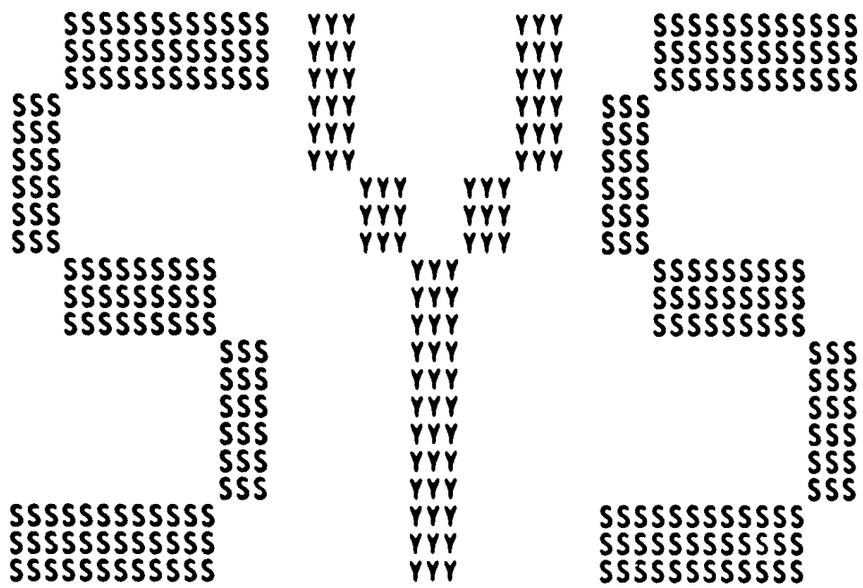

FILEID**SYSSETPRT

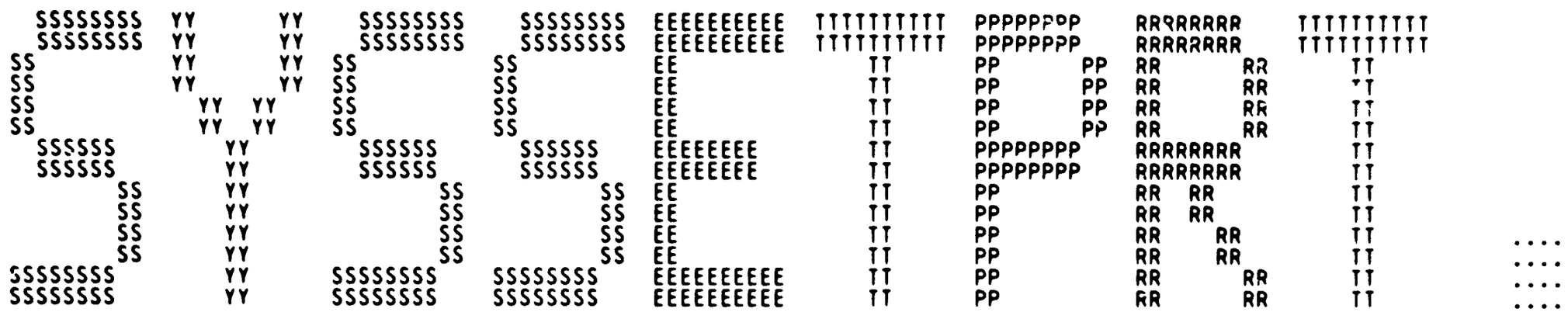

Table of contents

(2) 46 DECLARATIONS
(3) 79 SETPRT - SET PROTECTION FOR RANGE OF PAGES
(4) 191 SETPRTPAG - SET PROTECTION FOR A SINGLE PAGE

```
0000     1          .TITLE  SYSSETPRT - Set Page Protection System Service
0000     2          .IDENT  'V04-000'
0000     3 ;
0000     4 ;*****************************************************************************
0000     5 ;*                                                                           *
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0000    23 ;*                                                                           *
0000    24 ;*                                                                           *
0000    25 ;*****************************************************************************
0000    26
0000    27 ;++
0000    28 ; FACILITY:
0000    29 ;
0000    30 ; ABSTRACT:
0000    31 ;
0000    32 ; ENVIRONMENT:
0000    33 ;
0000    34 ; AUTHOR: PETER H. LIPMAN       , CREATION DATE: 24-APR-78
0000    35 ;
0000    36 ; MODIFIED BY:
0000    37 ;
0000    38 ;       V03-002 WMC0001         Wayne Cardoza           02-Mar-1983
0000    39 ;               MMG$CRECOM1 has gone away.
0000    40 ;
0000    41 ;       V03-001 KDM0002         Kathleen D. Morse       28-Jun-1982
0000    42 ;               Add $PCBDEF.  Fix some comments.
