M 7

```
   CCCCCCCCCCCC     000000000     BBBBBBBBBBBB     RRRRRRRRRRRR     TTTTTTTTTTTTTTT  LLL
   CCCCCCCCCCCC     000000000     BBBBBBBBBBBB     RRRRRRRRRRRR     TTTTTTTTTTTTTTT  LLL
   CCCCCCCCCCCC     000000000     BBBBBBBBBBBB     RRRRRRRRRRRR     TTTTTTTTTTTTTTT  LLL
CCC              000         000  BBB         BBB  RRR         RRR        TTT        LLL
CCC              000         000  BBB         BBB  RRR         RRR        TTT        LLL
CCC              000         000  BBB         BBB  RRR         RRR        TTT        LLL
CCC              000         000  BBB         BBB  RRR         RRR        TTT        LLL
CCC              000         000  BBB         BBB  RRR         RRR        TTT        LLL
CCC              000         000  BBB         BBB  RRR         RRR        TTT        LLL
CCC              000         000  BBBBBBBBBBBB     RRRRRRRRRRRR           TTT        LLL
CCC              000         000  BBBBBBBBBBBB     RRRRRRRRRRRR           TTT        LLL
CCC              000         000  BBBBBBBBBBBB     RRRRRRRRRRRR           TTT        LLL
CCC              000         000  BBB         BBB  RRR   RRR              TTT        LLL
CCC              000         000  BBB         BBB  RRR   RRR              TTT        LLL
CCC              000         000  BBB         BBB  RRR   RRR              TTT        LLL
CCC              000         000  BBB         BBB  RRR      RRR           TTT        LLL
CCC              000         000  BBB         BBB  RRR      RRR           TTT        LLL
CCC              000         000  BBB         BBB  RRR      RRR           TTT        LLL
   CCCCCCCCCCCC     000000000     BBBBBBBBBBBB     RRR         RRR        TTT        LLLLLLLLLLLLLLL
   CCCCCCCCCCCC     000000000     BBBBBBBBBBBB     RRR         RRR        TTT        LLLLLLLLLLLLLLL
   CCCCCCCCCCCC     000000000     BBBBBBBBBBBB     RRR         RRR        TTT        LLLLLLLLLLLLLLL
```

```
**FILE**ID**COBACCECV                                                        L 12




  CCCCCCCC    OOOOOO    BBBBBBBB      AAAAAA        CCCCCCCC    CCCCCCCC  EEEEEEEEEE    CCCCCCCC  VV      VV
  CCCCCCCC    OOOOOO    BBBBBBBB      AAAAAA        CCCCCCCC    CCCCCCCC  EEEEEEEEEE    CCCCCCCC  VV      VV
CC          OO      OO  BB      BB  AA      AA  CC          CC          EE          CC          VV      VV
CC          OO      OO  BB      BB  AA      AA  CC          CC          EE          CC          VV      VV
CC          OO      OO  BB      BB  AA      AA  CC          CC          EE          CC          VV      VV
CC          OO      OO  BB      BB  AA      AA  CC          CC          EE          CC          VV      VV
CC          OO      OO  BBBBBBBB    AA      AA  CC          CC          EEEEEEEE    CC          VV      VV
CC          OO      OO  BBBBBBBB    AA      AA  CC          CC          EEEEEEEE    CC          VV      VV
CC          OO      OO  BB      BB  AAAAAAAAAA  CC          CC          EE          CC          VV      VV
CC          OO      OO  BB      BB  AAAAAAAAAA  CC          CC          EE          CC          VV      VV
CC          OO      OO  BB      BB  AA      AA  CC          CC          EE          CC            VV  VV        ....
CC          OO      OO  BB      BB  AA      AA  CC          CC          EE          CC            VV  VV        ....
  CCCCCCCC    OOOOOO    BBBBBBBB    AA      AA    CCCCCCCC    CCCCCCCC  EEEEEEEEEE    CCCCCCCC      VV          ....
  CCCCCCCC    OOOOOO    BBBBBBBB    AA      AA    CCCCCCCC    CCCCCCCC  EEEEEEEEEE    CCCCCCCC      VV          ....

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
```

```
0 %TITLE 'COB$ACCECV - ACCEPT Conversion routines'
0 MODULE COB$ACCECV (                                  !
0                         IDENT = '1-001'             ! File: COBACCECV.B32 EDIT:LGB1001
0                                         ) =
1 BEGIN
1 !
1 !****************************************************************************
1 !*                                                                          *
1 !*  COPYRIGHT (c) 1978, 1980, 1982, 1984 BY                                 *
1 !*  DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS.                  *
1 !*  ALL RIGHTS RESERVED.                                                    *
1 !*                                                                          *
1 !*  THIS SOFTWARE IS FURNISHED UNDER A LICENSE AND MAY BE USED AND COPIED   *
1 !*  ONLY IN  ACCORDANCE WITH  THE  TERMS  OF  SUCH  LICENSE  AND WITH THE   *
1 !*  INCLUSION OF THE ABOVE COPYRIGHT NOTICE. THIS SOFTWARE OR  ANY  OTHER   *
1 !*  COPIES THEREOF MAY NOT BE PROVIDED OR OTHERWISE MADE AVAILABLE TO ANY   *
1 !*  OTHER PERSON.  NO TITLE TO AND OWNERSHIP OF  THE  SOFTWARE IS  HEREBY   *
1 !*  TRANSFERRED.                                                            *
1 !*                                                                          *
1 !*  THE INFORMATION IN THIS SOFTWARE IS  SUBJECT TO CHANGE WITHOUT NOTICE   *
1 !*  AND  SHOULD  NOT  BE  CONSTRUED AS  A COMMITMENT BY DIGITAL EQUIPMENT   *
1 !*  CORPORATION.                                                            *
1 !*                                                                          *
1 !*  DIGITAL ASSUMES NO RESPONSIBILITY FOR THE USE  OR  RELIABILITY OF ITS   *
1 !*  SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DIGITAL.                 *
1 !*                                                                          *
1 !*                                                                          *
1 !****************************************************************************
1 !
1
1 !++
1 ! FACILITY:  COBOL SUPPORT
1 !
1 ! ABSTRACT:
1 !
1 !       Supports the COBOL ACCEPT statement.
1 !
1 ! ENVIRONMENT:  VAX-11 User Mode
1 !
1 ! AUTHOR: Linda Baillie, CREATION DATE: 7-FEB-84
1 !
1 ! MODIFIED BY:
1 !
1 ! 1-001 - Original.  LGB 7-FEB-84
1 !--
```

```
1 !
1 ! PROLOGUE FILE
1 !
1 REQUIRE 'RTLIN:COBPROLOG' ;                              ! Switches, Psects, Include
1                                                          ! files
1 !
1 ! LINKAGES:
1 !
1 LINKAGE
1         JSB_678 = JSB
1                 (REGISTER = 6, REGISTER = 7, REGISTER = 8):
1                 NOPRESERVE (2, 3, 4, 5, 6, 7, 8)
1                 NOTUSED (9, 10, 11),
1
1         JSB_6789 = JSB
1                 (REGISTER = 6, REGISTER = 7, REGISTER = 8, REGISTER = 9):
1                 NOPRESERVE (2, 3, 4, 5, 6, 7, 8, 9)
1                 NOTUSED (10, 11);
1 !
1 ! TABLE OF CONTENTS:
1 !
1 FORWARD ROUTINE
1         COB$$ACC_CONVERT,                               ! Conversion routine
1         COB$$NUMERIC_CONV,                              ! Convert to numeric text strings
1         COB$$COMP_CONV,                                 ! Convert to Word, Longword,
1                                                          ! Quadword and Packed strings
1         COB$$FLOAT_CONV,                                ! Convert to Floating and Double
1                                                          ! Floating Point strings
1         COB$$STRIP_BLANKS_SIGN,                         ! Strip blanks and sign from
1                                                          ! input numeric string
1         COB$$ZERO_FILL          :  NOVALUE,             ! Initialize STRING_DEST with
1                                                          ! zeroes
1         COB$$VERIFY_FL_RANGE,                           ! Check that input for Floating
1                                                          ! Point data items is within range
1         COB$$SCAN_INPUT ;                               ! Scan input data
1
1 !
1 ! EQUATED SYMBOLS
1 !
1 LITERAL
1         V_DEC_PT = 64 ;                                 ! Bit flag for 'DECIMAL POINT
1                                                          ! IS COMMA'
1 !
1 ! EXTERNAL REFERENCES:
1 !
1 EXTERNAL ROUTINE
1
1         COB$CVTIL_R8: JSB_678,                          ! Convert CIT to long
1         COB$CVTIP_R9: JSB_6789,                         ! Convert CIT to packed
1         COB$CVTIQ_R8: JSB_678,                          ! Convert CIT to quad
1         COB$CVTIW_R8: JSB_678,                          ! Convert CIT to word
1         COB$CVTTI_R8: JSB_678,                          ! Convert text to CIT
1         LIB$STOP : NOVALUE,                             ! Signals fatal error
1         STR$GET1_DX,                                    ! Allocate a string
1         STR$DUPL_CHAR,                                  ! Duplicate character n times
1         STR$FREE1_DX,                                   ! Deallocate a string
1         STR$COPY_R,                                     ! Copy a string by ref
```

```
;  104       1619  1          COB$$FREE_STRINGS,                         ! Free local strings
;  105       1620  1          OTS$CVT_T_F,                               ! Convert Text to Floating point
;  106       1621  1          OTS$CVT_T_D ;                              ! Convert Text to Double Fl point
;  107       1622  1
;  108       1623  1 EXTERNAL LITERAL
;  109       1624  1          COB$_INVARG ;                              ! Invalid Argument(s)
```

```
1 %SBTTL 'COB$$ACC_CONVERT - Conversion'
1 GLOBAL ROUTINE COB$$ACC_CONVERT (STRING_DEST  :  REF $STR$DESCRIPTOR,
1                                                  ! Final destination for input chars
1                                FLAGS,            ! Enhancement flag
1                                DEFAULT     :  REF $STR$DESCRIPTOR,
1                                                  ! Input default value
1                                PUT_HERE    :  REF BLOCK [8, BYTE],
1                                                  ! Contains input characters
1                                CHARS_READ,       ! # of input characters
1                                YES_DEFAULT,      ! =1 if DEFAULT was used
1                                YES_SIGN          ! =1 if sign should be included
1                               ) =
1 !++
1 ! FUNCTIONAL DESCRIPTION:
1 !
1 !       Convert TEXT input string to specified VAX COBOL data type.
1 !       This routine selects the appropriate routine to convert the specified
1 !       data type.
1 !
1 ! FORMAL PARAMETERS:
1 !
1 !
1 !       STRING_DEST.mt.ds   Address of descriptor to receive the read input.
1 !
1 !       FLAGS.rlu.v     Screen enhancement flag;
1 !
1 !       DEFAULT.rt.dx   Default source moved to destination descriptor
1 !                       (STRING_DEST) in the event of null input.
1 !
1 !       PUT_HERE.rt.dx  Buffer to hold input characters.
1 !
1 !       CHARS_READ.rlu.v   Number of characters accepted as input.
1 !
1 !       YES_DEFAULT.rlu.v  Flag = 1 if DEFAULT used because of null input.
1 !
1 !       YES_SIGN.rlu.v  Flag = 1 if sign should be included in COMP or COMP3
1 !                       data type.
1 !
1 ! IMPLICIT INPUTS:
1 !
1 !       NONE
1 !
1 ! IMPLICIT OUTPUTS:
1 !
1 !       NONE
1 !
1 ! ROUTINE VALUE:
1 !
1 !       1 - Conversion Success
1 !       0 - Conversion Failure
1 !
1 ! SIDE EFFECTS:
1 !
1 !       Signals COB$_INVARG if the syntax of the number is wrong,
1 !--
1
2   BEGIN
```

```
        LOCAL
            ERROR          :  INITIAL (0),                 ! = 1, Conversion error
            PUT_HERE_BUF   :  REF VECTOR [1100, BYTE],     ! Temp for special case
                                                           ! Conversion check
            CONV_OK        :  INITIAL (0) ;                ! Return Status

            !+
            !  This validity check does not apply to TEXT, FLOATING or
            !  DOUBLE FLOATING POINT data types.
            !-
            IF ( .STRING_DEST [DSC$B_DTYPE] NEQ DSC$K_DTYPE_T AND
                 .STRING_DEST [DSC$B_DTYPE] NEQ DSC$K_DTYPE_F AND
                 .STRING_DEST [DSC$B_DTYPE] NEQ DSC$K_DTYPE_D )
            THEN
                BEGIN                                      ! Begin special case
                !+
                !  Looking for two special case conversion errors not caught
                !  in other conversion routines.
                !  Check for invalid value  '.-9' and '0000-1234'
                !  ('9-.' found in COB$$NUMERIC_CONV).
                !-

                IF .YES_DEFAULT                            ! Use local buffer for
                THEN                                       ! convenience
                    PUT_HERE_BUF = .DEFAULT [DSC$A_POINTER]
                ELSE
                    PUT_HERE_BUF = .PUT_HERE [DSC$A_POINTER] ;

                INCR X FROM 0 TO .CHARS_READ - 1 DO
                    BEGIN
                    !+
                    !  Work through characters one at a time.
                    !-
                    SELECTONE .PUT_HERE_BUF [.X] OF
                        SET

                        [%C'0' TO %C'9'] :
                            0 ;                            ! Legal
                        [%C' '] :
                            0 ;                            ! Legal

                        [%C'-', %C'+'] :
                            IF .X NEQ 0 AND .X NEQ .CHARS_READ - 1
                            THEN
                                !+
                                ! Looking for 0000-1234 case - a sign in middle
                                ! of digits.  Sign should be first or last
                                ! character.  Note: bbbb-1234 is legal.
                                !-
                                IF (( .PUT_HERE_BUF [.X-1] GEQ %C'0'  AND
                                      .PUT_HERE_BUF [.X-1] LEQ %C'9' ) AND
                                    ( .PUT_HERE_BUF [.X+1] GEQ %C'0'  AND
                                      .PUT_HERE_BUF [.X+1] LEQ %C'9' ))
                                THEN
                                    BEGIN
                                    ERROR = 1 ;
                                    EXITLOOP ;
```

```
4                                   END ;
4
4                       [%C'.', %C','] :
5                           BEGIN
5                           IF .X NEQ .CHARS_READ - 1
5                           THEN
5                               !+
5                               ! Looking for .-9 case - a sign separating a
5                               ! decimal point and digit.  -.9 and .9- are
5                               ! acceptable.  (9-. caught by COB$$NUMERIC_CONV)
5                               !-
5                               IF .PUT_HERE_BUF [.X+1] EQL %C'-'  OR
5                                   .PUT_HERE_BUF [.X+1] EQL %C' '
5                               THEN
6                                   BEGIN
6                                   ERROR = 1 ;
6                                   EXITLOOP ;
5                                   END ;
4                           END ;
4
4                       [ OTHERWISE ]:
4                           0;                          ! Let conversion routines
4                                                       ! handle other errors
4                       TES ;
3                   END ;
2               END ;                                   ! End special case
2
2               IF .ERROR
2               THEN
2                   CONV_OK = 0                         ! Return failure status
2               ELSE
2               !+
2               ! Continue with rest of conversion check.  Call appropriate
2               ! routine (determined by data type).
2               !-
2               CASE .STRING_DEST [DSC$B_DTYPE] FROM DSC$K_DTYPE_WU TO
2                                                           DSC$K_DTYPE_P OF
2                   SET
2
2                   [DSC$K_DTYPE_NU,                    ! Numeric string
2                    DSC$K_DTYPE_NL, DSC$K_DTYPE_NR,
2                    DSC$K_DTYPE_NLO, DSC$K_DTYPE_NRO] :
2
3                       BEGIN
4                       CONV_OK = COB$$NUMERIC_CONV (( IF .YES_DEFAULT
4                                                      THEN .DEFAULT
3                                                      ELSE .PUT_HERE ),
3                               .STRING_DEST, .CHARS_READ, .FLAGS ) ;
2                       END ;
2
2                   [DSC$K_DTYPE_W, DSC$K_DTYPE_WU,     ! Word
2                    DSC$K_DTYPE_L, DSC$K_DTYPE_LU,     ! Longword
2                    DSC$K_DTYPE_Q, DSC$K_DTYPE_QU,     ! Quadword
2                    DSC$K_DTYPE_P] :                   ! Packed Decimal
3
3                       BEGIN
3                       CONV_OK = COB$$COMP_CONV ( .STRING_DEST,
                                                    .FLAGS, .DEFAULT, .PUT_HERE,
                                                    .CHARS_READ, .YES_DEFAULT,
                                                    .YES_SIGN  ) ;
                        END ;

                [DSC$K_DTYPE_F, DSC$K_DTYPE_D] :      ! Floating and Double
                                                      ! Floating Point
                        BEGIN
                        !+
                        !  Since DEFAULT is Read-only, copy it to PUT_HERE if
                        !  it was used, just in case it is necessary to WRITE
                        !  a DOT to override a COMMA in routine COB$$FLOAT_CONV.
                        !-

                        IF .YES_DEFAULT
                        THEN
                            CH$MOVE ( .CHARS_READ, .DEFAULT [DSC$A_POINTER],
                                          .PUT_HERE [DSC$A_POINTER] ) ;

                        CONV_OK = COB$$FLOAT_CONV ( .STRING_DEST, .FLAGS,
                                                    .PUT_HERE, .CHARS_READ ) ;
                        END ;

                [DSC$K_DTYPE_T] :                     ! Text

                        !+
                        !  Copy ACCEPTed data to STRING_DEST.  If more chars
                        !  are ACCEPTed than STRING_DEST[DSC$W_LENGTH] can
                        !  handle, accept only the leftmost characters and
                        !  ignore the extra characters.
                        !  Use STR$COPY because it BLANK fills.
                        !-

                        BEGIN
                            LOCAL
                                COPY_NUM ;

                        IF .CHARS_READ LSS .STRING_DEST[DSC$W_LENGTH]
                        THEN
                            COPY_NUM = .CHARS_READ
                        ELSE
                            COPY_NUM = .STRING_DEST[DSC$W_LENGTH] ;

                        STR$COPY_R ( .STRING_DEST, COPY_NUM,
                                    (IF .YES_DEFAULT
                                    THEN .DEFAULT [DSC$A_POINTER]
                                    ELSE .PUT_HERE [DSC$A_POINTER] )) ;
                        CONV_OK = 1 ;                 ! no need to conv TEXT
                        END ;

                [INRANGE, OUTRANGE] :

                        LIB$STOP ( COB$_INVARG ) ;

                TES ;

        RETURN .CONV_OK ;
```

```
;  339         1853  1       END ;                                     ! End of COB$$ACC_CONVERT


                                                                        .TITLE  COB$ACCECV COB$ACCECV - ACCEPT Conversion routi
;                                                                                          nes
                                                                        .IDENT  \1-001\

                                                                        .EXTRN  COB$CVTIL_R8, COB$CVTIP_R9
                                                                        .EXTRN  COB$CVTIQ_R8, COB$CVTIW_R8
                                                                        .EXTRN  COB$CVTTI_R8, LIB$STOP
                                                                        .EXTRN  STR$GET1_DX, STR$DUPL_CHAR
                                                                        .EXTRN  STR$FREE1_DX, STR$COPY_R
                                                                        .EXTRN  COB$$FREE_STRINGS
                                                                        .EXTRN  OTS$CVT_T_F, OTS$CVT_T_D
                                                                        .EXTRN  COB$_INVARG

                                                                        .PSECT  _COB$CODE,NOWRT,  SHR,  PIC,2

                                                  00FC 00000            .ENTRY  COB$$ACC_CONVERT, Save R2,R3,R4,R5,R6,R7     ; 1626
                                   5E          04   C2 00002            SUBL2   #4, SP                                       ;
                                               53   D4 00005            CLRL    ERROR                                        ; 1681
                                               57   D4 00007            CLRL    CONV_OK                                      ;
                                   56     04   AC   D0 00009            MOVL    STRING_DEST, R6                              ; 1692
                                   0E     02   A6   91 0000D            CMPB    2(R6), #14                                   ;
                                               0A   13 00011            BEQL    1$                                           ;
                                   0A     02   A6   91 00013            CMPB    2(R6), #10                                   ; 1693
                                               04   13 00017            BEQL    1$                                           ;
                                   0B     02   A6   91 00019            CMPB    2(R6), #11                                   ; 1694
                                               03   12 0001D 1$:        BNEQ    2$                                           ;
                                             008C   31 0001F            BRW     12$                                          ;
                                   06     18   AC   E9 00022 2$:        BLBC    YES_DEFAULT, 3$                              ; 1704
                                   50     0C   AC   D0 00026            MOVL    DEFAULT, R0                                  ; 1706
                                               04   11 0002A            BRB     4$                                           ;
                                   50     10   AC   D0 0002C 3$:        MOVL    PUT_HERE, R0                                 ; 1708
                                   50     04   A0   D0 00030 4$:        MOVL    4(R0), PUT_HERE_BUF                          ;
                                   51          01   CE 00034            MNEGL   #1, X                                        ; 1715
                                               70   11 00037            BRB     11$                                          ;
                                   52        6140   9A 00039 5$:        MOVZBL  (X)[PUT_HERE_BUF], R2                        ;
                                   30          52   91 0003D            CMPB    R2, #48                                      ; 1718
                                               05   1F 00040            BLSSU   6$                                           ;
                                   39          52   91 00042            CMPB    R2, #57                                      ;
                                               62   1B 00045            BLEQU   11$                                          ;
                                   20          52   91 00047 6$:        CMPB    R2, #32                                      ; 1720
                                               5D   13 0004A            BEQL    11$                                          ;
                                   2B          52   91 0004C            CMPB    R2, #43                                      ; 1723
                                               05   13 0004F            BEQL    7$                                           ;
                                   2D          52   91 00051            CMPB    R2, #45                                      ;
                                               2C   12 00054            BNEQ    8$                                           ;
                                               51   D5 00056 7$:        TSTL    X                                            ; 1724
                                               4F   13 00058            BEQL    11$                                          ;
                      52          14       AC  01   C3 0005A            SUBL3   #1, CHARS_READ, R2                           ;
                                   52          51   D1 0005F            CMPL    X, R2                                        ;
                                               45   13 00062            BEQL    11$                                          ;
                                   30     FF A140   91 00064            CMPB    -1(X)[PUT_HERE_BUF], #48                     ; 1731
                                               3E   1F 00069            BLSSU   11$                                          ;
                                   39     FF A140   91 0006B            CMPB    -1(X)[PUT_HERE_BUF], #57                     ; 1732
                                               37   1A 00070            BGTRU   11$                                          ;
```

```
                                30       01 A140   91 00072          CMPB    1(X)[PUT_HERE_BUF], #48              ; 1733
                                               30  1F 00077          BLSSU   11$                                  ;
                                39       01 A140   91 00079          CMPB    1(X)[PUT_HERE_BUF], #57              ; 1734
                                               29  1A 0007E          BGTRU   11$                                  ;
                                               22  11 00080          BRB     10$                                  ; 1737
                                2C             52  91 00082  8$:     CMPB    R2, #44                              ; 1741
                                               05  13 00085          BEQL    9$                                   ;
                                2E             52  91 00087          CMPB    R2, #46                              ;
                                               1D  12 0008A          BNEQ    11$                                  ;
                  52      14    AC             01  C3 0008C  9$:     SUBL3   #1, CHARS_READ, R2                   ; 1743
                                52             51  D1 00091          CMPL    X, R2                                ;
                                               13  13 00094          BEQL    11$                                  ;
