```
RRRRRRRRRRRR        UUU           UUU  NNN           NNN   000000000     FFFFFFFFFFFFFFF   FFFFFFFFFFFFFFFF
RRRRRRRRRRRR        UUU           UUU  NNN           NNN   000000000     FFFFFFFFFFFFFFF   FFFFFFFFFFFFFFFF
RRRRRRRRRRRR        UUU           UUU  NNN           NNN   000000000     FFFFFFFFFFFFFFF   FFFFFFFFFFFFFFFF
RRR       RRR       UUU           UUU  NNN           NNN   000       000  FFF               FFF
RRR       RRR       UUU           UUU  NNN           NNN   000       000  FFF               FFF
RRR       RRR       UUU           UUU  NNN           NNN   000       000  FFF               FFF
RRR       RRR       UUU           UUU  NNNNNN        NNN   000       000  FFF               FFF
RRR       RRR       UUU           UUU  NNNNNN        NNN   000       000  FFF               FFF
RRRRRRRRRRRR        UUU           UUU  NNN    NNN    NNN   000       000  FFFFFFFFFFF       FFFFFFFFFFF
RRRRRRRRRRRR        UUU           UUU  NNN    NNN    NNN   000       000  FFFFFFFFFFF       FFFFFFFFFFF
RRRRRRRRRRRR        UUU           UUU  NNN    NNN    NNN   000       000  FFFFFFFFFFF       FFFFFFFFFFF
RRR    RRR          UUU           UUU  NNN       NNNNN     000       000  FFF               FFF
RRR     RRR         UUU           UUU  NNN       NNNNN     000       000  FFF               FFF
RRR      RRR        UUU           UUU  NNN          NNN    000       000  FFF               FFF
RRR       RRR       UUU           UUU  NNN          NNN    000       000  FFF               FFF
RRR       RRR       UUU           UUU  NNN          NNN    000       000  FFF               FFF
RRR       RRR       UUUUUUUUUUUUUUUUU  NNN          NNN     000000000     FFF               FFF
RRR       RRR       UUUUUUUUUUUUUUUUU  NNN          NNN     000000000     FFF               FFF
RRR       RRR       UUUUUUUUUUUUUUUUU  NNN          NNN     000000000     FFF               FFF
```
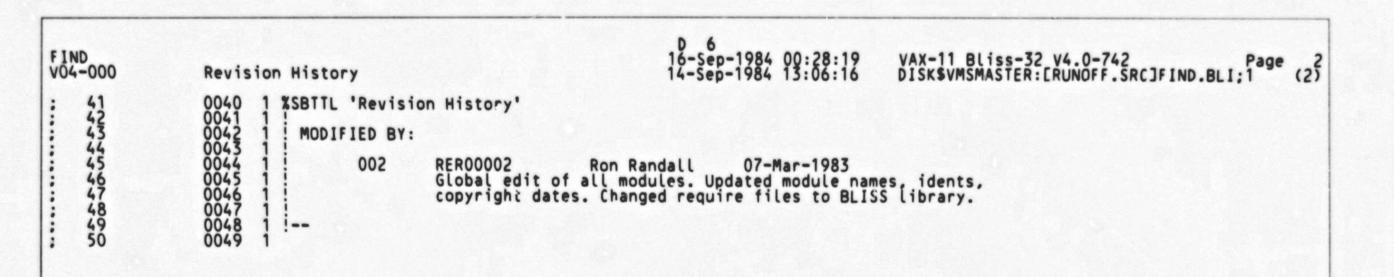
```
FFFFFFFFFF   IIIIII   NN      NN  DDDDDDD
FFFFFFFFFF   IIIIII   NN      NN  DDDDDDD
FF             II     NN      NN  DD      DD
FF             II     NN      NN  DD      DD
FF             II     NNNN    NN  DD      DD
FF             II     NNNN    NN  DD      DD
FFFFFFFF       II     NN  NN  NN  DD      DD
FFFFFFFF       II     NN  NN  NN  DD      DD
FF             II     NN    NNNN  DD      DD
FF             II     NN    NNNN  DD      DD
FF             II     NN      NN  DD      DD    ....
FF             II     NN      NN  DD      DD    ....
FF           IIIIII   NN      NN  DDDDDDD       ....
FF           IIIIII   NN      NN  DDDDDDD       ....


LL           IIIIII      SSSSSSS
LL           IIIIII      SSSSSSS
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   SSSSSSS
LLLLLLLLLL   IIIIII   SSSSSSS
```

```
     1    0001  0  MODULE find (     IDENT = 'V04-000'
     2  P 0002  0                    %BLISS32[, ADDRESSING_MODE (EXTERNAL     = LONG_RELATIVE,
     3    0003  0                                                NONEXTERNAL = LONG_RELATIVE)]
     4    0004  0                    ) =
     5    0005  1  BEGIN
     6    0006  1  !
     7    0007  1  !****************************************************************
     8    0008  1  !*                                                              *
     9    0009  1  !*    COPYRIGHT (c) 1978, 1980, 1982, 1984 BY                    *
    10    0010  1  !*    DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS.     *
