



```

CCCCCCCC 000000 BBBB8888 CCCCCCCC VV VV TTTTTTTTTT RRRRRRRR DDDDDDDD QQQQQQ
CCCCCCCC 000000 BBBB8888 CCCCCCCC VV VV TTTTTTTTTT RRRRRRRR DDDDDDDD QQQQQQ
CC        00      00 BB      BB CC        VV VV TT      RR      RR DD      DD QQ      QQ
CC        00      00 BB      BB CC        VV VV TT      RR      RR DD      DD QQ      QQ
CC        00      00 BB      BB CC        VV VV TT      RR      RR DD      DD QQ      QQ
CC        00      00 BB      BB CC        VV VV TT      RR      RR DD      DD QQ      QQ
CC        00      00 BBBB8888 CC        VV VV TT      RRRRRRRR DD      DD QQ      QQ
CC        00      00 BBBB8888 CC        VV VV TT      RRRRRRRR DD      DD QQ      QQ
CC        00      00 BB      BB CC        VV VV TT      RR RR DD      DD QQ      QQ
CC        00      00 BB      BB CC        VV VV TT      RR RR DD      DD QQ      QQ
CC        00      00 BB      BB CC        VV VV TT      RR RR DD      DD QQ      QQ
CC        00      00 BB      BB CC        VV VV TT      RR RR DD      DD QQ      QQ
CCCCCCCC 000000 BBBB8888 CCCCCCCC VV VV TT      RR RR DD      DD QQ      QQ
CCCCCCCC 000000 BBBB8888 CCCCCCCC VV VV TT      RR RR DD      DD QQ      QQ

```

```

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        IIIIII SSSSSSSS
LLLLLLLLLL IIIIII SSSSSSSS
LLLLLLLLLL IIIIII SSSSSSSS

