


```

LL      IIIIII  BBBB8888  FFFFFFFFFE  MM      MM  UU      UU  LL
LL      IIIIII  BBBB8888  FFFFFFFFFE  MM      MM  UU      UU  LL
LL      II      BB      BB  FFF      FFF  MMMM  MMMM  UU      UU  LL
LL      II      BB      BB  FFF      FFF  MMMM  MMMM  UU      UU  LL
LL      II      BB      BB  FFF      FFF  MM  MM  MM  UU      UU  LL
LL      II      BB      BB  FFF      FFF  MM  MM  MM  UU      UU  LL
LL      II      BBBB8888  FFFFFFFFFE  MM      MM  UU      UU  LL
LL      II      BBBB8888  FFFFFFFFFE  MM      MM  UU      UU  LL
LL      II      BB      BB  FFF      FFF  MM      MM  UU      UU  LL
LL      II      BB      BB  FFF      FFF  MM      MM  UU      UU  LL
LL      II      BB      BB  FFF      FFF  MM      MM  UU      UU  LL
LL      II      BB      BB  FFF      FFF  MM      MM  UU      UU  LL
LLLLLLLLLLLL  IIIIII  BBBB8888  FFFFFFFFFE  MM      MM  UUUUUUUUUU  LLLLLLLLLL  ....
LLLLLLLLLLLL  IIIIII  BBBB8888  FFFFFFFFFE  MM      MM  UUUUUUUUUU  LLLLLLLLLL  ....

```

```

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
LLLLLLLLLLLL  IIIIII  SSSSSSSS
LLLLLLLLLLLL  IIIIII  SSSSSSSS

```

.....

LIBSEMUL
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- Execute EMUL instruction

DECLARATIONS
LIBSEMUL - Execute EMUL instruction

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1-

```

0000 1 .TITLE LIBSEMUL - Execute EMUL instruction
0000 2 .IDENT /1-001/ ; File: LIBEMUL.MAR Edit: SBL1001
0000 3
0000 4
0000 5 *****
0000 6 *
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0000 24 *
0000 25 *
0000 26 *****
0000 27
0000 28
0000 29 **
0000 30 FACILITY: General Utility Library
0000 31
0000 32 ABSTRACT:
0000 33
0000 34 This module contains LIBSEMUL, which makes the VAX EMUL instruction
0000 35 available as a callable procedure.
0000 36
0000 37 ENVIRONMENT: Runs at any access mode, AST Reentrant
0000 38
0000 39 AUTHOR: Steven B. Lionel, CREATION DATE: 8-July-1981
0000 40
0000 41 MODIFIED BY:
0000 42
0000 43 1-001 - Original. SBL 8-July-1981
0000 44 --

```

```
0000 46 .SBTTL DECLARATIONS
0000 47 :
0000 48 : LIBRARY MACRO CALLS:
0000 49 :
0000 50 $SSDEF ; Define SS$ symbols
0000 51 :
0000 52 : EXTERNAL DECLARATIONS:
0000 53 :
0000 54 .DSABL GBL ; force all external symbols to be declared
0000 55 NONE
0000 56 :
0000 57 : MACROS:
0000 58 :
0000 59 NONE
0000 60 :
0000 61 : EQUATED SYMBOLS:
0000 62 :
0000 63 NONE
0000 64 :
0000 65 : OWN STORAGE:
0000 66 :
0000 67 NONE
0000 68 :
0000 69 : PSECT DECLARATIONS:
0000 70 :
00000000 71 .PSECT _LIB$CODE PIC,USR,CON,REL,LCL,SHR,-
0000 72 EXE,RD,NOWRT, LONG
0000 73
```

```

0000 75 .SBTTL LIBSEMUL - Execute EMUL instruction
0000 76 :++
0000 77 : FUNCTIONAL DESCRIPTION:
0000 78 :
0000 79 : This procedure makes the VAX EMUL instruction available as
0000 80 : a callable procedure.
0000 81 :
0000 82 : The multiplicand argument is multiplied by the multiplier
0000 83 : argument giving a double-length result. The addend argument
0000 84 : is sign-extended to double-length and added to the result, and
0000 85 : then the product argument is replaced by the final result.
0000 86 :
0000 87 : For more information, see the VAX-11 Architecture Handbook.
0000 88 :
0000 89 : CALLING SEQUENCE:
0000 90 :
0000 91 : >status.wlc.v = LIBSEMUL (multiplier.rl.r, multiplicand.rl.r,
0000 92 : addend.rl.r, product.wq.r)
0000 93 :
0000 94 : FORMAL PARAMETERS:
0000 95 :
00000004 0000 96 : multiplier = 4 ; The address of the longword integer multiplier.
00000008 0000 97 : multiplicand = 8 ; The address of the longword integer multiplicand.
0000000C 0000 98 : addend = 12 ; The address of the longword integer addend.
00000010 0000 99 : product = 16 ; The address of a quadword integer for the
0000 100 : product result.
0000 101 :
0000 102 : IMPLICIT INPUTS:
0000 103 :
0000 104 : NONE
0000 105 :
0000 106 : IMPLICIT OUTPUTS:
0000 107 :
0000 108 : NONE
0000 109 :
0000 110 : COMPLETION STATUS:
0000 111 :
0000 112 : SSS_NORMAL, normal successful completion
0000 113 :
0000 114 : SIDE EFFECTS:
0000 115 :
0000 116 : NONE
0000 117 :
0000 118 :
0000 119 :
0000 120 :
0000 121 :--
0000 122 :
0000 123 : .ENTRY LIBSEMUL, ^M<IV> ; Entry point
0002 124 :
10 BC 0C BC 04 BC 08 BC 7A 0002 125 : EMUL @multiplicand(AP), @multiplier(AP), -
000B 126 : @addend(AP), @product(AP)
000B 127 :
50 01 D0 000B 128 : MOVL #SS$_NORMAL, R0 ; The EMUL can not fail
000E 129 : RET
000F 130 :
000F 131 : .END ; End of module LIBSEMUL

