```
SSSSSSSSSSSS   YYY         YYY   SSSSSSSSSSSS
SSSSSSSSSSSS   YYY         YYY   SSSSSSSSSSSS
SSSSSSSSSSSS   YYY         YYY   SSSSSSSSSSSS
SSS            YYY         YYY
SSS            YYY         YYY   SSS
SSS            YYY         YYY   SSS
SSS              YYY     YYY     SSS
SSS              YYY     YYY     SSS
SSS              YYY     YYY     SSS
   SSSSSSSS        YYY             SSSSSSSS
   SSSSSSSS        YYY             SSSSSSSS
   SSSSSSSS        YYY             SSSSSSSS
           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
```

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```
SSSSSSSS   VV       VV    AAAAAA   PPPPPPPP    TTTTTTTTTT  EEEEEEEEEE
SSSSSSSS   VV       VV    AAAAAA   PPPPPPPP    TTTTTTTTTT  ECEEEEEEEE
SS         VV       VV   AA    AA  PP     PP       TT      EE
SS         VV       VV   AA    AA  PP     PP       TT      EE
SS         VV       VV   AA    AA  PP     PP       TT      EE
   SSSSSS   VV     VV    AA    AA  PPPPPPPP        TT      EEEEEEEE
   SSSSSS   VV     VV    AA    AA  PPPPPPPP        TT      EEEEEEEE
       SS   VV    VV    AAAAAAAAAA  PP             TT      EE
       SS   VV    VV    AAAAAAAAAA  PP             TT      EE
       SS    VV  VV     AA    AA   PP              TT      EE       ....
       SS    VV  VV     AA    AA   PP              TT      EE       ....
SSSSSSSS      VV        AA    AA   PP              TT      EEEEEEEEEE ....
SSSSSSSS      VV        AA    AA   PP              TT      EEEEEEEEEE ....

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

SVAPTE
V04-000

C 2
- SYSTEM VIRTUAL ADDRESS OF PAGE TABLE E 16-SEP-1984 C1:18:49 VAX/VMS Macro V04-00   Page 1
                                          5-SEP-1984 03:48:09 [SYS.SRC]SVAPTE.MAR;1   (1)