0000    43 ;
0000    44 ;--
```

```
                     0000     46          .SBTTL  DECLARATIONS
                     0000     47 ;
                     0000     48 ; INCLUDE FILES:
                     0000     49 ;
                     0000     50          $PCBDEF                         ;PROCESS CONTROL BLOCK OFFSETS
                     0000     51          $JIBDEF                         ;JIB OFFSETS
                     0000     52          $MMGDEF                         ;OFFSETS FROM FP INTO SCRATCH AREA
                     0000     53          $PFNDEF                         ;PAGE FRAME NUMBER DATA BASE
                     0000     54          $PHDDEF                         ;PROCESS HEADER DEFINITIONS
                     0000     55          $PRDEF                          ;PROCESSOR REGISTER DEFINTIONS
                     0000     56          $PRTDEF                         ;PROTECTION CODE DEFINITIONS
                     0000     57          $PTEDEF                         ;PAGE TABLE ENTRY DEFINITIONS
                     0000     58          $SSDEF                          ;SYSTEM STATUS CODE DEFINTIONS
                     0000     59 ;
                     0000     60 ; EXTERNAL SYMBOLS:
                     0000     61 ;
                     0000     62 ;
                     0000     63 ; MACROS:
                     0000     64 ;
                     0000     65 ;
                     0000     66 ; EQUATED SYMBOLS:
                     0000     67 ;
                     0000     68 ; OFFSET FROM AP
                     0000     69 ;
00000004             0000     70          INADR           = 4             ;OFFSET TO INPUT RANGE
00000008             0000     71          RETADR          = 8             ;OFFSET TO RETURN RANGE
0000000C             0000     72          ACMODE          = 12            ;ACCESS MODE
00000010             0000     73          PROT            = 16            ;NEW PROTECTION
00000014             0000     74          PRVPRT          = 20            ;PREVIOUS PROTECTION ADDRESS
                     0000     75 ;
                     0000     76 ; OWN STORAGE:
                     0000     77 ;
```

```
0000     79          .SBTTL  SETPRT - SET PROTECTION FOR RANGE OF PAGES
0000     80 ;++
0000     81 ; FUNCTIONAL DESCRIPTION:
0000     82 ;
0000     83 ;       THE SET PROTECTION SYSTEM SERVICE SETS THE PROTECTION FOR
0000     84 ;       THE SPECIFIED RANGE OF PAGES CHECKING THAT THE SPECIFIED MODE
0000     85 ;       IS AT LEAST AS PRIVILEGED AS THE OWNER OF THE PAGE.
0000     86 ;
0000     87 ; CALLING SEQUENCE:
0000     88 ;
0000     89 ;       CALLG   ARGLIST,@#SYS$SETPRT
0000     90 ;
0000     91 ; INPUT PARAMETERS:
0000     92 ;
0000     93 ;       INADR(AP) = ADDRESS OF 2 LONG WORDS THE 1ST OF WHICH SPECIFIES
0000     94 ;               THE STARTING VIRTUAL ADDRESS TO CREATE, THE 2ND SPECIFIES
0000     95 ;               THE ENDING VIRTUAL ADDRESS TO CREATE (INCLUSIVE).
0000     96 ;       RETADR(AP) = ADDRESS OF A 2 LONGWORD ARRAY INTO WHICH IS RETURNED
0000     97 ;               THE STARTING AND ENDING VIRTUAL ADDRESSES (INCLUSIVE)
0000     98 ;               OF THE PAGES JUST CREATED
0000     99 ;       ACMODE(AP) = THE ACCESS MODE (MAXIMIZED WITH CALLING MODE)
0000    100 ;               ON BEHALF OF WHICH THE CHANGE PROTECTION IS TO BE DONE
0000    101 ;               THIS MODE MUST BE AT LEAST AS PRIVILEGED AS THE MODE
0000    102 ;               OF THE PAGE OWNER.
0000    103 ;       PROT(AP)    = THE NEW PROTECTION FOR THE PAGE(S) SPECIFIED IN
0000    104 ;               THE LOW 4 BITS OF THE PARAMETER IN THE HARDWARE FORMAT.
0000    105 ;               THE REMAINING BITS ARE IGNORED.
0000    106 ;       PRVPRT(AP) = THE ADDRESS TO RETURN THE PREVIOUS PROTECTION
0000    107 ;               OF THE LAST (ONLY) PAGE CHANGED.
