECE, IS ZERO.  IN THIS CASE THERE IS NO SHARED MEMORY NAME
                          0431       ;    TO BE RETURNED.  IF THERE IS ALSO NO OBJECT NAME TO BE RETURNED, THEN
                          0431       ;    RETURN AN ERROR STATUS.
                          0431       ;
                          0431       ; 2. THE CURRENT RESULTANT STRING BEGINS WITH AN UNDERSCORE.  REMOVE THE
                          0431       ;    UNDERSCORE.  IN THIS CASE THERE IS ALSO NO SHARED MEMORY NAME TO BE
                          0431       ;    RETURNED.  IF THERE IS ALSO NO OBJECT NAME TO BE RETURNED, THEN RETURN AN
                          0431       ;    ERROR STATUS.
                          0431       ;
                          0431       ; 3. THE CURRENT RESULTANT TRANSLATION IS MARKED WITH THE TERMINAL ATTRIBUTE.
                          0431       ;    IN THIS CASE RETURN AN OBJECT NAME, AND IF APPROPRIATE A SHARED MEMORY
                          0431       ;    NAME.
                          0431       ;
                          0431       ; 1. MAXIMUM LEVEL OF ITERATION HAS BEEN REACHED.  IN THIS CASE AN ERROR WILL
                          0431       ;    BE RETURNED.
                          0431       ;
                          0431       ; IF ONE OF THE ABOVE CONDITIONS IS NOT MET, THE REMAINING RESULTANT NAME STRING
                          0431       ; BECOMES THE CURRENT NAME STRING AND IS SUBJECTED TO FURTHER TRANSLATION.
                          0431       ;
                          0431
          04 A7     D5    0431  40$:      TSTL    LWA_INPUT_DESC(R7)       ;ANY NAME AT ALL REMAINING?
             0F     13    0434            BEQL    50$                      ;IF NOT THEN GO DETERMINE IF THERE IS
                          0436                                             ;ANY OBJECT NAME TO BE RETURNED
                          0436
 12 A7   5F 8F      91    0436            CMPB    #^A/_/,LWA_INPUT(R7)     ;BRANCH IF CURRENT RESULTANT NAME STRING
             10     12    0438            BNEQ    60$                      ;DOESN'T BEGIN WITH AN UNDERSCORE
          08 A7     D6    043D            INCL    LWA_INPUT_DESC+4(R7)     ;ELSE REMOVE "_" FROM CURRENT RESULTANT
          04 A7     D7    0440            DECL    LWA_INPUT_DESC(R7)       ;NAME STRING AND TERMINATE TRANSLATION
             1B     1A    0443            BGTRU   STOP_TRANSLATION         ;IF THERE IS SOMETHING LEFT
                          0445
             6B     D5    0445  50$:      TSTL    (R11)                    ;ANY OBJECT NAME TO BE RETURNED?
             4A     13    0447            BEQL    INVALID_LOGNAM           ;IF NOT THEN GO RETURN AN ERROR
             6A     D4    0449            CLRL    (R10)                    ;ELSE NO SHARED MEMORY NAME TO BE
             41     11    044B            BRB     TRANSLATION_DONE         ;RETURNED AND WE ARE DONE
                          044D
             01     E0    044D  60$:      BBS     #LNMX$V_TERMINAL,-       ;IF THE CURRENT RESULTANT TRANSLATION
                          044F                    LNMX$B_FLAGS+-           ;IS MARKED WITH THE TERMINAL ATTRIBUTE
                          044F                    LWA_XLATION(R7),-        ;THEN STOP THE ITERATIVE TRANSLATIONS
       0E 0D A7           044F                    STOP_TRANSLATION
                          0452
             59     D7    0452            DECL    R9                       ;DECREMENT TRANSLATION ITERATION COUNT
             03     19    0454            BLSS    65$                      ;GO RETURN ERROR IF EXCEEDED MAX DEPTH
           FF5D     31    0456            BRW     TRANSLATE_LOOP           ;ELSE CONTINUE WITH CURRENT ITERATION
 50     0374 8F     3C    0459  65$:      MOVZWL  #SS$_TOOMANYLNAM,R0      ;MAXIMUM ITERATION DEPTH EXCEEDED
             38     11    045E            BRB     RETURN                   ;GO RETURN THE APPROPRIATE ERROR
```

```
                               0460
                               0460  ;
                               0460  ; WHEN THE ITERATIVE LOGICAL NAME TRANSLATION OF THE USER SUPPLIED INPUT STRING
                               0460  ; TERMINATES THE LEFTOVER NAME STRING BECOMES THE SHARED MEMORY NAME RETURNED
                               0460  ; TO THE CALLER IF AN OBJECT NAME HAD BEEN CONSTRUCTED DURING THE ITERATIVE
                               0460  ; LOGICAL NAME TRANSLATION PROCESS.  OTHERWISE, THE LEFTOVER NAME STRING IS
                               0460  ; RETURNED TO THE CALLER AS THE OBJECT NAME, AND THERE IS NO SHARED MEMORY NAME
                               0460  ; TO BE RETURNED.
                               0460  ;
                               0460
                               0460 STOP_TRANSLATION:                             ;STOP THE ITERATIVE TRANSLATIONS
                    6B    D5   0460         TSTL    (R11)                         ;DOES AN OBJECT NAME ALREADY EXIST?
                    15    12   0462         BNEQ    70$                           ;IF SO THEN LEFTOVER BECOMES THE
                               0464                                               ;SHARED MEMORY NAME
                               0464
                    6A    D4   0464         CLRL    (R10)                         ;INDICATE NO SHARED MEMORY NAME
                    5B    DD   0466         PUSHL   R11                           ;SWITCH THE OBJECT AND SHARED MEMORY
               5B   5A    D0   0468         MOVL    R10,R11                       ;NAME POINTERS SO THAT THE LEFTOVER
                    5A  8ED0   046B         POPL    R10                           ;GETS SAVED AS THE OBJECT NAME
               6A   58    D0   046E         MOVL    R8,(R10)                      ;RESTORE OBJECT NAME BUFFER SIZE TO
                               0471                                               ;THE SIZE FIELD OF ITS DESCRIPTOR
                               0471
                 0C A7    95   0471         TSTB    LWA_COLON(R7)                 ;COLON SEEN IN LAST RESULTANT STRING?
                    03    13   0474         BEQL    70$                           ;BRANCH IF IT WASN'T; ELSE RETURN COLON
                 04 A7    D6   0476         INCL    LWA_INPUT_DESC(R7)            ;AS PART OF OBJECT NAME STRING
                               0479
            50   04 A7    D0   0479 70$:    MOVL    LWA_INPUT_DESC(R7),R0         ;SIZE OF STRING TO BE RETURNED
               6A   50    D1   047D         CMPL    R0,(R10)                      ;DOES STRING SIZE EXCEED BUFFER SIZE?
                    11    1A   0480         BGTRU   INVALID_LOGNAM                ;RETURN ERROR IF SO
                    50    2C   0482         MOVC5   R0,-
                               0484                 @LWA_INPUT_DESC+4(R7),-
 04 BA    6A    00   08 B7     0484                 #0,(R10),@4(R10)              ;MOVE NAME STRING, ZERO FILLED
            6A   04 A7    D0   048A         MOVL    LWA_INPUT_DESC(R7),(R10);STORE STRING'S LENGTH
                               048E
                               048E  ;
                               048E  ; SETUP THE APPROPRIATE RETURN STATUS, AND RETURN TO THE CALLER AFTER
                               048E  ; DEALLOCATING THE KRP BACK TO THE KRP LOOKASIDE LIST.
                               048E  ;
                               048E
                               048E TRANSLATION_DONE:                             ;TRANSLATIONS HAVE COMPLETED
               50   01    D0   048E         MOVL    #SS$_NORMAL,R0                ;SET APPROPRIATE STATUS
                    05    11   0491         BRB     RETURN                        ;RETURN STATUS
                               0493
                               0493 INVALID_LOGNAM:                               ;REPORT AN INVALID LOGICAL NAME
          50   0154 8F    3C   0493         MOVZWL  #SS$_IVLOGNAM,R0              ;SET APPROPRIATE ERROR CODE
                               0498
      56   00000000'GF    9E   0498 RETURN: MOVAB   G^CTL$GL_KRPFL,R6             ;RETRIEVE ADDRESS OF KRP QUEUE LISTHEAD
             04 B6   67   0E   049F         INSQUE  (R7),@4(R6)                   ;INSERT KRP INTO LIST
                               04A3
               0FFE 8F    BA   04A3         POPR    #^M<R1,R2,R3,R4,R5,R6,R7,R8,R9,R10,R11> ;RESTORE REGISTERS
                          05   04A7         RSB                                   ;RETURN STATUS
                               04A8         .DSABL  LSB
```

```
                        04A8          .SBTTL  MMG$READ_GSD/MMG$WRITE_GSD - READ/WRITE SHARED MEM GBL SECTION
                        04A8
                        04A8    ;++
                        04A8    ; FUNCTIONAL DESCRIPTION:
                        04A8    ;
                        04A8    ; THIS ROUTINE READS THE PAGES OF A GLOBAL SECTION BEING CREATED INTO
                        04A8    ; SHARED MEMORY OR WRITES THE PAGES BACK TO A DISK FILE.
                        04A8    ;
                        04A8    ; CALLING SEQUENCE:
                        04A8    ;
                        04A8    ;       BSBW    MMG$READ_GSD
                        04A8    ;       BSBW    MMG$WRITE_GSD
                        04A8    ;
                        04A8    ; INPUT PARAMETERS:
                        04A8    ;
                        04A8    ;       R6 = GLOBAL SECTION DESCRIPTOR ADDRESS
                        04A8    ;       R2 = STARTING VIRTUAL ADDRESS INTO WHICH SECTION IS MAPPED
                        04A8    ;               (MMG$READ_GSD ONLY)
                        04A8    ;       R3 = ENDING VIRTUAL ADDRESS INTO WHICH SECTION IS MAPPED
                        04A8    ;               (MMG$READ_GSD ONLY)
                        04A8    ;       4(SP) = RETURN STATUS CODE SO FAR FOR $CRMPSC SYSTEM SERVICE
                        04A8    ;                       (MMG$READ_GSD ONLY)
                        04A8    ;
                        04A8    ; IMPLICIT INPUTS:
                        04A8    ;
                        04A8    ;       THE GSD IS FULLY INITIALIZED AS WELL THE SECTION TABLE ENTRY (IF
                        04A8    ;       THERE IS ONE).
                        04A8    ;
                        04A8    ; OUTPUT PARAMETERS:
                        04A8    ;
                        04A8    ;       R0 CONTAINS THE STATUS CODE FOR THE I/O TRANSFER.
                        04A8    ;
                        04A8    ; IMPLICIT OUTPUTS:
                        04A8    ;
                        04A8    ;       THE GLOBAL SECTION IS READ/WRITTEN.
                        04A8    ;
                        04A8    ; COMPLETION CODES:
                        04A8    ;
                        04A8    ;       SS$_NORMAL - SUCCESSFUL COMPLETION
                        04A8    ;       VARIOUS SYSTEM SERVICE FAILURE CODES.
                        04A8    ;
                        04A8    ; SIDE EFFECTS:
                        04A8    ;
                        04A8    ;       NONE
                        04A8    ;
                        04A8    ;--
                        04A8
          00000020      04A8          MAXIO = 32                              ;MAXIMUM # PAGES IN ONE I/O
                        04A8
                        04A8
                        04A8    MMG$WRITE_GSD::
                        04A8          .ENABL  LSB
    0FFE 8F     BB      04A8          PUSHR   #^M<R1,R2,R3,R4,R5,R6,R7,R8,R9,R10,R11> ;SAVE REGISTERS
    57   01     D0      04AC          MOVL    #1,R7                           ;INDICATE GS IS BEING WRITTEN
         0D     11      04AF          BRB     5$                              ;JOIN COMMON CODE
                        04B1
                        04B1    MMG$READ_GSD::
```