SWA
V04

```
0000      1              .TITLE  SVAPTE - SYSTEM VIRTUAL ADDRESS OF PAGE TABLE ENTRY
0000      2              .IDENT  'V04-000'
0000      3    ;
0000      4    ;******************************************************************
0000      5    ;*                                                                *
0000      6    ;*   COPYRIGHT (c) 1978, 1980, 1982, 1984 BY                      *
0000      7    ;*   DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS.       *
0000      8    ;*   ALL RIGHTS RESERVED.                                         *
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0000     10    ;*   THIS SOFTWARE IS FURNISHED UNDER A LICENSE AND MAY BE USED AND COPIED *
0000     11    ;*   ONLY IN  ACCORDANCE WITH  THE  TERMS  OF  SUCH  LICENSE  AND WITH THE *
0000     12    ;*   INCLUSION OF THE ABOVE COPYRIGHT NOTICE. THIS SOFTWARE OR  ANY  OTHER *
0000     13    ;*   COPIES THEREOF MAY NOT BE PROVIDED OR OTHERWISE MADE AVAILABLE TO ANY *
0000     14    ;*   OTHER PERSON.  NO TITLE TO AND OWNERSHIP OF  THE  SOFTWARE IS  HEREBY *
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0000     16    ;*                                                                *
0000     17    ;*   THE INFORMATION IN THIS SOFTWARE IS  SUBJECT TO CHANGE WITHOUT NOTICE *
0000     18    ;*   AND  SHOULD  NOT  BE  CONSTRUED AS  A COMMITMENT BY DIGITAL EQUIPMENT *
0000     19    ;*   CORPORATION.                                                 *
0000     20    ;*                                                                *
0000     21    ;*   DIGITAL ASSUMES NO RESPONSIBILITY FOR THE USE  OR  RELIABILITY OF ITS *
0000     22    ;*   SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DIGITAL.      *
0000     23    ;*                                                                *
0000     24    ;*                                                                *
0000     25    ;******************************************************************
0000     26
0000     27    ;++
0000     28    ; FACILITY:     EXECUTIVE, MEMORY MANAGEMENT SUBROUTINES
0000     29    ;
0000     30    ; ABSTRACT:     GIVEN A VIRTUAL ADDRESS (PROCESS OR SYSTEM),
0000     31    ;               RETURN THE SYSTEM VIRTUAL ADDRESS OF ITS ASSOCIATED PAGE TABLE ENTRY.
0000     32    ;
0000     33    ; ENVIRONMENT: KERNEL MODE, NO INTERLOCK REQUIRED
0000     34    ;
0000     35    ;--
0000     36    ;
0000     37    ;         .PAGE
0000     38    ;         .SBTTL  HISTORY                   ; DETAILED
0000     39    ;
0000     40    ; AUTHOR: PETER H. LIPMAN        , CREATION DATE: 14-SEP-76
0000     41    ;
0000     42    ; MODIFIED BY:
0000     43    ;
0000     44    ;         V03-001 WMC0001         Wayne Cardoza   02-MAY-1984
0000     45    ;               Don't allow change to working set in PTEREF.
0000     46    ;
```

```
                0000    48              .SBTTL  DECLARATIONS
                0000    49
                0000    50 ;
                0000    51 ; INCLUDE FILES:
                0000    52 ;
                0000    53              $IPLDEF                          ;PROCESSOR PRIORITY LEVEL DEFINITIONS
                0000    54              $PCBDEF                          ;DEFINE PROCESS CONTROL BLOCK OFFSETS
                0000    55              $PHDDEF                          ;DEFINE PROCESS HEADER OFFSETS
                0000    56              $PRDEF                           ;PROCESSOR REGISTER DEFINITIONS
                0000    57              $SSDEF                           ;SYSTEM STATUS CODES
                0000    58              $VADEF                           ;VIRTUAL ADDRESS VIELDS
                0000    59 ;
                0000    60 ; EXTERNAL SYMBOLS:
                0000    61 ;
                0000    62
                0000    63 ;
                0000    64 ; MACROS:
                0000    65 ;
                0000    66
                0000    67
                0000    68 ; EQUATED SYMBOLS:
                0000    69 ;
                0000    70
                0000    71 ; OWN STORAGE:
                0000    72 ;
                0000    73 ;
                0000    74 ; *********************************************************************
                0000    75 ;
                0000    76 ; *************** THIS ENTIRE MODULE MUST BE RESIDENT ****************
                0000    77 ;
            00000000    78          .PSECT  $MMGCOD
                0000    79 ;
                0000    80 ; *********************************************************************
                0000    81 ;
```

SVAPTE
V04-000

E 2
- SYSTEM VIRTUAL ADDRESS OF PAGE TABLE E 16-SEP-1984 01:18:49   VAX/VMS Macro V04-00   Page 3
SVAPTECHK - SYSTEM VIRTUAL ADDRESS OF PA 5-SEP-1984 03:48:09 [SYS.SRC]SVAPTE.MAR;1   (2)

