```
LLL                 IIIIIIIII     BBBBBBBBBBBB     RRRRRRRRRRRR     TTTTTTTTTTTTTTT  LLL
LLL                 IIIIIIIII     BBBBBBBBBBBB     RRRRRRRRRRRR     TTTTTTTTTTTTTTT  LLL
LLL                 IIIIIIIII     BBBBBBBBBBBB     RRRRRRRRRRRR     TTTTTTTTTTTTTTT  LLL
LLL                    III        BBB         BBB  RRR         RRR        TTT        LLL
LLL                    III        BBB         BBB  RRR         RRR        TTT        LLL
LLL                    III        BBB         BBB  RRR         RRR        TTT        LLL
LLL                    III        BBB         BBB  RRR         RRR        TTT        LLL
LLL                    III        BBB         BBB  RRR         RRR        TTT        LLL
LLL                    III        BBB         BBB  RRR         RRR        TTT        LLL
LLL                    III        BBBBBBBBBBBB     RRRRRRRRRRRR           TTT        LLL
LLL                    III        BBBBBBBBBBBB     RRRRRRRRRRRR           TTT        LLL
LLL                    III        BBBBBBBBBBBB     RRRRRRRRRRRR           TTT        LLL
LLL                    III        BBB         BBB  RRR   RRR              TTT        LLL
LLL                    III        BBB         BBB  RRR   RRR              TTT        LLL
LLL                    III        BBB         BBB  RRR   RRR              TTT        LLL
LLL                    III        BBB         BBB  RRR      RRR           TTT        LLL
LLL                    III        BBB         BBB  RRR      RRR           TTT        LLL
LLL                    III        BBB         BBB  RRR      RRR           TTT        LLL
LLLLLLLLLLLLLLL     IIIIIIIII     BBBBBBBBBBBB     RRR         RRR        TTT        LLLLLLLLLLLLLLL
LLLLLLLLLLLLLLL     IIIIIIIII     BBBBBBBBBBBB     RRR         RRR        TTT        LLLLLLLLLLLLLLL
LLLLLLLLLLLLLLL     IIIIIIIII     BBBBBBBBBBBB     RRR         RRR        TTT        LLLLLLLLLLLLLLL
```

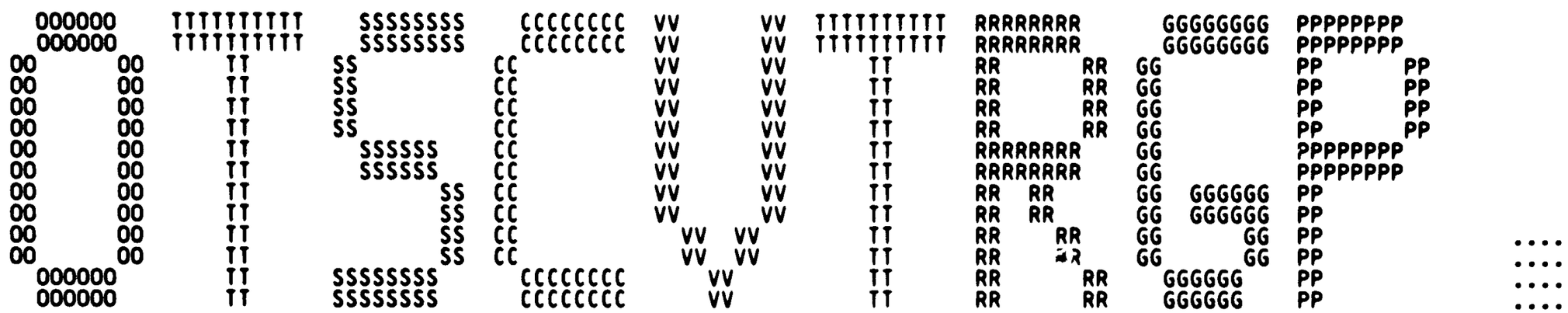
OOOOOO TTTTTTTTTT SSSSSSSS CCCCCCCC VV VV TTTTTTTTTT RRRRRRRR GGGGGGGG PPPPPPPP
OOOOOO TTTTTTTTTT SSSSSSSS CCCCCCCC VV VV TTTTTTTTTT RRRRRRRR GGGGGGGG PPPPPPPP
OO OO TT SS CC VV VV TT RR RR GG PP PP
OO OO TT SS CC VV VV TT RR RR GG PP PP
OO OO TT SS CC VV VV TT RR RR GG PP PP
OO OO TT SSSSSS CC VV VV TT RRRRRRRR GG PPPPPPPP
OO OO TT SSSSSS CC VV VV TT RRRRRRRR GG PPPPPPPP
OO OO TT SS CC VV VV TT RR RR GG GGGGGG PP
OO OO TT SS CC VV VV TT RR RR GG GGGGGG PP
OO OO TT SS CC VV VV TT RR RR GG GG PP
OO OO TT SS CC VV VV TT RR RR GG GG PP
OOOOOO TT SSSSSSSS CCCCCCCC VV TT RR RR GGGGGG PP
OOOOOO TT SSSSSSSS CCCCCCCC VV TT RR RR GGGGGG PP
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
LLLLLLLLLL IIIIII SSSSSSSS
LLLLLLLLLL IIIIII SSSSSSSS

