F 5

```
   SSSSSSSSSSSS  DDDDDDDDDDDD        AAAAAAAAA
   SSSSSSSSSSSS  DDDDDDDDDDDD        AAAAAAAAA
   SSSSSSSSSSSS  DDDDDDDDDDDD        AAAAAAAAA
SSS              DDD         DDD  AAA         AAA
SSS              DDD         DDD  AAA         AAA
SSS              DDD         DDD  AAA         AAA
SSS              DDD         DDD  AAA         AAA
SSS              DDD         DDD  AAA         AAA
SSS              DDD         DDD  AAA         AAA
   SSSSSSSSS     DDD         DDD  AAA         AAA
   SSSSSSSSS     DDD         DDD  AAA         AAA
   SSSSSSSSS     DDD         DDD  AAA         AAA
            SSS  DDD         DDD  AAAAAAAAAAAAAAA
            SSS  DDD         DDD  AAAAAAAAAAAAAAA
            SSS  DDD         DDD  AAAAAAAAAAAAAAA
            SSS  DDD         DDD  AAA         AAA
            SSS  DDD         DDD  AAA         AAA
            SSS  DDD         DDD  AAA         AAA
SSSSSSSSSSSS     DDDDDDDDDDDD     AAA         AAA
SSSSSSSSSSSS     DDDDDDDDDDDD     AAA         AAA
SSSSSSSSSSSS     DDDDDDDDDDDD     AAA         AAA
```

```
_S
Sy
--
CT
CT
CT
CT
CU
CU
CU
CU
DC
DC
DC
DC
DC
DC
DE
DE
DE
DE
DE
DE
DE
DE
DI
DI
DI
DI
DI
DI
DI
DI
DI
DI
DI
DI
DI
DU
DU
DU
DU
DU
DU
DU
DU
DV
DV
DV
DY
DY
DY
DY
DY
ER
ES
```

FILEID**PROCESS


```
PPPPPPPP    RRRRRRRR      OOOOOO        CCCCCCCC  EEEEEEEEEE    SSSSSSSS    SSSSSSSS
PPPPPPPP    RRRRRRRR      OOOOOO        CCCCCCCC  EEEEEEEEEE    SSSSSSSS    SSSSSSSS
PP      PP  RR      RR  OO      OO  CC          EE          SS          SS
PP      PP  RR      RR  OO      OO  CC          EE          SS          SS
PP      PP  RR      RR  OO      OO  CC          EE          SS          SS
PP      PP  RR      RR  OO      OO  CC          EE          SS          SS
PPPPPPPP    RRRRRRRR    OO      OO  CC          EEEEEEEE      SSSSSS      SSSSSS
PPPPPPPP    RRRRRRRR    OO      OO  CC          EEEEEEEE      SSSSSS      SSSSSS
PP          RR  RR      OO      OO  CC          EE                  SS          SS
PP          RR  RR      OO      OO  CC          EE                  SS          SS
PP          RR    RR    OO      OO  CC          EE                  SS          SS      ....
PP          RR    RR    OO      OO  CC          EE                  SS          SS      ....
PP          RR      RR    OOOOOO      CCCCCCCC  EEEEEEEEEE  SSSSSSSS    SSSSSSSS        ....
PP          RR      RR    OOOOOO      CCCCCCCC  EEEEEEEEEE  SSSSSSSS    SSSSSSSS        ....

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

Table of contents

```
0000            .TITLE  PROCESS PROCESS FORMATTING ROUTINES
0000            .SBTTL  COPYRIGHT NOTICE
0000            .IDENT  'V04-000'
0000    ;
0000    ;****************************************************************************
0000    ;*                                                                          *
0000    ;*  COPYRIGHT (c) 1978, 1980, 1982, 1984 BY                                 *
0000    ;*  DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS.                  *
0000    ;*  ALL RIGHTS RESERVED.                                                    *
0000    ;*                                                                          *
0000    ;*  THIS SOFTWARE IS FURNISHED UNDER A LICENSE AND MAY BE USED AND COPIED   *
0000    ;*  ONLY IN  ACCORDANCE WITH  THE  TERMS  OF  SUCH  LICENSE  AND WITH THE   *
0000    ;*  INCLUSION OF THE ABOVE COPYRIGHT NOTICE. THIS SOFTWARE OR  ANY  OTHER   *
0000    ;*  COPIES THEREOF MAY NOT BE PROVIDED OR OTHERWISE MADE AVAILABLE TO ANY   *
0000    ;*  OTHER PERSON.  NO TITLE TO AND OWNERSHIP OF  THE  SOFTWARE IS  HEREBY   *
0000    ;*  TRANSFERRED.                                                            *
0000    ;*                                                                          *
0000    ;*  THE INFORMATION IN THIS SOFTWARE IS  SUBJECT TO CHANGE WITHOUT NOTICE   *
0000    ;*  AND  SHOULD  NOT  BE  CONSTRUED AS  A COMMITMENT BY DIGITAL EQUIPMENT   *
0000    ;*  CORPORATION.                                                            *
0000    ;*                                                                          *
0000    ;*  DIGITAL ASSUMES NO RESPONSIBILITY FOR THE USE  OR  RELIABILITY OF ITS   *
0000    ;*  SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DIGITAL.                 *
0000    ;*                                                                          *
0000    ;*                                                                          *
0000    ;****************************************************************************
0000    ;
```

```
0000          .SBTTL  PROGRAM DESCRIPTION
0000    ;++
0000    ; FACILITY
0000    ;
0000    ;       SYSTEM DUMP ANALYZER
0000    ;
0000    ; ABSTRACT
0000    ;
0000    ;       ROUTINES TO FORMAT PROCESS INFORMATION
0000    ;
0000    ; ENVIRONMENT
0000    ;
0000    ;       NATIVE MODE, USER MODE
0000    ;
0000    ; AUTHOR
0000    ;
0000    ;       TIM HALVORSEN, JULY 1978
0000    ;
0000    ; MODIFIED BY
0000    ;
0000    ;       V03-013 MSH0072         Michael S. Harvey       3-Aug-1984
0000    ;               Correct some bugs causing errors getting data for
0000    ;               processes other than your own.
0000    ;
0000    ;       V03-012 EMB0101         Ellen M. Batbouta       14-Jun-1984
0000    ;               Decode MWAIT so as to correctly display the resource
0000    ;               a process is waiting for when a SHOW PROCESS or SHOW
0000    ;               SUMMARY command is issued.  Show the full device name
0000    ;               on a SHOW PROCESS/CHANNELS display.
0000    ;
0000    ;       V03-011 PRB0314         Paul Beck       28-Feb-1984  16:48
0000    ;               Use longword formatting for BUFIO byte count/limit.
0000    ;
0000    ;       V03-010 WMC0002         Wayne Cardoza           02-Dec-1983
0000    ;               Some PHD fields have changed to longwords
0000    ;
0000    ;       V03-009 WMC0001         Wayne Cardoza           11-Jul-1983
0000    ;               Support separate display of process P0 and P1 page tables.
0000    ;
0000    ;       V03-008 TCM0001         Trudy C. Matthews       12-Apr-1983
0000    ;               Make sure references to working set list offsets in the
0000    ;               process header are treated as unsigned words.
0000    ;
0000    ;       V03-007 CWH1004         CW Hobbs                26-Mar-1983
0000    ;               Run process names through !AF directive to keep escape
0000    ;               sequences from the displays.
0000    ;
0000    ;       V03-006 CWH1003         CW Hobbs                23-Mar-1983
0000    ;               Shuffle items in SHOW SUMMARY a little.
0000    ;
0000    ;       V03-005 CWH1002         CW Hobbs                1-Mar-1983
0000    ;               Display extended PIDs in heading and SHOW PROCESS /PCB
0000    ;               display.  Change SHOW SUMMARY to add /IMAGE qualifier
0000    ;               and alter items in summary line.
0000    ;
0000    ;       V03-004 MSH0002         Maryann Hinden          22-Oct-1982
0000    ;               Pass extra argument to SHOW_PROC_LOCK.
```

```
0000   ;
0000   ;       V03-003 LMP0033         L. Mark Pilant,         25-Jun-1982  15:36
0000   ;               Fix a problem introduced by KTA0103.  Also, fix a bug that
0000   ;               caused a BADPROC error message to appear if a display for all
0000   ;               processes terminated abnormally.
0000   ;
0000   ;       V03-002 LMP0031         L. Mark Pilant,         17-Jun-1982  13:25
0000   ;               Add support for SHOW PROCESS/CHANNELS.
0000   ;
0000   ;       V03-001 MSH0001         Maryann Hinden          10-Jun-1982
0000   ;               Add SHOW PROC/LOCK.
0000   ;
0000   ;--
```

```
0000            .SBTTL  DECLARATIONS
0000    ;
0000    ;       SYMBOL DEFINITIONS
0000    ;
0000            $PCBDEF                 ; PROCESS CONTROL BLOCK DEFINITIONS
0000            $PHDDEF                 ; PROCESS HEADER DEFINITIONS
0000            $WSLDEF                 ; WORKING SET LIST DEFINITIONS
0000            $SECDEF                 ; SECTION TABLE DEFINITIONS
0000            $IFDDEF                 ; IMAGE FILE DESCRIPTOR DEFINITIONS
0000            $JIBDEF                 ; JOB INFORMATION BLOCK DEFINITIONS
0000            $OPTDEF                 ; OPTION DEFINITIONS
0000            $CCBDEF                 ; CHANNEL CONTROL BLOCK OFFSETS
0000            $DDBDEF                 ; DEVICE DATA BLOCK OFFSETS
0000            $DYNDEF                 ; DYNAMIC BLOCK TYPE CODES
0000            $FCBDEF                 ; FCB OFFSETS
0000            $RSNDEF                 ; RESOURCE NAME DEFINITIONS
0000            $SBDEF                  ; SYSTEM BLOCK DEFINITIONS
0000            $STSDEF                 ; STATUS FIELD DEFINITIONS
0000            $UCBDEF                 ; UCB OFFSETS
0000            $WCBDEF                 ; WCB OFFSETS
0000
0000    ;
0000    ;       LOCAL MACRO DEFINITIONS
0000    ;
0000
0000            .MACRO  CSTABLE,LEN
0000            CSL =   LEN
0000            .ENDM
0000
0000
0000            .MACRO  CS,TEXT
0000            SAV = .
0000            .ASCIC  \TEXT\
0000            . = SAV + CSL
0000            .ENDM
```

```
                    0000          .SBTTL  STORAGE DEFINITIONS
                    0000  ;
                    0000  ;       STORAGE DEFINITIONS
                    0000  ;
                    0000
                00000000          .PSECT  SDADATA,NOEXE,WRT
                    0000
                    0000          .default displacement,long
                    0000
                    0000  PCBADR::
        00000004    0000          .BLKL   1                               ; ADDRESS OF PCB
                    0004
                    0004  PCB::
        00000124    0004          .BLKB   PCB$C_LENGTH                    ; BUFFER TO HOLD PCB
                    0124
                    0124  PHDADR::
        00000128    0124          .BLKL   1                               ; ADDRESS OF PHD
                    0128
                    0128  PHD::
        000002A4    0128          .BLKB   PHD$C_LENGTH                    ; BUFFER TO HOLD PHD
                    02A4
                    02A4  JIBADR::
        000002A8    02A4          .BLKL   1                               ; ADDRESS OF JIB
                    02A8  JIB::
        0000031C    02A8          .BLKB   JIB$C_LENGTH                    ; BUFFER TO HOLD JIB
                    031C
                    031C  CHANTBL_SIZE:
        00000320    031C          .BLKL   1                               ; SIZE OF THE CHANNEL TABLE
                    0320  CHANTBL_ADDR:
        00000324    0320          .BLKL   1                               ; ADDRESS OF THE CHANNEL TABLE COPY
                    0324  CHANNEL_DEVICE:
                    0324  CHANDEV_SIZE:
        00000328    0324          .BLKL   1                               ; SIZE OF DEVICE NAME FOR CHANNEL
        0000032D'   0328          .ADDRESS        CHANDEV_NAME+1          ; ADDRESS OF NAME STORAGE
                    032C  CHANDEV_NAME:
        0000033C    032C          .BLKB   16                              ; STORAGE FOR THE DEVICE NAME
                    033C  FILE_NAME:
        00000084    033C          .LONG   132                             ; FILE NAME DESCRIPTOR
        00000344'   0340          .ADDRESS        FILE_NAMETXT
                    0344  FILE_NAMETXT:
        000003C8    0344          .BLKB   132
                    03C8  NODE:
        000003D8    03C8          .BLKB   SB$S_NODENAME                   ; NODE NAME
                    03D8  FCB:
        0000048C    03D8          .BLKB   FCB$C_LENGTH                    ; STORAGE FOR THE FCB
                    048C  WCB:
        000004BC    048C          .BLKB   WCB$C_LENGTH                    ; STORAGE FOR THE WCB (NO MAP POINTERS)
                    04BC
                00000000          .PSECT  PROCESS,EXE,NOWRT
                    0000
                    0000          .DEFAULT DISPLACEMENT,LONG
```

```
                                 0000          .SBTTL  READ-ONLY DATA DEFINITIONS
                                 0000
                                 0000  ;
                                 0000  ;       READ-ONLY DATA DEFINITIONS
                                 0000  ;
                                 0000
                                 0000  NOTAVAIL:
61 6E 20 65 67 61 6D 69 20 2D 2D 00'  0000          .ASCIC  '-- image name not available --'
6C 69 61 76 61 20 74 6F 6E 20 65 6D   000C
            2D 2D 20 65 6C 62 61      0018
                              1E      0000
                                 001F
                                 001F          .MACRO  $DEFINI NAME,P1,P2
                                 001F          .ENDM
                                 001F          .MACRO  $DEFEND NAME,P1,P2
                                 001F          .ENDM
                                 001F          .MACRO  $EQU SYMBOL,VALUE
                                 001F  S = %LOCATE(< >,SYMBOL)+1
                                 001F  L = %LENGTH(SYMBOL)-S
                                 001F          .ASCIC  /%EXTRACT(S,L,SYMBOL)/
                                 001F          .BLKB   8-<L+1>
                                 001F          .ENDM   $EQU
                                 001F
                                 001F  STATE_TABLE:
         4C 41 47 45 4C 4C 49 00'  001F          .ASCIC  'ILLEGAL'                   ; FOR ZERO CASE
                              07  001F
                                 0027          $STATEDEF                           ; TABLE OF PROCESS STATE NAMES
                                 0097
                        00000003  0097          .MDELETE        $DEFINI,$DEFEND,$EQU
                                 0097
                                 0097          $STATEDEF
                                 0097
                                 0097  PROCESS_STATUS:
                                 0097          TABLE   PCB$V_,<RES,DELPEN,FORCPEN,INQUAN,PSWAPM,RESPEN,SSFEXC,-
                                 0097                  SSFEXCE,SSFEXCS,SSFEXCU,SSRWAIT,SUSPEN,WAKEPEN,WALL,-
                                 0097                  BATCH,NOACNT,SWPVBN,ASTPEN,PHDRES,HIBER,LOGIN,NETWRK,-
                                 0097                  PWRAST,NODELET>
                                 015F
                                 015F  ;
                                 015F  ; Below is a complete list of the resources a process could be waiting for
                                 015F  ; if it is in mwait state.  The mutex resource is a special case.  It is
                                 015F  ; detected by examining the field, PCB$L_EFWM, in the pcb.  This field will
                                 015F  ; contain the address of the mutex if the process is waiting for one.
                                 015F  ; Otherwise this field will contain the number of the resource when in mwait.
                                 015F  ;
                                 015F
                                 015F  ASSUME  RSN$_MAX  EQ   15
                                 015F
                                 015F  RESOURCE_WAIT:
                                 015F          ADDR_TABLE          RSN$_,  <-
                                 015F                              <ASTWAIT,AST>,-
                                 015F                              <MAILBOX,MBX>,-
                                 015F                              <NPDYNMEM,NONPAGED>,-
                                 015F                              <PGFILE,PAGING>,-
                                 015F                              <PGDYNMEM,PAGED>,-
                                 015F                              <BRKTHRU,BREAK>,-
                                 015F                              <IACLOCK,IMGACT>,-
```