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```
                          0000      83              .SBTTL  SVAPTECHK - SYSTEM VIRTUAL ADDRESS OF PAGE TABLE ENTRY
                          0000      84      ;++
                          0000      85      ; FUNCTIONAL DESCRIPTION:
                          0000      86      ;
                          0000      87      ;       GIVEN A PROCESS OR SYSTEM VIRTUAL ADDRESS IN R2, RETURN THE
                          0000      88      ;       SYSTEM VIRTUAL ADDRESS OF THE CORRESPONDING PAGE TABLE ENTRY
                          0000      89      ;       IF THE ADDRESS IS OFF THE END OF ITS PAGE TABLE, BUGCHK
                          0000      90      ;
                          0000      91      ; CALLING SEQUENCE:
                          0000      92      ;
                          0000      93      ;       BSBW    MMG$SVAPTECHK
                          0000      94      ;
                          0000      95      ; INPUT PARAMETERS:
                          0000      96      ;
                          0000      97      ;       R2 = VIRTUAL ADDRESS (P0, P1, OR SYSTEM SPACE)
                          0000      98      ;       R4 = PROCESS CONTROL BLOCK ADDRESS
                          0000      99      ;       R5 = PROCESS HEADER ADDRESS
                          0000     100      ;       IPL = SYNCH (TO AVOID HAVING PROCESS PAGE TABLE MOVE)
                          0000     101      ;
                          0000     102      ; IMPLICIT INPUTS:
                          0000     103      ;
                          0000     104      ;       NONE
                          0000     105      ;
                          0000     106      ; OUTPUT PARAMETERS:
                          0000     107      ;
                          0000     108      ;       R2 PRESERVED
                          0000     109      ;       R3 = SYSTEM VIRTUAL ADDRESS OF THE PAGE TABLE ENTRY
                          0000     110      ;
                          0000     111      ; IMPLICIT OUTPUTS:
                          0000     112      ;
                          0000     113      ;       NONE
                          0000     114      ;
                          0000     115      ; COMPLETION CODES:
                          0000     116      ;
                          0000     117      ;       NONE
                          0000     118      ;
                          0000     119      ; SIDE EFFECTS:
                          0000     120      ;
                          0000     121      ;       NONE
                          0000     122      ;
                          0000     123      ;--
                          0000     124      MMG$SVAPTECHK::
        15 52    1F   E1  0000     125              BBC     #31,R2,MMG$PTEADRCHK    ;HANDLE PROCESS SPACE VIA PTEADRCHK
  00000000'EF    52   D1  0004     126              CMPL    R2,MMG$GL_FRESVA       ;ADDRESS WITHIN PAGE TABLE?
              11 1E  000B     127              BGEQU   PTELENVIO             ;BRANCH IF NOT, LENGTH VIOLATION
  53 52   15  09  EF  000D     128              EXTZV   #VA$V_VPN,#VA$S_VPN,R2,R3 ;VIRTUAL PAGE NUMBER
  53   0000'DF43  DE  0012     129              MOVAL   @W^MMG$GL_SPTBASE[R3],R3        ;SYS VIRTUAL ADDRESS OF PTE
              05  0018     130              RSB
```

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V04-000

F 2
- SYSTEM VIRTUAL ADDRESS OF PAGE TABLE E 16-SEP-1984 01:18:49 VAX/VMS Macro V04-00   Page 4
PTEADR, PTEINDX - PAGE TABLE ENTRY ADDRE 5-SEP-1984 03:48:09 [SYS.SRC]SVAPTE.MAR;1   (3)

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5F