    11    0011  1  !*    ALL RIGHTS RESERVED.                                       *
    12    0012  1  !*                                                              *
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    14    0014  1  !*    ONLY IN  ACCORDANCE WITH  THE  TERMS  OF  SUCH  LICENSE  AND WITH THE  *
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    16    0016  1  !*    COPIES THEREOF MAY NOT BE PROVIDED OR OTHERWISE MADE AVAILABLE TO ANY  *
    17    0017  1  !*    OTHER PERSON.  NO TITLE TO AND OWNERSHIP OF  THE  SOFTWARE IS  HEREBY  *
    18    0018  1  !*    TRANSFERRED.                                               *
    19    0019  1  !*                                                              *
    20    0020  1  !*    THE INFORMATION IN THIS SOFTWARE IS  SUBJECT TO CHANGE WITHOUT NOTICE  *
    21    0021  1  !*    AND  SHOULD  NOT  BE  CONSTRUED AS  A COMMITMENT BY DIGITAL EQUIPMENT  *
    22    0022  1  !*    CORPORATION.                                               *
    23    0023  1  !*                                                              *
    24    0024  1  !*    DIGITAL ASSUMES NO RESPONSIBILITY FOR THE USE  OR  RELIABILITY OF ITS  *
    25    0025  1  !*    SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DIGITAL.    *
    26    0026  1  !*                                                              *
    27    0027  1  !*                                                              *
    28    0028  1  !****************************************************************
    29    0029  1  !
    30    0030  1  !++
    31    0031  1  ! FACILITY:     DSR (Digital Standard RUNOFF) / DSRPLUS
    32    0032  1  !
    33    0033  1  ! ABSTRACT:     Uses a binary search to look up a keyword.
    34    0034  1  !
    35    0035  1  ! ENVIRONMENT:  Transportable
    36    0036  1  !
    37    0037  1  ! AUTHOR:       R.W.Friday        CREATION DATE: May, 1978
    38    0038  1  !
    39    0039  1  !
```

```
;   41     0040  1 %SBTTL 'Revision History'
;   42     0041  1 !
;   43     0042  1 ! MODIFIED BY:
;   44     0043  1 !
;   45     0044  1 !    002     RER00002      Ron Randall      07-Mar-1983
;   46     0045  1 !            Global edit of all modules. Updated module names, idents,
;   47     0046  1 !            copyright dates. Changed require files to BLISS library.
;   48     0047  1 !
;   49     0048  1 !--
;   50     0049  1
```

```
  52        0050   1   %SBTTL 'Module Level Declarations'
  53        0051   1
  54        0052   1   !
  55        0053   1   !   TABLE OF CONTENTS:
  56        0054   1   !
  57        0055   1   !   INCLUDE FILES:
  58        0056   1   !
  59        0057   1   LIBRARY 'NXPORT:XPORT';                    ! XPORT Library
  60        0058   1   REQUIRE 'REQ:RNODEF';                      ! RUNOFF variant definitions
  61        0189   1
  62   U    0190   1   %IF DSRPLUS %THEN
  63   U    0191   1   LIBRARY 'REQ:DPLLIB';                      ! DSRPLUS BLISS Library
  64        0192   1   %ELSE
  65        0193   1   LIBRARY 'REQ:DSRLIB';                      ! DSR BLISS Library
  66        0194   1   %FI
  67        0195   1
  68        0196   1   !
  69        0197   1   !   EXTERNAL REFERENCES:
  70        0198   1   !
  71        0199   1   EXTERNAL ROUTINE
  72        0200   1       TPROBE;
  73        0201   1
```