0000    108 ;
0000    109 ; IMPLICIT INPUTS:
0000    110 ;
0000    111 ;       CURRENT PCB LOCATED VIA SCH$GL_CURPCB
0000    112 ;       PROCESS HEADER AS SPECIFIED IN PCB$L_PHD OF THE PCB
0000    113 ;
0000    114 ; OUTPUT PARAMETERS:
0000    115 ;
0000    116 ;       R0 = SYSTEM STATUS CODE
0000    117 ;
0000    118 ; IMPLICIT OUTPUTS:
0000    119 ;
0000    120 ;       NONE
0000    121 ;
0000    122 ; COMPLETION CODES:
0000    123 ;
0000    124 ;       SS$_NORMAL                      ;SUCCESSFUL COMPLETION
0000    125 ;       SS$_NOPRIV                      ;NO PRIV TO CHANGE PROT ON SYS OR GLOBAL PAG
0000    126 ;       SS$_PAGOWNVIO                   ;PAGE OWNER VIOLATION
0000    127 ;       SS$_LENVIO                      ;LENGTH VIOLATION
0000    128 ;       SS$_ACCVIO                      ;ACCESS VIOLATION
0000    129 ;                                       ;INPUT RANGE INACCESSIBLE
0000    130 ;                                       ;RETURN RANGE NOT WRITABLE
0000    131 ;                                       ;PREVIOUS PROTECTION ADDRESS NOT WRITABLE
0000    132 ;
0000    133 ; SIDE EFFECTS:
0000    134 ;
0000    135 ;       NONE
```

```
                                                K 8
                                0000   136 ;
                                0000   137 ;--
                                0000   138
                                0000   139 ;
                                0000   140 ; ****************************************************************************
                                0000   141 ;
                                0000   142 ; ***************** THE FOLLOWING CODE MAY BE PAGED *****************
                                0000   143 ;
                            00000000   144         .PSECT  Y$EXEPAGED
                                0000   145 ;
                                0000   146 ; ****************************************************************************
                                0000   147 ;
                             03FC  0000   148         .ENTRY  EXE$SETPRT,^M<R2,R3,R4,R5,R6,R7,R8,R9>
                                0002   149
                          5E    1C  C2  0002   150         SUBL    S^#-MMG$C_LENGTH,SP     ;RESERVE SCRATCH AREA
                    56  00000000'EF  DE  0005   151         MOVAL   L^MMG$SETPRTPAG,R6      ;R6 = SUBR ADR TO CALL
                                000C   152
                                000C   153         ASSUME  PRT$C_NA EQ 0
                                000C   154         ASSUME  PRT$C_RESERVED EQ 1
                          58    10 AC  9A  000C   155         MOVZBL  PROT(AP),R8             ;GET NEW PROTECTION
                             01    58  D1  0010   156         CMPL    R8,#PRT$C_RESERVED      ;RESERVED OR NO ACCESS?
                                   32  15  0013   157         BLEQ    40$                     ;BRANCH IF YES
                          58    F0 8F  93  0015   158         BITB    #^C<PTE$M_PROT @ -PTE$V_PROT>,R8 ;BAD PROTECTION CODE?
                                   33  12  0019   159         BNEQ    50$                     ;BRANCH IF YES
                                   59  D4  001B   160 10$:     CLRL    R9                      ;INIT THE RETURN PROTECTION
                                FFE0'  30  001D   161         BSBW    MMG$INADRINI            ;INITIALIZE RETURN ADDRESS ARAYS & SCRATCH A
                             1F 50     E9  0020   162         BLBC    R0,20$
                             52   54   7D  0023   163         MOVQ    R4,R2                   ;R2 = START OF RANGE, R3 = END
                                FFD7'  30  0026   164         BSBW    MMG$CREDEL              ;COMMON CREATE CODE
                                   50  DD  0029   165         PUSHL   R0                      ;SAVE STATUS
                                FFD2'  30  002B   166         BSBW    MMG$RETRANGE            ;RETURN AFFECTED ADDRESS RANGE
                             11 50     E9  002E   167         BLBC    R0,20$                  ;USE THIS BAD STATUS RATHER THAN CREDEL
                                   50  BA  0031   168         POPR    R0
                          52    14 AC  D0  0033   169         MOVL    PRVPRT(AP),R2           ;ADDRESS TO RETURN PREVIOUS PROTECTION
                                   09  13  0037   170         BEQL    20$                     ;BRANCH IF NONE SPECIFIED
                                       0039   171         IFNOWRT #1,(R2),30$             ;BRANCH IF NOT WRITABLE
                             62    59  90  003F   172         MOVB    R9,(R2)                 ;RETURN THE PREVIOUS PROTECTION
                                       0042   173 20$:
                                   04  0042   174         RET                             ;EXIT WITH STATUS FROM CRECOM1
                          50    0C  3C  0043   175 30$:     MOVZWL  #SS$_ACCVIO,R0          ;ACCESS VIOLATION
                                   04  0046   176         RET
                                05     13  0047   177 40$:     BEQL    50$                     ;BRANCH IF RESERVED
                                       0049   178 ;
                                       0049   179 ; REQUESTED PROTECTION IS NO ACCESS
                                       0049   180 ; MUST BE AT LEAST KERNEL READ FOR THE FAULTING LOGIC TO WORK FOR
                                       0049   181 ; TRANSITION PAGES IN BOTH SETPRTPAG AND DELPAG.
