
SSSSSSSSSSS DDDDDDDDDDD AAAAAAAAA
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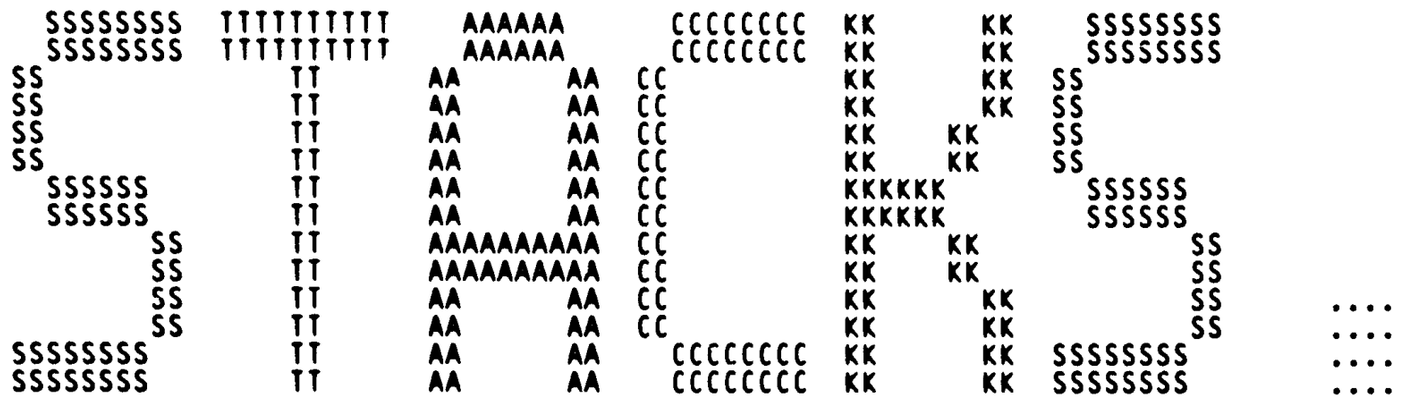
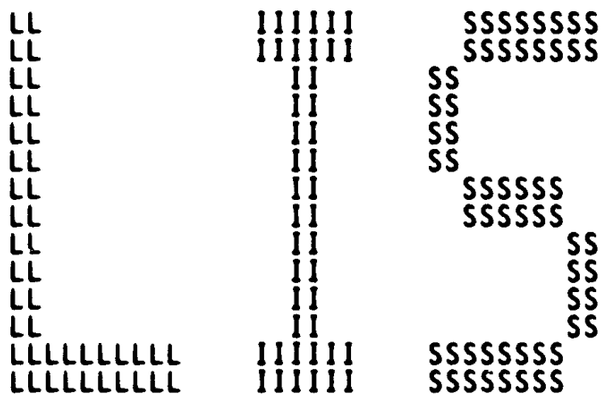
FILEID**STACKS





STA
V04

Table of contents

```
0000     1          .TITLE  STACKS  DUMP STACK MEMORY ROUTINES
0000     2          .SBTTL  COPYRIGHT NOTICE
0000     3          .IDENT  'V04-000'
0000     4 ;
0000     5 ;**********************************************************************
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0000    25 ;*                                                                    *
0000    26 ;**********************************************************************
0000    27 ;
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```
0000     29          .SBTTL  PROGRAM DESCRIPTION
0000     30 ;++
0000     31 ;   FACILITY
0000     32 ;
0000     33 ;       SYSTEM DUMP ANALYZER
0000     34 ;
0000     35 ;   ABSTRACT
0000     36 ;
0000     37 ;       DUMP STACK MEMORY ROUTINES
0000     38 ;
0000     39 ;   ENVIRONMENT
0000     40 ;
0000     41 ;       NATIVE MODE, USER MODE
0000     42 ;
0000     43 ;   AUTHOR
0000     44 ;
0000     45 ;       TIM HALVORSEN, JULY 1978
0000     46 ;
0000     47 ;   MODIFIED BY
0000     48 ;
0000     49 ;       V005    TMH0005         Tim Halvorsen   19-Oct-1981
0000     50 ;               Fix KTA0023 to correctly read stack limit/base arrays
0000     51 ;               (it wasn't doing an indirection through the required
0000     52 ;               symbol pointers to get the array address in P1 space).
0000     53 ;
0000     54 ;       V03-004 KTA0023         Kerbey Altmann  05-Jul-1981
0000     55 ;               Change method of calculating stack sizes so as
0000     56 ;               to conform to new array of limits.
0000     57 ;
0000     58 ;       V003    MTR0001         Mike Rhodes     22-Jun-1981
0000     59 ;               Change all CMPW's referencing an MSG$_ symbol to CMPL's.
0000     60 ;               Remove references to $SDAMSGDEF macro.
0000     61 ;
0000     62 ;       V002    TMH0002         Tim Halvorsen   20-May-1981
0000     63 ;               Add routine to print any range of memory as a stack.
0000     64 ;
0000     65 ;       V001    TMH0001         Tim Halvorsen   07-Feb-1981
0000     66 ;               Change word displacements to longword displacements.
0000     67 ;--
```

```
0000     69          .SBTTL  DECLARATIONS
0000     70 ;
0000     71 ;       SYMBOL DEFINTIONS
0000     72 ;
0000     73          $VADEF                      ; VIRTUAL ADDRESS DEFINITIONS
0000     74          $EMBDEF <CR>                ; CRASHDUMP ERROR LOG ENTRY
0000     75          $PCBDEF                     ; PROCESS CONTROL BLOCK
0000     76          $PHDDEF                     ; PROCESS HEADER BLOCK
0000     77          $PSLDEF                     ; PROCESS STATUS LONGWORD
0000     78          $OPTDEF                     ; DEFINE OPTION BITS
```