Table of contents

```
0000     1          .TITLE  OTS$CVTRGP_R9   Convert Rounded G Floating to Packed
0000     2          .IDENT  /1-005/         ; File: OTSCVTRGP.MAR Edit: DG1005
0000     3
0000     4 ;
0000     5 ;*****************************************************************************
0000     6 ;*                                                                           *
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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 ; FACILITY: LANGUAGE INDEPENDENT SUPPORT
0000    29 ;++
0000    30 ; ABSTRACT:
0000    31 ;       This module contains the routine that converts g floating
0000    32 ;       numbers to packed with rounding.
0000    33 ;
0000    34 ;
0000    35 ;--
0000    36 ;
0000    37 ; VERSION: 1
0000    38 ;
0000    39 ; HISTORY:
0000    40 ;
0000    41 ; AUTHOR:
0000    42 ;       Pamela Levesque, 21-Jan-1982
0000    43 ;
0000    44 ; MODIFIED BY:
0000    45 ;
0000    46 ;
0000    47 ;
```

```
0000     49          .SBTTL  HISTORY         ; Detailed Current Edit History
0000     50
0000     51
0000     52 ; Edit History for Version 1 of OTSCVTRGP
0000     53 ;
0000     54 ; 1-001 - Original.  PLL 21-Jan-1982
0000     55 ; 1-002 - Call g floating conversion routine.  PLL 2-Mar-1982
0000     56 ; 1-003 - Expect a 2 digit exponent from the conversion routine.  PLL 8-Mar-1982
0000     57 ; 1-004 - determine how many digits there are in the exponent on the fly.
0000     58 ;         MDL 9-Apr-1984
0000     59 ; 1-005 - Make sure result will not overflow destination after calculating
0000     60 ;         longword exponent.  DG 9-Apr-1984
```

```
                        .SBTTL  DECLARATIONS

;
; INCLUDE FILES:
;
                        $DSCDEF

;
; EXTERNAL SYMBOLS:

                        .DSABL  GBL             ; Prevent undeclared symbols from being
                                                ; automatically global

                        .EXTRN  OTS$CNVOUT_G    ; E-format conversion
                        .EXTRN  LIB$STOP        ; Error halt
                        .EXTRN  OTS$_FATINTERR  ; Fatal internal error code
;

;
; MACROS:
;       NONE
;

;
; PSECT DECLARATIONS:
00000000                .PSECT  _OTS$CODE       PIC, SHR, LONG, EXE, NOWRT,-
                                                USR, CON, REL, LCL, RD

;
; EQUATED SYMBOLS:
;       NONE
;

;
; OWN STORAGE:
;       NONE
;
```

```
                                        .SBTTL  OTS$CVTRGP_R9
                                ;++
                                ; FUNCTIONAL DESCRIPTION:
                                ;
                                ;       Converts a g floating number to packed with rounding.
                                ;
                                ; CALLING SEQUENCE:
                                ;
                                ;       JSB OTS$CVTRGP_R9 (scale.rl.v, src.rg.r, dstlen.rl.v, dst.wp.r)
                                ;
                                ;       Arguments are passed in R6, R7, R8 and R9.
                                ;
                                ; INPUT PARAMETERS:
                                ;
                                ;       SCALE.rl.v              The power of ten by which the internal
                                ;                               representation of the source must be
                                ;                               multiplied to scale the same as the
                                ;                               internal representation of the dest.
                                ;       SRC.rg.r                The number to be converted
                                ;       DSTLEN.rl.v             The number of digits in the destination
                                ;
                                ; IMPLICIT INPUTS:
                                ;
                                ;       All of the trap bits in the PSL are assumed off.
                                ;
                                ; OUTPUT PARAMETERS:
                                ;
                                ;       DST.wp.r                The place to store the converted number
                                ;
                                ; IMPLICIT OUTPUTS:
                                ;
                                ;       NONE
                                ;
                                ; FUNCTION VALUE:
                                ;
                                ;       1 = SUCCESS, 0 = FAILURE
                                ;
                                ; SIDE EFFECTS:
                                ;
                                ;       Destroys registers R0 through R9.
                                ;
                                ;--
                                
                                OTS$CVTRGP_R9::
5E  30  C2                      SUBL2   #48,SP                  ; Allocate temp space
6E  30  00  6E  00  2C          MOVC5   #0,(SP),#^A'',#48,(SP)  ; Clear temp space
            6E  67  50FD        MOVG    (R7),(SP)               ; Get input number
                                ;
                                ; Make a descriptor for the temporary string.
                                ;
      08    AE  9F              PUSHAB  8(SP)                   ; Address = space reserved
            7E  01  90          MOVB    #DSC$K_CLASS_S,-(SP)    ; Class = static
            7E  0E  90          MOVB    #DSC$K_DTYPE_T,-(SP)    ; Data type = ASCII string
            7E  26  B0          MOVW    #38,-(SP)               ; Length in bytes
                                ;
```

```
                                0019   157 ; Call OTS$CNVOUT.
                                0019   158 ;
                          1F    DD 0019   159         PUSHL   #31                     ; Digits in fraction
                       04 AE    9F 001B   160         PUSHAB  4(SP)                   ; Output string descriptor