```
              50    04 AE   D0  04B1            MOVL    4(SP),R0                        ;GET RETURN CODE SO FAR
                    60 50   E9  04B5            BLBC    R0,50$                          ;BR IF ERROR CREATING SECTION
                  0FFE 8F   BB  04B8            PUSHR   #^M<R1,R2,R3,R4,R5,R6,R7,R8,R9,R10,R11> ;SAVE REGISTERS
                       57   D4  04BC            CLRL    R7                              ;INDICATE GS IS BEING READ
                  5B   04   9A  04BE       5$:  MOVZBL  #GSD$C_PFNBASMAX,R11            ;SET COUNT OF PFN BASES IN GSD
       5A    56   00000054 8F   C1  04C1        ADDL3   #GSD$L_BASPFN1,R6,R10           ;GET ADR OF 1ST PFN BASE IN GSD
              59 20 A6   02   E1  04C9          BBC     #SEC$V_DZRO,GSD$W_FLAGS(R6),100$ ;BR IF SECTION MUST BE READ IN
                    56 57   E8  04CE            BLBS    R7,100$                         ;BR IF WRITING SECTION TO DISK
                                04D1       ;
                                04D1       ; THE SECTION IS DEMAND-ZERO.  INITIALIZE THE PAGES TO ALL ZEROS.
                                04D1       ;
                                04D1       ; R10 = ADDRESS OF NEXT PFN BASE IN GSD
                                04D1       ; R11 = NUMBER OF PFN BASES IN GSD
                                04D1       ;
                  57   52   7D  04D1            MOVQ    R2,R7                           ;GET START AND END VA
             7E   0200 8F   3C  04D4            MOVZWL  #^X200,-(SP)                    ;SET VA INCREMENT
             7E   58   57   C3  04D9            SUBL3   R7,R8,-(SP)                     ;GET # BYTES MAPPED
                       06   18  04DD            BGEQ    6$                              ;BR IF RANGE MAPPED FORWARDS
                  6E   6E   CE  04DF            MNEGL   (SP),(SP)                       ;CONVERT TO POSITIVE BYTE COUNT
                  57   58   D0  04E2            MOVL    R8,R7                           ;REVERSE STARTING ADR FOR MOVC
         6E    6E    F7 8F   78  04E5      6$:  ASHL    #-9,(SP),(SP)                   ;CONVERT FROM BYTE TO PAGE COUNT
                       6E   D6  04EA            INCL    (SP)                            ;ACTUAL # OF PAGES MAPPED
                                04EC            ASSUME  GSD$L_BASCNT1 EQ <GSD$L_BASPFN1 + 4>
                  59   8A   D0  04EC      10$:  MOVL    (R10)+,R9                       ;NEXT PFN BASE IN GSD
                  59   8A   D0  04EF            MOVL    (R10)+,R9                       ;NEXT BASE CNT IN GSD
                       17   13  04F2            BEQL    25$                             ;BR ON NO MORE PAGES TO INIT
                  6E   59   C2  04F4            SUBL    R9,(SP)                         ;IS THIS PIECE MAPPED?
                       20   19  04F7            BLSS    NOT_MAPPED                      ;BR ON ERROR, NOT MAPPED
   67    0200 8F    00   66   00   2C  04F9 20$: MOVC5  #0,(R6),#0,#^X200,(R7)          ;ZERO-FILL A PAGE
              57    04 AE   C0  0501            ADDL2   4(SP),R7                        ;GET VA OF NEXT PAGE TO INIT
                    F1 59   F5  0505            SOBGTR  R9,20$                          ;REPEAT FOR EACH PAGE IN PIECE
                    E1 5B   F5  0508            SOBGTR  R11,10$                         ;REPEAT FOR EACH PIECE OF GS
                  5E   04   C0  050B      25$:  ADDL2   #4,SP                           ;CLEAN OFF # PAGES MAPPED
                  50   01   9A  050E      30$:  MOVZBL  #SS$_NORMAL,R0                  ;REPORT SUCCESS
                  5E   04   C0  0511      35$:  ADDL2   #4,SP                           ;CLEAN OFF INCREMENT
                  0FFE 8F   BA  0514      40$:  POPR    #^M<R1,R2,R3,R4,R5,R6,R7,R8,R9,R10,R11> ;RESTORE REGISTERS
                            05  0518      50$:  RSB
                                0519
                                0519       NOT_MAPPED:
              50    036C 8F   3C  0519          MOVZWL  #SS$_SHMGSNOTMAP,R0             ;DZRO SECTION MUST BE MAPPED, TO
               38 AE   50   D0  051E            MOVL    R0,<T4*4>(SP)                   ;ERROR CODE TO RETURN TO CALLER
                  5E   04   C0  0522            ADDL2   #4,SP                           ;CLEAN OFF # PAGES MAPPED
                       EA   11  0525            BRB     35$                             ;ALLOW INIT. DURING CREATION
                                0527
                                0527       ;
                                0527       ; THE SECTION WAS NOT DEMAND-ZERO, THEREFORE IT MUST BE MAPPED TO A FILE.
                                0527       ; (PFN MAPPED SECTIONS ARE NEVER INITIALIZED AND THUS NEVER REACH THIS CODE.)
                                0527       ; THE PAG¯S MUST BE READ FROM THE FILE INTO SHARED MEMORY BEFORE A STATUS
                                0527       ; CODE CAN BE RETURNED TO THE CALLER OF $CRMPSC.
                                0527       ;
                                0527       ;
                                0527       ; FIRST GET THE NEEDED PARAMETERS FROM THE SECTION TABLE ENTRY. (ALL GLOBAL
                                0527       ; SECTIONS MAPPED TO A FILE, HAVE A SECTION TABLE ENTRY IN THE SYSTEM PROCESS
                                0527       ; HEADER.)  THESE PARAMETERS INCLUDE THE WINDOW ADDRESS, VIRTUAL BLOCK NUMBER,
                                0527       ; PAGE FAULT CLUSTER SIZE FOR THE SECTION.
                                0527       ;
             00000113'EF    16  0527     100$:  JSB     MMG$FINDSHD                     ;GET SHD AND SHB ADDRS
             10 A4    DD  052D  1752           PUSHL   SHB$L_BASGSPFN(R4)                  ;REMEMBER BASE PFN OF SHM
       51    16 A6    32  0530  1753           CVTWL   GSD$W_GSTX(R6),R1                   ;GET SECTION TABLE INDEX
 50   00000000'GF     D0  0534  1754           MOVL    G^MMG$GL_SYSPHD,R0                  ;GET SYSTEM PROCESS HEADER
       50    20 A0    C0  053B  1755           ADDL2   PHD$L_PSTBASOFF(R0),R0              ;GET BASE ADR OF PROC SEC TBL
        51    6041    DE  053F  1756           MOVAL   (R0)[R1],R1                         ;GET ADR OF SECTION TABLE ENTRY
       52    0C A1    D0  0543  1757           MOVL    SEC$L_WINDOW(R1),R2                 ;GET ADR OF WINDOW
       50    10 A1    D0  0547  1758           MOVL    SEC$L_VBN(R1),R0                    ;GET FIRST VBN MAPPED
       56    0B A1    9A  054B  1759           MOVZBL  SEC$B_PFC(R1),R6                    ;GET PAGE FAULT CLUSTER FOR GS
                          054F  1760 ;
                          054F  1761 ; NOW COMPUTE THE SIZE OF THE I/O REQUEST TO BE MADE.  THIS IS LIMITED BY
                          054F  1762 ; (1) THE SIZE OF THE PIECE OF SECTION BEING INITIALIZED, (2) THE PAGE FAULT
                          054F  1763 ; CLUSTER SIZE OF THE SECTION, AND (3) THE MAXIMUM I/O REQUEST ALLOWED BY THE
                          054F  1764 ; SYSTEM.  THE LARGEST I/O POSSIBLE IS ALLOWED.  (REMEMBER THAT SHARED MEMORY
                          054F  1765 ; SECTIONS MAY BE MAPPED IN UP TO #GSD$C_PFNBASMAX PIECES OF CONSECUTIVE PAGES.)
                          054F  1766 ;
                          054F  1767           ASSUME  GSD$L_BASCNT1 EQ <GSD$L_BASPFN1 + 4>
      58    6E    8A  C1  054F  1768 110$:     ADDL3   (R10)+,(SP),R8                      ;BASE PFN OF NEXT PIECE
            59    8A  D0  0553  1769           MOVL    (R10)+,R9                           ;CNT OF PAGES IN NEXT PIECE
                  B6  13  0556  1770           BEQL    30$                                 ;BR IF NO MORE PAGES TO READ/WRT
            51    56  D0  0558  1771 120$:     MOVL    R6,R1                               ;ASSUME READ SIZE IS PFC SIZE
                  05  13  055B  1772           BEQL    130$                                ;BR IF NO PFC SPECIFIED
            51    59  D1  055D  1773           CMPL    R9,R1                               ;IS PIECE > CLUSTER SIZE?
                  03  14  0560  1774           BGTR    140$                                ;BR IF PIECE GREATER
            51    59  D0  0562  1775 130$:     MOVL    R9,R1                               ;PIECE IS SMALLER, USE PIECE SIZ
            20    51  D1  0565  1776 140$:     CMPL    R1,#MAXIO                           ;IS READ SIZE > MAXIMUM I/O?
                  03  19  0568  1777           BLSS    150$                                ;BR IF READ SIZE IS OK
            51    20  3C  056A  1778           MOVZWL  #MAXIO,R1                           ;READ MAXIMUM SIZE I/O ALLOWED
       51   51    09  78  056D  1779 150$:     ASHL    #9,R1,R1                            ;CONVERT PAGES TO BYTES
 54   00000000'GF     D0  0571  1780           MOVL    G^SCH$GL_CURPCB,R4                  ;CURRENT PROCESS CONTROL BLOCK
       55    6C A4    D0  0578  1781           MOVL    PCB$L_PHD(R4),R5                    ;CURRENT PROCESS HEADER ADR
                          057C  1782 ;
                          057C  1783 ; NOW ALLOCATE ONE PACKET THAT WILL CONTAIN AN IRP AND A LIST OF PAGE
                          057C  1784 ; TABLE ENTRIES, DESCRIBING THE RANGE OF PHYSICAL PAGES TO BE READ/WRITTEN.
                          057C  1785 ; THE PTE'S MUST BE CREATED AS THE PAGES MAY NOT BE MAPPED TO VIRTUAL
                          057C  1786 ; ADDRESSES.  THE PTE'S MUST BE IN THE SAME BLOCK OF NON-PAGED POOL AS
                          057C  1787 ; THE IRP, OTHERWISE THE PROCESS MIGHT BE DELETED AND THE POOL SPACE FOR
                          057C  1788 ; THE PTE'S LOST.  THE I/O SYSTEM WILL RELEASE THE IRP IF THE PROCESS IS
                          057C  1789 ; DELETED.
                          057C  1790 ;
                  07  BB  057C  1791           PUSHR   #^M<R0,R1,R2>                       ;SAVE WINDOW ADDRESS, CNT & VBN
  51    51     F9 8F  78  057E  1792           ASHL    #-7,R1,R1                           ;# OF BYTES OF PTE NEEDED
  7E    51     FE 8F  78  0583  1793           ASHL    #-2,R1,-(SP)                        ;# OF PTE'S TO BE CREATED
 51   000000C4 8F     C0  0588  1794           ADDL2   #IRP$C_LENGTH,R1                    ;ADD IN SIZE OF I/O PACKET
      00000000'GF     16  058F  1795           JSB     G^EXE$ALONONPAGED                   ;ALLOCATE NONPAGED PACKET
               03 50  E8  0595  1796           BLBS    R0,155$                             ;SUCCESSFUL
                0084  31  0598  1797           BRW     NO_IRP                              ;BR IF UNABLE TO GET PACKET
            55    52  D0  059B  1798 155$:     MOVL    R2,R5                               ;SET PACKET ADR FOR EXE$BLDPKT
        0A A5     0A  90  059E  1799           MOVB    #DYN$C_IRP,IRP$B_TYPE(R5)           ;INDICATE THAT IT IS IRP
        08 A5     51  B0  05A2  1800           MOVW    R1,IRP$W_SIZE(R5)                   ;SET SIZE OF PACKET ALLOCATED
               51 8ED0  05A6  1801           POPL    R1                                  ;GET # OF PTE'S TO CREATE
      52   00C4 C2    9E  05A9  1802           MOVAB   <IRP$C_LENGTH+^X3>&<^C<^X3>>(R2),R2 ;LONGWORD ALIGN ADR FOR PTE
            53    52  D0  05AE  1803           MOVL    R2,R3                               ;REMEMBER FIRST SVAPTE
                          05B1  1804 ;
                          05B1  1805 ; R1 = SIZE OF PACKET ALLOCATED IN BYTES
                          05B1  1806 ; R2 = LONGWORD ALIGNED ADDRESS FOR FIRST SVAPTE TO BE CREATED
                          05B1  1807 ; R5 = ADDRESS OF PACKET ALLOCATED
                          05B1  1808 ; R8 = NEXT PFN TO BE READ/WRITTEN
```