                                2D       01 A140   91 00096          CMPB    1(X)[PUT_HERE_BUF], #45              ; 1750
                                               07  13 0009B          BEQL    10$                                  ;
                                20       01 A140   91 0009D          CMPB    1(X)[PUT_HERE_BUF], #32              ; 1751
                                               05  12 000A2          BNEQ    11$                                  ;
                                53             01  D0 000A4  10$:    MOVL    #1, ERROR                            ; 1754
                                               05  11 000A7          BRB     12$                                  ; 1753
                  8B            51       14    AC  F2 000A9  11$:    AOBLSS  CHARS_READ, X, 5$                    ; 1710
                                04             53  E9 000AE  12$:    BLBC    ERROR, 13$                           ; 1766
                                               57  D4 000B1          CLRL    CONV_OK                              ; 1768
                                               38  11 000B3          BRB     16$                                  ;
                  12            03       02    A6  8F 000B5  13$:    CASEB   2(R6), #3, #18                       ; 1774
        0026    0050          0050          0050      000BA  14$:    .WORD   20$-14$,-                            ;
        0065    0050          0050          0050      000C2                  20$-14$,-                            ;
        008B    0026          0026          0065      000CA                  20$-14$,-                            ;
        0035    0035          0035          0035      000D2                  15$-14$,-                            ;
                0050          0026          0035      000DA                  20$-14$,-                            ;
                                                                             20$-14$,-                            ;
                                                                             20$-14$,-                            ;
                                                                             21$-14$,-                            ;
                                                                             21$-14$,-                            ;
                                                                             15$-14$,-                            ;
                                                                             15$-14$,-                            ;
                                                                             25$-14$,-                            ;
                                                                             17$-14$,-                            ;
                                                                             17$-14$,-                            ;
                                                                             17$-14$,-                            ;
                                                                             17$-14$,-                            ;
                                                                             17$-14$,-                            ;
                                                                             15$-14$,-                            ;
                                                                             20$-14$                              ;
                                    00000000G  8F  DD 000E0  15$:    PUSHL   #COB$_INVARG                         ; 1848
                     00000000G  00             01  FB 000E6          CALLS   #1, LIB$STOP                         ;
                                               54  11 000ED  16$:    BRB     24$                                  ;
                                         08    AC  DD 000EF  17$:    PUSHL   FLAGS                                ; 1786
                                         14    AC  DD 000F2          PUSHL   CHARS_READ                           ;
                                               56  DD 000F5          PUSHL   R6                                   ;
                                05       18    AC  E9 000F7          BLBC    YES_DEFAULT, 18$                     ; 1783
                                         0C    AC  DD 000FB          PUSHL   DEFAULT                              ; 1784
                                               03  11 000FE          BRB     19$                                  ;
                                         10    AC  DD 00100  18$:    PUSHL   PUT_HERE                             ; 1785
                         0000V  CF             04  FB 00103  19$:    CALLS   #4, COB$$NUMERIC_CONV                ; 1783
                                               36  11 00108          BRB     23$                                  ;
                                7E       18    AC  7D 0010A  20$:    MOVQ    YES_DEFAULT, -(SP)                   ; 1797
                                7E       10    AC  7D 0010E          MOVQ    PUT_HERE, -(SP)                      ; 1796
                                7E       08    AC  7D 00112          MOVQ    FLAGS, -(SP)                         ;
```

```
                                       56 DD 00116         PUSHL   R6                                        ; 1795
                         0000V  CF     07 FB 00118         CALLS   #7, COB$$COMP_CONV                        ;
                                       21 11 0011D         BRB     23$                                       ;
                                0F  18 AC E9 0011F  21$:   BLBC    YES_DEFAULT, 22$                          ; 1810
                                51  0C AC D0 00123         MOVL    DEFAULT, R1                               ; 1812
                                50  10 AC D0 00127         MOVL    PUT_HERE, R0                              ; 1813
               04   B0      04  B1  14 AC 28 0012B         MOVC3   CHARS_READ, @4(R1), @4(R0)                ;
                                7E  10 AC 7D 00132  22$:   MOVQ    PUT_HERE, -(SP)                           ; 1816
                                    08 AC DD 00136         PUSHL   FLAGS                                     ; 1815
                                       56 DD 00139         PUSHL   R6                                        ;
                         0000V  CF     04 FB 0013B         CALLS   #4, COB$$FLOAT_CONV                       ;
                                57     50 D0 00140  23$:   MOVL    R0, CONV_OK                               ;
                                       31 11 00143  24$:   BRB     30$                                       ; 1774
      14   AC               66  10     00 ED 00145  25$:   CMPZV   #0, #16, (R6), CHARS_READ                 ; 1833
                                       06 15 0014B         BLEQ    26$                                       ;
                                6E  14 AC D0 0014D         MOVL    CHARS_READ, COPY_NUM                      ; 1835
                                       03 11 00151         BRB     27$                                       ;
                                6E     66 3C 00153  26$:   MOVZWL  (R6), COPY_NUM                            ; 1837
                                06  18 AC E9 00156  27$:   BLBC    YES_DEFAULT, 28$                          ; 1840
                                50  0C AC D0 0015A         MOVL    DEFAULT, R0                               ; 1841
                                       04 11 0015E         BRB     29$                                       ;
                                50  10 AC D0 00160  28$:   MOVL    PUT_HERE, R0                              ; 1842
                                    04 A0 DD 00164  29$:   PUSHL   4(R0)                                     ;
                                    04 AE 9F 00167         PUSHAB  COPY_NUM                                  ; 1839
                                       56 DD 0016A         PUSHL   R6                                        ;
                     00000000G  00     03 FB 0016C         CALLS   #3, STR$COPY_R                            ;
                                57     01 D0 00173         MOVL    #1, CONV_OK                               ; 1843
                                50     57 D0 00176  30$:   MOVL    CONV_OK, R0                               ; 1852
                                          04 00179         RET                                               ; 1853

; Routine Size:  378 bytes,    Routine Base:  _COB$CODE + 0000


;  340          1854  1
```

```
1 %SBTTL 'COB$$NUMERIC_CONV - Convert to numeric string'
1 ROUTINE COB$$NUMERIC_CONV (                           ! Scan a number and divide it up
1         ARG_DESC       :  REF BLOCK [8, BYTE],        ! The number to scan
1         STRING_DEST    :  REF BLOCK [12,BYTE],        ! Final resting place of input
1         CHARS_READ,                                   ! Number of characters read
1         FLAGS ) =                                     ! Needed for DECIMAL POINT IS COMMA
1
1 !++
1 ! FUNCTIONAL DESCRIPTION:
1 !
1 !       Convert a TEXT input string to the appropriate VAX COBOL Text
1 !       Numeric data type.  Pull off decimal point, pull off sign then
1 !       place it in the correct position for internal representation.
1 !       Do nothing about errors in this routine, return control to COB$ACC_SCR
1 !       via COB$$ACC_CONVERT.
1 !
1 ! FORMAL PARAMETERS:
1 !
1 !       ARG_DESC.rt.dx      The number to parse
1 !
1 !       STRING_DEST.mt.ds   Address of descriptor to receive the read input.
1 !
1 !       CHARS_READ.rlu.v    Number of characters accepted as input.
1 !
1 !       FLAGS.rlu.v         Screen enhancement flag;
1 !
1 ! IMPLICIT INPUTS:
1 !
1 !       NONE
1 !
1 ! IMPLICIT OUTPUTS:
1 !
1 !       NONE
1 !
1 ! ROUTINE VALUE:
1 !
1 !       1 = Conversion Success
1 !       0 = Conversion Failure
1 !
1 ! SIDE EFFECTS:
1 !
1 !       Signals COB$_INVARG if the syntax of the number is wrong.
1 !--
1
2     BEGIN
2
2     LOCAL
2         SIGN_VAL : BYTE,                              ! Holds + or - sign
2         BUF_DESC : BLOCK [8, BYTE] VOLATILE,          ! Temporary buffer
2         SIGN_SEEN    :  INITIAL (0),                  ! 1 = we have seen a + or -
2         DIGIT_SEEN   :  INITIAL (0),                  ! 1 = we have seen at least one digit
2         DOT_SEEN     :  INITIAL (0),                  ! 1 = we have seen a decimal point
2         BLANKS_SEEN :  INITIAL (0),                   ! 1 = we have seen trailing blanks
2         ZERO_SEEN    :  INITIAL (0),                  ! 1 = zero seen
2         PUTTER       :  INITIAL (0),                  ! Counts position in the output buffer
2         BUF : REF VECTOR [1100, BYTE],                ! Addresses result
2         ARG : REF VECTOR [1100, BYTE],                ! Addresses source
```

```
2           ARG_LEN,                               ! Length of the source
2           NUM_DIGITS  :  INITIAL (0),            ! Number of digits in ARG_DESC
2           LEFT_DEC    :  INITIAL (0),            ! Number of digits to left of dec pt
2           RIGHT_DEC   :  INITIAL (0),            ! Number of digits to right of dec pt
2           LEADING_ZEROES: INITIAL (0),           ! Counter of leading zeroes
2           OK_LEFT  ;                             ! Correct number of digits allowed
2                                                  ! to left of decimal point
2
2       BIND
2           ZERO = UPLIT ('0');
2
2   !+
2   ! Enable a handler to free the local string in case of an error.
2   !-
2       ENABLE
2           COB$$FREE_STRINGS (BUF_DESC);
2
2   !+
2   ! Allocate enough space to hold the digits.  It is convenient to
2   ! allocate before scanning, so we may allocate a little too much,
2   ! but the space will be freed before we return.
2   !-
2       BUF_DESC [DSC$W_LENGTH] = 0;
2       BUF_DESC [DSC$B_DTYPE] = DSC$K_DTYPE_NU;
2       BUF_DESC [DSC$B_CLASS] = DSC$K_CLASS_D;
2       BUF_DESC [DSC$A_POINTER] = 0;
2       ARG_LEN = .ARG_DESC [DSC$W_LENGTH];
2       STR$GET1_DX (%REF (.ARG_LEN + 20), BUF_DESC);
2   !+
2   !  Set pointers.
2   !-
2       BUF = .BUF_DESC [DSC$A_POINTER];
2       ARG = .ARG_DESC [DSC$A_POINTER];
2       SIGN_VAL = %C'+';
2
2   !+
2   !  Scan the input number, put result in BUF.
2   !-
2
3       IF NOT ( COB$$SCAN_INPUT ( .ARG_DESC, .CHARS_READ, .FLAGS, BUF_DESC,
3                LEFT_DEC, NUM_DIGITS, SIGN_VAL, PUTTER, LEADING_ZEROES, SIGN_SEEN,
3                          DIGIT_SEEN, DOT_SEEN, ZERO_SEEN, BLANKS_SEEN ) )
2       THEN
2           RETURN 0 ;
2
2   !+
2   !  Now ensure that a number of the form 1.0000 has the trailing
2   !  zeroes stripped off.
2   !-
2       IF .DOT_SEEN
2       THEN
3           BEGIN
3             LOCAL
3               X;
3
3           X = .PUTTER - 1;
3           IF .X NEQ 0
```

```
3           THEN
4               BEGIN
4               WHILE .BUF[.X] EQL %C'0' DO
5                   BEGIN                               ! Throw out trailing
5                   NUM_DIGITS = .NUM_DIGITS - 1;       ! zeroes after dec pt.
5                   IF .X EQL 0
5                   THEN
6                       BEGIN                           ! Get here if all digits
6                       DIGIT_SEEN = 0;                 ! after decimal point
6                       DOT_SEEN = 0;                   ! are zeroes, and zeroes
6                       EXITLOOP;                       ! are the only digits in
5                       END;                            ! the string (eg. .0000)
5                   X = .X - 1;
4                 END;
3               END;
2           END;
2
2 !+
2 !  NOTE: Call to COB$$ZERO_FILL was originally done here, however because
2 !        VAX RPG wants an illegal string returned in its original state,
2 !        it was necessary to be more selective about where and when to
2 !        call COB$$ZERO_FILL.
2 !-
2
2 !+
2 ! If there are no digits, or only leading zeros, take the number to
2 ! be zero.  Don't be too gullible, however.
2 !-
3     IF ( NOT .DIGIT_SEEN)
2     THEN
3         BEGIN
3
4         IF (.SIGN_SEEN OR .DOT_SEEN OR .BLANKS_SEEN) AND (.ZERO_SEEN EQL 0)
3         THEN RETURN 0 ;
3
3         !+
3         !  Fill STRING_DEST with zeroes
3         !-
3
3         COB$$ZERO_FILL ( .STRING_DEST ) ;
3         RETURN 1 ;
3
3         END
3
3 !+
3 !  Validate size of entered data, left and right of decimal point.
3 !  If everything is OK, copy the input string to STRING_DEST with
3 !  the sign set up correctly.
3 !  Return if DEFAULT is being converted (there will never be a decimal point
3 !  in the DEFAULT parameter)
3 !-
2     ELSE
3         BEGIN
3
3         LOCAL
3             DEST_PTR ,                                ! Pointer where result will go in destination
3             DIGITS_IN_STRING ,                        ! Number of digits in destination string
```

```
;     3                 DEST_LENGTH ,                               ! Destination length
;     3                 LENGTH_DIFF ;                               ! Difference between number of digits
;     3                                                             ! to the left of the decimal point
;     3                                                             ! in the number typed in and the dest
;     3
;     3         LITERAL
;     3                 POSOP = 16,                                 ! Number to add to make overpunched +
;     3                 NEGOP = 25,                                 ! Number to add to make overpunched -
;     3                 POSZEROP = 123,                             ! +0 overpunched
;     3                 NEGZEROP = 125;                             ! -0 overpunched
;     3
;     3
;     4         IF NOT (.DOT_SEEN)                                  ! No dec pt. therefore
;     3         THEN LEFT_DEC = .NUM_DIGITS ;                       ! all digits are left_dec
;     3         RIGHT_DEC = .NUM_DIGITS - .LEFT_DEC ;
;     3
;     3         DEST_LENGTH = .STRING_DEST [DSC$W_LENGTH];
;     3
;     3         SELECTONE .STRING_DEST [DSC$B_CLASS] OF
;     3                 SET
;     3
;     3                 [ DSC$K_CLASS_S ] :
;     3
;     4                     BEGIN
;     4
;     4                     !+
;     4                     ! If a decimal point was typed in, all the digits after it
;     4                     ! MUST be zeroes.
;     4                     !-
;     4
;     4                     IF .RIGHT_DEC GTR 0
;     4                     THEN
;     4                         INCR I FROM (.PUTTER - .RIGHT_DEC) TO .PUTTER DO
;     4                             IF .BUF[.I] NEQ %C'0'
;     4                             THEN RETURN 0;
;     4
;     4                     !+
;     4                     ! If the number of digits typed in is less than the number of
;     4                     ! digits in the destination string, then a pointer must be
;     4                     ! set up here so that the typed in digits get moved to the
;     4                     ! correct place in the destination.
;     4                     !-
;     4
;     4                     DIGITS_IN_STRING =
;     5                             (IF (.STRING_DEST [DSC$B_DTYPE] EQL DSC$K_DTYPE_NL) OR
;     6                                 (.STRING_DEST [DSC$B_DTYPE] EQL DSC$K_DTYPE_NR)
;     5                              THEN .DEST_LENGTH - 1
;     4                              ELSE .DEST_LENGTH );
;     4                     IF .LEFT_DEC GTR .DIGITS_IN_STRING
;     4                     THEN RETURN 0;                          ! Data entered too bit
;     4
;     4                     STR$DUPL_CHAR (.STRING_DEST, DEST_LENGTH, ZERO);! Zero the destination
;     4                     LENGTH_DIFF = .DIGITS_IN_STRING - .LEFT_DEC;
;     4                     IF .LENGTH_DIFF GTR 0
;     4                     THEN
;     4                         DEST_PTR = .STRING_DEST [DSC$A_POINTER] + .LENGTH_DIFF
;     4                     ELSE
```

```
4               DEST_PTR = .STRING_DEST [DSC$A_POINTER];
4
3           END ;
3
3       [ DSC$K_CLASS_SD ] :
3
4           BEGIN
4           !+
4           !  All code for "P" data types are in lowercase.
4           !-
4
4           LOCAL
4               ok_right,
4               LENGTH_DIFF2;                       ! Difference between number of digits
4                                                   ! to the right of the decimal point
4                                                   ! in the typed in number and the dest
4
4           dest_length = .string_dest[dsc$b_digits];
4
4           !+
4           ! This is checking for the P Picture of 99PP.
4           ! If the scale is positive and the number of digits in the
4           ! number equal the scale factor, then simply copy the digits
4           ! in BUF to the destination descriptor.
4           !-
4
4           if .string_dest[dsc$b_scale] gtr 0
4           then
5               begin
5
5               local
5                   tot_digits,
5                   diff;
5
6               if ((.right_dec gtr 0) or (.num_digits gtr (.string_dest[dsc$b_digits] + .string_dest[ds
5               then                                ! number too large
5                   return 0;                       ! re-prompt - error
5
5               if .num_digits leq .string_dest[dsc$b_scale]
5               then
5
5               !+
5               ! Zero out the destination field using the digits as the proper
5               ! number of zero fill characters, rather than using the length
5               ! as found in the descriptor, since class SD is a special case.
5               !-
6                   begin
6                   str$dupl_char (.string_dest, dest_length, zero);
6                   return 1;                       ! answer is zero
5                   end ;
5
5               if .leading_zeroes neq 0
5               then
6                   begin
6
6                   diff = (.string_dest[dsc$b_digits]+.string_dest[dsc$b_scale]) - .num_digits;
6                   dest_ptr = .string_dest[dsc$a_pointer]+.diff;
```

```
                        end
                    else
                        begin

                        diff = .num_digits - .string_dest[dsc$b_scale];
                        if .diff eql .string_dest[dsc$b_digits]
                        then
                            dest_ptr = .string_dest[dsc$a_pointer]
                        else
                            begin

                            tot_digits = (.string_dest[dsc$b_digits] + .string_dest[dsc$b_scale]) - .num_dig
                            dest_ptr = .string_dest[dsc$a_pointer]+.tot_digits;

                            end;

                        num_digits = .diff;

                        end;

                    end
                else
                    begin

                    OK_LEFT = .STRING_DEST [DSC$B_DIGITS] + .STRING_DEST [DSC$B_SCALE] ;
                    if .ok_left lss 0
                    then
                        !+
                        ! Here we have a P Picture field of type PP99.
                        ! We know this when OK_LEFT is less than zero.
                        ! It requires some special casing.
                        !-
                        begin

                        local
                            diff,
                            diff2,
                            ptr,
                            buf_ptr;

                        if .left_dec gtr 0              ! error no '.' entered
                        then                            ! ring bell and reprompt
                            return 0;

                        ok_left = 0;
                        ok_right = abs(.string_dest[dsc$b_scale]);
                        if .right_dec gtr .ok_right
                        then
                            return 0;

                        !+
                        ! This handles case where the number of digits
                        ! entered is less than the absolute value of the
                        ! scale factor, meaning that the number returned
                        ! would have to be zero.  The first part of the
                        ! if statement takes care of the case where the
```

```
;  6     ! number of digits entered equals the number of
;  6     ! digits expected taking into account if the absolute
;  6     ! value of the scale factor is equal to the number
;  6     ! of digits entered to the right of the decimal point
;  6     ! thereby giving us a result of zero again.
;  6     !-
;  6
;  7     diff = (abs(.string_dest[dsc$b_scale]) -
;  6                     .string_dest[dsc$b_digits]);     ! Number of Placeholders in picture
;  7     if ((.right_dec eql .string_dest[dsc$b_digits]) and
;  6     (.right_dec eql .diff)) OR
;  7     (.right_dec leq .diff)
;  6     then
;  7         begin
;  7         str$dupl_char (.string_dest, dest_length, zero);
;  7         return 1;                       ! done - answer is zero
;  6         end ;
;  6
;  6     buf_ptr = .buf_desc [dsc$a_pointer] + .diff;
;  6     diff = .num_digits - .diff;       ! Number of digits minus placeholders
;  6     ch$move (.diff, .buf_ptr, .buf_desc[dsc$a_pointer]);
;  6     diff2 = .string_dest[dsc$b_digits] - .diff;     ! Number of digits to zero fill
;  6     ptr = .buf_desc[dsc$a_pointer] + .diff;
;  6     incr i from 0 to .diff2 - 1 do
;  6         ch$move (1, zero, .ptr + .i);
;  6
;  6     dest_ptr = .string_dest[dsc$a_pointer];
;  6     num_digits = .string_dest[dsc$b_digits] ;       ! should only reflect number of digi
;  6
;  6     end
;  5 else
;  6     begin
;  6
;  6     LENGTH_DIFF = .OK_LEFT - .LEFT_DEC;
;  6     LENGTH_DIFF2 = (.STRING_DEST [DSC$B_DIGITS] - .OK_LEFT) - .RIGHT_DEC;
;  7     IF ( .LENGTH_DIFF LSS 0) OR ( .LENGTH_DIFF2 LSS 0)
;  6     THEN
;  6         RETURN 0 ;                      ! Data entered too big
;  6
;  6     !+
;  6     ! If the number of digits to the left of the decimal
;  6     ! point of the number typed in is less than what
;  6     ! should be in the destination string, then a pointer
;  6     ! must be set up here so that the typed in digits get
;  6     ! moved to the correct place in the destination.
;  6     !-
;  6     IF .LENGTH_DIFF GTR 0
;  6     THEN
;  6         DEST_PTR = .STRING_DEST [DSC$A_POINTER] + .LENGTH_DIFF
;  6     ELSE
;  6         DEST_PTR = .STRING_DEST [DSC$A_POINTER];
;  6
;  6     !+
;  6     ! If the number of digits to the right of the decimal
;  6     ! point of the number typed in is less than what
;  6     ! should be in the destination string, then the typed
;  6     ! in number must be padded with trailing zeroes so that
```

```
                        ! sign placement can be done correctly.
                        !-
                        IF .LENGTH_DIFF2 GTR 0
                        THEN
                            BEGIN

                            LOCAL
                                PTR;                    ! Pointer into input buffer
                                                        !  past the digits that were typed in

                            PTR = .BUF_DESC [DSC$A_POINTER] + .NUM_DIGITS - 1;
                            NUM_DIGITS = .NUM_DIGITS + .LENGTH_DIFF2;

                            DO
                                BEGIN

                                LOCAL
                                    PTR2;               ! Loop pointer

                                PTR2 = .PTR + .LENGTH_DIFF2;
                                CH$MOVE (1, ZERO, .PTR2);
                                LENGTH_DIFF2 = .LENGTH_DIFF2 - 1;

                                END
                            UNTIL .LENGTH_DIFF2 EQL 0;

                            END;

                        end;
                    end;
                END ;

            [ OTHERWISE ] :

                LIB$STOP ( COB$_INVARG ) ;

            TES ;

        !+
        ! Fill STRING_DEST with zeroes.
        ! If everything is OK, copy the input string to STRING_DEST with
        ! the sign set up correctly.
        !-

        COB$$ZERO_FILL ( .STRING_DEST ) ;

        CASE .STRING_DEST [DSC$B_DTYPE] FROM DSC$K_DTYPE_NU TO DSC$K_DTYPE_NRO
            OF
            SET

            [DSC$K_DTYPE_NU]:                           ! Numeric unsigned
                !+
                ! Simply ignore a sign if it was part of the input
                ! string.
                !-
                CH$MOVE (.NUM_DIGITS, .BUF_DESC [DSC$A_POINTER], .DEST_PTR);