                       10 AE    9F 001E   161         PUSHAB  16(SP)                  ; Number to convert
          00000000'GF    03    FB 0021   162         CALLS   #3,G^OTS$CNVOUT_G       ; Call conversion routine
                    5B   50    E9 0028   163         BLBC    R0,20$                  ; Should never fail
                                002B   164 ;
                                002B   165 ; Determine the number of digits in the exponent.
                                002B   166 ;
                                002B   167                                         ; find beginning of exponent (sign byte)
           14 AE    24    2B    3A 002B   168         LOCC    #^A'+',#36,20(SP)       ; look for sign byte (+)
                          07    12 0030   169         BNEQ    5$                      ; branch if we found it
           14 AE    24    2D    3A 0032   170         LOCC    #^A'-',#36,20(SP)       ; look for sign byte (-)
                          4D    13 0037   171         BEQL    20$                     ; branch to error if we didn't find it
                                0039   172                                         ;
                08 AE    51    D0 0039   173 5$:     MOVL    R1,8(SP)                ; save location of sign byte
                                003D   174                                         ; (contained in R1 after above LOCC)
                                003D   175                                         ;
           08 BE    05    00    3A 003D   176         LOCC    #^A'',#5,@B^8(SP)       ; look for NUL (end of string)
        0C AE    51    08 AE    C3 0042   177         SUBL3   8(SP),R1,12(SP)         ; determine number of digits by subtracting
                                0048   178                                         ; location of beginning of exponent from
                                0048   179                                         ; location of end of exponent, and save it
                    0C AE    D7 0048   180         DECL    12(SP)                  ; adjust for sign byte
                                004B   181                                         ; at this point, 12(SP) = length of exponent
                                004B   182 ;
                                004B   183 ; Convert the exponent and correct for scale factor.
                                004B   184 ;
  6E    0C AE    08 BE    0C AE    09 004B   185         CVTSP   12(SP),@B^8(SP),12(SP),(SP)     ; Make packed exponent
             50    6E    0C AE    36 0053   186         CVTPL   12(SP),(SP),R0          ; Make longword exponent
                                0058   187         ;
                                0058   188         ; Here must check that the result will not overflow
                                0058   189         ; the destination.  The destination length (total number of
                                0058   190         ; digits) minus the scale factor will give the number of digits
                                0058   191         ; to the left of the decimal point.  If that number is greater than
                                0058   192         ; the longword exponent, then the result WILL overflow the dest.
                                0058   193         ;
                54    58    56    C3 0058   194         SUBL3   R6,R8,R4                ; Determine num of digits on left
                      54    50    D1 005C   195         CMPL    R0,R4                   ; Compare with longword exponent
                            1F    14 005F   196         BGTR    15$                     ; Branch if overflowed
                                0061   197
                56    E1 A640       9E 0061   198         MOVAB   -31(R6)[R0],R6          ; Correct for fraction size and scale
                                0066   199 ;
                                0066   200 ; Convert the fraction to packed.
                                0066   201 ;
              12 AE    10 AE    90 0066   202         MOVB    16(SP),18(SP)           ; Move sign over "."
        6E    1F    12 AE    1F 09 006B   203         CVTSP   #31,18(SP),#31,(SP)     ; Make packed fraction
69  58    05    6E    1F    56 F8 0071   204         ASHP    R6,#31,(SP),#5,R8,(R9)  ; Scale to destination
                                0078   205                                         ;    (also clears R0)
                          02    1D 0078   206         BVS     10$                     ; Branch if overflowed
                          50    D6 007A   207         INCL    R0                      ; Indicate success, R0 = 1
                       5E   38    C0 007C   208 10$:    ADDL2   #56,SP                  ; Delete stack temps
                                05 007F   209         RSB
                                0080   210
                          50    D4 0080   211 15$:    CLRL    R0                      ; Indicate failure, R0 = 0
                       5E   38    C0 0082   212         ADDL2   #56,SP                  ; Delete stack temps
                                05 0085   213         RSB
```

```
                        0086   214 ;
                        0086   215 ; Come here on failure of OTS$CNVOUT.  This should never happen.
                        0086   216 ;
      00000000'8F   DD  0086   217 20$:    PUSHL   #OTS$_FATINTERR          ; OTS fatal error message
00000000'GF   01  FB  008C   218          CALLS   #1,G^LIB$STOP            ; Signal and don't return
                        0093   219 ;
                        0093   220          .END
```

```
DSC$K_CLASS_S                   = 00000001
DSC$K_DTYPE_T                   = 0000000E
LIB$STOP                          ********    X   00
OTS$CNVOUT_G                      ********    X   00
OTS$CVTRGP_R9                     00000000 RG     02
OTS$_FATINTERR                    ********    X   00
```