STA
VAX

Pha

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Mac

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$2
TOT

763

The

MAC

```
                                                                B 3
                                0000     80          .SBTTL  READ-ONLY DATA DEFINITIONS
                                0000     81
                                0000     82 ;
                                0000     83 ;       READ-ONLY DATA DEFINITIONS
                                0000     84 ;
                                0000     85
                         00000000       86          .PSECT  STACKS,EXE,NOWRT
                                0000     87
                                0000     88          .DEFAULT DISPLACEMENT,LONG
                                0000     89
                                0000     90 INTERRUPT:
      54 50 55 52 52 45 54 4E 49 00'    0000     91          .ASCIC  'INTERRUPT'
                                09       0000
                                000A     92 MODES:
               4C 45 4E 52 45 4B 00'    000A     93          .ASCIC  'KERNEL'
                                06       000A
      45 56 49 54 55 43 45 58 45 00'    0011     94          .ASCIC  'EXECUTIVE'
                                09       0011
   52 4F 53 49 56 52 45 50 55 53 00'    001B     95          .ASCIC  'SUPERVISOR'
                                0A       001B
                     52 45 53 55 00'    0026     96          .ASCIC  'USER'
                                04       0026
                                002B     97 SWAPPER:
52 45 4B 20 52 45 50 50 41 57 53 00'    002B     98          .ASCIC  'SWAPPER KERNEL'
                           4C 45 4E     0037
                                0E       002B
                                003A     99 UNKNOWN:
            4E 57 4F 4E 4B 4E 55 00'    003A    100          .ASCIC  'UNKNOWN'
                                07       003A
```

```
                                0042   102          .SBTTL  PRINT_ANY_STACK, PRINT ANY RANGE AS STACK
                                0042   103 ;---
                                0042   104 ;
                                0042   105 ;       PRINT ANY RANGE OF MEMORY AS A STACK, ONE LONGWORD PER LINE,
                                0042   106 ;       WITH SYMBOLIZATION OF THE LONGWORDS.
                                0042   107 ;
                                0042   108 ; INPUTS:
                                0042   109 ;
                                0042   110 ;       OPTIONS = OPTIONS FLAGS (RANGE OR LENGTH BITS RELEVANT)
                                0042   111 ;       ESP     = BASE OF STACK (HIGHEST ADDRESS)
                                0042   112 ;                 (OR, IF LENGTH BIT SET)
                                0042   113 ;       ESP     = SIZE OF STACK
                                0042   114 ;       ESP+4   = LOWER LIMIT OF STACK
                                0042   115 ;
                                0042   116 ; OUTPUTS:
                                0042   117 ;
                                0042   118 ;       NONE
                                0042   119 ;---
                                0042   120          .ENABL  LSB
                                0042   121
                        001C    0042   122          .ENTRY  PRINT_ANY_STACK,^M<R2,R3,R4>
                                0044   123
    52  00000000'EF   D0    0044   124          MOVL    OPTIONS, R2
    51  00000000'EF   D0    004B   125          MOVL    ESP, R1                 ; POINT TO EXPRESSION STACK
     07 52    03      E0    0052   126          BBS     #OPT$V_RANGE, R2, 10$   ; RANGE SPECIFIED
     0C 52    04      E0    0056   127          BBS     #OPT$V_LENGTH, R2, 20$  ; LENGTH SPECIFIED
              50      D4    005A   128          CLRL    R0                      ; SYNTAX ERROR
                      04    005C   129          RET
                            005D   130
     52   04 A1      D0    005D   131 10$:      MOVL    4(R1),R2                ; R2 = LOWEST ADDRESS (LIMIT)
        53   61      D0    0061   132          MOVL    (R1),R3                 ; R3 = HIGHEST ADDRESS (BASE)
                      09    11    0064   133          BRB     30$
                            0066   134
     52   04 A1      D0    0066   135 20$:      MOVL    4(R1),R2                ; R2 = LOWEST ADDRESS (LIMIT)
53   04 A1      61    C1    006A   136          ADDL3   (R1),4(R1),R3           ; R3 = HIGHEST ADDRESS (BASE)
                            006F   137
        53   52    D1    006F   138 30$:      CMPL    R2,R3                   ; CHECK IF DONE YET
                      4A    1E    0072   139          BGEQU   90$             ; BRANCH IF NOT
                            0074   140          TRYMEM  (R2)                    ; GET NEXT LONGWORD
           31 50    E9    007D   141          BLBC    R0,80$                  ; BRANCH IF NOT FOUND
        54   51    D0    0080   142          MOVL    R1,R4                   ; SAVE IN R3
                            0083   143          ALLOC   40,-(SP)                ; RESULT BUFFER
                      54    DD    008D   144          PUSHL   R4
00000000'EF           02    FB    008F   145          CALLS   #2,SYMBOLIZE            ; ATTEMPT TO SYMBOLIZE
                      51    DD    0096   146          PUSHL   R1                      ; SYMBOL STRING
                      54    DD    0098   147          PUSHL   R4                      ; CONTENTS OF LONGWORD
                      52    DD    009A   148          PUSHL   R2                      ; ADDRESS OF LONGWORD
                            009C   149          PRINT   3,<!_!_!XL   !XL!_!AS>
        5E    30    C0    00A9   150          ADDL    #40+8,SP                ; DEALLOCATE BUFFER
        52    04    C0    00AC   151          ADDL2   #4,R2                   ; NEXT LONGWORD
              BE    11    00AF   152          BRB     30$                     ; LOOP UNTIL DONE
                            00B1   153
                            00B1   154 80$:      PRINT   0,<!_!_(Stack not in physical memory)>
                            00BE   155
        50    01    D0    00BE   156 90$:      MOVL    #1, R0                  ; SUCCEED
                      04    00C1   157          RET                             ;
                            00C2   158
```

