```
LLL                   IIIIIIIII      BBBBBBBBBBBB      RRRRRRRRRRRR      TTTTTTTTTTTTTTTT  LLL
LLL                   IIIIIIIII      BBBBBBBBBBBB      RRRRRRRRRRRR      TTTTTTTTTTTTTTTT  LLL
LLL                   IIIIIIIII      BBBBBBBBBBBB      RRRRRRRRRRRR      TTTTTTTTTTTTTTTT  LLL
LLL                      III         BBB         BBB   RRR          RRR         TTT        LLL
LLL                      III         BBB         BBB   RRR          RRR         TTT        LLL
LLL                      III         BBB         BBB   RRR          RRR         TTT        LLL
LLL                      III         BBB         BBB   RRR          RRR         TTT        LLL
LLL                      III         BBB         BBB   RRR          RRR         TTT        LLL
LLL                      III         BBBBBBBBBBBB      RRRRRRRRRRRR             TTT        LLL
LLL                      III         BBBBBBBBBBBB      RRRRRRRRRRRR             TTT        LLL
LLL                      III         BBBBBBBBBBBB      RRRRRRRRRRRR             TTT        LLL
LLL                      III         BBB         BBB   RRR   RRR                TTT        LLL
LLL                      III         BBB         BBB   RRR   RRR                TTT        LLL
LLL                      III         BBB         BBB   RRR   RRR                TTT        LLL
LLL                      III         BBB         BBB   RRR      RRR             TTT        LLL
LLL                      III         BBB         BBB   RRR      RRR             TTT        LLL
LLL                      III         BBB         BBB   RRR      RRR             TTT        LLL
LLLLLLLLLLLLLLLL      IIIIIIIII      BBBBBBBBBBBB      RRR          RRR         TTT        LLLLLLLLLLLLLLLL
LLLLLLLLLLLLLLLL      IIIIIIIII      BBBBBBBBBBBB      RRR          RRR         TTT        LLLLLLLLLLLLLLLL
LLLLLLLLLLLLLLLL      IIIIIIIII      BBBBBBBBBBBB      RRR          RRR         TTT        LLLLLLLLLLLLLLLL
```

```
LL              IIIIII    BBBBBBBB    LL              000000      000000    KK      KK  UU      UU  PPPPPPPP
LL              IIIIII    BBBBBBBB    LL              000000      000000    KK      KK  UU      UU  PPPPPPPP
LL                II      BB      BB  LL            00    00    00    00  KK      KK  UU      UU  PP      PP
LL                II      BB      BB  LL            00    00    00    00  KK      KK  UU      UU  PP      PP
LL                II      BB      BB  LL            00    00    00    00  KK    KK    UU      UU  PP      PP
LL                II      BB      BB  LL            00    00    00    00  KK    KK    UU      UU  PP      PP
LL                II      BBBBBBBB    LL            00    00    00    00  KKKKKK      UU      UU  PPPPPPPP
LL                II      BBBBBBBB    LL            00    00    00    00  KKKKKK      UU      UU  PPPPPPPP
LL                II      BB      BB  LL            00    00    00    00  KK    KK    UU      UU  PP
LL                II      BB      BB  LL            00    00    00    00  KK    KK    UU      UU  PP
LL                II      BB      BB  LL            00    00    00    00  KK      KK  UU      UU  PP              ....
LL                II      BB      BB  LL            00    00    00    00  KK      KK  UU      UU  PP              ....
LLLLLLLLLL      IIIIII    BBBBBBBB    LLLLLLLLLL      000000      000000    KK      KK  UUUUUUUUUU  PP              ....
LLLLLLLLLL      IIIIII    BBBBBBBB    LLLLLLLLLL      000000      000000    KK      KK  UUUUUUUUUU  PP              ....
```

```
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
```

```
;     1          0001  0 MODULE LIB$LOOKUP_KEY (          ! Keyword lookup routine
;     2          0002  0
;     3          0003  0         IDENT = '1-012'          ! File: LIBLOOKUP.B32 Edit: RKR1012
;     4          0004  0
;     5          0005  0                         ) =
;     6          0006  1 BEGIN
;     7          0007  1 !
;     8          0008  1 !*****************************************************************************
;     9          0009  1 !*                                                                           *
;    10          0010  1 !*  COPYRIGHT (c) 1978, 1980, 1982, 1984 BY                                  *
;    11          0011  1 !*  DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS.                    *
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;    18          0018  1 !*  OTHER PERSON.  NO TITLE TO AND OWNERSHIP OF  THE  SOFTWARE IS  HEREBY     *
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;    22          0022  1 !*  AND  SHOULD  NOT  BE  CONSTRUED AS  A COMMITMENT BY DIGITAL EQUIPMENT     *
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;    24          0024  1 !*                                                                           *
;    25          0025  1 !*  DIGITAL ASSUMES NO RESPONSIBILITY FOR THE USE  OR  RELIABILITY OF ITS     *
;    26          0026  1 !*  SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DIGITAL.                   *
