```
LLL                 IIIIIIIII     BBBBBBBBBBBB     RRRRRRRRRRRR        AAAAAAAAA     RRRRRRRRRRRR
LLL                 IIIIIIIII     BBBBBBBBBBBB     RRRRRRRRRRRR        AAAAAAAAA     RRRRRRRRRRRR
LLL                 IIIIIIIII     BBBBBBBBBBBB     RRRRRRRRRRRR        AAAAAAAAA     RRRRRRRRRRRR
LLL                    III        BBB         BBB  RRR         RRR  AAA         AAA  RRR         RRR
LLL                    III        BBB         BBB  RRR         RRR  AAA         AAA  RRR         RRR
LLL                    III        BBB         BBB  RRR         RRR  AAA         AAA  RRR         RRR
LLL                    III        BBB         BBB  RRR         RRR  AAA         AAA  RRR         RRR
LLL                    III        BBB         BBB  RRR         RRR  AAA         AAA  RRR         RRR
LLL                    III        BBB         BBB  RRR         RRR  AAA         AAA  RRR         RRR
LLL                    III        BBBBBBBBBBBB     RRRRRRRRRRRR     AAA         AAA  RRRRRRRRRRRR
LLL                    III        BBBBBBBBBBBB     RRRRRRRRRRRR     AAA         AAA  RRRRRRRRRRRR
LLL                    III        BBBBBBBBBBBB     RRRRRRRRRRRR     AAA         AAA  RRRRRRRRRRRR
LLL                    III        BBB         BBB  RRR   RRR        AAAAAAAAAAAAAAA  RRR   RRR
LLL                    III        BBB         BBB  RRR   RRR        AAAAAAAAAAAAAAA  RRR   RRR
LLL                    III        BBB         BBB  RRR   RRR        AAAAAAAAAAAAAAA  RRR   RRR
LLL                    III        BBB         BBB  RRR      RRR     AAA         AAA  RRR      RRR
LLL                    III        BBB         BBB  RRR      RRR     AAA         AAA  RRR      RRR
LLL                    III        BBB         BBB  RRR      RRR     AAA         AAA  RRR      RRR
LLLLLLLLLLLLLLL     IIIIIIIII     BBBBBBBBBBBB     RRR         RRR  AAA         AAA  RRR         RRR
LLLLLLLLLLLLLLL     IIIIIIIII     BBBBBBBBBBBB     RRR         RRR  AAA         AAA  RRR         RRR
LLLLLLLLLLLLLLL     IIIIIIIII     BBBBBBBBBBBB     RRR         RRR  AAA         AAA  RRR         RRR
```

FILEID**LISTLIB

I 1

LI
VC

```
LL          IIIIII     SSSSSSSS  TTTTTTTTTT  LL          IIIIII   BBBBBBBB
LL          IIIIII     SSSSSSSS  TTTTTTTTTT  LL          IIIIII   BBBBBBBB
LL            II     SS              TT      LL            II     BB      BB
LL            II     SS              TT      LL            II     BB      BB
LL            II     SS              TT      LL            II     BB      BB
LL            II     SS              TT      LL            II     BB      BB
LL            II       SSSSSS        TT      LL            II     BBBBBBBB
LL            II       SSSSSS        TT      LL            II     BBBBBBBB
LL            II             SS      TT      LL            II     BB      BB
LL            II             SS      TT      LL            II     BB      BB
LL            II             SS      TT      LL            II     BB      BB     ....
LL            II             SS      TT      LL            II     BB      BB     ....
LLLLLLLLLL  IIIIII   SSSSSSSS        TT      LLLLLLLLLL  IIIIII   BBBBBBBB       ....
LLLLLLLLLL  IIIIII   SSSSSSSS        TT      LLLLLLLLLL  IIIIII   BBBBBBBB       ....

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_LIST (                        ! Routines to list contents of a library
;     2          0002  0                 LANGUAGE (BLISS32),
;     3          0003  0                 IDENT = 'V04-000'
;     4          0004  0                 ) =
;     5          0005  1 BEGIN
;     6          0006  1
;     7          0007  1 !
;     8          0008  1 !**********************************************************************
;     9          0009  1 !*                                                                    *
;    10          0010  1 !*  COPYRIGHT (c) 1978, 1980, 1982, 1984 BY                           *
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;    22          0022  1 !*  AND  SHOULD  NOT  BE  CONSTRUED AS  A COMMITMENT BY DIGITAL EQUIPMENT   *
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;    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:  Library command processor
;    34          0034  1 !
;    35          0035  1 ! ABSTRACT:
;    36          0036  1 !
;    37          0037  1 !       The VAX/VMS librarian is invoked by DCL to process the LIBRARY
;    38          0038  1 !       command.  It utilizes the librarian procedure set to perform
;    39          0039  1 !       the actual modifications to the library.
;    40          0040  1 !
;    41          0041  1 ! ENVIRONMENT:
;    42          0042  1 !
;    43          0043  1 !       VAX native, user mode.
;    44          0044  1 !
;    45          0045  1 !--
;    46          0046  1 !
;    47          0047  1 !
;    48          0048  1 ! AUTHOR:  Benn Schreiber,       CREATION DATE:  21-June-1979                ;
;    49          0049  1 !
;    50          0050  1 ! MODIFIED BY:
;    51          0051  1 !
;    52          0052  1 !       V03-002 GJA0085         Greg Awdziewicz         2-May-1984
;    53          0053  1 !               Deal with "false" status returned from display_globals
;    54          0054  1 !               routine and now propagated back through LBR$Search.
;    55          0055  1 !
;    56          0056  1 !       V03-001 JWT0056         Jim Teague              17-Sep-1982
;    57          0057  1 !               Add a line to listing to indicate that library is in
```

```
;    58          0058  1 !                DCX data reduced format.
;    59          0059  1 !
;    60          0060  1 !        V02-008         RPG0048         Bob Grosso      17-Dec-1981
;    61          0061  1 !                Suppress history header line on empty history and
;    62          0062  1 !                report status of history.
;    63          0063  1 !
;    64          0064  1 !        V02-007         RPG0047         Bob Grosso      7-Aug-1981
;    65          0065  1 !                Support /BEFORE and /SINCE.
;    66          0066  1 !                Make descriptors shareable.
;    67          0067  1 !
;    68          0068  1 !        V02-006         RPG0039         Bob Grosso      1-Jul-1981
;    69          0069  1 !                List header even when library is empty.
;    70          0070  1 !
;    71          0071  1 !        V02-005         RPG0038         Bob Grosso      12-Jun-1981
;    72          0072  1 !                Add display_history.
;    73          0073  1 !
;    74          0074  1 !        V02-004 BLS0029         Benn Schreiber          23-Dec-1980
;    75          0075  1 !                Convert to message compiler.  Add library of shareable
;    76          0076  1 !                image symbol tables.
;    77          0077  1 !--
;    78          0078  1
;    79          0079  1
```

```
;    81          0080  1 LIBRARY
;    82          0081  1         'SYS$LIBRARY:STARLET.L32';              !System data structures
;    83          0082  1 REQUIRE
;    84          0085  1         'PREFIX';                               !Macros
;    85          0267  1 REQUIRE
;    86          0268  1         'LIBDEF';                               !Librarian data structures
;    87          0556  1 REQUIRE
;    88          0557  1         'LBRDEF';                               !Library processor defs.