```
                              05B1  ;
58   B0000000 8F        C8    05B1              BISL2   #<PTE$C_ERKW ! PTE$M_VALID>,R8  ;SET OWNER AND VALID IN PTE
          82   88       9E    05B8       160$:  MOVAB   (R8)+,(R2)+                     ;SET ONE PTE
            FA 51       F5    05BB              SOBGTR  R1,160$                         ;LOOP FOR SIZE OF TRANSFER
58   B0000000 8F        CA    05BE              BICL2   #<PTE$C_ERKW ! PTE$M_VALID>,R8  ;CLEAR OWNER AND VALID BITS
                              05C5  ;
                              05C5  ; FINALLY, INITIALIZE THE I/O REQUEST PACKET (IRP) ITSELF.  A LOCATION ON
                              05C5  ; THE STACK IS ALLOCATED TO HOLD THE I/O COMPLETION STATUS CODE.  THE I/O
                              05C5  ; COMPLETION AST ROUTINE WILL MOVE THE STATUS CODE INTO THIS LOCATION AND
                              05C5  ; DELETE THE IRP.
                              05C5  ;
               07       BA    05C5              POPR    #^M<R0,R1,R2>                   ;GET WINDOW ADR, CNT & VBN
               07       BB    05C7              PUSHR   #^M<R0,R1,R2>                   ;SAVE BYTE CNT & WINDOW ADR
               7E       7C    05C9              CLRQ    -(SP)                           ;INITIALIZE I/O RETURN STATUS
        24 A5  5E       D0    05CB              MOVL    SP,IRP$L_IOSB(R5)               ;SET ADR FOR RETURN STATUS
     14 A5   40'AF      9E    05CF              MOVAB   B^SHMIODONE,IRP$L_ASTPRM(R5)    ;SET AST ROUTINE ADR
     23 A5    2F A4     90    05D4              MOVB    PCB$B_PRIB(R4),IRP$B_PRI(R5)    ;SET PRIORITY FOR I/O
                              05D9  ;
                              05D9  ; THE INPUTS FOR EXE$BLDPKTGSR/EXE$BLDPKTGSW ARE:
                              05D9  ;       R0 = VBN
                              05D9  ;       R1 = NUMBER OF BYTES TO TRANSFER
                              05D9  ;       R2 = WINDOW ADDRESS
                              05D9  ;       R3 = SVAPTE
                              05D9  ;       R4 = PCB ADDRESS
                              05D9  ;       R5 = IRP ADDRESS
                              05D9  ;
                              05D9  ; IT DESTROYS R0, R1, R2, R3, R4 AND R5.
                              05D9  ;
             08 57      E9    05D9              BLBC    R7,185$                 ;BR IF READING SHM PAGES
       00000000'GF      16    05DC              JSB     G^EXE$BLDPKTGSW         ;GO BUILD & SUBMIT WRITE REQUEST
               06       11    05E2              BRB     190$                    ;JOIN COMMON CODE
       00000000'GF      16    05E4       185$:  JSB     G^EXE$BLDPKTGSR         ;GO BUILD & SUBMIT READ REQUEST
                              05EA  ;
                              05EA  ; NOW WAIT FOR THE I/O REQUEST TO COMPLETE.  THIS IS ACCOMPLISHED BY WAITING
                              05EA  ; FOR AN I/O COMPLETION STATUS CODE TO BE SET BY THE AST ROUTINE.  THIS CODE
                              05EA  ; MAY OR MAY NOT BE SET BEFORE THE WAIT STATE IS ENTERED.  THE WAIT STATE
                              05EA  ; MAY ALSO BE LEFT FOR THE WRONG REASON.  THEREFORE, THE STATUS CODE MUST BE
                              05EA  ; CHECKED BEFORE WAITING AND UPON AWAKENING.  THE WAIT STATE IS PAGE FAULT WAIT.
                              05EA  ;
                              05EA  ;
                              05EA  ; ******* THERE IS A PROBLEM HERE.  LOWERING IPL SO AS TO RECEIVE THE AST
                              05EA  ; ******* WILL ALLOW THE PROCESS CREATING THE SHM GS TO BE DELETED WHILE
                              05EA  ; ******* IT HOLDS AN UNFINISHED GSD.
                              05EA  ;
               00       DD    05EA       190$:  PUSHL   #0                              ;LOWER IPL TO RECEIVE AST'S
                              05EC       195$:  SETIPL  SYNCHIPL                        ;RAISE IPL TO SYNCH AND INSURE
                              05F3                                                      ;THAT CODE IS FAULTED INTO MEM
            04 AE       D5    05F3              TSTL    4(SP)                           ;CHECK IF I/O STATUS CODE IS SET
               17       12    05F6              BNEQ    200$                            ;BR IF I/O REQUEST IS COMPLETE
52   00000000'GF        7E    05F8              MOVAQ   G^SCH$GQ_PFWQ,R2                ;SET ADR OF PAGE FAULT WAIT QUE
54   00000000'GF        D0    05FF              MOVL    G^SCH$GL_CURPCB,R4              ;SET ADR OF CURRENT PROC CTL BLK
     00000000'GF        16    0606              JSB     G^SCH$WAITK                     ;WAIT ON A KERNEL AST
               DC       11    060C              BRB     190$                            ;CHECK IF AST WAS FOR THIS I/O
                              060E       REI_RTN1:
               02             060E              REI                                     ;SET NEW PSL AND PC FROM STACK
               FD       10    060F       200$:  BSBB    REI_RTN1                        ;RESTORE TO PSL BEFORE WAIT
        50     8E       D0    0611              MOVL    (SP)+,R0                        ;GET I/O COMPLETION CODE
```

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          08 50   E9  0614         BLBC    R0,IO_FAIL                    ;BR IF I/O FAILED
             8E   D5  0617         TSTL    (SP)+                         ;CLEAN OFF STACK
             0A   11  0619         BRB     220$                          ;CONTINUE
                      061B  ;
                      061B  ; PLACING THE SYNCH IPL IN A LONGWORD AT THIS LOCATION WILL FORCE THE ABOVE
                      061B  ; SETIPL INSTRUCTION TO FAULT INTO MEMORY ALL INSTRUCTIONS BETWEEN IT AND THIS
                      061B  ; LONGWORD.  THIS IS NECESSARY BECAUSE THIS CODE RESIDES IN A PAGEABLE PSECT
                      061B  ; RUNS AT RAISED IPL, AND PAGE FAULTS CANNOT BE ALLOWED AT RAISED IPL.
                      061B  ; THE ASSUME MACRO GUARANTEES THAT THE SETIPL INSTRUCTION AND THE IPL
                      061B  ; LONGWORD ARE ON ADJACENT PAGES.
                      061B  ;
                      061B  SYNCHIPL:
            00000008  061B         .LONG   IPL$_SYNCH                    ;SYNCH IPL
                      061F  205$:
                      061F         ASSUME  <205$ - 195$> LE 512          ;GUARANTEE PAGE ADJACENCY
                      061F  ;
                      061F  ; THE I/O TO INITIALIZE THE GLOBAL SECTION FAILED.
                      061F  ;
                      061F  IO_FAIL:
                      061F  ;
                      061F  ; UNABLE TO ALLOCATE AN IRP.  RETURN ERROR STATUS CODE.
                      061F  ;
                      061F  NO_IRP:
          5E    10    C0  061F         ADDL2   #<4*4>,SP                     ;WIND, CNT, VBN, PTE, & BAS PFN
              FEEC    31  0622         BRW     35$                           ;ERROR EXIT
                      0625  ;
                      0625  ; I/O REQUEST COMPLETED SUCCESSFULLY.  NOW SET UP TO DO THE NEXT
                      0625  ; PAGES OF THE GLOBAL SECTION.  THESE PAGES MAY BE IN THE SAME PIECE, (I.E.,
                      0625  ; HAVE THE SAME BASE PFN) OR THEY MAY BE PART OF THE NEXT PIECE OF THE SECTION.
                      0625  ; THE ENTIRE SECTION MAY NOW BE MAPPED, TOO.  THE PARAMETERS TO BE INITIALIZED
                      0625  ; ARE:  (1) PFN, (2) VIRTUAL BLOCK NUMBER, AND (3) NUMBER OF PAGES
                      0625  ; LEFT TO MAP IN THIS PIECE.
                      0625  ;
                07    BA  0625  220$:  POPR    #^M<R0,R1,R2>                 ;RESTORE REGISTERS
    51    51    F7 8F  78  0627         ASHL    #-9,R1,R1                     ;GET # OF PAGES READ/WRITTEN
          50    51    C0  062C         ADDL2   R1,R0                         ;GET NEXT VBN TO BE READ/WRITTEN
          59    51    C2  062F         SUBL2   R1,R9                         ;GET # PAGES IN PIECE TO XFER
                03    13  0632         BEQL    250$                          ;BR IF ALL OF THIS PIECE IS DONE
              FF21    31  0634         BRW     120$                          ;BR IF MORE OF PIECE TO READ
             03 5B    F5  0637  250$:  SOBGTR  R11,260$                      ;BR TO GET NEXT PIECE OF GS
              FED1    31  063A         BRW     30$                           ;BR IF NO MORE PIECES TO READ
              FF0F    31  063D  260$:  BRW     110$                          ;GO GET NEXT BASE PFN/CNT
                      0640  ;
                      0640  ; THIS IS THE AST ROUTINE CALLED WHEN I/O IS COMPLETED TO SHARED MEMORY.
                      0640  ; IT SETS THE COMPLETION STAUS CODE INTO A STACK ADDRESS FOR THE I/O
                      0640  ; REQUESTOR TO CHECK.  THE IRP IS THEN DELETED.
                      0640  ;
                      0640  SHMIODONE:
                      0640  270$:  DSBINT  NEWIPL                        ;DISABLE INTERRUPTS & PAGEFAULTS
     24 B5    38 A5   D0  064A         MOVL    IRP$L_IOST1(R5),@IRP$L_IOSB(R5) ;SET I/O COMPLETION STATUS CODE
          50    55    D0  064F         MOVL    R5,R0                         ;SET ADR OF IRP
       00000000'GF    16  0652         JSB     G^EXE$DEANONPAGED             ;DEALLOCATE THE IRP
  54   00000000'GF    D0  0658         MOVL    G^SCH$GL_CURPCB,R4            ;GET ADR OF CURRENT PCB
          52    01    9A  065F         MOVZBL  #PRI$_IOCOM,R2                ;SET I/O COMPLETION STATE CODE
                      0662         RPTEVT  PFCOM,CALL_TYPE=JSB           ;REPORT PAGEFAULT COMPLETE EVENT
                      0669         ENBINT                                ;ENABLE INTERRUPTS
                05    066C         RSB                                   ;RETURN FROM AST
```

```
                 066D  ;
                 066D  ; PLACING THE SYNCH IPL IN A LONGWORD AT THIS LOCATION WILL FORCE THE ABOVE
                 066D  ; SETIPL INSTRUCTION TO FAULT INTO MEMORY ALL INSTRUCTIONS BETWEEN IT AND THIS
                 066D  ; LONGWORD.  THIS IS NECESSARY BECAUSE THIS CODE RESIDES IN A PAGEABLE PSECT
                 066D  ; AND PAGE FAULTS CANNOT BE ALLOWED AT RAISED IPL.
                 066D  ;
                 066D  NEWIPL:
        00000008 066D          .LONG   IPL$_SYNCH                          ;SYNCH IPL
                 0671  300$:
                 0671          ASSUME  <300$ - 270$> LE 512                ;GUARANTEE PAGE ADJACENCY
                 0671          .DSABL  LSB
```

```
0671          .SBTTL  MMG$FINDGSNOTRN - FIND GSD WITHOUT LOGICAL NAME TRANSLATION
0671
0671   ;++
0671   ; FUNCTIONAL DESCRIPTION:
0671   ;
0671   ; THIS ROUTINE IS CALLED BY $MGBLSC AND $DGBLSC WHEN THEY CANNOT FIND A GLOBAL
0671   ; SECTION VIA THE NORMAL SEARCH PATH.  IF A SPECIFIC SHARED MEMORY WAS BEING
0671   ; SEARCHED, THE SECTION MIGHT NOT BE IN THAT MEMORY.  IF IT IS A COPY-ON-
0671   ; REFERENCE SECTION, IT WILL HAVE BEEN PLACED IN LOCAL MEMORY.  THIS ROUTINE
0671   ; CHECKS TO SEE IF THIS HAS OCCURRED.  IF THE SEARCH WAS IN A SPECIFIC SHARED
0671   ; MEMORY, THE RESULTANT GLOBAL SECTION NAME PREFIXED BY AN UNDERSCORE (CAUSING