FIND
V04-000

F 6
16-Sep-1984 00:28:19   VAX-11 Bliss-32 V4.0-742   Page 4
Module Level Declarations   14-Sep-1984 13:06:16   DISK$VMSMASTER:[RUNOFF.SRC]FIND.BLI;1   (4)

```
 75    0202   1   GLOBAL ROUTINE FIND (KEY, SIZE, LIST) =
 76    0203   1
 77    0204   1   !++
 78    0205   1   ! FUNCTIONAL DESCRIPTION:
 79    0206   1   !
 80    0207   1   !       Searches LIST in an attempt to recognize KEY.
 81    0208   1   !       A binary search algorithm is used.
 82    0209   1   !
 83    0210   1   ! FORMAL PARAMETERS:
 84    0211   1   !
 85    0212   1   !       KEY is the word that is to be identified; SIZE is its length.
 86    0213   1   !       LIST is a list of keywords, as defined in the module LP1.
 87    0214   1   !
 88    0215   1   ! IMPLICIT INPUTS:      None
 89    0216   1   !
 90    0217   1   ! IMPLICIT OUTPUTS:     None
 91    0218   1   !
 92    0219   1   ! ROUTINE VALUE:
 93    0220   1   ! COMPLETION CODES:
 94    0221   1   !
 95    0222   1   !       If KEY is recognized, the address of the corresponding
 96    0223   1   !       entry in LIST is returned.  Otherwise, zero is returned.
 97    0224   1   !
 98    0225   1   ! SIDE EFFECTS:         None
 99    0226   1   !--
100    0227   1
101    0228   2      BEGIN
102    0229   2      MAP
103    0230   2          LIST : REF VECTOR;
104    0231   2
105    0232   2      LOCAL
106    0233   2          RESULT,
107    0234   2          TOP,
108    0235   2          BOTTOM,
109    0236   2          HALF_OF_RANGE,
110    0237   2          MIDPOINT;
111    0238   2
112    0239   2      TOP = 0;
113    0240   2      BOTTOM = .LIST [-1] - 1;
114    0241   2
115    0242   2      WHILE 1 DO
116    0243   3          BEGIN
117    0244   3          HALF_OF_RANGE = (.BOTTOM - .TOP + 1)/2;
118    0245   3          MIDPOINT = .TOP + .HALF_OF_RANGE;
119    0246   3          RESULT = TPROBE (.KEY, .SIZE, .LIST [.MIDPOINT]);
120    0247   3
121    0248   3          CASE .RESULT FROM 0 TO 3 OF
122    0249   3              SET
123    0250   3
124    0251   3              [FOUND] :
125    0252   3                  RETURN .LIST [.MIDPOINT];
126    0253   3
127    0254   3              [GIVE_UP] :
128    0255   3                  RETURN 0;
129    0256   3
130    0257   3              [TRY_ABOVE] :
131    0258   4                  BEGIN
```