Psect synopsis

PSECT name	Allocation	PSECT No.	Attributes
. ABS .	00000000 (0.)	00 (0.)	NOPIC USR CON ABS LCL NOSHR NOEXE NORD NOWRT NOVEC BYTE
ABS	00000000 (0.)	01 (1.)	NOPIC USR CON ABS LCL NOSHR EXE RD WRT NOVEC BYTE
_OTS$CODE	00000093 (147.)	02 (2.)	PIC USR CON REL LCL SHR EXE RD NOWRT NOVEC LONG

Performance indicators

Phase	Page faults	CPU Time	Elapsed Time
Initialization	35	00:00:00.05	00:00:01.25
Command processing	129	00:00:00.29	00:00:01.49
Pass 1	132	00:00:01.19	00:00:06.66
Symbol table sort	0	00:00:00.09	00:00:00.94
Pass 2	57	00:00:00.38	00:00:01.44
Symbol table output	2	00:00:00.01	00:00:00.01
Psect synopsis output	2	00:00:00.01	00:00:00.01
Cross-reference output	0	00:00:00.00	00:00:00.00
Assembler run totals	359	00:00:02.02	00:00:11.80

```
The working set limit was 1050 pages.
9075 bytes (18 pages) of virtual memory were used to buffer the intermediate code.
There were 10 pages of symbol table space allocated to hold 135 non-local and 4 local symbols.
220 source lines were read in Pass 1, producing 10 object records in Pass 2.
8 pages of virtual memory were used to define 7 macros.
```

Macro library statistics

Macro library name	Macros defined
_255DUA28:[SYSLIB]STARLET.MLB;2	4

```
190 GETS were required to define 4 macros.

There were no errors, warnings or information messages.

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

OTSCVTPD
LIS

OTSCVTTF
LIS

OTSCVTRFP
LIS

OTSCVTRT
LIS

OTSCVTTOL
LIS

OTSCVTPG
LIS

OTSCVTTR
LIS

OTSCVTRHP
LIS

OTSLINKAG
LIS

OTSCVTRDP
LIS

OTSCVTTIL
LIS

OTSCVTTLL
LIS

OTSCVTPF
LIS

OTSCVTRGP
LIS

OTSMOVE
LIS

OTSMSG
LIS

OTSCVTPH
LIS

OTSLUN
LIS