```
                         015F                                       <JQUOTA,JOB_QUOTA>,-
                         015F                                       <LOCKID,LOCKS>,-
                         015F                                       <SWPFILE,SWAP>,-
                         015F                                       <MPLEMPTY,MPAGE_EMPTY>,-
                         015F                                       <MPWBUSY,MPAGE_BUSY>,-
                         015F                                       <SCS,SCSWAIT>,-
                         015F                                       <CLUSTRAN,CLUSTER>-
                         015F                                       >
                         01D7
                         01D7      AST:
 54 53 41 57 52 00'      01D7              .ASCIC       /RWAST/                       ; RESOURCE WAIT FOR AST COMPLETION
                05       01D7
                         01DD
                         01DD      MBX:
 58 42 4D 57 52 00'      01DD              .ASCIC       /RWMBX/                       ; MAILBOX FULL
                05       01DD
                         01E3
                         01E3      NONPAGED:
 47 50 4E 57 52 00'      01E3              .ASCIC       /RWNPG/                       ; NONPAGED DYNAMIC MEMORY
                05       01E3
                         01E9
                         01E9      PAGING:
 46 46 50 57 52 00'      01E9              .ASCIC       /RWPFF/                       ; PAGE FILL FULL
                05       01E9
                         01EF
                         01EF      PAGED:
 47 41 50 57 52 00'      01EF              .ASCIC       /RWPAG/                       ; PAGED DYNAMIC MEMORY
                05       01EF
                         01F5
                         01F5      BREAK:
 4B 52 42 57 52 00'      01F5              .ASCIC       /RWBRK/                       ; BREAKTHROUGH
                05       01F5
                         01FB
                         01FB      IMGACT:
 47 4D 49 57 52 00'      01FB              .ASCIC       /RWIMG/                       ; IMAGE ACTIVATION LOCK
                05       01FB
                         0201
                         0201      JOB_QUOTA:
 4F 55 51 57 52 00'      0201              .ASCIC       /RWQUO/                       ; JOB POOLED QUOTA
                05       0201
                         0207
                         0207      LOCKS:
 4B 43 4C 57 52 00'      0207              .ASCIC       /RWLCK/                       ; LOCK IDENTIFICATION DATABASE
                05       0207
                         020D
                         020D      SWAP:
 50 57 53 57 52 00'      020D              .ASCIC       /RWSWP/                       ; SWAP FILE SPACE
                05       020D
                         0213
                         0213      MPAGE_EMPTY:
 45 50 4D 57 52 00'      0213              .ASCIC       /RWMPE/                       ; MODIFIED PAGE LIST EMPTY
                05       0213
                         0219
                         0219      MPAGE_BUSY:
 42 50 4D 57 52 00'      0219              .ASCIC       /RWMPB/                       ; MODIFIED PAGE LIST BUSY
                05       0219
                         021F
```

```
                         021F  SCSWAIT:
     53 43 53 57 52 00'  021F        .ASCIC      /RWSCS/                      ; SYSTEM COMMUNICATIONS
                     05  021F
                         0225
                         0225  CLUSTER:
     55 4C 43 57 52 00'  0225        .ASCIC      /RWCLU/                      ; CLUSTER STATE TRANSITION
                     05  0225
                         022B
                         022B  MWAIT:                                         ; Process is waiting for the resource,
     58 45 54 55 4D 00'  022B        .ASCIC      /MUTEX/                      ; mutex.
                     05  022B
                         0231
                         0231  GBL_TABLE:
                    00'  0231              .ASCIC  ''
                     00  0231
        20 4C 42 47 00'  0232              .ASCIC  'GBL '
                     04  0232
                         0237  CRF_TABLE:
                    00'  0237              .ASCIC  ''
                     00  0237
        20 46 52 43 00'  0238              .ASCIC  'CRF '
                     04  0238
                         023D  DZRO_TABLE:
                    00'  023D              .ASCIC  ''
                     00  023D
  20 4F 52 45 5A 44 00'  023E              .ASCIC  'DZERO '
                     06  023E
                         0245  WRT_TABLE:
                    00'  0245              .ASCIC  ''
                     00  0245
        20 54 52 57 00'  0246              .ASCIC  'WRT '
                     04  0246
                         024B
                         024B  VALID_TABLE:
                    00'  024B              .ASCIC  ''
                     00  024B
  44 49 4C 41 56 20 00'  024C              .ASCIC  ' VALID'
                     06  024C
                         0253  PAGTYP_TABLE:
53 53 45 43 4F 52 50 00'  0253             .ASCIC  'PROCESS'
                     07  0253
20 4D 45 54 53 59 53 00'  025B             .ASCIC  'SYSTEM '
                     07  025B
20 4C 41 42 4F 4C 47 00'  0263             .ASCIC  'GLOBAL '
                     07  0263
20 54 52 57 4C 42 47 00'  026B             .ASCIC  'GBLWRT '
                     07  026B
20 4C 42 54 47 50 50 00'  0273             .ASCIC  'PPGTBL '
                     07  0273
20 4C 42 54 47 50 47 00'  027B             .ASCIC  'GPGTBL '
                     07  027B
20 20 20 20 20 20 20 00'  0283             .ASCIC  '       '
                     07  0283
20 20 20 20 20 20 20 00'  028B             .ASCIC  '       '
                     07  028B
                         0293  MODIFY_TABLE:
                    00'  0293              .ASCIC  ''
```

```
                                  00  0293
   44 45 49 46 49 44 4F 4D 20 00' 0294              .ASCIC  ' MODIFIED'
                                  09  0294
                                      029E  WSLOCK_TABLE:
                                 00'  029E              .ASCIC  ''
                                  00  029E
         4B 43 4F 4C 53 57 20 00' 029F              .ASCIC  ' WSLOCK'
                                  07  029F
                                      02A7  PFNLOCK_TABLE:
                                 00'  02A7              .ASCIC  ''
                                  00  02A7
      4B 43 4F 4C 4E 46 50 20 00' 02A8              .ASCIC  ' PFNLOCK'
                                  08  02A8
                                      02B1  GOODPAGE_TABLE:
                                 00'  02B1              .ASCIC  ''
                                  00  02B1
   45 47 41 50 44 4F 4F 47 20 00' 02B2              .ASCIC  ' GOODPAGE'
                                  09  02B2
                                      02BC
                                      02BC  CHANBUSY_TABLE:
                                 00'  02BC              .ASCIC  ''
                                  00  02BC
               20 79 73 75 42 00' 02BD              .ASCIC  'Busy '
                                  05  02BD
                                      02C3  CHANDPND_TABLE:
                                 00'  02C3              .ASCIC  ''
                                  00  02C3
               20 64 6E 70 44 00' 02C4              .ASCIC  'Dpnd '
                                  05  02C4
                                      02CA  CHANSEC_TABLE:
                                 00'  02CA              .ASCIC  ''
                                  00  02CA
66 20 6E 6F 69 74 63 65 73 28 20 00' 02CB              .ASCIC  ' (section file)'
                         29 65 6C 69  02D7
                                  0F  02CB
                                      02DB
                                      02DB  AST_TABLE:
                                      02DB              CSTABLE 8
                                      02DB              CS      NONE
                                      02E3              CS      K
                                      02EB              CS      E
                                      02F3              CS      KE
                                      02FB              CS      S
                                      0303              CS      KS
                                      030B              CS      ES
                                      0313              CS      KES
                                      031B              CS      U
                                      0323              CS      KU
                                      032B              CS      EU
                                      0333              CS      KEU
                                      033B              CS      SU
                                      0343              CS      KSU
                                      034B              CS      ESU
                                      0353              CS      KESU
                                      035B
                                      035B  HDRSTR1:
                                      035B              STRING  <Process index: !XW   Name: !AF   Extended PID: !XL>
```

```
                                    0395            .SBTTL  DISPLAY_PROCS -- DISPLAY PROCESS DATA
                                    0395    ;---
                                    0395    ;
                                    0395    ;       DISPLAY_PROCS
                                    0395    ;
                                    0395    ;       SHOWS INFORMATION ABOUT EACH PROCESS IN THE SYSTEM.
                                    0395    ;
                                    0395    ;   INPUTS:
                                    0395    ;
                                    0395    ;       NONE
                                    0395    ;
                                    0395    ;   OUTPUTS:
                                    0395    ;
                                    0395    ;       NONE
                                    0395    ;
                                    0395    ;---
                                    0395
                                    0395    DISPLAY_PROCS::
                              001C  0395            .WORD   ^M<R2,R3,R4>
                                    0397
                                    0397            REQMEM  @SCH$GL_PCBVEC,R2       ; VECTOR OF PCB ADDRESSES
                                    03A7            REQMEM  @SCH$GL_MAXPIX,R3       ; GET MAXIMUM PROCESS INDEX
                                    03B7
                         54    D4   03B7            CLRL    R4                      ; INITIALIZE CURRENT INDEX
                00000000'EF    D4   03B9            CLRL    PROC_NAME               ;SET TO PREVIOUS PROCESS IN CASE OF ERROR
                                    03BF    10$:
                  51   6244    DE   03BF            MOVAL   (R2)[R4],R1             ; ADDRESS OF POINTER TO PCB
                                    03C3            REQMEM  (R1),PCBADR             ; GET ADDRESS OF PCB
                                    03D3            REQMEM  @PCBADR,PCB,#PCB$C_LENGTH     ; GET PCB
                00000064'EF    B5   03EC            TSTW    PCB+PCB$L_PID           ; CHECK IF PROCESS INDEX = 0
                         04    12   03F2            BNEQ    20$                     ; BRANCH IF NOT
                         54    D5   03F4            TSTL    R4                      ; CHECK IF NULL PROCESS SLOT
                         50    12   03F6            BNEQ    90$                     ; SKIP IF NOT
                                    03F8    20$:
                00000070'EF    D5   03F8            TSTL    PCB+PCB$L_PHD           ; SWAPPED OUT?
                         39    13   03FE            BEQL    30$                     ; BRANCH IF SO
                                    0400            REQMEM  @PCB+PCB$L_PHD,PHD,#PHD$C_LENGTH ; READ PHD
             50 00000000'EF    DE   0419            MOVAL   P0BR,R0                 ; 4 LONGWORDS
             51 00000128'EF    9E   0420            MOVAB   PHD,R1
                  60   00C8 C1 7D   0427            MOVQ    PHD$L_P0BR(R1),(R0)     ; SETUP RELOCATION REGISTERS
               08 A0   00D0 C1 7D   042C            MOVQ    PHD$L_P1BR(R1),8(R0)
        04 A0   04 A0    18 00 EF   0432            EXTZV   #PHD$V_P0LR,#PHD$S_P0LR,4(R0),4(R0)
    00000000'EF 00000064'EF    D0   0439    30$:    MOVL    PCB+PCB$L_PID,PROC_PID  ; SET PID OF PROCESS TO READ
                   59'AF 00    FB   0444            CALLS   #0,B^DISPLAY_PROCESS    ; DISPLAY PROCESS INFORMATION
                                    0448    90$:
                   02 54 53    F3   0448            AOBLEQ  R3,R4,100$              ; CONTINUE UNTIL DONE
                         03    11   044C            BRB     110$
                       FF6E    31   044E    100$:   BRW     10$
                                    0451    110$:   STATUS  SUCCESS
                               04   0458            RET
```

```
                                     0459          .SBTTL  DISPLAY_PROCESS -- DISPLAY PROCESS INFORMATION
                                     0459  ;---
                                     0459  ;
                                     0459  ;       DISPLAY_PROCESS
                                     0459  ;
                                     0459  ;       THIS ROUTINE FORMATS ALL INFORMATION ABOUT A SINGLE
                                     0459  ;       PROCESS GIVEN THE PROCESS CONTROL BLOCK.
                                     0459  ;
                                     0459  ; INPUTS:
                                     0459  ;
                                     0459  ;       PCB = PROCESS CONTROL BLOCK FOR PROCESS
                                     0459  ;
                                     0459  ; OUTPUTS:
                                     0459  ;
                                     0459  ;       NONE
                                     0459  ;
                                     0459  ;---
                                     0459
                                     0459  DISPLAY_PROCESS::
                               003C  0459          .WORD   ^M<R2,R3,R4,R5>
    0074 8F   00   6E   00      2C  045B          MOVC5   #0,(SP),#0,#JIB$C_LENGTH,JIB    ; PRE-ZERO JIB IN CASE NOT THERE
              000002A8'EF            0462
000002A4'EF   00000084'EF       D0  0467          MOVL    PCB+PCB$L_JIB,JIBADR    ; CHECK FOR JIB
                         19     13  0472          BEQL    5$                      ; BR IF NONE
                                     0474          REQMEM  @JIBADR,JIB,#JIB$C_LENGTH        ; GET JIB
                                     048D  5$:
       52     00000004'EF       DE  048D          MOVAL   PCB,R2
       53     00000128'EF       DE  0494          MOVAL   PHD,R3
                                     049B          ALLOC   80,R4                   ; 80 BYTE BUFFER FOR HEADER
                      64 A2     DD  04AD          PUSHL   PCB$L_EPID(R2)          ; EXTENDED PROCESS ID
                      71 A2     9F  04B0          PUSHAB  PCB$T_LNAME+1(R2)       ; PROCESS NAME
               7E     70 A2     9A  04B3          MOVZBL  PCB$T_LNAME(R2),-(SP)   ; PROCESS NAME
                      60 A2     DD  04B7          PUSHL   PCB$L_PID(R2)           ; PROCESS INDEX
                         54     DD  04BA          PUSHL   R4
                         54     DD  04BC          PUSHL   R4
                    FE99 CF     9F  04BE          PUSHAB  HDRSTR1                 ; FAO CONTROL STRING
         00000000'GF     07     FB  04C2          CALLS   #7,G^SYS$FAO            ; FORMAT TITLE STRING
                         54     DD  04C9          PUSHL   R4
         00000000'EF     01     FB  04CB          CALLS   #1,SET_HEADING          ; SET NEW HEADING
                                     04D2          SKIP    PAGE
                                     04D9
       54     00000000'EF       D0  04D9          MOVL    OPTIONS,R4
       54     FFFFFFBF 8F       D3  04E0          BITL    #^C<OPT$M_SYSPROC>,R4   ; CHECK IF ANY OPTION SPECIFIED
                         04     13  04E7          BEQL    10$                     ; DEFAULT IS PCB
                 07 54   04     E1  04E9          BBC     #OPT$V_PCB,R4,20$       ; CHECK IF /PCB SPECIFIED
                                     04ED  10$:
         000005B0'EF     00     FB  04ED          CALLS   #0,SHOW_PCB             ; SHOW SOME PCB FIELDS
                                     04F4  20$:
       54     0000042F 8F       D3  04F4          BITL    #<OPT$M_PHD! -          ; IF ANY OF THESE OPTIONS CHOSEN
                                     04FB                  OPT$M_REGS! -
                                     04FB                  OPT$M_WSL! -
                                     04FB                  OPT$M_PST! -
                                     04FB                  OPT$M_PPT! -
                                     04FB                  OPT$M_CHAN>,R4
                         51     13  04FB          BEQL    70$                     ; SKIP READING PHD IF NONE
                      6C A2     D5  04FD          TSTL    PCB$L_PHD(R2)           ; PROCESS RESIDENT?
                         03     12  0500          BNEQ    25$                     ; XFER IF SO
```