;    89          1148  1 REQUIRE
;    90          1149  1         'OLDFMTDEF';                            !Old library format defintions
;    91          1245  1
;    92          1246  1 EXTERNAL ROUTINE
;    93          1247  1     lib_open_out,                               !Open output file
;    94          1248  1     lib_close_out,                              !Close output file
;    95          1249  1     lib_get_mem,                                !Allocate memory
;    96          1250  1     lib_free_mem,                               !and deallocate it
;    97          1251  1     lbr$lookup_key : ADDRESSING_MODE (GENERAL), !Lookup a key in the index
;    98          1252  1     lbr$get_header : ADDRESSING_MODE (GENERAL), !Return library header
;    99          1253  1     lbr$get_history : ADDRESSING_MODE (GENERAL),!Return library history
;   100          1254  1     lbr$get_index : ADDRESSING_MODE (GENERAL),  !Return contents of index
;   101          1255  1     lbr$set_module : ADDRESSING_MODE (GENERAL), !Get module header
;   102          1256  1     lbr$search : ADDRESSING_MODE (GENERAL),     !Search for other keys
;   103          1257  1     SYS$FAO : ADDRESSING_MODE (GENERAL),
;   104          1258  1     SYS$FAOL : ADDRESSING_MODE (GENERAL);
;   105          1259  1
;   106          1260  1 EXTERNAL
;   107          1261  1     lib$before_date : BBLOCK,                   !date for /BEFORE
;   108          1262  1     lib$since_date : BBLOCK,                    !date for /SINCE
;   109          1263  1     lbr$gl_rmsstv : ADDRESSING_MODE (GENERAL),  !RMS STV from librarian
;   110          1264  1     lbr$gl_control : REF BBLOCK ADDRESSING_MODE (GENERAL),!Pointer to current librarian control table
;   111          1265  1     lib$gl_modnamix,                            !Index number for module names
;   112          1266  1     lib$gl_objmodix,                            !object library module index number
;   113          1267  1     lib$gl_objgsdix,                            !object library gsd index number
;   114          1268  1     lib$gl_modlisl : VECTOR [2],                !Listhead for "listonly" name list
;   115          1269  1     lib$al_ascbinf : VECTOR [,LONG],            !Ascii/binary flags and name length
;   116          1270  1     lib$gl_type,                                !type of library
;   117          1271  1     lib$gl_keysize,                             !Max length of keys in library
;   118          1272  1     lib$gl_listwid,                             !/WIDTH-set listing width
;   119          1273  1     lib$al_months : VECTOR [,LONG],             !Address of ASCIC month name strings
;   120          1274  1     lib$gl_ctlmsk : BLOCK [2],                  !Librarian control mask
;   121          1275  1     lib$gl_libfdb : REF BBLOCK,                 !FDB for library
;   122          1276  1     lib$gl_libctl,                              !Library index number
;   123          1277  1     lib$al_rab : BBLOCK,                        !RAB for I/O
;   124          1278  1     lib$al_typnames : VECTOR [,LONG],           !Names of library types
;   125          1279  1     lib$gl_lisfdb : REF BBLOCK;                 !FDB for listing file
;   126          1280  1
;   127          1281  1 EXTERNAL LITERAL
;   128          1282  1     lbr$_nomtchfou,                             !No match found
;   129          1283  1     lbr$_nulidx,                                !Null index
;   130          1284  1     lib$_histerr,                               !Error with update history access
;   131          1285  1     lib$_initerr,                               !Error initializing library
;   132          1286  1     lib$_indexerr,                              !Index error
;   133          1287  1     lib$_mhderr,                                !Module header error
;   134          1288  1     lib$_nomtchfou,                             !No match found
;   135          1289  1     lib$_lookuperr,                             !Lookup error
;   136          1290  1     lib$_faofail;                               !FAO failure
;   137          1291  1
```

```
;  138          1292  1 FORWARD ROUTINE
;  139          1293  1     display_history,                   !Display library update history
;  140          1294  1     display_luhnames,                  !Display modules names in LUH record
;  141          1295  1     display_object,                    !Display one object module
;  142          1296  1     display_macro,                     !Display one macro
;  143          1297  1     check_date,                        !Check dates for BEFORE and SINCE
;  144          1298  1     list_header,                       !List the header of a library
;  145          1299  1     list_old_lib,                      !List old format library
;  146          1300  1     display_globals,                   !Display global symbols
;  147          1301  1     listselectdmods,                   !List selected modules only
;  148          1302  1     lib_faol,                          !format line with error handling
;  149          1303  1     output_listline;                   !Write listing line
;  150          1304  1
;  151          1305  1 BIND ROUTINE
;  152          1306  1     display_shrstb = display_object,   !Same routine as objects
;  153          1307  1     display_usr = display_macro,       !User defined libraries
;  154          1308  1     display_text = display_macro,      !all the same to list so
;  155          1309  1     display_help = display_macro;      !Use the same routine
;  156          1310  1
;  157          1311  1 OWN
;  158          1312  1     line_width,
;  159          1313  1     globalcount,                       !Counter for global symbol listing
;  160          1314  1     header_listed,                     !True if header listed
;  161          1315  1     histhdr_listed,                    !True if history header line printed
;  162          1316  1     curmatchdesc  : REF BBLOCK,        !Pointer to current key descriptor
;  163          1317  1     lib$al_luhop : VECTOR [3,LONG]
;  164          1318  1         INITIAL (CSTRING ('deleted '),
;  165          1319  1                  CSTRING ('inserted'),
;  166          1320  1                  CSTRING ('replaced')),
;  167          1321  1     outdesc : BBLOCK [dsc$c_s_bln],    !Descriptor for output buffer
;  168          1322  1     outsize,                           !Length of FAO'd string
;  169          1323  1     outputbuffer : REF BLOCK [,BYTE];  !Pointer to output buffer
;  170          1324  1
;  171          1325  1 BIND
;  172          1326  1     fao_dirnamtyp  = $descriptor ('Directory of !AC Library !AS on !20<!%D!>'),
;  173          1327  1     fao_line1      = $descriptor ('Creation date:  !20<!%D!>!6* !10<Creator:  !>!AC'),
;  174          1328  1     fao_line2      = $descriptor ('Revision date:  !20<!%D!>!6* !18<Library format:  !>!UL.!UL'),
;  175          1329  1     fao_line3      = $descriptor ('!20<Number of modules:  !>!5UL!17* !18<Max. key length:  !>!UL'),
;  176          1330  1     fao_line4      = $descriptor ('!20<Other entries:  !>!5UL!17* !28<Preallocated index blocks:  !>!5UL'),
;  177          1331  1     fao_line5      = $descriptor ('!29<Recoverable deleted blocks:  !>!5UL!8* !28<Total index blocks used:
;  178          1332  1     fao_line6      = $descriptor ('!31<Max. Number history records:  !>!5UL!6* !26<Library history records:
;  179          1333  1     fao_line7      = $descriptor ('Library is in DCX data reduced format'),
;  180          1334  1     fao_modhdr     = $descriptor ('!AS'),
;  181          1335  1     fao_modnamhdr  = $descriptor ('Module !AS'),
;  182          1336  1     fao_modhdr2    = $descriptor ('!31<!AS!> RFA !UL.:!4<!UW.!>(.XW)'),
;  183          1337  1     fao_modnamhdr2 = $descriptor ('Module !31<!AS!> RFA !UL.:!4<!UW.!>(!XW)'),
;  184          1338  1     fao_fulobjhdr  = $descriptor ('!16<!AS!> Ident !16<!AC!> Inserted !20<!%D!> !UL symbol!%S'),
;  185          1339  1     fao_fulobjhdr2 = $descriptor ('!AS Ident !AC Inserted !20<!%D!> !UL symbol!%S'),
;  186          1340  1     fao_fulobjhdr3 = $descriptor ('!16<!AS!> Ident !16<!AC!> Inserted !20<!%D!> !UL symbol!%S RFA !UL.:!4<!U
;  187          1341  1     fao_fulobjhdr4 = $descriptor ('!AS Ident !AC Inserted !20<!%D!> !UL symbol!%S RFA !UL.:!4<!UW.!>(!XW)'),
;  188          1342  1     fao_fulobjhdr5 = $descriptor ('Module !16<!AS!> Ident !16<!AC!> Inserted !20<!%D!> !UL symbol!%S'),
;  189          1343  1     fao_fulobjhdr6 = $descriptor ('Module !AS Ident !AC Inserted !20<!%D!> !UL symbol!%S'),
;  190          1344  1     fao_gsmatch    = $descriptor ('!2XL,!6XL'),
;  191          1345  1     fao_flags      = $descriptor ('!AS'),
;  192          1346  1     fao_1blankline = $descriptor ('!/'),
;  193          1347  1     fao_selsrc     = $descriptor ('     Selectively searched'),
;  194          1348  1     fao_fulmodhdr  = $descriptor ('!16<!AS!> inserted !20<!%D!>'),
```

```
;  195     1349  1     fao_fulmodhdr2 = $descriptor ('!AS inserted !20<!%D!>'),
;  196     1350  1     fao_fulmodhdr3 = $descriptor ('!16<!AS!> inserted !20<!%D!> RFA !UL.:!4<!UW.!>(!XW)'),
;  197     1351  1     fao_fulmodhdr4 = $descriptor ('!AS inserted !20<!%D!> RFA !UL.:.4<!UW.!>(!XW)'),
;  198     1352  1     fao_histline   = $descriptor ('Library Update History'),
;  199     1353  1     fao_luhrechdr  = $descriptor ('!AC !AC !3UI module!%S on !20<!%D!>'),
;  200     1354  1     fao_oldcredat  = $descriptor ('Library crea.ed by LIB VX129.0'),     !**
;  201     1355  1     fao_oldlstupd  = $descriptor ('Last update was !ZL-!AC-!ZL !ZL:!ZL:!ZL'),
;  202     1356  1     fao_oldmnt     = $descriptor ('!5UL modules allocated, !5UL used, !5UL free'),
;  203     1357  1     fao_oldgst     = $descriptor ('!5UL symbols allocated, !5UL used, !5UL free'),
;  204     1358  1     fao_oldelspc   = $descriptor ('!UL bytes of deleted, recoverable space'),
;  205     1359  1     fao_oldobjful  = $descriptor ('!16<!AS!> Ident !16<!AC!> Inserted !11<!%D!>'),
;  206     1360  1     fao_oldmacful  = $descriptor ('!16<!AS!> Inserted !11<!%D!>'),
;  207     1361  1     fao_oldobjful2 = $descriptor ('!16<!AS!> Ident !16<!AC!> Inserted !11<!%D!> RFA !UL.:!4<!UW.!>(!XW)'),
;  208     1362  1     fao_oldmacful2 = $descriptor ('!16<!AS!> Inserted !11<!%D!> RFA !UL.:!4<!UW.!>(!XW)')
;  209     1363  1     lisdefext      = $descriptor ('SYS$DISK:[].LIS'), !Default listing extension
;  210     1364  1
;  211     1365  1     lis_dispatch = PLIT (
;  212     1366  1                                  display_usr,    ! usr defined library
;  213     1367  1                                  display_object, !object
;  214     1368  1                                  display_macro,
;  215     1369  1                                  display_help,
;  216     1370  1                                  display_text,
;  217     1371  1                                  display_shrstb
;  218     1372  1                                  ) : VECTOR;
;  219     1373  1
```

```
;  221     1374  1 GLOBAL ROUTINE lib_list_lib =
;  222     1375  2 BEGIN
;  223     1376  2
;  224     1377  2 !++
;  225     1378  2 !
;  226     1379  2 ! FUNCTIONAL DESCRIPTION:
;  227     1380  2 !
;  228     1381  2 !
;  229     1382  2 !
;  230     1383  2 ! CALLING SEQUENCE:
;  231     1384  2 !
;  232     1385  2 ! INPUT PARAMETERS:
;  233     1386  2 !       NONE
;  234     1387  2 !
;  235     1388  2 ! IMPLICIT INPUTS:
;  236     1389  2 !       NONE
;  237     1390  2 !
;  238     1391  2 ! OUTPUT PARAMETERS:
;  239     1392  2 !       NONE
;  240     1393  2 !
;  241     1394  2 ! IMPLICIT CUTPUTS:
;  242     1395  2 !       NONE
;  243     1396  2 !
;  244     1397  2 ! ROUTINE VALUE:
;  245     1398  2 !       NONE
;  246     1399  2 !
;  247     1400  2 ! SIDE EFFECTS:
;  248     1401  2 !       NONE
;  249     1402  2 !