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                00C2    159         .DSABL  LSB
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```
                     00C2   161          .SBTTL  PRINT_STACKS -- PRINT THE AVAILABLE STACKS
                     00C2   162 ;---
                     00C2   163 ;
                     00C2   164 ;        PRINT_STACKS
                     00C2   165 ;
                     00C2   166 ;        THIS ROUTINE DETERMINES WHICH STACK IS CURRENTLY BEING
                     00C2   167 ;        RUN AND PRINTS THAT STACK.  IN ADDITION, IT ALSO PRINTS
                     00C2   168 ;        ALL THE REMAINING PROCESS STACKS TO FOLLOW CALL CHAINS.
                     00C2   169 ;
                     00C2   170 ;    INPUTS:
                     00C2   171 ;
                     00C2   172 ;        ERLPTR  = ADDRESS OF ERROR LOG ENTRY
                     00C2   173 ;
                     00C2   174 ;    OUTPUTS:
                     00C2   175 ;
                     00C2   176 ;        NONE
                     00C2   177 ;
                     00C2   178 ;---
                     00C2   179
                     00C2   180          .ENABL  LSB
                     00C2   181
                     00C2   182 PRINT_STACKS::
                07FC 00C2   183          .WORD   ^M<R2,R3,R4,R5,R6,R7,R8,R9,R10>
                     00C4   184
                     00C4   185 ;
                     00C4   186 ;        SETUP ARRAY CONTAINING EACH STACK POINTER, BASE AND LENGTH
                     00C4   187 ;        OF STACK, AND ADDRESS OF TEXT DESCRIBING STACK.
                     00C4   188 ;
                00C1   30 00C4   189          BSBW    GET_POINTERS            ; SETUP STACK ARRAY
                     00C7   190 ;        R8 = ADDRESS OF 5-ENTRY 4-LONGWORD ARRAY
                     00C7   191 ;        R9 = ADDRESS OF ARRAY ENTRY FOR STACK CURRENTLY IN USE
                     00C7   192 ;
                     00C7   193 ;        PRINT THE CURRENT OPERATING STACK IF NO OPTIONS SELECTED
                     00C7   194 ;
          56 00000000'EF   D0 00C7   195          MOVL    OPTIONS,R6              ; BIT MASK OF STACKS TO DUMP
                         3D   12 00CE   196          BNEQ    50$                     ; IF WANTS GIVEN STACK TYPE
                              00D0   197          SUBHD   <Current operating stack>
                         59   D5 00DD   198          TSTL    R9                      ; IS STACK POINTER KNOWN?
                         0F   13 00DF   199          BEQL    20$                     ; BRANCH IF NOT
              50   59    58   C3 00E1   200          SUBL3   R8,R9,R0                ; GET OFFSET INTO ARRAY
        50    50    FC 8F   78 00E5   201          ASHL    #-4,R0,R0               ; CALCULATE INDEX INTO ARRAY
              56   01    50   78 00EA   202          ASHL    R0,#1,R6                ; SET TO PRINT CURRENT STACK
                         2A   11 00EE   203          BRB     55$
                              00F0   204 20$:
                         56   01   D0 00F0   205          MOVL    #1,R6                   ; SET TO PRINT 1 STACK
                         59   58   D0 00F3   206          MOVL    R8,R9                   ; USE INTERRUPT STACK SLOT
                         69   5A   D0 00F6   207          MOVL    R10,(R9)                ; SET STACK POINTER
        04 A9    FE00 CA   9E 00F9   208          MOVAB   -512(R10),4(R9)         ; SET BASE 1 PAGE AWAY
        08 A9    0200 8F   3C 00FF   209          MOVZWL  #512,8(R9)              ; SET LENGTH TO 1 PAGE
        0C A9    FF31 CF   9E 0105   210          MOVAB   UNKNOWN,12(R9)          ; SET TEXT STRING ADDRESS
                         0D   11 010B   211          BRB     55$
                              010D   212 ;
                              010D   213 ;        PRINT THE SPECIFIED STACKS
                              010D   214 ;
                              010D   215 50$:
                              010D   216          SUBHD   <Process stacks>        ; SET PAGE HEADING
                              011A   217 55$:
```

