

LL	IIIIII	BBBBBBBB	PPPPPPPP	000000	LL	YY	YY	HH	HH
LL	IIIIII	BBBBBBBB	PPPPPPPP	000000	LL	YY	YY	HH	HH
LL	II	BB	PP	PP	00	YY	YY	HH	HH
LL	II	BB	PP	PP	00	YY	YY	HH	HH
LL	II	BB	PP	PP	00	YY	YY	HH	HH
LL	II	BB	PP	PP	00	YY	YY	HH	HH
LL	II	BBBBBBBB	PPPPPPPP	00	LL	YY	HHHHHHHHHH	HH	HH
LL	II	BBBBBBBB	PPPPPPPP	00	LL	YY	HHHHHHHHHH	HH	HH
LL	II	BB	PP	PP	00	YY	HH	HH	HH
LL	II	BB	PP	PP	00	YY	HH	HH	HH
LL	II	BB	PP	PP	00	YY	HH	HH	HH
LL	II	BB	PP	PP	00	YY	HH	HH	HH
LLLLLLLLLLLL	IIIIII	BBBBBBBB	PP	000000	LLLLLLLLLLLL	YY	HH	HH	HH
LLLLLLLLLLLL	IIIIII	BBBBBBBB	PP	000000	LLLLLLLLLLLL	YY	HH	HH	HH

```

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

```


(2) 44
(3) 49
(4) 87

Edit History
DECLARATIONS
LIB\$POLYH - Perform floating polynomial

LIB\$POLYH
1-
.....

```
0000 1 .TITLE LIBSPOLYH - Perform H floating polynomial calculation
0000 2 .IDENT /1-002/ ; File: LIBPOLYH.MAR Edit: SBL1002
0000 3
0000 4
0000 5 *****
0000 6
0000 7 *
0000 8 * COPYRIGHT (c) 1978, 1980, 1982, 1984 BY
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0000 24 * SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DIGITAL.
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 : Perform H floating point polynomial calculation.
0000 35
0000 36 : ENVIRONMENT: User Mode, AST Reentrant
0000 37
0000 38 --
0000 39 : AUTHOR: Steven B. Lionel, CREATION DATE: 31-July-1979
0000 40
0000 41 : MODIFIED BY:
0000 42 :
```


LIBSPOLYH
1-002

- Perform H floating polynomial calculat^{C 2} 16-SEP-1984 00:16:51 VAX/VMS Macro V04-00 Page 2
Edit History 6-SEP-1984 11:09:54 [LIBRTL.SRC]LIBPOLYH.MAR;1 (2)