0671   ; NO FURTHER LOGICAL NAME TRANSLATION) IS USED IN A SECOND SEARCH; THIS SEARCH
0671   ; STARTING IN LOCAL MEMORY.
0671   ;
0671   ; CALLING SEQUENCE:
0671   ;
0671   ;       BSBW    MMG$FINDGSNOTRN
0671   ;
0671   ; INPUT PARAMETERS:
0671   ;
0671   ;       R7 - ADDRESS OF A SCRATCH AREA CONTAINING THE RESULTANT ASCIC GLOBAL
0671   ;            SECTION NAME FOLLOWED BY THE IDENT QUADWORD
0671   ;       R9 - SECTION FLAGS SPECIFIED BY USER
0671   ;       R10 - 0 IF THE GSD WAS FOUND IN LOCAL MEMORY
0671   ;            -1 IF THE LOCAL MEMORY SEARCH EXTENDED INTO SHARED MEMORY TABLES
0671   ;            >0 IF A SPECIFIC SHARED MEMORY NAME WAS SPECIFIED
0671   ;
0671   ; IMPLICIT INPUTS:
0671   ;
0671   ;       NONE
0671   ;
0671   ; OUTPUT PARAMETERS:
0671   ;
0671   ;       R0 - RETURN STATUS CODE
0671   ;       R6 - GSD ADDRESS, IF FOUND
0671   ;       R10 - 0 IF THE GSD WAS FOUND IN LOCAL MEMORY
0671   ;            -1 IF THE LOCAL MEMORY SEARCH EXTENDED INTO SHARED MEMORY TABLES
0671   ;            >0 IF A SPECIFIC SHARED MEMORY NAME WAS SPECIFIED
0671   ;
0671   ; IMPLICIT OUTPUTS:
0671   ;
0671   ;       THE PREVIOUS MODE IS SET TO THE CURRENT MODE TO ALLOW THE DESCRIPTORS
0671   ;       AND BUFFERS WHICH ARE ON THE STACK TO BE PROBED.
0671   ;
0671   ; COMPLETION CODES:
0671   ;
0671   ;       SS$_NORMAL - SUCCESSFUL COMPLETION
0671   ;       SS$_NOSUCHSEC - NO SUCH GLOBAL SECTION
0671   ;       SS$_IVLOGNAM - INVALID LOGICAL NAME
0671   ;       SS$_ACCVIO - ACCESS VIOLATION
0671   ;
0671   ; SIDE EFFECTS:
0671   ;
0671   ;       NONE
0671   ;
0671   ;--
0671
```

```
                                0671
                                0671   MMG$FINDGSNOTRN::
                       5A   D5  0671           TSTL    R10                            ;SPECIFIC SHARED MEMORY SEARCH?
                       3A   15  0673           BLEQ    10$                            ;BR IF NOT SPEC MEM SEARCH
                                0675   ;
                                0675   ; THE ROUTINE THAT DOES A GSD TABLE SCAN PROBES THE NAME BUFFER AND THE IDENT
                                0675   ; QUADWORD FROM THE PREVIOUS MODE.  SINCE THESE AREAS ARE NOW ON THE KERNEL
                                0675   ; STACK AND THE PREVIOUS MODE IS PROBABLY USER, IT IS NECESSARY TO MAKE THE
                                0675   ; PREVIOUS MODE BE KERNEL.  NOTE:  NO OTHER PROBES OF USER PROVIDED DATA ARE
                                0675   ; DONE BY $CRMPSC OR $DGBLSC SYSTEM SERVICES FROM HERE ON.
                                0675   ;
                       7E   DC  0675           MOVPSL  -(SP)                          ;GET CURRENT PSL
                       7E   DC  0677           MOVPSL  -(SP)                          ;GET CURRENT PSL, AGAIN !!!
   50    6E    02      18   EF  0679           EXTZV   #PSL$V_CURMOD,#PSL$S_CURMOD,(SP),R0 ;EXTRACT CURRENT MODE
   6E    02    16      50   F0  067E           INSV    R0,#PSL$V_PRVMOD,#PSL$S_PRVMOD,(SP) ;SET PREV MODE TO CUR MODE
                       2B   10  0683           BSBB    REI_ROUTINE                    ;FORCE PREV MODE TO BE CUR MODE
                                0685
                       3E   BB  0685           PUSHR   #^M<R1,R2,R3,R4,R5>            ;SAVE REGISTERS
                  5E   2C   C2  0687           SUBL    #<11*4>,SP                     ;BUFFER FOR NEW NAME STRING
01 AE      01 A7       2B   28  068A           MOVC3   #43,1(R7),1(SP)                ;COPY RESULTANT NAME STRING
             6E     5F 8F   90  0690           MOVB    #^A/_/,(SP)                    ;FORCE NO LOG NAM TRANS
                       5E   DD  0694           PUSHL   SP                             ;SET ADR IN STR DESC
                  7E   67   9A  0696           MOVZBL  (R7),-(SP)                     ;SET SIZ IN STR DESC
                       6E   D6  0699           INCL    (SP)                           ;ADD IN ONE UNDERSCORE CHAR
                  50   5E   D0  069B           MOVL    SP,R0                          ;SET ADR OF STR DESC
                  56   59   D0  069E           MOVL    R9,R6                          ;SET SECTION FLAGS
             51     2C A7   9E  06A1           MOVAB   44(R7),R1                      ;SET MATCH CONTROL INFO
                     F958'  30  06A5           BSBW    MMG$GSDSCN                     ;GO SEARCH AGAIN
                  5E   34   C0  06A8           ADDL2   #<11*4>+8,SP                   ;RELEASE BUFFER AND STR DESC
                       3E   BA  06AB           POPR    #^M<R1,R2,R3,R4,R5>            ;RESTORE REGISTERS
                       01   10  06AD           BSBB    REI_ROUTINE                    ;RESTORE ORIGINAL PREVIOUS MODE
                            05  06AF   10$:    RSB                                    ;RETURN STATUS OF SEARCH
                                06B0
                                06B0   REI_ROUTINE:
                            02  06B0           REI                                    ;THIS WILL ALLOW A NEW MODE
                                06B1                                                  ;TO BE SET FROM THE STACK
```

```
                              06B1              .SBTTL  MMG$UNIQUEGSD - CHECK THAT SH MEM GSD IS UNIQUE
                              06B1
                              06B1      ;++
                              06B1      ; FUNCTIONAL DESCRIPTION:
                              06B1      ;
                              06B1      ; THIS ROUTINE IS CALLED BY $CRMPSC AFTER IT HAS INITIALIZED A SHARED MEMORY
                              06B1      ; GLOBAL SECTION.  A SEARCH OF THE SPECIFIC SHARED MEMORY'S GSD TABLE IS MADE
                              06B1      ; TO ASCERTAIN IF A GLOBAL SECTION OF THE SAME NAME WAS CREATED DURING THE
                              06B1      ; TIME THAT $CRMPSC WAS CREATING THE SECTION.
                              06B1      ;
                              06B1      ; TWO LOCKS MUST BE ACQUIRED BEFORE THE SHARED MEMORY GSD TABLE MAY BE SEARCHED
                              06B1      ; TO VERIFY A SECTION IS UNIQUE.  THE FIRST IS THE SHARED MEMORY GSD MUTEX
                              06B1      ; WHICH INTERLOCKS PROCESSES ON ONE PROCESSOR.  THE SECOND IS THE SHARED MEMORY
                              06B1      ; GSD TABLE LOCK CONTAINED IN THE SHARED MEMORY COMMON DATA PAGE, WHICH
                              06B1      ; INTERLOCKS BETWEEN PROCESSORS.
                              06B1      ;
                              06B1      ; CALLING SEQUENCE:
                              06B1      ;
                              06B1      ;       BSBW    MMG$UNIQUEGSD
                              06B1      ;
                              06B1      ; INPUT PARAMETERS:
                              06B1      ;
                              06B1      ;       R4 - ADDRESS OF SHARED MEMORY CONTROL BLOCK
                              06B1      ;       R11 - ADDRESS OF GLOBAL SECTION DESCRIPTOR TO BE VERIFIED AS UNIQUE
                              06B1      ;
                              06B1      ; IMPLICIT INPUTS:
                              06B1      ;
                              06B1      ;       NONE
                              06B1      ;
                              06B1      ; OUTPUT PARAMETERS:
                              06B1      ;
                              06B1      ;       R5 - ADDRESS OF SHARED MEMORY COMMON DATA PAGE
                              06B1      ;       R6 - 0 IF THE GSD IS UNIQUE
                              06B1      ;            OTHERWISE, ADDRESS OF DUPLICATE GSD
                              06B1      ;
                              06B1      ; IMPLICIT OUTPUTS:
                              06B1      ;
                              06B1      ;       NONE
                              06B1      ;
                              06B1      ; COMPLETION CODES:
                              06B1      ;
                              06B1      ;       NONE
                              06B1      ;
                              06B1      ; SIDE EFFECTS:
                              06B1      ;
                              06B1      ;       NONE
                              06B1      ;
                              06B1      ;--
                              06B1
                              06B1      MMG$UNIQUEGSD::
                              06B1              .ENABL  LSB
           041F 8F      BB    06B1              PUSHR   #^M<R0,R1,R2,R3,R4,R10>             ;SAVE REGISTERS
           50   02      9A    06B5              MOVZBL  #SHD$V_GSDLCK,R0                    ;BIT NUMBER OF LOCK REQUESTED
              0059      30    06B8              BSBW    MMG$SHMTXLK                         ;GET SHM MUTEX AND BIT LOCK
             52 50      E9    06BB              BLBC    R0,ERROR_EXIT                       ;REPORT UNABLE TO GET BIT LOCK
   00A0 C5   15 A4      90    06BE              MOVB    SHB$B_PORT(R4),SHD$B_GSDLOCK(R5)    ;SET OWNER OF GSD TBL LOCK
                01      DD    06C4              PUSHL   #1                                  ;INDICATE TO MMG$VALIDATE AND
              5A    5E    D0  06C6  2086          MOVL    SP,R10                                  ;MMG$GETNXTGSD NOT TO USE ALL
                              06C9  2087                                                          ;SHARED MEMORIES IN SEARCH
                              06C9  2088                                                          ;JUST THE ONE PASSED IN R4,R5
        56    55    04 A5  C1  06C9  2089          ADDL3   SHD$L_GSDPTR(R5),R5,R6                  ;GET ADR OF FIRST GSD IN SH MEM
           00000098'EF    16  06CE  2090          JSB     MMG$VALIDATEGSD                         ;FIND FIRST VALID GSD
                      08    11  06D4  2091          BRB     30$                                     ;BR TO CHECK IF GSD FOUND
                      30    BA  06D6  2092 20$:    POPR    #^M<R4,R5>                              ;RESTORE SHB, SHD ADRS
           0000009C'EF    16  06D8  2093          JSB     MMG$GETNXTGSD                           ;FIND NEXT VALID GSD
                      56    D5  06DE  2094 30$:    TSTL    R6                                      ;IS THERE A GSD ADR?
                      1E    13  06E0  2095          BEQL    NO_DUP_GSD                              ;BR ON NO MORE VALID GSD'S
                      30    BB  06E2  2096          PUSHR   #^M<R4,R5>                              ;REMEMBER SHB, SHD ADRS
              EE 66   01    E0  06E4  2097          BBS     #GSD$V_LOCKED,GSD$L_GSDFL(R6),20$ ;BR IF GSD LOCKED FOR READING
              EA 66   02    E0  06E8  2098          BBS     #GSD$V_DELPEND,GSD$L_GSDFL(R6),20$ ;BR IF GSD BEING DELETION
              54    22 A6   9B  06EC  2099          MOVZBW  GSD$T_GSDNAM(R6),R4                     ;GET GLOBAL SECTION NAME LENGTH
              22 AB   54    91  06F0  2100          CMPB    R4,GSD$T_GSDNAM(R11)                    ;DO LENGTHS MATCH?
                      E0    12  06F4  2101          BNEQ    20$                                     ;IF NEQ NO, TRY AGAIN