;    27          0027  1 !*                                                                           *
;    28          0028  1 !*                                                                           *
;    29          0029  1 !*****************************************************************************
;    30          0030  1 !
;    31          0031  1
;    32          0032  1 !++
;    33          0033  1 ! FACILITY:  General Utility Procedure library
;    34          0034  1 !
;    35          0035  1 ! ABSTRACT:
;    36          0036  1 !
;    37          0037  1 !       This routine attempts to match a caller-specified character
;    38          0038  1 !       string with a table of keywords built by the caller.
;    39          0039  1 !
;    40          0040  1 ! ENVIRONMENT:  User mode, AST re-entrant.  Non-shared library
;    41          0041  1 !
;    42          0042  1 ! AUTHOR:  Ward Clark,  CREATION DATE:  10 January 1978
;    43          0043  1 !
;    44          0044  1 ! MODIFIED BY:
;    45          0045  1 !       Jonathan M. Taylor - 5-Mar-78
;    46          0046  1 !
;    47          0047  1 ! 0-2   - Fixed call to LIB$SCOPY_R_DX after changing parameter
;    48          0048  1 !         order.  JMT 5-Mar-78
;    49          0049  1 ! 0-03  - Change to STARLET library.  DGP 20-Apr-78
;    50          0050  1 ! 0-04  - Change REQUIRE files for VAX system build.  DGP 28-Apr-78
;    51          0051  1 ! 0-05  - Change STARLET to RTLSTARLE to avoid conflicts.  DGP 1-May-78
;    52          0052  1 ! 0-06  - Addressing mode general for LIB$SCOPY.  TNH 17-June-78
;    53          0053  1 ! 0-08  - Change file name to LIBLOOKUP.B32.  JBS 14-NOV-78
;    54          0054  1 ! 1-001 - Update version number.  JBS 16-NOV-78
;    55          0055  1 ! 1-002 - Remove REQUIRE of LIBMAC.  Only LIBLOOKUP is using it so
;    56          0056  1 !         put its text directly in this file.  JBS 11-DEC-78
;    57          0057  1 ! 1-003 - Add REQUIRE of LIBMSG to define error symbols.  JBS 11-DEC-78
```

```
;    58          0058  1 ! 1-004 - Change LIB$S to STR$.  JBS 23-MAY-1979
;    59          0059  1 ! 1-005 - Change call to STR$COPY.  JBS 16-JUL-1979
;    60          0060  1 ! 1-006 - Declare message symbols as externals, add OUTLEN, and do some
;    61          0061  1 !         minor cleanups to the text.  JBS 18-SEP-1979
;    62          0062  1 ! 1-007 - Remove $LIB_KEY_TABLE, moved to RTLMACB32.REQ.
;    63          0063  1 !         JBS 19-DEC-1979
;    64          0064  1 ! 1-008 - Use handler to translate signals.  RW  22-Jan-1980
;    65          0065  1 ! 1-009 - Fix bug where STR$COPY_R was being called with length passed
;    66          0066  1 !         by value rather than by reference.  SBL 11-Mar-1980
;    67          0067  1 ! 1-010 - Enhance to recognize additional classes of string descriptors
;    68          0068  1 !         by invoking LIB$ANALYZE_SDESC_R3 to extract length and
;    69          0069  1 !         address of 1st data byte from descriptor.
;    70          0070  1 !         Change call to STR$COPY_R  to LIB$SCOPY_R_DX.
;    71          0071  1 !         This eliminates the need to establish a handler and the need
;    72          0072  1 !         to convert STR$ statuses to LIB$ statuses.
;    73          0073  1 !         RKR 28-MAY-1981.
;    74          0074  1 ! 1-011 - Add special-case code to process string descriptors that
;    75          0075  1 !         "read" like fixed string descriptors.  RKR 7-OCT-1981.
;    76          0076  1 ! 1-012 - Redirect jsb's from LIB$ANALYZE_SDESC_R3 to
;    77          0077  1 !         LIB$ANALYZE_SDESC_R2.  Use LIB$SCOPY_R_DX6 to do copying.
;    78          0078  1 !         RKR 18-NOV-1981.
;    79          0079  1 !--
;    80          0080  1 !<BLF/PAGE>
```

```
;    82          0081  1 !
;    83          0082  1 ! SWITCHES:
;    84          0083  1 !
;    85          0084  1
;    86          0085  1 SWITCHES ADDRESSING_MODE
;    87          0086  1                 (EXTERNAL = GENERAL, NONEXTERNAL = WORD_RELATIVE);
;    88          0087  1
;    89          0088  1 !
;    90          0089  1 ! LINKAGES
;    91          0090  1 !
;    92          0091  1 REQUIRE 'RTLIN:STRLNK';         ! Linkage for LIB$ANALYZE_SDESC_R2
;    93          0276  1
;    94          0277  1 !
;    95          0278  1 ! TABLE OF CONTENTS:
;    96          0279  1 !
;    97          0280  1
;    98          0281  1 FORWARD ROUTINE
;    99          0282  1     LIB$LOOKUP_KEY;             ! Keyword table scanning routine
;   100          0283  1
;   101          0284  1 !
;   102          0285  1 ! INCLUDE FILES:
;   103          0286  1 !
;   104          0287  1
;   105          0288  1 LIBRARY 'RTLSTARLE';            ! VAX/VMS Literals
;   106          0289  1
;   107          0290  1 REQUIRE 'RTLIN:RTLPSECT';       ! Define DECLARE_PSECTS macro
;   108          0385  1
;   109          0386  1 !
;   110          0387  1 ! MACROS:
;   111          0388  1 !
