```
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**MTHHCOSH

```
MM      MM  TTTTTTTTTT  HH      HH  HH      HH    CCCCCCCC    OOOOOO      SSSSSSSS  HH      HH
MM      MM  TTTTTTTTTT  HH      HH  HH      HH    CCCCCCCC    OOOOOO      SSSSSSSS  HH      HH
MMMM  MMMM      TT      HH      HH  HH      HH  CC            OO    OO  SS          HH      HH
MMMM  MMMM      TT      HH      HH  HH      HH  CC            OO    OO  SS          HH      HH
MM  MM  MM      TT      HH      HH  HH      HH  CC            OO    OO  SS          HH      HH
MM  MM  MM      TT      HH      HH  HH      HH  CC            OO    OO  SS          HH      HH
MM      MM      TT      HHHHHHHHHH  HHHHHHHHHH  CC            OO    OO    SSSSSS    HHHHHHHHHH
MM      MM      TT      HHHHHHHHHH  HHHHHHHHHH  CC            OO    OO    SSSSSS    HHHHHHHHHH
MM      MM      TT      HH      HH  HH      HH  CC            OO    OO          SS  HH      HH
MM      MM      TT      HH      HH  HH      HH  CC            OO    OO          SS  HH      HH
MM      MM      TT      HH      HH  HH      HH  CC            OO    OO          SS  HH      HH    ....
MM      MM      TT      HH      HH  HH      HH  CC            OO    OO          SS  HH      HH    ....
MM      MM      TT      HH      HH  HH      HH    CCCCCCCC    OOOOOO      SSSSSSSS  HH      HH    ....
MM      MM      TT      HH      HH  HH      HH    CCCCCCCC    OOOOOO      SSSSSSSS  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
LLLLLLLLLL      IIIIII    SSSSSSSS
LLLLLLLLLL      IIIIII    SSSSSSSS
```

Table of contents

```
0000     1          .TITLE  MTH$HCOSH       ; H floating Hyperbolic Cosine routine
0000     2                                  ; (HCOSH)
0000     3          .IDENT /1-006/          ; File: MTHHCOSH.MAR    EDIT: RNH1006
0000     4 ;
0000     5 ;*****************************************************************************
0000     6 ;*                                                                           *
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0000    24 ;*                                                                           *
0000    25 ;*                                                                           *
0000    26 ;*****************************************************************************
0000    27 ;
0000    28 ;
0000    29 ; FACILITY: MATH LIBRARY
0000    30 ;++
0000    31 ; ABSTRACT:
0000    32 ;
0000    33 ; MTH$HCOSH is a function  which  returns the H floating hyperbolic cosine
0000    34 ; of its H floating point argument. The call is standard
0000    35 ; call-by-reference.
0000    36 ;
0000    37 ;--
0000    38 ;
0000    39 ; VERSION: 1
0000    40 ;
0000    41 ; HISTORY:
0000    42 ; AUTHOR:
0000    43 ;       John A. Wheeler, 12-Sep-1979: Version 1
0000    44 ;
0000    45 ; MODIFIED BY:
0000    46 ;
0000    47 ;
0000    48 ;
```

```
0000     50          .SBTTL  HISTORY ; Detailed Current Edit History
0000     51
0000     52
0000     53 ; Edit History for Version 1 of MTH$HCOSH
0000     54 ;
0000     55 ; 1-001 - Adapted from MTH$GCOSH.  JW 12-Sep-1979
0000     56 ; 1-002 - Use MTH$HEXP_R6.  SBL 4-Oct-1979
0000     57 ; 1-003 - H_0.25 should be literal rather than own storage.  SBL 7-Oct-1979
0000     58 ; 1-004 - Don't store reserved operand before signal.  SBL 7-Feb-1980
0000     59 ; 1-005 - Changed lower limit for Chebyshev approximation from 2**-56 to
0000     60 ;         2**-57.
0000     61 ;       - Eliminated second call to EXP for input values between .25 and
0000     62 ;         57*ln2 by computing COSH(x) = (Z + 1/Z)/2, with Z = EXP(|x|)
0000     63 ;       - Eliminated second call to EXP for input values between 57*ln2
0000     64 ;         and 16383*ln2.
0000     65 ;       - Changed all final floating point divisions by 2 to interger
0000     66 ;         subrtracts of 1 from the exponent field.
0000     67 ;       - Extended maximum range to 16384*ln2.
0000     68 ;       - Chaneged logic for computing EXP(|x|-ln2) to reduce error.
0000     69 ;       - RNH 10-FEB-81
0000     70 ; 1-006 - Eliminated symbolic short literals.  RNH 15-Oct-81
```

