



```

SSSSSSSS YY YY SSSSSSSS CCCCCCCC HH HH GGGGGGGG MM MM 000000 DDDDDDDD
SSSSSSSS YY YY SSSSSSSS CCCCCCCC HH HH GGGGGGGG MM MM 000000 DDDDDDDD
SS SS YY YY SS SSSSSSSS CC CCCCCCCC HH HH GG GGGGGGGG MMMM MMMM 00 00 DD DD
SS SS YY YY SS SSSSSSSS CC CCCCCCCC HH HH GG GGGGGGGG MMMM MMMM 00 00 DD DD
SS SS YY YY SS SSSSSSSS CC CCCCCCCC HH HH GG GGGGGGGG MM MM 00 00 DD DD
SSSSSSS YY YY SSSSSSSS CCCCCCCC HH HH GGGGGGGG MM MM 00 00 DD DD
SSSSSSS YY YY SSSSSSSS CCCCCCCC HH HH GGGGGGGG MM MM 00 00 DD DD
SS SS YY YY SS SSSSSSSS CCCCCCCC HH HH GG GGGGGGGG MM MM 00 00 DD DD
SS SS YY YY SS SSSSSSSS CCCCCCCC HH HH GG GGGGGGGG MM MM 00 00 DD DD
SSSSSSSS YY YY SSSSSSSS CCCCCCCC HH HH GGGGGGGG MM MM 000000 DDDDDDDD
SSSSSSSS YY YY SSSSSSSS CCCCCCCC HH HH GGGGGGGG MM MM 000000 DDDDDDDD

LL LL IIIIII SSSSSSSS
LL LL IIIIII SSSSSSSS
LL LL II SS
LL LL II SS
LL LL II SS
LL LL II SSSSSS
LL LL II SSSSSS
LL LL II SS
LL LL II SS
LL LL II SS
LLLLLLLLLLLL IIIIII SSSSSSSS
LLLLLLLLLLLL IIIIII SSSSSSSS

```

(1) 72

CHANGE MODE TO EXECUTIVE AND KERNEL

```

0000 1 .TITLE SYSCHGMOD - SYSTEM SERVICES TO CHANGE MODE
0000 2 .IDENT 'V04-000'
0000 3
0000 4
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0000 27 :
0000 28
0000 29 :++
0000 30 : FACILITY.
0000 31
0000 32 : SYSTEM SERVICES TO CHANGE MODE
0000 33
0000 34 : ABSTRACT:
0000 35
0000 36 : CHANGE MODE TO EXECUTIVE SYSTEM SERVICE
0000 37 : CHANGE MODE TO KERNEL SYSTEM SERVICE
0000 38
0000 39 : AUTHOR: D. N. CUTLER, CREATION DATE: 30-SEP-76
0000 40
0000 41 : MODIFIED BY:
0000 42
0000 43 : V02-003 STJ0115 Steven T. Jeffreys 02-Sep-1981
0000 44 : Liberal rewrite to increase speed. Optimized for $CMKRNL.
0000 45
0000 46 : V02-002 KDM0037 Kathleen D. Morse 12-Feb-1981
0000 47 : Change non-kernel mode references to SCH$GL_CURPCB
0000 48 : to use CTL$GL_PCB instead.
0000 49
0000 50
0000 51 :--