;   112          0389  1 !+
;   113          0390  1 ! Macros used to access various elements of a keyword table built
;   114          0391  1 ! by a $LIB_KEY_TABLE macro for use with the LIB$KEY_TABLE keyword
;   115          0392  1 ! lookup routine.
;   116          0393  1 !-
;   117          0394  1
;   118          0395  1 MACRO
;   119        M 0396  1     $LIB_KEY_LENGTH (TABLE_POINTER) =
;   120          0397  1  .(.TABLE_POINTER)<0,8> %,      ! Length of a keyword table string
;   121        M 0398  1     $LIB_KEY_STRING (TABLE_POINTER) =
;   122          0399  1  .TABLE_POINTER + 1 %,          ! Address of a keyword table string
;   123        M 0400  1     $LIB_KEY_VALUE (TABLE_POINTER) =
;   124          0401  1  .(TABLE_POINTER + 4) %;        ! Value corresponding to a keyword table entry
;   125          0402  1
;   126          0403  1 !
;   127          0404  1 ! EQUATED SYMBOLS:
;   128          0405  1 !
;   129          0406  1 !    None
;   130          0407  1 !
;   131          0408  1 ! PSECT DECLARATIONS:
;   132          0409  1 !
;   133          0410  1 DECLARE_PSECTS (LIB);   ! This module belongs to the LIB facility
;   134          0411  1 !
;   135          0412  1 ! OWN STORAGE:
;   136          0413  1 !
;   137          0414  1 !    None
;   138          0415  1 !
```

```
;  139          0416  1 ! EXTERNAL REFERENCES:
;  140          0417  1 !
;  141          0418  1
;  142          0419  1 EXTERNAL ROUTINE
;  143          0420  1     LIB$ANALYZE_SDESC_R2 : LIB$ANALYZE_SDESC_JSB_LINK, ! Extract length
;  144          0421  1                                                        ! and address of
;  145          0422  1                                                        ! 1st data byte
;  146          0423  1                                                        ! from descriptor
;  147          0424  1     LIB$SCOPY_R_DX6 : STRING_JSB ; ! Copy a by-reference string to a
;  148          0425  1                                    ! descriptor of any type.
;  149          0426  1
;  150          0427  1 !+
;  151          0428  1 ! The following are the conditions returned by this module
;  152          0429  1 !-
;  153          0430  1
;  154          0431  1 EXTERNAL LITERAL
;  155          0432  1     LIB$_STRTRU,                ! String truncated
;  156          0433  1     LIB$_AMBKEY,                ! Multiple keyword match found
;  157          0434  1     LIB$_UNRKEY,                ! No keyword match found
;  158          0435  1     LIB$_INVARG;                ! Invalid argument(s)
;  159          0436  1
```

```
;  161     0437  1 GLOBAL ROUTINE LIB$LOOKUP_KEY (          ! Keyword table scanning routine
;  162     0438  1
;  163     0439  1         STRNG_DESC_ADDR,                    ! Search string
;  164     0440  1         KEY_TABLE_ADDR,                     ! Keyword table
;  165     0441  1         KEY_VALUE_ADDR,                     ! Keyword value deposit
;  166     0442  1                                             ! area
;  167     0443  1         FULL_DESC_ADDR,                     ! Full keyword deposit
;  168     0444  1                                             ! area
;  169     0445  1         OUTLEN                              ! Number of bytes stored
;  170     0446  1                                             ! in FULL_DESC_ADDR
;  171     0447  1
;  172     0448  1                                 ) =
;  173     0449  1
;  174     0450  1 !++
;  175     0451  1 ! FUNCTIONAL DESCRIPTION:
;  176     0452  1 !
;  177     0453  1 !       This keyword lookup routine scans a table of keywords (see
;  178     0454  1 !       below), attempting to find a keyword which matches a caller-
;  179     0455  1 !       specified keyword or keyword abbreviation.
;  180     0456  1 !
;  181     0457  1 !
;  182     0458  1 !       When a keyword match is found, the following information is
;  183     0459  1 !       optionally returned to the caller:
;  184     0460  1 !
;  185     0461  1 !            * longword value associated with the matched keyword
;  186     0462  1 !              (KEY_VALUE_ADDR)
;  187     0463  1 !            * full keyword string (any descriptor type)
;  188     0464  1 !              (FULL_DESC_ADDR)
;  189     0465  1 !
;  190     0466  1 !       If an exact keyword match is found (i.e., the caller's search
;  191     0467  1 !       string is an unabbreviated keyword), no further processing is
;  192     0468  1 !       performed and a normal completion code is returned to the
;  193     0469  1 !       caller.  Otherwise, after a match has been found, the rest of
;  194     0470  1 !       the keyword table is scanned.  If an additional match is found,
;  195     0471  1 !       a "not enough characters" completion code is returned to the
;  196     0472  1 !       caller.
;  197     0473  1 !
;  198     0474  1 !       The keyword table, which the caller creates for this routine
;  199     0475  1 !       has the following structure:
;  200     0476  1 !
;  201     0477  1 !            longword vector
;  202     0478  1 !          +---------------------------+
;  203     0479  1 !          |      vector size - 1      |
;  204     0480  1 !          +---------------------------+
;  205     0481  1 !          | address of keyword string |--------+
;  206     0482  1 !          - - - - - - - - - - - - - - -        |
;  207     0483  1 !          | associated keyword value  |        V
;  208     0484  1 !          +---------------------------+    +---+-------------------+
;  209     0485  1 !          |                           |    |   |  keyword string   |
;  210     0486  1 !          |             .             |    +---+-------------------+
;  211     0487  1 !          |             .             |      counted ASCII string
;  212     0488  1 !          |             .             |
;  213     0489  1 !          |                           |
;  214     0490  1 !          |                           |
;  215     0491  1 !          |                           |
;  216     0492  1 !          +---------------------------+
;  217     0493  1 !
```

```
;  218          0494  1 !       where the "counted ASCII string" starts with a byte which is
;  219          0495  1 !       the unsigned count of the number of ASCII characters which
;  220          0496  1 !       follow.
;  221          0497  1 !
;  222          0498  1 ! FORMAL PARAMETERS:
;  223          0499  1 !
;  224          0500  1 !       STRNG_DESC_ADDR.rt.dx - Address of search string descriptor
;  225          0501  1 !       KEY_TABLE_ADDR.rlu.ra - Address of keyword table
;  226          0502  1 !       [KEY_VALUE_ADDR.wlu.r] - Address of keyword value deposit area
;  227          0503  1 !                                (optional)
;  228          0504  1 !       [FULL_DESC_ADDR.wt.dx] - Address of full keyword deposit area
;  229          0505  1 !                                (optional)
;  230          0506  1 !       [OUTLEN.ww.r] - Number of bytes stored in FULL_DESC_ADDR
;  231          0507  1 !                       (optional)
;  232          0508  1 !
;  233          0509  1 ! IMPLICIT INPUTS:
;  234          0510  1 !
;  235          0511  1 !       None
;  236          0512  1 !
;  237          0513  1 ! IMPLICIT OUTPUTS:
;  238          0514  1 !
;  239          0515  1 !       None
;  240          0516  1 !
;  241          0517  1 ! COMPLETION CODES:
;  242          0518  1 !
;  243          0519  1 !       SS$_NORMAL      = Unique keyword match found
;  244          0520  1 !       LIB$_FATERRLIB  = Fatal error in library
;  245          0521  1 !       LIB$_INVSTRDES  = Invalid string descriptor
;  246          0522  1 !       LIB$_INSVIRMEM  = Insufficient Virtual memory
;  247          0523  1 !       LIB$_STRTRU     = String is truncated
;  248          0524  1 !       LIB$_AMBKEY     = Multiple keyword match found (i.e., not enough
;  249          0525  1 !                         characters specified)
;  250          0526  1 !       LIB$_UNRKEY     = No keyword match found
;  251          0527  1 !       LIB$_INVARG     = Invalid arguments, not enough arguments, bad
;  252          0528  1 !                         keyword table or bad string descriptor
;  253          0529  1 !
;  254          0530  1 ! SIDE EFFECTS:
;  255          0531  1 !
;  256          0532  1 !       None
;  257          0533  1 !
;  258          0534  1 !--
;  259          0535  1
;  260          0536  2     BEGIN
;  261          0537  2
;  262          0538  2     BUILTIN
;  263          0539  2         ACTUALCOUNT,            ! Actual parameter count
;  264          0540  2         NULLPARAMETER;          ! Test for presence of parameter
;  265          0541  2
;  266          0542  2     MAP
;  267          0543  2         STRNG_DESC_ADDR : REF BLOCK [, BYTE],   ! caller's search string
;  268          0544  2         FULL_DESC_ADDR  : REF BLOCK [, BYTE],   ! returned full key
;  269          0545  2         OUTLEN : REF VECTOR [1, WORD, UNSIGNED];  ! Number of bytes
;  270          0546  2                                                   ! stored in
;  271          0547  2                                                   ! FULL_DESC_ADDR
;  272          0548  2
;  273          0549  2     BIND  ! Redefine some routine arguments:
;  274          0550  2
```

```
;  275          0551  2          KEY_TABLE = .KEY_TABLE_ADDR : VECTOR,    ! Caller's keyword table
;  276          0552  2          KEY_VALUE = .KEY_VALUE_ADDR;             ! Caller's keyword
;  277          0553  2                                                   ! value deposit area
;  278          0554  2
;  279          0555  2      LOCAL
;  280          0556  2          STRING_LEN,                 ! Length of search string
;  281          0557  2          STRING_ADDR,                ! Address of search string
;  282          0558  2          MATCH,                      ! Index of a matched keyword table entry