0000 44 .SBTTL Edit History
0000 45 : 1-001 - Original. SBL 31-July-1979
0000 46 : 1-002 - Use local handler to insure that exceptions other than those documented
0000 47 : as statuses are resigalled. SBL 25-Sept-1980

```
0000 49      .SBTTL  DECLARATIONS
0000 50      :
0000 51      : INCLUDE FILES:
0000 52      :
0000 53      :     $CHFDEF      : Condition handling symbols
0000 54      :     $SSDEF      : System symbols
0000 55      :
0000 56      : EXTERNAL DECLARATIONS:
0000 57      :
0000 58      :     .EXTRN  LIB$SIG_TO_RET      : Library routine to convert
0000 59      :                                     : a signal to an error return
0000 60      :                                     : to caller of LIB$POLYH.
0000 61      :                                     : R0 = signalled condition
0000 62      :
0000 63      :
0000 64      : MACROS:
0000 65      :
0000 66      :
0000 67      :
0000 68      : EQUATED SYMBOLS:
0000 69      :
0000 70      :
00000004 0000 71      :     arg = 4      : argument
00000008 0000 72      :     degree = 8      : degree of polynomial
0000000C 0000 73      :     coeff = 12      : address of coefficient
00000010 0000 74      :     result = 16      : result of polynomial
0000 75      :     table
0000 76      :
0000 77      : OWN STORAGE:
0000 78      :
0000 79      :
0000 80      :
0000 81      : PSECT DECLARATIONS:
0000 82      :
00000000 0000 83      :     .PSECT _LIB$CODE PIC, USR, CON, REL, LCL, SHR, -
0000 84      :     EXE, RD, NOWRT, LONG
0000 85      :
```



```
0000 87      .SBTTL LIB$POLYH - Perform floating polynomial
0000 88      ;++
0000 89      FUNCTIONAL DESCRIPTION:
0000 90
0000 91      LIB$POLYH provides the functionality of the VAX hardware
0000 92      instruction POLYH to high level language users.
0000 93
0000 94      The third operand points to a table (array) of H_floating
0000 95      coefficients. The coefficient of
0000 96      the highest order term of the polynomial is pointed to
0000 97      by the table address operand, i.e. the first table element.
0000 98      The table is specified with lower order coefficients stored
0000 99      at increasing addresses.
0000 100
0000 101      The evaluation is carried out by Horner's method, and the
0000 102      result is stored at the location pointed to by the fourth
0000 103      operand. The result computed is:
0000 104
0000 105          if d = degree
0000 106          and x = arg
0000 107          result = C[0]+x*(C[1]+x*(C[2]+ ... x*C[d]))
0000 108
0000 109      The unsigned word degree operand specifies the highest
0000 110      numbered coefficient to participate in the evaluation.
0000 111
0000 112      For further detail, refer to the VAX-11 Architecture
0000 113      Handbook for the description of POLYx.
0000 114
0000 115      CALLING SEQUENCE:
0000 116
0000 117          status.wlc.v = LIB$POLYH (arg.rh.r, degree.rw.r, coeff.rh.ra,
0000 118                                result.wh.r)
0000 119
0000 120      INPUT PARAMETERS:
0000 121
0000 122          arh.rh.r      - argument, "x" in polynomial
0000 123          degree.rw.r   - degree of polynomial (GEQ 0)
0000 124          coeff.rh.ra  - table of coefficients, H_floating
0000 125
0000 126      IMPLICIT INPUTS:
0000 127
0000 128          NONE
0000 129
0000 130      OUTPUT PARAMETERS:
0000 131
0000 132          result.wh.r   - result of calculation
0000 133
0000 134      IMPLICIT OUTPUTS:
0000 135
0000 136          NONE
0000 137
0000 138      FUNCTION VALUE:
0000 139
0000 140          SSS_NORMAL    - successful execution
0000 141          SSS_FLTOVF    - floating overflow
0000 142          SSS_FLTUND    - floating underflow
0000 143          SSS_ROPRAND   - reserved operand, see VAX Architecture
```

manual for more details

SIDE EFFECTS:

All other exceptions are resignalled.

```
0000 144 :
0000 145 :
0000 146 : SIDE EFFECTS:
0000 147 :
0000 148 : All other exceptions are resignalled.
0000 149 :
0000 150 :--
0000 151 :
403C 0000 152 .ENTRY LIB$POLYH, ^M<IV,R2,R3,R4,R5> ; Entry point, enable int. ovf.
0002 153 ; and save R2, R3, R4, R5
0002 154
6D 17'AF 9E 0002 155 MOVAB B^HANDLER, (FP) ; Enable local handler to process
0006 156 ; exceptions
0006 157
OC BC 08 BC 04 BC 75FD 0006 158 POLYH @arg(AP), - ; perform polynomial
000E 159 @degree(AP), - ; trap on exception to
000E 160 @coeff(AP) ; handler which will
000E 161 ; unwind a return error
000E 162 ; condition in R0 to
000E 163 ; caller of LIB$POLYD.
000E 164
10 BC 50 7DFD 000E 165 MOVO R0, @result(AP) ; return value
0013 166
50 01 9A 0013 167 MOVZBL #1, R0 ; success status code
0016 168
04 0016 169 RET ; return
0017 170
0017 171
0017 172 HANDLER:
0017 173 .WORD 0
0019 174
0019 175 :+
0019 176 : If the exception is one of the documented exceptions for this routine,
0019 177 : call LIB$SIG_TO_RET to return it as a status. Otherwise, resignal.
0019 178 : Also, resignal if the depth is not zero.
0019 179 :-
0019 180
50 08 AC D0 0019 181 MOVL CHF$MCHARGLIST(AP), R0 ; Get mechanism vector address
001D 182 TSTL CHF$MCH_DEPTH(R0) ; Is depth zero?
0020 183 BNEQ 90$ ; If not, resignal
51 04 AC D0 0022 184 MOVL CHF$SIGARGLIST(AP), R1 ; Get signal vector address
50 04 A1 D0 0026 185 MOVL CHF$SIG_NAME(R1), R0 ; Get signalled condition
048C 8F 50 B1 002A 186 CMPW R0, #$$$_FLT0VF ; Compare conditions
049C 8F 2A 13 002F 187 BEQL 10$ ; If it matches, don't resignal
0454 8F 50 B1 0031 188 CMPW R0, #$$$_FLTUND
0454 8F 23 13 0036 189 BEQL 10$
0454 8F 50 B1 0038 190 CMPW R0, #$$$_ROPRAND
0454 8F 1C 13 003D 191 BEQL 10$
04C4 8F 50 B1 003F 192 CMPW R0, #$$$_FLTUND_F
04C4 8F 08 12 0044 193 BNEQ 5$
04 A1 049C 8F 3C 0046 194 MOVZWL #$$$_FLTUND, CHF$SIG_NAME(R1) ; Change fault code to trap code
04B4 8F 50 B1 004E 195 BRB 10$
04B4 8F 0E 12 0053 196 5$: CMPW R0, #$$$_FLT0VF_F
04 A1 048C 8F 3C 0055 197 BNEQ 90$
00000000'GF 6C FA 005B 198 MOVZWL #$$$_FLT0VF, CHF$SIG_NAME(R1)
0062 200 CALLG (AP), G^LIB$SIG_TO_RET ; Return signal as a status
RET
```