```
                     011A   218          SKIP    PAGE
          57   01    D0  0121   219          MOVL    #^B1,R7                 ; START AT INTERRUPT STACK
                     0124   220 60$:
          56   57    D3  0124   221          BITL    R7,R6                   ; CHECK IF REQUESTED
               4B    13  0127   222          BEQL    70$                     ; BRANCH IF NOT
          56   57    CA  0129   223          BICL2   R7,R6                   ; INDICATE PRINTED
            08 A8    D5  012C   224          TSTL    8(R8)                   ; CHECK LENGTH OF STACK
               43    13  012F   225          BEQL    70$                     ; SKIP IF COULD NOT LOCATE
               68    DD  0131   226          PUSHL   (R8)                    ; PUSH STACK POINTER
            08 A8    DD  0133   227          PUSHL   8(R8)                   ; LENGTH OF STACK SPACE
            04 A8    DD  0136   228          PUSHL   4(R8)                   ; BASE STACK ADDRESS
            0C A8    DD  0139   229          PUSHL   12(R8)                  ; ADDRESS OF TEXT STRING
                     013C   230          SKIP    PAGE
          59   58    D1  0143   231          CMPL    R8,R9                   ; IS THIS CURRENT STACK?
               0F    12  0146   232          BNEQ    65$                     ; BRANCH IF NOT
                     0148   233          PRINT   1,<Current operating stack (!AC):>
               0D    11  0155   234          BRB     68$
                     0157   235 65$:       PRINT   1,<!AC stack:>
                     0164   236 68$:       SKIP    1
0000032A'EF    03    FB  016D   237          CALLS   #3,DUMP_STACK           ; DUMP THE STACK
    57 57    01    78  0174   238 70$:       ASHL    #1,R7,R7                ; SHIFT BIT TO NEXT STACK
          58   10    C0  0178   239          ADDL    #16,R8                  ; SKIP TO NEXT ENTRY
          10   57    D1  017B   240          CMPL    R7,#^B10000             ; CHECK IF DONE
               A4    15  017E   241          BLEQ    60$                     ; CONTINUE UNTIL DONE
                     0180   242          STATUS  SUCCESS
                     0187   243          RET
                     0188   244
                     0188   245          .DSABL  LSB
```

```
                                0188   247          .SBTTL  GET_POINTERS, OBTAIN STACK POINTERS
                                0188   248 ;---
                                0188   249 ;
                                0188   250 ;       THIS SUBROUTINE IS USED TO OBTAIN THE STACK POINTERS
                                0188   251 ;       FOR THE CURRENTLY SELECTED PROCESS.  IT RETURNS AN ARRAY
                                0188   252 ;       OF ENTRIES FOR EACH OF THE POSSIBLE STACKS (ISP THRU USP).
                                0188   253 ;       EACH ENTRY CONTAINS THE STACK POINTER, STACK BASE, LENGTH
                                0188   254 ;       AND ASCIC STRING DESCRIBING ENTRY FOR DISPLAY PURPOSES.
                                0188   255 ;
                                0188   256 ; CALLING SEQUENCE:
                                0188   257 ;
                                0188   258 ;       ERLPTR = ADDRESS OF ERROR LOG ENTRY
                                0188   259 ;       PROC_INDEX = INDEX OF CURRENTLY SELECTED PROCESS
                                0188   260 ;       JSB
                                0188   261 ;       R8 = ADDRESS OF ARRAY (5 4-LONGWORD ENTRIES)
                                0188   262 ;               ISP     BASE    SIZE            TEXT
                                0188   263 ;               KSP     BASE    SIZE            TEXT
                                0188   264 ;               ESP     BASE    SIZE            TEXT
                                0188   265 ;               SSP     BASE    SIZE            TEXT
                                0188   266 ;               USP     BASE    (INFINITE)      TEXT
                                0188   267 ;       R9 = ADDRESS OF ARRAY ENTRY FOR STACK CURRENTLY IN USE
                                0188   268 ;               IF CURRENTLY USING UNKNOWN STACK, R9 = 0
                                0188   269 ;       R10 = CURRENT STACK POINTER
                                0188   270 ;
                                0188   271 ;---
                                0188   272
                                0188   273 GET_POINTERS:
                                0188   274 ;
                                0188   275 ;       ALLOCATE ARRAY ON CALLER'S STACK
                                0188   276 ;
                     50 8ED0    0188   277          POPL    R0                      ; SAVE RETURN ADDRESS
           5E    00000050 8F    C2   018B   278          SUBL    #5*4*4,SP               ; 5 4-LONGWORD ENTRIES
                        58    5E   D0   0192   279          MOVL    SP,R8                   ; ADDRESS OF ARRAY
                              50   DD   0195   280          PUSHL   R0                      ; SET RETURN ADDRESS
                              3C   BB   0197   281          PUSHR   #^M<R2,R3,R4,R5>        ; SAVE REGISTERS
68    0050 8F    00    6E    00   2C   0199   282          MOVC5   #0,(SP),#0,#5*4*4,(R8)  ; PRE-ZERO ARRAY
                              58   DD   01A1   283          PUSHL   R8                      ; SAVE ADDRESS OF ARRAY
                                   01A3   284 ;
                                   01A3   285 ;       FILL ENTRY FOR INTERRUPT STACK
                                   01A3   286 ;
           55    00000000'EF    D0   01A3   287          MOVL    ERLPTR,R5               ; ADDRESS OF ERROR LOG ENTRY
                    88    20 A5   D0   01AA   288          MOVL    EMB$L_CR_ISP(R5),(R8)+  ; SETUP ISP ENTRY
                                   01AE   289          REQMEM  @EXE$GL_RPB             ; RESTART PARAMETER BLOCK
            50    FC A8    51   C3   01BB   290          SUBL3   R1,-4(R8),R0            ; IS ISP IN RPB PAGE?
                              16   19   01C0   291          BLSS    5$                      ; BRANCH IF NOT
           00000200 8F    50   D1   01C2   292          CMPL    R0,#512                 ; RPB IS ONLY 1 PAGE
                              0D   14   01C9   293          BGTR    5$                      ; BRANCH IF NOT IN RPB
     88    00000200 8F    51   C1   01CB   294          ADDL3   R1,#512,(R8)+           ; BASE ADDRESS OF RPB STACK
                        51    01   D0   01D3   295          MOVL    #1,R1                   ; SIZE OF STACK IN PAGES
                              20   11   01D6   296          BRB     8$                      ; SET STACK SIZE
                                   01D8   297 5$:       REQMEM  @EXE$GL_INTSTK,(R8)+    ; BASE OF INTERRUPT STACK
                                   01E8   298          REQMEM  @SGN$GW_ISPPGCT         ; INTERRUPT STACK PAGE COUNT
                        51    51   3C   01F5   299          MOVZWL  R1,R1                   ; ZERO FILL TO LONGWORD
              88    51    09   78   01F8   300 8$:       ASHL    #9,R1,(R8)+             ; SET INTERRUPT STACK SIZE
              88    FE00  CF   9E   01FC   301          MOVAB   INTERRUPT,(R8)+         ; ADDRESS OF TEXT STRING
                                   0201   302 ;
                                   0201   303 ;       GET CURRENT SP AND ADDRESS OF PROCESS STACK POINTERS
```

