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

_S

Ps
--

YZ

Z$

Z$

Z$

Z$

Z$

Z$

Z$

Z$

Z$

Z$

Z$

```
SSSSSSSS   YY      YY   SSSSSSSS   SSSSSSSS  EEEEEEEEEE  TTTTTTTTTT  PPPPPPPP   RRRRRRRR      AAAAAA
SSSSSSSS   YY      YY   SSSSSSSS   SSSSSSSS  EEEEEEEEEE  TTTTTTTTTT  PPPPPPPP   RRRRRRRR      AAAAAA
SS          YY    YY    SS         SS        EE              TT      PP     PP  RR     RR   AA      AA
SS          YY    YY    SS         SS        EE              TT      PP     PP  RR     RR   AA      AA
SS            YY YY     SS         SS        EE              TT      PP     PP  RR     RR   AA      AA
SS            YY YY     SS         SS        EE              TT      PP     PP  RR     RR   AA      AA
SSSSSS          YY      SSSSSS     SSSSSS    EEEEEEE         TT      PPPPPPPP   RRRRRRRR   AA      AA
SSSSSS          YY      SSSSSS     SSSSSS    EEEEEEE         TT      PPPPPPPP   RRRRRRRR   AA      AA
    SS          YY          SS         SS    EE              TT      PP         RR   RR    AAAAAAAAAA
    SS          YY          SS         SS    EE              TT      PP         RR   RR    AAAAAAAAAA
    SS          YY          SS         SS    EE              TT      PP         RR     RR  AA      AA    ....
    SS          YY          SS         SS    EE              TT      PP         RR     RR  AA      AA    ....
SSSSSSSS        YY      SSSSSSSS   SSSSSSSS  EEEEEEEEEE      TT      PP         RR     RR  AA      AA    ....
SSSSSSSS        YY      SSSSSSSS   SSSSSSSS  EEEEEEEEEE      TT      PP         RR     RR  AA      AA    ....

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

SYSSETPRA
V04-000

D 7
- SET POWER FAIL AST SYSTEM SERVICE   16-SEP-1984 02:32:49 VAX/VMS Macro V04-00   Page 1
                                          5-SEP-1984 03:57:15 [SYS.SRC]SYSSETPRA.MAR;1   (1)

```
0000     1                    .TITLE  SYSSETPRA - SET POWER FAIL AST SYSTEM SERVICE
0000     2                    .IDENT  'V04-000'
0000     3          ;
0000     4          ;****************************************************************************
0000     5          ;*                                                                          *
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0000    23          ;*                                                                          *
0000    24          ;*                                                                          *
0000    25          ;****************************************************************************
0000    26
0000    27          ;++
0000    28
0000    29          ; Facility:
0000    30          ;
0000    31          ; Abstract: SYSSETPRA IMPLEMENTS THE $SETPRA SYSTEM SERVICE WHICH ENABLES
0000    32          ;           A PROCESS TO RECEIVE AN AST WHEN POWER IS RESTORED AFTER A
0000    33          ;           SUCCESSFUL POWER RECOVERY.
0000    34          ;
0000    35          ; Environment:
0000    36          ;
0000    37          ; Author: RICHARD I. HUSTVEDT, Creation date:  18-JUN-1978
0000    38          ;
0000    39          ; Modified by:
0000    40          ;
0000    41          ;   Version  ,
0000    42          ; 01       -
0000    43          ;--
0000    44
0000    45          ;
0000    46          ; Include files:
0000    47          ;
0000    48                  $ACBDEF                             ; DEFINE ACB OFFSETS
0000    49                  $PCBDEF                             ; DEFINE PCB OFFSETS
0000    50                  $SSDEF                              ; DEFINE SYSTEM SERVICE STATUS CODES
0000    51
0000    52          ;
0000    53          ; MACROS:
0000    54          ;
0000    55
0000    56          ;
0000    57          ; Equated Symbols:
```

```
                      0000        58 ;
          00000004    0000        59 ;          ASTADR = 4                        ; ARGUMENT LIST OFFSET TO AST ADDRESS
          00000008    0000        60 ;          ACMODE = 8                        ; ARGUMENT LIST OFFSET TO ACCESS MODE
                      0000        61 ;
                      0000        62 ;
                      0000        63 ;
                      0000        64 ; Own Storage:
                      0000        65 ;
          00000000    0000        66 ;          .PSECT  Y$EXEPAGED                ; PAGED CODE
```

SYSSETPRA
V04-000

F 7
- SET POWER FAIL AST SYSTEM SERVICE   16-SEP-1984 02:32:49   VAX/VMS Macro V04-00   Page 3
EXE$SETPRA - SET POWER FAIL AST ROUTINE   5-SEP-1984 03:57:15   [SYS.SRC]SYSSETPRA.MAR;1   (1)