```
                                        .SBTTL  DECLARATIONS    ; Declarative Part of Module
                                ;
                                ; INCLUDE FILES:
                                ;
                                ; EXTERNAL SYMBOLS:
                                        .DSABL  GBL
                                        .EXTRN  MTH$$SIGNAL
                                        .EXTRN  MTH$K_FLOOVEMAT
                                        .EXTRN  MTH$HEXP_R6
                                ;
                                ; EQUATED SYMBOLS:
                                ;
                                ; MACROS:        none
                                ;
                                ;
                                ; PSECT DECLARATIONS:
                                ;
                                        .PSECT  _MTH$CODE       PIC,SHR,LONG,EXE,NOWRT
                                                                        ; program section for math routines
                                ;
                                ; OWN STORAGE:  none
                                ;
                                ;
                                ; CONSTANTS:
                                ;
                                ;
                                H_16383_LOG_2:
E3E0A45E 62DE400E               .QUAD   ^XE3E0A45E62DE400E
6B251812 C66964DB               .QUAD   ^X6B251812C66964DB      ; 16383*ln2
                                H_16384_LOG_2:
A39E2FEF 62E4400E               .QUAD   ^XA39E2FEF62E4400E
07E66730 93C7F357               .QUAD   ^X07E6673093C7F357      ; 16384*ln2
                                H_LOG_2_HI:
A39E2FEF 62E44000               .QUAD   ^XA39E2FEF62E44000
40006730 93C7F357               .QUAD   ^X4000673093C7F357      ; (high 109 bits of ln2)+2*-109
                                H_LOG_2_LO:
F0CB950B C0D0BF9D               .QUAD   ^XF0CB950BC0D0BF9D
5F359D27 D674CD98               .QUAD   ^X5F359D27D674CD98      ; ln2 - H_LOG_2_HI
                                H_2_POWER_57:
00000000 0000403A               .QUAD   ^X000000000000403A
00000000 00000000               .QUAD   0                       ; 2*57
                                HCOSHTAB:
2B3EE172 8C8F3FA8               .LONG   ^X8C8F3FA8,^X2B3EE172   ;  2.50265827956782399016245815625471 1E -27
ADEB4F57 5BD2E986               .LONG   ^X5BD2E986,^XADEB4F57
D01949AF F2C93FB1               .LONG   ^XF2C93FB1,^XD01949AF   ;  1.61166539506646248033071976723655 9E -24
C60346B9 1DF63B8C               .LONG   ^X1DF63B8C,^XC60346B9
64FF997D 0CE33FBB               .LONG   ^X0CE33FBB,^X64FF997D   ;  8.89679272147687223764798237825356 8E -22
7CB38AA4 0B3F40F3               .LONG   ^X0B3F40F3,^X7CB38AA4
F4FDBA3C E5423FC3               .LONG   ^XE5423FC3,^XF4FDBA3C   ;  4.11031762171246693744590271725186 0E -19
60105113 6DEFA6F1               .LONG   ^X6DEFA6F1,^X60105113
9928863B 68273FCC               .LONG   ^X68273FCC,^X9928863B   ;  1.56192069685994452872180519113086 5E -16
```

```
E533A92E 54A49ACF  0098   129          .LONG   ^X54A49ACF,^XE533A92E
3B813E73 AE7F3FD4  00A0   130          .LONG   ^XAE7F3FD4,^X3B813E73   ;  4.7794773323873776349012551748084 71E -14
4B6B3FDC D10B2ED8  00A8   131          .LONG   ^XD10B2ED8,^X4B6B3FDC
07C94A8C 93973FDC  00B0   132          .LONG   ^X93973FDC,^X07C94A8C   ;  1.1470745597729724745132340837685 90E -11
7DE98CBB FC3DD25A  00B8   133          .LONG   ^XFC3DD25A,^X7DE98CBB
8D898EFF 1EED3FE4  00C0   134          .LONG   ^X1EED3FE4,^X8D898EFF   ;  2.0876756987868098979121124972124 23E  -9
85215944 371B7B54  00C8   135          .LONG   ^X371B7B54,^X85215944
89F5FB77 27E43FEB  00D0   136          .LONG   ^X27E43FEB,^X89F5FB77   ;  2.7557319223985890652557490928519 11E  -7
94EA88C4 F01FC72E  00D8   137          .LONG   ^XF01FC72E,^X94EA88C4
1A0101A0 A01A3FF1  00E0   138          .LONG   ^XA01A3FF1,^X1A0101A0   ;  2.4801587301587301587301587086939 22E  -5
1BE015A7 01A0A01A  00E8   139          .LONG   ^X01A0A01A,^X1BE015A7
16C1C16C 6C163FF7  00F0   140          .LONG   ^X6C163FF7,^X16C1C16C   ;  1.3888888888888888888888888889049 59E  -3
B9DF16C2 C16C6C16  00F8   141          .LONG   ^XC16C6C16,^XB9DF16C2
55555555 55553FFC  0100   142          .LONG   ^X55553FFC,^X55555555   ;  4.1666666666666666666666666666036 03E  -2
54ED5555 55555555  0108   143          .LONG   ^X55555555,^X54ED5555
00000000 00004000  0110   144          .LONG   ^X00004000,^X00000000   ;  5.0000000000000000000000000000000 0E  -1
00000000 00000000  0118   145          .LONG   ^X00000000,^X00000000
00000000 00004001  0120   146          .LONG   ^X00004001,^X00000000   ;  9.9999999999999999999999999999999 9E  -1
00000000 00000000  0128   147          .LONG   ^X00000000,^X00000000
                   0130   148
          0000000E 0130   149 HCOSHLEN        = .- HCOSHTAB/16
                   0130   150
```