;  283          0559  2          RETURN_CODE;                ! Routine return code
;  284          0560  2
;  285          0561  2  !+
;  286          0562  2  ! Verify that the caller provided a proper argument list.
;  287          0563  2  !-
;  288          0564  2
;  289          0565  3      IF (ACTUALCOUNT () LSSU 2) ! If less that 2 arguments were provided,
;  290          0566  2      THEN
;  291          0567  2          RETURN (LIB$_INVARG);  ! return an error code to the caller.
;  292          0568  2
;  293          0569  2  !+
;  294          0570  2  ! Prepare to scan the caller's keyword table.
;  295          0571  2  !-
;  296          0572  2      RETURN_CODE = LIB$_UNRKEY;  ! Initially assume no keyword match
;  297          0573  2                                  ! exists.
;  298          0574  2  !+
;  299          0575  2  ! Extract length and address of 1st data byte of search string.
;  300          0576  2  ! If error results from attempt to extract, return that error.
;  301          0577  2  !-
;  302          0578  2      IF .STRNG_DESC_ADDR [DSC$B_CLASS] GTRU DSC$K_CLASS_D
;  303          0579  2      THEN        ! Use generalized extract
;  304          0580  3          BEGIN
;  305          0581  3          LOCAL RET_STATUS ;
;  306          0582  3          RET_STATUS = LIB$ANALYZE_SDESC_R2 ( .STRNG_DESC_ADDR ;
;  307          0583  3                                              STRING_LEN, STRING_ADDR ) ;
;  308          0584  3
;  309          0585  3          IF NOT .RET_STATUS THEN RETURN (.RET_STATUS) ;
;  310          0586  3          END
;  311          0587  3
;  312          0588  2      ELSE                ! Fetch length and address directly
;  313          0589  2
;  314          0590  3          BEGIN
;  315          0591  3          STRING_LEN = .STRNG_DESC_ADDR [DSC$W_LENGTH] ;
;  316          0592  3          STRING_ADDR = .STRNG_DESC_ADDR [DSC$A_POINTER] ;
;  317          0593  2          END;
;  318          0594  2
;  319          0595  2  !+
;  320          0596  2  ! Scan the keyword table for a match with the caller's string.
;  321          0597  2  !-
;  322          0598  2
;  323          0599  2      INCR INDEX FROM 1 TO .KEY_TABLE BY 2 DO     ! Loop until the end of
;  324          0600  2                                                  ! the keyword table.
;  325          0601  3          BEGIN
;  326          0602  3
;  327          0603  3          !+
;  328          0604  3          ! First make sure that the caller's string is not longer than
;  329          0605  3          ! the current keyword.
;  330          0606  3          !-
;  331          0607  4          IF (.STRING_LEN LEQU $LIB_KEY_LENGTH (KEY_TABLE [.INDEX]))
```

```
;  332     0608  3          THEN
;  333     0609  3              !+
;  334     0610  3              ! If the caller's string matches the current keyword begin
;  335     0611  3              ! additional checking.
;  336     0612  3              !-
;  337     0613  3              IF CH$EQL(.STRING_LEN, .STRING_ADDR,
;  338     0614  3                        .STRING_LEN, $LIB_KEY_STRING (KEY_TABLE [.INDEX]))
;  339     0615  3              THEN
;  340     0616  4                  BEGIN
;  341     0617  4
;  342     0618  4                  !+
;  343     0619  4                  ! If the caller's search string is the same length as
;  344     0620  4                  ! the keyword it matches
;  345     0621  4                  !-
;  346     0622  5                  IF (.STRING_LEN EQLU
;  347     0623  5                      $LIB_KEY_LENGTH (KEY_TABLE [.INDEX]))
;  348     0624  4                  THEN
;  349     0625  5                      BEGIN ! special exact-match processing.
;  350     0626  5                      MATCH = .INDEX;       ! Save the current keyword table
;  351     0627  5                                            ! index,
;  352     0628  5                      RETURN_CODE = SS$_NORMAL;     ! indicate a keyword
;  353     0629  5                                                    ! match was found,
;  354     0630  5                      EXITLOOP;                     ! and bypass further key
;  355     0631  5                                                    ! word table scanning.
;  356     0632  4                      END;  ! special exact-match processing
;  357     0633  4
;  358     0634  4                  !+
;  359     0635  4                  ! If a match has not already been found,
;  360     0636  4                  !-
;  361     0637  5                  IF (.RETURN_CODE EQL LIB$_UNRKEY)
;  362     0638  4                  THEN
;  363     0639  5                      BEGIN
;  364     0640  5                      MATCH = .INDEX; ! save the current keyword table
;  365     0641  5                                      ! index
;  366     0642  5                      RETURN_CODE = SS$_NORMAL;     ! and indicate a match
;  367     0643  5                                                    ! has been found.