```
0019   132              .SBTTL  PTEADR, PTEINDX - PAGE TABLE ENTRY ADDRESS OR INDEX
0019   133      ;++
0019   134      ; FUNCTIONAL DESCRIPTION:
0019   135      ;
0019   136      ;       GIVEN A VIRTUAL ADDRESS (SYSTEM OR PROCESS), CALCULATE
0019   137      ;                  1) THE SYSTEM VIRTUAL ADDRESS OF THE PAGE TABLE ENTRY
0019   138      ;       OR
0019   139      ;                  2) THE LONG WORD INDEX FROM THE BASE OF THE PROCESS/SYSTEM
0019   140      ;                  HEADER TO THE PAGE TABLE ENTRY
0019   141      ;
0019   142      ; CALLING SEQUENCE:
0019   143      ;
0019   144      ;       BSBW    MMG$PTEREF              ;FAULT PTE, RETURN SYS VIRT ADR OF PTE
0019   145      ;                                      ;RETURN IPL=SYNCH, RO = SYSTEM STATUS
0019   146      ;       BSBW    MMG$PTEADRCHK           ;RETURN SYSTEM VIRTUAL ADDRESS OF PTE
0019   147      ;                                      ;BUGCHK IF LENGTH VIOLATION
0019   148      ;       BSBW    MMG$PTEINDX            ;RETURN LONG WORD INDEX TO PTE
0019   149      ;                                      ;RO = SYSTEM STATUS CODE
0019   150      ;       BSBW    MMG$PTEINDXCHK         ;RETURN LONG WORD INDEX TO PTE
0019   151      ;                                      ;BUGCHK IF LENGTH VIOLATION
0019   152      ;
0019   153      ; INPUT PARAMETERS:
0019   154      ;
0019   155      ;       R2    PROCESS VIRTUAL ADDRESS (P0 OR P1 SPACE)
0019   156      ;       R4 = PROCESS CONTROL BLOCK ADDRESS
0019   157      ;       R5 = PROCESS HEADER ADDRESS
0019   158      ;               THIS MAY BE EITHER THE SYSTEM SPACE OR P1 SPACE ADDRESS
0019   159      ;               OF THE PROCESS HEADER, BUT IF IT IS THE SYSTEM SPACE ADDRESS
0019   160      ;               THE CALLING IPL MUST BE AT SYNCH TO PREVENT SWAPPING
0019   161      ;       IPL LEQ SYNCH - IF REQUESTING THE ADDRESS OF THE PAGE TABLE ENTRY
0019   162      ;               OR IF THE SYSTEM SPACE ADDRESS OF THE PROCESS HEADER IS
0019   163      ;               SPECIFIED, IPL MUST BE AT SYNCH TO PREVENT SWAPPING
0019   164      ;
0019   165      ;   OR
0019   166      ;
0019   167      ;       R2 = SYSTEM SPACE VIRTUAL ADDRESS
0019   168      ;       R4 = SYSTEM PROCESS CONTROL BLOCK ADDRESS
0019   169      ;       R5 = SYSTEM ADDRESS (NO P1 SPACE EQUIVALENT) OF SYSTEM PROCESS HEADER
0019   170      ;       IPL NOT REQUIRED TO BE AT SYNCH SINCE THE SYSTEM PAGE TABLE IS
0019   171      ;               NOT EVER MOVED.
0019   172      ;
0019   173      ; IMPLICIT INPUTS:
0019   174      ;
0019   175      ;       NONE
0019   176      ;
0019   177      ; OUTPUT PARAMETERS:
0019   178      ;
0019   179      ;       RO = SYSTEM STATUS CODE
0019   180      ;       R2 PRESERVED
0019   181      ;       R3 = SYSTEM VIRTUAL ADDRESS OF PAGE TABLE ENTRY OR LONG WORD
0019   182      ;               INDEX TO PAGE TABLE ENTRY ACCORDING TO THE ENTRY POINT
0019   183      ;
0019   184      ; IMPLICIT OUTPUTS:
0019   185      ;
0019   186      ;       NONE
0019   187      ;
0019   188      ; COMPLETION CODES:
```

SVAPTE
V04-000

G 2
- SYSTEM VIRTUAL ADDRESS OF PAGE TABLE E 16-SEP-1984 01:18:49 VAX/VMS Macro V04-00   Page   5
PTEADR, PTEINDX - PAGE TABLE ENTRY ADDRE 5-SEP-1984 03:48:09 [SYS.SRC]SVAPTE.MAR;1   (3)

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```
0019  189 :
0019  190 :         SSS_LENVIO                      ;PAGE TABLE LENGTH VIOLATION
0019  191 :
0019  192 : SIDE EFFECTS:
0019  193 :
0019  194 :         NONE
0019  195 :
0019  196 :--
```

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V04-000

H 2
- SYSTEM VIRTUAL ADDRESS OF PAGE TABLE E 16-SEP-1984 01:18:49 VAX/VMS Macro V04-00   Page 6
PTEADR, PTEINDX - PAGE TABLE ENTRY ADDRE 5-SEP-1984 03:48:09 [SYS.SRC]SVAPTE.MAR;1   (4)