        23 AB    23 A6   54    29  06F6  2102          CMPC3   R4,GSD$T_GSDNAM+1(R6),GSD$T_GSDNAM+1(R11) ;COMPARE NAME STRINGS
                      D8    12  06FC  2103          BNEQ    20$                                     ;IF NEQ, DIFFERENT NAMES
                      30    BA  06FE  2104          POPR    #^M<R4,R5>                              ;RESTORE SHB,SHD ADRS
                              0700  2105 NO_DUP_GSD:
        00 009F C5   02    E7  0700  2106          BBCCI   #SHD$V_GSDLCK,SHD$B_FLAGS(R5),50$ ;RELEASE SHM GSD TBL LOCK
                    0048    30  0706  2107 50$:    BSBW    MMG$SHMTXULK                            ;RELEASE SHM MUTEX
                      8E    D5  0709  2108          TSTL    (SP)+                                   ;CLEAN OFF DUMMY SHMEM NAM CNT
              041F 8F    BA  070B  2109 60$:    POPR    #^M<R0,R1,R2,R3,R4,R10>                 ;RESTORE REGISTERS
                            05  070F  2110          RSB                                             ;RETURN TO $CRMPSC
                              0710  2111
                              0710  2112 ; ***********
                              0710  2113 ; AT SOME LATER DATE, THIS SHOULD SEND AN ERROR MESSAGE TO THE ERROR LOGGER.
                              0710  2114 ; ***********
                              0710  2115 ERROR_EXIT:
                      56    D4  0710  2116          CLRL    R6                                      ;FAILURE TO ACQUIRE BIT LOCK
                      F7    11  0712  2117          BRB     60$                                     ;RETURN ERROR STATUS
                              0714  2118          .DSABL  LSB
```

```
                          0714  2120          .SBTTL  MMG$SHMTXLK/MMG$SHMTXULK - GET/RELEASE SHARED MEMORY MUTEX
                          0714  2121
                          0714  2122  ;++
                          0714  2123  ; FUNCTIONAL DESCRIPTION:
                          0714  2124  ;
                          0714  2125  ; THE ROUTINE MMG$SHMTXLK IS CALLED TO ACQUIRE EXCLUSIVE USE OF A SHARED
                          0714  2126  ; MEMORY GLOBAL SECTION DATA STRUCTURE.  THIS IS DONE BY ACQUIRING A LOCAL
                          0714  2127  ; MEMORY MUTEX AND THEN A SHARED MEMORY BIT LOCK.  A WAIT IS DONE FOR THE MUTEX
                          0714  2128  ; AND A LOOP IS EXECUTED TO ACQUIRE THE BIT LOCK.  THE STATUS CODE FOR
                          0714  2129  ; ACQUIRING THE LOCK, IS RETURNED.  IF THE BIT LOCK COULD NOT BE ACQUIRED, THEN
                          0714  2130  ; AN ERROR CODE IS RETURNED.
                          0714  2131  ;
                          0714  2132  ; THE ROUTINE MMG$SHMTXULK RELEASES THE SHARED MEMORY GLOBAL SECTION DATA
                          0714  2133  ; STRUCTURE MUTEX.
                          0714  2134  ;
                          0714  2135  ; CALLING SEQUENCE:
                          0714  2136  ;
                          0714  2137  ;       BSBW    MMG$SHMTXLK
                          0714  2138  ;       BSBW    MMG$SHMTXULK
                          0714  2139  ;
                          0714  2140  ; INPUT PARAMETERS:
                          0714  2141  ;
                          0714  2142  ;       R0 - BIT NUMBER OF LOCK BEING REQUESTED, FOR MMG$SHMTXLK ONLY
                          0714  2143  ;       R4 - ADDRESS OF SHARED MEMORY CONTROL BLOCK
                          0714  2144  ;
                          0714  2145  ; IMPLICIT INPUTS:
                          0714  2146  ;
                          0714  2147  ;       NONE
                          0714  2148  ;
                          0714  2149  ; OUTPUT PARAMETERS:
                          0714  2150  ;
                          0714  2151  ;       R0 - STATUS CODE, FOR MMG$SHMTXLK ONLY
                          0714  2152  ;       R5 - ADR OF SHARED MEMORY COMMON DATA PAGE, FOR MMG$SHMTXLK ONLY.
                          0714  2153  ;
                          0714  2154  ; IMPLICIT OUTPUTS:
                          0714  2155  ;
                          0714  2156  ;       THE SHARED MEMORY MUTEX AND BIT LOCK MAY BE ACQUIRED BY MMG$SHMTXLK.
                          0714  2157  ;       THE SHARED MEMORY MUTEX MAY BE RELEASED BY MMG$SHMTXULK.
                          0714  2158  ;
                          0714  2159  ; COMPLETION CODES:
                          0714  2160  ;
                          0714  2161  ;       SS$_NORMAL - SUCCESSFULLY ACQUIRED LOCKS, FOR MMG$SHMTXLK ONLY.
                          0714  2162  ;       SS$_INTERLOCK  - UNABLE TO ACQUIRE LOCK, FOR MMG$SHMTXLK ONLY.
                          0714  2163  ;       NONE FOR MMG$SHMTXULK.
                          0714  2164  ;
                          0714  2165  ; SIDE EFFECTS:
                          0714  2166  ;
                          0714  2167  ;       NONE
                          0714  2168  ;
                          0714  2169  ;--
                          0714  2170
                          0714  2171  MMG$SHMTXLK::
                  51  DD  0714  2172          PUSHL   R1                              ;SAVE REGISTER
                  11  BB  0716  2173          PUSHR   #^M<R0,R4>                      ;REMEMBER SHB AND BIT LOCK #
      50  00000000'GF  DE  0718  2174          MOVAL   G^EXE$GL_SHMGSMTX,R0            ;ADR OF SH MEM GSD MUTEX
      54  00000000'GF  D0  071F  2175          MOVL    G^SCH$GL_CURPCB,R4              ;ADR OF CURRENT PCB
          00000000'GF  16  0726  2176          JSB     G^SCH$LOCKW                     ;GET UNIQUE ACCESS TO MUTEX
```

```
              11   BA  072C                POPR    #^M<R0,R4>                      ;RESTORE SHB AND BIT LOCK #
51    00000000'GF  D0  072E                MOVL    G^EXE$GL_LOCKRTRY,R1            ;GET LOOP COUNT FOR BIT LOCK
        55    04 A4  D0  0735              MOVL    SHB$L_DATAPAGE(R4),R5           ;GET ADR OF COMMON DATA PAGE
 07 009F  C5   50  E6  0739      10$:      BBSSI   R0,SHD$B_FLAGS(R5),20$          ;TRY TO ACQUIRE BIT LOCK
           50   01  9A  073F               MOVZBL  #SS$_NORMAL,R0                  ;REPORT LOCK SUCCESSFULLY ACQUIR
              51 8ED0  0742                POPL    R1                              ;RESTORE REGISTER
                   05  0745                RSB                                     ;RETURN SUCCESS CODE
           F0 51   F5  0746      20$:      SOBGTR  R1,10$                          ;TRY AGAIN TO ACQUIRE BIT LOCK
              51 8ED0  0749                POPL    R1                              ;RESTORE REGISTER
                       074C                                                        ;R0 CONTAINS 0 TO REPORT FAILURE
    50    038C 8F  3C  074C                MOVZWL  #SS$_INTERLOCK,R0               ;REPORT ERROR STATUS
                       0751                                                        ;FALL THRU TO RELEASE SHM MUTEX
                       0751      MMG$SHMTXULK::
              13   BB  0751                PUSHR   #^M<R0,R1,R4>                   ;SAVE REGISTERS
50    00000000'GF  DE  0753                MOVAL   G^EXE$GL_SHMGSMTX,R0            ;ADR OF SH MEM GSD MUTEX
54    00000000'GF  D0  075A                MOVL    G^SCH$GL_CURPCB,R4              ;ADR OF CURRENT PCB
      00000000'GF  16  0761                JSB     G^SCH$UNLOCK                    ;GET UNIQUE ACCESS TO MUTEX
              13   BA  0767                POPR    #^M<R0,R1,R4>                   ;RESTORE REGISTERS
                   05  0769                RSB                                     ;RETURN TO CALLER
```

```
                        076A          .SBTTL  MMG$DELSHMGS - DELETE SHARED MEMORY GLOBAL SECTION
                        076A
                        076A ;++
                        076A ; FUNCTIONAL DESCRIPTION:
                        076A ;
                        076A ; THIS ROUTINE IS CALLED DURING A SCAN OF THE SECTION TABLE FOR SECTIONS READY
                        076A ; TO BE DELETED.  IT CHECKS THE PTE REFERENCE COUNTS FOR THE PARTICULAR GLOBAL
                        076A ; SECTION, DETERMINING WHETHER OR NOT THE SECTION IS READY TO BE DELETED.  IF
                        076A ; IT CAN BE DELETED, THEN THE PAGES ALLOCATED ARE RELEASED, THE GSD IS RELEASED,
                        076A ; AND LASTLY, THE SECTION TABLE ENTRY IS RELEASED.
                        076A ;
                        076A ; CALLING SEQUENCE:
                        076A ;
                        076A ;        BSBW    MMG$DELSHMGS
                        076A ;
                        076A ; INPUT PARAMETERS:
                        076A ;
                        076A ;        R1 - SECTION TABLE OFFSET
                        076A ;        R3 - ADDRESS OF SECTION TABLE ENTRY TO BE DELETED
                        076A ;        R5 - SYSTEM PROCESS HEADER ADDRESS
                        076A ;
                        076A ; IMPLICIT INPUTS:
                        076A ;
                        076A ;        THE SHARED MEMORY GLOBAL SECTION PAGE BITMAP MUST HAVE BEEN INITIALIZED.
                        076A ;
                        076A ; OUTPUT PARAMETERS:
                        076A ;
                        076A ;        NONE
                        076A ;
                        076A ; IMPLICIT OUTPUTS:
                        076A ;
                        076A ;        THE GLOBAL SECTION PAGES, GLOBAL SECTION DESCRIPTOR, AND SECTION TABLE
                        076A ;        ENTRY ARE RELEASED, IF ALL REFERENCE COUNTS ARE ZERO.
                        076A ;
                        076A ; COMPLETION CODES:
                        076A ;
                        076A ;        NONE
                        076A ;
                        076A ; SIDE EFFECTS:
                        076A ;
                        076A ;        NONE
                        076A ;
                        076A ;--
                        076A          .ENABL  LSB
                        076A ;
                        076A ; SET INDICATOR TO CHECK LATER TO DELETE THIS SECTION.  THERE IS STILL A PROCESS
                        076A ; MAPPED TO IT AT PRESENT.
                        076A ;
                        076A RETRY_DEL:
00 36 A5    01    E6    076A          BBSSI   #PHD$V_DALCSTX,PHD$W_FLAG (R5),NO_DEL ;SECTION STILL TO BE DEALLOC
       009A       31    076F NO_DEL:  BRW     100$                              ;BRANCH TO EXIT
                        0772
                        0772 MMG$DELSHMGS::
    007E 8F       BB    0772          PUSHR   #^M<R1,R2,R3,R4,R5,R6>            ;SAVE REGISTERS
      56    63    D0    0776          MOVL    SEC$L_GSD(R3),R6                  ;GET ADR OF GSD
            2F    13    0779          BEQL    18$                               ;BR IF PARTIALLY CREATED GS
                        077B ;
```

```
                              077B  ; NOW CHECK IF THE GLOBAL SECTION IS MARKED FOR DELETION.  IF SO, CHECK THE
                              077B  ; PROCESSOR PTE REFERENCE COUNTS TO SEE IF THE SECTION CAN BE DELETED NOW.