```

COBSCVTRDQ\_R8  
Table of contents

(2) 49  
(3) 62  
(4) 110

HISTORY ; Detailed Current Edit History  
DECLARATIONS  
COBSCVTRDQ\_R8

```
0000 1 .TITLE COBSCVTRDQ_R8 COBOL Convert Rounded Double Floating to Quadword
0000 2 .IDENT /1-006/ ; File: COBCVTRDQ.MAR
0000 3
0000 4
0000 5 :*****
0000 6 :*
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0000 24 :*
0000 25 :*
0000 26 :*****
0000 27 :
0000 28 : FACILITY: COBOL SUPPORT
0000 29 :++
0000 30 : ABSTRACT:
0000 31 : This module contains the routine that converts double floating
0000 32 : numbers to quadword 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 : Marty Jack, 14-Mar-1979
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 COBSCVTRDQ
0000 53 ;
0000 54 ; 1-001 - Original. MLJ 14-Mar-1979
0000 55 ; 1-002 - Correct problem with high order longword. MLJ 22-Mar-1979
0000 56 ; 1-003 - Correct round toward zero problem. PDG 12-Jul-1979
0000 57 ; 1-004 - Make external references explicit. RKR 17-JULY-1979
0000 58 ; 1-005 - Change all references to FOR$CNV_OUT_E to COB$CNVOUT
0000 59 ; RKR 27-SEPT-79
0000 60 ; 1-006 - Cosmetic changes. RKR 18-OCT-79
```

```
0000 62 .SBTTL DECLARATIONS
0000 63
0000 64 :
0000 65 : INCLUDE FILES:
0000 66 :
0000 67 .SDSCDEF
0000 68
0000 69 :
0000 70 : EXTERNAL SYMBOLS:
0000 71
0000 72 .DSABL GBL ; Prevent undeclared symbols from being
0000 73 ; automatically global
0000 74
0000 75 .EXTRN COB$CNVOUT ; E-format conversion
0000 76 .EXTRN LIB$STOP ; Error halt
0000 77 .EXTRN OTSS_FATINTERR ; Fatal internal error code
0000 78 :
0000 79 :
0000 80 :
0000 81 : MACROS:
0000 82 : NONE
0000 83 :
0000 84 :
0000 85 :
0000 86 : PSECT DECLARATIONS:
0000 87 .PSECT _COB$CODE PIC, SHR, LONG, EXE, NOWRT
0000 88
0000 89 :
0000 90 : EQUATED SYMBOLS:
0000 91 : NONE
0000 92 :
0000 93 :
0000 94 :
0000 95 : OWN STORAGE:
0000 96 :
0000 97 :+
0000 98 : The following constant has the value 2**32. It is used for scaling
0000 99 : the high 32 bits and for compensating for unsigned arithmetic.
0000 100 :-
6C 29 67 49 29 04 0000 101 BIAS: .PACKED 4294967296
0006 102 :+
0006 103 : The following constant is 2**32-1. It's subtracted from negative numbers,
0006 104 : to compensate for rounding towards zero.
0006 105 :-
5C 29 67 49 29 04 0006 106 BIAS_1: .PACKED 4294967295
000C 107 BIAS_DIGITS=10
000C 108 :
```

```

000C 110      .SBTTL COB$CVTRDQ_R8
000C 111
000C 112 :++
000C 113 : FUNCTIONAL DESCRIPTION:
000C 114 :
000C 115 :     Converts a double floating number to quadword with rounding.
000C 116 :
000C 117 : CALLING SEQUENCE:
000C 118 :
000C 119 :     JSB COB$CVTRDQ_R8 (scale.rl.v, src.rd.r, dst.wq.r)
000C 120 :
000C 121 :     Arguments are passed in R6, R7, and R8.
000C 122 :
000C 123 : INPUT PARAMETERS:
000C 124 :
000C 125 :     SCALE.rl.v           The power of ten by which the internal
000C 126 :                          representation of the source must be
000C 127 :                          multiplied to scale the same as the
000C 128 :                          internal representation of the dest.
000C 129 :     SRC.rd.r             The number to be converted
000C 130 :
000C 131 : IMPLICIT INPUTS:
000C 132 :
000C 133 :     All of the trap bits in the PSL are assumed off.
000C 134 :
000C 135 : OUTPUT PARAMETERS:
000C 136 :
000C 137 :     DST.wq.r             The place to store the converted number
000C 138 :
000C 139 : IMPLICIT OUTPUTS:
000C 140 :
000C 141 :     NONE
000C 142 :
000C 143 : FUNCTION VALUE:
000C 144 :
000C 145 :     1 = SUCCESS, 0 = FAILURE
000C 146 :
000C 147 : SIDE EFFECTS:
000C 148 :
000C 149 :     Destroys registers R0 through R8.
000C 150 :
000C 151 : --
000C 152 :
000C 153 :
000C 154 COB$CVTRDQ_R8::
5E 30 C2 000C 155      SUBL2  #48,SP           ; Allocate temp space
6E 67 70 000F 156      MOVD   (R7),(SP)       ; Get input number
0012 157 :
0012 158 : Make a descriptor for the temporary string.
0012 159 :
0012 160      PUSHAB 8(SP)           ; Address = space reserved
7E 08 AE 9F 0015 161      MOVB  #DSC$K_CLASS_S,-(SP)   ; Class = static
7E 01 90 0018 162      MOVB  #DSC$K_DTYPE_T,-(SP)   ; Data type = ASCII string
7E 0E 90 001B 163      MOVW  #38,-(SP)           ; Length in bytes
001E 164 :
001E 165 : Call COB$CNVOUT.
001E 166 :