```

```
3               [DSC$K_DTYPE_NL]:                          ! Numeric left separate
3
4                   BEGIN
4
4                   CH$MOVE (1, SIGN_VAL, .STRING_DEST [DSC$A_POINTER]);
4                   CH$MOVE (.NUM_DIGITS, .BUF_DESC [DSC$A_POINTER], .DEST_PTR + 1);
4
3                   END;
3
3               [DSC$K_DTYPE_NR]:                          ! Numeric right separate
3
4                   BEGIN
4
4                   BUF [.NUM_DIGITS] = .SIGN_VAL;
4                   CH$MOVE (.NUM_DIGITS + 1, .BUF_DESC [DSC$A_POINTER], .DEST_PTR);
4
3                   END;
3
3               [DSC$K_DTYPE_NLO]:                         ! Numeric left overpunched
3
4                   BEGIN
4                   LOCAL
4                       FIRST_TWO    : VECTOR [2, BYTE],   ! To be compared with
4                                                          ! first two bytes of STRING_DEST
4                       FIRST_DIGIT  :  BYTE ;             ! First digit and overpunch sign
4
4                   FIRST_TWO [0] = %X'7B' ;               ! Positive overpunched 0
4                   FIRST_TWO [1] = %X'30' ;               ! Regular 0
4
4                   !+
4                   !  First byte of initial state STRING_DEST is always 7B,
4                   !  therefore have to look at first two bytes.
4                   !-
4
4                   CH$MOVE (.NUM_DIGITS, .BUF_DESC [DSC$A_POINTER], .DEST_PTR) ;
4                   IF CH$EQL (2, .STRING_DEST [DSC$A_POINTER], 2, FIRST_TWO )
4
4                   THEN
4                       FIRST_DIGIT =
5                           ( IF .SIGN_VAL EQL %C'+'
5                             THEN POSZEROP
5                             ELSE NEGZEROP )
4                   ELSE
4                       !+
4                       !  Special treatment needed when .NUM_DIGITS is less
4                       !  than total # STRING_DEST can hold.
4                       !  For example :  S99V99 - input 3.00 ->
4                       !  First two bytes of STRING_DEST now hold '7B' and '33',
4                       !  but want POSZEROP not POSOP as POSOP will result in wrong
4                       !  number 33.00.
4                       !-
4                       IF .NUM_DIGITS LSS .STRING_DEST [DSC$W_LENGTH]
4                       THEN
4                           FIRST_DIGIT =
5                               ( IF .SIGN_VAL EQL %C'+'
5                                     THEN POSZEROP
5                                     ELSE NEGZEROP )
```

```
; 4                          ELSE
; 4                              FIRST_DIGIT =
; 4                                  !+
; 4                                  !   Add whatever necessary to a regular hex number
; 4                                  !   to put it in overpunch format.  Have to special
; 4                                  !   case zero.
; 4                                  !-
; 5                                  ( IF .SIGN_VAL EQL %C'+'
; 5                                    THEN
; 5                                        IF .BUF [0] EQL %C'0'
; 5                                        THEN POSZEROP
; 5                                        ELSE .BUF [0] + POSOP
; 5                                    ELSE
; 5                                        IF .BUF [0] EQL %C'0'
; 5                                        THEN NEGZEROP
; 4                                        ELSE .BUF [0] + NEGOP );
; 4
; 4                      CH$MOVE (1, FIRST_DIGIT, .STRING_DEST [DSC$A_POINTER] ) ;
; 4
; 3                      END;
; 3
; 3                  [DSC$K_DTYPE_NRO]:                           ! Numeric right overpunched
; 3
; 4                      BEGIN
; 4                      !+
; 4                      !   Add whatever necessary to a regular hex number
; 4                      !   to put it in overpunch format.  Have to special
; 4                      !   case zero.
; 4                      !-
; 4
; 4                      IF .BUF [.NUM_DIGITS - 1] EQL %C'0'
; 4                      THEN
; 4                          BUF [.NUM_DIGITS - 1] =
; 5                              ( IF .SIGN_VAL EQL %C'+'
; 5                                THEN POSZEROP
; 5                                ELSE NEGZEROP )
; 4                      ELSE
; 4                          BUF [.NUM_DIGITS - 1] =
; 5                              ( IF .SIGN_VAL EQL %C'+'
; 5                                THEN .BUF [.NUM_DIGITS - 1] + POSOP
; 4                                ELSE .BUF [.NUM_DIGITS - 1] + NEGOP );
; 4
; 4                      CH$MOVE (.NUM_DIGITS, .BUF_DESC [DSC$A_POINTER], .DEST_PTR);
; 4
; 3                      END;
; 3
; 3                  TES;
; 3
; 2              END ;
; 2
; 2      !+
; 2      ! Free local string
; 2      !-
; 2          STR$FREE1_DX (BUF_DESC);
; 2          RETURN 1 ;
; 1          END;                                     ! end of COB$$NUMERIC_CONV
```

```
                                            0017A          .BLKB    2
                           00  00  00  30   0017C P.AAA:   .ASCII   \0\<0><0><0>                                  ;

                                                  ZERO=             P.AAA


                                      0FFC 00000 COB$$NUMERIC_CONV:
                                                           .WORD    Save R2,R3,R4,R5,R6,R7,R8,R9,R10,R11          ; 1856
                       5B        F7   AF   9E 00002        MOVAB    ZERO, R11                                     ;
                       5E             3C   C2 00006        SUBL2    #60, SP                                       ;
                                 10   AE   7C 00009        CLRQ     DIGIT_SEEN                                    ; 1899
                                 04   AE   D4 0000C        CLRL     BLANKS_SEEN                                   ;
                                 08   AE   7C 0000F        CLRQ     ZERO_SEEN                                     ;
                                 24   AE   7C 00012        CLRQ     NUM_DIGITS                                    ;
                                      52   D4 00015        CLRL     RIGHT_DEC                                     ;
                                 18   AE   7C 00017        CLRQ     LEADING_ZEROES                                ;
                                 34   AE   7C 0001A        CLRQ     BUF_DESC                                      ;
                       6D      0327   CF   DE 0001D        MOVAL    63$, (FP)                                     ;
                                 34   AE   B4 00022        CLRW     BUF_DESC                                      ; 1934
                  36   AE             0F   90 00025        MOVB     #15, BUF_DESC+2                               ; 1935
                  37   AE             02   90 00029        MOVB     #2, BUF_DESC+3                                ; 1936
                                 38   AE   D4 0002D        CLRL     BUF_DESC+4                                    ; 1937
                       53        04   AC   D0 00030        MOVL     ARG_DESC, R3                                  ; 1938
                       50             63   3C 00034        MOVZWL   (R3), ARG_LEN                                 ;
                                 34   AE   9F 00037        PUSHAB   BUF_DESC                                      ; 1939
                  04   AE        14   A0   9E 0003A        MOVAB    20(R0), 4(SP)                                 ;
                                 04   AE   9F 0003F        PUSHAB   4(SP)                                         ;
           00000000G   00             02   FB 00042        CALLS    #2, STR$GET1_DX                               ;
                       59        38   AE   D0 00049        MOVL     BUF_DESC+4, BUF                               ; 1943
                       50        04   A3   D0 0004D        MOVL     4(R3), ARG                                    ; 1944
                  20   AE             2B   90 00051        MOVB     #43, SIGN_VAL                                 ; 1945
                                 04   AE   9F 00055        PUSHAB   BLANKS_SEEN                                   ; 1951
                                 0C   AE   9F 00058        PUSHAB   ZERO_SEEN                                     ;
                                 14   AE   9F 0005B        PUSHAB   DOT_SEEN                                      ;
                                 1C   AE   9F 0005E        PUSHAB   DIGIT_SEEN                                    ;
                                 24   AE   9F 00061        PUSHAB   SIGN_SEEN                                     ;
                                 2C   AE   9F 00064        PUSHAB   LEADING_ZEROES                                ;
                                 34   AE   9F 00067        PUSHAB   PUTTER                                        ;
                                 3C   AE   9F 0006A        PUSHAB   SIGN_VAL                                      ;
                                 44   AE   9F 0006D        PUSHAB   NUM_DIGITS                                    ;
                                 4C   AE   9F 00070        PUSHAB   LEFT_DEC                                      ;
                                 5C   AE   9F 00073        PUSHAB   BUF_DESC                                      ;
                       7E        0C   AC   7D 00076        MOVQ     CHARS_READ, -(SP)                             ;
                                      53   DD 0007A        PUSHL    R3                                            ;
               0000V   CF             0E   FB 0007C        CALLS    #14, COB$$SCAN_INPUT                          ;
                       03             50   E8 00081        BLBS     R0, 2$                                        ;
                                    02BE   31 00084 1$:    BRW      62$                                           ;
                       1D        0C   AE   E9 00087 2$:    BLBC     DOT_SEEN, 5$                                  ; 1961
         50       1C   AE             01   C3 0008B        SUBL3    #1, PUTTER, X                                 ; 1967
                                      16   13 00090        BEQL     5$                                            ; 1968
                       30           6049   91 00092 3$:    CMPB     (X)[BUF], #48                                 ; 1971
                                      10   12 00096        BNEQ     5$                                            ;
                                 24   AE   D7 00098        DECL     NUM_DIGITS                                    ; 1973
                                      50   D5 0009B        TSTL     X                                             ; 1974
                                      05   12 0009D        BNEQ     4$                                            ;
```

```
                                0C    AE  7C 0009F         CLRQ     DOT_SEEN                                  ; 1978
                                      04  11 000A2         BRB      5$                                        ; 1976
                                      50  D7 000A4  4$:    DECL     X                                         ; 1981
                                      EA  11 000A6         BRB      3$                                        ; 1971
                          56    08    AC  D0 000A8  5$:    MOVL     STRING_DEST, R6                           ; 2008
                          1B    10    AE  E8 000AC         BLBS     DIGIT_SEEN, 8$                            ; 1997
                          08    14    AE  E8 000B0         BLBS     SIGN_SEEN, 6$                             ; 2001
                          04    0C    AE  E8 000B4         BLBS     DOT_SEEN, 6$                              ;
                          05    04    AE  E9 000B8         BLBC     BLANKS_SEEN, 7$                           ;
                                08    AE  D5 000BC  6$:    TSTL     ZERO_SEEN                                 ;
                                      C3  13 000BF         BEQL     1$                                        ;
                                      56  DD 000C1  7$:    PUSHL    R6                                        ; 2008
                 0000V    CF          01  FB 000C3         CALLS    #1, COB$$ZERO_FILL                        ;
                                    0276  31 000C8         BRW      61$                                       ; 2009
                          05    0C    AE  E8 000CB  8$:    BLBS     DOT_SEEN, 9$                              ; 2038
                  28      AE    24    AE  D0 000CF         MOVL     NUM_DIGITS, LEFT_DEC                      ; 2039
                          55    24    AE  D0 000D4  9$:    MOVL     NUM_DIGITS, R5                            ; 2040
                          57    28    AE  D0 000D8         MOVL     LEFT_DEC, R7                              ;
        52                55          57  C3 000DC         SUBL3    R7, R5, RIGHT_DEC                         ;
                  2C      AE          66  3C 000E0         MOVZWL   (R6), DEST_LENGTH                         ; 2042
                          50    03    A6  9A 000E4         MOVZBL   3(R6), R0                                 ; 2044
                          01          50  91 000E8         CMPB     R0, #1                                    ; 2047
                                      54  12 000EB         BNEQ     17$                                       ;
                                      52  D5 000ED         TSTL     RIGHT_DEC                                 ; 2056
                                      14  15 000EF         BLEQ     12$                                       ;
        50        1C      AE          52  C3 000F1         SUBL3    RIGHT_DEC, PUTTER, R0                     ; 2058
                                      50  D7 000F6         DECL     I                                         ; 2059
                                      06  11 000F8         BRB      11$                                       ;
                          30        6049  91 000FA  10$:   CMPB     (I)[BUF], #48                             ;
                                      84  12 000FE         BNEQ     1$                                        ;
        F5                50    1C    AE  F3 00100  11$:   AOBLEQ   PUTTER, I, 10$                            ;
                          10    02    A6  91 00105  12$:   CMPB     2(R6), #16                                ; 2070
                                      06  13 00109         BEQL     13$                                       ;
                          12    02    A6  91 0010B         CMPB     2(R6), #18                                ; 2071
                                      07  12 0010F         BNEQ     14$                                       ;
        53        2C      AE          01  C3 00111  13$:   SUBL3    #1, DEST_LENGTH, DIGITS_IN_STRING         ; 2072
                                      04  11 00116         BRB      15$                                       ;
                          53    2C    AE  D0 00118  14$:   MOVL     DEST_LENGTH, DIGITS_IN_STRING             ; 2073
                          53          57  D1 0011C  15$:   CMPL     R7, DIGITS_IN_STRING                      ; 2074
                                      45  14 0011F         BGTR     19$                                       ;
                                      5B  DD 00121         PUSHL    R11                                       ; 2077
                                30    AE  9F 00123         PUSHAB   DEST_LENGTH                               ;
                                      56  DD 00126         PUSHL    R6                                        ;
             00000000G    00          03  FB 00128         CALLS    #3, STR$DUPL_CHAR                         ;
                          53          57  C2 0012F         SUBL2    R7, LENGTH_DIFF                           ; 2078
                                      07  15 00132         BLEQ     16$                                       ; 2079
        58                53    04    A6  C1 00134         ADDL3    4(R6), LENGTH_DIFF, DEST_PTR              ; 2081
                                      77  11 00139         BRB      23$                                       ;
                          58    04    A6  D0 0013B  16$:   MOVL     4(R6), DEST_PTR                           ; 2083
                                      71  11 0013F         BRB      23$                                       ; 2044
                          09          50  91 00141  17$:   CMPB     R0, #9                                    ; 2087
                                      03  13 00144         BEQL     18$                                       ;
                                    011B  31 00146         BRW      39$                                       ;
                          54    09    A6  9A 00149  18$:   MOVZBL   9(R6), R4                                 ; 2100
                  2C      AE          54  D0 0014D         MOVL     R4, DEST_LENGTH                           ;
                          5A    04    A6  9E 00151         MOVAB    4(R6), R10                                ; 2139
                          58    08    A6  98 00155         CVTBL    8(R6), R8                                 ; 2109
```

```
                                   59 15 00159          BLEQ    24$                                   ;
                                   52 D5 0015B          TSTL    RIGHT_DEC                             ; 2117
                                   6F 14 0015D          BGTR    26$                                   ;
          50             54        58 C1 0015F          ADDL3   R8, R4, R0                            ;
                         50        55 D1 00163          CMPL    R5, R0                                ;
                                   66 14 00166 19$:     BGTR    26$                                   ;
                         58        55 D1 00168          CMPL    R5, R8                                ; 2121
                                   79 15 0016B          BLEQ    30$                                   ;
                              18   AE D5 0016D          TSTL    LEADING_ZEROES                        ; 2134
                                   15 13 00170          BEQL    20$                                   ;
                         51   09   A6 9A 00172          MOVZBL  9(R6), R1                             ; 2138
                         50   08   A6 98 00176          CVTBL   8(R6), R0                             ;
                         51        50 C0 0017A          ADDL2   R0, R1                                ;
          50             51        55 C3 0017D          SUBL3   R5, R1, DIFF                          ;
          58             6A        50 C1 00181          ADDL3   DIFF, (R10), DEST_PTR                 ; 2139
                                   2B 11 00185          BRB     23$                                   ; 2134
                         50   08   A6 98 00187 20$:     CVTBL   8(R6), DIFF                           ; 2145
          50             55        50 C3 0018B          SUBL3   DIFF, R5, DIFF                        ;
50   09   A6             08        00 ED 0018F          CMPZV   #0, #8, 9(R6), DIFF                   ; 2146
                                   05 12 00195          BNEQ    21$                                   ;
                         58        6A D0 00197          MOVL    (R10), DEST_PTR                       ; 2148
                                   12 11 0019A          BRB     22$                                   ;
                         51   09   A6 9A 0019C 21$:     MOVZBL  9(R6), R1                             ; 2152
                         53   08   A6 98 001A0          CVTBL   8(R6), R3                             ;
                         51        53 C0 001A4          ADDL2   R3, R1                                ;
                         51        55 C2 001A7          SUBL2   R5, TOT_DIGITS                        ;
          58             6A        51 C1 001AA          ADDL3   TOT_DIGITS, (R10), DEST_PTR           ; 2153
                    24   AE        50 D0 001AE 22$:     MOVL    DIFF, NUM_DIGITS                      ; 2157
                                   72 11 001B2 23$:     BRB     34$                                   ; 2109
          50             54        58 C1 001B4 24$:     ADDL3   R8, R4, OK_LEFT                       ; 2165
                                   6E 18 001B8          BGEQ    35$                                   ; 2166
                                   57 D5 001BA          TSTL    R7                                    ; 2181
                                   10 14 001BC          BGTR    26$                                   ;
                                   50 D4 001BE          CLRL    OK_LEFT                               ; 2185
                         50        58 D0 001C0          MOVL    R8, R0                                ; 2186
                                   03 18 001C3          BGEQ    25$                                   ;
                         50        50 CE 001C5          MNEGL   R0, R0                                ;
                         51        50 D0 001C8 25$:     MOVL    R0, OK_RIGHT                          ;
                         51        52 D1 001CB          CMPL    RIGHT_DEC, OK_RIGHT                   ; 2187
                                   03 15 001CE 26$:     BLEQ    28$                                   ;
                                 0172 31 001D0 27$:     BRW     62$                                   ;
          57             50        54 C3 001D3 28$:     SUBL3   R4, R0, DIFF                          ; 2205
                         54        52 D1 001D7          CMPL    RIGHT_DEC, R4                         ; 2206
                                   05 12 001DA          BNEQ    29$                                   ;
                         57        52 D1 001DC          CMPL    RIGHT_DEC, DIFF                       ; 2207
                                   05 13 001DF          BEQL    30$                                   ;
                         57        52 D1 001E1 29$:     CMPL    RIGHT_DEC, DIFF                       ; 2208
                                   11 14 001E4          BGTR    31$                                   ;
                                   5B DD 001E6 30$:     PUSHL   R11                                   ; 2211
                              30   AE 9F 001E8          PUSHAB  DEST_LENGTH                           ;
                                   56 DD 001EB          PUSHL   R6                                    ;
             00000000G   00        03 FB 001ED          CALLS   #3, STR$DUPL_CHAR                     ;
                                 014A 31 001F4          BRW     61$                                   ; 2212
          50             57   38   AE C1 001F7 31$:     ADDL3   BUF_DESC+4, DIFF, BUF_PTR             ; 2215
          57             55        57 C3 001FC          SUBL3   DIFF, R5, DIFF                        ; 2216
     38   BE             60        57 28 00200          MOVC3   DIFF, (BUF_PTR), @BUF_DESC+4          ; 2217
                         52   09   A6 9A 00205          MOVZBL  9(R6), DIFF2                          ; 2218
```

```
                                                                  J 14
COB$ACCECV        COB$ACCECV - ACCEPT Conversion routines        15-Sep-1984 23:49:06    VAX-11 Bliss-32 V4.0-742            Page  24
1-001             COB$$NUMERIC_CONV - Convert to numeric string  14-Sep-1984 12:10:22    [COBRTL.SRC]COBACCECV.B32;1          (4)

                         52            57  C2 00209        SUBL2    DIFF, DIFF2                          ;
            50           57      38    AE  C1 0020C        ADDL3    BUF_DESC+4, DIFF, PTR                ; 2219
                         51            01  CE 00211        MNEGL    #1, I                                ; 2221
                                       04  11 00214        BRB      33$                                  ;
                       6140            6B  90 00216  32$:  MOVB     ZERO, (I)[PTR]                       ;
            F8           51            52  F2 0021A  33$:  AOBLSS   DIFF2, I, 32$                        ;
                         58            6A  D0 0021E        MOVL     (R10), DEST_PTR                      ; 2223
                   24    AE      09    A6  9A 00221        MOVZBL   9(R6), NUM_DIGITS                    ; 2224
                                       49  11 00226  34$:  BRB      40$                                  ; 2166
            53           50            57  C3 00228  35$:  SUBL3    R7, OK_LEFT, LENGTH_DIFF             ; 2230
                         54            50  C2 0022C        SUBL2    OK_LEFT, R4                          ; 2231
            51           54            52  C3 0022F        SUBL3    RIGHT_DEC, R4, LENGTH_DIFF2          ;
                                       53  D5 00233        TSTL     LENGTH_DIFF                          ; 2232
                                       99  19 00235        BLSS     27$                                  ;
                                       51  D5 00237        TSTL     LENGTH_DIFF2                         ;
                                       95  19 00239        BLSS     27$                                  ;
                                       53  D5 0023B        TSTL     LENGTH_DIFF                          ; 2243
                                       06  15 0023D        BLEQ     36$                                  ;
            58           6A            53  C1 0023F        ADDL3    LENGTH_DIFF, (R10), DEST_PTR         ; 2245
                                       03  11 00243        BRB      37$                                  ;
                         58            6A  D0 00245  36$:  MOVL     (R10), DEST_PTR                      ; 2247
                                       51  D5 00248  37$:  TSTL     LENGTH_DIFF2                         ; 2256
                                       25  15 0024A        BLEQ     40$                                  ;
            50           55      38    AE  C1 0024C        ADDL3    BUF_DESC+4, R5, R0                   ; 2264
                                       50  D7 00251        DECL     PTR                                  ;
                   24    AE            51  C0 00253        ADDL2    LENGTH_DIFF2, NUM_DIGITS             ; 2265
            52           50            51  C1 00257  38$:  ADDL3    LENGTH_DIFF2, PTR, PTR2              ; 2273
                         62            6B  90 0025B        MOVB     ZERO, (PTR2)                         ; 2274
                                       51  D7 0025E        DECL     LENGTH_DIFF2                         ; 2275
                                       F5  12 00260        BNEQ     38$                                  ; 2278
                                       0D  11 00262        BRB      40$                                  ; 2044
                          000000000G   8F  DD 00264  39$:  PUSHL    #COB$_INVARG                         ; 2288
               000000000G  00          01  FB 0026A        CALLS    #1, LIB$STOP                         ;
                                       56  DD 00271  40$:  PUSHL    R6                                   ; 2298
                   0000V  CF           01  FB 00273        CALLS    #1, COB$$ZERO_FILL                   ;
                         57      24    AE  D0 00278        MOVL     NUM_DIGITS, R7                       ; 2309
            04           0F      02    A6  8F 0027C        CASEB    2(R6), #15, #4                       ; 2300
 001A       002A       000D          00B1     00281  41$:  .WORD    59$-41$,-                            ;
                                     007E     00289                 42$-41$,-                            ;
                                                                    44$-41$,-                            ;
                                                                    43$-41$,-                            ;
                                                                    54$-41$                              ;
                                     00A4  31 0028B        BRW      59$                                  ; 2309
                   04    B6      20    AE  90 0028E  42$:  MOVB     SIGN_VAL, @4(R6)                     ; 2315
       01   A8     38    BE            57  28 00293        MOVC3    R7, @BUF_DESC+4, 1(DEST_PTR)         ; 2316
                                       62  11 00299        BRB      53$                                  ; 2300
                       6749      20    AE  90 0029B  43$:  MOVB     SIGN_VAL, (R7)[BUF]                  ; 2324
                         50      01    A7  9E 002A0        MOVAB    1(R7), R0                            ; 2325
            68     38    BE            50  28 002A4        MOVC3    R0, @BUF_DESC+4, (DEST_PTR)          ;
                                       52  11 002A9        BRB      53$                                  ; 2300
                   30    AE    307B    8F  B0 002AB  44$:  MOVW     #12411, FIRST_TWO                    ; 2337
            68     38    BE            57  28 002B1        MOVC3    R7, @BUF_DESC+4, (DEST_PTR)          ; 2345
                   30    AE      04    B6  B1 002B6        CMPW     @4(R6), FIRST_TWO                    ; 2346
                                       07  13 002BB        BEQL     45$                                  ;
  57        66           10            00  ED 002BD        CMPZV    #0, #16, (R6), R7                    ; 2362
                                       08  15 002C2        BLEQ     46$                                  ;
                         2B      20    AE  91 002C4  45$:  CMPB     SIGN_VAL, #43                        ; 2365
```

```
                                      20  12 002C8          BNEQ    50$                                  ;
                                      0B  11 002CA          BRB     47$                                  ;
                       2B       20    AE  91 002CC 46$:     CMPB    SIGN_VAL, #43                        ; 2375
                                      13  12 002D0          BNEQ    49$                                  ;
                       30             69  91 002D2          CMPB    (BUF), #48                           ; 2377
                                      06  12 002D5          BNEQ    48$                                  ;