;  250     1403  2 !--
;  251     1404  2
;  252     1405  2 LOCAL
;  253     1406  2     status,
;  254     1407  2     headary : BBLOCK [lbr$c_pagesize];   !Return library header info here
;  255     1408  2
;  256     1409  2 BIND
;  257     1410  2     lisdefnam = lib$gl_lisfdb  [fdb$l_defext] : BBLOCK;
;  258     1411  2
;  259     1412  2 header_listed = false;                                  !No header listed yet
;  260     1413  2 CH$MOVE (dsc$c_s_bln, lisdefext, lisdefnam);            !Set up default output file
;  261   P 1414  2 perform (lib_open_out (.lib$gl_lisfdb, lib$gl_libfdb [fdb$t_nam], !Open the output file
;  262     1415  2                       true, line_width));
;  263     1416  2 IF .lib$gl_listwid NEQ 0
;  264     1417  2 THEN line_width = .lib$gl_listwid;
;  265     1418  2
;  266     1419  2 line_width = MIN (lib$c_lisreclng, .line_width);
;  267   P 1420  2 perform (lib_get_mem (lib$c_lisreclng*2, outputbuffer),          !*2 to allow for long filenames
;  268     1421  2                     [lib$_initerr, 1, lib$gl_libfdb [fdb$l_namdesc]);
;  269     1422  2 outdesc [dsc$w_length] = lib$c_lisreclng*2;
;  270     1423  2 outdesc [dsc$a_pointer] = .outputbuffer;
;  271     1424  2 !
;  272     1425  2 !  If /HISTORY requested, then only print list if /FULL also
;  273     1426  2 !
;  274     1427  2 IF (.lib$gl_ctlmsk [lib$v_history] AND .lib$gl_ctlmsk [lib$v_full]) OR
;  275     1428  3     ( NOT .lib$gl_ctlmsk [lib$v_history] )
;  276     1429  2 THEN
;  277     1430  3     BEGIN
```

```
;  278          1431  3     IF .lib$gl_ctlmsk [lib$v_only]                          !Listing selected modules?
;  279          1432  3     THEN listselectdmods ()                                 ! then do it
;  280          1433  4     ELSE BEGIN
;  281          1434  4         status = lbr$get_index (lib$gl_libctl, lib$gl_modnamix,
;  282          1435  4                                 .lis_dispatch [.lib$gl_type]);
;  283          1436  4         IF NOT .status
;  284          1437  4         THEN
;  285          1438  4             IF .status NEQ lbr$_nulidx
;  286          1439  4             THEN SIGNAL (lib$_indexerr, 1, lib$gl_libfdb [fdb$l_namdesc],
;  287          1440  4                          .status, .lbr$gl_rmsstv);
;  288          1441  3         END;
;  289          1442  2     END;
;  290          1443  2 !
;  291          1444  2 ! List header now if it didn't get out
;  292          1445  2 !
;  293          1446  2 IF NOT .header_listed
;  294          1447  2     THEN perform (list_header ());
;  295          1448  2 !
;  296          1449  2 ! list the update history if requested
;  297          1450  2 !
;  298          1451  2 histhdr_listed = false;
;  299          1452  2 IF  .lib$gl_ctlmsk [lib$v_history]      ! If /HIST
;  300          1453  2 THEN
;  301          1454  3     BEGIN
;  302          1455  3     !
;  303          1456  3     !    For each LUH record in the library, call display_history
;  304          1457  3     !
;  305        P 1458  3     perform ( lbr$get_history (lib$gl_libctl, display_history ),
;  306          1459  3                               lib$_histerr, 1, lib$gl_libfdb [fdb$l_namdesc]);
;  307          1460  2     END;
;  308          1461  2
;  309          1462  2 lib_close_out (.lib$gl_lisfdb, false);                     !close output file
;  310          1463  2 lib_free_mem (lib$c_lisreclng, .outputbuffer);             !free the memory
;  311          1464  2 RETURN true
;  312          1465  1 END;                                          !Of lib_list_lib


                                                                .TITLE  LIB_LIST
                                                                .IDENT  \V04-000\

                                                                .PSECT  $PLIT$,NOWRT,NOEXE,2

                                                        08  00000 P.AAA:  .BYTE   8
                                    20  64  65  74  65  6C  65  64  00001        .ASCII  \deleted \
                                                        08  00009 P.AAB:  .BYTE   8
                                    64  65  74  72  65  73  6E  69  0000A        .ASCII  \inserted\
                                                        08  00012 P.AAC:  .BYTE   8
                                    64  65  63  61  6C  70  65  72  00013        .ASCII  \replaced\
41  21  20  66  6F  20  79  72  6F  74  63  65  72  69  44  0001B P.AAE:  .ASCII  \Directory of !AC library !AS on !20<!%D!\
6F  20  53  41  21  20  79  72  61  72  62  69  6C  20  43  0002A
                        21  44  25  21  3C  30  32  21  20  6E  00039
                                                        3E  00043        .ASCII  \>\
                                                00000029    00044 P.AAD:  .LONG   41
                                                00000000'   00048        .ADDRESS P.AAE
20  3A  65  74  61  64  20  6E  6F  69  74  61  65  72  43  0004C P.AAG:  .ASCII  \Creation date:  !20<!%D!>!6* !10<Creator\
21  20  2A  36  21  3E  21  44  25  21  3C  30  32  21  20  0005B
                        72  6F  74  61  65  72  43  3C  30  31  0006A
```

```
                                                43 41 21 3E 21 20 20 3A 00074             .ASCII  \:  !>!AC\
                                                   00000030 0007C P.AAF:  .LONG   48
                                                   00000000 00080         .ADDRESS P.AAG
20 3A 65 74 61 64 20 6E 6F 69 73 69 76 65 52 00084 P.AAI:  .ASCII  \Revision date:  !20<!%D!>!6* !18<Library\
21 20 2A 36 21 3E 21 44 25 21 3C 30 32 21 20 00093
                  79 72 61 72 62 69 4C 3C 38 31 000A2
4C 55 21 3E 21 20 20 3A 74 61 6D 72 6F 66 20 000AC         .ASCII  \ format:  !>!UL.!UL\
                                    4C 55 21 2E 000BB
                                                000BF         .BLKB   1
                                                   0000003B 000C0 P.AAH:  .LONG   59
                                                   00000000' 000C4        .ADDRESS P.AAI
6D 20 66 6F 20 72 65 62 6D 75 4E 3C 30 32 21 000C8 P.AAK:  .ASCII  \!20<Number of modules:  !>!5UL!17* !18<M\
4C 55 35 21 3E 21 20 20 3A 73 65 6C 75 64 6F 000D7
                  4D 3C 38 31 21 20 2A 37 31 21 000E6
3A 68 74 67 6E 65 6C 20 79 65 6B 20 2E 78 61 000F0         .ASCII  \ax. key length:  !>!UL\
                        4C 55 21 3E 21 20 20 000FF
                                                00106         .BLKB   2
                                                   0000003E 00108 P.AAJ:  .LONG   62
                                                   00000000' 0010C        .ADDRESS P.AAK
69 72 74 6E 65 20 72 65 68 74 4F 3C 30 32 21 00110 P.AAM:  .ASCII  \!20<Other entries:  !>!5UL!17* !28<Preal\
2A 37 31 21 4C 55 35 21 3E 21 20 20 3A 73 65 0011F
                  6C 61 65 72 50 3C 38 32 21 20 0012E
62 20 78 65 64 6E 69 20 64 65 74 61 63 6F 6C 00138         .ASCII  \located index blocks:  !>!5UL\
   4C 55 35 21 3E 21 20 20 3A 73 6B 63 6F 6C 00147
                                                00155         .BLKB   3
                                                   00000045 00158 P.AAL:  .LONG   69
                                                   00000000' 0015C        .ADDRESS P.AAM
65 6C 62 61 72 65 76 6F 63 65 52 3C 39 32 21 00160 P.AAO:  .ASCII  \!29<Recoverable deleted blocks:  !>!5UL!\
73 6B 63 6F 6C 62 20 64 65 74 65 6C 65 64 20 0016F
                  21 4C 55 35 21 3E 21 20 20 3A 0017E
6E 69 20 6C 61 74 6F 54 3C 38 32 21 20 2A 38 00188         .ASCII  \8* .28<Total index blocks used:  !>!5UL\
64 65 73 75 20 73 6B 63 6F 6C 62 20 78 65 64 00197
                  4C 55 35 21 3E 21 20 20 3A 001A6
                                                001AF         .BLKB   1
                                                   0000004F 001B0 P.AAN:  .LONG   79
                                                   00000000' 001B4        .ADDRESS P.AAO
72 65 62 6D 75 4E 20 2E 78 61 4D 3C 31 33 21 001B8 P.AAQ:  .ASCII  \!31<Max. Number history records:  !>!5UL\
64 72 6F 63 65 72 20 79 72 6F 74 73 69 68 20 001C7
                  4C 55 35 21 3E 21 20 20 3A 73 001D6
79 72 61 72 62 69 4C 3C 36 32 21 20 2A 36 21 001E0         .ASCII  \!6* !26<Library history records:  !>!7UL\
64 72 6F 63 65 72 20 79 72 6F 74 73 69 68 20 001EF
                  4C 55 37 21 3E 21 20 20 3A 73 001FE
                                                   00000050 00208 P.AAP:  .LONG   80
                                                   00000000' 0020C        .ADDRESS P.AAQ
44 20 6E 69 20 73 69 20 79 72 61 72 62 4C 69 00210 P.AAS:  .ASCII  \Library is in DCX data reduced format\
64 65 63 75 64 65 72 20 61 74 61 64 20 58 43 0021F
                        74 61 6D 72 6F 66 20 0022E
                                                00235         .BLKB   3
                                                   00000025 00238 P.AAR:  .LONG   37
                                                   00000000' 0023C        .ADDRESS P.AAS
                                             53 41 21 00240 P.AAU:  .ASCII  \!AS\
                                                00243         .BLKB   1
                                                   00000003 00244 P.AAT:  .LONG   3
                                                   00000000' 00248        .ADDRESS P.AAU
                        53 41 21 20 65 6C 75 64 6F 4D 0024C P.AAW:  .ASCII  \Module !AS\
                                                00256         .BLKB   2
                                                   0000000A 00258 P.AAV:  .LONG   10
```

```
                                                    00000000'  0025C           .ADDRESS P.AAW                                    ;
21 20 41 46 52 20 3E 21 53 41 21 3C 31 33 21  00260 P.AAY:   .ASCII  \!31<!AS!> RFA !UL.:!4<!UW.!>(!XW)\       ;
21 28 3E 21 2E 57 55 21 3C 34 21 3A 2E 4C 55  0026F                                                            ;
                                     29 57 58  0027E                                                            ;
                                               00281           .BLKB   3
                                    00000021   00284 P.AAX:   .LONG   33                                        ;
                                    00000000'  00288           .ADDRESS P.AAY                                    ;