```

```
0000 53 :  
0000 54 : MACRO LIBRARY CALLS  
0000 55 :  
0000 56 :  
0000 57 $PCBDEF ;DEFINE PCB OFFSETS  
0000 58 $PRVDEF ;DEFINE PRIVILEGE BITS  
0000 59 $PSLDEF ;DEFINE PROCESSOR STATUS FIELDS  
0000 60 $$SFDEF ;DEFINE STACK FRAME OFFSETS  
0000 61 $$SSDEF ;DEFINE SYSTEM STATUS VALUES  
0000 62 :  
0000 63 :  
0000 64 : LOCAL SYMBOLS  
0000 65 :  
0000 66 : ARGUMENT LIST OFFSET DEFINITIONS  
0000 67 :  
0000 68 :  
00000004 0000 69 ROUTIN=4 ;ADDRESS OF ROUTINE TO BE EXECUTED  
00000008 0000 70 ARGLST=8 ;ADDRESS OF ARGUMENT LIST
```

```

0000 72 .SBTTL CHANGE MODE TO EXECUTIVE AND KERNEL
0000 73 :+
0000 74 : EXE$CMEXEC - CHANGE MODE TO EXECUTIVE
0000 75 : EXE$CMKRNL - CHANGE MODE TO KERNEL
0000 76
0000 77 : THESE SERVICES PROVIDE THE CAPABILITY TO CHANGE THE CURRENT PROCESSOR
0000 78 : ACCESS MODE AND CALL A SPECIFIED ROUTINE WITH A SPECIFIED ARGUMENT LIST.
0000 79
0000 80 : INPUTS:
0000 81
0000 82 : ROUTIN(AP) = ADDRESS OF ROUTINE TO BE EXECUTED AT SPECIFIED MODE.
0000 83 : ARGST(AP) = ADDRESS OF ARGUMENT LIST TO BE PASSED TO ROUTINE.
0000 84
0000 85 : IF ENTRY AT EXE$CMKRNL, THEN
0000 86
0000 87 : R4 = CURRENT PROCESS PCB ADDRESS.
0000 88
0000 89 : OUTPUTS:
0000 90
0000 91 : R0 LOW BIT CLEAR INDICATES FAILURE TO PERFORM SPECIFIED ROUTINE.
0000 92
0000 93 : R0 = SSS$NOPRIV - PROCESS DOES NOT HAVE PRIVILEGE TO CHANGE
0000 94 : TO THE SPECIFIED ACCESS MODE.
0000 95
0000 96 : R0 = FINAL VALUE RETURNED BY EXECUTED ROUTINE.
0000 97
0000 98 : R0 LOW BIT SET INDICATES SUCCESSFUL COMPLETION.
0000 99
0000 100 : R0 = FINAL VALUE RETURNED BY EXECUTED ROUTINE.
0000 101 :-
0000 102
0000 103 .ENABLE LSB
0000 104 .ENTRY EXE$CMEXEC,^M<R4>
54 00000000'GF 0010 0000 105 MOVL G^CTL$GL_PCB,R4 ;GET CURRENT PCB ADDRESS
01 01 E0 0002 106 BBS #PRV$V_CMEXEC,- ;BRANCH IF PROCESS HAS CMEXEC PRIVILEGE
0A 6C B4 000B 107 @PCB$$_PHD(R4),20$
02 11 000E 108 BRB 10$ ;CONTINUE IN COMMON CODE
0010 0010 109 .ENTRY EXE$CMKRNL,^M<R4>
10 50 50 DC 0012 110 10$: MOVPSL R0 ;GET PSL
17 E0 0014 111 BBS #PSL$$_PRVMOD+1,R0,30$ ;BRANCH IF CALLER NOT IN EXEC OR KERNEL
0018 112
0018 113 : CALL THE SPECIFIED ROUTINE, PASSING IT THE SPECIFIED ARGUMENT LIST.
0018 114 : IF THE ROUTINE RETURNS A SUCCESS STATUS IN R0, TAKE A FAST EXIT PATH
0018 115 : OUT OF THE SYSTEM SERVICE. THE IDEA IS TO AVOID A 'RET' INSTRUCTION,
0018 116 : WHICH IS FAR SLOWER THAN THE 'MOVL' AND 'ADDL'. IF THE ROUTINE
0018 117 : RETURNS A FAILURE STATUS, 'RET' BACK TO THE SYSTEM SERVICE DISPATCHER
0018 118 : TO USE THE SPECIAL SYSTEM SERVICE FAILURE CODE PATH.
0018 119
04 BC 08 BC FA 0018 120 20$: CALLG @ARGST(AP),@ROUTIN(AP) ;CALL SPECIFIED ROUTINE
10 50 E9 001D 121 BLBC R0,40$ ;IF ERROR, THEN TAKE 'NORMAL' EXIT PATH
5D 0C AD D0 0020 122 MOVL SF$$_SAVE_FP(FP),FP ;RESTORE FRAME POINTER
5E 00' C0 0024 123 ADDL S^#EXE$$_CMSTKSZ,SP ;CLEAN STACK BACK TO PC, PSL
02 0027 124 REI ;RETURN FROM THE SYSTEM SERVICE CALL
00 E0 0028 125 30$: BBS #PRV$V_CMKRNL,- ;BRANCH IF PROCESS HAS CMKRNL PRIVILEGE
EB 6C B4 002A 126 @PCB$$_PHD(R4),20$
50 24 3C 002D 127 MOVZWL #SS$$_NOPRIV,R0 ;SET ERROR STATUS
04 0030 128 40$: RET