                       50       7B    8F  9A 002D7 47$:     MOVZBL  #123, R0                             ;
                                      19  11 002DB          BRB     52$                                  ;
                       50             69  9A 002DD 48$:     MOVZBL  (BUF), R0                            ; 2379
                       50             10  C0 002E0          ADDL2   #16, R0                              ;
                                      11  11 002E3          BRB     52$                                  ; 2377
                       30             69  91 002E5 49$:     CMPB    (BUF), #48                           ; 2381
                                      06  12 002E8          BNEQ    51$                                  ;
                       50       7D    8F  9A 002EA 50$:     MOVZBL  #125, R0                             ;
                                      06  11 002EE          BRB     52$                                  ;
                       50             69  9A 002F0 51$:     MOVZBL  (BUF), R0                            ; 2383
                       50             19  C0 002F3          ADDL2   #25, R0                              ;
                       51             50  90 002F6 52$:     MOVB    R0, FIRST_DIGIT                      ; 2375
                 04    B6             51  90 002F9          MOVB    FIRST_DIGIT, @4(R6)                  ; 2385
                                      38  11 002FD 53$:     BRB     60$                                  ; 2300
                       50       FF A749  9E 002FF 54$:      MOVAB   -1(R7)[BUF], R0                      ; 2398
                       30             60  91 00304          CMPB    (R0), #48                            ;
                                      12  12 00307          BNEQ    56$                                  ;
                       2B       20    AE  91 00309          CMPB    SIGN_VAL, #43                        ; 2401
                                      06  12 0030D          BNEQ    55$                                  ;
                       51       7B    8F  9A 0030F          MOVZBL  #123, R1                             ;
                                      1A  11 00313          BRB     58$                                  ;
                       51       7D    8F  9A 00315 55$:     MOVZBL  #125, R1                             ;
                                      14  11 00319          BRB     58$                                  ;
                       2B       20        91 0031B 56$:     CMPB    SIGN_VAL, #43                        ; 2406
                                      08  12 0031F          BNEQ    57$                                  ;
                       51             60  9A 00321          MOVZBL  (R0), R1                             ; 2407
                       51             10  C0 00324          ADDL2   #16, R1                              ;
                                      06  11 00327          BRB     58$                                  ;
                       51             60  9A 00329 57$:     MOVZBL  (R0), R1                             ; 2408
                       51             19  C0 0032C          ADDL2   #25, R1                              ;
                       60             51  90 0032F 58$:     MOVB    R1, (R0)                             ; 2406
       68        38    BE             57  28 00332 59$:     MOVC3   R7, @BUF_DESC+4, (DEST_PTR)          ; 2410
                                34    AE  9F 00337 60$:     PUSHAB  BUF_DESC                             ; 2421
            00000000G  00             01  FB 0033A          CALLS   #1, STR$FREE1_DX                     ;
                       50             01  D0 00341 61$:     MOVL    #1, R0                               ; 2422
                                      04 00344              RET                                          ;
                                      50  D4 00345 62$:     CLRL    R0                                   ; 2423
                                      04 00347              RET                                          ;
                                    0000 00348 63$:         .WORD   Save nothing                         ; 1899
                       50       08    AC  D0 0034A          MOVL    8(AP), R0                            ;
                       50       04    A0  D0 0034E          MOVL    4(R0), R0                            ;
                                F8    A0  9F 00352          PUSHAB  BUF_DESC                             ;
                                      01  DD 00355          PUSHL   #1                                   ;
                                      5E  DD 00357          PUSHL   SP                                   ;
                       7E       04    AC  7D 00359          MOVQ    4(AP), -(SP)                         ;
            00000000G  00             03  FB 0035D          CALLS   #3, COB$$FREE_STRINGS                ;
                                      04 00364              RET                                          ;

; Routine Size:  869 bytes,    Routine Base:  _COB$CODE + 0180
```

```
1 %SBTTL 'COB$$FLOAT_CONV - Convert to Floating Point'
1 ROUTINE COB$$FLOAT_CONV (STRING_DEST   :  REF $STR$DESCRIPTOR,
1                                               ! Final destination for input chars
1                         FLAGS,                ! Enhancement flag
1                         PUT_HERE     :  REF BLOCK [8, BYTE],
1                                               ! Contains input characters
1                         CHARS_READ            ! # of input characters
1                        ) =
1
1 !++
1 ! FUNCTIONAL DESCRIPTION:
1 !
1 !       Convert TEXT input string to Floating or Double Floating Point.
1 !       Do nothing about errors in this routine, return control to calling
1 !       routine.
1 !
1 ! FORMAL PARAMETERS:
1 !
1 !       STRING_DEST.mt.ds   Address of descriptor to receive the read input.
1 !
1 !       FLAGS.rlu.v     Screen enhancement flag;
1 !
1 !       PUT_HERE.rt.dx  Buffer to hold input characters.
1 !
1 !       CHARS_READ.rlu.v   Number of characters accepted as input.
1 !
1 ! IMPLICIT INPUTS:
1 !
1 !       NONE
1 !
1 ! IMPLICIT OUTPUTS:
1 !
1 !       NONE
1 !
1 ! ROUTINE VALUE:
1 !
1 !       1 = Conversion Success
1 !       0 = Conversion Failure
1 !
1 ! SIDE EFFECTS:
1 !
1 !       Signals COB$_INVARG if the syntax of the number is wrong,
1 !--
1
2    BEGIN
2        LOCAL
2            CONV_OK  :  INITIAL (0) ;                   ! Conversion flag
2                                                        ! =0 error, =1 no error
2    LABEL
2        FLOAT_PROCESSOR ;
2
2        FLOAT_PROCESSOR:
3                    BEGIN
3                        LOCAL
3                            TEMP_PUT_HERE   :  BLOCK [12,BYTE] VOLATILE ;
3                                               ! Temporary buffer with length
3                                               ! reflecting number of chars read
```

```
3   LITERAL
3       ONLY_E_ALLOWED = 15 ;           ! Bit 0 - blanks are ignored
3                                       ! Bit 1 - only E or e for exp
3                                       ! Bit 2 - underflow is an error
3                                       ! Bit 3 - do not round
3   BIND
3       COMMA = UPLIT (','),
3       DOT = UPLIT ('.');
3
3   !+
3   ! Pick appropriate conversion routine based on
3   ! data type.
3   !-
4   BIND ROUTINE CVTTX = (
4           IF .STRING_DEST [DSC$B_DTYPE] EQL DSC$K_DTYPE_F
4           THEN OTS$CVT_T_F
4
4           ELSE IF .STRING_DEST [DSC$B_DTYPE] EQL DSC$K_DTYPE_D
4           THEN OTS$CVT_T_D
3           ELSE 0 );
3
3   !+
3   !  Make TEMP_PUT_HERE a fixed length descriptor -
3   !  don't need STR$GET1_DX or STR$FREE1_DX.
3   !-
3   TEMP_PUT_HERE [DSC$W_LENGTH]  = .CHARS_READ ;
3   TEMP_PUT_HERE [DSC$B_DTYPE]   = DSC$K_DTYPE_NL ;
3   TEMP_PUT_HERE [DSC$B_CLASS]   = DSC$K_CLASS_S ;
3   TEMP_PUT_HERE [DSC$A_POINTER] = .PUT_HERE [DSC$A_POINTER] ;
3
3   !+
3   ! If DECIMAL POINT IS COMMA is set and a comma came in,
3   ! must change it to a decimal point before the convert.
3   ! OTS$ routines expect a decimal point.
3   ! Also must not allow a dec pt as input in that case.
3   !-
3   IF (.FLAGS AND V_DEC_PT) NEQ 0
3   THEN
4       BEGIN
4
4       INCR PTR FROM 0 TO (.CHARS_READ - 1) DO
5           BEGIN
5
5           IF CH$EQL (1,.TEMP_PUT_HERE [DSC$A_POINTER] + .PTR,
5                   1, DOT)
5           THEN
6               BEGIN
6
6               CONV_OK = 0;            ! Illegal, looking
6               LEAVE FLOAT_PROCESSOR;  ! for a comma
6
5               END;
5
5           IF CH$EQL (1, .TEMP_PUT_HERE [DSC$A_POINTER] + .PTR,
5                   1, COMMA)
5           THEN
5               CH$MOVE (1, DOT, .TEMP_PUT_HERE [DSC$A_POINTER] + .PTR);
```

```
4                                   END;
4                               END
4                           !+
4                           ! If DECIMAL POINT IS COMMA is NOT set and a comma
4                           ! came in, this is a conversion error
4                           !-
3                           ELSE
4                               BEGIN
4
4                               INCR PTR FROM 0 TO (.CHARS_READ - 1) DO
5                                   BEGIN
5
5                                   IF CH$EQL (1,.TEMP_PUT_HERE [DSC$A_POINTER] + .PTR,
5                                              1, COMMA)
5                                   THEN
6                                       BEGIN
6
6                                       CONV_OK = 0;           ! Illegal, looking
6                                       LEAVE FLOAT_PROCESSOR; ! for a decimal pt
6
5                                       END;
4                                   END ;
3                               END ;
3
3                           !+
3                           ! Check that input data is not out of range.
3                           !-
4                           BEGIN
4                               LOCAL
4                                   MAX ;   ! Maximum significant digits allowed
4
5                           MAX = ( IF .STRING_DEST [DSC$B_DTYPE] EQL DSC$K_DTYPE_F
5                                   THEN 7                      ! Floating
4                                   ELSE 16 ) ;                 ! Double Floating
4
4                           CONV_OK = COB$$VERIFY_FL_RANGE ( TEMP_PUT_HERE, .CHARS_READ,
4                                                                           .MAX ) ;
4                           IF .CONV_OK
4                           THEN
5                               BEGIN
5                               !+
5                               ! Convert to float or double.
5                               !-
6                               IF NOT ( CVTTX ( TEMP_PUT_HERE,
6                                           .STRING_DEST[DSC$A_POINTER],
6                                           0, 0, ONLY_E_ALLOWED ) )
5                               THEN CONV_OK = 0                ! Conversion error
5                               ELSE
5                                   CONV_OK = 1 ;               ! No error
4                               END ;
3                           END ;
2                       END ;
2
2       RETURN .CONV_OK ;
1       END ;                                                   ! End of COB$$FLOAT_CONV
```

```
                                            004E5             .BLKB    3
                            00  00  00  2C  004E8 P.AAB:      .ASCII   \,\<0><0><0>                                    ;
                            00  00  00  2E  004EC P.AAC:      .ASCII   \.\<0><0><0>                                    ;

                                                  COMMA=               P.AAB
                                                  DOT=                 P.AAC


                                       007C 00000 COB$$FLOAT_CONV:
                                                              .WORD    Save R2,R3,R4,R5,R6                             ; 2425
                      56        F7    AF  9E 00002            MOVAB    DOT, R6                                         ;
                      5E              0C  C2 00006            SUBL2    #12, SP                                         ;
                                      53  D4 00009            CLRL     CONV_OK                                         ; 2468
                      52        04    AC  D0 0000B            MOVL     STRING_DEST, R2                                 ; 2495
                                      54  D4 0000F            CLRL     R4                                              ;
                      0A        02    A2  91 00011            CMPB     2(R2), #10                                      ;
                                      0B  12 00015            BNEQ     1$                                              ;
                                      54  D6 00017            INCL     R4                                              ;
                      50 00000000G    00  9E 00019            MOVAB    OTS$CVT_T_F, R0                                 ;
                                      11  11 00020            BRB      3$                                              ;
                      0B        02    A2  91 00022 1$:        CMPB     2(R2), #11                                      ; 2498
                                      09  12 00026            BNEQ     2$                                              ;
                      50 00000000G    00  9E 00028            MOVAB    OTS$CVT_T_D, R0                                 ;
                                      02  11 0002F            BRB      3$                                              ;
                                      50  D4 00031 2$:        CLRL     R0                                              ;
                      55              50  D0 00033 3$:        MOVL     R0, R5                                          ;
                      6E        10    AC  B0 00036            MOVW     CHARS_READ, TEMP_PUT_HERE                       ; 2506
                02    AE              10  90 0003A            MOVB     #16, TEMP_PUT_HERE+2                            ; 2507
                03    AE              01  90 0003E            MOVB     #1, TEMP_PUT_HERE+3                             ; 2508
                      50        0C    AC  D0 00042            MOVL     PUT_HERE, R0                                    ; 2509
                04    AE        04    A0  D0 00046            MOVL     4(R0), TEMP_PUT_HERE+4                          ;
        51      10    AC              01  C3 0004B            SUBL3    #1, CHARS_READ, R1                              ; 2521
        1F      08    AC              06  E1 00050            BBC      #6, FLAGS, 6$                                   ; 2517
                      50              01  CE 00055            MNEGL    #1, PTR                                         ; 2524
                                      14  11 00058            BRB      5$                                              ;
                      66        04  BE40  91 0005A 4$:        CMPB     @TEMP_PUT_HERE+4[PTR], DOT                      ;
                                      52  13 0005F            BEQL     12$                                             ;
                FC    A6        04  BE40  91 00061            CMPB     @TEMP_PUT_HERE+4[PTR], COMMA                    ; 2534
                                      05  12 00067            BNEQ     5$                                              ;
                04  BE40              66  90 00069            MOVB     DOT, @TEMP_PUT_HERE+4[PTR]                      ; 2537
        E8            50              51  F3 0006E 5$:        AOBLEQ   R1, PTR, 4$                                     ; 2521
                                      11  11 00072            BRB      9$                                              ; 2517
                      50              01  CE 00074 6$:        MNEGL    #1, PTR                                         ; 2547
                                      08  11 00077            BRB      8$                                              ;
                FC    A6        04  BE40  91 00079 7$:        CMPB     @TEMP_PUT_HERE+4[PTR], COMMA                    ; 2550
                                      32  13 0007F            BEQL     12$                                             ;
        F4            50              51  F3 00081 8$:        AOBLEQ   R1, PTR, 7$                                     ; 2547
                      05              54  E9 00085 9$:        BLBC     R4, 10$                                         ; 2569
                      50              07  D0 00088            MOVL     #7, MAX                                         ;
                                      03  11 0008B            BRB      11$                                             ;
                      50              10  D0 0008D 10$:       MOVL     #16, MAX                                        ;
                                      50  DD 00090 11$:       PUSHL    MAX                                             ; 2574
                                10    AC  DD 00092            PUSHL    CHARS_READ                                      ; 2573
                                08    AE  9F 00095            PUSHAB   TEMP_PUT_HERE                                   ;
            0000V     CF              03  FB 00098            CALLS    #3, COB$$VERIFY_FL_RANGE                        ;
                      53              50  D0 0009D            MOVL     R0, CONV_OK                                     ;
                17          53  E9 000A0            BLBC    CONV_OK, 14$                        ; 2575
                            0F  DD 000A3            PUSHL   #15                                 ; 2581
                            7E  7C 000A5            CLRQ    -(SP)                               ;
                       04   A2  DD 000A7            PUSHL   4(R2)                               ; 2582
                       10   AE  9F 000AA            PUSHAB  TEMP_PUT_HERE                       ; 2581
                65          05  FB 000AD            CALLS   #5, (R5)                            ;
                04          50  E8 000B0            BLBS    R0, 13$                             ;
                            53  D4 000B3 12$:       CLRL    CONV_OK                             ; 2584
                            03  11 000B5            BRB     14$                                 ;
                53          01  D0 000B7 13$:       MOVL    #1, CONV_OK                         ; 2586
                50          53  D0 000BA 14$:       MOVL    CONV_OK, R0                         ; 2591
                                04 000BD            RET                                         ; 2592

; Routine Size:  190 bytes,    Routine Base:  _COB$CODE + 04F0
```

```
1 %SBTTL 'COB$$COMP_CONV - Convert to COMP and COMP3'
1 ROUTINE COB$$COMP_CONV (STRING_DEST  :  REF $STR$DESCRIPTOR,
1                                               ! Final destination for input chars
1                         FLAGS,                ! Enhancement flag
1                         DEFAULT      :  REF $STR$DESCRIPTOR,
1                         PUT_HERE     :  REF BLOCK [8, BYTE],
1                                               ! Contains input characters
1                         CHARS_READ,           ! # of input characters
1                         YES_DEFAULT,          ! =1 if DEFAULT value is used
1                         YES_SIGN              ! =1 if sign should be included
1                        ) =
1
1 !++
1 ! FUNCTIONAL DESCRIPTION:
1 !
1 !       Convert TEXT input string to appropriate VAX COBOL COMP or COMP3
1 !       data type.
1 !       Do nothing about errors in this routine, return control to calling
1 !       routine.
1 !
1 ! FORMAL PARAMETERS:
1 !
1 !       STRING_DEST.mt.ds   Address of descriptor to receive the read input.
1 !
1 !       FLAGS.rlu.v     Screen enhancement flag;
1 !
1 !       DEFAULT.rt.dx   Default source moved to destination descriptor
1 !                       (STRING_DEST) in the event of null input.
1 !
1 !       PUT_HERE.rt.dx  Buffer to hold input characters.
1 !
1 !       CHARS_READ.rlu.v   Number of characters accepted as input.
1 !
1 !       YES_DEFAULT.rlu.v  Flag = 1 if DEFAULT used because of null input.
1 !
1 !       YES_SIGN.rlu.v  Flag = 1 if sign should be included in COMP or COMP3
1 !                       data type.
1 !
1 ! IMPLICIT INPUTS:
1 !
1 !       NONE
1 !
1 ! IMPLICIT OUTPUTS:
1 !
1 !       NONE
1 !
1 ! ROUTINE VALUE:
1 !
1 !       1 = Conversion Success
1 !       0 = Conversion Failure
1 !
1 ! SIDE EFFECTS:
1 !
1 !       Signals COB$_INVARG if the syntax of the number is wrong.
1 !--
1
2    BEGIN
```

```
2       LOCAL
2           CONV_OK  :  INITIAL (0) ;                     ! Conversion flag,
2                                                         ! =0 error, =1 no error
3                       BEGIN
3
3                       LOCAL
3                           EXPONENT: INITIAL (0),        ! Exponent for the CIT
3                           I_VALUE: VECTOR[12, BYTE],    ! COBOL intermediate temporary
3                           SIGN: BYTE,                   ! Sign of the input string
3                           SEND_CHARS_READ;              ! Local to hold .CHARS_READ
3
3                       !+
3                       !  COB$$STRIP_BLANKS_SIGN may change the value of
3                       !  SEND_CHARS_READ therefore it is important to send
3                       !  this local instead of CHARS_READ (which should NEVER
3                       !  be altered).
3                       !-
3                       SEND_CHARS_READ = .CHARS_READ ;
3
3                       !+
3                       ! First must strip off leading and trailing blanks and
3                       ! the sign because COB$CVTTI won't accept them.
3                       !-
3                       IF .YES_DEFAULT
3                       THEN
3                           !+
3                           !  This move must be done because STRIP routine
3                           !  writes back into the 1st parameter and DEFAULT
3                           !  is read-only.
3                           !-
3                           CH$MOVE (.CHARS_READ, .DEFAULT [DSC$A_POINTER],
3                                   .PUT_HERE [DSC$A_POINTER]);
3
3                       CONV_OK = COB$$STRIP_BLANKS_SIGN (.PUT_HERE, .STRING_DEST,
3                                   SEND_CHARS_READ, EXPONENT, SIGN, .FLAGS);
3                       IF .CONV_OK
3                       THEN
3                           !+
3                           ! Convert the stripped input string to CIT.
3                           ! Must do convert to CIT, THEN to destination data
3                           ! type because these COBOL conversion routines take
3                           ! into account the scale factor.
3                           !-
3                           CONV_OK = COB$CVTTI_R8 (.SEND_CHARS_READ,
3                               .PUT_HERE [DSC$A_POINTER], I_VALUE);
3
3                       IF .CONV_OK
3                       THEN
4                           BEGIN
4
4                           LOCAL
4                               SCALE;
4
4                           !+
4                           ! Pick the appropriate conversion routine based
4                           ! on data type.  Note that routines have the
4                           ! same linkage.  At this point we can be sure that
```

```
4        ! we are dealing with one of these six data types.
4        !-
5        BIND ROUTINE CVTIX = (
5            IF .STRING_DEST [DSC$B_DTYPE] EQL DSC$K_DTYPE_W
5            THEN COB$CVTIW_R8
5
5            ELSE IF .STRING_DEST [DSC$B_DTYPE] EQL DSC$K_DTYPE_WU
5            THEN COB$CVTIW_R8
5
5            ELSE IF .STRING_DEST [DSC$B_DTYPE] EQL DSC$K_DTYPE_L
5            THEN COB$CVTIL_R8
5
5            ELSE IF .STRING_DEST [DSC$B_DTYPE] EQL DSC$K_DTYPE_LU
5            THEN COB$CVTIL_R8
5
5            ELSE IF .STRING_DEST [DSC$B_DTYPE] EQL DSC$K_DTYPE_Q
5            THEN COB$CVTIQ_R8
5
5            ELSE IF .STRING_DEST [DSC$B_DTYPE] EQL DSC$K_DTYPE_QU
5            THEN COB$CVTIQ_R8
4            ELSE 0) : JSB_678 ;
4
4        !+
4        ! First must re-insert the sign in the CIT.
4        ! The sign of the CIT is contained in byte 12
4        ! (see appendix C of the RTL Ref Manual for a
4        ! description of the CIT).  'C' means + and 'D'
4        ! means -.  COB$CVTTI always returns a positive
4        ! number, so if the input number was really
4        ! negative, must make the sign byte negative.
4        ! Check to see if sign should be included.
4        !-
4        IF .SIGN EQL %C'-' AND .YES_SIGN
4        THEN
4                I_VALUE[11] = .I_VALUE[11] + 1;
4
4        !+
4        ! Next must insert the exponent in the CIT.
4        ! The first word of the CIT contains the exponent.
4        !-
4        CH$MOVE (2, EXPONENT, I_VALUE);
4
4        !+
4        ! Convert from CIT to destination data type taking
4        ! into account the scale factor.
4        !-
5        SCALE = ( IF .STRING_DEST [DSC$B_CLASS] EQL DSC$K_CLASS_SD
5                  THEN -.STRING_DEST [DSC$B_SCALE]
4                  ELSE 0 );
4
5        CONV_OK = ( IF CVTIX EQL 0
5                    THEN
5                        !+
5                        ! Packed
5                        !-
5                        COB$CVTIP_R9 (.SCALE, I_VALUE,
5                            .STRING_DEST [DSC$W_LENGTH], .STRING_DEST [DSC$A_POINTER])
; 1253          2764  5                                       ELSE
; 1254          2765  5                                           !+
; 1255          2766  5                                           ! Integer types
; 1256          2767  5                                           !-
; 1257          2768  4                                           CVTIX (.SCALE, I_VALUE, .STRING_DEST [DSC$A_POINTER]) ) ;
; 1258          2769  3                               END;
; 1259          2770  2                           END ;
; 1260          2771  2
; 1261          2772  2         RETURN .CONV_OK ;
; 1262          2773  1         END ;                                                     ! End of COB$$COMP_CONV



                                                 0FFC 00000 COB$$COMP_CONV:
                                                            .WORD   Save R2,R3,R4,R5,R6,R7,R8,R9,R10,R11                   ; 2594
                               5E          18    C2 00002   SUBL2   #24, SP                                                ;
                                           5B    D4 00005   CLRL    CONV_OK                                                ; 2649
                                     04    AE    D4 00007   CLRL    EXPONENT                                               ; 2653
                         08    AE    14    AC    D0 0000A   MOVL    CHARS_READ, SEND_CHARS_READ                            ; 2667
                               0F    18    AC    E9 0000F   BLBC    YES_DEFAULT, 1$                                        ; 2673
                               51    0C    AC    D0 00013   MOVL    DEFAULT, R1                                            ; 2680
                               50    10    AC    D0 00017   MOVL    PUT_HERE, R0                                           ; 2681
          04    B0       04    B1    14    AC    28 0001B   MOVC3   CHARS_READ, @4(R1), @4(R0)                             ;
                                     08    AC    DD 00022 1$:    PUSHL   FLAGS                                          ; 2684
                                     04    AE    9F 00025   PUSHAB  SIGN                                                   ; 2683
                                     0C    AE    9F 00028   PUSHAB  EXPONENT                                               ;
                                     14    AE    9F 0002B   PUSHAB  SEND_CHARS_READ                                        ;
                               5A    04    AC    D0 0002E   MOVL    STRING_DEST, R10                                       ;
                                           5A    DD 00032   PUSHL   R10                                                    ;
                               52    10    AC    D0 00034   MOVL    PUT_HERE, R2                                           ;
                                           52    DD 00038   PUSHL   R2                                                     ;
                         0000V CF          06    FB 0003A   CALLS   #6, COB$$STRIP_BLANKS_SIGN                             ;
                               5B          50    D0 0003F   MOVL    R0, CONV_OK                                            ;
                               15          5B    E9 00042   BLBC    CONV_OK, 2$                                            ; 2685
                               58    0C    AE    9E 00045   MOVAB   I_VALUE, R8                                            ; 2693
                               57    04    A2    D0 00049   MOVL    4(R2), R7                                              ;
                               56    08    AE    D0 0004D   MOVL    SEND_CHARS_READ, R6                                    ;
                                  00000000G 00   16 00051   JSB     COB$CVTTI_R8                                           ;
                               5B          50    D0 00057   MOVL    R0, CONV_OK                                            ;
                               03          5B    E8 0005A 2$:    BLBS    CONV_OK, 3$                                    ; 2696
                                         009D    31 0005D   BRW     18$                                                    ;
                               50    02    AA    9A 00060 3$:    MOVZBL  2(R10), R0                                     ; 2710
                               07          50    91 00064   CMPB    R0, #7                                                 ;
                                           09    12 00067   BNEQ    4$                                                     ;
                               51 00000000G 00   9E 00069   MOVAB   COB$CVTIW_R8, R1                                       ;
                                           45    11 00070   BRB     12$                                                    ;