21 53 41 21 3C 31 33 21 20 65 6C 75 64 6F 4D  0028C P.ABA:   .ASCII  \Module !31<!AS!> RFA !UL.:!4<!UW.!>(!XW)\ ;
21 3C 34 21 3A 2E 4C 55 21 20 41 46 52 20 3E  0029B                                                            ;
               29 57 58 21 28 3E 21 2E 57 55  002AA                                                            ;
                                    00000028   002B4 P.AAZ:   .LONG   40                                        ;
                                    00000000'  002B8           .ADDRESS P.ABA                                    ;
74 6E 65 64 49 20 3E 21 53 41 21 3C 36 31 21  002BC P.ABC:   .ASCII  \!16<!AS!> Ident !16<!AC!> Inserted !20<!\ ;
65 73 6E 49 20 3E 21 43 41 21 3C 36 31 21 20  002CB                                                            ;
               21 3C 30 32 21 20 64 65 74 72  002DA                                                            ;
6C 6F 62 6D 79 73 20 4C 55 21 20 3E 21 44 25  002E4           .ASCII  \%D!> !UL symbol!%S\                     ;
                                     53 25 21  002F3                                                            ;
                                               002F6           .BLKB   2
                                    0000003A   002F8 P.ABB:   .LONG   58                                        ;
                                    00000000'  002FC           .ADDRESS P.ABC                                    ;
49 20 43 41 21 20 74 6E 65 64 49 20 53 41 21  00300 P.ABE:   .ASCII  \!AS Ident !AC Inserted !20<!%D!> !UL sym\ ;
44 25 21 3C 30 32 21 20 64 65 74 72 65 73 6E  0030F                                                            ;
               6D 79 73 20 4C 55 21 20 3E 21  0031E                                                            ;
                           53 25 21 6C 6F 62  00328           .ASCII  \bo'!%S\                                 ;
                                               0032E           .BLKB   2
                                    0000002E   00330 P.ABD:   .LONG   46                                        ;
                                    00000000'  00334           .ADDRESS P.ABE                                    ;
74 6E 65 64 49 20 3E 21 53 41 21 3C 36 31 21  00338 P.ABG:   .ASCII  \!16<!AS!> Ident !16<!AC!> Inserted !20<!\ ;
65 73 6E 49 20 3E 21 43 41 21 3C 36 31 21 20  00347                                                            ;
               21 3C 30 32 21 20 64 65 74 72  00356                                                            ;
6C 6F 62 6D 79 73 20 4C 55 21 20 3E 21 44 25  00360           .ASCII  \%D!> !UL symbol!%S RFA !UL.:!4<!UW.!>(!X\ ;
34 21 3A 2E 4C 55 21 20 41 46 52 20 53 25 21  0036F                                                            ;
               58 21 28 3E 21 2E 57 55 21 3C  0037E                                                            ;
                                        29 57  00388           .ASCII  \W)\                                     ;
                                               0038A           .BLKB   2
                                    00000052   0038C P.ABF:   .LONG   82                                        ;
                                    00000000'  00390           .ADDRESS P.ABG                                    ;
49 20 43 41 21 20 74 6E 65 64 49 20 53 41 21  00394 P.ABI:   .ASCII  \!AS Ident !AC Inserted !20<!%D!> !UL sym\ ;
44 25 21 3C 30 32 21 20 64 65 74 72 65 73 6E  003A3                                                            ;
               6D 79 73 20 4C 55 21 20 3E 21  003B2                                                            ;
2E 4C 55 21 20 41 46 52 20 53 25 21 6C 6F 62  003BC           .ASCII  \bol!%S RFA !UL.:!4<!UW.!>(!XW)\          ;
29 57 58 21 28 3E 21 2E 57 55 21 3C 34 21 3A  003CB                                                            ;
                                               003DA           .BLKB   2
                                    00000046   003DC P.ABH:   .LONG   70                                        ;
                                    00000000'  003E0           .ADDRESS P.ABI                                    ;
21 53 41 21 3C 36 31 21 20 65 6C 75 64 6F 4D  003E4 P.ABK:   .ASCII  \Module !16<!AS!> Ident !16<!AC!> Inserte\ ;
43 41 21 3C 36 31 21 20 74 6E 65 64 49 20 3E  003F3                                                            ;
               65 74 72 65 73 6E 49 20 3E 21  00402                                                            ;
4C 55 21 20 3E 21 44 25 21 3C 30 32 21 20 64  0040C           .ASCII  \d !20<!%D!> !UL symbol!%S\              ;
               53 25 21 6C 6F 62 6D 79 73 20  0041B                                                            ;
                                               00425           .BLKB   3
                                    00000041   00428 P.ABJ:   .LONG   65                                        ;
                                    00000000'  0042C           .ADDRESS P.ABK                                    ;
6E 65 64 49 20 53 41 21 20 65 6C 75 64 6F 4D  00430 P.ABM:   .ASCII  \Module !AS Ident !AC Inserted !20<!%D!> \ ;
20 64 65 74 72 65 73 6E 49 20 43 41 21 20 74  0043F                                                            ;
               20 3E 21 44 25 21 3C 30 32 21  0044E                                                            ;
      53 25 21 6C 6F 62 6D 79 73 20 4C 55 21  00458           .ASCII  \!UL symbol!%S\                          ;
```

```
                                                      00465          .BLKB   3
                                           00000035   00468 P.ABL:   .LONG   53                                   ;
                                           00000000'  0046C          .ADDRESS P.ABM                               ;
                    4C 58 36 21 2C 4C 58 32 21        00470 P.ABO:   .ASCII  \!2XL,!6XL\                          ;
                                                      00479          .BLKB   3
                                           00000009   0047C P.ABN:   .LONG   9                                    ;
                                           00000000'  00480          .ADDRESS P.ABO                               ;
                                         53 41 21     00484 P.ABQ:   .ASCII  \!AS\                                ;
                                                      00487          .BLKB   1
                                           00000003   00488 P.ABP:   .LONG   3                                    ;
                                           00000000'  0048C          .ADDRESS P.ABQ                               ;
                                            2F 21     00490 P.ABS:   .ASCII  \!/\                                 ;
                                                      00492          .BLKB   2
                                           00000002   00494 P.ABR:   .LONG   2                                    ;
                                           00000000'  00498          .ADDRESS P.ABS                               ;
6C 65 76 69 74 63 65 6C 65 53 20 20 20 20 20         0049C P.ABU:   .ASCII  \     Selectively searched\          ;
               64 65 68 63 72 61 65 73 20 79          004AB                                                       ;
                                                      004B5          .BLKB   3
                                           00000019   004B8 P.ABT:   .LONG   25                                   ;
                                           00000000'  004BC          .ADDRESS P.ABU                               ;
72 65 73 6E 69 20 3E 21 53 41 21 3C 36 31 21         004C0 P.ABW:   .ASCII  \!16<!AS!> inserted !20<!%D!>\       ;
      3E 21 44 25 21 3C 30 32 21 20 64 65 74          004CF                                                       ;
                                           0000001C   004DC P.ABV:   .LONG   28                                   ;
                                           00000000'  004E0          .ADDRESS P.ABW                               ;
32 21 20 64 65 74 72 65 73 6E 69 20 53 41 21         004E4 P.ABY:   .ASCII  \!AS inserted !20<!%D!>\             ;
                        3E 21 44 25 21 3C 30          004F3                                                       ;
                                                      004FA          .BLKB   2
                                           00000016   004FC P.ABX:   .LONG   22                                   ;
                                           00000000'  00500          .ADDRESS P.ABY                               ;
72 65 73 6E 69 20 3F 21 53 41 21 3C 36 31 21         00504 P.ACA:   .ASCII  \!16<!AS!> inserted !20<!%D!> RFA !UL.:!4\ ;
52 20 3E 21 44 25 2  3C 30 32 21 20 64 65 74         00513                                                       ;
               34 21 3A 2E 4C 55 21 20 41 46          00522                                                       ;
         29 57 58 21 28 3E 21 2E 57 55 21 3C          0052C          .ASCII  \<!UW.!>(!XW)\                       ;
                                           00000034   00538 P.ABZ:   .LONG   52                                   ;
                                           00000000'  0053C          .ADDRESS P.ACA                               ;
32 21 20 64 65 74 72 65 73 6E 69 20 53 41 21         00540 P.ACC:   .ASCII  \!AS inserted !20<!%D!> RFA !UL.:!4<!UW.!\ ;
4C 55 21 20 41 46 52 20 3E 21 44 25 21 3C 30         0054F                                                       ;
               21 2E 57 55 21 3C 34 21 3A 2E          0055E                                                       ;
                           29 57 58 21 28 3E          00568          .ASCII  \>(!XW)\                             ;
                                                      0056E          .BLK3   2
                                           0000002E   00570 P.ACB:   .LONG   46                                   ;
                                           00000000'  00574          .ADDRESS P.ACC                               ;
20 65 74 61 64 70 55 20 79 72 61 72 62 69 4C         00578 P.ACE:   .ASCII  \Library Update History\             ;
                        79 72 6F 74 73 69 48          00587                                                       ;