```
                     0201    304 ;
52  00000000'EF   3C 0201    305          MOVZWL  PROC_INDEX,R2               ; GET CURRENTLY SELECTED INDEX
    016C C5    52 B1 0208    306          CMPW    R2,EMB$C_CR_LENGTH+PCB$L_PID(R5) ; CRASH PROCESS?
               0A 12 020D    307          BNEQ    10$                         ; BRANCH IF SOME OTHER PROCESS
     52    10 A5 9E 020F    308          MOVAB   EMB$L_CR_KSP(R5),R2         ; R2 = ADDRESS OF KSP-USP
     53    5C A5 D0 0213    309          MOVL    EMB$L_CR_SP(R5),R3          ; R3 = STACK POINTER
               58 11 0217    310          BRB     20$
                     0219    311 10$:     REQMEM  @SCH$GL_PCBVEC              ; VECTOR OF PCB ADDRESSES
     51    6142   DE 0226    312          MOVAL   (R1)[R2],R1                 ; ADDRESS OF POINTER TO PCB
                     022A    313          REQMEM  (R1)                        ; GET ADDRESS OF PCB
                     0233    314          REQMEM  PCB$L_PHD(R1)               ; GET ADDRESS OF PHD
                     023D    315          REQMEM  (R1),PHD,#PHD$C_LENGTH      ; READ ENTIRE PROCESS HEADER
52  00000078'EF   9E 0252    316          MOVAB   PHD+PHD$L_KSP,R2            ; R2 = ADDRESS OF KSP-USP
50  000000C4'EF   D0 0259    317          MOVL    PHD+PHD$L_PSL,R0            ; GET PROCESS STATUS LONGWORD
     53    20 A5 D0 0260    318          MOVL    EMB$L_CR_ISP(R5),R3         ; ASSUME ON INTERRUPT STACK
     09 50    1A E0 0264    319          BBS     #PSL$V_IS,R0,20$            ; BRANCH IF OK
50   50    02   18 EF 0268    320          EXTZV   #PSL$V_CURMOD,#PSL$S_CURMOD,R0,R0 ; GET CURRENT MODE
     53    6240   D0 026D    321          MOVL    (R2)[R0],R3                 ; GET PROCESS STACK POINTER
                     0271    322 ;
                     0271    323 ;       FILL PROCESS STACK ENTRIES
                     0271    324 ;
     5E    20   C2 0271    325 20$:     SUBL    #8*4,SP                     ; ALLOCATE 8 LONGWORD ARRAY
     54    10 AE DE 0274    326          MOVAL   4*4(SP),R4                  ; R4 = LIMIT ADDRESS BUFFER
                     0278    327          TRYMEM  @CTL$AL_STACKLIM,(R4),#4*4  ; READ 4 LIMIT ADDRESSES
        3E 50 E9 0289    328          BLBC    R0,45$                      ; BRANCH IF CANNOT READ
     54    5E   D0 028C    329          MOVL    SP,R4                       ; R4 = BASE ADDRESS BUFFER
                     028F    330          TRYMEM  @CTL$AL_STACK,(R4),#4*4     ; READ 4 BASE ADDRESSES
        27 50 E9 02A0    331          BLBC    R0,45$                      ; BRANCH IF CANNOT READ
     55 FD63 CF 9E 02A3    332          MOVAB   MODES,R5                    ; ADDRESS OF TEXT STRINGS
     50    04   D0 02A8    333          MOVL    #4,R0                       ; ITERATION COUNT
                     02AB    334 30$:
     88    82   D0 02AB    335          MOVL    (R2)+,(R8)+                 ; SET STACK POINTER
     88    64   D0 02AE    336          MOVL    (R4),(R8)+                  ; SET BASE OF STACK
  88 84    10 A4 C3 02B1    337          SUBL3   4*4(R4),(R4)+,(R8)+         ; SET LENGTH OF STACK SPACE
               06 14 02B6    338          BGTR    40$                         ; BRANCH IF OK
  FC A8  FFFF 8F 3C 02B8    339          MOVZWL  #^XFFFF,-4(R8)              ; USER STACK HAS INFINITE LENGTH
     88    55   D0 02BE    340 40$:     MOVL    R5,(R8)+                    ; ADDRESS OF TEXT STRING
     51    85   9A 02C1    341          MOVZBL  (R5)+,R1                    ; LENGTH OF STRING
     55    51   C0 02C4    342          ADDL    R1,R5                       ; SKIP TO NEXT STRING
        E1 50   F5 02C7    343          SOBGTR  R0,30$                      ; CONTINUE UNTIL DONE
                     02CA    344 45$:
     5E    20   C0 02CA    345          ADDL    #8*4,SP                     ; DEALLOCATE BUFFER SPACE
                     02CD    346 ;
                     02CD    347 ;       DECIDE WHICH STACK IS CURRENTLY IN USE AND SET R9
                     02CD    348 ;
     58    6E   D0 02CD    349          MOVL    (SP),R8                     ; RESET R8 TO START OF ARRAY
     50    05   D0 02D0    350          MOVL    #5,R0                       ; ITERATION COUNT
                     02D3    351 50$:
     04 A8    53   D1 02D3    352          CMPL    R3,4(R8)                    ; CHECK IF BELOW BASE ADDRESS
               10 1E 02D7    353          BGEQU   60$                         ; BRANCH IF NOT
51   04 A8    08 A8 C3 02D9    354          SUBL3   8(R8),4(R8),R1              ; CALCULATE LOWEST ADDRESS
     51    53   D1 02DF    355          CMPL    R3,R1                       ; CHECK IF ABOVE LOW ADDRESS
               05 1F 02E2    356          BLSSU   60$                         ; BRANCH IF NOT
     59    58   D0 02E4    357          MOVL    R8,R9                       ; SET ADDRESS OF CURRENT ENTRY
               38 11 02E7    358          BRB     90$                         ; AND EXIT
     58    10   C0 02E9    359 60$:     ADDL    #16,R8                      ; SKIP TO NEXT ENTRY
        E4 50   F5 02EC    360          SOBGTR  R0,50$                      ; CONTINUE UNTIL ALL CHECKED
```