                               03          50    91 00072 4$:    CMPB    R0, #3                                         ; 2713
                                           09    12 00075   BNEQ    5$                                                     ;
                               51 00000000G 00   9E 00077   MOVAB   COB$CVTIW_R8, R1                                       ;
                                           1F    11 0007E   BRB     8$                                                     ;
                               08          50    91 00080 5$:    CMPB    R0, #8                                         ; 2716
                                           09    12 00083   BNEQ    7$                                                     ;
                               51 00000000G 00   9E 00085 6$:    MOVAB   COB$CVTIL_R8, R1                               ;
                                           11    11 0008C   BRB     8$                                                     ;
                               04          50    91 0008E 7$:    CMPB    R0, #4                                         ; 2719
```

```
                                   F2  13 00091          BEQL    6$                                       ;
                   09              50  91 00093          CMPB    R0, #9                                   ; 2722
                                   0C  12 00096          BNEQ    9$                                       ;
                   51 00000000G    00  9E 00098          MOVAB   COB$CVTIQ_R8, R1                         ;
                   50              51  D0 0009F  8$:     MOVL    R1, R0                                   ;
                                   10  11 000A2          BRB     11$                                      ;
                   05              50  91 000A4  9$:     CMPB    R0, #5                                   ; 2725
                                   09  12 000A7          BNEQ    10$                                      ;
                   50 00000000G    00  9E 000A9          MOVAB   COB$CVTIQ_R8, R0                         ;
                                   02  11 000B0          BRB     11$                                      ;
                                   50  D4 000B2  10$:    CLRL    R0                                       ;
                   51              50  D0 000B4  11$:    MOVL    R0, R1                                   ; 2713
                   2D              6E  91 000B7  12$:    CMPB    SIGN, #45                                ; 2739
                                   07  12 000BA          BNEQ    13$                                      ;
                   03         1C   AC  E9 000BC          BLBC    YES_SIGN, 13$                            ;
                              17   AE  96 000C0          INCB    I_VALUE+11                               ; 2741
            0C     AE         04   AE  B0 000C3  13$:    MOVW    EXPONENT, I_VALUE                        ; 2747
                   09         03   AA  91 000C8          CMPB    3(R10), #9                               ; 2753
                                   09  12 000CC          BNEQ    14$                                      ;
                   56         08   AA  98 000CE          CVTBL   8(R10), SCALE                            ; 2754
                   56              56  CE 000D2          MNEGL   SCALE, SCALE                             ;
                                   02  11 000D5          BRB     15$                                      ;
                                   56  D4 000D7  14$:    CLRL    SCALE                                    ; 2753
                                   51  D5 000D9  15$:    TSTL    R1                                       ; 2757
                                   13  12 000DB          BNEQ    16$                                      ;
                   57         0C   AE  9E 000DD          MOVAB   I_VALUE, R7                              ; 2762
                   59         04   AA  D0 000E1          MOVL    4(R10), R9                               ;
                   58              6A  3C 000E5          MOVZWL  (R10), R8                                ;
                      00000000G    00  16 000E8          JSB     COB$CVTIP_R9                             ;
                                   0A  11 000EE          BRB     17$                                      ;
                   57         0C   AE  9E 000F0  16$:    MOVAB   I_VALUE, R7                              ; 2768
                   58         04   AA  D0 000F4          MOVL    4(R10), R8                               ;
                                   61  16 000F8          JSB     (R1)                                     ;
                   5B              50  D0 000FA  17$:    MOVL    R0, CONV_OK                              ;
                   50              5B  D0 000FD  18$:    MOVL    CONV_OK, R0                              ; 2772
                                       04 00100          RET                                              ; 2773

; Routine Size:  257 bytes,    Routine Base:  _COB$CODE + 05AE
```

```
1 %SBTTL 'COB$$STRIP_BLANKS_SIGN - Pull blanks and sign'
1 ROUTINE COB$$STRIP_BLANKS_SIGN (                         ! Strip blanks and sign from
1                                                          ! input numeric string
1         INPUT_STRING     : REF $STR$DESCRIPTOR,          ! Numeric string to scan
1         STRING_DEST      : REF $STR$DESCRIPTOR,          ! Destination string
1         NUM_DIGITS,                                      ! Number of characters read
1                                                          ! Will contain the number of
1                                                          ! chars after the stripping
1         EXPONENT,                                        ! Will contain the exponent
1         SIGN_VAL         : REF BLOCK [,BYTE],            ! Will contain the sign char
1         FLAGS    ) =                                     ! Needed for COMMA verification
1
1 !++
1 ! FUNCTIONAL DESCRIPTION:
1 !
1 !       Strips leading and trailing blanks from the input numeric string.
1 !       Puts the remaining string back and adjusts the number of digits
1 !       accordingly.  Also strips off the sign char and puts it into the
1 !       output parameter SIGN_VAL.
1 !       Strips the decimal point and figures out the exponent.
1 !       Does nothing about errors in this routine, returns control to
1 !       calling routine.
1 !
1 ! FORMAL PARAMETERS:
1 !
1 !       INPUT_STRING.rt.dx      The numeric string to scan
1 !       STRING_DESC.rt.dx       The destination string
1 !       NUM_DIGITS.ml.r         As input, its the number of chars read
1 !                               As output, its the number of chars after
1 !                               the stripping
1 !       EXPONENT.wl.r           The exponent
1 !       SIGN_VAL.wb.r           The sign character
1 !
1 ! IMPLICIT INPUTS:
1 !
1 !       NONE
1 !
1 ! IMPLICIT OUTPUTS:
1 !
1 !       NONE
1 !
1 ! ROUTINE VALUE:
1 !
1 !       0 = failure, 1 = success
1 !
1 ! SIDE EFFECTS:
1 !
1 !       NONE
1 !--
1
2   BEGIN
2
2   LOCAL
2       TEMP_NUM_DIGITS : INITIAL (0),          ! Tally of stripped number of digits
2       BUF_DESC : BLOCK [8, BYTE] VOLATILE,    ! Temporary buffer
2       SIGN_SEEN : INITIAL (0),                ! 1 = we have seen a + or -
2       DIGIT_SEEN : INITIAL (0),               ! 1 = we have seen at least one digit
```

```
              DOT_SEEN : INITIAL (0),                ! 1 = we have seen a decimal point
              ZERO_SEEN   :  INITIAL (0),            ! 1 = zero seen
              BLANKS_SEEN : INITIAL (0),             ! 1 = we have seen trailing blanks
              PUTTER : INITIAL (0),                  ! Counts position in the output buffer
              LEFT_DEC : INITIAL (0),                ! Number of digits to left of dec. pt.
              PDATA_FLAG: INITIAL (0),               ! Flag to indicate if a P Picture item
              BUF : REF VECTOR [1100, BYTE],         ! Addresses result
              INP : REF VECTOR [1100, BYTE],         ! Addresses result in input_string
              LEADING_ZEROES:INITIAL (0),            ! Counter of leading zeroes
              ARG : REF VECTOR [1100, BYTE];         ! Addresses source

          LITERAL
              SUCCESS = 1,
              FAILURE = 0;

         BIND
              ZERO = UPLIT ('0');
      !+
      ! Enable a handler to free the local string in case of an error.
      !-

          ENABLE
              COB$$FREE_STRINGS (BUF_DESC);

      !+
      ! If there were no digits input, it means that a <CR> was hit.
      !-
          IF ..NUM_DIGITS EQL 0
          THEN
              RETURN SUCCESS;

      !+
      ! Allocate enough space to hold the digits.  It is convenient to
      ! allocate before scanning, so we may allocate a little too much,
      ! but the space will be freed before we return.
      !-
          BUF_DESC [DSC$W_LENGTH] = 0;
          BUF_DESC [DSC$B_DTYPE] = DSC$K_DTYPE_NU;
          BUF_DESC [DSC$B_CLASS] = DSC$K_CLASS_D;
          BUF_DESC [DSC$A_POINTER] = 0;
          STR$GET1_DX (.NUM_DIGITS, BUF_DESC);

      !+
      !  Set pointers.
      !-
          BUF = .BUF_DESC [DSC$A_POINTER];
          ARG = .INPUT_STRING [DSC$A_POINTER];
          .SIGN_VAL = %C'+';

      !+
      !  Scan the input number, put result in BUF.
      !-

          IF NOT ( COB$$SCAN_INPUT ( .INPUT_STRING, ..NUM_DIGITS, .FLAGS, BUF_DESC,
                              LEFT_DEC, TEMP_NUM_DIGITS, .SIGN_VAL, PUTTER,
                              LEADING_ZEROES, SIGN_SEEN, DIGIT_SEEN, DOT_SEEN,
                              ZERO_SEEN, BLANKS_SEEN ) )
```

```
2           THEN
2               RETURN 0 ;
2
2       !+
2       ! If there are no digits, or only leading zeros, take the number to
2       ! be zero.  Don't be too gullible, however.
2       !-
3           IF ( NOT .DIGIT_SEEN)
2           THEN
3               BEGIN
3
4               IF (.SIGN_SEEN OR .DOT_SEEN OR .BLANKS_SEEN) AND (.ZERO_SEEN EQL 0)
3               THEN RETURN FAILURE ;
3
3               BUF [.PUTTER] = %C'0' ;
3               PUTTER = .PUTTER + 1 ;
3               TEMP_NUM_DIGITS = .TEMP_NUM_DIGITS + 1;
3
3               END
3
3       !+
3       !  Validate size of entered data, left and right of decimal point.
3       !-
2           ELSE
3               BEGIN
3
3               LOCAL
3                   DEST_LENGTH ,                               ! Destination length
3                   OK_LEFT ,                                   ! Correct number of digits allowed
3                                                               ! to left of decimal point
3                   RIGHT_DEC    :  INITIAL (0) ;               ! Number of digits to right of dec pt
3
3
4               IF NOT (.DOT_SEEN)                              ! No dec pt. therefore
3               THEN LEFT_DEC = .TEMP_NUM_DIGITS ;              ! all digits are left_dec
3               RIGHT_DEC = .TEMP_NUM_DIGITS - .LEFT_DEC ;
3               !+
3               ! Strip trailing zeroes after the decimal point.
3               !-
3               INCR GETTER FROM 1 TO .RIGHT_DEC DO
3                   IF .BUF [.TEMP_NUM_DIGITS - .GETTER] EQL %C'0'
3                   THEN
3                       RIGHT_DEC = .RIGHT_DEC - 1
3                   ELSE
3                       EXITLOOP;
3
3
3               DEST_LENGTH = .STRING_DEST [DSC$W_LENGTH];
3
3               SELECTONE .STRING_DEST [DSC$B_CLASS] OF
3                   SET
3
3                   [ DSC$K_CLASS_S ] :
3
4                       BEGIN
4
4                       !+
'          ! If a decimal point was typed in, all the digits after it
4          ! MUST be zeroes.
4          !-
4
4          IF .RIGHT_DEC GTR 0
4          THEN
4              INCR I FROM (.PUTTER - .RIGHT_DEC) TO .PUTTER DO
4                  IF .BUF[.I] NEQ %C'0'
4                  THEN RETURN FAILURE;
4
4          IF .LEFT_DEC GTR .DEST_LENGTH
4          THEN RETURN FAILURE;                    ! Data entered too big
4
3          END ;
3
3        [ DSC$K_CLASS_SD ] :
3
4          BEGIN
4
4          LOCAL
4              LENGTH_DIFF,                        ! Difference between number of digits
4                                                  !  to the left of the decimal point
4                                                  !  in the typed in number and the dest
4              LENGTH_DIFF2;                       ! Difference between number of digits
4                                                  !  to the right of the decimal point
4                                                  !  in the typed in number and the dest
4          !+
4          ! This is checking for the P Picture of 99PP.
4          ! If the scale is positive and the number of digits in the
4          ! number equal the scale factor, then simply copy the digits
4          ! in BUF to the destination descriptor.
4          ! NOTE: Code for P Picture left in lowercase.
4          !-
4          if .string_dest[dsc$b_scale] gtr 0
4          then
5              begin
5
5              local
5                  tot_digits,
5                  diff;
5
5              tot_digits = (.string_dest[dsc$b_digits] + .string_dest[dsc$b_scale]);
6              if ((.right_dec gtr 0) or (.temp_num_digits gtr .tot_digits))
5              then                                ! number too large
5                  return 0;                       ! re-prompt - error
5
5              if .temp_num_digits leq .string_dest[dsc$b_scale]
5              then
6                  begin
6
6                  str$dupl_char (.input_string,temp_num_digits,zero);
6                  pdata_flag = 1;                 ! answer is zero
6
6                  end
5              else
6                  begin
6                  !+
6                   ! Zero out the destination field using the digits as
6                   ! proper number of zero fill characters, rather than
6                   ! using the length as found in the descriptor, since
6                   ! class SD is a special case.
6                   !-
6                   str$dupl_char (.input_string,tot_digits,zero);
6                   if .leading_zeroes neq 0
6                   then
7                       begin
7
7                       diff = (.string_dest[dsc$b_digits] + .string_dest[dsc$b_scale]) - .temp_num_digi
7                       ch$move (.string_dest[dsc$b_digits],.buf,.input_string[dsc$a_pointer]+.diff);
7                       end
6                   else
7                       begin
7
7                       diff = .temp_num_digits - .string_dest[dsc$b_scale];
7                       if .diff eql .string_dest[dsc$b_digits]
7                       then
7                           ch$move (.diff,.buf,.input_string[dsc$a_pointer])
7                       else
8                           begin
8
8                           tot_digits = .tot_digits - .temp_num_digits;
8                           ch$move (.diff,.buf,.input_string[dsc$a_pointer]+.tot_digits);
8
7                           end;
7
6                       end;
6                   pdata_flag = 1;
6                   .num_digits = .string_dest[dsc$b_digits] + .string_dest[dsc$b_scale];
6
5                   end;
5
5           end
4           else
5               begin
5
5               if .string_dest[dsc$b_scale] gtr 0
5               then
5                   ok_left = .string_dest[dsc$b_digits]
5               else
5                   OK_LEFT = .STRING_DEST [DSC$B_DIGITS] + .STRING_DEST [DSC$B_SCALE] ;
5               if .ok_left lss 0
5               then
6                   begin
6                   !
6                   ! Here we have a P Picture field of type PP99.
6                   ! We know this when OK_LEFT is less than zero.
6                   ! It requires some special casing.
6                   !-
6                   local
6                       diff,
6                       ok_right,
6                       buf_ptr;
6
6                   if .left_dec gtr 0              ! error no '.' entered
```

```
6                          then                               ! ring bell and reprompt
6                              return 0;
6
6                          ok_left = 0;
6                          ok_right = abs(.string_dest[dsc$b_scale]);
6                          if .right_dec gtr .ok_right
6                          then
6                              return 0;
6
6                          !+
6                          ! This handles case where the number of digits entered
6                          ! is less than the absolute value of the scale factor,
6                          ! meaning that the number returned would have to be 0.
6                          ! The first part of the if statement takes care of the
6                          ! case where the number of digits entered equals the
6                          ! number of digits expected taking into account if the
6                          ! absolute value of the scale factor is equal to the
6                          ! number of digits entered to the right of the decimal
6                          ! point thereby giving us a result of zero again.
6                          !-
6                          diff = (abs(.string_dest[dsc$b_scale]) - .string_dest[dsc$b_digits]);
7                          if ((.right_dec eql .string_dest[dsc$b_digits]) and
7                              (.right_dec eql .diff)) OR
7                              (.right_dec leq .diff)
6                          then
7                              begin
7
7                              str$dupl_char (.input_string,temp_num_digits,zero);
7                              pdata_flag = 1;                    ! done - result is zero
7
7                              end
6                          else
7                              begin
7
7                              buf_ptr = .buf_desc[dsc$a_pointer] + .diff;
7                              diff = .right_dec - .diff;         ! move only necessary digits
7                              !+
7                              ! Zero out the destination field using the digits
7                              ! as the proper number of zero fill characters,
7                              ! rather than using the length as found in the
7                              ! descriptor, since class SD is a special case.
7                              !-
7                              str$dupl_char (.input_string,temp_num_digits,zero);
7                              ch$move (.diff,.buf_ptr,(.input_string[dsc$a_pointer]+(.temp_num_digits-.diff)))
7                              pdata_flag = 1;
7
6                              end;
6
6                          end
5                      else
5
6                          begin                              ! ok left is not < zero
6                          OK_LEFT = .STRING_DEST [DSC$B_DIGITS] + .STRING_DEST [DSC$B_SCALE] ;
6                          LENGTH_DIFF = .OK_LEFT - .LEFT_DEC;
6                          LENGTH_DIFF2 = (.STRING_DEST [DSC$B_DIGITS] - .OK_LEFT) - .RIGHT_DEC;
7                          IF ( .LENGTH_DIFF LSS 0)
6                                  OR
```

```
7                ( .LENGTH_DIFF2 LSS 0)
6                 THEN RETURN FAILURE ;          ! Data entered too big
5                end;
4             end;
3            END ;
3
3          [ OTHERWISE ] :
3
3              LIB$STOP ( COB$_INVARG ) ;
3
3          TES ;
3
2        END;
2
2  !+
2  ! Figure out the exponent.
2  !-
3      IF NOT (.DOT_SEEN)                        ! No decimal pt. therefore
2      THEN                                      ! all digits are left_dec
2          LEFT_DEC = .TEMP_NUM_DIGITS;
2
2      IF .LEFT_DEC EQL 0
2      THEN
2          !+
2          ! Figure out exponent if all digits are to right of decimal point.
2          !-
2      if .pdata_flag
2        then
3          begin
3          inp = .input_string [dsc$a_pointer];    ! point to re-written data
3          .EXPONENT = 0;
3          INCR GETTER FROM 0 TO (.TEMP_NUM_DIGITS - 1) DO
3              !+
3              ! Exponent decreases for every leading zero.
3              !-
3              IF .inp [.GETTER] EQL %C'0'
3              THEN
3                  .EXPONENT = ..EXPONENT - 1
3              ELSE
3                  EXITLOOP;
3
3          END
2      ELSE
3          BEGIN
3          .EXPONENT = 0;
3          INCR GETTER FROM 0 TO (.TEMP_NUM_DIGITS - 1) DO
3              !+
3              ! Exponent decreases for every leading zero.
3              !-
3              IF .BUF [.GETTER] EQL %C'0'
3              THEN
3                  .EXPONENT = ..EXPONENT - 1
3              ELSE
3                  EXITLOOP;
3
3          END
2      ELSE
```

```
; 1663      3173  2            !+
; 1664      3174  2            ! If all digits are to left of decimal point, exponent is equal
; 1665      3175  2            ! to left_dec.
; 1666      3176  2            !-
; 1667      3177  2            .EXPONENT = .LEFT_DEC;
; 1668      3178  2
; 1669      3179  2  !+
; 1670      3180  2  ! Move the stripped string into the buffer and adjust the number-of-digits
; 1671      3181  2  !-
; 1672      3182  2
; 1673      3183  2      if .pdata_flag eql 0
; 1674      3184  2      then
; 1675      3185  3          begin
; 1676      3186  3          CH$MOVE (.TEMP_NUM_DIGITS, .BUF_DESC [DSC$A_POINTER],
; 1677      3187  3                  .INPUT_STRING [DSC$A_POINTER]);
; 1678      3188  3          .NUM_DIGITS = .TEMP_NUM_DIGITS;
; 1679      3189  3          end
; 1680      3190  2      else
; 1681      3191  2          if .string_dest[dsc$b_scale] lss 0
; 1682      3192  2          then
; 1683      3193  2              .num_digits = .temp_num_digits ;
; 1684      3194  2
; 1685      3195  2  !+
; 1686      3196  2  ! Free our local string
; 1687      3197  2  !-
; 1688      3198  2      STR$FREE1_DX (BUF_DESC);
; 1689      3199  2      RETURN SUCCESS ;
; 1690      3200  2
; 1691      3201  1      END;                                        ! end of COB$$STRIP_BLANKS_SIGN


                                         006AF            .BLKB   1
                        00  00  00  30   006B0 P.AAD:     .ASCII  \0\<0><0><0>                                  ;

                                               ZERO=               P.AAD


                                     0FFC 00000 COB$$STRIP_BLANKS_SIGN:
                                                          .WORD   Save R2,R3,R4,R5,R6,R7,R8,R9,R10,R11         ; 2775
                    5E            1C  C2 00002            SUBL2   #28, SP                                       ;
                           10     AE  D4 00005            CLRL    TEMP_NUM_DIGITS                               ; 2824
                                  7E  7C 00008            CLRQ    DIGIT_SEEN                                    ;
                                  7E  7C 0000A            CLRQ    ZERO_SEEN                                     ;
                                  7E  D4 0000C            CLRL    BLANKS_SEEN                                   ;
                           18     AE  7C 0000E            CLRQ    PUTTER                                        ;
                                  7E  D4 00011            CLRL    PDATA_FLAG                                    ;
                           18     AE  D4 00013            CLRL    LEADING_ZEROES                                ;
                           2C     AE  7C 00016            CLRQ    BUF_DESC                                      ;
                    6D   027F     CF  DE 00019            MOVAL   45$, (FP)                                     ;
                           0C     BC  D5 0001E            TSTL    @NUM_DIGITS                                   ; 2858
                                  03  12 00021            BNEQ    1$                                            ;
                                026F  31 00023            BRW     43$                                           ;
                           2C     AE  B4 00026 1$:        CLRW    BUF_DESC                                      ; 2867
               2E   AE            0F  90 00029            MOVB    #15, BUF_DESC+2                               ; 2868
               2F   AE            02  90 0002D            MOVB    #2, BUF_DESC+3                                ; 2869
                           30     AE  D4 00031            CLRL    BUF_DESC+4                                    ; 2870
```

```
                                  2C    AE  9F 00034          PUSHAB  BUF_DESC                                    ; 2871
                                  0C    AC  DD 00037          PUSHL   NUM_DIGITS                                  ;
                  00000000G  00         02  FB 0003A          CALLS   #, STR$GET1_DX                              ;
                             58   30    AE  D0 00041          MOVL    BUF_DESC+4, BUF                             ; 2876
                             59   04    AC  D0 00045          MOVL    INPUT_STRING, R9                            ; 2877
                             5A   04    A9  9E 00049          MOVAB   4(R9), R10                                  ;
                             50         6A  D0 0004D          MOVL    (R10), ARG                                  ;
                       14    BC         2B  D0 00050          MOVL    #43, @SIGN_VAL                              ; 2878
                                  04    AE  9F 00054          PUSHAB  BLANKS_SEEN                                 ; 2884
                                  0C    AE  9F 00057          PUSHAB  ZERO_SEEN                                   ;
                                  14    AE  9F 0005A          PUSHAB  DOT_SEEN                                    ;
                                  1C    AE  9F 0005D          PUSHAB  DIGIT_SEEN                                  ;
                                  24    AE  9F 00060          PUSHAB  SIGN_SEEN                                   ;
                                  2C    AE  9F 00063          PUSHAB  LEADING_ZEROES                              ;
                                  34    AE  9F 00066          PUSHAB  PUTTER                                      ;
                                  14    AC  DD 00069          PUSHL   SIGN_VAL                                    ; 2885
                                  48    AE  9F 0006C          PUSHAB  TEMP_NUM_DIGITS                             ; 2884
                                  44    AE  9F 0006F          PUSHAB  LEFT_DEC                                    ;
                                  54    AE  9F 00072          PUSHAB  BUF_DESC                                    ;
                                  18    AC  DD 00075          PUSHL   FLAGS                                       ;
                                  0C    BC  DD 00078          PUSHL   @NUM_DIGITS                                 ;
                                        59  DD 0007B          PUSHL   R9                                          ;
                       0000V CF         0E  FB 0007D          CALLS   #14, COB$$SCAN_INPUT                        ;
                             7C         50  E9 00082          BLBC    R0, 13$                                     ;
                             1F   10    AE  E8 00085          BLBS    DIGIT_SEEN, 5$                              ; 2895
                             08   14    AE  E8 00089          BLBS    SIGN_SEEN, 2$                               ; 2899
                             04   0C    AE  E8 0008D          BLBS    DOT_SEEN, 2$                                ;
                             05   04    AE  E9 00091          BLBC    BLANKS_SEEN, 3$                             ;
                                  08    AE  D5 00095 2$:      TSTL    ZERO_SEEN                                   ;
                                        67  13 00098          BEQL    13$                                         ;
                       1C BE48          30  90 0009A 3$:      MOVB    #48, @PUTTER[BUF]                           ; 2902
                                  1C    AE  D6 0009F          INCL    PUTTER                                      ; 2903
                                  28    AE  D6 000A2          INCL    TEMP_NUM_DIGITS                             ; 2904
                                      017D  31 000A5 4$:      BRW     31$                                         ; 2895
                                        56  D4 000A8 5$:      CLRL    RIGHT_DEC                                   ; 2912
                             05   0C    AE  E8 000AA          BLBS    DOT_SEEN, 6$                                ; 2921
                       20    AE   28    AE  D0 000AE          MOVL    TEMP_NUM_DIGITS, LEFT_DEC                   ; 2922
                             54   28    AE  D0 000B3 6$:      MOVL    TEMP_NUM_DIGITS, R4                         ; 2923
                 56          54   20    AE  C3 000B7          SUBL3   LEFT_DEC, R4, RIGHT_DEC                     ;
                             52         56  D0 000BC          MOVL    RIGHT_DEC, R2                               ; 2927
                                        50  D4 000BF          CLRL    GETTER                                      ;
                                        0C  11 000C1          BRB     8$                                          ;
                 51          54         50  C3 000C3 7$:      SUBL3   GETTER, R4, R1                              ; 2928
                             30       6148  91 000C7          CMPB    (R1)[BUF], #48                              ;
                                        06  12 000CB          BNEQ    9$                                          ;
                                        56  D7 000CD          DECL    RIGHT_DEC                                   ; 2930
                 F0          50         52  F3 000CF 8$:      AOBLEQ  R2, GETTER, 7$                              ; 2928
                             50   08    AC  D0 000D3 9$:      MOVL    STRING_DEST, R0                             ; 2935
                             52         60  3C 000D7          MOVZWL  (R0), DEST_LENGTH                           ;
                             51   03    A0  9A 000DA          MOVZBL  3(R0), R1                                   ; 2937
                             01         51  91 000DE          CMPB    R1, #1                                      ; 2940
                                        21  12 000E1          BNEQ    14$                                         ;