                                                      0058E          .BLKB   2
                                           00000016   00590 P.ACD:   .LONG   22                                   ;
                                           00000000'  00594          .ADDRESS P.ACE                               ;
6F 6D 20 4C 55 33 21 20 43 41 21 20 43 41 21         00598 P.ACG:   .ASCII  \!AC !AC !3UL module!%S on !20<!%D!>\ ;
3C 30 32 21 20 6E 6F 20 53 25 21 65 6C 75 64         005A7                                                       ;
                                 3E 21 44 25 21       005B6                                                       ;
                                                      005BB          .BLKB   1
                                           00000023   005BC P.ACF:   .LONG   35                                   ;
                                           00000000'  005C0          .ADDRESS P.ACG                               ;
64 65 74 61 65 72 63 20 79 72 61 72 62 69 4C         005C4 P.ACI:   .ASCII  \Library created by LIB VX129.0\     ;
30 2E 39 32 31 58 56 20 42 49 4C 20 79 62 20         005D3                                                       ;
                                                      005E2          .BLKB   2
                                           0000001E   005E4 P.ACH:   .LONG   30                                   ;
```

```
                                                  00000000'  005E8           .ADDRESS P.ACI
73 61 77 20 65 74 61 64 70 75 20 74 73 61 4C  005EC P.ACK:  .ASCII  \Last update was !ZL-!AC-!ZL !ZL:!ZL:!ZL\
5A 21 20 4C 5A 21 2D 43 41 21 2D 4C 5A 21 20  005FB
               4C 5A 21 3A 4C 5A 21 3A 4C  0060A
                                              00613           .BLKB   1
                                  00000027  00614 P.ACJ:  .LONG   39
                                  00000000' 00618           .ADDRESS P.ACK
6C 61 20 73 65 6C 75 64 6F 6D 20 4C 55 35 21  0061C P.ACM:  .ASCII  \!5UL modules allocated, !5UL used, !5UL \
75 20 4C 55 35 21 20 2C 64 65 74 61 63 6F 6C  0062B
         20 4C 55 35 21 20 2C 64 65 73  0063A
                              65 65 72 66  00644           .ASCII  \free\
                                  0000002C  00648 P.ACL:  .LONG   44
                                  00000000' 0064C           .ADDRESS P.ACM
6C 61 20 73 6C 6F 62 6D 79 73 20 4C 55 35 21  00650 P.ACO:  .ASCII  \!5UL symbols allocated, !5UL used, !5UL \
75 20 4C 55 35 21 20 2C 64 65 74 61 63 6F 6C  0065F
         20 4C 55 35 21 20 2C 64 65 73  0066E
                              65 65 72 66  00678           .ASCII  \free\
                                  0000002C  0067C P.ACN:  .LONG   44
                                  00000000' 00680           .ADDRESS P.ACO
65 64 20 66 6F 20 73 65 74 79 62 20 4C 55 21  00684 P.ACQ:  .ASCII  \!UL bytes of deleted, recoverable space\
61 72 65 76 6F 63 65 72 20 2C 64 65 74 65 6C  00693
               65 63 61 70 73 20 65 6C 62  006A2
                                              006AB           .BLKB   1
                                  00000027  006AC P.ACP:  .LONG   39
                                  00000000' 006B0           .ADDRESS P.ACQ
74 6E 65 64 49 20 3E 21 53 41 21 3C 36 31 21  006B4 P.ACS:  .ASCII  \!16<!AS!> Ident !16<!AC!> Inserted !11<!\
65 73 6E 49 20 3E 21 43 41 21 3C 36 31 21 20  006C3
         21 3C 31 31 21 20 64 65 74 72  006D2
                              3E 21 44 25  006DC           .ASCII  \%D!>\
                                  0000002C  006E0 P.ACR:  .LONG   44
                                  00000000' 006E4           .ADDRESS P.ACS
72 65 73 6E 49 20 3E 21 53 41 21 3C 36 31 21  006E8 P.ACU:  .ASCII  \!16<!AS!> Inserted !11<!%D!>\
      3E 21 44 25 21 3C 31 31 21 20 64 65 74  006F7
                                  0000001C  00704 P.ACT:  .LONG   28
                                  00000000' 00708           .ADDRESS P.ACU
74 6E 65 64 49 20 3E 21 53 41 21 3C 36 31 21  0070C P.ACW:  .ASCII  \!16<!AS!> Ident !16<!AC!> Inserted !11<!\
65 73 6E 49 20 3E 21 43 41 21 3C 36 31 21 20  0071B
         21 3C 31 31 21 20 64 65 74 72  0072A
21 3A 2E 4C 55 21 20 41 46 52 20 3E 21 44 25  00734           .ASCII  \%D!> RFA !UL.:!4<!UW.!>(!XW)\
      29 57 58 21 28 3E 21 2E 57 55 21 3C 34  00743
                                  00000044  00750 P.ACV:  .LONG   68
                                  00000000' 00754           .ADDRESS P.ACW
72 65 73 6E 49 20 3E 21 53 41 21 3C 36 31 21  00758 P.ACY:  .ASCII  \!16<!AS!> Inserted !11<!%D!> RFA !UL.:!4\
52 20 3E 21 44 25 21 3C 31 31 21 20 64 65 74  00767
         34 21 3A 2E 4C 55 21 20 41 46  00776
      29 57 58 21 28 3E 21 2E 57 55 21 3C  00780           .ASCII  \<!UW.!>(!XW)\
                                  00000034  0078C P.ACX:  .LONG   52
                                  00000000' 00790           .ADDRESS P.ACY
53 49 4C 2E 5D 5B 3A 4B 53 49 44 24 53 59 53  00794 P.ADA:  .ASCII  \SYS$DISK.[].LIS\
                                              007A3           .BLKB   1
                                  0000000F  007A4 P.ACZ:  .LONG   15
                                  00000000' 007A8           .ADDRESS P.ADA
                                  00000006  007AC           .LONG   6
00000000V 00000000V 00000000V 00000000V 00000000V 00000000V 007B0 P.ADB:  .ADDRESS DISPLAY_USR, DISPLAY_OBJECT, -
                                                                   DISPLAY_MACRO, DISPLAY_HELP, -
                                                                   DISPLAY_TEXT, DISPLAY_SHRSTB
```

```
                                .PSECT  $OWN$,NOEXE,2

                            00000 LINE_WIDTH:
                                        .BLKB   4
                            00004 GLOBALCOUNT:
                                        .BLKB   4
                            00008 HEADER_LISTED:
                                        .BLKB   4
                            0000C HISTHDR_LISTED:
                                        .BLKB   4
                            00010 CURMATCHDESC:
                                        .BLKB   4
00000000' 00000000' 00000000' 00014 LIB$AL_LUHOP:
                                        .ADDRESS P.AAA, P.AAB, P.AAC                    ;
                            00020 OUTDESC:.BLKB   8
                            00028 OUTSIZE:.BLKB   4
                            0002C OUTPUTBUFFER:
                                        .BLKB   4

                                FAO_DIRNAMTYP=      P.AAD
                                FAO_LINE1=          P.AAF
                                FAO_LINE2=          P.AAH
                                FAO_LINE3=          P.AAJ
                                FAO_LINE4=          P.AAL
                                FAO_LINE5=          P.AAN
                                FAO_LINE6=          P.AAP
                                FAO_LINE7=          P.AAR
                                FAO_MODHDR=         P.AAT
                                FAO_MODNAMHDR=      P.AAV
                                FAO_MODHDR2=        P.AAX
                                FAO_MODNAMHDR2=     P.AAZ
                                FAO_FULOBJHDR=      P.ABB
                                FAO_FULOBJHDR2=     P.ABD
                                FAO_FULOBJHDR3=     P.ABF
                                FAO_FULOBJHDR4=     P.ABH
                                FAO_FULOBJHDR5=     P.ABJ
                                FAO_FULOBJHDR6=     P.ABL
                                FAO_GSMATCH=        P.ABN
                                FAO_FLAGS=          P.ABP
                                FAO_1BLANKLINE=     P.ABR
                                FAO_SELSRC=         P.ABT
                                FAO_FULMODHDR=      P.ABV
                                FAO_FULMODHDR2=     P.ABX
                                FAO_FULMODHDR3=     P.ABZ
                                FAO_FULMODHDR4=     P.ACB
                                FAO_HISTLINE=       P.ACD
                                FAO_LUHRECHDR=      P.ACF
                                FAO_OLDCREDAT=      P.ACH
                                FAO_OLDLSTUPD=      P.ACJ
                                FAO_OLDMNT=         P.ACL
                                FAO_OLDGST=         P.ACN
                                FAO_OLDELSPC=       P.ACP
                                FAO_OLDOBJFUL=      P.ACR
                                FAO_OLDMACFUL=      P.ACT
                                FAO_OLDOBJFUL2=     P.ACV
                                FAO_OLDMACFUL2=     P.ACX
                                LISDEFEXT=          P.ACZ
```

```
                        LIS_DISPATCH=        P.ADB
                                .EXTRN  LIB_OPEN_OUT, LIB_CLOSE_OUT
                                .EXTRN  LIB_GET_MEM, LIB_FREE_MEM
                                .EXTRN  LBR$LOOKUP_KEY, LBR$GET_HEADER
                                .EXTRN  LBR$GET_HISTORY
                                .EXTRN  LBR$GET_INDEX, LBR$SET_MODULE
                                .EXTRN  LBR$SEARCH, SYS$FAO
                                .EXTRN  SYS$FAOL, LIB$BEFORE_DATE
                                .EXTRN  LIB$SINCE_DATE, LBR$GL_RMSSTV
                                .EXTRN  LBR$GL_CONTROL, LIB$GL_MODNAMIX
                                .EXTRN  LIB$GL_OBJMODIX
                                .EXTRN  LIB$GL_OBJGSDIX
                                .EXTRN  LIB$GL_MODLISL, LIB$AL_ASCBINF
                                .EXTRN  LIB$GL_TYPE, LIB$GL_KEYSIZE
                                .EXTRN  LIB$GL_LISTWID, LIB$AL_MONTHS
                                .EXTRN  LIB$GL_CTLMSK, LIB$GL_LIBFDB
                                .EXTRN  LIB$GL_LIBCTL, LIB$AL_RAB
                                .EXTRN  LIB$AL_TYPNAMES
                                .EXTRN  LIB$GL_LISFDB, LBR$_NOMTCHFOU
                                .EXTRN  LBR$_NOLIDX, LIB$_HISTERR
                                .EXTRN  LIB$_INITERR, LIB$_INDEXERR
                                .EXTRN  LIB$_MHDERR, LIB$_NOMTCHFOU
                                .EXTRN  LIB$_LOOKUPERR, LIB$_FAOFAIL

                                .PSECT  $CODE$,NOWRT,2

                    03FC 00000          .ENTRY  LIB_LIST_LIB, Save R2,R3,R4,R5,R6,R7,R8,R9  ; 1374