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```
                              0019    198              .ENABL  LSB
                              0019    199
                              0019    200   MMG$PTEADRCHK::
                 32     10    0019    201              BSBB    MMG$PTEINDX             ;GET INDEX TO PAGE TABLE ENTRY
              1A 50     E8    001B    202              BLBS    R0,20$                  ;BRANCH IF GOT ONE
                              001E    203   PTELENVIO:
                              001E    204              BUG_CHECK PTELENVIOL,FATAL      ;UNEXPECTED PAGE TABLE LENGTH VIOLATION
                              0022    205
                              0022    206   MMG$PTEREF::
                 29     10    0022    207              BSBB    MMG$PTEINDX             ;GET INDEX TO PAGE TABLE ENTRY
              16 50     E9    0024    208              BLBC    R0,30$                  ;BRANCH IF LENGTH VIOLATION
        12 36 A5 06     E2    0027    209              BBSS    #PHD$V_NO_WS_CHNG,PHD$W_FLAGS(R5),40$ ;NO CHANGE TO WORKING SET ALLO
           6C B443     D5    002C    210              TSTL    @PCB$L_PHD(R4)[R3]       ;FAULT THE PAGE TABLE IF NECESSARY
                              0030    211              SETIPL  #IPL$_SYNCH             ;AND THEN RAISE TO SYNCH
                              0033    212              ASSUME  PHD$M_NO_WS_CHNG LE 255
        36 A5 40 8F     8A    0033    213              BICB    #PHD$M_NO_WS_CHNG,PHD$W_FLAGS(R5) ;BACK TO NORMAL
           53 6C B443  DE    0038    214   20$:        MOVAL   @PCB$L_PHD(R4)[R3],R3   ;CONVERT INDEX TO SYSTEM VIRTUAL
                              003D    215                                             ;ADDRESS OF PAGE TABLE ENTRY
                 05    003D    216   30$:        RSB
                              003E    217
           6C B443     D5    003E    218   40$:        TSTL    @PCB$L_PHD(R4)[R3]      ;FAULT THE PAGE TABLE IF NECESSARY
                              0042    219              SETIPL  #IPL$_SYNCH             ;AND THEN RAISE TO SYNCH
                 F1     11    0045    220              BRB     20$                     ;LEAVE BIT SET
                              0047    221
                              0047    222              .DSABL  LSB
                              0047    223
                              0047    224   MMG$PTEINDXCHK::
                 04     10    0047    225              BSBB    MMG$PTEINDX             ;GET INDEX TO PAGE TABLE ENTRY
              D2 50     E9    0049    226              BLBC    R0,PTELENVIO            ;BUGCHK IF LENGTH VIOLATION
                 05    004C    227              RSB
                              004D    228
                              004D    229   MMG$PTEINDX::
              50 01     3C    004D    230              MOVZWL  #SS$_NORMAL,R0          ;ASSUME SUCCESSFUL COMPLETION
        53 52 16 09     EE    0050    231              EXTV    #VA$V_VPN,#VA$S_VPN+1,R2,R3 ;SIGN EXTENDED VIRTUAL PAGE NUMBER
                              0055    232                                             ;INCLUDING P1 SPACE BIT
              1A     19    0055    233              BLSS    20$                     ;BRANCH IF P1 SPACE
           28 A5 52     D1    0057    234              CMPL    R2,PHD$L_FREP0VA(R5)    ;OFF THE END OF P0 (OR SYSTEM) SPACE?
                 20     1E    005B    235              BGEQU   30$                     ;BRANCH IF YES, LENGTH VIOLATION
           06 52     1F     E0    005D    236              BBS     #31,R2,10$              ;BRANCH IF SYSTEM SPACE
        53 0000'CF     C0    0061    237              ADDL    W^SGN$GL_PHDLWCNT,R3    ;ADD OFFSET FROM PHD TO POPT
                 05    0066    238              RSB
        7E 0000'CF     1E     9C    0067    239   10$:        ROTL    #<32-2>,W^MMG$GL_SYSPHDLN,-(SP) ;ADD OFFSET FROM SYSPHD
           53 8E     C0    006D    240              ADDL    (SP)+,R3               ;TO SYSPT
                 05    0070    241              RSB
                              0071    242   ;
                              0071    243   ; P1 SPACE VIRTUAL ADDRESS
                              0071    244   ;
        30 A5 52     D1    0071    245   20$:        CMPL    R2,PHD$L_FREP1VA(R5)    ;OFF THE END OF P1 SPACE?
                 06     1B    0075    246              BLEQU   30$                     ;BRANCH IF YES, LENGTH VIOLATION
        53 0000'CF     C0    0077    247              ADDL    W^SGN$GL_P1LWCNT,R3     ;ADD OFFSET FROM PHD
                              007C    248                                             ;TO LAST + 1 ENTRY OFF END OF P1PT
                 05    007C    249              RSB
           50 018C 8F     3C    007D    250   30$:        MOVZWL  #SS$_LENVIO,R0          ;LENGTH VIOLATION STATUS
                 05    0082    251              RSB
                              0083    252
                              0083    253
                              0083    254              .END
```