```

```

00000000'GF 03 FB 0026 170          PUSHL  #31          ; Digits in fraction
04 AE 09F 0020 168          PUSHAB  4(SP)       ; Output string descriptor
10 AF 9F 0023 169          PUSHAB  16(SP)      ; Number to convert
55 50 E9 002D 171          CALLS   #3,G^COB$CNVOUT ; Call conversion routine
0030 172          BLBC   R0,20$ ; Should never fail
0030 173          ;
0030 174          ; Convert the exponent and correct for scale factor.
6E 02 33 AE 02 09 0030 175          CVTSP   #2,51(SP),#2,(SP) ; Make packed exponent
50 6E 02 36 0036 176          CVTPL  #2,(SP),R0 ; Make longword exponent
56 E1 A640 9E 003A 177          MOVAB  -31(R6)[R0],R6 ; Correct for fraction size and scale
003F 178          ;
003F 179          ; Convert the fraction to packed.
003F 180          ;
10 AE 13 05 12 AE 10 AE 90 003F 181          MOVAB  16(SP),18(SP) ; Move sign over ""
6E 1F 12 AE 1F 56 F8 0044 182          CVTSP  #31,18(SP),#31,(SP) ; Make packed fraction
05 6E 1F 56 F8 004A 183          ASHP   R6,#31,(SP),#5,#19,16(SP) ; Scale to temporary
68 63 13 36 0052 184          ; (also clears R0)
0D 1D 0052 185          BVS    10$ ; Branch if won't fit in 19 digits
68 63 13 36 0054 186          CVTPL  #19,(R3),(R8) ; Convert to longword
0058 187          ; (also clears R0)
68 88 E1 8F 78 0058 188          BVS    11$ ; Can't fit in 32 bits
50 D6 005A 189          ASHL  #-31,(R8)+,(R8) ; Spread sign bit
5E 38 C0 005F 190          INCL  R0 ; Indicate success, R0 = 1
05 0061 191 10$: ADDL2 #56,SP ; Delete stack temps
0064 192          RSB ;
0065 193          ;
0065 194          ; Come here if the packed number won't fit in 32 bits.
0065 195          ; Divide by 2**32 to get the high 32 bits of the quadword.
0065 196          ;
13 10 AE 13 06 09 A1 E9 0065 197 11$: BLBC  9(R1),13$ ; Skip if positive
61 13 99 AF 0A 22 0069 198          SUBP4  #BIAS_DIGITS,BIAS_1,#19,(R1) ; Make more negative
10 AE 13 8D AF 0A 27 006F 199 13$: DIVP  #BIAS_DIGITS,BIAS,#19,16(SP),#19,(SP) ; Divide by 2**32
04 A8 6E 13 36 0077          ;
0078 200          CVTPL  #19,(SP),4(R8) ; Convert and store high bits
007D 201          ; (also clears R0)
02 1D 007D 202          BVS    12$ ; Number too large for a 64-bit integer
50 D6 007F 203          INCL  R0 ; Indicate success, R0 = 1
5E 38 C0 0081 204 12$: ADDL2 #56,SP ; Delete stack temps
05 0084 205          RSB ; Return
0085 206          ;
0085 207          ; Come here on failure of COB$CNVOUT. This should never happen.
0085 208          ;
00000000'8F DD 0085 209 20$: PUSHL  #OTS$_FATINTERR ; OTS fatal error message
00000000'GF 01 FB 008B 210          CALLS  #1,G^[IB$STOP ; Signal and don't return
0092 211          ;
0092 212          .END

```



```

BIAS          00000000 R    02
BIAS_1        00000006 R    02
BIAS_DIGITS   = 0000000A
COBSCNVOUT    ***** X    00
COBSCVTRDQ_R8 0000000C RF   02
DSCSK_CLASS_S = 00000001
DSCSK_DTYPE_T = 0000000E
LIB$STOP      ***** X    00
OTSS_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
\$AB\$\$	00000000 ( 0.)	01 ( 1.)	NOPIC USR CON ABS LCL NOSHR EXE RD WRT NOVEC BYTE
_COB\$CODE	00000092 ( 146.)	02 ( 2.)	PIC USR CON REL LCL SHR EXE RD NOWRT NOVEC LONG

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

Phase	Page faults	CPU Time	Elapsed Time
Initialization	40	00:00:00.08	00:00:01.14
Command processing	118	00:00:00.28	00:00:03.32
Pass 1	135	00:00:01.19	00:00:10.34
Symbol table sort	0	00:00:00.10	00:00:00.20
Pass 2	55	00:00:00.40	00:00:02.86
Symbol table output	3	00:00:00.01	00:00:00.01
Psect synopsis output	5	00:00:00.02	00:00:00.02
Cross-reference output	0	00:00:00.00	00:00:00.00
Assembler run totals	358	00:00:02.09	00:00:17.92

The working set limit was 1050 pages.  
 9011 bytes (18 pages) of virtual memory were used to buffer the intermediate code.  
 There were 10 pages of symbol table space allocated to hold 138 non-local and 5 local symbols.  
 212 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
_\$255\$DUA28:[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\$:COBSCVTRDQ/OBJ=OBJ\$:COBSCVTRDQ MSRC\$:COBSCVTRDQ/UPDATE=(ENH\$:COBSCVTRDQ)

0061 AH-BT13A-SE  
VAX/VMS V4.0

# DIGITAL EQUIPMENT CORPORATION

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This section contains a dense grid of technical diagrams and code snippets, including:

- COBCUTRPO LIS** (multiple instances)
- COBCUTDQ LIS**
- COBCANCEL LIS**
- COBACCTIM LIS**
- COBCVTPQ LIS**
- COBCVTRFQ LIS** (multiple instances)
- COBCVTRFQ LIS** (multiple instances)
- COBCVTRFQ LIS**
- COBACCEPT LIS**
- COBCALL LIS**
- COBCVTRFQ LIS**
- COBCVTRDQ LIS**
- COBCUTDQ LIS**

The diagrams feature various data structures, flowcharts, and code listings, all rendered in a high-contrast, monochrome style.