                                       0049   182 ;
                          58    03     D0  0049   183         MOVL    #PRT$C_KR,R8            ;FORCE AT LEAST KERNEL READ
                                CD     11  004C   184         BRB     10$
                                       004E   185 ;
                                       004E   186 ; ILLEGAL OR RESERVED PROTECTION CODE SPECIFIED
                                       004E   187 ;
                    50  02F4 8F     3C  004E   188 50$:     MOVZWL  #SS$_IVPROTECT,R0       ;INVALID PROTECTION CODE
                                   04  0053   189         RET
```

```
0054   191          .SBTTL  SETPRTPAG - SET PROTECTION FOR A SINGLE PAGE
0054   192 ;++
0054   193 ; FUNCTIONAL DESCRIPTION:
0054   194 ;
0054   195 ;
0054   196 ; CALLING SEQUENCE:
0054   197 ;
0054   198 ;       BSBW    MMG$SETPRTPAG
0054   199 ;
0054   200 ;
0054   201 ; INPUT PARAMETERS:
0054   202 ;
0054   203 ;       R0 = ACCESS MODE FOR PAGE OWNERSHIP CHECK
0054   204 ;       R2 = VIRTUAL ADDRESS
0054   205 ;       R4 = CURRENT PCB ADDRESS
0054   206 ;       R5 = PROCESS HEADER ADDRESS - P1 OR SYSTEM SPACE
0054   207 ;       R6 = COUNT - 1 OF PAGES TO BE PROCESSED INCLUDING THIS ONE
0054   208 ;       R7 = +^X200 IF GOING FORWARD IN THE ADDRESS SPACE
0054   209 ;          = -^X200 IF GOING BACKWARDS IN THE ADDRESS SPACE
0054   210 ;       R8 = NEW PROTECTION
0054   211 ;
0054   212 ;       IPL = ASTDEL
0054   213 ;
0054   214 ; IMPLICIT INPUTS:
0054   215 ;       NONE
0054   216 ;
0054   217 ; OUTPUT PARAMETERS:
0054   218 ;
0054   219 ;       R0 = STATUS CODE
0054   220 ;       R2   PRESERVED
0054   221 ;
0054   222 ; IMPLICIT OUTPUTS:
0054   223 ;       NONE
0054   224 ;
0054   225 ; COMPLETION CODES:
0054   226 ;
0054   227 ;       SS$_NORMAL                      ;SUCCESSFUL COMPLETION
0054   228 ;       SS$_NOPRIV                      ;NO PRIV TO CHANGE PROT ON SYS OR GLOBAL PAG
0054   229 ;       SS$_PAGOWNVIO                   ;PAGE OWNER VIOLATION
0054   230 ;       SS$_LENVIO                      ;LENGTH VIOLATION
0054   231 ;       SS$_ACCVIO                      ;ACCESS VIOLATION
0054   232 ;
0054   233 ; SIDE EFFECTS:
0054   234 ;
0054   235 ;       NONE
0054   236 ;
0054   237 ;--
```

```
                        0054   239 ;
                        0054   240 ; ****************************************************************************
                        0054   241 ;
                        0054   242 ; ***************** THE FOLLOWING CODE MUST BE RESIDENT ***********************
                        0054   243 ;
                   00000000   244         .PSECT  $MMGCOD
                        0000   245 ;
                        0000   246 ; ****************************************************************************
                        0000   247 ;
                        0000   248 MMG$SETPRTPAG::
                        0000   249         SAVIPL                          ;SAVE CALLER'S IPL
                  50    DD    0003   250         PUSHL   R0                      ;SAVE ACCESS MODE
                FFF8'   30    0005   251         BSBW    MMG$PTEREF              ;REFERENCE PTE, RETURN SVAPTE
                        0008   252                                         ;RETURN AT IPL=SYNCH
               7F 50    E9    0008   253         BLBC    R0,BRPRTPAGRET          ;BRANCH IF LENGTH VIOLATION
            51    63    D0    000B   254         MOVL    (R3),R1                 ;FETCH THE PAGE TABLE ENTRY
                  4F    13    000E   255         BEQL    PRTPAGACCVIO            ;BRANCH IF DELETED
            50    6E    D0    0010   256         MOVL    (SP),R0                 ;ACCESS MODE
               FFEA'    30    0013   257         BSBW    MMG$PAGETYPE            ;CHECK ACCESS, RETURN PAGE TYPE
              71 50     E9    0016   258         BLBC    R0,BRPRTPAGRET          ;BRANCH IF PAGE OWNER VIOLATION
                        0019   259 ;
                        0019   260 ; R1 <0:7> PTE TYPE TO CASE ON (TYP0*2 + TYP1)
                        0019   261 ; R2 = VA, R3 = SVAPTE, IPL = SYNCH
                        0019   262 ; 0(SP) = ACCESS MODE, 4(SP) = SAVED IPL
                        0019   263 ;
      59    63    04    1B    EF  0019   264         EXTZV   #PTE$V_PROT,#PTE$S_PROT,(R3),R9 ;PREVIOUS PROTECTION
                        001E   265 ;
                        001E   266 ; THE FOLLOWING CODE SETS BIT 31 OF R8 IF THE REQUESTED PROTECTION
                        001E   267 ; CHANGE IS FROM READ ONLY TO READ WRITE, WHICH IN TURN WILL TRIGGER
                        001E   268 ; COPY ON REFERENCE LOGIC FOR SECTION TABLE PAGES.