59      0000G   CF   9E 00002          MOVAB   LIB$GL_LISFDB, R9                           ;
58      0000G   CF   9E 00007          MOVAB   LIB$GL_LIBFDB, R8                           ;
57 00000000G    00   9E 0000C          MOVAB   LIB$SIGNAL, R7                              ;
56      0000'   CF   9E 00013          MOVAB   LINE_WIDTH, R6                              ;
5E      FE00    CE   9E 00018          MOVAB   -512(SP), SP                                ;
50              69   08 C1 0001D       ADDL3   #8, LIB$GL_LISFDB, R0                       ; 1410
                  08 A6 D4 00021        CLRL    HEADER_LISTED                               ; 1412
60      0000'   CF   08 28 00024       MOVC3   #8, LISDEFEXT, (R0)                         ; 1413
                     56 DD 0002A        PUSHL   R6                                          ; 1415
                     01 DD 0002C        PUSHL   #1                                          ;
7E              68 00000040 8F C1 0002E ADDL3   #64, LIB$GL_LIBFDB, -(SP)                  ;
                     69 DD 00036        PUSHL   LIB$GL_LISFDB                               ;
        0000G   CF   04 FB 00038        CALLS   #4, LIB_OPEN_OUT                            ;
                01   50 E8 0003D        BLBS    STATUS, 1$                                  ;
                     04 00040           RET                                                 ;
                50      0000G   CF D0 00041 1$: MOVL    LIB$GL_LISTWID, R0                  ; 1416
                     03 13 00046        BEQL    2$                                          ;
                66   50 D0 00048        MOVL    R0, LINE_WIDTH                              ; 1417
                50   66 D0 0004B 2$:    MOVL    LINE_WIDTH, R0                              ; 1419
    00000084    8F   50 D1 0004E        CMPL    R0, #132                                    ;
                     04 15 00055        BLEQ    3$                                          ;
                50      84   8F 9A 00057 MOVZBL  #132, R0                                  ;
                66   50 D0 0005B 3$:    MOVL    R0, LINE_WIDTH                              ;
                  2C A6 9F 0005E        PUSHAB  OUTPUTBUFFER                                ; 1421
                7E      0108 8F 3C 00061 MOVZWL #264, -(SP)                                 ;
        0000G   CF   02 FB 00066        CALLS   #2, LIB_GET_MEM                             ;
                11   50 E8 0006B        BLBS    STATUS, 4$                                  ;
                     50 DD 0006E        PUSHL   STATUS                                      ;
7E              68   10 C1 00070        ADDL3   #16, LIB$GL_LIBFDB, -(SP)                   ;
                     01 DD 00074        PUSHL   #1                                          ;
```

```
                    00000000G  8F   DD 00076          PUSHL   #LIB$_INITERR                          ;
                67              04   FB 0007C          CALLS   #4, LIB$SIGNAL                       ;
          20    A6      0108    8F   B0 0007F 4$:      MOVW    #264, OUTDESC                        ; 1422
          24    A6        2C    A6   D0 00085          MOVL    OUTPUTBUFFER, OUTDESC+4              ; 1423
    0B  0000G   CF              05   E1 0008A          BBC     #5, LIB$GL_CTLMSK+3, 5$              ; 1427
                06      0000G   CF   E8 00090          BLBS    LIB$GL_CTLMSK+2, 5$                  ;
    49  0000G   CF              05   E0 00095          BBS     #5, LIB$GL_CTLMSK+3, 7$              ; 1428
    07  0000G   CF              02   E1 0009B 5$:      BBC     #2, LIB$GL_CTLMSK+3, 6$              ; 1431
        0000V   CF              00   FB 000A1          CALLS   #0, LISTSELECTDMODS                  ; 1432
                                3C   11 000A6          BRB     7$                                   ;
                50      0000G   CF   D0 000A8 6$:      MOVL    LIB$GL_TYPE, R0                      ; 1435
                        0000'CF 40   DD 000AD          PUSHL   LIS_DISPATCH[R0]                     ;
                        0000G   CF   9F 000B2          PUSHAB  LIB$GL_MODNAMIX                      ; 1434
                        0000G   CF   9F 000B6          PUSHAB  LIB$GL_LIBCTL                        ;
    00000000G   00              03   FB 000BA          CALLS   #3, LBR$GET_INDEX                    ;
                20              50   E8 000C1          BLBS    STATUS, 7$                           ; 1436
    00000000G   8F              50   D1 000C4          CMPL    STATUS, #LBR$_NULIDX                 ; 1438
                                17   13 000CB          BEQL    7$                                   ;
                    00000000G   00   DD 000CD          PUSHL   LBR$GL_RMSSTV                        ; 1440
                                50   DD 000D3          PUSHL   STATUS                               ;
    7E              68          10   C1 000D5          ADDL3   #16, LIB$GL_LIBFDB, -(SP)            ; 1439
                                01   DD 000D9          PUSHL   #1                                   ;
                    00000000G   8F   DD 000DB          PUSHL   #LIB$_INDEXERR                       ;
                67              05   FB 000E1          CALLS   #5, LIB$SIGNAL                       ;
                08        08    A6   E8 000E4 7$:      BLBS    HEADER_LISTED, 8$                    ; 1446
          0000V CF              00   FB 000E8          CALLS   #0, LIST_HEADER                      ; 1447
                44              50   E9 000ED          BLBC    STATUS, 10$                          ;
                      0C        A6   D4 000F0 8$:      CLRL    HISTHDR_LISTED                       ; 1451
    23  0000G   CF              05   E1 000F3          BBC     #5, LIB$GL_CTLMSK+3, 9$              ; 1452
                        0000V   CF   9F 000F9          PUSHAB  DISPLAY_HISTORY                      ; 1459
                        0000G   CF   9F 000FD          PUSHAB  LIB$GL_LIBCTL                        ;
        00000000G   00              02   FB 00101          CALLS   #2, LBR$GET_HISTORY              ;
                    11              50   E8 00108          BLBS    STATUS, 9$                       ;
                                    50   DD 0010B          PUSHL   STATUS                           ;
    7E              68              10   C1 0010D          ADDL3   #16, LIB$GL_LIBFDB, -(SP)        ;
                                    01   DD 00111          PUSHL   #1                               ;
                        00000000G   8F   DD 00113          PUSHL   #LIB$_HISTERR                    ;
                    67              04   FB 00119          CALLS   #4, LIB$SIGNAL                   ;
                                    7E   D4 0011C 9$:      CLRL    -(SP)                            ; 1462
                                    69   DD 0011E          PUSHL   LIB$GL_LISFDB                    ;
                    0000G   CF      02   FB 00120          CALLS   #2, LIB_CLOSE_OUT                ;
                              2C    A6   DD 00125          PUSHL   OUTPUTBUFFER                     ; 1463
                    7E        84    8F   9A 00128          MOVZBL  #132, -(SP)                      ;
                    0000G   CF      02   FB 0012C          CALLS   #2, LIB_FREE_MEM                 ;
                    50              01   D0 00131          MOVL    #1, R0                           ; 1464
                                    04   00134 10$:        RET                                      ; 1465

; Routine Size:  309 bytes,    Routine Base:  $CODE$ + 0000
```

```
;  314          1466  1 ROUTINE display_history ( rec_desc ) =
;  315          1467  2 BEGIN
;  316          1468  2 !
;  317          1469  2 !     This routine is called by lbr$get_history for each LUH record.
;  318          1470  2 !     It prints the library update history record in the listing file.
;  319          1471  2 !
;  320          1472  2 MAP
;  321          1473  2     rec_desc : REF BBLOCK [dsc$c_s_bln];
;  322          1474  2 BIND
;  323          1475  2     luhrec = .rec_desc [dsc$a_pointer] : BBLOCK;
;  324          1476  2 LOCAL
;  325          1477  2     num_modules;
;  326          1478  2
;  327          1479  2 IF NOT .histhdr_listed
;  328          1480  2 THEN
;  329          1481  3     BEGIN
;  330          1482  3     !
;  331          1483  3     !   Make sure that the header line needs to be printed.
;  332          1484  3     !   If /LIST/HIST then header has been printed.
;  333          1485  3     !   If /LIST/HIST/FULL then header and full library listing has been printed
;  334          1486  3     !   and the Library History header line is needed.
;  335          1487  3     !
;  336          1488  3     IF .lib$gl_ctlmsk [lib$v_full]
;  337          1489  3     THEN
;  338          1490  4         BEGIN
;  339          1491  4         perform (output_listline ());                          ! Print blank line
;  340          1492  4         perform (lib_faol (fao_histline, outsize, outdesc));   ! Print history header line
;  341          1493  4         perform (output_listline ());                          ! Print blank line
;  342          1494  3         END;
;  343          1495  3     histhdr_listed = true;                                     ! Only list header line once
;  344          1496  2     END;
;  345          1497  2
;  346          1498  2 num_modules = .luhrec [lhe$w_modcnt];   ! Number of module names in update history record
;  347        P 1499  2 perform ( lib_faol ( fao_luhrechdr, outsize, outdesc,
;  348        P 1500  2                      [uhrec [lhe$b_usrnamlen],                ! user who updated library
;  349        P 1501  2                      .lib$al_luhop [(.luhrec [lhe$b_modcode] - 1)],  ! what kind of update
;  350        P 1502  2                      .num_modules,                            ! number of modules affected
;  351          1503  2                      luhrec [lhe$[_time] ) );                 ! time of update
;  352          1504  2 IF  .lib$gl_ctlmsk [lib$v_full]
;  353          1505  2 THEN
;  354          1506  3     BEGIN
;  355          1507  3     !