```
           008B   31  0502   472           BRW     100$                          ; ELSE GIVE A WARNING
                      0505   473 25$:      REQMEM  @PCB$L_PHD(R2),(R3),#PHD$C_LENGTH   ; READ PROCESS HEADER
                      0517   474
        07 54     05  E1  0517   475           BBC     #OPT$V_PHD,R4,30$             ; CHECK IF /PHD SPECIFIED
  000007BA'EF     00  FB  051B   476           CALLS   #0,SHOW_PHD                   ; SHOW PROCESS HEADER
        07 54     03  E1  0522   477 30$:      BBC     #OPT$V_REGS,R4,40$            ; CHECK IF /REGS SPECIFIED
  00000934'EF     00  FB  0526   478           CALLS   #0,SHOW_REGS                  ; SHOW SAVED REGISTERS
        07 54     00  E1  052D   479 40$:      BBC     #OPT$V_WSL,R4,50$             ; CHECK IF /WSL SPECIFIED
  00000A31'EF     00  FB  0531   480           CALLS   #0,SHOW_WSL                   ; SHOW WORKING SET LIST
        07 54     02  E1  0538   481 50$:      BBC     #OPT$V_PST,R4,60$             ; CHECK IF /PST SPECIFIED
  00000C35'EF     00  FB  053C   482           CALLS   #0,SHOW_PST                   ; SHOW PROCESS SECTION TABLE
        07 54     01  E1  0543   483 60$:      BBC     #OPT$V_PPT,R4,70$             ; CHECK IF /PPT SPECIFIED
  00000DD7'EF     00  FB  0547   484           CALLS   #0,SHOW_PPT                   ; SHOW PROCESS PAGE TABLES
        14 54     07  E1  054E   485 70$:      BBC     #OPT$V_RMS,R4,80$             ; CHECK IF /RMS SPECIFIED
        09 54     08  E0  0552   486           BBS     #OPT$V_RMSD,R4,71$            ; CHECK IF /RMS=... SPECIFIED
  00000000'EF     00  FB  0556   487           CALLS   #0,SHOW_RMS                   ; SHOW CURRENTLY SELECTED RMS STRUCTS
              07  11  055D   488           BRB     80$                           ; GO ON TO NEXT OPTION
  00000000'EF     00  FB  055F   489 71$:      CALLS   #0,SHOW_RMS_DIS               ; SHOW RMS STURCTS SPECIFIED ON
                      0566   490                                                 ;  THIS COMMAND
        13 54     09  E1  0566   491 80$:      BBC     #OPT$V_LCK,R4,85$             ; CHECK IF /LOCK SPECIFIED
     00000000'EF      9F  056A   492           PUSHAB  PCBADR                        ; PASS ON ADDRESS OF PCB IN SYSTEM
     00000004'EF      9F  0570   493           PUSHAB  PCB                           ; PASS ON ADDRESS OF PCB COPY IN SDA
  00000000'EF     02  FB  0576   494           CALLS   #2,SHOW_PROC_LOCK             ; SHOW LOCKS OWNED BY PROCESS
                      057D   495
        07 54     0A  E1  057D   496 85$:      BBC     #OPT$V_CHAN,R4,90$            ; CHECK IF /CHANNELS SPECIFIED
  00000F94'EF     00  FB  0581   497           CALLS   #0,SHOW_CHANNELS              ; DISPLAY PROCESS CHANNEL INFORMATION
                      0588   498
                      0588   499 90$:      STATUS  SUCCESS                       ; EXIT
              04      058F   500           RET
                      0590   501
                      0590   502 100$:     SKIP    1                             ; IN CASE ALL PROCESSES ARE DISPLAYED
50   00000000'8F  D0  0599   503           MOVL    #<<MSG$_NOTRES&^XFFFFFFF8>!STS$K_WARNING>,R0     ; SET STATUS
                      05A0   504           SIGNAL  1                             ; SIGNAL WARNING
              9E  11  05AE   505           BRB     70$                           ; MUST RETURN SUCCESS TO TPARSE
```

```
                              05B0          .SBTTL  SHOW_PCB -- SHOW PROCESS CONTROL BLOCK
                              05B0  ;---
                              05B0  ;
                              05B0  ;       SHOW_PCB
                              05B0  ;
                              05B0  ;       THIS ROUTINE FORMATS SOME INTERESTING FIELDS IN THE
                              05B0  ;       PROCESS CONTROL BLOCK FOR EASY READING.
                              05B0  ;
                              05B0  ;   INPUTS:
                              05B0  ;
                              05B0  ;       PCB = CURRENT PROCESS CONTROL BLOCK
                              05B0  ;
                              05B0  ;   OUTPUTS:
                              05B0  ;
                              05B0  ;       NONE
                              05B0  ;
                              05B0  ;---
                              05B0
                              05B0  SHOW_PCB:
                        0004  05B0          .WORD   ^M<R2>
                              05B2
   52   00000004'EF     DE    05B2          MOVAL   PCB,R2
                              05B9          ENSURE  12
                              05D1          ALLOC   80                              ; 80 BYTE OUTPUT BUFFER
              24 A2     DD    05E0          PUSHL   PCB$L_STS(R2)                   ; PROCESS STATUS
            FAB0 CF     9F    05E3          PUSHAB  PROCESS_STATUS                  ; BIT DEFINITION TABLE
 00000000'EF     02     FB    05E7          CALLS   #2,TRANSLATE_BITS               ; TRANSLATE BITS INTO NAMES
                 5E     DD    05EE          PUSHL   SP                              ; ADDRESS OF RESULT DESCRIPTOR
              24 A2     DD    05F0          PUSHL   PCB$L_STS(R2)
                              05F3          PRINT   2,<Process status:  !XL    !AS>
                              0600          SKIP    1
                              0609
        000002A4'EF     DD    0609          PUSHL   JIBADR                          ; ADDRESS OF JIB
        00000000'EF     DD    060F          PUSHL   PCBADR                          ; ADDRESS OF PCB
                              0615          PRINT   2,<-
                              0615  PCB address                 !XL    -
                              0615  JIB address                 !XL>
                              0622
              20 A2     DD    0622          PUSHL   PCB$L_WSSWP(R2)
              6C A2     DD    0625          PUSHL   PCB$L_PHD(R2)
                              0628          PRINT   2,<-
                              0628  PHD address                 !XL    -
                              0628  Swapfile disk address       !XL>
                              0635
        000002EC'EF     DD    0635          PUSHL   JIB+JIB$W_PRCCNT
        000002FC'EF     DD    063B          PUSHL   JIB+JIB$L_MPID                  ; MASTER PID
                              0641          PRINT   2,<-
                              0641  Master internal PID         !XL    -
                              0641  Subprocess count            !8UW>
                              064E
              1C A2     DD    064E          PUSHL   PCB$L_OWNER(R2)                 ; CREATOR PID
              60 A2     DD    0651          PUSHL   PCB$L_PID(R2)
                              0654          PRINT   2,<-
                              0654  Internal PID                !XL    -
                              0654  Creator internal PID        !XL>
                              0661
              68 A2     DD    0661          PUSHL   PCB$L_EOWNER(R2)                ; CREATOR EXTENDED PID
```

```
        64 A2   DD  0664          PUSHL   PCB$L_EPID(R2)           ; EXTENDED PID
                    0667          PRINT   2,<-
                    0667  Extended PID          !XL    -
                    0667  Creator extended PID  !XL>
                    0674
        32 A2   DD  0674          PUSHL   PCB$W_TMBU(R2)
   02   2C A2   B1  0677          CMPW    PCB$W_STATE(R2),#SCH$C_MWAIT    ; CHECK FOR MWAIT
           25   12  067B          BNEQ    15$                      ; NOT EQUAL, TRANSLATE TO STATE NAME
           52   DD  067D  10$:    PUSHL   R2                       ; SAVE R2, DETERMINE RESOURCE WAIT STATE
   52   4C A2   D0  067F          MOVL    PCB$L_EFWM(R2),R2        ; RESOURCE WAIT
 53   FAD8 CF   9E  0683          MOVAB   RESOURCE_WAIT,R3         ; ADDRESS OF TABLE OF STATES
  00000000'GF   16  0688          JSB     G^TRANSLATE_ADDRESS      ; DETERMINE STATE
   52      8E   D0  068E          MOVL    (SP)+,R2                 ; RESTORE R2
           0B   12  0691          BNEQ    12$                      ; MATCH FOUND, IF NOT EQUAL
        4C A2   D5  0693          TSTL    PCB$L_EFWM(R2)           ; CHECK FOR MUTEX ADDRESS
           0A   18  0696          BGEQ    15$                      ; BRANCH IF NOT ADDRESS
      FB8F CF   9F  0698          PUSHAB  MWAIT                    ; ADDRESS OF MUTEX COUNTED STRING
           0D   11  069C          BRB     20$                      ; DISPLAY
           50   DD  069E  12$:    PUSHL   R0                       ; ADDRESS OF RESOURCE WAITING FOR
           09   11  06A0          BRB     20$                      ; DISPLAY
                    06A2  15$:
   51   2C A2   3C  06A2          MOVZWL  PCB$W_STATE(R2),R1
   F974 CF41    7F  06A6          PUSHAQ  STATE_TABLE[R1]
                    06AB  20$:
                    06AB          PRINT   2,<-
                    06AB  State                          !5AC     -
                    06AB  Termination mailbox             !XW>
                    06B8
   51   0D A2   9A  06B8          MOVZBL  PCB$B_ASTEN(R2),R1
   FC1A CF41    7F  06BC          PUSHAQ  AST_TABLE[R1]
   7E   0B A2   9A  06C1          MOVZBL  PCB$B_PRI(R2),-(SP)
 6E   1F   6E   C3  06C5          SUBL3   (SP),#31,(SP)
                    06C9          PRINT   2,<-
                    06C9  Current priority          !8UB     -
                    06C9  AST's enabled                    !4AC>
                    06D6
   51   0C A2   9A  06D6          MOVZBL  PCB$B_ASTACT(R2),R1
   FBFC CF41    7F  06DA          PUSHAQ  AST_TABLE[R1]
   7E   2F A2   9A  06DF          MOVZBL  PCB$B_PRIB(R2),-(SP)
 6E   1F   6E   C3  06E3          SUBL3   (SP),#31,(SP)
                    06E7          PRINT   2,<-
                    06E7  Base priority             !8UB     -
                    06E7  AST's active                     !4AC>
                    06F4
        38 A2   DD  06F4          PUSHL   PCB$W_ASTCNT(R2)
      00BC C2   DD  06F7          PUSHL   PCB$W_MEM(R2)
      00BE C2   DD  06FB          PUSHL   PCB$W_GRP(R2)
                    06FF          PRINT   3,<-
                    06FF  UIC                      [!3OW,!3OW]     -
                    06FF  AST's remaining           !8UW>
                    070C
        3C A2   DD  070C          PUSHL   PCB$W_BIOLM(R2)          ; BUFFERED I/O LIMIT
        3A A2   DD  070F          PUSHL   PCB$W_BIOCNT(R2)         ; BUFFERED I/O COUNT
        0E A2   DD  0712          PUSHL   PCB$W_MTXCNT(R2)         ; MUTEX COUNT
                    0715          PRINT   3,<-
                    0715  Mutex count               !8UW     -
                    0715  Buffered I/O count/limit   !6UW/!UW>
```

```
                         0722
          40 A2    DD    0722            PUSHL   PCB$W_DIOLM(R2)
          3E A2    DD    0725            PUSHL   PCB$W_DIOCNT(R2)
          2E A2    DD    0728            PUSHL   PCB$B_WEFC(R2)
                         072B            PRINT   3,<-
                         072B    Waiting EF cluster          !8UB     -
                         072B    Direct I/O count/limit        !6UW/!UW>
                         0738
    000002CC'EF    DD    0738            PUSHL   JIB+JIB$L_BYTLM
    000002C8'EF    DD    073E            PUSHL   JIB+JIB$L_BYTCNT
          28 A2    DD    0744            PUSHL   PCB$L_WTIME(R2)
                         0747            PRINT   3,<-
                         0747    Starting wait time          !XL      -
                         0747    BUFIO byte count/limit        !6UL/!UL>
                         0754
    000002D8'EF    DD    0754            PUSHL   JIB+JIB$W_FILCNT
          4C A2    DD    075A            PUSHL   PCB$L_EFWM(R2)
                         075D            PRINT   2,<-
                         075D    Event flag wait mask        !XL      -
                         075D    # open files allowed left   !6UW>
                         076A
    000002DC'EF    DD    076A            PUSHL   JIB+JIB$W_TQCNT
          50 A2    DD    0770            PUSHL   PCB$L_EFCS(R2)
                         0773            PRINT   2,<-
                         0773    Local EF cluster 0          !XL      -
                         0773    Timer entries allowed left !6UW>
                         0780
          30 A2    DD    0780            PUSHL   PCB$W_APTCNT(R2)
          54 A2    DD    0783            PUSHL   PCB$L_EFCU(R2)
                         0786            PRINT   2,<-
                         0786    Local EF cluster 1          !XL      -
                         0786    Active page table count       !6UW>
                         0793
          36 A2    DD    0793            PUSHL   PCB$W_PPGCNT(R2)
          58 A2    DD    0796            PUSHL   PCB$L_EFC2P(R2)
                         0799            PRINT   2,<-
                         0799    Global cluster 2 pointer !XL      -
                         0799    Process WS page count         !6UW>
                         07A6
          34 A2    DD    07A6            PUSHL   PCB$W_GPGCNT(R2)
          5C A2    DD    07A9            PUSHL   PCB$L_EFC3P(R2)
                         07AC            PRINT   2,<-
                         07AC    Global cluster 3 pointer !XL      -
                         07AC    Global WS page count          !6UW>
                         07B9
             04          07B9            RET
```

```
                                07BA          .SBTTL  SHOW_PHD -- SHOW PROCESS HEADER
                                07BA  ;---
                                07BA  ;
                                07BA  ;       SHOW_PHD
                                07BA  ;
                                07BA  ;       FORMAT THE FIELDS FROM THE PROCESS HEADER.
                                07BA  ;
                                07BA  ;   INPUTS:
                                07BA  ;
                                07BA  ;       PHD = PROCESS HEADER BLOCK
                                07BA  ;
                                07BA  ;   OUTPUTS:
                                07BA  ;
                                07BA  ;       NONE
                                07BA  ;
                                07BA  ;---
                                07BA
                                07BA          .ENABL  LSB
                                07BA
                                07BA  SHOW_PHD:
                          0004  07BA          .WORD   ^M<R2>
                                07BC
        52  00000128'EF   DE    07BC          MOVAL   PHD,R2                     ; ADDRESS OF PROCESS HEADER
                                07C3          SKIP    2
                                07CC          ENSURE  12
                                07E4          PRINT   0,<Process header>
                                07F1          PRINT   0,<-------------->
                                07FE          SKIP    1
                 38 A2    DD    0807          PUSHL   PHD$L_CPUTIM(R2)
                 28 A2    DD    080A          PUSHL   PHD$L_FREP0VA(R2)
                                080D          PRINT   2,<-
                                080D  First free P0 address         !8XL!4* -
                                080D  Accumulated CPU time          !8XL>
                 3C A2    DD    081A          PUSHL   PHD$W_QUANT(R2)
                 2C A2    DD    081D          PUSHL   PHD$L_FREPTECNT(R2)
                                0820          PRINT   2,<-
                                0820  Free PTEs between P0/P1       !8UL!4* -
                                0820  CPU since last quantum        !8XW>
            000002EE'EF   DD    082D          PUSHL   JIB+JIB$W_PRCLIM
                 30 A2    DD    0833          PUSHL   PHD$L_FREP1VA(R2)
                                0836          PRINT   2,<-
                                0836  First free P1 address         !8XL!4* -
                                0836  Subprocess quota              !8UW>
                 40 A2    DD    0843          PUSHL   PHD$W_ASTLM(R2)
            000002E4'EF   DD    0846          PUSHL   JIB+JIB$L_PGFLCNT
                                084C          PRINT   2,<-
                                084C  Free page file pages          !8UL!4* -
                                084C  AST limit                     !8UW>
                 42 A2    DD    0859          PUSHL   PHD$W_PHVINDEX(R2)
                 34 A2    DD    085C          PUSHL   PHD$B_DFPFC(R2)
                                085F          PRINT   2,<-
                                085F  Page fault cluster size       !8UB!4* -
                                085F  Process header index          !8XW>
                 44 A2    DD    086C          PUSHL   PHD$L_BAK(R2)
                 35 A2    DD    086F          PUSHL   PHD$B_PGTBPFC(R2)
                                0872          PRINT   2,<-
                                0872  Page table cluster size       !8UB!4* -
```