                              077B  ;
        F0 66    02     E1    077B          BBC     #GSD$V_DELPEND,GSD$L_GSDFL(R6),NO_DEL ;BR IF NOT MARK FOR DEL
        52    51 A6     9A    077F          MOVZBL  GSD$B_PROCCNT(R6),R2              ;GET # OF PROC REF CNTS TO CHECK
        53    74 A6     9E    0783          MOVAB   GSD$L_PTECNT1(R6),R3              ;GET ADR OF FIRT PROC REF CNT
                 83     D5    0787  10$:    TSTL    (R3)+                             ;ARE THERE OUTSTANDING REFS?
                 DF     12    0789          BNEQ    RETRY_DEL                         ;BR IF REF EXISTS, CAN'T DEL YET
              F9 52     F5    078B          SOBGTR  R2,10$                            ;LOOP TO CHECK ALL REF CNTS
                              078E  ;
                              078E  ; THE GSD IS MARKED FOR DELETE AND ALL THE PROCESSOR REFERENCE COUNTS HAVE
                              078E  ; DROPPED TO ZERO.  THEREFORE, THE SHARED MEMORY GLOBAL PAGES MAY BE RELEASED
                              078E  ; AND THE GSD MARKED AS UNUSED.  IF THE SECTION IS WRITABLE, NOT COPY-ON-
                              078E  ; REFERENCE, AND MAPPED TO A FILE THEN THE SECTION MUST BE WRITTEN BACK TO
                              078E  ; THE FILE BEFORE IT CAN BE DELETED.
                              078E  ;
        53    16 A6     32    078E          CVTWL   GSD$W_GSTX(R6),R3                 ;IS IT MAPPED TO A FILE?
                 2A     13    0792          BEQL    20$                               ;NO, BR AS NO OUTPUT NEEDED
     08 20 A6    03     E1    0794          BBC     #SEC$V_WRT,GSD$W_FLAGS(R6),15$   ;BR IF NOT WRITABLE
     03 20 A6    01     E0    0799          BBS     #SEC$V_CRF,GSD$W_FLAGS(R6),15$   ;DON'T WRITE OUT CRF SEC EITHER
               FD07     30    079E          BSBW    MMG$WRITE_GSD                     ;WRITE SECTION INTO DISK FILE
  52    55    20 A5     C1    07A1  15$:    ADDL3   PHD$L_PSTBASOFF(R5),R5,R2         ;GET BASE OF SECTION TABLE
         53    6243     DE    07A6          MOVAL   (R2)[R3],R3                       ;GET ADR OF SECTION TABLE ENTRY
        53    0C A3     D0    07AA  18$:    MOVL    SEC$L_WINDOW(R3>,R3               ;GET WCB ADDRESS FOR SECTION
              0E A3     B7    07AE          DECW    WCB$W_REFCNT(R3)                  ;LAST REF ON SHARED WINDOW?
                 0B     14    07B1          BGTR    20$                               ;BRANCH IF NOT LAST REF
              16 A3     B4    07B3          CLRW    WCB$W_NMAP(R3)                    ;NO RETRIEVAL POINTERS
                              07B6          ASSUME WCB$W_P1_COUNT&3 EQ 0              ;STARTS AT LONG WORD OFFSET
00000000'GF   30 A3     0E    07B6          INSQUE  WCB$Q_PT_COUNT(R3),G^EXE$GL_WCBDELFL ;QUE WINDOW ON DELETE LIST
                 56     D5    07BE  20$:    TSTL    R6                                ;IS THIS A PARTIALLY CREATED GS?
                 3D     13    07C0          BEQL    70$                               ;BR ON YES, NO GSD TO DELETE
        00000113'EF     16    07C2          JSB     MMG$FINDSHD                       ;FIND THE SHB AND SHD FOR GSD
            50   01     9A    07C8          MOVZBL  #SHD$V_BITMAPLCK,R0               ;NUMBER OF BIT TO LOCK
               FF46     30    07CB          BSBW    MMG$SHMTXLK                       ;ACQUIRE MUTEX AND LOCK BIT
              40 50     E9    07CE          BLBC    R0,300$                           ;BR IF CAN'T LOCK BIT
    009E C5   15 A4     90    07D1          MOVB    SHB$B_PORT(R4),SHD$B_BITMAPLCK(R5) ;IDENTIFY HOLDER OF LOCK
               F826     30    07D7          BSBW    MMG$SET_BITMAP                    ;FREE THE PAGES OF THE SECTION
 00 009F C5      01     E7    07DA          BBCCI   #SHD$V_BITMAPLCK,SHD$B_FLAGS(R5),25$ ;RELEASE BITMAP LOCK
               FF6E     30    07E0  25$:    BSBW    MMG$SHMTXULK                      ;RELEASE MUTEX
        00 66    01     E6    07E3          BBSSI   #GSD$V_LOCKED,GSD$L_GSDFL(R6),30$ ;LOCK THE GSD TO RELEASE IT
        00 66    02     E7    07E7  30$:    BBCCI   #GSD$V_DELPEND,GSD$[_GSDFL(R6),40$ ;INDICATE NO MORE DELETE PEND
        00 66    00     E7    07EB  40$:    BBCCI   #GSD$V_VALID,GSD$L_GSDFL(R6),50$ ;RELEASE THE GSD
        00 66    01     E7    07EF  50$:    BBCCI   #GSD$V_LOCKED,GSD$[_GSDFL(R6),60$ ;UNLOCK THE GSD FOR RE-USE
        56    15 A4     9A    07F3  60$:    MOVZBL  SHB$B_PORT(R4),R6                 ;GET PORT NUMBER
              0C A4     D7    07F7          DECL    SHB$L_REFCNT(R4)                  ;ONE LESS PORT REFCNT
     3C A546     01     58    07FA          ADAWI   #1,SHD$W_GSDQUOTA(R5)[R6]         ;RETURN QUOTA FOR GSD
  55   00000000'FF      DE    07FF  70$:    MOVAL   @L^MMG$G[_SYSPHD,R5               ;GET SYSTEM HEADER ADDRESS
            51   6E     D0    0806          MOVL    (SP),R1                           ;GET SECTION TABLE OFFSET
              F7F4'     30    0809          BSBW    MMG$DALCSTX                       ;GO RELEASE THE SEC TBL ENTRY
                              080C  ;
                              080C  ; RETURN SUCCESSFULLY HERE.
                              080C  ;
           007E 8F      BA    080C  100$:   POPR    #^M<R1,R2,R3,R4,R5,R6>            ;RESTORE REGISTERS
                        05    0810          RSB                                       ;RETURN TO CALLER
                              0811
                              0811  ;
                              0811  ; CAN'T LOCK BITMAP.  MAKE THE GSD LOOK UNOWNED AND CONTINUE CLEANING UP
```

```
                     0811  ; THE SECTION TABLE ENTRY.  EVENTUALLY, MMG$FREEGSD WILL FIND AND FREE
                     0811  ; UP THE GSD AND BITMAP.
                     0811  ;
      16 A6     B4   0811  300$:   CLRW    GSD$W_GSTX(R6)               ;NULL SECTION TABLE INDEX
 52 A6   00     92   0814          MCOMB   #0,GSD$B_CREATPORT(R6)       ;MAKE CREATOR INVALID
         D9     11   0818          BRB     60$                          ;REJOIN MAIN FLOW
                     081A          .DSABL  LSB
```

```
                                081A         .SBTTL  MMG$FINDSHD - FIND THE SHARED MEMORY CONTAINING THIS GSD
                                081A
                                081A   ;++
                                081A   ; FUNCTIONAL DESCRIPTION:
                                081A   ;
                                081A   ; THIS ROUTINE FINDS THE SHARED MEMORY CONTROL BLOCK ADDRESS AND COMMON
                                081A   ; DATA PAGE ADDRESS FOR A SHARED MEMORY THAT CONTAINS A PARTICULAR GLOBAL
                                081A   ; SECTION.
                                081A   ;
                                081A   ; CALLING SEQUENCE:
                                081A   ;
                                081A   ;       BSBW    MMG$FINDSHD
                                081A   ;
                                081A   ; INPUT PARAMETERS:
                                081A   ;
                                081A   ;       R6 - ADDRESS OF GLOBAL SECTION DESCRIPTOR
                                081A   ;
                                081A   ; IMPLICIT INPUTS.
                                081A   ;
                                081A   ;       THE SHARED MEMORY DATA STRUCTURES ARE AVAILABLE (NOT DISCONNECTED).
                                081A   ;
                                081A   ; OUTPUT PARAMETERS:
                                081A   ;
                                081A   ;       R4 - ADDRESS OF SHARED MEMORY CONTROL BLOCK
                                081A   ;       R5 - ADDRESS OF SHARED MEMORY COMMON DATA PAGE
                                081A   ;
                                081A   ; IMPLICIT OUTPUTS:
                                081A   ;
                                081A   ;       NONE
                                081A   ;
                                081A   ; COMPLETION CODES:
                                081A   ;
                                081A   ;       NONE
                                081A   ;
                                081A   ; SIDE EFFECTS:
                                081A   ;
                                081A   ;       NONE
                                081A   ;
                                081A   ;--
                                081A   ; ******************************************************************************
                                081A   ;
                                081A   ; *********************** THE FOLLOWING CODE MUST BE RESIDENT ******************
                                081A   ;
                            00000113         .PSECT  $MMGCOD
                                0113   ;
                                0113   ; ******************************************************************************
                                0113   ;
                                0113
                                0113   MMG$FINDSHD::
                      07    BB  0113         PUSHR   #^M<R0,R1,R2>                    ;SAVE REGISTERS
      54      00000000'GF   D0  0115         MOVL    G^EXE$GL_SHBLIST,R4              ;GET ADR OF FIRST SHB
                      03    11  011C         BRB     20$                              ;JOIN COMMON CODE
                 54   64    D0  011E   10$:  MOVL    SHB$L_LINK(R4),R4                ;GET ADR OF NEXT SHB
                      29    13  0121   20$:  BEQL    NO_SHD_FOUND                     ;IF NO NEXT SHB, FATAL ERROR
           F6 0B A4   00    E1  0123         BBC     #SHB$V_CONNECT,SHB$B_FLAGS(R4),10$ ;IF DISCONNECTED, TRY NXT SHB
              55   04 A4    D0  0128         MOVL    SHB$L_DATAPAGE(R4),R5            ;GET ADR OF COMMON DATA PAGE
      51      55   04 A5    C1  012C         ADDL3   SHD$L_GSDPTR(R5),R5,R1           ;FIND START OF GSD TABLE
```

```
    51      56   D1   0131           CMPL     R6,R1                                  ;IS GSD WITHIN THIS TABLE?
            E8   1F   0134           BLSSU    10$                                    ;NO, GO FIND NEXT SHB
50       08 A1   3C   0136           MOVZWL   GSD$W_SIZE(R1),R0                      ;GET SIZE OF ONE GSD
52       18 A5   3C   013A           MOVZWL   SHD$W_GSDMAX(R5),R2                    ;GET NUMBER OF GSD'S IN TABLE
    52      50   C4   013E           MULL2    R0,R2                                  ;GET # OF BYTES IN TABLE
    52      51   C0   0141           ADDL2    R1,R2                                  ;GET ADR PAST END OF GSD TABLE
    52      56   D1   0144           CMPL     R6,R2                                  ;IS GSD IN THIS TABLE?
            D5   1E   0147           BGEQU    10$                                    ;NO, GC FIND NEXT SHB
            07   BA   0149           POPR     #^M<R0,R1,R2>                          ;RESTORE REGISTERS
                 05   014B           RSB                                             ;RETURN TO CALLER
                      014C
                      014C     ;
                      014C     ; THE GSD IS NOT IN A CONNECTED SHARED MEMORY.  THIS IS AN INCONSISTENCY IN