;  356          1508  3     !     List module names in LUH record
;  357          1509  3     !     The module names are stored are counted ASCII strings after the
;  358          1510  3     !     fixedsize portion of the LUH record.
;  359          1511  3     !     Locate size byte and address of module name and call display_luhnames
;  360          1512  3     !     to print it.  Then use name length to hop over it and print next
;  361          1513  3     !     module name, till all have been printed.
;  362          1514  3     !
;  363          1515  3     LOCAL
;  364          1516  3         modnamsadr;      ! Address where counted ASCII modules names begin
;  365          1517  3     modnamsadr = luhrec + lhe$c_fixedsize;      ! First module name stored after fixedsize of LUH record
;  366          1518  3     WHILE .num_modules GTR 0 DO                 ! num_modules is decremented for each name listed
;  367          1519  4         BEGIN
;  368          1520  4         BIND
;  369          1521  4             namlen = .modnamsadr : BYTE,        ! namlen contains length of module name
;  370          1522  4             name = .modnamsadr + 1;             ! name is bound to start of string
```

```
;    4          perform (display_luhnames (.namlen, name) );
;    4          num_modules = .num_modules - 1;
;    4          modnamsadr = .modnamsadr + 1 + .namlen; ! Skip past module name just listed, to the next one in the
;    3          END;
;    3      perform (output_listline ());               ! Flush the buffer
;    3      perform (output_listline ());               ! Print a blank line
;    2      END;
;    2 RETURN true;
;    1 END;             ! routine  display_history


                                   007C 00000 DISPLAY_HISTORY:
                                                        .WORD   Save R2,R3,R4,R5,R6                 ; 1466
                 56     0000V   CF   9E 00002           MOVAB   OUTPUT_LISTLINE, R6                 ;
                 55     0000'   CF   9E 00007           MOVAB   HISTHDR_LISTED, R5                  ;
                 50        04   AC   D0 0000C           MOVL    REC_DESC, R0                        ; 1475
                 52        04   A0   D0 00010           MOVL    4(R0), R2                           ;
                 26             65   E8 00014           BLBS    HISTHDR_LISTED, 2$                  ; 1479
                 1E     0000G   CF   E9 00017           BLBC    LIB$GL_CTLMSK+2, 1$                 ; 1488
                 66             00   FB 0001C           CALLS   #0, OUTPUT_LISTLINE                 ; 1491
                 74             50   E9 0001F           BLBC    STATUS, 6$                          ;
                           14   A5   9F 00022           PUSHAB  OUTDESC                             ; 1492
                           1C   A5   9F 00025           PUSHAB  OUTSIZE                             ;
                        0000'   CF   9F 00028           PUSHAB  FAO_HISTLINE                        ;
          0000V  CF             03   FB 0002C           CALLS   #3, LIB_FAOL                        ;
                 62             50   E9 00031           BLBC    STATUS, 6$                          ;
                 66             00   FB 00034           CALLS   #0, OUTPUT_LISTLINE                 ; 1493
                 5C             50   E9 00037           BLBC    STATUS, 6$                          ;
                 65             01   D0 0003A 1$:       MOVL    #1, HISTHDR_LISTED                  ; 1495
                 54        08   A2   3C 0003D 2$:       MOVZWL  8(R2), NUM_MODULES                  ; 1498
                                52   DD 00041           PUSHL   R2                                  ; 1503
                                54   DD 00043           PUSHL   NUM_MODULES                         ;
                 50        0A   A2   9A 00045           MOVZBL  10(R2), R0                          ;
                        04 A540      DD 00049           PUSHL   LIB$AL_LUHOP-4[R0]                  ;
                           0B   A2   9F 0004D           PUSHAB  11(R2)                              ;
                           14   A5   9F 00050           PUSHAB  OUTDESC                             ;
                           1C   A5   9F 00053           PUSHAB  OUTSIZE                             ;
                        0000'   CF   9F 00056           PUSHAB  FAO_LUHRECHDR                       ;
          0000V  CF             07   FB 0005A           CALLS   #7, LIB_FAOL                        ;
                 34             50   E9 0005F           BLBC    STATUS, 6$                          ;
                 2C     0000G   CF   E9 00062           BLBC    LIB$GL_CTLMSK+2, 5$                 ; 1504
                 52             18   C0 00067           ADDL2   #24, MODNAMSADR                     ; 1517
                                54   D5 0006A 3$:       TSTL    NUM_MODULES                         ; 1518
                                19   15 0006C           BLEQ    4$                                  ;
                           01   A2   9F 0006E           PUSHAB  1(MODNAMSADR)                       ; 1523
                 53             62   9A 00071           MOVZBL  (MODNAMSADR), R3                    ;
                                53   DD 00074           PUSHL   R3                                  ;
          0000V  CF             02   FB 00076           CALLS   #2, DISPLAY_LUHNAMES                ;
                 18             50   E9 0007B           BLBC    STATUS, 6$                          ;
                                54   D7 0007E           DECL    NUM_MODULES                         ; 1524
                 52     01 A342      9E 00080           MOVAB   1(R3)[MODNAMSADR], MODNAMSADR       ; 1525
                                E3   11 00085           BRB     3$                                  ; 1518
                 66             00   FB 00087 4$:       CALLS   #0, OUTPUT_LISTLINE                 ; 1527
                 09             50   E9 0008A           BLBC    STATUS, 6$                          ;
```

```
                66 00 FB 0008D          CALLS   #0, OUTPUT_LISTLINE                ; 1528
                03 50 E9 00090          BLBC    STATUS, 6$                        ;
                50 01 D0 00093 5$:      MOVL    #1, R0                            ; 1530
                   04 00096 6$:         RET                                       ; 1531

; Routine Size:  151 bytes,    Routine Base:  $CODE$ + 0135
```

```
;  381     1532  1 ROUTINE display_luhnames (namelen, nameadr) =
;  382     1533  2 BEGIN
;  383     1534  2 !
;  384     1535  2 ! This routine is called by the library processor for each
;  385     1536  2 ! module name in the LUH record when /HIST/FULL is specified.
;  386     1537  2 !
;  387     1538  2
;  388     1539  2 IF (.outsize + .lib$gl_keysize + 2) GTRU .line_width    !enough line left?
;  389     1540  2 THEN perform (output_listline ());                     !output the line
;  390     1541  2 CH$MOVE (.namelen, .nameadr, .outdesc [dsc$a_pointer]); !copy name into buffer
;  391     1542  2 outdesc [dsc$w_length] = .outdesc [dsc$w_length] -
;  392     1543  2                 .lib$gl_keysize - 2;                            !update descriptor
;  393     1544  2 outdesc [dsc$a_pointer] = .outdesc [dsc$a_pointer] +
;  394     1545  2                 .lib$gl_keysize + 2;
;  395     1546  2 outsize = .outsize + .lib$gl_keysize + 2;                      !and length of line used
;  396     1547  2 RETURN true;
;  397     1548  1 END;                                     !Of display_luhnames


                                              007C 00000 DISPLAY_LUHNAMES:
                                                               .WORD    Save R2,R3,R4,R5,R6                        ; 1532
                         56       0000'  CF    9E 00002        MOVAB    OUTSIZE, R6                                ;
      50                 66       0000G  CF    C1 00007        ADDL3    LIB$GL_KEYSIZE, OUTSIZE, R0                ; 1539
                         50              02    C0 0000D        ADDL2    #2, R0                                     ;
                 D8      A6              50    D1 00010        CMPL     R0, LINE_WIDTH                             ;
                                         08    1B 00014        BLEQU    1$                                         ;
               0000V     CF              00    FB 00016        CALLS    #0, OUTPUT_LISTLINE                        ; 1540
                         2D              50    E9 0001B        BLBC     STATUS, 2$                                 ;
 FC    B6        08      BC       04     AC    28 0001E 1$:    MOVC3    NAMELEN, @NAMEADR, @OUTDESC+4              ; 1541
                         51       0000G  CF    D0 00025        MOVL     LIB$GL_KEYSIZE, R1                         ; 1543
                         50       F8     A6    3C 0002A        MOVZWL   OUTDESC, R0                                ;
                         50              51    C2 0002E        SUBL2    R1, R0                                     ;
 F8    A6                50              02    A3 00031        SUBW3    #2, R0, OUTDESC                            ;
       50                51       FC     A6    C1 00036        ADDL3    OUTDESC+4, R1, R0                          ; 1545
                 FC      A6       02     A0    9E 0003B        MOVAB    2(R0), OUTDESC+4                           ;
       50                66              51    C1 00040        ADDL3    R1, OUTSIZE, R0                            ; 1546
                         66       02     A0    9E 00044        MOVAB    2(R0), OUTSIZE                             ;
                         50              01    D0 00048        MOVL     #1, R0                                     ; 1547
                                               04 0004B 2$:    RET                                                 ; 1548

; Routine Size:  76 bytes,    Routine Base:  $CODE$ + 01CC
```

```
;  399          1549  1 ROUTINE display_object (keydesc, txtrfa) =
;  400          1550  2 BEGIN
;  401          1551  2 !
;  402          1552  2 ! This routine is called by the library processor for each object module.
;  403          1553  2 ! The information is printed in the listing file.
;  404          1554  2 !
;  405          1555  2 MAP
;  406          1556  2     keydesc : REF BBLOCK [dsc$c_s_bln],          !String descriptor
;  407          1557  2     txtrfa  : REF BBLOCK [rfa$c_length];
;  408          1558  2 LOCAL
;  409          1559  2     shrgstring : VECTOR [sym$c_maxlng+1,BYTE],  !Buffer to hold formatted gsmatch
;  410          1560  2     shrgsdesc : BBLOCK [dsc$c_s_bln],           !Descriptor for shrgstring
;  411          1561  2     faostr,
;  412          1562  2     header : BBLOCK [lbr$c_maxhdrsiz];          !buffer to hold header
;  413          1563  2
;  414          1564  2 IF NOT .header_listed                          !If library header not listed yet
;  415          1565  2 THEN perform (list_header ());                 ! then do it now
;  416          1566  2 IF .lib$gl_ctlmsk [lib$v_full]                 !Full listing?