                        001E   269 ;
            58    58    9A  001E   270         MOVZBL  R8,R8                   ;RESET BIT 31
                  12    13  0021   271         BEQL    50$                     ;BRANCH IF NEW PROT IS "NO ACCESS"
   03    58    02    00    ED  0023   272         CMPZV   #0,#2,R8,#3             ;IF EITHER OF 2 LOW BITS IS CLEAR
                        0028   273                                         ;THEN NEW PROT ALLOWS WRITE
                  0B    13  0028   274         BEQL    50$                     ;BRANCH IF READ ONLY
                        002A   275 ;
                        002A   276 ; NEW PROTECTION WILL SET PAGE WRITABLE
                        002A   277 ; SEE IF OLD PROTECTION WAS READ ONLY
                        002A   278 ;
   03    59    02    00    ED  002A   279         CMPZV   #0,#2,R9,#3             ;IF BOTH LOW BITS WERE SET
                        002F   280                                         ;THEN PAGE WAS READ ONLY
                  04    12  002F   281         BNEQ    50$                     ;BRANCH IF PAGE WAS WRITABLE
         00 58    1F    E2  0031   282         BBSS    #31,R8,50$              ;SET BIT INDICATING TRANSITION
                        0035   283                                         ;FROM READ ONLY TO WRITABLE
                        0035   284 50$:
   50    63    15    00    EF  0035   285         EXTZV   #PTE$V_PFN,#PTE$S_PFN,(R3),R0 ;R0=PFN IF PTE HAS ONE
                        003A   286         CASE    TYPE=B, SRC=R1, DISPLIST=<- ;DISPATCH ON PTE TYPE
                        003A   287                 PRTTRANS,-              ;TRANSITION OR DZRO
                        003A   288                 PRTPAGFIL,-             ;PAGING FILE
                        003A   289                 PRTGLOBAL,-             ;GLOBAL
                        003A   290                 PRTSTX,-                ;SECTION TABLE INDEX
                        003A   291                 PRTVALID-               ;VALID PAGE
                        003A   292         >
                        0048   293 ;
                        0048   294 ; TRANSITION OR DEMAND ZERO PAGE
                        0048   295 ; FAULT THIS PAGE TO AVOID HAVING ANY CODE OTHER THAN THE PAGE FAULT
```

```
                                0048   296 ; UNDERSTAND ALL THE TRANSITION STATES.  THE FAULTING OF DEMAND ZERO
                                0048   297 ; PAGES ELIMINATES THE POSSIBILITY OF THE "ZERO PAGE" LOGIC IN THE
                                0048   298 ; PAGE FAULT GETTING AN ACCESS VIOLATION.
                                0048   299 ;
                                0048   300 PRTTRANS:
                          50    D5 0048   301         TSTL    R0                      ;DEMAND ZERO PAGE?
                          0A    12 004A   302         BNEQ    20$                     ;BRANCH IF NOT
                03 58     02    00 ED 004C   303         CMPZV   #0,#2,R8,#3             ;NEW PROT ALLOWS WRITING IF
                                0051   304                                         ;EITHER LOW BIT IS 0
                          03    13 0051   305         BEQL    20$                     ;CONTINUE IF PAGE WILL NOT BE WRITABLE
                       00AA     31 0053   306         BRW     PRTCHANGE               ;BRANCH IF PAGE WILL STILL BE WRITABLE
                                0056   307                                         ;CHANGE PROTECTION WITHOUT FAULTING PAGE
                          01    BA 0056   308 20$:    POPR    #^M<R0>                 ;R0 = SAVED ACCESS MODE
                                0058   309         ENBINT                          ;POP AND RESTORE SAVED IPL
                          62    95 005B   310         TSTB    (R2)                    ;FAULT THE PAGE
                          A1    11 005D   311         BRB     MMG$SETPRTPAG           ;AND RESTART THE SET PROT ROUTINE
                                005F   312 ;
                                005F   313 ; PAGE ALREADY DELETED, CAN'T CHANGE PROTECTION
                                005F   314 ;
                                005F   315 PRTPAGACCVIO:
                    50    0C    3C 005F   316         MOVZWL  #SS$_ACCVIO,R0          ;ACCESS VIOLATION
                          26    11 0062   317         BRB     BRPRTPAGRET
                                0064   318 ;
                                0064   319 ; GLOBAL PAGE
                                0064   320 ;
                                0064   321 PRTGLOBAL:
              50  00000000'EF    D0 0064   322         MOVL    MMG$GL_GPTBASE,R0
            51 63    16    00    EF 006B   323         EXTZV   #PTE$V_GPTX,#PTE$S_GPTX,(R3),R1 ; GET GPTX
                  51    6041    D0 0070   324         MOVL    (R0)[R1],R1             ;GET GPTE
                        51    DD 0074   325         PUSHL   R1
                        50    D4 0076   326         CLRL    R0                      ;ASSUME KERNEL MODE ACCESS
                     FF85'    30 0078   327         BSBW    MMG$PAGETYPE
                50    8E    D0 007B   328         MOVL    (SP)+,R0                ;GET BACK THE GPTE
                03    51    91 007E   329         CMPB    R1,#3                   ;IS IT A GLOBAL SECTION INDEX
                      04    12 0081   330         BNEQ    PRTNOPRIV               ;NO - CAN'T CHANGE THE PROTECTION
             79 50    10    E0 0083   331         BBS     #PTE$V_CRF,R0,PRTCHANGE ;ALLOWED IF CRF
                                0087   332 PRTNOPRIV:
                50    24    3C 0087   333         MOVZWL  #SS$_NOPRIV,R0          ;NO PRIVILEGE
                                008A   334 BRPRTPAGRET:
                      7F    11 008A   335         BRB     PRTPAGRET
                                008C   336 ;
                                008C   337 ;       R0 - ADDRESS OF JIB
                                008C   338 ;
                                008C   339 ; EXCEEDED PAGE FILE QUOTA
                                008C   340 ;
                                008C   341 PGFLQUOTA:
                   3C A0        D6 008C   342         INCL    JIB$L_PGFLCNT(R0)       ;FIX UP THE COUNT
                      8E        D5 008F   343         TSTL    (SP)+                   ;CLEAN STACK
                50    1C        3C 0091   344         MOVZWL  #SS$_EXQUOTA,R0         ;RETURN "EXCEEDED QUOTA"
                    0074        31 0094   345         BRW     PRTPAGRET
                                0097   346 ;
                                0097   347 ; SECTION TABLE PAGE
                                0097   348 ;
                                0097   349 PRTSTX:
             65 58    1F        E1 0097   350         BBC     #31,R8,PRTCHANGE        ;BRANCH IF NO NEED TO COPY ON REF
             61 63    12        E0 009B   351         BBS     #PTE$V_WRT,(R3),PRTCHANGE ;BRANCH IF SECTION IS WRITABLE
                      50        DD 009F   352         PUSHL   R0                      ;SAVE PFN
```

```
                50   0080 C4    D0  00A1   353          MOVL    PCB$L_JIB(R4),R0        ;GET JIB ADDRESS
                       3C A0    D7  00A6   354          DECL    JIB$L_PGFLCNT(R0)       ;CHARGE A PAGE FILE PAGE
                          E1    19  00A9   355          BLSS    PGFLQUOTA               ;BRANCH IF OVER QUOTA
                          50 8ED0  00AB   356          POPL    R0                      ;RESTORE PFN
                     4E 63    10   E3  00AE   357          BBCS    #PTE$V_CRF,(R3),PRTCHANGE ;FORCE COPY ON REFERENCE
                              4C   11  00B2   358          BRB     PRTCHANGE               ;AND GO CHANGE THE PROTECTION
                                   00B4   359 ;
                                   00B4   360 ; VALID PAGE
                                   00B4   361 ;
                                   00B4   362 PRTVALID:
          00000000'EF    50    D1  00B4   363          CMPL    R0,MMG$GL_MAXPFN        ;IS THIS PAGE IN SHARED MEMORY?