```

SRM JEC

LIBSEMUL
Symbol table

- Execute EMUL instruction

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VAX/VMS Macro V04-00
[LIBRTL.SRC]LIBEMUL.MAR;1

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(3)

ADDEND = 0000000C
LIBSEMUL = 00000000 RG 02
MULTIPLICAND = 00000008
MULTIPLIER = 00000004
PRODUCT = 00000010
SSS_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
\$ABSS	00000000 (0.)	01 (1.)	NOPIC USR CON ABS LCL NOSHR EXE RD WRT NOVEC BYTE
_LIB\$CODE	0000000F (15.)	02 (2.)	PIC USR CON RE! LCL SHR EXE RD NOWRT NOVEC LONG

! Performance indicators !

Phase	Page faults	CPU Time	Elapsed Time
Initialization	29	00:00:00.05	00:00:01.48
Command processing	102	00:00:00.28	00:00:02.20
Pass 1	179	00:00:02.41	00:00:10.72
Symbol table sort	0	00:00:00.42	00:00:02.64
Pass 2	40	00:00:00.47	00:00:03.02
Symbol table output	3	00:00:00.02	00:00:00.02
Psect synopsis output	2	00:00:00.01	00:00:00.01
Cross-reference output	0	00:00:00.00	00:00:00.00
Assembler run totals	357	00:00:03.67	00:00:20.10

The working set limit was 1200 pages.
19637 bytes (39 pages) of virtual memory were used to buffer the intermediate code.
There were 30 pages of symbol table space allocated to hold 412 non-local and 0 local symbols.
131 source lines were read in Pass 1, producing 12 object records in Pass 2.
8 pages of virtual memory were used to define 7 macros.

! Macro library statistics !

Macro library name	Macros defined
_\$255\$DUA28:[SYSLIB]STARLET.MLB;2	4

469 GETS were required to define 4 macros.

There were no errors, warnings or information messages.

MACRO/ENABLE=SUPPRESSION/DISABLE=(GLOBAL,TRACEBACK)/LIS=LIS\$:LIBEMUL/OBJ=OBJ\$:LIBEMUL MSRC\$:LIBEMUL/UPDATE=(ENH\$:LIBEMUL)

0206 AH-BT13A-SE
VAX/VMS V4.0

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The image displays a grid of 144 small, faint terminal window screenshots, arranged in a 12x12 grid. Each window shows a different library (LIB) interface, likely from the Digital Equipment Corporation (DEC) VAX/VMS operating system. The libraries are arranged in a grid, with some labels clearly visible in the center of each window. The labels include:

- LIBEMODH LIS
- LIBESTEMU LIS
- LIBEMULAT LIS
- LIBFAO LIS
- LIBBFFS LIS
- LIBFINCUT LIS
- LIBBEZAREV LIS
- LIBEMODG LIS
- LIBEXTV LIS
- LIBEDIV LIS
- LIBESTABL LIS
- LIBBFFC LIS
- LIBMODF LIS
- LIBEMUL LIS
- LIBFILSCA LIS
- LIBEXTZU LIS
- LIBBASC LIS
- LIBFAOL LIS

The screenshots are very faint and difficult to read, but they appear to be standard terminal windows with a title bar and various data fields, including what looks like a list of files or a directory listing. The overall appearance is that of a large collection of similar but distinct terminal outputs.