```
                    0872  Backup address vector      !8XL>
       48 A2   DD   087F            PUSHL   PHD$L_WSLX(R2)
       36 A2   DD   0882            PUSHL   PHD$W_FLAGS(R2)
                    0885            PRINT   2,<-
                    0885  Flags                      !8XW!4* -
                    0885  WSL index save area        !8XL>
       6C A2   DD   0892            PUSHL   PHD$W_PTCNTLCK(R2)
       54 A2   DD   0895            PUSHL   PHD$L_DIOCNT(R2)
                    0898            PRINT   2,<-
                    0898  Direct I/O count           !8UL!4* -
                    0898  PTs having locked WSLs     !8UW>
       6E A2   DD   08A5            PUSHL   PHD$W_PTCNTVAL(R2)
       58 A2   DD   08A8            PUSHL   PHD$L_BIOCNT(R2)
                    08AB            PRINT   2,<-
                    08AB  Buffered I/O count         !8UL!4* -
                    08AB  PTs having valid WSLs      !8UW>
       70 A2   DD   08B8            PUSHL   PHD$W_PTCNTACT(R2)
       5C A2   DD   08BB            PUSHL   PHD$L_CPULIM(R2)
                    08BE            PRINT   2,<-
                    08BE  Limit on CPU time          !8XL!4* -
                    08BE  Active page tables         !8UW>
       72 A2   DD   08CB            PUSHL   PHD$W_PTCNTMAX(R2)
 000002E0'EF   DD   08CE            PUSHL   JIB+JIB$L_PGFLQUOTA
                    08D4            PRINT   2,<-
                    08D4  Maximum page file count    !8UL!4* -
                    08D4  Maximum active PTs         !8UW>
       74 A2   DD   08E1            PUSHL   PHD$W_WSFLUID(R2)
       4C A2   DD   08E4            PUSHL   PHD$L_PAGEFLTS(R2)
                    08E7            PRINT   2,<-
                    08E7  Total page faults          !8UL!4* -
                    08E7  Guaranteed fluid WS pages  !8UW>
       76 A2   DD   08F4            PUSHL   PHD$W_EXTDYNWS(R2)
 000002DA'EF   DD   08F7            PUSHL   JIB+JIB$W_FILLM
                    08FD            PRINT   2,<-
                    08FD  File limit                 !8UW!4* -
                    08FD  Extra dynamic WS entries   !8UW>
       64 A2   DD   090A            PUSHL   PHD$L_PTWSLELCK(R2)
 000002DE'EF   DD   090D            PUSHL   JIB+JIB$W_TQLM
                    0913            PRINT   2,<-
                    0913  Timer queue limit          !8UW!4* -
                    0913  Locked WSLE counts array   !8XW>
       68 A2   DD   0920            PUSHL   PHD$L_PTWSLEVAL(R2)
       1C A2   DD   0923            PUSHL   PHD$L_PAGFIL(R2)
                    0926            PRINT   2,<-
                    0926  Paging file index          !8XL!4* -
                    0926  Valid WSLE counts array    !8XW>
                    0933
               04   0933            RET
```

```
                            0934          .SBTTL  SHOW_REGS -- SHOW SAVED PROCESS REGISTERS
                            0934  ;---
                            0934  ;
                            0934  ;       SHOW_REGS
                            0934  ;
                            0934  ;       DISPLAY THE SAVED PROCESS REGISTERS
                            0934  ;
                            0934  ;   INPUTS:
                            0934  ;
                            0934  ;       PHD = CURRENT PROCESS HEADER
                            0934  ;
                            0934  ;   OUTPUTS:
                            0934  ;
                            0934  ;       NONE
                            0934  ;
                            0934  ;---
                            0934
                            0934  SHOW_REGS:
                     0004   0934          .WORD   ^M<R2>
                            0936
                            0936          SKIP    2
                            093F          ENSURE  7
                            0957          PRINT   0,<Saved process registers>
                            0964          PRINT   0,<----------------------->
                            0971          SKIP    1
     52   00000128'EF  DE   097A          MOVAL   PHD,R2                        ; ADDRESS OF PROCESS HEADER
                0094 C2  DD   0981          PUSHL   PHD$L_R3(R2)
                0090 C2  DD   0985          PUSHL   PHD$L_R2(R2)
                008C C2  DD   0989          PUSHL   PHD$L_R1(R2)
                0088 C2  DD   098D          PUSHL   PHD$L_R0(R2)
                            0991          PRINT   4,<R0   = !XL    R1   = !XL    R2   = !XL    R3   = !XL>
                00A4 C2  DD   099E          PUSHL   PHD$L_R7(R2)
                00A0 C2  DD   09A2          PUSHL   PHD$L_R6(R2)
                009C C2  DD   09A6          PUSHL   PHD$L_R5(R2)
                0098 C2  DD   09AA          PUSHL   PHD$L_R4(R2)
                            09AE          PRINT   4,<R4   = !XL    R5   = !XL    R6   = !XL    R7   = !XL>
                00B4 C2  DD   09BB          PUSHL   PHD$L_R11(R2)
                00B0 C2  DD   09BF          PUSHL   PHD$L_R10(R2)
                00AC C2  DD   09C3          PUSHL   PHD$L_R9(R2)
                00A8 C2  DD   09C7          PUSHL   PHD$L_R8(R2)
                            09CB          PRINT   4,<R8   = !XL    R9   = !XL    R10  = !XL    R11  = !XL>
                00C4 C2  DD   09D8          PUSHL   PHD$L_PSL(R2)
                00C0 C2  DD   09DC          PUSHL   PHD$L_PC(R2)
                00BC C2  DD   09E0          PUSHL   PHD$L_R13(R2)
                00B8 C2  DD   09E4          PUSHL   PHD$L_R12(R2)
                            09E8          PRINT   4,<AP   = !XL    FP   = !XL    PC   = !XL    PSL  = !XL>
                0084 C2  DD   09F5          PUSHL   PHD$L_USP(R2)
                0080 C2  DD   09F9          PUSHL   PHD$L_SSP(R2)
                  7C A2  DD   09FD          PUSHL   PHD$L_ESP(R2)
                  78 A2  DD   0A00          PUSHL   PHD$L_KSP(R2)
                            0A03          PRINT   4,<KSP  = !XL    ESP  = !XL    SSP  = !XL    USP  = !XL>
                00D4 C2  DD   0A10          PUSHL   PHD$L_P1LR(R2)
                00D0 C2  DD   0A14          PUSHL   PHD$L_P1BR(R2)
  7E    00CC C2   18    00  EF   0A18          EXTZV   #PHD$V_P0LR,#PHD$S_P0LR,PHD$L_P0LRASTL(R2),-(SP)
                00C8 C2  DD   0A1F          PUSHL   PHD$L_P0BR(R2)
                            0A23          PRINT   4,<P0BR = !XL    P0LR = !XL    P1BR = !XL    P1LR = !XL>
                            0A30
```

```
04  0A30   831          RET
```

```
                              0A31          .SBTTL  SHOW_WSL -- SHOW WORKING SET LIST
                              0A31     ;---
                              0A31     ;
                              0A31     ;        SHOW_WSL
                              0A31     ;
                              0A31     ;        THIS ROUTINE FORMATS INFORMATION ABOUT THE PROCESSES
                              0A31     ;        WORKING SET LIST FROM THE PROCESS HEADER.
                              0A31     ;
                              0A31     ;    INPUTS:
                              0A31     ;
                              0A31     ;        PHD = PROCESS HEADER BLOCK
                              0A31     ;
                              0A31     ;    OUTPUTS:
                              0A31     ;
                              0A31     ;        NONE
                              0A31     ;
                              0A31     ;---
                              0A31
                              0A31          .ENABL  LSB
                              0A31
                              0A31     SHOW_WSL:
                        007C  0A31          .WORD   ^M<R2,R3,R4,R5,R6>
                              0A33
                              0A33          SKIP    2
                              0A3C          ENSURE  8
                              0A54          PRINT   0,<Working set information>
                              0A61          PRINT   0,<----------------------->
                              0A6E          SKIP    1
52      00000128'EF      DE   0A77          MOVAL   PHD,R2
        53    08 A2      3C   0A7E          MOVZWL  PHD$W_WSLIST(R2),R3       ; BIAS TO WORKING SET LIST
                    53   D7   0A82          DECL    R3                        ; ADJUST BIAS
7E      0A A2       53   C3   0A84          SUBL3   R3,PHD$W_WSAUTH(R2),-(SP) ; CURRENT AUTHORIZED SIZE
              08 A2      DD   0A89          PUSHL   PHD$W_WSLIST(R2)          ; 1ST WSL ENTRY
                              0A8C          PRINT   1,<First WSL entry           !XW        Current authorized working se
7E      1A A2       53   C3   0A99          SUBL3   R3,PHD$W_DFWSCNT(R2),-(SP) ; DEFAULT WORKING SET SIZE
              0C A2      DD   0A9E          PUSHL   PHD$W_WSLOCK(R2)          ; 1ST LOCKED WSL ENTRY
                              0AA1          PRINT   1,<First locked entry        !XW        Default (initial) working set
7E      18 A2       53   C3   0AAE          SUBL3   R3,PHD$W_WSQUOTA(R2),-(SP) ; MAXIMUM WORKING SET ALLOWED
              0E A2      DD   0AB3          PUSHL   PHD$W_WSDYN(R2)           ; 1ST DYNAMIC ENTRY
                              0AB6          PRINT   1,<First dynamic entry       !XW        Maximum working set allowed (
              10 A2      DD   0AC3          PUSHL   PHD$W_WSNEXT(R2)          ; LAST ENTRY REPLACED
                              0AC6          PRINT   1,<Last entry replaced       !XW>
              12 A2      DD   0AD3          PUSHL   PHD$W_WSLAST(R2)          ; LAST ENTRY IN LIST
                              0AD6          PRINT   1,<Last entry in list        !XW>
              08 A2      B5   0AE3          TSTW    PHD$W_WSLIST(R2)          ; CHECK IF REASONABLE
                    01   14   0AE6          BGTR    5$                        ; BRANCH IF OK
                         04   0AE8          RET
                              0AE9     5$:
                              0AE9          SKIP    2
                              0AF2          ENSURE  8
                              0B0A          PRINT   0,<Working set list>
                              0B17          PRINT   0,<---------------->
        56    12 A2      3C   0B24          MOVZWL  PHD$W_WSLAST(R2),R6       ; LONGWORD OFFSET TO LAST ENTRY
                    56   D6   0B28          INCL    R6                        ; LONGWORDS IN PHD+WSL
   56      56       02   78   0B2A          ASHL    #2,R6,R6                  ; R6 = LENGTH IN BYTES
                    56   DD   0B2E          PUSHL   R6                        ; LENGTH TO ALLOCATE
00000000'EF         01   FB   0B30          CALLS   #1,ALLOCATE               ; ALLOCATE SPACE FOR PHD+WSL
```

```
                 52    51  D0 0B37          MOVL    R1,R2                         ; ADDRESS OF PHD/WSL BUFFER
                              0B3A          GETMEM  @PCB+PCB$L_PHD,(R2),R6        ; GET ENTIRE WORKING SET LIST
                    25 50  E9 0B4B          BLBC    R0,90$                        ; SKIP IF CANNOT BE READ
                              0B4E
        00000C13'EF    00  FB 0B4E          CALLS   #0,WSL_TITLE                  ; PRINT THE HEADING LINES
  00000000'EF   00000C13'EF 9E 0B55          MOVAB   WSL_TITLE,HEADING_ROUTINE     ; SET HEADING ROUTINE
              53    08 A2  3C 0B60          MOVZWL  PHD$W_WSLIST(R2),R3           ; STARTING INDEX OF LIST
              54    12 A2  3C 0B64          MOVZWL  PHD$W_WSLAST(R2),R4           ; LAST ENTRY TO DUMP
                       53  D7 0B68          DECL    R3                            ; ADJUST FOR FIRST ITERATION
                       55  D4 0B6A          CLRL    R5                            ; EMPTY WSLE COUNT
                              0B6C  10$:
                       53  D6 0B6C          INCL    R3                            ; INCREMENT INDEX
                 54    53  D1 0B6E          CMPL    R3,R4                         ; CHECK IF DONE
                       12  15 0B71          BLEQ    20$                           ; BRANCH IF OK
                              0B73  90$:
           00000000'EF     D4 0B73          CLRL    HEADING_ROUTINE               ; CLEAR HEADING ROUTINE ADDRESS
                       56  DD 0B79          PUSHL   R6                            ; LENGTH OF BUFFER
                       52  DD 0B7B          PUSHL   R2                            ; ADDRESS OF PHD+WSL BUFFER
         00000000'EF   02  FB 0B7D          CALLS   #2,DEALLOCATE                 ; DEALLOCATE BUFFER
                           04 0B84          RET
                              0B85  20$:
               50    6243  D0 0B85          MOVL    (R2)[R3],R0                   ; GET ENTRY
               04 50   00  E0 0B89          BBS     #WSL$V_VALID,R0,30$           ; BRANCH IF VALID
                       55  D6 0B8D          INCL    R5                            ; INCREMENT EMPTY ENTRIES
                       DB  11 0B8F          BRB     10$
                              0B91  30$:
                       55  D5 0B91          TSTL    R5                            ; CHECK IF EMPTY ENTRIES
                       28  13 0B93          BEQL    40$                           ; BRANCH IF NOT
                       50  DD 0B95          PUSHL   R0                            ; SAVE PENDING WSLE
                       55  DD 0B97          PUSHL   R5
                              0B99          SKIP    1
                              0BA2          PRINT   1,<!_ ----  !UL empty entries>
                              0BAF          SKIP    1
                       55  D4 0BB8          CLRL    R5                            ; RESET EMPTY WSLE COUNT
                    50 8ED0   0BBA          POPL    R0                            ; RESTORE PENDING WSLE TO SHOW
                              0BBD  40$:
        51    50   01   06 EF 0BBD          EXTZV   #WSL$V_GOODPAGE,#1,R0,R1
                F6EA CF41  9F 0BC2          PUSHAB  GOODPAGE_TABLE[R1]
        51    50   01   04 EF 0BC7          EXTZV   #WSL$V_PFNLOCK,#1,R0,R1
                F6D6 CF41  9F 0BCC          PUSHAB  PFNLOCK_TABLE[R1]
        51    50   01   05 EF 0BD1          EXTZV   #WSL$V_WSLOCK,#1,R0,R1
                F6C3 CF41  9F 0BD6          PUSHAB  WSLOCK_TABLE[R1]
        51    50   01   08 EF 0BDB          EXTZV   #WSL$V_MODIFY,#1,R0,R1
                F6AE CF41  9F 0BE0          PUSHAB  MODIFY_TABLE[R1]
        51    50   03   01 EF 0BE5          EXTZV   #WSL$V_PAGTYP,#WSL$S_PAGTYP,R0,R1
                F664 CF41  7F 0BEA          PUSHAQ  PAGTYP_TABLE[R1]
        51    50   01   00 EF 0BEF          EXTZV   #WSL$V_VALID,#1,R0,R1
                F652 CF41  9F 0BF4          PUSHAB  VALID_TABLE[R1]
  7E    50    000001FF 8F  CB 0BF9          BICL3   #^X1FF,R0,-(SP)               ; VIRTUAL ADDRESS
                       53  DD 0C01          PUSHL   R3                            ; INDEX
                              0C03          PRINT   8,<!_ !XW  !XL    !AC !5(AC)>
                  FF59     31 0C10          BRW     10$
                              0C13
                              0C13          .DSABL  LSB
                              0C13
                              0C13  ;
                              0C13  ;       THIS ROUTINE PRINTS THE HEADING LINES FOR EACH PAGE
```

```
      0C13   ;           OF THE WORKING SET LIST DISPLAY.
      0C13   ;
      0C13   WSL_TITLE:
0000  0C13               .WORD   0
      0C15
      0C15               SKIP    1
      0C1E               PRINT   0,<!_INDEX   ADDRESS    STATUS>
      0C2B               SKIP    1
  04  0C34               RET
```