;  368     0644  5                      END
;  369     0645  5
;  370     0646  4                  ELSE                  ! Otherwise, indicate that a multiple
;  371     0647  4                                        ! keyword match has been found
;  372     0648  4
;  373     0649  5                      BEGIN
;  374     0650  5                      RETURN_CODE = LIB$_AMBKEY;    ! (i.e., no enough
;  375     0651  5                                                    ! characters provided)
;  376     0652  5                      EXITLOOP;                     ! and exit the keyword
;  377     0653  5                                                    ! scanning loop.
;  378     0654  4                      END;
;  379     0655  4
;  380     0656  3                  END;                  ! End of keyword match processing.
;  381     0657  3
;  382     0658  2          END;                  ! End of the keyword table searching loop.
;  383     0659  2
;  384     0660  2 !+
;  385     0661  2 ! If a keyword match was found, return the keyword information to the
;  386     0662  2 ! caller.
;  387     0663  2 !-
;  388     0664  2
```

```
;  389     0665  3     IF (.RETURN_CODE NEQ LIB$_UNRKEY)    ! Make sure a keyword match was
;  390     0666  3                                          ! found.
;  391     0667  2     THEN
;  392     0668  3         BEGIN   ! match was found code
;  393     0669  3         !+
;  394     0670  3         ! If the caller provided a parameter to receive the key value,
;  395     0671  3         ! return it to him.
;  396     0672  3         !-
;  397     0673  3
;  398     0674  3         IF ( NOT NULLPARAMETER (3)) THEN
;  399     0675  3                 KEY_VALUE = $LIB_KEY_VALUE (KEY_TABLE [.MATCH]);
;  400     0676  3
;  401     0677  3         !+
;  402     0678  3         ! If the caller has provided a descriptor to receive the matched
;  403     0679  3         ! key, return it to him.
;  404     0680  3         !-
;  405     0681  3
;  406     0682  4         IF ( NOT NULLPARAMETER (4))
;  407     0683  3         THEN
;  408     0684  4             BEGIN       ! returning optional arguments
;  409     0685  4
;  410     0686  4             LOCAL
;  411     0687  4                 RET_STATUS;
;  412     0688  4
;  413     0689  4             RET_STATUS = LIB$SCOPY_R_DX6 (
;  414     0690  4                         $LIB_KEY_LENGTH (KEY_TABLE [.MATCH]),
;  415     0691  4                         $LIB_KEY_STRING (KEY_TABLE [.MATCH]),
;  416     0692  4                         .FULL_DESC_ADDR ) ;
;  417     0693  4             !+
;  418     0694  4             ! If the copy failed, record the status
;  419     0695  4             !-
;  420     0696  4             IF NOT .RET_STATUS THEN RETURN_CODE = .RET_STATUS ;
;  421     0697  4
;  422     0698  4             !+
;  423     0699  4             ! If the caller is using fixed length strings, he may want
;  424     0700  4             ! to know how many characters we actually stored, not
;  425     0701  4             ! counting trailing pads.
;  426     0702  4             ! There is no need to check status on call to
;  427     0703  4             ! LIB$ANALYZE_SDESC_R2.
;  428     0704  4             ! If the descriptor was bad, it would have gotten caught
;  429     0705  4             ! during the copy operation above.
;  430     0706  4             !-
;  431     0707  4
;  432     0708  5             IF ( NOT NULLPARAMETER (5))
;  433     0709  4             THEN
;  434     0710  5                 BEGIN   ! returning length
;  435     0711  5                 LOCAL
;  436     0712  5                     FULL_LEN,
;  437     0713  5                     FULL_ADDR;
;  438     0714  5                 IF .FULL_DESC_ADDR [DSC$B_CLASS] GTRU DSC$K_CLASS_D
;  439     0715  5                 THEN            ! Use general length extraction
;  440     0716  6                     BEGIN
;  441     0717  6                     LIB$ANALYZE_SDESC_R2 ( .FULL_DESC_ADDR ;
;  442     0718  6                                            FULL_LEN, FULL_ADDR ) ;
;  443     0719  6                     END
;  444     0720  6
;  445     0721  5                 ELSE            ! Fetch length directly
```

```
;  446          0722  5                    FULL_LEN = .FULL_DESC_ADDR [DSC$W_LENGTH ] ;
;  447          0723  5
;  448          0724  5                OUTLEN [0] = MIN ($LIB_KEY_LENGTH (KEY_TABLE [.MATCH]),
;  449          0725  5                                 .FULL_LEN);
;  450          0726  4                END;     ! returning length
;  451          0727  4
;  452          0728  3            END;         ! returning optional arguments
;  453          0729  3
;  454          0730  2        END;     ! match as found code
;  455          0731  2
;  456          0732  2 !+
;  457          0733  2 ! Return the current keyword match return code to the caller.
;  458          0734  2 !-
;  459          0735  2     RETURN (.RETURN_CODE);      ! Return the current match code to the