                         CA    1A  00BB   364          BGTRU   PRTNOPRIV               ;BR IF IN SHAR MEM, MUST BE GBL SEC PAG
                     C6 63    15  00BD   365          BBS     #PTE$V_WINDOW,(R3),PRTNOPRIV ;RETURN ERROR IF PFN MAPPED PAGE
                                  00C1   366          ASSUME  PFN$C_PROCESS EQ 0      ;PROCESS PAGE TYPE
                0000'DF40    07    93  00C1   367          BITB    #PFN$M_PAGTYP,@W^PFN$AB_TYPE[R0] ;PROCESS PAGE?
                             BE    12  00C7   368          BNEQ    PRTNOPRIV               ;BRANCH IF NOT
                        33 58    1F  E1  00C9   369          BBC     #31,R8,PRTCHANGE        ;BRANCH IF NO NEED TO COPY ON REF
          51    0000'DF40    09    9C  00CD   370          ROTL    #<31-PTE$V_TYPO>,@W^PFN$AL_BAK[R0],R1 ;R1<31> = TYPO BIT
                             2A    18  00D4   371          BGEQ    PRTCHANGE               ;BRANCH IF ALREADY PAGING FILE ADDRESS
                                   00D6   372 ;
                                   00D6   373 ; CHANGE SECTION ADDRESS TO "NOT YET ALLOCATED" PAGING FILE ADDRESS
                                   00D6   374 ;
                        26 51    1B  E0  00D6   375          BBS     #<PTE$V_WRT+<31-PTE$V_TYPO>>,R1,PRTCHANGE ;BRANCH IF SECTION WRITABL
                                 50  DD  00DA   376          PUSHL   R0                      ;SAVE PFN
                50   0080 C4    D0  00DC   377          MOVL    PCB$L_JIB(R4),R0        ;GET JIB ADDRESS
                       3C A0    D7  00E1   378          DECL    JIB$L_PGFLCNT(R0)       ;CHARGE PAGE FILE QUOTA
                          A6    19  00E4   379          BLSS    PGFLQUOTA               ;BRANCH IF OVER QUOTA
                          50 8ED0  00E6   380          POPL    R0                      ;RESTORE PFN
                          09    EE  00E9   381          EXTV    #<PTE$V_STX+<31-PTE$V_TYPO>>,- ;GET SECTION INDEX
                51    51    10       00EB   382                  #PTE$S_STX,R1,R1        ;FROM SHIFTED BACKING STORE ADDRESS
                             52  DD  00EE   383          PUSHL   R2                      ;SAVE VIRTUAL ADDRESS
                         FF0D' 30  00F0   384          BSBW    MMG$DECSECREF           ;COUNT ONE LESS SECTION REFERENCE
                          04   BA  00F3   385          POPR    #^M<R2>                 ;RESTORE SAVED VIRTUAL ADDRESS
          0000'DF40    1C A5    D0  00F5   386          MOVL    PHD$L_PAGFIL(R5),@W^PFN$AL_BAK[R0] ;SET NULL PAGING FILE ADDRESS
                                   00FC   387                                          ;SET NULL PAGING FILE ADR
                 00 63    1A    E2  00FC   388          BBSS    #PTE$V_MODIFY,(R3),10$  ;FORCE MODIFY
                                   0100   389 10$:
                                   0100   390 ;
                                   0100   391 ; PAGE FILE PAGE
                                   0100   392 ;
                                   0100   393 PRTPAGFIL:
                                   0100   394 ;
                                   0100   395 ; CHANGE THE PAGE PROTECTION
                                   0100   396 ;
                                   0100   397 PRTCHANGE:
63      04    1B    58    F0  0100   398          INSV    R8,#PTE$V_PROT,#PTE$S_PROT,(R3) ;SET NEW PROTECTION
                                   0105   399          INVALID R2                      ;AND INVALIDATE THE TRANS BUFFER
                 50    01    3C  0108   400          MOVZWL  #SS$_NORMAL,R0          ;SUCCESSFUL COMPLETION
                                   010B   401 ;
                                   010B   402 ; EXIT HERE WITH R0 ALREADY SET
                                   010B   403 ; 0(SP) = ACCESS MODE, 4(SP) = IPL TO RESTORE, 8(SP) = SAVED PSL
                                   010B   404 ;
                                   010B   405 PRTPAGRET:
                          02   BA  010B   406          POPR    #^M<R1>                 ;POP THE SAVED ACCESS MODE
                                   010D   407          ENBINT                          ;RESTORE CALLER'S IPL
                               05  0110   408          RSB                             ;AND RETURN
                                   0111   409
```

```
0111    410
0111    411
0111    412          .END
```

```
ACMODE                          = 0000000C          SS$_NORMAL                      = 00000001
BRPRTPAGRET                       0000008A R      03
EXE$SETPRT                        00000000 RG     02
INADR                           = 00000004
JIB$L_PGFLCNT                   = 0000003C
MMG$CREDEL                        ********    X   02
