```
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**MTHGFLOOR

```
MM      MM  TTTTTTTTTT  HH      HH    GGGGGGGG  FFFFFFFFFF  LL            OOOOOO     OOOOOO    RRRRRRRR
MM      MM  TTTTTTTTTT  HH      HH    GGGGGGGG  FFFFFFFFFF  LL            OOOOOO     OOOOOO    RRRRRRRR
MMMM  MMMM      TT      HH      HH  GG          FF          LL          OO      OO  OO      OO  RR      RR
MMMM  MMMM      TT      HH      HH  GG          FF          LL          OO      OO  OO      OO  RR      RR
MM  MM  MM      TT      HH      HH  GG          FF          LL          OO      OO  OO      OO  RR      RR
MM  MM  MM      TT      HH      HH  GG          FF          LL          OO      OO  OO      OO  RR      RR
MM      MM      TT      HHHHHHHHHH  GG          FFFFFFFF    LL          OO      OO  OO      OO  RRRRRRRR
MM      MM      TT      HHHHHHHHHH  GG          FFFFFFFF    LL          OO      OO  OO      OO  RRRRRRRR
MM      MM      TT      HH      HH  GG  GGGGGG  FF          LL          OO      OO  OO      OO  RR  RR
MM      MM      TT      HH      HH  GG  GGGGGG  FF          LL          OO      OO  OO      OO  RR  RR
MM      MM      TT      HH      HH  GG      GG  FF          LL          OO      OO  OO      OO  RR    RR        ....
MM      MM      TT      HH      HH  GG      GG  FF          LL          OO      OO  OO      OO  RR    RR        ....
MM      MM      TT      HH      HH    GGGGGG    FF          LLLLLLLLLL    OOOOOO     OOOOOO    RR      RR      ....
MM      MM      TT      HH      HH    GGGGGG    FF          LLLLLLLLLL    OOOOOO     OOOOOO    RR      RR      ....

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
```

Table of contents

```
                        1          .TITLE  MTH$GFLOOR - Greatest integer routine for G_floating
                        2          .IDENT  /1-001/                    ; File: MTHGFLOOR.MAR
                        3
                        4 ;
                        5 ;*****************************************************************************
                        6 ;*                                                                           *
                        7 ;*  COPYRIGHT (c) 1978, 1980, 1982, 1984 BY                                  *
                        8 ;*  DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS.                   *
                        9 ;*  ALL RIGHTS RESERVED.                                                     *
                       10 ;*                                                                           *
                       11 ;*  THIS SOFTWARE IS FURNISHED UNDER A LICENSE AND MAY BE USED AND COPIED    *
                       12 ;*  ONLY IN  ACCORDANCE WITH  THE  TERMS  OF  SUCH  LICENSE  AND WITH THE   *
                       13 ;*  INCLUSION OF THE ABOVE COPYRIGHT NOTICE. THIS SOFTWARE OR  ANY  OTHER    *
                       14 ;*  COPIES THEREOF MAY NOT BE PROVIDED OR OTHERWISE MADE AVAILABLE TO ANY    *
                       15 ;*  OTHER PERSON.  NO TITLE TO AND OWNERSHIP OF  THE  SOFTWARE IS  HEREBY    *
                       16 ;*  TRANSFERRED.                                                             *
                       17 ;*                                                                           *
                       18 ;*  THE INFORMATION IN THIS SOFTWARE IS  SUBJECT TO CHANGE WITHOUT NOTICE    *
                       19 ;*  AND  SHOULD  NOT  BE  CONSTRUED AS  A COMMITMENT BY DIGITAL EQUIPMENT    *
                       20 ;*  CORPORATION.                                                             *
                       21 ;*                                                                           *
                       22 ;*  DIGITAL ASSUMES NO RESPONSIBILITY FOR THE USE  OR  RELIABILITY OF ITS    *
                       23 ;*  SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DIGITAL.                  *
                       24 ;*                                                                           *
                       25 ;*                                                                           *
                       26 ;*****************************************************************************
                       27 ;
                       28
                       29 ;++
                       30 ; FACILITY: Math Library
                       31 ;
                       32 ; ABSTRACT:
                       33 ;
                       34 ;       This routine finds the largest integer less than the input
                       35 ;       value, i.e. it truncates toward negative infinity
                       36 ;       for data type G_floating.
                       37 ;
                       38 ; ENVIRONMENT: User Mode, AST Reentrant
                       39 ;
                       40 ;--
                       41 ; Author: John Sauter, Creation date: 27-JUL-1979
                       42 ;
                       43 ; MODIFIED BY:
                       44 ;
                       45 ; VERSION 00
                       46 ; 1-001 - Original, from MTH$DFLOOR.
```