```
                     0130   152          .SBTTL  MTH$HCOSH  - H Floating point COSH function
                     0130   153
                     0130   154
                     0130   155 ;++
                     0130   156 ; FUNCTIONAL DESCRIPTION:
                     0130   157 ;
                     0130   158 ; HCOSH  - double precision H floating point function
                     0130   159 ;
                     0130   160 ; HCOSH(X) is computed as:
                     0130   161 ;
                     0130   162 ;       If |X| < 2**-57, HCOSH(X) = 1.
                     0130   163 ;       IF 2**-57 =< |X| < 0.25, HCOSH(X) = Chebyshev series
                     0130   164 ;       If 0.25 =< |X| < 57*ln2, let Z = HEXP(|X|) and set HCOSH(X) = (Z+1/Z)/2
                     0130   165 ;       If 57*ln2 =< |X| 16383*ln2, then HCOSH(X) = HEXP(|X|)/2.
                     0130   166 ;       If 16383*ln2 =< |X| < 16384*ln2, then HCOSH(X) = HEXP(|X|-ln2).
                     0130   167 ;       If 16384*ln2 =< |X|, then overflow.
                     0130   168 ;
                     0130   169 ; CALLING SEQUENCE:
                     0130   170 ;
                     0130   171 ;       hcosh.wh.v = MTH$HCOSH(x.rh.r)
                     0130   172 ;
                     0130   173 ;               -or-
                     0130   174 ;
                     0130   175 ;       CALL MTH$HCOSH(hcosh.wh.r, x.rh.r)
                     0130   176 ;
                     0130   177 ;       Because an H-floating result cannot be expressed in 64 bits, it is
                     0130   178 ;       returned as the first argument, with the input parameter displaced
                     0130   179 ;       to the second argument, in accordance with the Procedure Calling
                     0130   180
                     0130   181 ;
                     0130   182 ; INPUT PARAMETERS:
                     0130   183
00000004             0130   184          LONG = 4                        ; define longword multiplier
00000008             0130   185          x = 2 * LONG                    ; Contents of x is the argument
                     0130   186
                     0130   187 ; IMPLICIT INPUTS:      none
                     0130   188 ;
                     0130   189 ; OUTPUT PARAMETERS:
                     0130   190 ;
00000004             0130   191          hcosh = 1 * LONG
                     0130   192 ;
                     0130   193 ; IMPLICIT OUTPUTS:     none
                     0130   194 ;
                     0130   195 ; COMPLETION CODES:     none
                     0130   196 ;
                     0130   197 ; SIDE EFFECTS:
                     0130   198 ;
                     0130   199 ; Signal: MTH$_FLOOVEMAT if 16384*ln2 =< |X| with reserved operand in R0/R3
                     0130   200 ; (copied to the signal mechanism vector CHF$L_MCH_R0/R1 by LIB$SIGNAL).
                     0130   201 ; Associated message is: "FLOATING OVERFLOW IN MATH LIBRARY". Result is reserved
                     0130   202 ; operand -0.0 unless a user supplied (or any) error handler changes CHF$L_MCH_R0/R1
                     0130   203 ;
                     0130   204 ; NOTE: This procedure disables floating point underflow, enables integer
                     0130   205 ; overflow.
                     0130   206 ;
                     0130   207 ;---
                     0130   208
```

