```
MMM          MMM  TTTTTTTTTTTTTTT  HHH          HHH  RRRRRRRRRRR     TTTTTTTTTTTTTTT  LLL
MMM          MMM  TTTTTTTTTTTTTTT  HHH          HHH  RRRRRRRRRRRR    TTTTTTTTTTTTTTT  LLL
MMM          MMM  TTTTTTTTTTTTTTT  HHH          HHH  RRRRRRRRRRRR    TTTTTTTTTTTTTTT  LLL
MMMMMM    MMMMMM        TTT       HHH          HHH  RRR         RRR       TTT         LLL
MMMMMM    MMMMMM        TTT       HHH          HHH  RRR         RRR       TTT         LLL
MMMMMM    MMMMMM        TTT       HHH          HHH  RRR         RRR       TTT         LLL
MMM  MMM  MMM           TTT       HHH          HHH  RRR         RRR       TTT         LLL
MMM  MMM  MMM           TTT       HHH          HHH  RRR         RRR       TTT         LLL
MMM  MMM  MMM           TTT       HHH          HHH  RRR         RRR       TTT         LLL
MMM       MMM           TTT       HHHHHHHHHHHHHHH  RRRRRRRRRRR         TTT         LLL
MMM       MMM           TTT       HHHHHHHHHHHHHHH  RRRRRRRRRRRR        TTT         LLL
MMM       MMM           TTT       HHHHHHHHHHHHHHH  RRRRRRRRRRRR        TTT         LLL
MMM       MMM           TTT       HHH          HHH  RRR   RRR           TTT         LLL
MMM       MMM           TTT       HHH          HHH  RRR   RRR           TTT         LLL
MMM       MMM           TTT       HHH          HHH  RRR   RRR           TTT         LLL
MMM       MMM           TTT       HHH          HHH  RRR      RRR        TTT         LLL
MMM       MMM           TTT       HHH          HHH  RRR      RRR        TTT         LLL
MMM       MMM           TTT       HHH          HHH  RRR      RRR        TTT         LLL
MMM       MMM           TTT       HHH          HHH  RRR         RRR     TTT         LLLLLLLLLLLLLLL
MMM       MMM           TTT       HHH          HHH  RRR         RRR     TTT         LLLLLLLLLLLLLLL
MMM       MMM           TTT       HHH          HHH  RRR         RRR     TTT         LLLLLLLLLLLLLLL
```

FILEID**MTHHNINT

```
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  MM      TT      HH      HH  HH      HH  NNNN    NN      II      NNNN    NN      TT
MM  MM  MM      TT      HH      HH  HH      HH  NNNN    NN      II      NNNN    NN      TT
MM      MM      TT      HHHHHHHHHH  HHHHHHHHHH  NN  NN  NN      II      NN  NN  NN      TT
MM      MM      TT      HHHHHHHHHH  HHHHHHHHHH  NN  NN  NN      II      NN  NN  NN      TT
MM      MM      TT      HH      HH  HH      HH  NN    NNNN      II      NN    NNNN      TT
MM      MM      TT      HH      HH  HH      HH  NN    NNNN      II      NN    NNNN      TT
MM      MM      TT      HH      HH  HH      HH  NN      NN      II      NN      NN      TT      ....
MM      MM      TT      HH      HH  HH      HH  NN      NN      II      NN      NN      TT      ....
MM      MM      TT      HH      HH  HH      HH  NN      NN    IIIIII    NN      NN      TT      ....
MM      MM      TT      HH      HH  HH      HH  NN      NN    IIIIII    NN      NN      TT      ....

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
```

Table of contents

```
0000     1          .TITLE  MTH$HNINT  - Nearest Integer
0000     2          .IDENT  /1-002/          ; File: MTHHNINT.MAR  EDIT: RH1002
0000     3
0000     4  ;
0000     5  ;*****************************************************************************
0000     6  ;*                                                                           *
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0000    24  ;*                                                                           *
0000    25  ;*                                                                           *
0000    26  ;*****************************************************************************
0000    27  ;
0000    28  ;
0000    29  ; FACILITY: MATH LIBRARY
0000    30  ;++
0000    31  ; ABSTRACT:
0000    32  ;       This module contains routine MTH$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
```

```
0000     58 ;          R0 as the argument + sign(argument)*.5 and the result as
0000     59 ;          R0 minus the fractional part of R0.  Specificly, the entry mask
0000     60 ;          was expanded to include R4-R7; the last two operands of the
0000     61 ;          EMODH instruction were chaneged from R0 to R4; and the first two
0000     62 ;          operands of SUBH3 were change from R0 and @8(AP) to R4 and R0
0000     63 ;          respectively.  RNH 9-DEC-1980
0000     64 ;
```

```
                        .SBTTL  DECLARATIONS

;
; INCLUDE FILES:
;       NONE
;

;
; EXTERNAL SYMBOLS:
;       NONE
;

;
; MACROS:
;       NONE
;

;
; PSECT DECLARATIONS:
00000000        .PSECT  _MTH$CODE       PIC, SHR, LONG, EXE, NOWRT

;
; EQUATED SYMBOLS:
;       NONE
;

;
; OWN STORAGE:
;       NONE
;
```

```
                                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
                          00FC  0000   136           .ENTRY  MTH$HNINT,      ^M<R2,R3,R4,R5,R6,R7>
          50    08 BC     00 61FD  0002   137           ADDH3   #0.5, @8(AP), R0        ; R0-R3 = arg + 0.5
                          04   14  0008   138           BGTR    1$                      ; branch if positive
                50    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)
                    04  001B   142           RET
                        001C   143
                        001C   144
                        001C   145           .END
```

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
_255DUA28:[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)

MTHIISIGN
LIS

MTHHFLOOR
LIS

MTHHSIGN
LIS

MTHHMIN
LIS

MTHHLOG
LIS

MTHHTAN
LIS

MTHIIONNT
LIS

MTHIIHNNT
LIS

MTHHSQRT
LIS

MTHIMAX0
LIS

MTHHNINT
LIS

MTHHSINH
LIS

MTHHTANH
LIS

MTHHINT
LIS

MTHHMAX1
LIS

MTHHSINCO
LIS

MTHHMOD
LIS

MTHIIGNNT
LIS