                      014C     ; IN THE DATA BASE.  FOR NOW, BUGCHECK.
                      014C     ;
                      014C     NO_SHD_FOUND:
                      014C               BUG_CHECK       NOSHMGSD,FATAL          ;FATAL ERROR
                      0150               .END
```

```
ALL_DONE                  00000063 R      02      IRP$L_IOST1             = 00000038
ALL_REST_SET              000000CC R      02      IRP$W_SIZE              = 00000008
BUG$_KRPEMPTY             ********    X   02      LNM$C_MAXDEPTH          = 0000000A
BUG$_NEGSHBREF            ********    X   03      LNM$C_NAMLENGTH         = 000000FF
BUG$_NOSHMGSD             ********    X   03      LNM$SEARCH_ONE            ********    X   02
BUG$_REFCNTNEG            ********    X   03      LNMX$B_FLAGS            = 00000000
CHECK_XLATION             000003F0 R      02      LNMX$T_XLATION          = 00000004
CLR_BITMAP                00000143 R      02      LNMX$V_TERMINAL         = 00000001
CTL$GL_KRPFL              ********    X   02      LOCK_ERR                  00000099 R      02
CTL$GL_PCB                ********    X   02      LWA_COLON               = 0000000C
DYN$C_IRP               = 0000000A                LWA_END                 = 00000111
END_OF_BITMAP             00000125 R      02      LWA_INPUT               = 00000012
ERROR_EXIT                00000710 R      02      LWA_INPUT_DESC          = 00000004
EVT$_PFCOM                ********    X   02      LWA_PREFIX              = 00000000
EXE$ALONONPAGED           ********    X   02      LWA_XLATION             = 0000000D
EXE$BLDPKTGSR             ********    X   02      MAXIO                   = 00000020
EXE$BLDPKTGSW             ********    X   02      MMG$ALOSHMGSD             00000174 RG     02
EXE$DEANONPAGED           ********    X   02      MMG$ALOSHMPAG             00000068 RG     02
EXE$GL_GSDGRPFL           ********    X   02      MMG$CEFTRNLOG             0000034F RG     02
EXE$GL_LOCKRTRY           ********    X   02      MMG$CLR_BITMAP            00000009 RG     02
EXE$GL_SHBLIST            ********    X   03      MMG$DALCSTX               ********    X   02
EXE$GL_SHMGSMTX           ********    X   02      MMG$DECSHMREF             00000076 RG     03
EXE$GL_WCBDELFL           ********    X   02      MMG$DELSHMGS              00000772 RG     02
FILE_DEV                  00000343 R      02      MMG$FIND1STGSD            0000026B RG     02
FILE_DEV_DESC             0000033B R      02      MMG$FINDGSDPFN            00000000 RG     03
FILE_DEV_SIZE           = 0000000C                MMG$FINDGSNOTRN           00000671 RG     02
FIND_PIECE                0000001B R      02      MMG$FINDSHB               00000293 RG     02
FIND_PIECE_END            000000AA R      02      MMG$FINDSHD               00000113 RG     03
FOUND_1_PIECE             0000012F R      02      MMG$FREEGSD               000001FF RG     02
FOUND_IT                  00000057 R      03      MMG$GETGSNAM              000002C8 RG     02
GET_NXT_SHM               0000006A R      03      MMG$GETNXTGSD             0000009C RG     03
GOT_PIECE                 000000D1 R      02      MMG$GL_SYSPHD             ********    X   02
GSD$B_CREATPORT         = 00000052                MMG$GSDSCN                ********    X   02
GSD$B_DELETPORT         = 00000053                MMG$GSDTRNLOG             00000361 RG     02
GSD$B_LOCK              = 00000050                MMG$INCSHMREF             00000079 RG     03
GSD$B_PROCCNT           = 00000051                MMG$MBXTRNLOG             00000358 RG     02
GSD$C_PFNBASMAX         = 00000004                MMG$READ_GSD              000004B1 RG     02
GSD$L_BASCNT1           = 00000058                MMG$SET_BITMAP            00000000 RG     02
GSD$L_BASPFN1           = 00000054                MMG$SHMTXLK               00000714 RG     02
GSD$L   DFL             = 00000000                MMG$SHMTXULK              00000751 RG     02
GSD$L_   ECNT1          = 00000074                MMG$UNIQUEGSD             000005B1 RG     02
GSD$T_GSDNAM            = 00000022                MMG$VALIDATEGSD           00000098 RG     03
GSD$V_DELPEND           = 00000002                MMG$WRITE_GSD             000004A8 RG     02
GSD$V_LOCKED            = 00000001                NEWIPL                    0000066D R      02
GSD$V_VALID             = 00000000                NEXT_PIECE                00000060 R      02
GSD$W_FLAGS             = 00000020                NOT_FOUND                 0000006F R      03
GSD$W_GSTX              = 00000016                NOT_MAPPED                00000519 R      02
GSD$W_SIZE              = 00000008                NO_BIT_SET                0000011C R      02
INSF_MEM                  00000157 R      02      NO_DEL                    0000076F R      02
INVALID_LOGNAM            00000493 R      02      NO_DUP_GSD                00000700 R      02
IO_FAIL                   0000061F R      02      NO_FREE_GSD               000001E8 R      02
IPL$_SYNCH              = 00000008                NO_IRP                    0000061F R      02
IRP$B_PRI               = 00000023                NO_QUOTA                  000001F3 R      02
IRP$B_TYPE              = 0000000A                NO_SHD_FOUND              0000014C R      03
IRP$C_LENGTH            = 000000C4                NXT_PIECE                 0000009C R      02
IRP$L_ASTPRM            = 00000014                PCB$B_PRIB              = 0000002F
IRP$L_IOSB              = 00000024                PCB$L_PHD               = 0000006C
```

```
PHD$L_PSTBASOFF          = 00000020                  SS$_SHMGSNOTMAP          = 0000036C
PHD$V_DALCSTX            = 00000001                  SS$_SHMNOTCNCT           = 0000037C
PHD$W_FLAGS              = 00000036                  SS$_TOOMANYLNAM          = 00000374
PR$_IPL                  = 00000012                  STOP_TRANSLATION           00000460 R     02
PRI$_IOCOM               = 00000001                  SYNCHIPL                   0000061B R     02
PSL$C_USER               = 00000003                  TRANSLATE_LOOP             000003B6 R     02
PSL$S_CURMOD             = 00000002                  TRANSLATION_DONE           0000048E R     02
PSL$S_PRVMOD             = 00000002                  WCB$W_NMAP               = 00000016
PSL$V_CURMOD             = 00000018                  WCB$W_P1_COUNT           = 00000030
PSL$V_PRVMOD             = 00000016                  WCB$W_REFCNT             = 0000000E
PTE$C_ERKW               = 30000000
PTE$M_VALID              = 80000000
REI_ROUTINE                000006B0 R     02
REI_RTN1                   0000060E R     02
RETRY_DEL                  0000076A R     02
RETURN                     00000498 R     02
RSB_HERE                   00000062 R     03
SCH$GL_CURPCB              ********    X  02
SCH$GQ_PFWQ                ********    X  02
SCH$LOCKW                  ********    X  02
SCH$RSE                    ********    X  02
SCH$UNLOCK                 ********    X  02
SCH$WAITK                  ********    X  02
SEC$B_PFC                = 0000000B
SEC$L_GSD                = 00000000
SEC$L_VBN                = 00000010
SEC$L_WINDOW             = 0000000C
SEC$V_CRF                = 00000001
SEC$V_DZRO               = 00000002
SEC$V_WRT                = 00000003
SHB$B_FLAGS              = 0000000B
SHB$B_PORT               = 00000015
SHB$L_BASGSPFN           = 00000010
SHB$L_DATAPAGE           = 00000004
SHB$L_LINK               = 00000000
SHB$L_REFCNT             = 0000000C
SHB$V_CONNECT            = 00000000
SHD$B_BITMAPLCK          = 0000009E
SHD$B_FLAGS              = 0000009F
SHD$B_GSDLOCK            = 000000A0
SHD$L_GSBITMAP           = 0000000C
SHD$L_GSDPTR             = 00000004
SHD$L_GSPAGCNT           = 00000010
SHD$T_NAME               = 00000020
SHD$V_BITMAPLCK          = 00000001
SHD$V_GSDLCK             = 00000002
SHD$W_GSDMAX             = 00000018
SHD$W_GSDQUOTA           = 0000003C
SHMIODONE                  00000640 R     02
SS$_EXPORTQUOTA          = 000003AC
SS$_GSDFULL              = 000000CC
SS$_INSFMEM              = 00000124
SS$_INTERLOCK            = 0000038C
SS$_IVLOGNAM             = 00000154
SS$_NOLOGNAM             = 000001BC
SS$_NORMAL               = 00000001
SS$_NOSUCHSEC            = 00000978
```

```
                                          +----------------+
                                          ! Psect synopsis !
                                          +----------------+

PSECT name                      Allocation          PSECT No.  Attributes
----------                      ----------          ---------  ----------
.  ABS  .                       00000000  (    0.)  00 (  0.)  NOPIC   USR   CON   ABS   LCL NOSHR NOEXE NORD   NOWRT NOVEC BYTE
$ABS$                           00000000  (    0.)  01 (  1.)  NOPIC   USR   CON   ABS   LCL NOSHR   EXE   RD     WRT NOVEC BYTE
Y$EXEPAGED                      0000081A  ( 2074.)  02 (  2.)  NOPIC   USR   CON   REL   LCL NOSHR   EXE   RD     WRT NOVEC BYTE
$MMGCOD                         00000150  (  336.)  03 (  3.)  NOPIC   USR   CON   REL   LCL NOSHR   EXE   RD     WRT NOVEC BYTE

                                        +------------------------+
                                        ! Performance indicators !
                                        +------------------------+

Phase                     Page faults    CPU Time       Elapsed Time
-----                     -----------    --------       ------------
Initialization                    29     00:00:00.04    00:00:01.29
Command processing               113     00:00:00.52    00:00:05.67
Pass 1                           476     00:00:18.43    00:01:14.95
Symbol table sort                  0     00:00:02.67    00:00:07.35
Pass 2                           400     00:00:06.04    00:00:21.42
Symbol table output                1     00:00:00.17    00:00:00.58
Psect synopsis output              0     00:00:00.03    00:00:00.03
Cross-reference output             0     00:00:00.00    00:00:00.00
Assembler run totals            1021     00:00:27.90    00:01:51.30

The working set limit was 2100 pages.
113259 bytes (222 pages) of virtual memory were used to buffer the intermediate code.
There were 90 pages of symbol table space allocated to hold 1630 non-local and 118 local symbols.
2393 source lines were read in Pass 1, producing 23 object records in Pass 2.
32 pages of virtual memory were used to define 31 macros.

                                       +--------------------------+
                                       ! Macro library statistics !
                                       +--------------------------+

Macro library name                         Macros defined
------------------                         --------------
_$255$DUA28:[SYS.OBJ]LIB.MLB;1                    19
_$255$DUA28:[SYSLIB]STARLET.MLB;2                  9
TOTALS (all libraries)                            28

1711 GETS were required to define 28 macros.

There were no errors, warnings or information messages.

MACRO/LIS=LIS$:SHMGSDRTN/OBJ=OBJ$:SHMGSDRTN MSRC$:SHMGSDRTN/UPDATE=(ENH$:SHMGSDRTN)+EXECML$/LIB
```