```
                                0130   209
                        40FC    0130   210          .ENTRY  MTH$HCOSH, ^M<IV, R2, R3, R4, R5, R6, R7 >
                                0132   211                                              ; standard call-by-reference entry
                                0132   212                                              ; disable DV (and FU), enable IV
                                0132   213          MTH$FLAG_JACKET                     ; flag that this is a jacket procedure in
                                0132                                                    ;
    6D  00000000'GF     9E      0132                MOVAB   G^MTH$$JACKET_HND, (FP)
                                0139                                                    ; set handler address to jacket
                                0139                                                    ; handler
                                0139                                                    ;
                                0139   214                                              ; case of an error in routine
    6D  00000000'GF     9E      0139   215          MOVAB   G^MTH$$JACKET_HND, (FP)     ; Set handler address to jacket handler
                                0140   216                                              ; If an error, convert signal to user PC
                                0140   217                                              ; and resignal
      50    08 BC     70FD      0140   218          MOVH    @x(AP), R0                  ; R0/R3 = |X| = @value(AP)
    50    8000 8F       AA      0145   219          BICW2   #^X8000, R0                 ; R0/R3 = |X|
    3FFF 8F   50        B1      014A   220          CMPW    R0, #^X3FFF                 ; compare |X| with 0.25
              1E        18      014F   221          BGEQ    GEQ_TO_0.25                 ; branch if |X| >= 0.25
                                0151   222
                                0151   223 ;
                                0151   224 ; |X| < 0.25
                                0151   225 ;
                                0151   226
    3FC8 8F   50        B1      0151   227          CMPW    R0, #^X3FC8                 ; compare |X| with 2**-57
              06        18      0156   228          BGEQ    GEQ_TO_2M57                 ; branch if |X| >= 2**-57
                                0158   229
                                0158   230 ;
                                0158   231 ; |X| < 2**-57
                                0158   232 ;
                                0158   233
      04 BC     08 70FD         0158   234          MOVH    #1, @hcosh(AP)              ; Store 1.0 as result
                  04            015D   235          RET                                 ; return
                                015E   236
                                015E   237 ;
                                015E   238 ; 2**-57 =< |X| < 0.25
                                015E   239 ;
                                015E   240
                                015E   241 GEQ_TO_2M57:
        50      50 64FD         015E   242          MULH2   R0,R0                       ;Get ARG*2 for POLYH.
FEE7 CF   0D    50 75FD         0162   243          POLYH   R0, #HCOSHLEN-1, HCOSHTAB
                                0169   244                                              ; R0/R3 = SUM(Ci*X**i)
      04 BC     50 70FD         0169   245          MOVH    R0, @hcosh(AP)              ; Store result in first argument
                  04            016E   246          RET                                 ; return
                                016F   247
                                016F   248 ;
                                016F   249 ; 0.25 =< |X|
                                016F   250 ;
                                016F   251
                                016F   252 GEQ_TO_0.25:
    FE8B CF     50 71FD         016F   253          CMPH    R0, H_16383_LOG_2           ; compare |X| with 16383*ln2
              20    14          0175   254          BGTR    GTR_THAN_16383_LOG_2        ; branch if |X| > 16383*ln2
                                0177   255
                                0177   256 ;
                                0177   257 ; 0.25 =< |X| =< 16383*ln2
                                0177   258 ;
                                0177   259
    00000000'EF       16        0177   260          JSB     MTH$HEXP_R6                 ; R0/R3 = HEXP(|X|)
```