```
                          0000    68                .SBTTL   EXE$SETPRA - SET POWER FAIL AST ROUTINE ADDRESS
                          0000    69        ;++
                          0000    70        ; Functional Description:
                          0000    71        ;     EXE$SETPRA IMPLEMENTS THE SYSTEM SERVICE $SETPRA WHICH ENABLES A
                          0000    72        ;     PROCESS TO REQUEST AN AST AFTER THE RESTORATION OF POWER FOLLOWING
                          0000    73        ;     A POWER FAILURE.  THE AST ROUTINE IS ENTERED WITH A PARAMETER
                          0000    74        ;     GIVING THE DURATION OF THE POWER OUTAGE IN .01 SECOND UNITS.
                          0000    75        ;     THIS IS A SINGLE SHOT AST AND MUST BE RE-ENABLED EACH TIME IT OCCURS.
                          0000    76        ;     IT IS AUTOMATICALLY CANCELED AT IMAGE RUNDOWN.
                          0000    77        ;
                          0000    78        ; Calling Sequence:
                          0000    79        ;     CALLG   ARGLIST,EXE$SETPRA
                          0000    80        ;
                          0000    81        ; Input Parameters:
                          0000    82        ;     ASTADR(AP) - ADDRESS OF AST ROUTINE
                          0000    83        ;     ACMODE(AP) - ACCESS MODE, MAXIMIZED WITH THAT OF CALLER
                          0000    84        ;
                          0000    85        ; Implicit Inputs:
                          0000    86        ;     PCB OF CURRENT PROCESS LOCATED VIA SCH$GL_CURPCB
                          0000    87        ;
                          0000    88        ; Output Parameters:
                          0000    89        ;     R0 - COMPLETION STATUS CODE
                          0000    90        ;
                          0000    91        ; Implicit Outputs:
                          0000    92        ;     NONE
                          0000    93        ;
                          0000    94        ; Side Effects:
                          0000    95        ;     NONE
                          0000    96        ;
                          0000    97        ; Status Codes:
                          0000    98        ;     SS$_NORMAL  - NORMAL, SUCCESSFUL COMPLETION
                          0000    99        ;     SS$_EXQUOTA - AST QUOTA EXCEEDED
                          0000   100        ;
                          0000   101        ;--
                          0000   102                .LIST    MEB                          ; Show macro expansions
                          0000   103
                   003C   0000   104                .ENTRY   EXE$SETPRA,^M<R2,R3,R4,R5>    ;
50  08 AC  02  00   EF    0002   105                EXTZV    #0,#2,ACMODE(AP),R0           ; GET ACCESS MODE ARGUMENT
            FFF5'   30    0008   106                BSBW     EXE$MAXACMODE                 ; MAXIMIZE WITH THAT OF CALLER
51  00000000'EF     9E    000B   107                MOVAB    CTL$GL_POWERAST,R1           ; GET ADDRESS OF POWER FAIL AST POINTER
            61    D5      0012   108                TSTL     (R1)                         ; IS THERE ONE CURRENTLY?
            08    12      0014   109                BNEQ     10$                          ; YES, SKIP QUOTA BUSINESS
         38 A4    B5      0016   110                TSTW     PCB$W_ASTCNT(R4)             ; CHECK FOR AST QUOTA
            15    15      0019   111                BLEQ     EXQUOTA                      ; ERROR EXIT IF NO QUOTA
         38 A4    B7      001B   112                DECW     PCB$W_ASTCNT(R4)             ; ONE LESS FOR AST QUOTA
      61  04 AC    D0     001E   113   10$:         MOVL     ASTADR(AP),(R1)             ; SET ADDRESS OF AST ROUTINE
  0000'C1  50    90       0022   114                MOVB     R0,<CTL$GB_PWRMODE-CTL$GL_POWERAST>(R1) ; AND ACCESS MODE FOR AST
  00 24 A4  16   E2       0027   115                BBSS     #PCB$V_PWRAST,PCB$L_STS(R4),20$ ; SET POWER AST FLAG FOR PROCESS
      50   01    3C       002C   116   20$:         MOVZWL   #SS$_NORMAL,R0              ; RETURN NORMAL SUCCESSFUL COMPLETION
            04           002F   117                RET                                   ;
                          0030   118
                          0030   119   EXQUOTA:                                          ; EXCEEDED AST QUOTA
      50   1C    3C       0030   120                MOVZWL   #SS$_EXQUOTA,R0            ; SET STATUS CODE FOR QUOTA EXCEEDED
            04           0033   121                RET                                   ; AND RETURN
                          0034   122
```

G 7

SYSSETPRA   - SET POWER FAIL AST SYSTEM SERVICE   16-SEP-1984 02:32:49   VAX/VMS Macro V04-00   Page 4
V04-000   EXE$POWERAST - INITIATE POWER FAIL AST F   5-SEP-1984 03:57:15   [SYS.SRC]SYSSETPRA.MAR;1   (1)