MMG$C_LENGTH                    = FFFFFFE4
MMG$DECSECREF                     ********    X   03
MMG$GL_GPTBASE                    ********    X   03
MMG$GL_MAXPFN                     ********    X   03
MMG$INADRINI                      ********    X   02
MMG$PAGETYPE                      ********    X   03
MMG$PTEREF                        ********    X   03
MMG$RETRANGE                      ********    X   02
MMG$SETPRTPAG                     00000000 RG     03
PCB$L_JIB                       = 00000080
PFN$AB_TYPE                       ********    X   03
PFN$AL_BAK                        ********    X   03
PFN$C_PROCESS                   = 00000000
PFN$M_PAGTYP                    = 00000007
PGFLQUOTA                         0000008C R      03
PHD$L_PAGFIL                    = 0C000010
PR$_IPL                         = 00000012
PR$_TBIS                        = 0000003A
PROT                            = 00000010
PRT$C_KR                        = 00000003
PRT$C_NA                        = 00000000
PRT$C_RESERVED                  = 00000001
PRTCHANGE                         00000100 R      03
PRTGLOBAL                         00000064 R      03
PRTNOPRIV                         00000087 R      03
PRTPAGACCVIO                      0000005F R      03
PRTPAGFIL                         00000100 R      03
PRTPAGRET                         0000010B R      03
PRTSTX                            00000097 R      03
PRTTRANS                          00000048 R      03
PRTVALID                          000000B4 R      03
PRVPRT                          = 00000014
PTE$M_PROT                      = 78000000
PTE$S_GPTX                      = 00000016
PTE$S_PFN                       = 00000015
PTE$S_PROT                      = 00000004
PTE$S_STX                       = 00000010
PTE$V_CRF                       = 00000010
PTE$V_GPTX                      = 00000000
PTE$V_MODIFY                    = 0000001A
PTE$V_PFN                       = 00000000
PTE$V_PROT                      = 0000001B
PTE$V_STX                       = 00000000
PTE$V_TYPO                      = 00000016
PTE$V_WINDOW                    = 00000015
PTE$V_WRT                       = 00000012
RETADR                          = 00000008
SS$_ACCVIO                      = 0000000C
SS$_EXQUOTA                     = 0000001C
SS$_IVPROTECT                   = 000002F4
SS$_NOPRIV                      = 00000024
```

```
                    +----------------+
                    ! 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                      00000054  (   84.)  02 (  2.)  NOPIC   USR   CON   REL   LCL NOSHR   EXE   RD    WRT NOVEC BYTE
$MMGCOD                         00000111  (  273.)  03 (  3.)  NOPIC   USR   CON   REL   LCL NOSHR   EXE   RD    WRT NOVEC BYTE

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

Phase                       Page faults     CPU Time        Elapsed Time
-----                       -----------     --------        ------------
Initialization                       30     00:00:00.11     00:00:00.44
Command processing                  125     00:00:00.57     00:00:02.07
Pass 1                              299     00:00:08.86     00:00:16.71
Symbol table sort                     0     00:00:01.44     00:00:02.97
Pass 2                               84     00:00:01.80     00:00:04.02
Symbol table output                   8     00:00:00.08     00:00:00.28
Psect synopsis output                 2     00:00:00.02     00:00:00.03
Cross-reference output                0     00:00:00.00     00:00:00.00
Assembler run totals                550     00:00:12.89     00:00:26.52

The working set limit was 1200 pages.
50505 bytes (99 pages) of virtual memory were used to buffer the intermediate code.
There were 50 pages of symbol table space allocated to hold 937 non-local and 10 local symbols.
412 source lines were read in Pass 1, producing 18 object records in Pass 2.
22 pages of virtual memory were used to define 21 macros.

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

Macro library name                      Macros defined
------------------                      --------------
_$255$DUA28:[SYS.OBJ]LIB.MLB;1                      11
_$255$DUA28:[SYSLIB]STARLET.MLB;2                    7
TOTALS (all libraries)                              18

1043 GETS were required to define 18 macros.

There were no errors, warnings or information messages.

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

SYSSETPRA LIS

SYSSETSSF LIS

SYSSNDJBC LIS

SYSSETIME LIS

SYSSETPFM LIS

SYSUPDSEC LIS

SYSSNDMSG LIS

SYSSETPRT LIS

SYSSETPRV LIS

SYSUNWIND LIS

SYSSETSTK LIS

SYSSETMOD LIS

SYSSETEXV LIS

SYSSETPRI LIS

SYSSCHEVT LIS