```
                FEBD CF    50 71FD  017D   261          CMPH    R0, H_2_POWER_57        ; Compare HEXP(|X|) with 2*57, if
                           09   14  0183   262          BGTR    ONE_TERM_ONLY           ; larger, only one term is needed.
                54   08    50 67FD  0185   263          DIVH3   R0, #1, R4              ; R4/R7 = HEXP(-|X|)
                      50    54 60FD  018A   264          ADDH2   R4, R0                  ; R0/R3 = HEXP(X) + HEXP(-X)
                                     018E   265 ONE_TERM_ONLY:
                      50    01   A2  018E   266          SUBW2   #^X0001, R0             ; R0/R3 = (HEXP(X) + HEXP(-X))/2
                  04 BC    50 7DFD  0191   267          MOVO    R0, @hcosh(AP)          ; move COSH(x) to first argument
                                04  0196   268          RET                             ; and return
                                     0197   269
                                     0197   270 ;
                                     0197   271 ; 16383*ln2 < |X|
                                     0197   272 ;
                                     0197   273
                                     0197   274 GTR_THAN_16383_LOG_2:
                FE73 CF    50 71FD  0197   275          CMPH    R0, H_16384_LOG_2       ; compare |X| with 16384*ln2
                           1A   18  019D   276          BGEQ    ERROR                   ; branch to ERROR if 16384*ln2 =<|X|
                                     019F   277
                                     019F   278
                                     019F   279 ;
                                     019F   280 ; 16383*ln2 =< |X| < 16384*ln2
                                     019F   281 ;
                                     019F   282
                      50    FE7C CF 62FD  019F   283          SUBH2   H_LOG_2_HI, R0          ; R0/R3=|X|-(hi 109 bits of ln2+2*-109)
                        00000000'EF   16  01A5   284          JSB     MTH$HEXP_R6             ; R0/R3=HEXP(|X|-H_LOG_2_HI)
              54        50    FE80 CF 65FD  01AB   285          MULH3   H_LOG_2_LO, R0, R4      ; R4/R7=H_LOG_2_LO*HEXP(|X|-H_LOG_2_LO)
                  04 BC    50   54 61FD  01B2   286          ADDH3   R4, R0, @hcosh(AP)      ; Store HEXP(|X|-ln2) in 1st argument
                                04  01B8   287          RET                             ; return
                                     01B9   288
                                     01B9   289 ;
                                     01B9   290 ; 16383*ln2 + LOG(2) =< |X|, error
                                     01B9   291 ;
                                     01B9   292
                   7E    00'8F    9A  01B9   293 ERROR:  MOVZBL  #MTH$K_FLOOVEMAT, -(SP) ; condition value
                50    01    0F   79  01BD   294          ASHQ    #15, #1, R0             ; R0 = result = reserved operand -0.0
                                     01C1   295                                          ; goes to R0/R3 so error handler
                                     01C1   296                                          ; can modify the result.
                            52   7C  01C1   297          CLRQ    R2                      ; ...
          00000000'EF       01   FB  01C3   298          CALLS   #1, MTH$$SIGNAL         ; signal error and use real user's PC
                  04 BC    50 7DFD  01CA   299          MOVO    R0, @hcosh(AP)          ; Restore result
                                04  01CF   300          RET                             ; return
                                     01D0   301
                                     01D0   302
                                     01D0   303
                                     01D0   304          .END
```

```
ERROR                           000001B9 R      01
GEQ_TO_0.25                     0000016F R      01
GEQ_TO_2M57                     0000015E R      01
GTR_THAN_16383_LOG_2            00000197 R      01
HCOSH                         = 00000004
HCOSHLEN                      = 0000000E
HCOSHTAB                        00000050 R      01
H_16383_LOG_2                   00000000 R      01
H_16384_LOG_2                   00000010 R      01
H_2_POWER_57                    00000040 R      01
H_LOG_2_HI                      00000020 R      01
H_LOG_2_LO                      00000030 R      01
LONG                          = 00000004
MTH$$JACKET_HND                 ********    X   01
MTH$$SIGNAL                     ********    X   00
MTH$HCOSH                       00000130 RG     01
MTH$HEXP_R6                     ********    X   00
MTH$K_FLOOVEMAT                 ********    X   00
ONE_TERM_ONLY                   0000018E R      01
X                             = 00000008
```

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	000001D0 (464.)	01 (1.)	PIC USR CON REL LCL SHR EXE RD NOWRT NOVEC LONG

Performance indicators

Phase	Page faults	CPU Time	Elapsed Time
Initialization	32	00:00:00.07	00:00:01.11
Command processing	126	00:00:00.68	00:00:03.06
Pass 1	91	00:00:01.06	00:00:04.74
Symbol table sort	0	00:00:00.00	00:00:00.00
Pass 2	66	00:00:00.78	00:00:02.77
Symbol table output	4	00:00:00.02	00:00:00.02
Psect synopsis output	3	00:00:00.02	00:00:00.12
Cross-reference output	0	00:00:00.00	00:00:00.00
Assembler run totals	324	00:00:02.64	00:00:11.85

```
The working set limit was 900 pages.
4622 bytes (10 pages) of virtual memory were used to buffer the intermediate code.
There were 10 pages of symbol table space allocated to hold 20 non-local and 0 local symbols.
364 source lines were read in Pass 1, producing 11 object records in Pass 2.
1 page of virtual memory was used to define 1 macro.
```

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$:MTHHCOSH/OBJ=OBJ$:MTHHCOSH MSRC$:MTHJACKET/UPDATE=(ENH$:MTHJACKET)+MSRC