```
                            0034    124                .SBTTL  EXE$POWERAST - INITIATE POWER FAIL AST FOR ALL INTERESTED PROCESSES
                            0034    125        ;++
                            0034    126        ; Functional Description:
                            0034    127        ;    EXE$POWERAST IS CALLED BY THE SWAPPER AFTER A POWER RECOVERY TO
                            0034    128        ;    SEND A SPECIAL KERNEL MODE AST TO EACH PROCESS WHICH HAS ENABLED
                            0034    129        ;    POWER FAIL ASTS.
                            0034    130        ;
                            0034    131        ; Calling sequence:
                            0034    132        ;    JSB     EXE$POWERAST
                            0034    133        ;
                            0034    134        ;--
                            0034    135   EXE$POWERAST::
             0070 8F   BB   0034    136        PUSHR   #^M<R4,R5,R6>              ; SAVE NON-VOLATILE REGISTERS
     56  00000000'EF   DO   0038    137        MOVL    SCH$GL_MAXPIX,R6          ; SET STARTING PROCESS INDEX FOR SCAN
                            003F    138   PCBLOOP:
     54  00000000'FF46 DO   003F    139        MOVL    @SCH$GL_PCBVEC[R6],R4     ; GET A PCB ADDRESS
       30 24 A4   16   E1   0047    140        BBC     #PCB$V_PWRAST,PCB$L_STS(R4),NEXTPCB ; BRANCH IF NO AST FOR THIS PROC
         00000000'EF   16   004C    141        JSB     EXE$ALLOCIRP              ; ALLOCATE AN I/O PACKET
             27 50     E9   0052    142        BLBC    R0,NEXTPCB               ; SKIP IF ERROR
       00 24 A4   16   E5   0055    143        BBCC    #PCB$V_PWRAST,PCB$L_STS(R4),10$ ; CLEAR AST FLAG
             55 52     DO   005A    144   10$: MOVL    R2,R5                    ; MOVE BASE TO ACB BASE REGISTER
       0B A5   CO 8F   90   005D    145        MOVB    #<<1@ACB$V_QUOTA>!<1@ACB$V_KAST>>,ACB$B_RMOD(R5) ; SET AS SPECIAL AS
       0C A5   60 A4   DO   0062    146        MOVL    PCB$L_PID(R4),ACB$L_PID(R5)   ; SET PID FOR AST
       18 A5   8A'AF   9E   0067    147        MOVAB   B^PROCAST,ACB$L_KAST(R5) ; SET ADDRESS FO SPECIAL AST
    14 A5  00000000'EF   DO  006C    148        MOVL    EXE$GL_PFATIM,ACB$L_ASTPRM(R5) ; SET AST PARAMETER
                   52   D4   0074    149        CLRL    R2                       ; NULL PRIORITY INCREMENT
         00000000'EF   16   0076    150        JSB     SCH$QAST                 ; ENQUEUE AST FOR PROCESS
                            007C    151   NEXTPCB:
             CO 56     F4   007C    152        SOBGEQ  R6,PCBLOOP               ; CONTINUE FOR ALL PIX VALUES
         00000000'EF   D4   007F    153        CLRL    EXE$GL_PFATIM            ; CLEAR DURATION OF POWERFAIL
             0070 8F   BA   0085    154        POPR    #^M<R4,R5,R6>            ; RESTORE REGISTERS
                   05        0089    155        RSB                             ; AND RETURN
                            008A    156
```