                                        56  D5 000E3          TSTL    RIGHT_DEC                                   ; 2949
                                        14  15 000E5          BLEQ    12$                                         ;
                 51    1C    AE         56  C3 000E7          SUBL3   RIGHT_DEC, PUTTER, R1                       ; 2951
                                        51  D7 000EC          DECL    I                                           ;
                                        06  11 000EE          BRB     11$                                         ;
```

```
                              30        6148  91 000F0 10$:     CMPB    (I)[BUF], #48                              ; 2952
                                          0B  12 000F4          BNEQ    13$                                         ;
                    F5        51    1C    AE  F3 000F6 11$:     AOBLEQ  PUTTER, I, 10$                              ;
                              52    20    AE  D1 000FB 12$:     CMPL    LEFT_DEC, DEST_LENGTH                       ; 2955
                                          A4  15 000FF          BLEQ    4$                                          ;
                                        0195  31 00101 13$:     BRW     44$                                         ; 2956
                              09          51  91 00104 14$:     CMPB    R1, #9                                      ; 2960
                                          03  13 00107          BEQL    15$                                         ;
                                        010C  31 00109          BRW     30$                                         ;
                              53    09    A0  9E 0010C 15$:     MOVAB   9(R0), R3                                   ; 2986
                              52    08    A0  98 00110          CVTBL   8(R0), R2                                   ; 2978
                                          50  D4 00114          CLRL    R0                                          ;
                                          52  D5 00116          TSTL    R2                                          ;
                                          6A  15 00118          BLEQ    20$                                         ;
                                          50  D6 0011A          INCL    R0                                          ;
                              5B          63  9A 0011C          MOVZBL  (R3), R11                                   ; 2986
                              5B          52  C0 0011F          ADDL2   R2, R11                                     ;
                         24   AE          5B  D0 00122          MOVL    R11, TOT_DIGITS                             ;
                                          56  D5 00126          TSTL    RIGHT_DEC                                   ; 2987
                                          D7  14 00128          BGTR    13$                                         ;
                         24   AE          54  D1 0012A          CMPL    R4, TOT_DIGITS                              ;
                                          D1  14 0012E          BGTR    13$                                         ;
                              6E          01  D0 00130          MOVL    #1, PDATA_FLAG                              ; 2996
                              52          54  D1 00133          CMPL    R4, R2                                      ; 2991
                                          03  14 00136          BGTR    16$                                         ;
                                        008A  31 00138          BRW     25$                                         ;
                                  FEBD    CF  9F 0013B 16$:     PUSHAB  ZERO                                        ; 3007
                                    28    AE  9F 0013F          PUSHAB  TOT_DIGITS                                  ;
                                          59  DD 00142          PUSHL   R9                                          ;
                    00000000G 00          03  FB 00144          CALLS   #3, STR$DUPL_CHAR                           ;
                                    18    AE  D5 0014B          TSTL    LEADING_ZEROES                              ; 3008
                                          0F  13 0014E          BEQL    17$                                         ;
                    57        5B          54  C3 00150          SUBL3   R4, R11, DIFF                               ; 3012
                              50          63  9A 00154          MOVZBL  (R3), R0                                    ; 3013
             00 BA47          68          50  28 00157          MOVC3   R0, (BUF), @0(R10)[DIFF]                    ;
                                          1F  11 0015D          BRB     19$                                         ; 3008
                    57        54          52  C3 0015F 17$:     SUBL3   R2, R4, DIFF                                ; 3018
       57           63        08          00  ED 00163          CMPZV   #0, #8, (R3), DIFF                          ; 3019
                                          07  12 00168          BNEQ    18$                                         ;
             00     BA        68          57  28 0016A          MOVC3   DIFF, (BUF), @0(R10)                        ; 3021
                                          0D  11 0016F          BRB     19$                                         ;
                         24   AE          54  C2 00171 18$:     SUBL2   R4, TOT_DIGITS                              ; 3025
                    50        6A    24    AE  C1 00175          ADDL3   TOT_DIGITS, (R10), R0                       ; 3026
                    60        68          57  28 0017A          MOVC3   DIFF, (BUF), (R0)                           ;
                         0C   BC          5B  D0 0017E 19$:     MOVL    R11, @NUM_DIGITS                            ; 3032
                                          77  11 00182          BRB     27$                                         ; 2978
                              08          50  E9 00184 20$:     BLBC    R0, 21$                                     ; 3040
                              51          63  9A 00187          MOVZBL  (R3), R1                                    ; 3042
                              50          51  D0 0018A          MOVL    R1, OK_LEFT                                 ;
                                          07  11 0018D          BRB     22$                                         ;
                              51          63  9A 0018F 21$:     MOVZBL  (R3), R1                                    ; 3044
                    50        51          52  C1 00192          ADDL3   R2, R1, OK_LEFT                             ;
                                          65  18 00196 22$:     BGEQ    28$                                         ; 3045
                                    20    AE  D5 00198          TSTL    LEFT_DEC                                    ; 3058
                                          78  14 0019B          BGTR    29$                                         ;
                                          50  D4 0019D          CLRL    OK_LEFT                                     ; 3062
                              50          52  D0 0019F          MOVL    R2, R0                                      ; 3063
```

```
                                       03  18 001A2       BGEQ    23$                                        ;
                     50                50  CE 001A4       MNEGL   R0, R0                                     ;
                     53                50  D0 001A7 23$:  MOVL    R0, OK_RIGHT                               ;
                     53                56  D1 001AA       CMPL    RIGHT_DEC, OK_RIGHT                        ; 3064
                                       66  14 001AD       BGTR    29$                                        ;
          52         50                51  C3 001AF       SUBL3   R1, R0, DIFF                               ; 3079
                     6E                01  D0 001B3       MOVL    #1, PDATA_FLAG                             ; 3087
                     51                56  D1 001B6       CMPL    RIGHT_DEC, R1                              ; 3080
                                       05  12 001B9       BNEQ    24$                                        ;
                     52                56  D1 001BB       CMPL    RIGHT_DEC, DIFF                            ; 3081
                                       05  13 001BE       BEQL    25$                                        ;
                     52                56  D1 001C0 24$:  CMPL    RIGHT_DEC, DIFF                            ; 3082
                                       12  14 001C3       BGTR    26$                                        ;
                               FE33    CF  9F 001C5 25$:  PUSHAB  ZERO                                       ; 3086
                                 2C    AE  9F 001C9       PUSHAB  TEMP_NUM_DIGITS                            ;
                                       59  DD 001CC       PUSHL   R9                                         ;
             00000000G  00             03  FB 001CE       CALLS   #3, STR$DUPL_CHAR                          ;
                                       4E  11 001D5       BRB     31$                                        ; 3080
          53         52        30      AE  C1 001D7 26$:  ADDL3   BUF_DESC+4, DIFF, BUF_PTR                  ; 3093
          52         56                52  C3 001DC       SUBL3   DIFF, RIGHT_DEC, DIFF                      ; 3094
                               FE18    CF  9F 001E0       PUSHAB  ZERO                                       ; 3101
                                 2C    AE  9F 001E4       PUSHAB  TEMP_NUM_DIGITS                            ;
                                       59  DD 001E7       PUSHL   R9                                         ;
             00000000G  00             03  FB 001E9       CALLS   #3, STR$DUPL_CHAR                          ;
          50       28   AE             52  C3 001F0       SUBL3   DIFF, TEMP_NUM_DIGITS, R0                  ; 3102
     00 BA40            63             52  28 001F5       MOVC3   DIFF, (BUF_PTR), @0(R10)[R0]               ;
                                       28  11 001FB 27$:  BRB     31$                                        ; 3045
          50            51             52  C1 001FD 28$:  ADDL3   R2, R1, OK_LEFT                            ; 3111
          52            50     20      AE  C3 00201       SUBL3   LEFT_DEC, OK_LEFT, LENGTH_DIFF             ; 3112
                        51             50  C2 00206       SUBL2   OK_LEFT, R1                                ; 3113
          50            51             56  C3 00209       SUBL3   RIGHT_DEC, R1, LENGTH_DIFF2                ;
                                       52  D5 0020D       TSTL    LENGTH_DIFF                                ; 3114
                                       04  19 0020F       BLSS    29$                                        ;
                                       50  D5 00211       TSTL    LENGTH_DIFF2                               ; 3116
                                       10  18 00213       BGEQ    31$                                        ;
                                     0081  31 00215 29$:  BRW     44$                                        ; 3117
                         00000000G     8F  DD 00218 30$:  PUSHL   #COB$_INVARG                               ; 3124
             00000000G  00             01  FB 0021E       CALLS   #1, LIB$STOP                               ;
                        05     0C      AE  E8 00225 31$:  BLBS    DOT_SEEN, 32$                              ; 3133
                   20   AE     28      AE  D0 00229       MOVL    TEMP_NUM_DIGITS, LEFT_DEC                  ; 3135
                        50     10      AC  D0 0022E 32$:  MOVL    EXPONENT, R0                               ; 3146
                               20      AE  D5 00232       TSTL    LEFT_DEC                                   ; 3137
                                       35  12 00235       BNEQ    38$                                        ;
          53       28   AE             01  C3 00237       SUBL3   #1, TEMP_NUM_DIGITS, R3                    ; 3147
                        18             6E  E9 0023C       BLBC    PDATA_FLAG, 35$                            ; 3142
                        51             6A  D0 0023F       MOVL    (R10), INP                                 ; 3145
                                       60  D4 00242       CLRL    (R0)                                       ; 3146
                        52             01  CE 00244       MNEGL   #1, GETTER                                 ; 3151
                                       08  11 00247       BRB     34$                                        ;
                        30           6241  91 00249 33$:  CMPB    (GETTER)[INP], #48                         ;
                                       21  12 0024D       BNEQ    39$                                        ;
                                       60  D7 0024F       DECL    (R0)                                       ; 3153
          F4            52             53  F3 00251 34$:  AOBLEQ  R3, GETTER, 33$                            ; 3151
                                       19  11 00255       BRB     39$                                        ; 3142
                                       60  D4 00257 35$:  CLRL    (R0)                                       ; 3160
                        51             01  CE 00259       MNEGL   #1, GETTER                                 ; 3161
                                       08  11 0025C       BRB     37$                                        ;
                         30            6148  91 0025E 36$:    CMPB     (GETTER)[BUF], #48                         ; 3165
                                         0C  12 00262         BNEQ     39$                                        ;
                                         60  D7 00264         DECL     (R0)                                       ; 3167
               F4        51              53  F3 00266 37$:    AOBLEQ   R3, GETTER, 36$                            ; 3165
                                         04  11 0026A         BRB      39$                                        ; 3142
                         60        20    AE  D0 0026C 38$:    MOVL     LEFT_DEC, (R0)                             ; 3177
                                         6E  D5 00270 39$:    TSTL     PDATA_FLAG                                 ; 3183
                                         09  12 00272         BNEQ     40$                                        ;
         00    BA    30    BE        28  AE  28 00274         MOVC3    TEMP_NUM_DIGITS, @BUF_DESC+4, @0(R10)      ; 3187
                                         09  11 0027B         BRB      41$                                        ; 3188
                         50        08    AC  D0 0027D 40$:    MOVL     STRING_DEST, R0                            ; 3191
                                   08    A0  95 00281         TSTB     8(R0)                                      ;
                                         05  18 00284         BGEQ     42$                                        ;
                   0C    BC        28    AE  D0 00286 41$:    MOVL     TEMP_NUM_DIGITS, @NUM_DIGITS               ; 3193
                                   2C    AE  9F 0028B 42$:    PUSHAB   BUF_DESC                                   ; 3198
              00000000G  00              01  FB 0028E         CALLS    #1, STR$FREE1_DX                           ;
                         50              01  D0 00295 43$:    MOVL     #1, R0                                     ; 3199
                                             04 00298         RET                                                 ;
                                         50  D4 00299 44$:    CLRL     R0                                         ; 3201
                                             04 0029B         RET                                                 ;
                                           0000 0029C 45$:    .WORD    Save nothing                               ; 2824
                         50        08    AC  D0 0029E         MOVL     8(AP), R0                                  ;
                         50        04    A0  D0 002A2         MOVL     4(R0), R0                                  ;
                                   F8    A0  9F 002A6         PUSHAB   BUF_DESC                                   ;
                                         01  DD 002A9         PUSHL    #1                                         ;
                                         5E  DD 002AB         PUSHL    SP                                         ;
                         7E        04    AC  7D 002AD         MOVQ     4(AP), -(SP)                               ;
              00000000G  00              03  FB 002B1         CALLS    #3, COB$$FREE_STRINGS                      ;
                                             04 002B8         RET                                                 ;

; Routine Size:  697 bytes,    Routine Base:  _COB$CODE + 06B4
```

```
1 %SBTTL 'COB$$ZERO_FILL - Initialize destination'
1 ROUTINE COB$$ZERO_FILL ( STRING_DEST  :  REF $STR$DESCRIPTOR
1                                                    ! Destination for input
1                   )  :  NOVALUE  =
1
1 !++
1 ! FUNCTIONAL DESCRIPTION:
1 !
1 !       This routine will initialize STRING_DEST to zeroes before the input
1 !       data is copied to it.
1 !
1 ! FORMAL PARAMETERS:
1 !
1 !       STRING_DEST.mt.ds   Address of descriptor to receive the read input.
1 !
1 ! IMPLICIT INPUTS:
1 !
1 !       NONE
1 !
1 ! IMPLICIT OUTPUTS:
1 !
1 !       NONE
1 !
1 ! ROUTINE VALUE:
1 !
1 !       NONE
1 !
1 ! SIDE EFFECTS:
1 !
1 !--
1
2       BEGIN
2
2       LOCAl
2           SIGN        : BYTE,
2           ZERO        : BYTE,
2           DEST_PTR ,                              ! Pointer where result will go in destination
2           DEST_LENGTH ;                           ! Destination length
2
2       LITERAL
2           ZERO_O   = 48,                          ! Zero
2           POS_SIGN = 43,                          ! Plus sign
2           POSZEROP = 123 ;                        ! +0 overpunched
2
2
2       ZERO = ZERO_O ;
2       DEST_PTR    = .STRING_DEST [DSC$A_POINTER] ;
2       DEST_LENGTH = .STRING_DEST [DSC$W_LENGTH] ;
2
2       !+
2       !  Zero fill, then handle sign correctly.
2       !-
2
2       STR$DUPL_CHAR ( .STRING_DEST, DEST_LENGTH, ZERO ) ;
2
2       CASE .STRING_DEST [DSC$B_DTYPE] FROM DSC$K_DTYPE_NU TO DSC$K_DTYPE_NRO
2           OF
```

```
SET

[DSC$K_DTYPE_NU]:                               ! Numeric unsigned
    !+
    !  Move all zeroes to STRING_DEST
    !-
    0 ;                                         ! No further action

[DSC$K_DTYPE_NL]:                               ! Numeric left separate
    !+
    !  Move sign then all zeroes to STRING_DEST
    !-

    BEGIN

    SIGN = POS_SIGN ;
    CH$MOVE (1, SIGN, .STRING_DEST [DSC$A_POINTER]);

    END;

[DSC$K_DTYPE_NR]:                               ! Numeric right separate
    !+
    !  Move all zeroes followed by sign to STRING_DEST
    !-

    BEGIN

    SIGN = POS_SIGN ;
    CH$MOVE ( 1, SIGN, (.DEST_PTR + (.DEST_LENGTH - 1)) ) ;

    END;

[DSC$K_DTYPE_NLO]:                              ! Numeric left overpunched
    !+
    !  Move all zeroes to STRING_DEST
    !  First digit has overpunch sign (positive)
    !-

    BEGIN

    SIGN = POSZEROP ;
    CH$MOVE (1, SIGN, .STRING_DEST[DSC$A_POINTER]);

    END;

[DSC$K_DTYPE_NRO]:                              ! Numeric right overpunched
    !+
    !  Move all zeroes to STRING_DEST
    !  Last digit has overpunch sign (positive)
    !-

    BEGIN

    SIGN = POSZEROP ;
    CH$MOVE (1, SIGN, (.DEST_PTR + (.DEST_LENGTH - 1)) );

    END;
```

```
: 1807       3316  2
: 1808       3317  2           TES;
: 1809       3318  2
: 1810       3319  1       END ;                                       ! End of COB$$ZERO_FILL



                                              000C 00000 COB$$ZERO_FILL:
                                                                   .WORD   Save R2,R3                                          : 3203
                           5E           08   C2 00002              SUBL2   #8, SP
                           6E           30   90 00005              MOVB    #48, ZERO                                           : 3247
                           52      04   AC   D0 00008              MOVL    STRING_DEST, R2                                     : 3248
                           53      04   A2   D0 0000C              MOVL    4(R2), DEST_PTR
                      04   AE           62   3C 00010              MOVZWL  (R2), DEST_LENGTH                                   : 3249
                                        5E   DD 00014              PUSHL   SP                                                  : 3255
                                   08   AE   9F 00016              PUSHAB  DEST_LENGTH                                         :
                                        52   DD 00019              PUSHL   R2                                                  :
                  00000000G  00         03   FB 0001B              CALLS   #3, STR$DUPL_CHAR                                   :
                 04          0F    02   A2   8F 00022              CASEB   2(R2), #15, #4                                      : 3257
        0010     0015        000B       002B    00027 1$:          .WORD   8$-1$,-                                             :
                                        001E    0002F                      2$-1$,-                                             :
                                                                           4$-1$,-                                             :
                                                                           3$-1$,-                                             :
                                                                           6$-1$                                               :
                                             04 00031              RET                                                         :
                           50           2B   90 00032 2$:          MOVB    #43, SIGN                                           : 3274
                                        09   11 00035              BRB     5$                                                  : 3275
                           50           2B   90 00037 3$:          MOVB    #43, SIGN                                           : 3286
                                        0D   11 0003A              BRB     7$                                                  : 3287
                           50      7B   8F   90 0003C 4$:          MOVB    #123, SIGN                                          : 3299
                      04   B2           50   90 00040 5$:          MOVB    SIGN, @4(R2)                                        : 3300
                                             04 00044              RET                                                         : 3257
                           50      7B   8F   90 00045 6$:          MOVB    #123, SIGN                                          : 3312
                 51        53      04   AE   C1 00049 7$:          ADDL3   DEST_LENGTH, DEST_PTR, R1                           : 3313
                      FF   A1           50   90 0004E              MOVB    SIGN, -1(R1)                                        :
                                             04 00052 8$:          RET                                                         : 3319

; Routine Size:  83 bytes,    Routine Base:  _COB$CODE + 096D
```

```
1 %SBTTL 'COB$$VERIFY_FL_RANGE - Verify Float Pt range'
1 ROUTINE COB$$VERIFY_FL_RANGE (
1                               TEMP_PUT_HERE  :  REF BLOCK [8, BYTE], ! # to scan
1                               CHARS_READ,             ! # of chars in TEMP_PUT_HERE
1                               MAX                     ! # of significant digits allowed
1                            ) =
1
1 !++
1 ! FUNCTIONAL DESCRIPTION:
1 !
1 !       Check range of Floating and Double Floating Point input data.
1 !       Do nothing about errors in this routine, return to calling routine.
1 !
1 ! FORMAL PARAMETERS:
1 !
1 !       TEMP_PUT_HERE.rt.dx     Input data to be verified.
1 !
1 !       CHARS_READ.rlu.v        Number of input characters.
1 !
1 !       MAX.rlu.v               Number of significant digits allowed in
1 !                               mantissa of E notation representation.
1 !                               7 for Floating Point
1 !                               16 for Double Floating Point
1 ! IMPLICIT INPUTS:
1 !
1 !       NONE
1 !
1 ! IMPLICIT OUTPUTS:
1 !
1 !       NONE
1 !
1 ! ROUTINE VALUE:
1 !
1 !       1 = SUCCESS
1 !       0 = FAILURE
1 !
1 ! SIDE EFFECTS:
1 !
1 !       NONE
1 !--
1
2     BEGIN
2     !+
2     !  This routine counts the significant digits (1-9) and significant zeroes
2     !  of data that is input to either a floating point or a double floating
2     !  point data item.   Some zeroes can be ignored.
2     !
2     !     0000000000012.3400000000000000000
2     !     \_____T____/     \______T_______/
2     !           :                :
2     !        ignore            ignore
2     !
2     !     000.0000000000000000000000000012345
2     !     \T/ \____________T____________/
2     !      :               :
2     !    ignore     do not ignore
2     !
```

```
2       !       1234000000000000000000000000000.000
2       !           \_______________________/ \_/
2       !                       !              !
2       !               do not ignore        ignore
2       !-
2
2
2           LOCAL
2                   PUT_BUF         :  REF VECTOR [1100, BYTE],
2                   COUNT           :  INITIAL (0),         ! Count for TEMP_PUT_HERE
2                   DOT_SEEN        :  INITIAL (0),         ! =1 Decimal point seen
2                   DIGIT_SEEN      :  INITIAL (0),         ! =1 At least 1 digit seen
2                   SIGN_SEEN       :  INITIAL (0),         ! =1 Sign seen
2                   E_SEEN          :  INITIAL (0),         ! =1 E/e of exponent seen
2                   R_SIGNIF        :  INITIAL (0),         ! Signigicant digits to
2                                                           ! right of decimal point
2                   L_SIGNIF        :  INITIAL (0),         ! Significant digits to
2                                                           ! left of decimal point
2                   R_ZERO          :  INITIAL (0),         ! Significant zeroes to
2                                                           ! right of decimal point
2                                          ! Calculated after incr loop .00...00123
2                   L_ZERO          :  INITIAL (0) ;        ! Significant zeroes to
2                                                           ! left of decimal point
2                                          ! Calculated in incr loop 1200...0.0
2
2                           PUT_BUF = .TEMP_PUT_HERE [DSC$A_POINTER] ;
2
2                           INCR X FROM 0 TO .CHARS_READ - 1 DO
3                               BEGIN                                   ! Begin INCR loop
3                                   !+
3                                   ! Count significant digits and significant zeroes.
3                                   !-
3                                   SELECTONE .PUT_BUF [.X] OF
3                                       SET
3
3                                       [ %C'1' TO %C'9' ] :
3                                           !+
3                                           ! Count significant digits to the left
3                                           ! or right of the decimal point.
3                                           !-
3
4                                           BEGIN
4                                           DIGIT_SEEN = 1 ;
4                                           IF .DOT_SEEN
4                                           THEN
4                                               R_SIGNIF = .R_SIGNIF + 1
4                                           ELSE
4                                               L_SIGNIF = .L_SIGNIF + 1 ;
4                                           COUNT = .COUNT + 1 ;
3                                           END ;
3
3                                       [ %C'0' ] :
3                                           !+
3                                           ! Count zeroes after DIGIT_SEEN
3                                           ! and/or after DOT_SEEN.
3                                           !-
3
```

```
                    BEGIN
                    IF .DIGIT_SEEN
                    THEN
                        IF .DOT_SEEN
                        THEN
                            R_SIGNIF = .R_SIGNIF + 1
                        ELSE
                            L_SIGNIF = .L_SIGNIF + 1
                    ELSE
                        !+
                        ! Count zeroes after decimal point,
                        ! but before significant digits
                        !-
                        IF .DOT_SEEN
                        THEN
                            R_ZERO = .R_ZERO + 1 ;
                    COUNT = .COUNT + 1 ;
                    END ;

                [ %C'-', %C'+' ] :
                    !+
                    ! Only one sign is valid
                    !-

                    IF .SIGN_SEEN EQL 0
                    THEN
                        BEGIN
                        SIGN_SEEN = 1 ;
                        COUNT = .COUNT + 1 ;
                        END
                    ELSE
                        RETURN 0 ;

                [ %C'.', %C',' ] :

                    BEGIN
                    DOT_SEEN = 1 ;
                    COUNT = .COUNT + 1 ;
                    END ;

                [ %C' '] :
                    !+
                    ! Spaces are allowed
                    !-
                        COUNT = .COUNT + 1 ;

                [ %C'E', %C'e' ] :

                    !+
                    ! Don't check range of exponent, leave
                    ! that for OTS$CVT_T_F/D
                    !-
                    BEGIN
                    E_SEEN = 1 ;
                    EXITLOOP ;
                    END ;