;  460          0736  2                                 ! caller.
;  461          0737  1     END;                        ! End of LIB$LOOKUP_KEY routine

                                                        .TITLE  LIB$LOOKUP_KEY
                                                        .IDENT  \1-012\

                                                        .EXTRN  LIB$ANALYZE_SDESC_R2
                                                        .EXTRN  LIB$SCOPY_R_DX6
                                                        .EXTRN  LIB$_STRTRU, LIB$_AMBKEY
                                                        .EXTRN  LIB$_UNRKEY, LIB$_INVARG

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

                                    0FFC 00000          .ENTRY  LIB$LOOKUP_KEY, Save R2,R3,R4,R5,R6,R7,R8,- ; 0437
                                                                R9,R10,R11
                5B 00000000G    00  9E 00002            MOVAB   LIB$ANALYZE_SDESC_R2, R11                   ;
                5A 00000000G    8F  D0 00009            MOVL    #LIB$_UNRKEY, R10                           ;
                02              6C  91 00010            CMPB    (AP), #2                                    ; 0565
                                08  1E 00013            BGEQU   1$                                          ;
                50 00000000G    8F  D0 00015            MOVL    #LIB$_INVARG, R0                            ; 0567
                                04  00001C              RET                                                 ;
                59              5A  D0 0001D 1$:        MOVL    R10, RETURN_CODE                            ; 0572
                53        04    AC  D0 00020            MOVL    STRNG_DESC_ADDR, R3                         ; 0578
                02        03    A3  91 00024            CMPB    3(R3), #2                                   ;
                                0C  1B 00028            BLEQU   2$                                          ;
                50              53  D0 0002A            MOVL    R3, R0                                      ; 0582
                                6B  16 0002D            JSB     LIB$ANALYZE_SDESC_R2                        ;
                57              51  7D 0002F            MOVQ    R1, R7                                      ;
                08              50  E8 00032            BLBS    RET_STATUS, 3$                              ; 0585
                                04  00035              RET                                                 ;
                57              63  3C 00036 2$:        MOVZWL  (R3), STRING_LEN                            ; 0591
                58        04    A3  D0 00039            MOVL    4(R3), STRING_ADDR                          ; 0592
                54              01  CE 0003D 3$:        MNEGL   #1, INDEX                                   ; 0607
                                38  11 00040            BRB     7$                                          ;
                55        08 BC44   D0 00042 4$:        MOVL    @KEY_TABLE_ADDR[INDEX], R5                  ;
57              65        08        00  ED 00047        CMPZV   #0, #8, (R5), STRING_LEN                    ;
                                    2C  1F 0004C        BLSSU   7$                                          ;
      01        A5        68        57  29 0004E        CMPC3   STRING_LEN, (STRING_ADDR), 1(R5)            ; 0613
                                    25  12 00053        BNEQ    7$                                          ;
57              65        08        00  ED 00055        CMPZV   #0, #8, (R5), STRING_LEN                    ; 0623
                                    08  12 0005A        BNEQ    5$                                          ;
                          56        54  D0 0005C        MOVL    INDEX, MATCH                                ; 0626
```

```
                 59              01  D0 0005F         MOVL    #1, RETURN_CODE                          ; 0628
                                 1D  11 00062         BRB     8$                                       ; 0625
                 5A              59  D1 00064 5$:     CMPL    RETURN_CODE, R10                         ; 0637
                                 08  12 00067         BNEQ    6$                                       ;
                 56              54  D0 00069         MOVL    INDEX, MATCH                             ; 0640
                 59              01  D0 0006C         MOVL    #1, RETURN_CODE                          ; 0642
                                 09  11 0006F         BRB     7$                                       ; 0637
                 59 00000000G    8F  D0 00071 6$:     MOVL    #LIB$_AMBKEY, RETURN_CODE                ; 0650
                                 07  11 00078         BRB     8$                                       ; 0649
  FFC1        54     02      08  BC  F1 0007A 7$:     ACBL    @KEY_TABLE_ADDR, #2, INDEX, 4$           ; 0599