```
BUG$_PTELENVIOL          ******** X  02
IPL$_SYNCH             = 00000008
MMG$GL_FRESVA            ******** X  02
MMG$GL_SPTBASE           ******** X  02
MMG$GL_SYSPHDLN          ******** X  02
MMG$PTEADRCHK           00000019 RG  02
MMG$PTEINDX            0000004D RG  02
MMG$PTEINDXCHK         00000047 RG  02
MMG$PTEREF             00000022 RG  02
MMG$SVAPTECHK          00000000 RG  02
PCB$L_PHD             = 0000006C
PHD$L_FREPOVA         = 00000028
PHD$L_FREP1VA         = 00000030
PHD$M_NO_WS_CHNG      = 00000040
PHD$V_NO_WS_CHNG      = 00000006
PHD$W_FLAGS           = 00000036
PR$_IPL               = 00000012
PTELENVIO             0000001E R   02
SGN$GL_P1LWCNT          ******** X  02
SGN$GL_PHDLWCNT         ******** X  02
SS$_LENVIO            = 0000018C
SS$_NORMAL            = 00000001
VA$S_VPN              = 00000015
VA$V_VPN              = 00000009
```

```
                         +-----------------+
                         ! 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
$MMGCOD                  00000083 (   131.)  02 (   2.)  NOPIC   USR  CON  REL  LCL NOSHR  EXE   RD    WRT NOVEC BYTE


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


Phase                 Page faults   CPU Time      Elapsed Time
-----                 -----------   --------      ------- -----
Initialization                30   00:00:00.07   00:00:00.39
Command processing           105   00:00:00.52   00:00:04.66
Pass 1                       258   00:00:07.11   00:00:27.45
Symbol table sort              0   00:00:01.24   00:00:03.31
Pass 2                        61   00:00:01.30   00:00:05.64
Symbol table output            5   00:00:00.05   00:00:00.05
Psect synopsis output          1   00:00:00.02   00:00:00.02
Cross-reference output         0   00:00:00.00   00:00:00.00
Assembler run totals         462   00:00:10.31   00:00:41.53
```

The working set limit was 1200 pages.
39410 bytes (77 pages) of virtual memory were used to buffer the intermediate code.
There were 40 pages of symbol table space allocated to hold 776 non-local and 6 local symbols.
254 source lines were read in Pass 1, producing 13 object records in Pass 2.
16 pages of virtual memory were used to define 15 macros.

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

Macro library name                     Macros defined
-----------------                      --------------
_$255$DUA28:[SYS.OBJ]LIB.MLB;1                6
_$255$DUA28:[SYSLIB]STARLET.MLB;2             6
TOTALS (all libraries)                       12
```

864 GETS were required to define 12 macros.

There were no errors, warnings or information messages.

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

SSDEF
LIS

SYSASCEFC
LIS

SYSACPFDT
LIS

SYSADJSTK
LIS

SYSBRKTHR
LIS

SYSASSIGN
LIS

SWAPPER
LIS

SYSASTCON
LIS

SVAPTE
LIS

SYSADJWSL
LIS