```
                                     0C35               .SBTTL  SHOW_PST -- SHOW PROCESS SECTION TABLE
                                     0C35      ;---
                                     0C35      ;
                                     0C35      ;        SHOW_PST
                                     0C35      ;
                                     0C35      ;        DISPLAY THE PROCESS SECTION TABLE
                                     0C35      ;
                                     0C35      ;    INPUTS:
                                     0C35      ;
                                     0C35      ;        PHD = PROCESS HEADER BLOCK
                                     0C35      ;
                                     0C35      ;    OUTPUTS:
                                     0C35      ;
                                     0C35      ;        NONE
                                     0C35      ;
                                     0C35      ;---
                                     0C35
                                     0C35               .ENABL  LSB
                                     0C35
                                     0C35      SHOW_PST:
                             00FC    0C35               .WORD   ^M<R2,R3,R4,R5,R6,R7>
                                     0C37
                                     0C37               SKIP    2
                                     0C40               ENSURE  5
                                     0C58               PRINT   0,<Process section table information>
                                     0C65               PRINT   0,<---------------------------------->
                                     0C72               SKIP    1
         52   00000128'EF      DE    0C7B               MOVAL   PHD,R2
                    24 A2      DD    0C82               PUSHL   PHD$W_PSTLAST(R2)       ; LAST PST ENTRY ALLOCATED
                                     0C85               PRINT   1,<! Last entry allocated      !XW>
                    26 A2      DD    0C92               PUSHL   PHD$W_PSTFREE(R2)
                                     0C95               PRINT   1,<! First free PST entry      !XW>
                    24 A2      B5    0CA2               TSTW    PHD$W_PSTLAST(R2)       ; CHECK IF REASONABLE
                       01      19    0CA5               BLSS    5$                      ; BRANCH IF OK
                               04    0CA7               RET
                                     0CA8      5$:
                                     0CA8               SKIP    2
                                     0CB1               ENSURE  8
                                     0CC9               PRINT   0,<Process section table>
                                     0CD6               PRINT   0,<--------------------->
        00000DB5'EF     00     FB    0CE3               CALLS   #0,PST_TITLE            ; PRINT TITLE LINE
  00000000'EF   00000DB5'EF    9E    0CEA               MOVAB   PST_TITLE,HEADING_ROUTINE       ; SET HEADING ROUTINE
                  50   24 A2   32    0CF5               CVTWL   PHD$W_PSTLAST(R2),R0    ; LAST ENTRY ALLOCATED
  57   20 A2   00000070'EF     C1    0CF9               ADDL3   PCB+PCB$L_PHD,PHD$L_PSTBASOFF(R2),R7  ; BASE ADDRESS
                  54   6740    DE    0D02               MOVAL   (R7)[R0],R4             ; ADDRESS OF LOWEST ENTRY
                    57   54    C2    0D06               SUBL2   R4,R7                   ; LENGTH OF PST IN USE
                         57    DD    0D09               PUSHL   R7                      ; LENGTH TO ALLOCATE
        00000000'EF     01     FB    0D0B               CALLS   #1,ALLOCATE             ; ALLOCATE PST BUFFER
                    56   51    D0    0D12               MOVL    R1,R6                   ; SAVE ADDRESS OF PST BUFFER
                                     0D15               GETMEM  (R4),(R6),R7            ; GET USED PART OF PST
                                     0D22               RETIFERR                        ; SKIP IF ERROR READING
                                     0D26
                    53   57    D0    0D26               MOVL    R7,R3                   ; SET LENGTH OF PST TO SCAN
                  54   6647    9E    0D29               MOVAB   (R6)[R7],R4             ; FIRST ENTRY + 1
                         55    D4    0D2D               CLRL    R5                      ; INITIALIZE PST INDEX
                                     0D2F      10$:
                    54   20    C2    0D2F               SUBL2   #SEC$C_LENGTH,R4        ; DECREMENT ADDRESS
```

```
                 55    08   C2 0D32          SUBL2   #SEC$C_LENGTH/4,R5          ; DECREMENT INDEX
                 53    20   C2 0D35          SUBL2   #SEC$C_LENGTH,R3            ; DECREMENT BUFFER LENGTH
                       19   18 0D38          BGEQ    20$                         ; BRANCH IF OK
        00000000'EF         D4 0D3A          CLRL    HEADING_ROUTINE             ; CLEAR HEADING ROUTINE ADDRESS
                       57   DD 0D40          PUSHL   R7                          ; LENGTH TO DEALLOCATE
                       56   DD 0D42          PUSHL   R6                          ; ADDRESS OF PST BUFFER
   00000000'EF         02   FB 0D44          CALLS   #2,DEALLOCATE               ; DEALLOCATE PST BUFFER
                               0D4B          STATUS  SUCCESS
                            04 0D52          RET
                               0D53  20$:
  51    14 A4    01    00   EF 0D53          EXTZV   #SEC$V_GBL,#1,SEC$W_FLAGS(R4),R1
           F4D3 CF41        9F 0D59          PUSHAB  GBL_TABLE[R1]
  51    14 A4    01    01   EF 0D5E          EXTZV   #SEC$V_CRF,#1,SEC$W_FLAGS(R4),R1
           F4CE CF41        9F 0D64          PUSHAB  CRF_TABLE[R1]
  51    14 A4    01    02   EF 0D69          EXTZV   #SEC$V_DZRO,#1,SEC$W_FLAGS(R4),R1
           F4C9 CF41        9F 0D6F          PUSHAB  DZRO_TABLE[R1]
  51    14 A4    01    03   EF 0D74          EXTZV   #SEC$V_WRT,#1,SEC$W_FLAGS(R4),R1
           F4C6 CF41        9F 0D7A          PUSHAB  WRT_TABLE[R1]
                 06 A4      DD 0D7F          PUSHL   SEC$W_SECXBL(R4)            ; BACKWARD LINK
                 04 A4      DD 0D82          PUSHL   SEC$W_SECXFL(R4)            ; FORWARD LINK
                 18 A4      DD 0D85          PUSHL   SEC$L_REFCNT(R4)            ; REFERENCE COUNT
                    64      DD 0D88          PUSHL   SEC$L_CCB(R4)               ; CCB ADDRESS
  7E    08 A4    08    18   EF 0D8A          EXTZV   #SEC$V_PFC,#SEC$S_PFC,SEC$L_VPXPFC(R4),-(SP)
                 10 A4      DD 0D90          PUSHL   SEC$L_VBN(R4)               ; STARTING BLOCK NUMBER
                 0C A4      DD 0D93          PUSHL   SEC$L_WINDOW(R4)            ; WINDOW CONTROL BLOCK
                 1C A4      DD 0D96          PUSHL   SEC$L_PAGCNT(R4)            ; PAGE COUNT
  51    08 A4    16    00   EF 0D99          EXTZV   #SEC$V_VPX,#SEC$S_VPX,SEC$L_VPXPFC(R4),R1
           7E    51    09   78 0D9F          ASHL    #9,R1,-(SP)                 ; VIRTUAL ADDRESS OF SECTION
                       55   DD 0DA3          PUSHL   R5                          ; SECTION TABLE INDEX
                               0DA5          PRINT   14,<!_ !XW    !XL !XL  !XL  !XL   !4UL  !XL  !4UL     !XW  !XW   !
                 FF7A       31 0DB2          BRW     10$
                               0DB5
                               0DB5          .DSABL  LSB
                               0DB5
                               0DB5  ;
                               0DB5  ;       SUBROUTINE TO PRINT THE SUB-HEADING LINE
                               0DB5  ;
                               0DB5  PST_TITLE:
                          0000 0DB5          .WORD   0
                               0DB7
                               0DB7          SKIP    1
                               0DC0          PRINT   0,<!_INDEX      ADDRESS   PAGES    WINDOW     VBN    CLUSTER  CHANN
                               0DCD          SKIP    1
                            04 0DD6          RET
```

```
                                   0DD7          .SBTTL  SHOW_PPT -- SHOW PROCESS PAGE TABLES
                                   0DD7   ;---
                                   0DD7   ;
                                   0DD7   ;      SHOW_PPT
                                   0DD7   ;
                                   0DD7   ;      THIS ROUTINE DISPLAYS THE CONTENTS OF THE P0 AND
                                   0DD7   ;      P1 PAGE TABLES FOR THE CURRENT PROCESS.
                                   0DD7   ;
                                   0DD7   ;  INPUTS:
                                   0DD7   ;
                                   0DD7   ;      PCB = PROCESS CONTROL BLOCK
                                   0DD7   ;      PHD = PROCESS HEADER BLOCK
                                   0DD7   ;
                                   0DD7   ;  OUTPUTS:
                                   0DD7   ;
                                   0DD7   ;      NONE
                                   0DD7   ;
                                   0DD7   ;---
                                   0DD7
                                   0DD7   SHOW_PPT:
                            003C   0DD7          .WORD   ^M<R2,R3,R4,R5>
                                   0DD9
                                   0DD9          .ENABL  LSB
      00000000'EF   00      FB     0DD9          CALLS   #0,INIT_PFN              ; SETUP ACCESS TO PFN DATA BASE
      52  00000004'EF       DE     0DE0          MOVAL   PCB,R2
      53  00000128'EF       DE     0DE7          MOVAL   PHD,R3
00000000'EF   00006000 8F   D3     0DEE          BITL    #OPT$M_PPT_LEN!OPT$M_PPT_RNG,OPTIONS ; SPECIFIC ADDRESSES?
                      03    13     0DF9          BEQL    5$                       ; NO
                    00FB    31     0DFB          BRW     100$
00000000'EF   00001800 8F   D3     0DFE   5$:    BITL    #OPT$M_P0_PPT!OPT$M_P1_PPT,OPTIONS ; SPECIFIC PAGE TABLES?
                      08    13     0E09          BEQL    10$                      ; NO
   70 00000000'EF     0B    E1     0E0B          BBC     #OPT$V_P0_PPT,OPTIONS,20$ ; P0 NOT REQUESTED
                                   0E13   10$:   SKIP    2
                                   0E1C          ENSURE  8
                                   0E34          PRINT   0,<P0 page table>
                                   0E41          PRINT   0,<-------------->
                                   0E4E          SKIP    1
                   6C A2    DD     0E57          PUSHL   PCB$L_PHD(R2)            ; ADDRESS OF PROCESS HEADER
                 00C8 C3    DD     0E5A          PUSHL   PHD$L_P0BR(R3)           ; ADDRESS OF P0 PAGE TABLE
                      00    DD     0E5E          PUSHL   #0                       ; STARTING ADDRESS BEING MAPPED
   7E   00CC C3   18  00    EF     0E60          EXTZV   #PHD$V_P0LR,#PHD$S_P0LR,PHD$L_P0LRASTL(R3),-(SP) ; NUM ENTRIES
      00000000'EF   04      FB     0E67          CALLS   #4,DUMP_PTE              ; FORMAT PAGE TABLE
                                   0E6E
00000000'EF   00001800 8F   D3     0E6E          BITL    #OPT$M_P0_PPT!OPT$M_P1_PPT,OPTIONS ; SPECIFIC PAGE TABLES?
                      08    13     0E79          BEQL    20$                      ; NO
   75 00000000'EF     0C    E1     0E7B          BBC     #OPT$V_P1_PPT,OPTIONS,90$ ; P1 NOT REQUESTED
                                   0E83   20$:   SKIP    2
                                   0E8C          ENSURE  8
                                   0EA4          PRINT   0,<P1 page table>
                                   0EB1          PRINT   0,<-------------->
                                   0EBE          SKIP    1
           51   00D4 C3     D0     0EC7          MOVL    PHD$L_P1LR(R3),R1        ; GET P1LR
                      2A    13     0ECC          BEQL    90$                      ; SKIP IF ZERO
   51   00200000 8F   51    C3     0ECE          SUBL3   R1,#^X200000,R1          ; TOTAL PAGES ALLOCATED
           50   51    09    78     0ED6          ASHL    #9,R1,R0                 ; SIZE OF P1 SPACE IN BYTES
                   6C A2    DD     0EDA          PUSHL   PCB$L_PHD(R2)            ; ADDRESS OF PROCESS HEADER
           52   00D4 C3     D0     0EDD          MOVL    PHD$L_P1LR(R3),R2        ; GET NUMBER OF PAGES
```

```
         00D0 D342   DF  0EE2        PUSHAL  @PHD$L_P1BR(R3)[R2]        ; STARTING ADDRESS OF TABLE
7E    80000000 8F    50  C3  0EE7        SUBL3   R0,#^X80000000,-(SP)        ; STARTING ADDRESS BEING MAPPED
                     51  DD  0EEF        PUSHL   R1                         ; TOTAL PAGES IN TABLE
      00000000'EF    04  FB  0EF1        CALLS   #4,DUMP_PTE                ; FORMAT PAGE TABLE
                             0EF8
                         04  0EF8  90$:  RET
                             0EF9
                             0EF9  100$: SKIP    2
                             0F02        ENSURE  8
                             0F1A        PRINT   0,<Process page table>
                             0F27        PRINT   0,<------------------->
                             0F34        SKIP    1
              6C A2  DD  0F3D        PUSHL   PCB$L_PHD(R2)              ; ADDRESS OF PROCESS HEADER
  51    00000000'EF  D0  0F40        MOVL    ESP,R1                     ; EXPRESSION STACK
              54 61  7D  0F47        MOVQ    (R1),R4                    ; R5 = LOW LIMIT
03 00000000'EF   0D  E0  0F4A        BBS     #OPT$V_PPT_LEN,OPTIONS,110$ ; R4 IS ALREADY LENGTH
              54 55  C2  0F52        SUBL    R5,R4                      ; GET LENGTH
      55   01FF 8F   AA  0F55  110$: BICW    #^X1FF,R5                  ; ROUND DOWN
  54   000003FF 8F   C0  0F5A        ADDL    #^X3FF,R4
  54    54   F7 8F   78  0F61        ASHL    #-9,R4,R4                  ; NUMBER OF PTE'S
            00C8 C3  DD  0F66        PUSHL   PHD$L_P0BR(R3)             ; ASSUME P0
  51    55   F9 8F   78  0F6A        ASHL    #-7,R5,R1                  ; OFFSET IN PAGE TABLE
         12 55   1E  E1  0F6F        BBC     #30,R5,120$                ; IT WAS P0
      6E   00D0 C3   D0  0F73        MOVL    PHD$L_P1BR(R3),(SP)        ; USE P1
51    55   40000000 8F   C3  0F78        SUBL3   #^X40000000,R5,R1
  51    51   F9 8F   78  0F80        ASHL    #-7,R1,R1                  ; OFFSET IN PAGE TABLE
         6E      51  C0  0F85  120$: ADDL    R1,(SP)
                 55  DD  0F88        PUSHL   R5                         ; BASE
                 54  DD  0F8A        PUSHL   R4                         ; NUMBER OF ENTRIES
      00000000'EF    04  FB  0F8C        CALLS   #4,DUMP_PTE                ; FORMAT PAGE TABLE
                     04  0F93        RET
                         0F94
                         0F94        .DSABL  LSB
```