0380 AH-BT13A-SE
VAX/VMS V4.0

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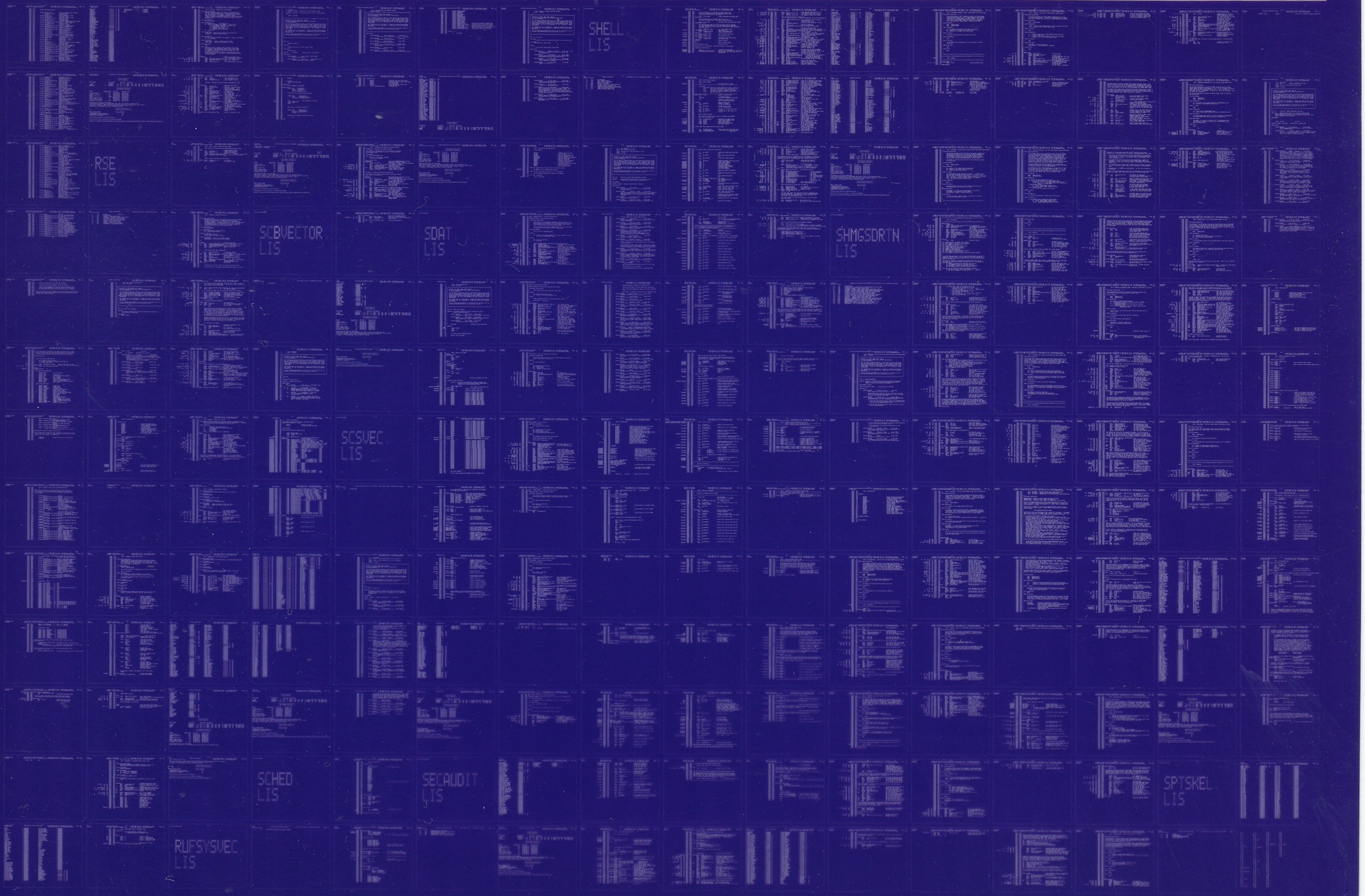

SHELL
LIS

RSE
LIS

SCBVECTOR
LIS

SDAT
LIS

SHMGSDRTN
LIS

SCSVEC
LIS

SCHED
LIS

SECAUDIT
LIS

SPTSKEL
LIS

RUFSYSVEC
LIS