FIND
V04-000

Module Level Declarations

G 6
16-Sep-1984 00:28:19
14-Sep-1984 13:06:16

VAX-11 Bliss-32 V4.0-742
DISK$VMSMASTER:[RUNOFF.SRC]FIND.BLI;1

Page   5
(4)

```
 132      0259  4                        IF .MIDPOINT EQL .TOP
 133      0260  4                        THEN
 134      0261  4                            RETURN 0
 135      0262  4                        ELSE
 136      0263  4                            BOTTOM = .MIDPOINT - 1;
 137      0264  4
 138      0265  4
 139      0266  3                        END;
 140      0267  3
 141      0268  3                    [TRY BELOW] :
 142      0269  4                        BEGIN
 143      0270  4
 144      0271  4                        IF .MIDPOINT EQL .BOTTOM
 145      0272  4                        THEN
 146      0273  4                            RETURN 0
 147      0274  4                        ELSE
 148      0275  4                            TOP = .MIDPOINT + 1;
 149      0276  4
 150      0277  3                        END;
 151      0278  3                    TES;
 152      0279  3
 153      0280  3                END
 154      0281  3
 155      0282  1            END;                               !End of FIND
```

```
                                                        .TITLE  FIND
                                                        .IDENT  \V04-000\

                                                        .EXTRN  TPROBE

                                                        .PSECT  $CODE$,NOWRT,2

                                007C 00000              .ENTRY  FIND, Save R2,R3,R4,R5,R6
                            55   D4 00002               CLRL    TOP
                    54  0C  AC   D0 00004               MOVL    LIST, R4
           53   FC  A4       01  C3 00008               SUBL3   #1, -4(R4), BOTTOM
           51       53       55  C3 0000D 1$:           SUBL3   TOP, BOTTOM, R1
                            51   D6 00011               INCL    R1
           56       51       02  C7 00013               DIVL3   #2, R1, HALF OF RANGE
           52       55       56  C1 00017               ADDL3   HALF OF RANGE, TOP, MIDPOINT
                         6442   DD 0001B               PUSHL   (R4)[MIDPOINT]
                    7E  04  AC  7D 0001E               MOVQ    KEY, -(SP)
       00000000G  EF       03  FB 00022               CALLS   #3, TPROBE
           03       00       50  CF 00029               CASEL   RESULT, #0, #3
    0018        000D    0008    001D     0002D 2$:      .WORD   6$-2$,-
                                                                3$-2$,-
                                                                4$-2$,-
                                                                5$-2$
                    50       6442  D0 00035 3$:         MOVL    (R4)[MIDPOINT], R0
                             04 00039                   RET
                    55       52  D1 0003A 4$:           CMPL    MIDPOINT, TOP
                         0B  13 0003D                   BEQL    6$
           53   FF  A2       9E 0003F                   MOVAC   -1(R2), BOTTOM
                         C8  11 00043                   BRB     1$
                    53       52  D1 00045 5$:           CMPL    MIDPOINT, BOTTOM
                         03  12 00048                   BNEQ    7$
```

FLGS
V04-

:
:
:
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: 0202
: 0239
: 0240
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: 0244
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: 0245
: 0246
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: 0248
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:
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:
: 0252
:
: 0260
:
: 0264
: 0248
: 0271

```
                                              50   D4 0004A 6$:      CLRL     R0                                              ; 0273
                                                   04 0004C          RET
                                    55        01   A2 9E 0004D 7$:   MOVAB    1(R2), TOP                                      ; 0275
                                                   BA 11 00051        BRB      1$                                             ; 0242
```

; Routine Size: 83 bytes,   Routine Base: $CODE$ + 0000

; 156   0283 1
; 157   0284 1 END   !End of module
; 158   0285 0 ELUDOM

                        PSECT SUMMARY

;
;   Name   Bytes   Attributes
;
; $CODE$ 83 NOVEC,NOWRT, RD , EXE,NOSHR, LCL, REL, CON,NOPIC,ALIGN(2)

                        Library Statistics

;   -------- Symbols --------   Pages   Processing
;   File   Total   Loaded Percent   Mapped   Time
;
; _255DUA28:[SYSLIB]XPORT.L32;1   590   0   0   252   00:00.1
; _255DUA28:[RUNOFF.SRC]DSRLIB.L32;1   1248   4   0   86   00:00.3

:   COMMAND QUALIFIERS

:   BLISS/CHECK=(FIELD,INITIAL,OPTIMIZE)/LIS=LIS$:FIND/OBJ=OBJ$:FIND MSRC$:FIND/UPDATE=(ENH$:FIND)

; Size: 83 code + 0 data bytes
; Run Time: 00:03.4
; Elapsed Time: 00:14.3
; Lines/CPU Min: 5104
; Lexemes/CPU-Min: 9438
; Memory Used: 43 pages
; Compilation Complete

FIND
LIS

ENDWRD
LIS

ERROR
LIS

FIGURE
LIS

FLGSEM
LIS

FOOFIL
LIS

GCODE
LIS

FCIMRA
LIS

FNONLY
LIS

FUNFNU
LIS

FOOBOT
LIS

GBLDCL
LIS

FNDFLG
LIS

FOOOUT
LIS

FORMAT
LIS