```
                                  0F94          .SBTTL  SHOW_CHANNELS -- DISPLAY ACTIVE CHANNELS
                                  0F94  ;---
                                  0F94  ;
                                  0F94  ;       SHOW_CHANNELS
                                  0F94  ;
                                  0F94  ;       THIS ROUTINE DISPLAYS THE INFORMATION IN THE PROCESS CHANNEL TABLE
                                  0F94  ;       PERTAINING TO THE ACTIVE CHANNELS.  FOR A CRASH FILE, YOU GET YOUR
                                  0F94  ;       CHOICE OF JUST THE DEVICE NAME OR A DEVICE NAME WITH THE FILE-ID.
                                  0F94  ;       FOR A RUNNING SYSTEM, THE FILE NAME (IF AVAILABLE) IS ALSO DISPLAYED.
                                  0F94  ;
                                  0F94  ; INPUTS:
                                  0F94  ;
                                  0F94  ;       PCB = PROCESS CONTROL BLOCK
                                  0F94  ;       PHD = PROCESS HEADER BLOCK
                                  0F94  ;
                                  0F94  ; OUTPUTS:
                                  0F94  ;
                                  0F94  ;       NONE
                                  0F94  ;
                                  0F94  ;---
                                  0F94
                                  0F94          .ENABL  LSB
                                  0F94
                                  0F94  SHOW_CHANNELS:
                           07FC   0F94          .WORD   ^M<R2,R3,R4,R5,R6,R7,R8,R9,R10>
                                  0F96
                                  0F96          TRYMEM  @CTL$GL_CCBBASE                 ;SEE IF CCB TABLE EXISTS
                   0A 50     E8   0FA3          BLBS    R0,10$                          ;XFER IF AVAILABLE
                                  0FA6          SKIP    1                               ;ELSE FORCE ONE BLANK LINE
                             04   0FAF          RET                                     ;AND RETURN NOW
            0000031C'EF      D4   0FB0  10$:    CLRL    CHANTBL_SIZE                    ;RESET SIZE
                                  0FB6          REQMEM  @CTL$GW_CHINDX,CHANTBL_SIZE,#2  ;GET CHANNEL HIGH WATER MARK
         57 0000031C'EF      D0   0FCB          MOVL    CHANTBL_SIZE,R7                 ;GET THE TABLE SIZE
            00000320'EF      9F   0FD2          PUSHAB  CHANTBL_ADDR                    ;GET MEMORY FOR CCB TABLE COPY
            0000031C'EF      9F   0FD8          PUSHAB  CHANTBL_SIZE
         00000000'GF   02    FB   0FDE          CALLS   #2,G^LIB$GET_VM
                   01 50     E8   0FE5          BLBS    R0,20$                          ;XFER IF SUCCESSFUL
                             04   0FE8          RET                                     ;ELSE RETURN NOW
                                  0FE9  20$:    SKIP    2
                                  0FF2          PRINT   0,<!28* Process active channels>
                                  0FFF          PRINT   0,<!28* ------------------------>
         000012E2'EF   00    FB   100C          CALLS   #0,CHAN_TITLE                   ;PRINT COLUMN HEADINGS
 00000000'EF   000012E2'EF   9E   1013          MOVAB   CHAN_TITLE,HEADING_ROUTINE      ;SET HEADING ROUTINE ADDRESS
 57    00   00000320'FF  00  2C   101E          MOVC5   #0,@CHANTBL_ADDR,#0,R7,@CHANTBL_ADDR    ;CLEAR TABLE
            00000320'FF           1027
                                  102C          REQMEM  @CTL$GL_CCBBASE,R6              ;GET CCB TABLE END ADDRESS
                   56 57     C2   103C          SUBL2   R7,R6                           ;CALC START OF THE TABLE
                                  103F          REQMEM  (R6),@CHANTBL_ADDR,R7           ;COPY CCB TABLE
      56  00000320'EF  57    C1   1050          ADDL3   R7,CHANTBL_ADDR,R6              ;PROCESS FROM THE TOP DOWN
                   58 56     D0   1058          MOVL    R6,R8                           ;SAVE FOR CALCULATING CHANNEL NUMBER
                    0261     31   105B          BRW     160$                            ;JUMP INTO THE LOOP
                   09 A6     95   105E  30$:    TSTB    CCB$B_AMOD(R6)                  ;IS THE CHANNEL ACTIVE?
                      03     12   1061          BNEQ    40$                             ;XFER IF SO
                    0259     31   1063  35$:    BRW     160$                            ;ELSE GO TRY THE NEXT ONE
                   55 66     D0   1066  40$:    MOVL    CCB$L_UCB(R6),R5                ;GET THE UCB ADDRESS
                      F8     13   1069          BEQL    35$                             ;IF EQL THEN TRY NEXT ONE
                                  106B          REQMEM  UCB$L_DDB(R5),R4                ;GET THE DDB ADDRESS
```

```
                                     1078  ;
                                     1078  ;  Read node name into local memory.  The node name will be displayed along
                                     1078  ;  with the device name.
                                     1078  ;
             000003C8'EF       D4    1078          CLRL    NODE                            ; ZERO THE LENGTH FIELD
        53   00000000'EF       D0    107E          MOVL    SCS$GA_LOCALSB,R3               ; LOCAL SYSTEM BLOCK
                                     1085          REQMEM  DDB$L_SB(R4),R0                 ; GET ADDRESS OF SYSTEM BLOCK
                  53    50     D1    1092          CMPL    R0,R3                           ; IS THIS THE LOCAL NODE?
                        2E     13    1095          BEQL    43$                             ; BRANCH, LOCAL NODE
   50   50   00000044 8F       C1    1097          ADDL3   #SB$T_NODENAME,R0,R0            ; POINT TO NODE NAME
                                     109F          GETMEM  (R0),NODE,#SB$S_NODENAME        ; READ INTO LOCAL STORAGE
        50   000003C8'EF       9A    10B0          MOVZBL  NODE,R0                         ; GET LENGTH OF NAME
     000003C9'EF40    24       90    10B7          MOVB    #^A/$/,NODE+1[R0]               ; APPEND "$" TO NODE NAME
             000003C8'EF       96    10BF          INCB    NODE                            ; INCREMENT LENGTH
                                     10C5  43$:
                                     10C5          REQMEM  DDB$T_NAME(R4),CHANDEV_NAME,#16 ;COPY THE DEVICE NAME
  00000324'EF        0000032C'EF   9A    10D7      MOVZBL  CHANDEV_NAME,CHANDEV_SIZE       ;SET THE SIZE OF THE DEVICE NAME
                                     10E2
                                     10E2          REQMEM  UCB$W_UNIT(R5),R0               ;GET THE DEVICE UNIT NUMBER
                        7E     7C    10EF          CLRQ    -(SP)                           ;DESCRIPTOR FOR THE OUTPUT STRING
                  54    5E     D0    10F1          MOVL    SP,R4                           ;SAVE ADDRESS FOR LATER
      64   0F   00000324'EF    A3    10F4          SUBW3   CHANDEV_SIZE,#15,(R4)           ;SET THE SIZE
  0000032D'8F   00000324'EF    C1    10FC          ADDL3   CHANDEV_SIZE,#CHANDEV_NAME+1,4(R4)      ;SET THE ADDRESS
                     04 A4           1107
                        50     DD    1109          PUSHL   R0                              ;STASH THE UNIT NUMBER
                        54     DD    110B          PUSHL   R4                              ;FORMAT THE DEVICE NAME
                        54     DD    110D          PUSHL   R4
             00001308'EF       9F    110F          PUSHAB  CHANDEV_FMT
        00000000'GF   04       FB    1115          CALLS   #4,G^SYS$FAO
                  50    8E     7D    111C          MOVQ    (SP)+,R0                        ;GET THE DESCRIPTOR & CLEAN THE STACK
        00000324'EF   50       A0    111F          ADDW2   R0,CHANDEV_SIZE                 ;SET FULL DEVICE NAME SIZE
     00   000003D8'EF   00     2C    1126          MOVC5   #0,FCB,#0,#FCB$C_LENGTH,FCB     ;CLEAR THE FCB
     000003D8'EF    00B4 8F          112E
 30  00   0000048C'EF   00     2C    1136          MOVC5   #0,WCB,#0,#WCB$C_LENGTH,WCB     ; AND THE WCB
             0000048C'EF             113F
          7E    F182 CF        9E    1144          MOVAB   CHANSEC_TABLE,-(SP)             ;NO SECTION SO FAR
                  55    5E     D0    1149          MOVL    SP,R5                           ;SAVE ADDRESS FOR LATER
             0000033C'EF       9F    114C          PUSHAB  FILE_NAME                       ;SET ADDRESS OF FILE NAME DESCRIPTOR
             0000033C'EF       D4    1152          CLRL    FILE_NAME                       ;NO FILE NAME SO FAR
  00000340'EF   00000344'EF    9E    1158          MOVAB   FILE_NAMETXT,FILE_NAME+4        ;RESET ADDRESS
             54    04 A6       D0    1163          MOVL    CCB$L_WIND(R6),R4               ;GET THE WINDOW ADDRESS
                        05     13    1167          BEQL    45$                             ;XFER IF NO WINDOW PRESENT
                     05 54     E9    1169          BLBC    R4,50$                          ;XFER IF WINDOW NOW INTERLOCKED
                        54     D4    116C          CLRL    R4                              ;ELSE NO WINDOW ADDRESS
                      00A9     31    116E  45$:    BRW     70$                             ;SKIP THE FOLOWING TEST
                        54     D5    1171  50$:    TSTL    R4                              ;REAL WINDOW OR PST OFFSET
                        20     19    1173          BLSS    60$                             ;XFER IF REAL WINDOW
                  54    54     32    1175          CVTWL   R4,R4                           ;ELSE EXTEND OFFSET
 50   00000148'EF   00000070'EF C1   1178          ADDL3   PCB+PCB$L_PHD,PHD+PHD$L_PSTBASOFF,R0    ;CALC PST ADDRESS
          54    0C A044        DE    1184          MOVAL   SEC$L_WINDOW(R0)[R4],R4         ;GET ADDRESS OF THE WINDOW ADDRESS
                                     1189          REQMEM  (R4),R4                         ;GET THE WINDOW ADDRESS
                                     1195  60$:    REQMEM  (R4),WCB,#WCB$C_LENGTH          ;COPY WINDOW (MINUS MAP POINTERS)
        12   00000496'EF       91    11A6          CMPB    WCB+WCB$B_TYPE,#DYN$C_WCB       ;CHECK BLOCK TYPE
                        6B     12    11AD          BNEQ    70$                             ;XFER IF NOT A WCB
        53   000004A4'EF       D0    11AF          MOVL    WCB+WCB$L_FCB,R3                ;ELSE GET FCB ADDRESS
                        62     13    11B6          BEQL    70$                             ;XFER IF NONE
                                     11B8          REQMEM  (R3),FCB,#FCB$C_LENGTH          ;ELSE COPY THE FCB
```

```
           07  000003E2'EF  91  11CD          CMPB    FCB+FCB$B_TYPE,#DYN$C_FCB       ;CHECK BLOCK TYPE
                        44  12  11D4          BNEQ    70$                             ;XFER IF NOT AN FCB
               00000498'EF  B5  11D6          TSTW    WCB+WCB$L_PID                   ;IS FILE A SECTION?
                        05  12  11DC          BNEQ    65$                             ;XFER IF NOT
              65   F0E9 CF  9E  11DE          MOVAB   CHANSEC_TABLE+1,(R5)            ;ELSE SET NEW ADDRESS
     0000033C'EF   0084 8F  3C  11E3  65$:    MOVZWL  #132,FILE_NAME                  ;ELSE RESET DESCRIPTOR SIZE
                        7E  D4  11EC          CLRL    -(SP)                           ;MAKE ROOM FOR SECONDARY STATUS
                        5E  DD  11EE          PUSHL   SP                              ;CONVERT FILE-ID TO A FILE NAME
                        00  DD  11F0          PUSHL   #0
               0000033C'EF  9F  11F2          PUSHAB  FILE_NAME
               0000033C'EF  9F  11F8          PUSHAB  FILE_NAME
               000003FC'EF  9F  11FE          PUSHAB  FCB+FCB$W_FID
               00000324'EF  9F  1204          PUSHAB  CHANNEL_DEVICE
          00000000'GF   06  FB  120A          CALLS   #6,G^LIB$FID_TO_NAME
                     51 8E  D0  1211          MOVL    (SP)+,R1                        ;RETRIEVE SECONDARY STATUS
                     03 50  E9  1214          BLBC    R0,70$                          ;CAN'T USE FILE NAME IF ANY ERRORS
                     10 51  E8  1217          BLBS    R1,80$
               0000033C'EF  D4  121A  70$:    CLRL    FILE_NAME                       ;NO FILE NAME DESCRIPTOR
               000003FC'EF  D5  1220          TSTL    FCB+FCB$W_FID                   ;ANY FILE-ID?
                        1F  12  1226          BNEQ    100$                            ;XFER IF SO
                        32  11  1228          BRB     110$                            ;ELSE SKIP FOLLOWING
       0000033C'EF    5B 8F  3A  122A  80$:   LOCC    #^A\[\,FILE_NAME,@FILE_NAME+4   ;STRIP DEVICE NAME
               00000340'FF      1232
                        07  13  1237          BEQL    90$                             ;XFER IF NONE
          0000033C'EF   50  7D  1239          MOVQ    R0,FILE_NAME                    ;ELSE SAVE NEW DESCRIPTOR
            15 00000000'EF  E8  1240  90$:    BLBS    CURRENT_SYSTEM,110$             ;XFER IF THE RUNNING SYSTEM
        7E     00000400'EF  3C  1247  100$:   MOVZWL  FCB+FCB$W_FID_RVN,-(SP)         ;ELSE SAVE THE FILE-ID
        7E     000003FE'EF  3C  124E          MOVZWL  FCB+FCB$W_FID_SEQ,-(SP)
        7E     000003FC'EF  3C  1255          MOVZWL  FCB+FCB$W_FID_NUM,-(SP)
               00000324'EF  9F  125C  110$:   PUSHAB  CHANNEL_DEVICE                  ;SET THE DEVICE NAME
               000003C8'EF  9F  1262          PUSHAB  NODE                            ;SET THE NODE NAME
              7E   F050 CF  9E  1268          MOVAB   CHANBUSY_TABLE,-(SP)            ;SET AS NOT BUSY
                     0A A6  B5  126D          TSTW    CCB$W_IOC(R6)                   ;RIGHT?
                        05  13  1270          BEQL    120$                            ;XFER IF SO
              6E   F047 CF  9E  1272          MOVAB   CHANBUSY_TABLE+1,(SP)           ;ELSE NOTE BUSY
              7E   F048 CF  9E  1277  120$:   MOVAB   CHANDPND_TABLE,-(SP)            ;NO DEACCESS PENDING
                     0C A6  D5  127C          TSTL    CCB$L_DIRP(R6)                  ;RIGHT?
                        05  13  127F          BEQL    130$                            ;XFER IF SO
              6E   F03F CF  9E  1281          MOVAB   CHANDPND_TABLE+1,(SP)           ;ELSE NOTE DEACCESS
                        54  DD  1286  130$:   PUSHL   R4                              ;SAVE THE WINDOW ADDRESS
                  7E  58 56  C3  1288         SUBL3   R6,R8,-(SP)                     ;SET THE CHANNEL NUMBER
               000003FC'EF  D5  128C          TSTL    FCB+FCB$W_FID                   ;ANY FILE-ID TO PRINT?
                        1E  13  1292          BEQL    150$                            ;XFER IF NOT
               0000033C'EF  B5  1294          TSTW    FILE_NAME                       ;DO I HAVE A FILE NAME?
                        07  13  129A          BEQL    140$                            ;YES, SKIP NEXT TEST
            0F 00000000'EF  E8  129C          BLBS    CURRENT_SYSTEM,150$             ;DON'T DISPLAY FID IF CURRENT SYSTEM
                                12A3  140$:   PRINT   8,<  !XW          !XL   !5AC!5AC          !AC!AS:(!UW,!UW,!UW)!AS!AC>
                        0D  11  12B0          BRB     160$                            ;GO GET THE NEXT CHANNEL BLOCK
                                12B2  150$:   PRINT   5,<  !XW          !XL   !5AC!5AC          !AC!AS:!AS!AC>
                     56 10  C2  12BF  160$:   SUBL2   #CCB$C_LENGTH,R6                ;NEXT CCB PLEASE...
          00000320'EF   56  D1  12C2          CMPL    R6,CHANTBL_ADDR                 ;DONE WITH ALL OF THEM?
                        03  1F  12C9          BLSSU   170$                            ;XFER IF SO
                      FD90  31  12CB          BRW     30$                             ;ELSE TRY ANOTHER
               00000320'EF  9F  12CE  170$:   PUSHAB  CHANTBL_ADDR                    ;RELEASE MEMORY ALLOCATED FOR CCB TABLE
               0000031C'EF  9F  12D4          PUSHAB  CHANTBL_SIZE
          00000000'GF   02  FB  12DA          CALLS   #2,G^LIB$FREE_VM
                            04  12E1          RET                                     ; AND RETURN
```

```
                                  12E2
                                  12E2   CHAN_TITLE:
                         0000     12E2           .WORD   0
                                  12E4           SKIP    1
                                  12ED           PRINT   0,<Channel      Window          Status          Device/file accessed
                                  12FA           PRINT   0,<-------      ------          ------          --------------------
                           04     1307           RET
                                  1308
                                  1308   CHANDEV_FMT:
   57 55 21 00001310'010E0000'    1308           .ASCID  \!UW\                   ;FOR FORMATTING THE DEVICE UNIT NUMBER
                                  1313
                                  1313           .DSABL  LSB
```