```
                                02EF   361 ;
                                02EF   362 ;       IF NOT ANY OF THE STACKS IN THE ARRAY, THEN MAKE SPECIAL
                                02EF   363 ;       CHECK FOR SWAPPER STACK.  IF NOT SWAPPER, SET R9 = 0.
                                02EF   364 ;
                        59      D4  02EF   365          CLRL    R9                              ; ASSUME UNKNOWN ADDRESS
    50  00000000'EF         53      C3  02F1   366          SUBL3   R3,SWP$A_KSTK,R0            ; CHECK IF BELOW BASE ADDRESS
                                26      19  02F9   367          BLSS    90$                     ; BRANCH IF NOT
                00000000'EF     50      D1  02FB   368          CMPL    R0,SWP$K_KSTKSZ         ; CHECK IF WITHIN SWAPPER STACK
                                1D      1A  0302   369          BGTRU   90$                     ; BRANCH IF NOT IN RANGE
                    59  6E      10      C1  0304   370          ADDL3   #16,(SP),R9             ; SET TO KERNEL STACK
                        58      59      D0  0308   371          MOVL    R9,R8
                        88      53      D0  030B   372          MOVL    R3,(R8)+                ; SET STACK POINTER
                88   00000000'EF     D0  030E   373          MOVL    SWP$A_KSTK,(R8)+        ; SET SWAPPER BASE ADDRESS
                88   00000000'EF     D0  0315   374          MOVL    SWP$K_KSTKSZ,(R8)+      ; SET SWAPPER STACK SIZE
                    88  FD0B CF     9E  031C   375          MOVAB   SWAPPER,(R8)+           ; SET SWAPPER TEXT STRING
                                58  8ED0  0321   376 90$:     POPL    R8                      ; RESTORE ADDRESS OF ARRAY
                        5A      53      D0  0324   377          MOVL    R3,R10                  ; RETURN CURRENT STACK POINTER
                                3C      BA  0327   378          POPR    #^M<R2,R3,R4,R5>        ; RESTORE REGISTERS
                                        05  0329   379          RSB
```