```
                     48          .SBTTL  DECLARATIONS
                     49 ;
                     50 ; INCLUDE FILES:
                     51 ;
                     52
                     53 ;
                     54 ; EXTERNAL DECLARATIONS:
                     55 ;
                     56          .DSABL  GBL                                 ; Prevent undeclared
                     57                                                      ; symbols from being
                     58                                                      ; automatically global.
                     59 ;
                     60 ; MACROS:
                     61 ;
                     62
                     63 ;
                     64 ; EQUATED SYMBOLS:
                     65 ;
                     66
                     67 ;
                     68 ; OWN STORAGE:
                     69 ;
                     70
                     71 ;
                     72 ; PSECT DECLARATIONS:
                     73 ;
            00000000 74          .PSECT _MTH$CODE PIC, USR, CON, REL, LCL, SHR, -
                     75                      EXE, RD, NOWRT, LONG
                     76
```

```
                     0000     78          .SBTTL  MTH$GFLOOR  - greatest integer G_floating routine
                     0000     79 ;++
                     0000     80 ; FUNCTIONAL DESCRIPTION:
                     0000     81 ;
                     0000     82 ;       This routine finds the floor by truncating, and then if the
                     0000     83 ;       input value is negative and not an integer subtracting 1.
                     0000     84 ;
                     0000     85 ; CALLING SEQUENCE:
                     0000     86 ;
                     0000     87 ;       CALL result_int.wg.v = MTH$GFLOOR (input.rg.r)
                     0000     88 ;
                     0000     89 ; INPUT PARAMETERS:
                     0000     90 ;
00000004             0000     91          input_addr = 4                  ; address of the G_floating number
                     0000     92                                          ; to get the floor of
                     0000     93 ;
                     0000     94 ; IMPLICIT INPUTS:
                     0000     95 ;
                     0000     96 ;       NONE
                     0000     97 ;
                     0000     98 ; OUTPUT PARAMETERS:
                     0000     99 ;
                     0000    100 ;       NONE
                     0000    101 ;
                     0000    102 ; IMPLICIT OUTPUTS:
                     0000    103 ;
                     0000    104 ;       NONE
                     0000    105 ;
                     0000    106 ; FUNCTION VALUE:
                     0000    107 ; COMPLETION CODES:
                     0000    108 ;
                     0000    109 ;       the G_floating value of the greatest integer
                     0000    110 ;
                     0000    111 ; SIDE EFFECTS:
                     0000    112 ;
                     0000    113 ;       NONE
                     0000    114 ;
                     0000    115 ;--
                     0000    116
                000C 0000    117          .ENTRY  MTH$GFLOOR, ^M<R2, R3>          ; entry point
                     0002    118
          50   04 BC 50FD    0002    119          MOVG    @input_addr(AP), R0     ; R0/R1 = input argument
52   52   08   00   50 54FD  0007    120          EMODG   R0, #0, #1, R2, R2      ; R2/R3 = fraction_part (arg)
               50   52 42FD  000E    121          SUBG2   R2, R0                  ; R0/R1 = integer_part (arg)
                     0012    122
                09    14     0012    123          BGTR    40$                     ; if > 0, have correct answer
                     0014    124
                52 53FD      0014    125          TSTG    R2                      ; look at fraction part
                04    18     0017    126          BGEQ    40$                     ; if > 0 then 0 < input < 1 and
                     0019    127                                                  ;  we have the correct answer
                     0019    128                                                  ; if = 0 then input was integer
                     0019    129                                                  ;  and we have correct answer
                     0019    130
               50    08 42FD 0019    131          SUBG2   #1,R0                   ; subtract 1 from truncated
                     001D    132                                                  ; negative non-integer
                     001D    133
                04   001D    134 40$:    RET
```