```
                                    1313            .SBTTL  PROCESS_SUMMARY -- DISPLAY LIST OF RUNNING PROCESSES
                                    1313 ;---
                                    1313 ;
                                    1313 ;          PROCESS_SUMMARY
                                    1313 ;
                                    1313 ;          PRINT A LIST OF THE PROCESSES CURRENTLY RUNNING
                                    1313 ;
                                    1313 ;  INPUTS:
                                    1313 ;
                                    1313 ;          NONE
                                    1313 ;
                                    1313 ;  OUTPUTS:
                                    1313 ;
                                    1313 ;          NONE
                                    1313 ;
                                    1313 ;---
                                    1313
                                    1313            .ENABL  LSB
                                    1313
                                    1313 PROCESS_SUMMARY::
                              03FC  1313            .WORD   ^M<R2,R3,R4,R5,R6,R7,R8,R9>
                                    1315
                                    1315            SUBHD   <Current process summary>
                                    1322            SKIP    PAGE
        0000147F'EF    00     FB    1329            CALLS   #0,SUMMARY_TITLE        ; PRINT SUBHEADING LINE
00000000'EF   0000147F'EF     9E    1330            MOVAB   SUMMARY_TITLE,HEADING_ROUTINE   ; SET HEADING ROUTINE
                                    133B
                                    133B            REQMEM  @SCH$GL_PCBVEC,R2       ; VECTOR OF PCB ADDRESSES
                                    134B            REQMEM  @SCH$GL_MAXPIX,R3       ; GET MAXIMUM PROCESS INDEX
              57       52     D0    135B            MOVL    R2,R7                   ; ADDRESS OF NULL PROCESS SLOT
        58  000002A8'EF       9E    135E            MOVAB   JIB,R8
        54  00000004'EF       9E    1365            MOVAB   PCB,R4
        55  00000128'EF       9E    136C            MOVAB   PHD,R5
                                    1373 10$:
                                    1373            REQMEM  (R2),R9                 ; GET ADDRESS OF NEXT PCB
                                    137F            GETMEM  (R9),(R4),#PCB$C_LENGTH ; READ ENTIRE PCB
                 0A 50        E9    1390            BLBC    R0,12$                  ; SKIP IF ERROR READING
                 60 A4        B5    1393            TSTW    PCB$L_PID(R4)           ; CHECK IF NULL PROCESS
                    08        12    1396            BNEQ    15$                     ; BRANCH IF NOT
              57    52        D1    1398            CMPL    R2,R7                   ; IS THIS THE REAL NULL PROCESS?
                    03        13    139B            BEQL    15$                     ; OK IF NULL PROCESS
                  00A0        31    139D 12$:       BRW     50$                     ; BYPASS THIS ENTRY
                                    13A0 15$:
                                    13A0 ;          MOVC5   #0,(SP),#0,#JIB$C_LENGTH,(R8)   ; PRE-ZERO JIB IN CASE NOT THERE
        50   20202020 8F      D0    13A0            MOVL    #^A"    ",R0            ; SET R0 TO SPACES
               0C A8   50     D0    13A7            MOVL    R0,JIB$T_USERNAME(R8)   ; AND FILL THE USERNAME WITH SPACES
               10 A8   50     D0    13AB            MOVL    R0,JIB$T_USERNAME+4(R8)
               14 A8   50     D0    13AF            MOVL    R0,JIB$T_USERNAME+8(R8)
                  0080 C4     D5    13B3            TSTL    PCB$L_JIB(R4)           ; CHECK FOR JIB
                    13        13    13B7            BEQL    18$                     ; BR IF NONE
                                    13B9            TRYMEM  @PCB$L_JIB(R4),(R8),#JIB$C_LENGTH  ; GET JIB
                                    13CC 18$:
      50    34 A4    36 A4    A1    13CC            ADDW3   PCB$W_PPGCNT(R4),PCB$W_GPGCNT(R4),R0
                 7E    50     3C    13D2            MOVZWL  R0,-(SP)                ; WORKING SET SIZE (PHYS. MEM.)
                 6C A4        DD    13D5            PUSHL   PCB$L_PHD(R4)           ; PHD ADDRESS
                    59        DD    13D8            PUSHL   R9                      ; PCB ADDRESS
      51      1F     0B A4    83    13DA            SUBB3   PCB$B_PRI(R4),#31,R1    ; CURRENT PRIORITY
```

```
        7E    51   9A  13DF          MOVZBL  R1,-(SP)
   02    2C A4    B1  13E2          CMPW    PCB$W_STATE(R4),#SCH$C_MWAIT    ; CHECK FOR MWAIT
             62   13  13E6          BEQL    80$                      ; EQUAL, DETERMINE RESOURCE WAIT STATE
   51    2C A4    3C  13E8 19$:     MOVZWL  PCB$W_STATE(R4),R1       ; CURRENT STATE
      EC2E CF41   7F  13EC          PUSHAQ  STATE_TABLE[R1]
                      13F1 20$:
          0C A8   9F  13F1          PUSHAB  JIB$T_USERNAME(R8)       ; ADDRESS OF USERNAME
             0C   DD  13F4          PUSHL   #12                      ; LENGTH OF USERNAME
          71 A4   9F  13F6          PUSHAB  PCB$T_LNAME+1(R4)        ; PROCESS NAME
   7E     70 A4   9A  13F9          MOVZBL  PCB$T_LNAME(R4),-(SP)    ; PROCESS NAME LENGTH
          60 A4   DD  13FD          PUSHL   PCB$L_PID(R4)            ; INTERNAL PROCESS IDENTIFICATION
          64 A4   DD  1400          PUSHL   PCB$L_EPID(R4)           ; EXTENDED PROCESS IDENTIFICATION
                      1403          PRINT   10,< !XL !XW !15AF !12AF !5AC !2UB !XL !XL !5UL>
28 00000000'EF    00   E1  1410     BBC     #OPT$V_IMAGE,OPTIONS,50$; CHECK IF /IMAGE SPECIFIED
        EBE4 CF   9F  1418          PUSHAB  NOTAVAIL                 ; PRESET TO USE "NOT AVAILABLE" STRING
  0000149C'EF 00  FB  141C          CALLS   #0,READ_IMAGE            ; READ IMAGE FILE NAME
          03 50   E9  1423          BLBC    R0,25$                   ; BRANCH IF ERROR READING
      6E     56   D0  1426          MOVL    R6,(SP)                  ; ADDRESS OF NAME BUFFER
                      1429 25$:
          00 BE   95  1429          TSTB    @(SP)                    ; DID IT GIVE US A NULL?
             05   12  142C          BNEQ    35$
      5E     04   C0  142E          ADDL2   #4,SP                    ; POP THE STRING OFF, DON'T PRINT
             0D   11  1431          BRB     50$
                      1433 35$:     PRINT   1,<              !AC>
                      1440 50$:
      52     04   C0  1440          ADDL2   #4,R2                    ; NEXT PCB ADDRESS
             53   D7  1443          DECL    R3                       ; DECREMENT ITERATION COUNT
             29   19  1445          BLSS    90$                      ; BRANCH IF FINISHED
           FF29   31  1447          BRW     10$                      ; CONTINUE UNTIL DONE
                      144A
             0C   BB  144A 80$:     PUSHR   #^M<R2,R3>               ; SAVE NEXT PCB ADDRESS AND COUNTER
    52    4C A4   D0  144C          MOVL    PCB$L_EFWM(R4),R2        ; RESOURCE WAIT
  53   EDOB CF    9E  1450          MOVAB   RESOURCE_WAIT,R3         ; ADDRESS OF TABLE OF STATES
    00000000'GF   16  1455          JSB     G^TRANSLATE_ADDRESS      ; DETERMINE STATE
             0C   BA  145B          POPR    #^M<R2,R3>               ; RESTORE PCB ADDRESS AND COUNTER
             0C   12  145D          BNEQ    85$                      ; MATCH FOUND, IF NOT EQUAL
          4C A4   D5  145F          TSTL    PCB$L_EFWM(R4)           ; CHECK FOR MUTEX ADDRESS
             84   18  1462          BGEQ    19$                      ; BRANCH IF NOT ADDRESS
        EDC3 CF   9F  1464          PUSHAB  MWAIT                    ; ADDRESS OF MUTEX COUNTED STRING
           FF86   31  1468          BRW     20$                      ; RETURN TO MAIN PATH
             50   DD  146B 85$:     PUSHL   R0                       ; ADDRESS OF RESOURCE WAITING FOR
           FF81   31  146D          BRW     20$                      ; RETURN TO MAIN PATH
                      1470
                      1470 90$:
 00000000'EF     00   FB  1470      CALLS   #0,SET_PROCESS           ; RESET PROCESS PAGE REGISTERS
                      1477          STATUS  SUCCESS
                  04  147E          RET
                      147F
                      147F          .DSABL  LSB
                      147F
                      147F ;
                      147F ;        SUBROUTINE TO PRINT TITLE LINE
                      147F ;
                      147F SUMMARY_TITLE:
                0000  147F          .WORD   0
                      1481
                      1481          PRINT   0,< Extended Indx Process name    Username    State Pri   PCB      P
```

```
     148E  1443          PRINT   0,<-- PID -- ---- --------------- ----------- ----- --- -------- ---
04   149B  1444          RET
```

```
                                  149C          .SBTTL  READ_IMAGE, READ IMAGE FILE NAME STRING
                                  149C  ;---
                                  149C  ;
                                  149C  ;       SUBROUTINE TO READ THE IMAGE FILE NAME FOR THE
                                  149C  ;       PROCESS DESCRIBED BY THE SPECIFIED PCB AND PHD.
                                  149C  ;
                                  149C  ;       R4 = ADDRESS OF PCB
                                  149C  ;       R5 = ADDRESS OF PHD
                                  149C  ;       CALL
                                  149C  ;       R0 = SUCCESS/FAILURE FLAG
                                  149C  ;       R6 = ADDRESS OF BUFFER CONTAINING ASCIC FILE NAME
                                  149C  ;
                                  149C  ;---
                                  149C
                                  149C  READ_IMAGE:
                           0004   149C          .WORD   ^M<R2>
                                  149E
      56   00000000'EF      9E    149E          MOVAB   L^BUFFER,R6                     ; SET BUFFER ADDRESS
                    66      94    14A5          CLRB    (R6)                            ; PRESET TO NULL STRING
      01        60 A4       B1    14A7          CMPW    PCB$L_PID(R4),#1                ; CHECK IF INDEX = 0 OR 1
                    03      1A    14AB          BGTRU   15$                             ; IF NULL,SWAPPER SKIP THIS
                  0087      31    14AD          BRW     50$                             ; IF NULL,SWAPPER SKIP THIS
                 6C A4      D5    14B0  15$:    TSTL    PCB$L_PHD(R4)                   ; CHECK IF ZERO
                    15      13    14B3          BEQL    18$                             ; BRANCH IF SWAPPED OUT
                                  14B5          TRYMEM  @PCB$L_PHD(R4),(R5),#PHD$C_LENGTH  ; READ PROCESS HEADER
                 03 50      E8    14C7          BLBS    R0,20$                          ; BRANCH IF OK
                    50      D4    14CA  18$:    CLRL    R0
                    04            14CC          RET
      50   00000000'EF      7E    14CD  20$:    MOVAQ   P0BR,R0
         60    00C8 C5      7D    14D4          MOVQ    PHD$L_P0BR(R5),(R0)             ; SETUP RELOCATION REGISTERS
      08 A0    00D0 C5      7D    14D9          MOVQ    PHD$L_P1BR(R5),8(R0)
04 A0   04 A0   18   00     EF    14DF          EXTZV   #PHD$V_P0LR,#PHD$S_P0LR,4(R0),4(R0)
   00000000'EF      60 A4   D0    14E6          MOVL    PCB$L_PID(R4),PROC_PID          ; SET PROCESS PID TO READ
        4C 00000000'EF      E8    14EE          BLBS    VERSION_FLAGS,10$               ; BRANCH IF RELEASE 2
                                  14F5  ;
                                  14F5  ;       VMS RELEASE 1 - IMAGE FILE NAME RESIDES IN IFD BUFFER
                                  14F5  ;
      51   00000000'EF      D0    14F5          MOVL    MMG$IMGHDRBUF,R1                ; ADDRESS OF IMAGE BUFFER
                                  14FC          TRYMEM  4(R1),R2                        ; GET ADDRESS OF IFD
                 2E 50      E9    1509          BLBC    R0,90$                          ; BRANCH IF ERROR
                                  150C          TRYMEM  IFD$W_FILNAMOFF(R2)             ; GET OFFSET TO FILE NAME
                 21 50      E9    1516          BLBC    R0,90$                          ; BRANCH IF ERROR
            51      51      32    1519          CVTWL   R1,R1
                    19      13    151C          BEQL    50$                             ; BRANCH IF ZERO OFFSET
                                  151E          TRYMEM  (R2)[R1],(R6),#32               ; GET ASCIC IMAGE FILE NAME
                 0B 50      E9    152C          BLBC    R0,90$                          ; BRANCH IF ERROR
            20      66      91    152F          CMPB    (R6),#32                        ; CHECK IF OVER 32 CHARACTERS
                    03      1B    1532          BLEQU   50$                             ; BRANCH IF OK
            66      20      90    1534          MOVB    #32,(R6)                        ; TRUNCATE TO 32 CHARACTERS
            50      01      D0    1537  50$:    MOVL    #1,R0                           ; SET NO IMAGE NAME
           00000000'EF      D4    153A  90$:    CLRL    PROC_PID                        ; CLEAR PID ON EXIT SO THAT MEMORY
                                  1540                                                  ; REQUESTS FOR SYSTEM SPACE WILL GO
                                  1540                                                  ; FASTER (DON'T NEED THIS CONTEXT)
                            04    1540          RET
                                  1541  ;
                                  1541  ;       VMS RELEASE 2 - IMAGE FILE DESCRIBED BY IFD$Q_CURPROG
                                  1541  ;
```

```
                      1541  10$:    TRYMEM  @CTL$GL_IMGHDRBF           ; READ ADDRESS OF IMAGE HEADER
     E9 50    E9      154E          BLBC    R0,90$                     ; BRANCH IF ERROR
        51    D5      1551          TSTL    R1                         ; ANY IMAGE HEADER?
        E2    13      1553          BEQL    50$                        ; BRANCH IF NONE
                      1555          TRYMEM  4(R1)                      ; READ IFD POINTER
     D8 50    E9      155F          BLBC    R0,90$                     ; BRANCH IF ERROR
                      1562          TRYMEM  IFD$Q_CURPROG(R1),(R6),#8          ; READ DESCRIPTOR
     C7 50    E9      1570          BLBC    R0,90$                     ; BRANCH IF ERROR
  50    66    9A      1573          MOVZBL  (R6),R0                    ; CHECK LENGTH OF STRING
        BF    13      1576          BEQL    50$                        ; BRANCH IF NULL
                      1578          TRYMEM  @4(R6),1(R6),R0            ; READ FILE NAME STRING
     B0 50    E9      1587          BLBC    R0,90$                     ; BRANCH IF ERROR
        AB    11      158A          BRB     50$                        ; SUCCESS
```