```
                                032A   381          .SBTTL  DUMP_STACK -- DUMP CONTENTS OF STACK
                                032A   382 ;---
                                032A   383 ;
                                032A   384 ;       DUMP_STACK
                                032A   385 ;
                                032A   386 ;       THIS ROUTINE PRINTS THE CONTENTS OF THE SPECIFIED
                                032A   387 ;       STACK, 1 LONGWORD PER LINE.  AN ATTEMPT IS MADE
                                032A   388 ;       TO PRINT THE SYMBOLIC VALUE OF EACH LONGWORD NEXT
                                032A   389 ;       TO ITS HEXIDECIMAL VALUE.  SOME OF THE MEMORY PRECEEDING
                                032A   390 ;       THE STACK POINTER IS DUMPED AS IT IS SOMETIMES
                                032A   391 ;       USEFUL IN DEBUGGING.
                                032A   392 ;
                                032A   393 ;   INPUTS:
                                032A   394 ;
                                032A   395 ;        4(AP)  = INITIAL ADDRESS OF STACK
                                032A   396 ;        8(AP)  = LENGTH OF STACK SPACE
                                032A   397 ;       12(AP)  = STACK POINTER
                                032A   398 ;
                                032A   399 ;   OUTPUTS:
                                032A   400 ;
                                032A   401 ;       NONE
                                032A   402 ;
                                032A   403 ;---
                                032A   404
                    00000600    032A   405 STACKLIM =      3*512                    ; MAX. BYTES TO DUMP
                                032A   406
                                032A   407          .ENABL  LSB
                                032A   408
                                032A   409 DUMP_STACK::
                        000C    032A   410          .WORD   ^M<R2,R3>
                                032C   411
          52   0C AC    20   C3  032C   412          SUBL3   #32,12(AP),R2            ; 32 BYTES PRECEEDING SP
      51   04 AC    0C AC   C3  0331   413          SUBL3   12(AP),4(AP),R1          ; STACK SPACE IN USE
                            0F   1F  0337   414          BLSSU   1$                       ; IF SP OUT OF BOUNDS
                     08 AC  51   D1  0339   415          CMPL    R1,8(AP)                 ; CHECK IF BEYOND STACK
                            09   1A  033D   416          BGTRU   1$                       ; IF SP OUT OF BOUNDS
                00000600 8F 51   D1  033F   417          CMPL    R1,#STACKLIM             ; MAX. DUMP SIZE
                            0C   15  0346   418          BLEQ    5$                       ; BRANCH IF OK
04 AC    0C AC    00000600 8F   C1  0348   419 1$:       ADDL3   #STACKLIM,12(AP),4(AP)   ; SET NEW ENDING ADDRESS
                            0E   11  0352   420          BRB     10$                      ; NEVER RESET STARTING ADDR.
                                0354   421 5$:
      51   04 AC    08 AC   C3  0354   422          SUBL3   8(AP),4(AP),R1           ; COMPUTE BASE ADDRESS
                        51   52  D1  035A   423          CMPL    R2,R1                    ; UNLESS IT RUNS OVER
                            03   1E  035D   424          BGEQU   10$                      ; IF NOT, GO AHEAD
                        52   51  D0  035F   425          MOVL    R1,R2                    ; IF SO, START AT THE BASE
                                0362   426 10$:
                    04 AC   52  D1  0362   427          CMPL    R2,4(AP)                 ; CHECK IF DONE YET
                            03   1F  0366   428          BLSSU   15$                      ; BRANCH IF NOT
                         006A   31  0368   429          BRW     90$                      ; EXIT - DONE
                                036B   430 15$:
                                036B   431          TRYMEM  (R2)                     ; GET NEXT LONGWORD
                     50 50  E9  0374   432          BLBC    R0,80$                   ; BRANCH IF NOT FOUND
                        53   51  D0  0377   433          MOVL    R1,R3                    ; SAVE IN R3
                                037A   434          ALLOC   40,-(SP)                 ; RESULT BUFFER
                            53  DD  0384   435          PUSHL   R3
                00000000'EF 02  FB  0386   436          CALLS   #2,SYMBOLIZE             ; ATTEMPT TO SYMBOLIZE
                            51  DD  038D   437          PUSHL   R1                       ; SYMBOL STRING
```