```

SYSCHGMOD  
V04-000

- SYSTEM SERVICES TO CHANGE MODE B 5  
CHANGE MODE TO EXECUTIVE AND KERNEL

16-SEP-1984 01:46:59 VAX/VMS Macro V04-00  
5-SEP-1984 03:49:20 [SYS.SRC]SYSCHGMOD.MAR;1

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SYS  
V04

0031 129  
0031 130 .DISABLE LSB  
0031 131 .END

SYSGMOD  
Symbol table

- SYSTEM SERVICES TO CHANGE MODE

C 5

16-SEP-1984 01:46:59  
5-SEP-1984 03:49:20

VAX/VMS Macro V04-00  
[SYS.SRC]SYSGMOD.MAR;1

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SYS  
V04

ARGLST	=	00000008		
CTLSGL_PCB		*****	X	01
EXESCMEXEC		00000000	RG	01
EXESCMKRNL		00000010	RG	01
EXESC_CMSTKSZ		*****	X	01
PCBSL_PHD	=	0000006C		
PRVSV_CMEXEC	=	00000001		
PRVSV_CMKRNL	=	00000000		
PSLSV_PRVMOD	=	00000016		
ROUTIN	=	00000004		
SFSL_SAVE_FP	=	0000000C		
SSS_NOPRIV	=	00000024		

-----  
! Psect synopsis !  
-----

PSECT name	Allocation	PSECT No.	Attributes
. ABS :	00000000 ( 0.)	00 ( 0.)	NOPIC USR CON ABS LCL NOSHR NOEXE NORD NOWRT NOVEC BYTE
. BLANK :	00000031 ( 49.)	01 ( 1.)	NOPIC USR CON REL LCL NOSHR EXE RD WRT NOVEC BYTE
\$ABSS	00000000 ( 0.)	02 ( 2.)	NOPIC USR CON ABS LCL NOSHR EXE RD WRT NOVEC BYTE

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

Phase	Page faults	CPU Time	Elapsed Time
Initialization	29	00:00:00.06	00:00:00.53
Command processing	105	00:00:00.50	00:00:05.00
Pass 1	249	00:00:06.07	00:00:18.43
Symbol table sort	0	00:00:01.01	00:00:03.54
Pass 2	41	00:00:01.08	00:00:03.43
Symbol table output	2	00:00:00.04	00:00:00.04
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	430	00:00:08.79	00:00:31.00

The working set limit was 1200 pages.  
33589 bytes (66 pages) of virtual memory were used to buffer the intermediate code.  
There were 40 pages of symbol table space allocated to hold 689 non-local and 4 local symbols.  
131 source lines were read in Pass 1, producing 18 object records in Pass 2.  
12 pages of virtual memory were used to define 11 macros.

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

Macro library name	Macros defined
-\$255\$DUA28:[SYS.OBJ]LIB.MLB;1	1
-\$255\$DUA28:[SYSLIB]STARLET.MLB;2	7
TOTALS (all libraries)	8

761 GETS were required to define 8 macros.



SYSCHGMOD  
VAX-11 Macro Run Statistics

- SYSTEM SERVICES TO CHANGE MODE D 5

16-SEP-1984 01:46:59 VAX/VMS Macro V04-00  
5-SEP-1984 03:49:20 [SYS.SRC]SYSCHGMOD.MAR;1

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(1)

SYS  
V04

There were no errors, warnings or information messages.

MACRO/LIS=LISS:SYSCHGMOD/OBJ=OBJ\$:SYSCHGMOD MSRC\$:SYSCHGMOD/UPDATE=(ENH\$:SYSCHGMOD)+EXECMLS/LIB