```
158C
158C            .END
```

```
$$$                 = 0000009F R     04
ALLOCATE              ********   X   03
ARGS                = 00000003
AST                   000001D7 R     03
AST_TABLE             000002DB R     03
BREAK                 000001F5 R     03
BUFFER                ********   X   03
CCB$B_AMOD          = 00000009
CCB$C_LENGTH        = 00000010
CCB$L_DIRP          = 0000000C
CCB$L_UCB           = 00000000
CCB$L_WIND          = 00000004
CCB$W_IOC           = 0000000A
CHANBUSY_TABLE        000002BC R     03
CHANDEV_FMT           00001308 R     03
CHANDEV_NAME          0000032C R     02
CHANDEV_SIZE          00000324 R     02
CHANDPND_TABLE        000002C3 R     03
CHANNEL_DEVICE        00000324 R     02
CHANSEC_TABLE         000002CA R     03
CHANTBL_ADDR          00000320 R     02
CHANTBL_SIZE          0000031C R     02
CHAN_TITLE            000012E2 R     03
CLUSTER               00000225 R     03
CRF_TABLE             00000237 R     03
CSL                 = 00000008
CTL$GL_CCBBASE        ********   X   03
CTL$GL_IMGHDRBF       ********   X   03
CTL$GW_CHINDX         ********   X   03
CURRENT_SYSTEM        ********   X   03
DDB$L_SB            = 00000034
DDB$T_NAME          = 00000014
DEALLOCATE            ********   X   03
DISPLAY_PROCESS       00000459 RG    03
DISPLAY_PROCS         00000395 RG    03
DUMP_PTE              ********   X   03
DYN$C_FCB           = 00000007
DYN$C_WCB           = 00000012
DZRO_TABLE            0000023D R     03
ESP                   ********   X   03
FCB                   000003D8 R     02
FCB$B_TYPE          = 0000000A
FCB$C_LENGTH        = 000000B4
FCB$W_FID           = 00000024
FCB$W_FID_NUM       = 00000024
FCB$W_FID_RVN       = 00000028
FCB$W_FID_SEQ       = 00000026
FILE_NAME             0000033C R     02
FILE_NAMETXT          00000344 R     02
GBL_TABLE             00000231 R     03
GETMEM                ********   X   03
GOODPAGE_TABLE        000002B1 R     03
HDRSTR1               0000035B R     03
HEADING_ROUTINE       ********   X   03
IFD$Q_CURPROG       = 00000014
IFD$W_FILNAMOFF     = 00000002
IMGACT                000001FB R     03
INIT_PFN              ********   X   03
JIB                   000002A8 RG    02
JIB$C_LENGTH        = 00000074
JIB$L_BYTCNT        = 00000020
JIB$L_BYTLM         = 00000024
JIB$L_MPID          = 00000054
JIB$L_PGFLCNT       = 0000003C
JIB$L_PGFLQUOTA     = 00000038
JIB$T_USERNAME      = 0000000C
JIB$W_FILCNT        = 00000030
JIB$W_FILLM         = 00000032
JIB$W_PRCCNT        = 00000044
JIB$W_PRCLIM        = 00000046
JIB$W_TQCNT         = 00000034
JIB$W_TQLM          = 00000036
JIBADR                000002A4 RG    02
JOB_QUOTA             00000201 R     03
L                   = 00000003
LIB$FID_TO_NAME       ********   X   03
LIB$FREE_VM           ********   X   03
LIB$GET_VM            ********   X   03
LIB$SIGNAL            ********   X   03
LINE_COUNT            ********   X   03
LOCKS                 00000207 R     03
MBX                   000001DD R     03
MMG$IMGHDRBUF         ********   X   03
MODIFY_TABLE          00000293 R     03
MPAGE_BUSY            00000219 R     03
MPAGE_EMPTY           00000213 R     03
MSG$_NOTRES           ********   X   03
MSG$_SUCCESS          ********   X   03
MWAIT                 0000022B R     03
NEW_PAGE              ********   X   03
NODE                  000003C8 R     02
NONPAGED              000001E3 R     03
NOTAVAIL              00000000 R     03
OPT$M_CHAN          = 00000400
OPT$M_P0_PPT        = 00000800
OPT$M_P1_PPT        = 00001000
OPT$M_PHD           = 00000020
OPT$M_PPT           = 00000002
OPT$M_PPT_LEN       = 00002000
OPT$M_PPT_RNG       = 00004000
OPT$M_PST           = 00000004
OPT$M_REGS          = 00000008
OPT$M_SYSPROC       = 00000040
OPT$M_WSL           = 00000001
OPT$V_CHAN          = 0000000A
OPT$V_IMAGE         = 00000000
OPT$V_LCK           = 00000009
OPT$V_P0_PPT        = 0000000B
OPT$V_P1_PPT        = 0000000C
OPT$V_PCB           = 00000004
OPT$V_PHD           = 00000005
OPT$V_PPT           = 00000001
OPT$V_PPT_LEN       = 0000000D
OPT$V_PST           = 00000002
```

```
OPT$V_REGS                       = 00000003                PCB$W_ASTCNT                     = 00000038
OPT$V_RMS                        = 00000007                PCB$W_BIOCNT                     = 0000003A
OPT$V_RMSD                       = 00000008                PCB$W_BIOLM                      = 0000003C
OPT$V_WSL                        = 00000000                PCB$W_DIOCNT                     = 0000003E
OPTIONS                            *********   X   03      PCB$W_DIOLM                      = 00000040
POBR                               *********   X   03      PCB$W_GPGCNT                     = 00000034
PAGED                              000001EF R      03      PCB$W_GRP                        = 000000BE
PAGE_SIZE                          *********   X   03      PCB$W_MEM                        = 000000BC
PAGING                             000001E9 R      03      PCB$W_MTXCNT                     = 0000000E
PAGTYP_TABLE                       00000253 R      03      PCB$W_PPGCNT                     = 00000036
PCB                                00000004 RG     02      PCB$W_STATE                      = 0000002C
PCB$B_ASTACT                     = 0000000C                PCB$W_TMBU                       = 00000032
PCB$B_ASTEN                      = 0000000D                PCBADR                             00000000 RG     02
PCB$B_PRI                        = 0000000B                PFNLOCK_TABLE                      000002A7 R      03
PCB$B_PRIB                       = 0000002F                PHD                                00000128 RG     02
PCB$B_WEFC                       = 0000002E                PHD$B_DFPFC                      = 00000034
PCB$C_LENGTH                     = 00000120                PHD$B_PGTBPFC                    = 00000035
PCB$L_EFC2P                      = 00000058                PHD$C_LENGTH                     = 0000017C
PCB$L_EFC3P                      = 0000005C                PHD$L_BAK                        = 00000044
PCB$L_EFCS                       = 00000050                PHD$L_BIOCNT                     = 00000058
PCB$L_EFCU                       = 00000054                PHD$L_CPULIM                     = 0000005C
PCB$L_EFWM                       = 0000004C                PHD$L_CPUTIM                     = 00000038
PCB$L_EOWNER                     = 00000068                PHD$L_DIOCNT                     = 00000054
PCB$L_EPID                       = 00000064                PHD$L_ESP                        = 0000007C
PCB$L_JIB                        = 00000080                PHD$L_FREPOVA                    = 00000028
PCB$L_OWNER                      = 0000001C                PHD$L_FREP1VA                    = 00000030
PCB$L_PHD                        = 0000006C                PHD$L_FREPTECNT                  = 0000002C
PCB$L_PID                        = 00000060                PHD$L_KSP                        = 00000078
PCB$L_STS                        = 00000024                PHD$L_POBR                       = 000000C8
PCB$L_WSSWP                      = 00000020                PHD$L_POLRASTL                   = 000000CC
PCB$L_WTIME                      = 00000028                PHD$L_P1BR                       = 000000D0
PCB$T_LNAME                      = 00000070                PHD$L_P1LR                       = 000000D4
PCB$V_ASTPEN                     = 00000011                PHD$L_PAGEFLTS                   = 0000004C
PCB$V_BATCH                      = 0000000E                PHD$L_PAGFIL                     = 0000001C
PCB$V_DELPEN                     = 00000001                PHD$L_PC                         = 000000C0
PCB$V_FORCPEN                    = 00000002                PHD$L_PSL                        = 000000C4
PCB$V_HIBER                      = 00000013                PHD$L_PSTBASOFF                  = 00000020
PCB$V_INQUAN                     = 00000003                PHD$L_PTWSLELCK                  = 00000064
PCB$V_LOGIN                      = 00000014                PHD$L_PTWSLEVAL                  = 00000068
PCB$V_NETWRK                     = 00000015                PHD$L_R0                         = 00000088
PCB$V_NOACNT                     = 0000000F                PHD$L_R1                         = 0000008C
PCB$V_NODELET                    = 00000017                PHD$L_R10                        = 000000B0
PCB$V_PHDRES                     = 00000012                PHD$L_R11                        = 000000B4
PCB$V_PSWAPM                     = 00000004                PHD$L_R12                        = 000000B8
PCB$V_PWRAST                     = 00000016                PHD$L_R13                        = 000000BC
PCB$V_RES                        = 00000000                PHD$L_R2                         = 00000090
PCB$V_RESPEN                     = 00000005                PHD$L_R3                         = 00000094
PCB$V_SSFEXC                     = 00000006                PHD$L_R4                         = 00000098
PCB$V_SSFEXCE                    = 00000007                PHD$L_R5                         = 0000009C
PCB$V_SSFEXCS                    = 00000008                PHD$L_R6                         = 000000A0
PCB$V_SSFEXCU                    = 00000009                PHD$L_R7                         = 000000A4
PCB$V_SSRWAIT                    = 0000000A                PHD$L_R8                         = 000000A8
PCB$V_SUSPEN                     = 0000000B                PHD$L_R9                         = 000000AC
PCB$V_SWPVBN                     = 00000010                PHD$L_SSP                        = 00000080
PCB$V_WAKEPEN                    = 0000000C                PHD$L_USP                        = 00000084
PCB$V_WALL                       = 0000000D                PHD$L_WSLX                       = 00000048
PCB$W_APTCNT                     = 00000030                PHD$S_POLR                       = 00000018
```

```
PHD$V_POLR                 = 00000000
PHD$W_ASTLM                = 00000040
PHD$W_DFWSCNT              = 0000001A
PHD$W_EXTDYNWS             = 00000076
PHD$W_FLAGS                = 00000036
PHD$W_PHVINDEX             = 00000042
PHD$W_PSTFREE              = 00000026
PHD$W_PSTLAST              = 00000024
PHD$W_PTCNTACT             = 00000070
PHD$W_PTCNTLCK             = 0000006C
PHD$W_PTCNTMAX             = 00000072
PHD$W_PTCNTVAL             = 0000006E
PHD$W_QUANT                = 0000003C
PHD$W_WSAUTH               = 0000000A
PHD$W_WSDYN                = 0000000E
PHD$W_WSFLUID              = 00000074
PHD$W_WSLAST               = 00000012
PHD$W_WSLIST               = 00000008
PHD$W_WSLOCK               = 0000000C
PHD$W_WSNEXT               = 00000010
PHD$W_WSQUOTA              = 00000018
PHDADR                       00000124 RG      02
PRINT                        ********    X    03
PROCESS_STATUS               00000097 R       03
PROCESS_SUMMARY              00001313 RG      03
PROC_NAME                    ********    X    03
PROC_PID                     ********    X    03
PST_TITLE                    00000DB5 R       03
READ_IMAGE                   0000149C R       03
REQMEM                       ********    X    03
RESOURCE_WAIT                0000015F R       03
RSN$_ASTWAIT               = 00000001
RSN$_BRKTHRU               = 00000006
RSN$_CLUSTRAN              = 0000000E
RSN$_IACLOCK               = 00000007
RSN$_JQUOTA                = 00000008
RSN$_LOCKID                = 00000009
RSN$_MAILBOX               = 00000002
RSN$_MAX                   = 0000000F
RSN$_MPLEMPTY              = 0000000B
RSN$_MPWBUSY               = 0000000C
RSN$_NPDYNMEM              = 00000003
RSN$_PGDYNMEM              = 00000005
RSN$_PGFILE                = 00000004
RSN$_SCS                   = 0000000D
RSN$_SWPFILE               = 0000000A
S                          = 00000006
SAV                        = 00000353 R       03
SB$S_NODENAME              = 00000010
SB$T_NODENAME              = 00000044
SCH$C_MWAIT                = 00000002
SCH$GL_MAXPIX                ********    X    03
SCH$GL_PCBVEC                ********    X    03
SCS$GA_LOCALSB               ********    X    03
SCSWAIT                      0000021F R       03
SEC$C_LENGTH               = 00000020
SEC$L_CCB                  = 00000000
SEC$L_PAGCNT               = 0000001C
SEC$L_REFCNT               = 00000018
SEC$L_VBN                  = 00000010
SEC$L_VPXPFC               = 00000008
SEC$L_WINDOW               = 0000000C
SEC$S_PFC                  = 00000008
SEC$S_VPX                  = 00000016
SEC$V_CRF                  = 00000001
SEC$V_DZRO                 = 00000002
SEC$V_GBL                  = 00000000
SEC$V_PFC                  = 00000018
SEC$V_VPX                  = 00000000
SEC$V_WRT                  = 00000003
SEC$W_FLAGS                = 00000014
SEC$W_SECXBL               = 00000006
SEC$W_SECXFL               = 00000004
SET_HEADING                  ********    X    03
SET_PROCESS                  ********    X    03
SHOW_CHANNELS                00000F94 R       03
SHOW_PCB                     000005B0 R       03
SHOW_PHD                     000007BA R       03
SHOW_PPT                     00000DD7 R       03
SHOW_PROC_LOCK               ********    X    03
SHOW_PST                     00000C35 R       03
SHOW_REGS                    00000934 R       03
SHOW_RMS                     ********    X    03
SHOW_RMS_DIS                 ********    X    03
SHOW_WSL                     00000A31 R       03
SKIP_LINES                   ********    X    03
STATE_TABLE                  0000001F R       03
STS$K_WARNING              = 00000000
SUMMARY_TITLE                0000147F R       03
SWAP                         0000020D R       03
SYS$FAO                      ********    X    03
TRANSLATE_ADDRESS            ********    X    03
TRANSLATE_BITS               ********    X    03
TRYMEM                       ********    X    03
UCB$L_DDB                  = 00000028
UCB$W_UNIT                 = 00000054
VALID_TABLE                  0000024B R       03
VERSION_FLAGS                ********    X    03
WCB                          0000048C R       02
WCB$B_TYPE                 = 0000000A
WCB$C_LENGTH               = 00000030
WCB$L_FCB                  = 00000018
WCB$L_PID                  = 0000000C
WRT_TABLE                    00000245 R       03
WSL$S_PAGTYP               = 00000003
WSL$V_GOODPAGE             = 00000006
WSL$V_MODIFY               = 00000008
WSL$V_PAGTYP               = 00000001
WSL$V_PFNLOCK              = 00000004
WSL$V_VALID                = 00000000
WSL$V_WSLOCK               = 00000005
WSLOCK_TABLE                 0000029E R       03
WSL_TITLE                    00000C13 R       03
```

```
                                  +----------------+
                                  ! 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
SDADATA                         000004BC  (  1212.)  02 (  2.)  NOPIC   USR   CON   REL   LCL NOSHR NOEXE   RD     WRT NOVEC BYTE
PROCESS                         0000158C  (  5516.)  03 (  3.)  NOPIC   USR   CON   REL   LCL NOSHR   EXE   RD   NOWRT NOVEC BYTE
LITERALS                        00001208  (  4616.)  04 (  4.)  NOPIC   USR   CON   REL   LCL NOSHR   EXE   RD   NOWRT NOVEC BYTE

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

Phase                    Page faults    CPU Time       Elapsed Time
-----                    -----------    --------       ------------
Initialization                    29    00:00:00.05    00:00:00.90
Command processing               107    00:00:00.45    00:00:03.12
Pass 1                           530    00:00:13.56    00:00:48.08
Symbol table sort                  0    00:00:01.65    00:00:04.86
Pass 2                           286    00:00:04.07    00:00:17.61
Symbol table output               39    00:00:00.18    00:00:00.18
Psect synopsis output              3    00:00:00.03    00:00:00.20
Cross-reference output             0    00:00:00.00    00:00:00.00
Assembler run totals             996    00:00:19.99    00:01:14.96

The working set limit was 2250 pages.
139106 bytes (272 pages) of virtual memory were used to buffer the intermediate code.
There were 80 pages of symbol table space allocated to hold 1422 non-local and 171 local symbols.
1518 source lines were read in Pass 1, producing 54 object records in Pass 2.
42 pages of virtual memory were used to define 41 macros.

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

Macro library name                        Macros defined
------------------                        --------------
_$255$DUA28:[SDA.OBJ]SDALIB.MLB;1                     15
_$255$DUA28:[SYS.OBJ]LIB.MLB;1                        14
_$255$DUA28:[SYSLIB]STARLET.MLB;2                      8
TOTALS (all libraries)                                37

1597 GETS were required to define 37 macros.

There were no errors, warnings or information messages.

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

0353 AH-BT13A-SE
VAX/VMS V4.0

DIGITAL EQUIPMENT CORPORATION
CONFIDENTIAL AND PROPRIETARY

PROCESS
LIS

RMS
LIS

QAST
LIS

RELEASE
LIS

POOL
LIS