```
                53   DD  038F    438          PUSHL   R3                      ; CONTENTS OF LONGWORD
                52   DD  0391    439          PUSHL   R2                      ; ADDRESS OF LONGWORD
          0C AC 52   D1  0393    440          CMPL    R2,12(AP)               ; IS THIS TOP OF STACK?
                18   12  0397    441          BNEQ    20$                     ; BRANCH IF NOT
                     0399    442          SKIP    1
                     03A2    443          PRINT   3,^/!_ SP => !XL !XL!_!AS/
                0D   11  03AF    444          BRB     50$
                     03B1    445 20$:
                     03B1    446          PRINT   3,<!_!_!XL !XL!_!AS>
                     03BE    447 50$:
             5E 30   C0  03BE    448          ADDL    #40+8,SP                ; DEALLOCATE BUFFER
             52 04   C0  03C1    449          ADDL2   #4,R2                   ; NEXT LONGWORD
                FF9B 31  03C4    450          BRW     10$                     ; LOOP UNTIL DONE
                     03C7    451 80$:
                     03C7    452          PRINT   0,<!_!_(Stack not in physical memory)>
                04   03D4    453          RET
                     03D5    454 90$:
          0C AC 52   D1  03D5    455          CMPL    R2,12(AP)               ; ARE WE AT TOP OF STACK?
                16   12  03D9    456          BNEQ    95$                     ; BRANCH IF NOT
                     03DB    457          SKIP    1
                     03E4    458          PRINT   0,^/!_ SP => (STACK IS EMPTY)/
                     03F1    459 95$:
                04   03F1    460          RET
                     03F2    461
                     03F2    462          .DSABL  LSB
```


45

42
4E

```
                03F2   464
                03F2   465          .END
```

SYM
V04

54
51
54
4F
44
4E
44
4C
49
4E
46
45
43
54
58
43
46
50
44
52
54

```
ARGS                            = 00000001
CTL$AL_STACK                      ********    X   02
CTL$AL_STACKLIM                   ********    X   02
DUMP_STACK                        0000032A RG     02
EMB$C_CR_LENGTH                 = 0000010C
EMB$L_CR_ISP                    = 00000020
EMB$L_CR_KSP                    = 00000010
EMB$L_CR_SP                     = 0000005C
ERLPTR                            ********    X   02
ESP                               ********    X   02
EXE$GL_INTSTK                     ********    X   02
EXE$GL_RPB                        ********    X   02
GET_POINTERS                      00000188 R      02
INTERRUPT                         00000000 R      02
MODES                             0000000A R      02
MSG$_SUCCESS                      ********    X   02
NEW_PAGE                          ********    X   02
OPT$V_LENGTH                    = 00000004
OPT$V_RANGE                     = 00000003
OPTIONS                           ********    X   02
PCB$L_PHD                       = 0000006C
PCB$L_PID                       = 00000060
PHD                               ********    X   02
PHD$C_LENGTH                    = 0000017C
PHD$L_KSP                       = 00000078
PHD$L_PSL                       = 000000C4
PRINT                             ********    X   02
PRINT_ANY_STACK                   00000042 RG     02
PRINT_STACKS                      000000C2 RG     02
PROC_INDEX                        *** ****    X   02
PSL$S_CURMOD                    = 00000002
PSL$V_CURMOD                    = 00000018
PSL$V_IS                        = 0000001A
REQMEM                            ********    X   02
SCH$GL_PCBVEC                     ********    X   02
SET_HEADING                       ********    X   02
SGN$GW_ISPPGCT                    ********    X   02
SKIP_LINES                        ********    X   02
STACKLIM                        = 00000600
SWAPPER                           0000002B R      02
SWP$A_KSTK                        ********    X   02
SWP$K_KSTKSZ                      ********    X   02
SYMBOLIZE                         ********    X   02
TRYMEM                            ********    X   02
UNKNOWN                           0000003A R      02
```

+----------------+
! 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
STACKS	000003F2 (1010.)	02 (2.)	NOPIC USR CON REL LCL NOSHR EXE RD NOWRT NOVEC BYTE
LITERALS	00000134 (308.)	03 (3.)	NOPIC USR CON REL LCL NOSHR EXE RD NOWRT NOVEC BYTE

Performance indicators

Phase	Page faults	CPU Time	Elapsed Time
Initialization	35	00:00:00.05	00:00:02.00
Command processing	133	00:00:00.45	00:00:01.86
Pass 1	257	00:00:04.82	00:00:18.79
Symbol table sort	0	00:00:00.64	00:00:02.30
Pass 2	96	00:00:01.20	00:00:04.17
Symbol table output	6	00:00:00.05	00:00:00.56
Psect synopsis output	2	00:00:00.02	00:00:00.02
Cross-reference output	0	00:00:00.00	00:00:00.00
Assembler run totals	531	00:00:07.23	00:00:29.70

The working set limit was 1500 pages.
42929 bytes (84 pages) of virtual memory were used to buffer the intermediate code.
There were 40 pages of symbol table space allocated to hold 622 non-local and 41 local symbols.
465 source lines were read in Pass 1, producing 22 object records in Pass 2.
24 pages of virtual memory were used to define 23 macros.

Macro library statistics

Macro library name	Macros defined
_255DUA28:[SDA.OBJ]SDALIB.MLB;1	9
_255DUA28:[SYS.OBJ]LIB.MLB;1	7
_255DUA28:[SYSLIB]STARLET.MLB;2	4
TOTALS (all libraries)	20

763 GETS were required to define 20 macros.

There were no errors, warnings or information messages.

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

SYMBOLS
LIS

SMGRTL

SMGBLOTRM
MAP

SDAMSG
LIS

VAXINST
LIS

SMGMAPTRM
MAP

SMGKCB
SDL

VALIDATE
LIS

STACKS
LIS

SMGDEF
SDL

SMGKDE
SDL

SMGSHR
MAP