```
                              008A   158              .SBTTL  PROCAST - SPECIAL KERNEL AST FOR POWERFAIL
                              008A   159  ;++
                              008A   160  ; Functional Description:
                              008A   161  ;       PROCAST RUNS AS A SPECIAL KERNEL AST IN THE CONTEXT OF THE PROCESS
                              008A   162  ;       WHERE IT CAN ACCESS THE ADDRESS OF THE POWER FAIL AST ROUTINE AND
                              008A   163  ;       REQUEUE THE AST AT THE PROPER ACCESS MODE.
                              008A   164  ;
                              008A   165  ;--
                              008A   166  PROCAST:
   51   00000000'EF   9E      008A   167              MOVAB   CTL$GL_POWERAST,R1              ; GET ADDRESS OF POWER FAIL AST POINTER
         10 A5   61   D0      0091   168              MOVL    (R1),ACB$L_AST(R5)             ; SET CORRECT AST ROUTINE ADDRESS
   0B A5   0000'C1   88       0095   169              BISB    <CTL$GB_PWRMODE-CTL$GL_POWERAST>(R1),ACB$B_RMOD(R5) ;
                              009B   170                                                     ; SET CORRECT ACCESS MODE
                    61   D4   009B   171              CLRL    (R1)                           ; ZAP AST POINTER
                    52   D4   009D   172              CLRL    R2                             ; SET NULL PRIORITY INCREMENT
         00000000'EF   17     009F   173              JMP     SCH$QAST                       ; QUEUE NORMAL AST
                              00A5   174
                              00A5   175              .END                                   ;
```

```
ACB$B_RMOD                     = 0000000B
ACB$L_AST                      = 00000010
ACB$L_ASTPRM                   = 00000014
ACB$L_KAST                     = 00000018
ACB$L_PID                      = 0000000C
ACB$V_KAST                     = 00000007
ACB$V_QUOTA                    = 00000006
ACMODE                         = 00000008
ASTADR                         = 00000004
CTL$GB_PWRMODE                   ********    X   02
CTL$GL_POWERAST                  ********    X   02
EXE$ALLOCIRP                     ********    X   02
EXE$GL_PFATIM                    ********    X   02
EXE$MAXACMODE                    ********    X   02
EXE$POWERAST                     00000034 RG     02
EXE$SETPRA                       00000000 RG     02
EXQUOTA                          00000030 R      02
NEXTPCB                          0000007C R      02
PCB$L_PID                      = 00000060
PCB$L_STS                      = 00000024
PCB$V_PWRAST                   = 00000016
PCB$W_ASTCNT                   = 00000038
PCBLOOP                          0000003F R      02
PROCAST                          0000008A R      02
SCH$GL_MAXPIX                    ********    X   02
SCH$GL_PCBVEC                    ********    X   02
SCH$QAST                         ********    X   02
SS$_EXQUOTA                    = 0000001C
SS$_NORMAL                     = 00000001
```

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

PSECT name	Allocation	PSECT No.	Attributes										
. ABS .	00000000 (0.)	00 (0.)	NOPIC	USR	CON	ABS	LCL	NOSHR	NOEXE	NORD	NOWRT	NOVEC	BYTE
ABS	00000000 (0.)	01 (1.)	NOPIC	USR	CON	ABS	LCL	NOSHR	EXE	RD	WRT	NOVEC	BYTE
Y$EXEPAGED	000000A5 (165.)	02 (2.)	NOPIC	USR	CON	REL	LCL	NOSHR	EXE	RD	WRT	NOVEC	BYTE

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

Phase	Page faults	CPU Time	Elapsed Time
Initialization	29	00:00:00.07	00:00:00.33
Command processing	106	00:00:00.57	00:00:02.05
Pass 1	227	00:00:05.23	00:00:12.15
Symbol table sort	0	00:00:00.85	00:00:02.28
Pass 2	50	00:00:01.02	00:00:02.13
Symbol table output	5	00:00:00.04	00:00:00.05
Psect synopsis output	2	00:00:00.02	00:00:00.02
Cross-reference output	0	00:00:00.00	00:00:00.00
Assembler run totals	421	00:00:07.80	00:00:19.01

The working set limit was 1200 pages.

28491 bytes (56 pages) of virtual memory were used to buffer the intermediate code.
There were 30 pages of symbol table space allocated to hold 577 non-local and 3 local symbols.
175 source lines were read in Pass 1, producing 16 object records in Pass 2.
10 pages of virtual memory were used to define 9 macros.

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

Macro library name   Macros defined
------------------   --------------
-255DUA28:[SYS.OBJ]LIB.MLB;1   2
-255DUA28:[SYSLIB]STARLET.MLB;2   4
TOTALS (all libraries)   6

631 GETS were required to define 6 macros.

There were no errors, warnings or information messages.

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

SYSSETPRA
LIS

SYSSETSSF
LIS

SYSSNDJBC
LIS

SYSSETIME
LIS

SYSSETPFM
LIS

SYSUPDSEC
LIS

SYSSNDMSG
LIS

SYSSETPRI
LIS

SYSSETPRV
LIS

SYSUNWIND
LIS

SYSSETSTK
LIS

SYSSETMOD
LIS

SYSSETEXV
LIS

SYSSETPRI
LIS

SYSSCHEVT
LIS