                     5A          59  D1 00081 8$:     CMPL    RETURN_CODE, R10                         ; 0665
                                 66  13 00084         BEQL    14$                                      ;
                     03          6C  91 00086         CMPB    (AP), #3                                 ; 0674
                                 0F  1F 00089         BLSSU   9$                                       ;
                             0C  AC  D5 0008B         TSTL    12(AP)                                   ;
                                 0A  13 0008E         BEQL    9$                                       ;
                     50      08 BC46 DE 00090         MOVAL   @KEY_TABLE_ADDR[MATCH], R0               ; 0675
                0C   BC      04  A0  D0 00095         MOVL    4(R0), @KEY_VALUE_ADDR                   ;
                     04          6C  91 0009A 9$:     CMPB    (AP), #4                                 ; 0682
                                 4D  1F 0009D         BLSSU   14$                                      ;
                             10  AC  D5 0009F         TSTL    16(AP)                                   ;
                                 48  13 000A2         BEQL    14$                                      ;
                     57      10  AC  D0 000A4         MOVL    FULL_DESC_ADDR, R7                       ; 0692
                     58      08 BC46 D0 000A8         MOVL    @KEY_TABLE_ADDR[MATCH], R8               ; 0691
                     51      01  A8  9E 000AD         MOVAB   1(R8), R1                                ;
                     52          57  D0 000B1         MOVL    R7, R2                                   ; 0690
                     50          68  9A 000B4         MOVZBL  (R8), R0                                 ;
                       00000000G 00  16 000B7         JSB     LIB$SCOPY_R_DX6                          ;
                     03          50  E8 000BD         BLBS    RET_STATUS, 10$                          ; 0696
                     59          50  D0 000C0         MOVL    RET_STATUS, RETURN_CODE                  ;
                     05          6C  91 000C3 10$:    CMPB    (AP), #5                                 ; 0708
                                 24  1F 000C6         BLSSU   14$                                      ;
                             14  AC  D5 000C8         TSTL    20(AP)                                   ;
                                 1F  13 000CB         BEQL    14$                                      ;
                     02      03  A7  91 000CD         CMPB    3(R7), #2                                ; 0714
                                 07  1B 000D1         BLEQU   11$                                      ;
                     50          57  D0 000D3         MOVL    R7, R0                                   ; 0717
                                 6B  16 000D6         JSB     LIB$ANALYZE_SDESC_R2                     ;
                                 03  11 000D8         BRB     12$                                      ; 0714
                     51          67  3C 000DA 11$:    MOVZWL  (R7), FULL_LEN                           ; 0722
                     50          68  9A 000DD 12$:    MOVZBL  (R8), R0                                 ; 0725
                     51          50  D1 000E0         CMPL    R0, FULL_LEN                             ;
                                 03  15 000E3         BLEQ    13$                                      ;
                     50          51  D0 000E5         MOVL    FULL_LEN, R0                             ;
                14   BC          50  B0 000E8 13$:    MOVW    R0, @OUTLEN                              ; 0724
                     50          59  D0 000EC 14$:    MOVL    RETURN_CODE, R0                          ; 0735
                                     04 000EF         RET                                              ; 0737

; Routine Size:  240 bytes,    Routine Base:  _LIB$CODE + 0000


;   462        0738  1
;   463        0739  1 END                                 ! End of LIB$LOOKUP_KEY module
;   464        0740  1
;   465        0741  0 ELUDOM
```

```
;                                       PSECT SUMMARY
;
;       Name                        Bytes                              Attributes
;
;   _LIB$CODE                             240  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         5         0         581         00:00.7



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

; Size:          240 code + 0 data bytes
; Run Time:         00:06.1
; Elapsed Time:     00:36.4
; Lines/CPU Min:     7252
; Lexemes/CPU-Min: 25321
; Memory Used:  114 pages
; Compilation Complete
```

LIBLOCC
LIS

LIBLUN
LIS

LIBMOVC3
LIS

LIBMOVTC
LIS

LIBPOLYF
LIS

LIBINSQTI
LIS

LIBINTOVE
LIS

LIBLEXICA
LIS

LIBPKARIT
LIS

LIBMATCHC
LIS

LIBPOLYD
LIS

LIBLOOKUP
LIS

LIBLPLINE
LIS

LIBMOVC5
LIS

LIBLEN
LIS

LIBMSG
LIS

LIBINSV
LIS

LIBMATCA
LIS

LIBMOVTUC
LIS