```

```
                        [ OTHERWISE] :

                            RETURN 0 ;

                        TES ;

                !+
                !  If maximum significant digits allowed has already
                !  been reached, or all is left is the exponent
                !  - pull out of loop.
                !-

                IF (.L_SIGNIF + .R_SIGNIF EQL .MAX)  OR
                                            ( .E_SEEN )
                THEN EXITLOOP ;

                END ;                                  ! End INCR loop

                    !+
                    !  Make sure all remaining digits (if any)
                    !  are zeroes
                    !  Count zeroes after significant digits, but
                    !  before decimal point.
                    !-

                    IF .COUNT LSS .CHARS_READ
                    THEN
                        !+
                        !  All input characters have not yet been processed.
                        !-
                        BEGIN
                        INCR Y FROM .COUNT TO .CHARS_READ - 1 DO
                            BEGIN

                            SELECTONE .PUT_BUF [.Y] OF
                                SET

                                [ %C'E', %C'e' ] :

                                    !+
                                    ! Don't check range of exponent,
                                    ! leave that for OTS$CVT_T_F/D
                                    !-
                                    EXITLOOP ;

                                [ %C'0' ] :
                                    !+
                                    !  Count zeroes to left
                                    !  of decimal point.
                                    !-
                                      IF .DOT_SEEN EQL 0
                                      THEN
                                          L_ZERO = .L_ZERO + 1 ;

                                [ %C'.', %C',', %C'-', %C'+', %C' ' ]
                                    !+
                                    !  Of no consequence here
```

```
; 2040      3548  4                                        !-
; 2041      3549  4                                        0 ;
; 2042      3550  4
; 2043      3551  4                                   [ OTHERWISE ]:
; 2044      3552  4
; 2045      3553  4                                        RETURN 0 ;
; 2046      3554  4                                   TES ;
; 2047      3555  4
; 2048      3556  3                              END ;
; 2049      3557  2                         END ;
; 2050      3558  2
; 2051      3559  2                      !+
; 2052      3560  2                      !  Check range.  At this point you are only concerned
; 2053      3561  2                      !  about the  # of zeroes beteen the decimal point and
; 2054      3562  2                      !  the significant digits.  Anything greater then 38
; 2055      3563  2                      !  is out of range.  For example the following are out
; 2056      3564  2                      !  of range -
; 2057      3565  2                      !     0.000000000000000000000000000000000000000123
; 2058      3566  2                      !        because R_SIGNIF + R_ZERO GTR 38
; 2059      3567  2                      !     1230000000000000000000000000000000000000000
; 2060      3568  2                      !        because L_SIGNIF + L_ZERO GTR 38
; 2061      3569  2                      !
; 2062      3570  2                      ! NOTE :  The following error would have been caught
; 2063      3571  2                      !          by the loop above -
; 2064      3572  2                      !     120000000.0000000000000000000000000000000034
; 2065      3573  2                      !              out of range
; 2066      3574  2                      !-
; 2067      3575  2
; 2068      3576  2                      IF .R_SIGNIF + .R_ZERO GTR %X'38' OR
; 2069      3577  2                         .L_SIGNIF + .L_ZERO GTR %X'38'
; 2070      3578  2                      THEN
; 2071      3579  2                         RETURN 0 ;            ! Out of range
; 2072      3580  2
; 2073      3581  2      RETURN 1 ;
; 2074      3582  1      END ;                                            End COB$$VERIFY_FL_RANGE



                                    0FFC 00000 COB$$VERIFY_FL_RANGE:
                                                          .WORD    Save R2,R3,R4,R5,R6,R7,R8,R9,R10,R11              ; 3321
                                  52   D4 00002           CLRL     COUNT                                             ; 3361
                                  55   7C 00004           CLRQ     SIGN_SEEN                                         ;
                                  54   D4 00006           CLRL     E_SEEN                                            ;
                                  58   7C 00008           CLRQ     R_SIGNIF                                          ;
                                  57   D4 0000A           CLRL     L_SIGNIF                                          ;
                                  5A   7C 0000C           CLRQ     L_ZERO                                            ;
                  50        04    AC   D0 0000E           MOVL     TEMP_PUT_HERE, R0                                 ; 3402
                  51        04    A0   D0 00012           MOVL     4(R0), PUT_BUF                                    ;
                  53              01   CE 00016           MNEGL    #1, X                                             ; 3503
                                  76   11 00019           BRB      16$                                               ;
                  50            6341   9A 0001B  1$:      MOVZBL   (X)[PUT_BUF], R0                                  ; 3409
                  31              50   91 0001F           CMPB     R0, #49                                           ; 3412
                                  0A   1F 00022           BLSSU    2$                                                ;
                  39              50   91 00024           CMPB     R0, #57                                           ;
                                  05   1A 00027           BGTRU    2$                                                ;
```

```
                    56      01  D0 00029        MOVL    #1, DIGIT_SEEN                          : 3419
                            08  11 0002C        BRB     3$                                      : 3420
                    30      50  91 0002E 2$:    CMPB    R0, #48                                 : 3428
                            15  12 00031        BNEQ    6$                                      :
                    08      56  E9 00033        BLBC    DIGIT_SEEN, 5$                          : 3435
                    04      59  E9 00036 3$:    BLBC    DOT_SEEN, 4$                            : 3437
                            58  D6 00039        INCL    R_SIGNIF                                : 3439
                            32  11 0003B        BRB     11$                                     :
                            57  D6 0003D 4$:    INCL    L_SIGNIF                                : 3441
                            2E  11 0003F        BRB     11$                                     : 3437
                    23      59  E9 00041 5$:    BLBC    DOT_SEEN, 11$                           : 3447
                            5B  D6 00044        INCL    R_ZERO                                  : 3449
                            27  11 00046        BRB     11$                                     : 3450
                    2B      50  91 00048 6$:    CMPB    R0, #43                                 : 3453
                            05  13 0004B        BEQL    7$                                      :
                    2D      50  91 0004D        CMPB    R0, #45                                 :
                            09  12 00050        BNEQ    8$                                      :
                            55  D5 00052 7$:    TSTL    SIGN_SEEN                               : 3458
                            27  12 00054        BNEQ    13$                                     :
                    55      01  D0 00056        MOVL    #1, SIGN_SEEN                           : 3461
                            14  11 00059        BRB     11$                                     : 3462
                    2C      50  91 0005B 8$:    CMPB    R0, #44                                 : 3467
                            05  13 0005E        BEQL    9$                                      :
                    2E      50  91 00060        CMPB    R0, #46                                 :
                            05  12 00063        BNEQ    10$                                     :
                    59      01  D0 00065 9$:    MOVL    #1, DOT_SEEN                            : 3470
                            05  11 00068        BRB     11$                                     : 3471
                    20      50  91 0006A 10$:   CMPB    R0, #32                                 : 3474
                            04  12 0006D        BNEQ    12$                                     :
                            52  D6 0006F 11$:   INCL    COUNT                                   : 3478
                            11  11 00071        BRB     15$                                     :
               45   8F      50  91 00073 12$:   CMPB    R0, #69                                 : 3480
                            06  13 00077        BEQL    14$                                     :
               65   8F      50  91 00079        CMPB    R0, #101                                :
                            68  12 0007D 13$:   BNEQ    22$                                     :
                    54      01  D0 0007F 14$:   MOVL    #1, E_SEEN                              : 3487
                            12  11 00082        BRB     17$                                     : 3486
          50        57      58  C1 00084 15$:   ADDL3   R_SIGNIF, L_SIGNIF, R0                  : 3503
               0C   AC      50  D1 00088        CMPL    R0, MAX                                 :
                            08  13 0008C        BEQL    17$                                     :
                    05      54  E8 0008E        BLBS    E_SEEN, 17$                             : 3504
          85        53  08  AC  F2 00091 16$.   AOBLSS  CHARS_READ, X, 1$                       : 3404
               08   AC      52  D1 00096 17$:   CMPL    COUNT, CHARS_READ                       : 3516
                            35  18 0009A        BGEQ    21$                                     :
                            52  D7 0009C        DECL    Y                                       : 3522
                            2C  11 0009E        BRB     20$                                     :
                    50    6241  9A 000A0 18$:   MOVZBL  (Y)[PUT_BUF], R0                        : 3525
               45   8F      50  91 000A4        CMPB    R0, #69                                 : 3528
                            27  13 000A8        BEQL    21$                                     :
               65   8F      50  91 000AA        CMPB    R0, #101                                :
                            21  13 000AE        BEQL    21$                                     :
                    30      50  91 000B0        CMPB    R0, #48                                 : 3536
                            08  12 000B3        BNEQ    19$                                     :
                            59  D5 000B5        TSTL    DOT_SEEN                                : 3541
                            13  12 000B7        BNEQ    20$                                     :
                            5A  D6 000B9        INCL    L_ZERO                                  : 3543
                            0F  11 000BB        BRB     20$                                     : 3541
```

```
                          20          50  91 000BD 19$:    CMPB    R0, #32                                      ; 3545
                                      0A  13 000C0         BEQL    20$                                          ;
                          2B          50  91 000C2         CMPB    R0, #43                                      ;
                                      20  1F 000C5         BLSSU   22$                                          ;
                          2E          50  91 000C7         CMPB    R0, #46                                      ;
                                      1B  1A 000CA         BGTRU   22$                                          ;
            CF            52    08    AC  F2 000CC 20$:    AOBLSS  CHARS_READ, Y, 18$                           ; 3522
            50            58          5B  C1 000D1 21$:    ADDL3   R_ZERO, R_SIGNIF, R0                         ; 3576
                          38          50  D1 000D5         CMPL    R0, #56                                      ;
                                      0D  14 000D8         BGTR    22$                                          ;
            50            57          5A  C1 000DA         ADDL3   L_ZERO, L_SIGNIF, R0                         ; 3577
                          38          50  D1 000DE         CMPL    R0, #56                                      ;
                                      04  14 000E1         BGTR    22$                                          ;
                          50          01  D0 000E3         MOVL    #1, R0                                       ; 3581
                                          04 000E6         RET                                                  ;
                                      50  D4 000E7 22$:    CLRL    R0                                           ; 3582
                                          04 000E9         RET                                                  ;

; Routine Size:  234 bytes,    Routine Base:  _COB$CODE + 09C0
```

```
1 %SBTTL 'COB$$SCAN_INPUT - Scan the input string'
1 ROUTINE COB$$SCAN_INPUT ( ARG_DESC       :  REF $STR$DESCRIPTOR,
1                           CHARS_READ,
1                           FLAGS,
1                           BUF_DESC       :  REF $STR$DESCRIPTOR,
1                           LEFT_DEC,
1                           NUM_DIGITS,
1                           SIGN_VAL,
1                           PUTTER,
1                           LEADING_ZEROES,
1                           SIGN_SEEN,
1                           DIGIT_SEEN,
1                           DOT_SEEN,
1                           ZERO_SEEN,
1                           BLANKS_SEEN
1                         )  : =
1
1 !++
1 ! FUNCTIONAL DESCRIPTION:
1 !
1 !  Scan the input number, put result in BUF.
1 !
1 ! FORMAL PARAMETERS:
1 !
1 !       ARG_DESC.rt.dx          The numeric string to scan
1 !       CHARS_READ.rlu.v        Number of input characters read
1 !       FLAGS.rlu.v             Screen enhancement flag
1 !       BUF_DESC.rt.dx          Deposit for scanned input
1 !       LEFT_DEC.ml.r           # of digits to left of decimal point
1 !       NUM_DIGITS.ml.r         # of digits in ARG_DESC
1 !       SIGN_VAL.ml.r           Temp to hold sign
1 !       PUTTER.ml.r             Counts position in buffer BUF_DESC
1 !       LEADING_ZEROES.ml.r     # of leading zeroes
1 !       SIGN_SEEN.ml.r          = 1 if '+' or '-' scanned
1 !       DIGIT_SEEN.ml.r         = 1 if a digit 0-9 was scanned
1 !       DOT_SEEN.ml.r           = 1 if '.' or ',' scanned
1 !       ZERO_SEEN.ml.r          = 1 if digit 0 scanned
1 !       BLANKS_SEEN.ml.r        = 1 if trailing blanks scanned
1 !
1 ! IMPLICIT INPUTS:
1 !
1 !       NONE
1 !
1 ! IMPLICIT OUTPUTS:
1 !
1 !       NONE
1 !
1 ! ROUTINE VALUE:
1 ! COMPLETION CODES:
1 !
1 !       0 = Failure, 1 = Success
1 !
1 ! SIDE EFFECTS:
1 !
1 !       NONE
1 !--
1
```

```
2        BEGIN
2            LOCAL
2            BUF : REF VECTOR [1100, BYTE],           ! Addresses result
2            ARG : REF VECTOR [1100, BYTE] ;          ! Addresses source
2
2        BUF = .BUF_DESC [DSC$A_POINTER];
2        ARG = .ARG_DESC [DSC$A_POINTER];
2
2    !+
2    ! Scan Input, put result in BUF.
2    !-
2
2        INCR GETTER FROM 0 TO (.CHARS_READ - 1) DO
2
2            SELECTONE .ARG [.GETTER] OF
2                SET
2
2                [%C'0' TO %C'9'] :
2
3                    BEGIN                              ! Decimal digit
3                    IF ( .ARG [.GETTER] NEQ %C'0' ) OR (..DOT_SEEN EQL 1) OR
4                       ((.ARG [.GETTER] EQL %C'0' ) AND ..DIGIT_SEEN EQL 1)
3                    THEN
4                        BEGIN
4                        !+
4                        ! This is not a leading zero
4                        !-
4                        IF ..BLANKS_SEEN               ! Ensure no imbedded blanks
4                        THEN RETURN 0;
4
4                        .DIGIT_SEEN = 1;
4                        BUF [..PUTTER] = .ARG [.GETTER];
4                        .PUTTER = ..PUTTER + 1;
4
4                        .NUM_DIGITS = ..NUM_DIGITS + 1 ;
4                        END
3                    ELSE
4                        BEGIN
4                        .LEADING_ZEROES = ..LEADING_ZEROES + 1;
4                        .ZERO_SEEN = 1 ;               ! 00. is valid - dot_seen and
4                                                       ! zero_seen
3                        END;
2                    END;
2
2                [%C'+', %C'-'] :
2
3                    BEGIN                              ! Plus or minus sign
3                    IF ( ..SIGN_SEEN ) THEN RETURN 0 ;
3                    IF .GETTER NEQ .CHARS_READ - 1     ! Ensure no imbedded signs
3                    THEN
4                        IF (( ..DIGIT_SEEN ) AND ( .ARG [.GETTER + 1] NEQ %C' ' ))
3                        THEN RETURN 0 ;
3
3                    .SIGN_SEEN = 1;
3                    .SIGN_VAL = .ARG [.GETTER];
2                    END;
2
```