LIBSPOLYH
1-002

- Perform H floating polynomial calculat 16-SEP-1984 00:16:51 VAX/VMS Macro V04-00 Page 6
LIBSPOLYH - Perform floating polynomial 6-SEP-1984 11:09:54 [LIBRTL.SRC]LIBPOLYH.MAR;1 (4)

50	0918	8F	3C	0063	201	90\$:	MOVZWL	#SS\$_RESIGNAL, R0		
			04	0068	202		RET			
				0069	203					
				0069	204		.END			

; Resignal condition

LIB

LIB\$POLYH
Symbol table

- Perform H floating polynomial calculat ^{H 2} 16-SEP-1984 00:16:51 VAX/VMS Macro V04-00
6-SEP-1984 11:09:54 [LIBRTL.SRC]LIBPOLYH.MAR;1

Page 7
(4)

ARG	=	00000004		
CH\$\$_MCHARGLST	=	00000008		
CH\$\$_MCH_DEPTH	=	00000008		
CH\$\$_SIGARGLST	=	00000004		
CH\$\$_SIG_NAME	=	00000004		
COEFF	=	0000000C		
DEGREE	=	00000008		
HANDLER		00000017	R	02
LIB\$POLYH		00000000	RG	02
LIB\$SIG_TO_RET		*****	X	00
RESULT	=	00000010		
SS\$_FLTOVF	=	0000048C		
SS\$_FLTOVF_F	=	00000484		
SS\$_FLTUND	=	0000049C		
SS\$_FLTUND_F	=	000004C4		
SS\$_RESIGNAL	=	00000918		
SS\$_ROPRAND	=	00000454		

+-----+
! 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	00000069 (105.)	02 (2.)	PIC	USR	CON	REL	LCL	SHR	EXE	RD	NOWRT	NOVEC	LONG				

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

Phase	Page faults	CPU Time	Elapsed Time
Initialization	30	00:00:00.07	00:00:01.31
Command processing	106	00:00:00.33	00:00:02.57
Pass 1	187	00:00:02.73	00:00:13.35
Symbol table sort	0	00:00:00.39	00:00:02.08
Pass 2	54	00:00:00.57	00:00:03.20
Symbol table output	4	00:00:00.02	00:00:00.02
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	385	00:00:04.14	00:00:22.55

The working set limit was 1050 pages.
21679 bytes (43 pages) of virtual memory were used to buffer the intermediate code.
There were 30 pages of symbol table space allocated to hold 427 non-local and 3 local symbols.
204 source lines were read in Pass 1, producing 13 object records in Pass 2.
9 pages of virtual memory were used to define 8 macros.

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

Macro library name

Macros defined

_\$255\$DUA28:[SYSLIB]STARLET.MLB;2

5

486 GETS were required to define 5 macros.

There were no errors, warnings or information messages.

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

0209 AH-BT13A-SE
VAX/VMS V4.0

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