```
                     001E    136          .SBTTL  MTH$GFLOOR_R3  - greatest integer G_floating routine
                     001E    137 ;++
                     001E    138 ; FUNCTIONAL DESCRIPTION:
                     001E    139 ;
                     001E    140 ;       This is the JSB entry point to MTH$GFLOOR.
                     001E    141 ;
                     001E    142 ; CALLING SEQUENCE:
                     001E    143 ;
                     001E    144 ;       JSB result_int.wg.v = MTH$GFLOOR_R3 (input.rg.v)
                     001E    145 ;
                     001E    146 ; INPUT PARAMETERS:
                     001E    147 ;
                     001E    148 ;       R0 and R1 contain the input value
                     001E    149 ;
                     001E    150 ; IMPLICIT INPUTS:
                     001E    151 ;
                     001E    152 ;       NONE
                     001E    153 ;
                     001E    154 ; OUTPUT PARAMETERS:
                     001E    155 ;
                     001E    156 ;       NONE
                     001E    157 ;
                     001E    158 ; IMPLICIT OUTPUTS:
                     001E    159 ;
                     001E    160 ;       NONE
                     001E    161 ;
                     001E    162 ; FUNCTION VALUE:
                     001E    163 ; COMPLETION CODES:
                     001E    164 ;
                     001E    165 ;       the G_floating value of the greatest integer
                     001E    166 ;
                     001E    167 ; SIDE EFFECTS:
                     001E    168 ;
                     001E    169 ;       NONE
                     001E    170 ;
                     001E    171 ;--
                     001E    172
                     001E    173 MTH$GFLOOR_R3::                                 ; entry point
                     001E    174
52   52   08   00   50 54FD  001E    175          EMODG   R0, #0, #1, R2, R2      ; R2/R3 = fraction_part (arg)
                     50   52 42FD  0025    176          SUBG2   R2, R0          ; R0/R1 = integer_part (arg)
                                  0029    177
                          09   14  0029    178          BGTR    40$             ; if > 0, have correct answer
                                  002B    179
                          52 53FD 002B    180          TSTG    R2              ; look at fraction part
                          04   18 002E    181          BGEQ    40$             ; if > 0 then 0 < input < 1 and
                                  0030    182                                  ;  we have the correct answer
                                  0030    183                                  ; if = 0 then input was integer
                                  0030    184                                  ;  and we have correct answer
                                  0030    185
                     50   08 42FD 0030    186          SUBG2   #1,R0           ; subtract 1 from truncated
                                  0034    187                                  ; negative non-integer
                                  0034    188
                               05 0034    189 40$:     RSB
                                  0035    190
                                  0035    191          .END
```

```
INPUT_ADDR      = 00000004
MTH$GFLOOR        00000000 RG    01
MTH$GFLOOR_R3     0000001E 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	00000035 (53.)	01 (1.)	PIC USR CON REL LCL SHR EXE RD NOWRT NOVEC LONG

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

Phase	Page faults	CPU Time	Elapsed Time
Initialization	29	00:00:00.11	00:00:01.10
Command processing	117	00:00:00.44	00:00:03.29
Pass 1	76	00:00:00.50	00:00:02.14
Symbol table sort	0	00:00:00.00	00:00:00.00
Pass 2	45	00:00:00.40	00:00:02.01
Symbol table output	2	00:00:00.01	00:00:00.01
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	273	00:00:01.48	00:00:08.62

```
The working set limit was 900 pages.
2047 bytes (4 pages) of virtual memory were used to buffer the intermediate code.
There were 10 pages of symbol table space allocated to hold 3 non-local and 2 local symbols.
191 source lines were read in Pass 1, producing 11 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$:MTHGFLOOR/OBJ=OBJ$:MTHGFLOOR MSRC$:MTHGFLOOR/UPDATE=(ENH$:MTHGFLOOR)
```

MTHGCONJG
LIS

MTHGINT
LIS

MTHGMOD
LIS

MTHEXP
LIS

MTHFLOOR
LIS

MTHDTAN
LIS

MTHDTANH
LIS

MTHGEXP
LIS

MTHGFLOOR
LIS

MTHGMIN1
LIS

MTHGCOSH
LIS

MTHGLOG
LIS

MTHGACOS
LIS

MTHGASIN
LIS

MTHGNINT
LIS

MTHGATAN
LIS

MTHGATANH
LIS

MTHGMAX1
LIS