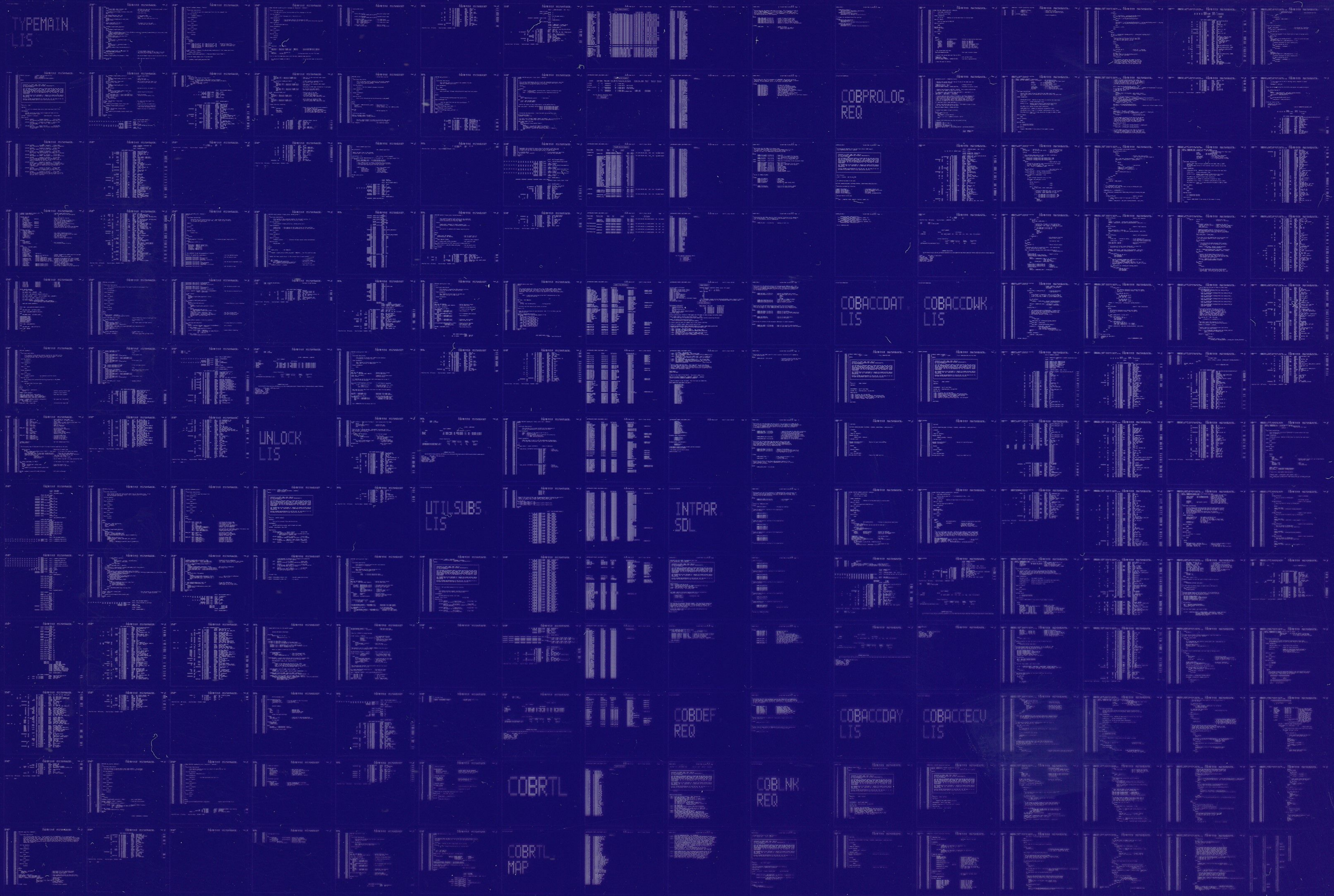
```
; 2190          3697  2                [%C'.'] :
; 2191          3698  2
; 2192          3699  3                    BEGIN                           ! Decimal point
; 2193          3700  3                    IF ( ..DOT_SEEN ) THEN RETURN 0;
; 2194          3701  3                    !+
; 2195          3702  3                    !  Is decimal point a valid character - look at bit 6 of FLAGS
; 2196          3703  3                    !-
; 2197          3704  3                    IF ( .FLAGS AND V_DEC_PT ) NEQ 0
; 2198          3705  3                    THEN
; 2199          3706  3                        RETURN 0                    ! Decimal point is illegal
; 2200          3707  3                    ELSE
; 2201          3708  4                        BEGIN
; 2202          3709  4                        .DOT_SEEN = 1;
; 2203          3710  4                        .LEFT_DEC = ..NUM_DIGITS ;  ! Count for validating size of
; 2204          3711  3                        END ;                       ! entered data.  NUM_DIGITS
; 2205          3712  2                    END;                            ! calculated below.
; 2206          3713  2
; 2207          3714  2                [%C','] :
; 2208          3715  2
; 2209          3716  3                    BEGIN                           ! Decimal point is Comma
; 2210          3717  3                    IF ( ..DOT_SEEN ) THEN RETURN 0;
; 2211          3718  3                    !+
; 2212          3719  3                    !  Is comma a valid character - look at bit 6 of FLAGS
; 2213          3720  3                    !-
; 2214          3721  3                    IF ( .FLAGS AND V_DEC_PT ) NEQ 0
; 2215          3722  3                    THEN
; 2216          3723  4                        BEGIN                       ! Comma is an illegal character
; 2217          3724  4                        .DOT_SEEN = 1;
; 2218          3725  4                        .LEFT_DEC = ..NUM_DIGITS ;  ! Count for validating size of
; 2219          3726  4                        END                         ! entered data.  NUM_DIGITS
; 2220          3727  3                    ELSE                            ! calculated below.
; 2221          3728  3                        RETURN 0 ;
; 2222          3729  2                    END;
; 2223          3730  2
; 2224          3731  2                [%C' '] :
; 2225          3732  2
; 2226          3733  3                    BEGIN                           ! Blank, better be leading or trailing.
; 2227          3734  4                    IF (..SIGN_SEEN OR ..DIGIT_SEEN OR ..DOT_SEEN)
; 2228          3735  3                    THEN .BLANKS_SEEN = 1;
; 2229          3736  2                    END;
; 2230          3737  2
; 2231          3738  2                [OTHERWISE] :        !  reprompt by passing back a routine value of 0
; 2232          3739  2
; 2233          3740  2                    RETURN 0 ;
; 2234          3741  2                TES;
; 2235          3742  2
; 2236          3743  2        RETURN 1 ;
; 2237          3744  1        END ;                                       ! End COB$$SCAN_INPUT


                                                003C 00000 COB$$SCAN_INPUT:
                                                                   .WORD    Save R2,R3,R4,R5                                  ; 3584
                              50        10   AC  D0 00002          MOVL     BUF_DESC, R0                                      ; 3645
                              55        04   A0  D0 00006          MOVL     4(R0), BUF                                        ;
```

```
                    50      04   AC  D0 0000A          MOVL    ARG_DESC, R0                                  ; 3646
                    52      04   A0  D0 0000E          MOVL    4(R0), ARG                                    ;
                    54           01  CE 00012          MNEGL   #1, GETTER                                    ; 3654
                                 75  11 00015          BRB     8$                                            ;
                    50         0442  9A 00017 1$:      MOVZBL  (GETTER)[ARG], R0                             ;
                    30           50  91 0001B          CMPB    R0, #48                                       ; 3657
                                 41  1F 0001E          BLSSU   5$                                            ;
                    39           50  91 00020          CMPB    R0, #57                                       ;
                                 3C  1A 00023          BGTRU   5$                                            ;
                    30           50  91 00025          CMPB    R0, #48                                       ; 3660
                                 11  12 00028          BNEQ    2$                                            ;
                    01      30   BC  D1 0002A          CMPL    @DOT_SEEN, #1                                 ;
                                 0B  13 0002E          BEQL    2$                                            ;
                    30           50  91 00030          CMPB    R0, #48                                       ; 3661
                                 23  12 00033          BNEQ    4$                                            ;
                    01      2C   BC  D1 00035          CMPL    @DIGIT_SEEN, #1                               ;
                                 1D  12 00039          BNEQ    4$                                            ;
                    03      38   BC  E9 0003B 2$:      BLBC    @BLANKS_SEEN, 3$                              ; 3667
                               0098  31 0003F          BRW     17$                                           ;
               2C   BC           01  D0 00042 3$:      MOVL    #1, @DIGIT_SEEN                               ; 3670
                    51      20   AC  D0 00046          MOVL    PUTTER, R1                                    ; 3671
                    53           61  D0 0004A          MOVL    (R1), R3                                      ;
                  6345           50  90 0004D          MOVB    R0, (R3)[BUF]                                 ;
                                 61  D6 00051          INCL    (R1)                                          ; 3672
                            18   BC  D6 00053          INCL    @NUM_DIGITS                                   ; 3674
                                 74  11 00056          BRB     14$                                           ; 3660
                            24   BC  D6 00058 4$:      INCL    @LEADING_ZEROES                               ; 3678
               34   BC           01  D0 0005B          MOVL    #1, @ZERO_SEEN                                ; 3679
                                 6B  11 0005F          BRB     14$                                           ; 3654
                    2B           50  91 00061 5$:      CMPB    R0, #43                                       ; 3684
                                 05  13 00064          BEQL    6$                                            ;
                    2D           50  91 00066          CMPB    R0, #45                                       ;
                                 23  12 00069          BNEQ    9$                                            ;
                    6B      28   BC  E8 0006B 6$:      BLBS    @SIGN_SEEN, 17$                               ; 3687
          51   08   AC           01  C3 0006F          SUBL3   #1, CHARS_READ, R1                            ; 3688
                    51           54  D1 00074          CMPL    GETTER, R1                                    ;
                                 0B  13 00077          BEQL    7$                                            ;
                    07      2C   BC  E9 00079          BLBC    @DIGIT_SEEN, 7$                               ; 3690
                    20      01 A442  91 0007D          CMPB    1(GETTER)[ARG], #32                           ;
                                 56  12 00082          BNEQ    17$                                           ;
               28   BC           01  D0 00084 7$:      MOVL    #1, @SIGN_SEEN                                ; 3693
               1C   BC           50  D0 00088          MOVL    R0, @SIGN_VAL                                 ; 3694
                                 3E  11 0008C 8$:      BRB     14$                                           ; 3654
                    2E           50  91 0008E 9$:      CMPB    R0, #46                                       ; 3697
                                 0B  12 00091          BNEQ    10$                                           ;
                    43      30   BC  E8 00093          BLBS    @DOT_SEEN, 17$                                ; 3700
          3E   0C   AC           06  E0 00097          BBS     #6, FLAGS, 17$                                ; 3704
                                 0E  11 0009C          BRB     11$                                           ; 3709
                    2C           50  91 0009E 10$:     CMPB    R0, #44                                       ; 3714
                                 14  12 000A1          BNEQ    12$                                           ;
                    33      30   BC  E8 000A3          BLBS    @DOT_SEEN, 17$                                ; 3717
          2E   0C   AC           06  E1 000A7          BBC     #6, FLAGS, 17$                                ; 3721
               30   BC           01  D0 000AC 11$:     MOVL    #1, @DOT_SEEN                                 ; 3724
               14   BC      18   BC  D0 000B0          MOVL    @NUM_DIGITS, @LEFT_DEC                        ; 3725
                                 15  11 000B5          BRB     14$                                           ; 3721
                    20           50  91 000B7 12$:     CMPB    R0, #32                                       ; 3731
                                 1E  12 000BA          BNEQ    17$                                           ;
```

```
                             08      28   BC  E8 000BC          BLBS    @SIGN_SEEN, 13$                          ; 3734
                             04      2C   BC  E8 000C0          BLBS    @DIGIT_SEEN, 13$                         ;
                             04      30   BC  E9 000C4          BLBC    @DOT_SEEN, 14$                           ;
                       38    BC           01  D0 000C8 13$:     MOVL    #1, @BLANKS_SEEN                         ; 3735
                02           54      08   AC  F2 000CC 14$:     AOBLSS  CHARS_READ, GETTER, 15$                  ; 3654
                                          03  11 000D1          BRB     16$                                      ;
                                        FF41  31 000D3 15$:     BRW     1$                                       ;
                             50           01  D0 000D6 16$:     MOVL    #1, R0                                   ; 3743
                                              04 000D9          RET                                              ;
                                          50  D4 000DA 17$:     CLRL    R0                                       ; 3744
                                              04 000DC          RET                                              ;

; Routine Size:  221 bytes,    Routine Base:  _COB$CODE + 0AAA


; 2238          3745  1
; 2239          3746  1     END                                         ! End of module COB$ACCECV
; 2240          3747  0     ELUDOM





;                                      PSECT SUMMARY
;
;       Name                       Bytes                     Attributes
;
;  _COB$CODE                          2951  NOVEC,NOWRT,  RD ,  EXE,  SHR,  LCL,  REL,  CON,  PIC,ALIGN(2)




;                                Library Statistics
;
;                                               -------- Symbols --------       Pages       Processing
;       File                                    Total    Loaded   Percent       Mapped      Time
;
;  _$255$DUA28:[SYSLIB]STARLET.L32;1             9776        27         0         581         00:00.8
;  _$255$DUA28:[COBRTL.OBJ]SMGLIB.L32;1           469         0         0          38         00:00.2




;                                      COMMAND QUALIFIERS
;
;       BLISS/CHECK=(FIELD,INITIAL,OPTIMIZE)/NOTRACE/LIS=LIS$:COBACCECV/OBJ=OBJ$:COBACCECV MSRC$:COBACCECV/UPDATE=(ENH$:COBACCECV
;       )

; Size:         2929 code + 22 data bytes
; Run Time:        00:42.5
; Elapsed Time:    04:56.0
; Lines/CPU Min:     5286
; Lexemes/CPU-Min: 21421
; Memory Used:  364 pages
; Compilation Complete
```

0060 AH-BT13A-SE
VAX/VMS V4.0

DIGITAL EQUIPMENT CORPORATION
CONFIDENTIAL AND PROPRIETARY



TYPEMAIN
LIS

COBPROLOG
REQ

COBACCDAT
LIS

COBACCDWK
LIS

UNLOCK
LIS

UTILSUBS
LIS

INTPAR
SDL

COBDEF
REQ

COBACCDAY
LIS

COBACCECV
LIS

COBRTL

COBLNK
REQ

COBRTL
MAP

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

DIGITAL EQUIPMENT CORPORATION
CONFIDENTIAL AND PROPRIETARY