


```

MM      MM      TTTTTTTTTT  HH      HH      HH      HH      NN      NN      IIIIII      NN      NN      TTTTTTTTTT
MM      MM      TTTTTTTTTT  HH      HH      HH      HH      NN      NN      IIIIII      NN      NN      TTTTTTTTTT
MMMM    MMMM      TT      HH      HH      HH      HH      NN      NN      II      NN      NN      TT
MMMM    MMMM      TT      HH      HH      HH      HH      NN      NN      II      NN      NN      TT
MM      MM      TT      HH      HH      HH      HH      NNNN   NN      NN      II      NNNN   NN      TT
MM      MM      TT      HH      HH      HH      HH      NNNN   NN      NN      II      NNNN   NN      TT
MM      MM      TT      HHHHHHHHHH  HHHHHHHHHH  NN      NN      NN      II      NN      NN      TT
MM      MM      TT      HHHHHHHHHH  HHHHHHHHHH  NN      NN      NN      II      NN      NN      TT
MM      MM      TT      HH      HH      HH      HH      NN      NNNN   NN      II      NN      NNNN   NN      TT
MM      MM      TT      HH      HH      HH      HH      NN      NNNN   NN      II      NN      NNNN   NN      TT
MM      MM      TT      HH      HH      HH      HH      NN      NN      NN      II      NN      NN      TT
MM      MM      TT      HH      HH      HH      HH      NN      NN      NN      IIIIII   NN      NN      TT
MM      MM      TT      HH      HH      HH      HH      NN      NN      NN      IIIIII   NN      NN      TT

```

....
....
....
....

```

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

```

MTH
Syn
MTH
RET
PSE
_M1
Pha
_In
Con
Pas
Syn
Pas
Syn
Pse
Cro
Ass
The
139
The
140
O
Mac
_Si
O
The
MA

MTH\$HNINT
Table of contents

- Nearest Integer

K 5

16-SEP-1984 01:38:27 VAX/VMS Macro V04-00

Page 0

(1)	49	HISTORY	; Detailed Current Edit History
(2)	66	DECLARATIONS	
(3)	97	MTH\$HNINT	- return nearest integer as REAL*16

```

0000 1 .TITLE MTH$HNINT - Nearest Integer
0000 2 .IDENT /1-002/ ; File: MTH$HNINT.MAR EDIT: RH1002
0000 3
0000 4
0000 5 :*****
0000 6 :*
0000 7 :* COPYRIGHT (c) 1978, 1980, 1982, 1984 BY
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0000 23 :* SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DIGITAL.
0000 24 :*
0000 25 :*
0000 26 :*****
0000 27
0000 28
0000 29 : FACILITY: MATH LIBRARY
0000 30 :++
0000 31 : ABSTRACT:
0000 32 : This module contains routine MTH$HNINT:
0000 33 : Return the rounded H floating-point argument.
0000 34
0000 35
0000 36 :--
0000 37
0000 38 : VERSION: 1
0000 39
0000 40 : HISTORY:
0000 41
0000 42 : AUTHOR:
0000 43 : Steven B. Lionel, 26-Jan-1979: Version 1
0000 44
0000 45 : MODIFIED BY:
0000 46
0000 47 : R. Hanek, 9-DEC-1980
0000 48
0000 49 : .SBTTL HISTORY ; Detailed Current Edit History
0000 50
0000 51
0000 52 : Edit History for Version 1 of MTH$HNINT
0000 53
0000 54 : 1-001 - Adapted from MTH$DNINT version 1-001. SBL 26-Jan-1979
0000 55 : 1-002 - The original version computed the result as the argument minus
0000 56 : the fractional part of (argument+sign(argument)*.5) which
0000 57 : is not the correct algorithm. The changes result in computing

```

MTHSHNINT
1-002

M 5

- Nearest Integer

HISTORY ; Detailed Current Edit History

16-SEP-1984 01:38:27

VAX/VMS Macro V04-00

Page 2

6-SEP-1984 11:25:16

[MTHRTL.SRC]MTHSHNINT.MAR;1

(1)

0000 58 :
0000 59 :
0000 60 :
0000 61 :
0000 62 :
0000 63 :
0000 64 :

R0 as the argument + sign(argument)*.5 and the result as
R0 minus the fractional part of R0. Specifically, the entry mask
was expanded to include R4-R7; the last two operands of the
EMODH instruction were changed from R0 to R4; and the first two
operands of SUBH3 were change from R0 and @8(AP) to R4 and R0
respectively. RNH 9-DEC-1980

MTH
2-(

```
0000 66      .SBTTL  DECLARATIONS
0000 67
0000 68 :
0000 69 : INCLUDE FILES:
0000 70 :     NONE
0000 71 :
0000 72 :
0000 73 :
0000 74 : EXTERNAL SYMBOLS:
0000 75 :     NONE
0000 76 :
0000 77 :
0000 78 :
0000 79 : MACROS:
0000 80 :     NONE
0000 81 :
0000 82 :
0000 83 :
0000 84 : PSECT DECLARATIONS:
0000 85 :     .PSECT  _MTH$CODE      PIC, SHR, LONG, EXE, NOWRT
0000 86 :
0000 87 :
0000 88 : EQUATED SYMBOLS:
0000 89 :     NONE
0000 90 :
0000 91 :
0000 92 :
0000 93 : OWN STORAGE:
0000 94 :     NONE
0000 95 :
```

```

0000 97      .SBTTL MTH$HNINT - return nearest integer as REAL*16
0000 98
0000 99      :++
0000 100     : FUNCTIONAL DESCRIPTION:
0000 101     : Returns the rounded (away from zero) argument.
0000 102     :
0000 103     :
0000 104     : CALLING SEQUENCE:
0000 105     :
0000 106     : CALL MTH$HNINT (nearest_integer.wh.r, arg.rh.r)
0000 107     :
0000 108     :
0000 109     : INPUT PARAMETERS:
0000 110     : The input parameter is a H floating-point value
0000 111     : and is call-by-reference.
0000 112     :
0000 113     :
0000 114     : IMPLICIT INPUTS:
0000 115     : NONE
0000 116     :
0000 117     : OUTPUT PARAMETERS:
0000 118     : The result is passed back as the first argument by reference.
0000 119     : This is in accordance with the system standard for function
0000 120     : values greater than 64 bits.
0000 121     :
0000 122     : IMPLICIT OUTPUTS:
0000 123     : NONE
0000 124     :
0000 125     : COMPLETION CODES:
0000 126     : NONE
0000 127     :
0000 128     : SIDE EFFECTS:
0000 129     : Reserved Operand and Floating Overflow exceptions can occur.
0000 130     :
0000 131     :
0000 132     :--
0000 133
0000 134
0000 135
0000 136     .ENTRY MTH$HNINT, ^M<R2,R3,R4,R5,R6,R7>
54 54 08 BC 00 00FC 0000 137     ADDH3 #0.5, @8(AP), R0      : R0-R3 = arg + 0.5
04 14 0008 138     BGTR 1$                               : branch if positive
08 62FD 000A 139     SUBH2 #1.0, R0                               : R0-R3 = arg - 0.5
54 54 08 00 50 74FD 000E 140 1$: EMODH R0, #0, #1, R4, R4      : R4-R7 = fraction_part(R0-R3)
04 BC 50 54 63FD 0015 141     SUBH3 R4, R0, @4(AP)      : Result = integer_part(R0-R3)
001B 142     RET
001C 143
001C 144
001C 145     .END

```

MTH\$HNINT
Symbol table

- Nearest Integer

C 6

16-SEP-1984 01:38:27 VAX/VMS Macro V04-00
6-SEP-1984 11:25:16 [MTHRTL.SRC]MTHHNINT.MAR;1

Page 5
(3)

MT
2-C

MTH\$HNINT 00000000 RG 01

! Psect synopsis !

PSECT name	Allocation	PSECT No.	Attributes														
. ABS	00000000 (0.)	00 (0.)	NOPIC	USR	CON	ABS	LCL	NOSHR	NOEXE	NORD	NOWRT	NOVEC	BYTE				
_MTH\$CODE	0000001C (28.)	01 (1.)	PIC	USR	CON	REL	LCL	SHR	EXE	RD	NOWRT	NOVEC	LONG				

! Performance indicators !

Phase	Page faults	CPU Time	Elapsed Time
Initialization	30	00:00:00.08	00:00:00.54
Command processing	112	00:00:00.54	00:00:03.49
Pass 1	76	00:00:00.39	00:00:02.53
Symbol table sort	0	00:00:00.00	00:00:00.00
Pass 2	40	00:00:00.27	00:00:01.74
Symbol table output	1	00:00:00.00	00:00:00.00
Psect synopsis output	3	00:00:00.02	00:00:00.01
Cross-reference output	0	00:00:00.00	00:00:00.00
Assembler run totals	264	00:00:01.31	00:00:08.32

The working set limit was 750 pages.
1486 bytes (3 pages) of virtual memory were used to buffer the intermediate code.
There were 10 pages of symbol table space allocated to hold 1 non-local and 1 local symbols.
145 source lines were read in Pass 1, producing 10 object records in Pass 2.
0 pages of virtual memory were used to define 0 macros.

! Macro library statistics !

Macro library name	Macros defined
_\$255\$DUA28:[SYSLIB]STARLET.MLB;2	0

0 GETS were required to define 0 macros.

There were no errors, warnings or information messages.

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

01E
E1E
414
C2
21
EA

00
00
00
81

MTHSIGN LIS

MTHHLOOR LIS

MTHSIGN LIS

MTHMINI LIS

MTHHLOG LIS

MTHHTAN LIS

MTHIDNNT LIS

MTHIHNT LIS

MTHHSORT LIS

MTHIMAX0 LIS

MTHHSINH LIS

MTHHTANH LIS

MTHHINT LIS

MTHMAX1 LIS

MTHHSINCO LIS

MTHMOD LIS

MTHIGNNT LIS