;  417          1567  2 OR .lib$gl_ctlmsk [lib$v_before] OR .lib$gl_ctlmsk [lib$v_since]
;  418          1568  3 OR (.lib$gl_ctlmsk [lib$v_names]               ! or listing global symbols
;  419          1569  3         AND NOT .lib$gl_ctlmsk [lib$v_oldlib])  ! and not old format library
;  420          1570  3 THEN BEGIN
;  421          1571  3     LOCAL
;  422          1572  3         hdrdesc : BBLOCK [dsc$c_s_bln],         !descriptor for header buffer
;  423          1573  3         hdrlen;                                 !length of header read from file
;  424          1574  3
;  425          1575  3     hdrdesc [dsc$w_length] = lbr$c_maxhdrsiz;   !set up header buffer descriptor
;  426          1576  3     hdrdesc [dsc$a_pointer] = header;
;  427        P 1577  3     rms_perform (lbr$set_module (lib$gl_libctl, .txtrfa, hdrdesc, hdrlen), !Read the module header                ;
;  428        P 1578  3                  [lib$_mhderr, .lbr$gl_rmssts, 2,
;  429          1579  3                  .keydesc, lib$gl_libfdb [fdb$l_namdesc]);
;  430          1580  3
;  431          1581  3     IF .lib$gl_ctlmsk [lib$v_before] OR .lib$gl_ctlmsk [lib$v_since]
;  432          1582  3     THEN
;  433          1583  3         IF NOT check_date ( header [mhd$l_datim] ) THEN RETURN true;            ! if dates don't match, give
;  434          1584  3
;  435          1585  3     IF .lib$gl_ctlmsk [lib$v_full]                      !Full listing
;  436          1586  4     THEN BEGIN
;  437          1587  4         IF .lib$gl_ctlmsk [lib$v_shrstb]                !If this is a shr image stb library
;  438          1588  5         THEN BEGIN
;  439          1589  5             shrgsdesc [dsc$w_length] = sym$c_maxlng;    !Set up descriptor for buffer
;  440          1590  5             shrgsdesc [dsc$a_pointer] = shrgstring [1];
;  441          1591  5             SYS$FAO (fao_gsmatch, shrgsdesc, shrgsdesc, !Format the GSMATCH
;  442          1592  5                      .(header [mhd$t_objident])<24,8,0>,     !**Needs symbols**
;  443          1593  5                      .(header [mhd$t_objident])<0,24,0>);
;  444          1594  5             shrgstring [0] = .shrgsdesc [dsc$w_length]; !Set length of formatted string
;  445          1595  4             END;
;  446          1596  4         IF NOT .lib$gl_ctlmsk [lib$v_address]           !If not printing RFA's
;  447          1597  5         THEN BEGIN
;  448          1598  6             faostr = (IF .lib$gl_ctlmsk [lib$v_names]
;  449          1599  6                       THEN fao_fulobjhdr5
;  450          1600  5                       ELSE fao_fulobjhdr);
;  451          1601  5             IF .keydesc [dsc$w_length] GTR 15           ! but if module name
;  452          1602  5             OR .header [mhd$b_objidlng] GTR 15          ! or ident larger
;  453          1603  6                 THEN faostr = (IF .lib$gl_ctlmsk [lib$v_names]
;  454          1604  6                       THEN fao_fulobjhdr6
;  455          1605  5                       ELSE fao_fulobjhdr2);
```

```
;  456          1606  5            IF .lib$gl_ctlmsk [lib$v_oldlib]                !If old format library
;  457          1607  5                THEN faostr = fao_oldobjful;
;  458          1608  5            END
;  459          1609  5        ELSE BEGIN                                          !Printing RFA's
;  460          1610  5            faostr = fao_fulobjhdr3;
;  461          1611  5            IF .keydesc [dsc$w_length] GTR 15
;  462          1612  5            OR .header [mhd$b_objidlng] GTR 15
;  463          1613  5                THEN faostr = fao_fulobjhdr4;
;  464          1614  5            IF .lib$gl_ctlmsk [lib$v_oldlib]
;  465          1615  5                THEN faostr = fao_oldobjful2;
;  466          1616  4            END;
;  467          1617  4        IF NOT .lib$gl_ctlmsk [lib$v_oldlib]
;  468        P 1618  4        THEN perform (lib_faol (.faostr, outsize, outdesc,      !Format the line
;  469        P 1619  4                .keydesc,
;  470        P 1620  4                (IF .lib$gl_ctlmsk [lib$v_shrstb] THEN shrgstring
;  471        P 1621  4                                                  ELSE header [mhd$b_objidlng]),
;  472        P 1622  4                 header [mhd$l_datim],
;  473        P 1623  4                .header [mhd$l_refcnt]-1, .txtrfa [rfa$l_vbn],
;  474          1624  5                .txtrfa [rfa$w_offset], .txtrfa [rfa$w_offset]))
;  475        P 1625  4        ELSE perform (lib_faol (.faostr, outsize, outdesc,
;  476        P 1626  4                .keydesc, header [mhd$b_objidlng], header [mhd$l_datim],
;  477        P 1627  4                .txtrfa [rfa$l_vbn], .txtrfa [rfa$w_offset],
;  478          1628  4                .txtrfa [rfa$w_offset]));
;  479          1629  4        IF .header [mhd$v_selsrc]                           !If this is selctively searched module
;  480          1630  4 !      OR .header [mhd$v_objtir]
;  481          1631  5        THEN BEGIN
;  482          1632  5            IF .header [mhd$v_selsrc]
;  483          1633  5            THEN perform (lib_faol (fao_selsrc, outsize, outdesc));
;  484          1634  5 !          IF .header [mhd$v_objtir]           !If module has TIR records
;  485          1635  5 !          THEN perform (lib_faol (fao_hastir, outsize, outdesc));
;  486          1636  4            END,
;  487          1637  4        END
;  488          1638  2    END;
;  489          1639  2 IF NOT .lib$gl_ctlmsk [lib$v_full]
;  490          1640  3 THEN BEGIN
;  491          1641  3     faostr = fao_modhdr;
;  492          1642  3     IF .lib$gl_ctlmsk [lib$v_names]
;  493          1643  3         THEN faostr = fao_modnamhdr;
;  494          1644  3     IF .lib$gl_ctlmsk [lib$v_address]
;  495          1645  4         THEN faostr = (IF .lib$gl_ctlmsk [lib$v_names]
;  496          1646  4                        THEN fao_modnamhdr2
;  497          1647  3                        ELSE fao_modhdr2);
;  498        P 1648  3     perform (lib_faol (.faostr, outsize, outdesc, .keydesc,
;  499        P 1649  3                .txtrfa [rfa$l_vbn], .txtrfa [rfa$w_offset],
;  500          1650  3                .txtrfa [rfa$w_offset]));
;  501          1651  2    END;
;  502          1652  2 IF .lib$gl_ctlmsk [lib$v_names]                  !Want global symbols also?
;  503          1653  2 AND (globalcount = .header [mhd$l_refcnt] - 1) NEQ 0 ! and there are some to list
;  504          1654  2 THEN
;  505          1655  3     BEGIN
;  506          1656  3
;  507          1657  4     BEGIN                                  ! Search for globals with same RFA
;  508          1658  4
;  509          1659  4     ! Search for globals with the same RFA, calling display_globals for
;  510          1660  4     ! each one found.  Display_globals will return a "false" status to
;  511          1661  4     ! terminate the search when the globals count has been decremented
;  512          1662  4     ! to zero.  Any other error is signaled:
```

```
;  513       1663  4        !
;  514       1664  4        LOCAL
;  515       1665  4            loc_status;
;  516       1666  5        IF NOT (loc_status = lbr$search (lib$gl_libctl, lib$gl_objgsdix,
;  517       1667  5                                        .txtrfa, display_globals))
;  518       1668  4        THEN
;  519       1669  4            IF .loc_status NEQ false THEN
;  520       1670  4                SIGNAL (lib$_indexerr, 1, lib$gl_libfdb [fdb$l_namdesc],
;  521       1671  4                            .loc_status, .lbr$gl_rmsstv);
;  522       1672  3        END;                                ! End of search for globals with same RFA
;  523       1673  3
;  524       1674  3        IF .outsize NEQ 0                           !Partial globals line to list?
;  525       1675  3        THEN perform (output_listline ());          !yes--do it
;  526       1676  3        perform (output_listline ());               !Followed by a blank line
;  527       1677  2        END;
;  528       1678  2   RETURN true
;  529       1679  1   END;                                !Of display_module


                                          00FC 00000 DISPLAY_OBJECT:
                                                         .WORD   Save R2,R3,R4,R5,R6,R7              ; 1549
                     57       0000V   CF   9E 00002      MOVAB   LIB_FAOL, R7                        ;
                     56 00000000G     00   9E 00007      MOVAB   LIB$SIGNAL, R6                      ;
                     55 00000000G     00   9E 0000E      MOVAB   LBR$GL_RMSSTV, R5                   ;
                     54       0000'   CF   9E 00015      MOVAB   OUTSIZE, R4                         ;
                     53       0000G   CF   9E 0001A      MOVAB   LIB$GL_CTLMSK, R3                   ;
                     5E        FF4C   CE   9E 0001F      MOVAB   -180(SP), SP                        ;
                     09          E0   A4   E8 00024      BLBS    HEADER_LISTED, 1$                   ; 1564
              0000V  CF               00   FB 00028      CALLS   #0, LIST_HEADER                     ; 1565
                     01               50   E8 0002D      BLBS    STATUS, 1$                          ;
                                           04 00030      RET                                         ;
                     16          02   A3   E8 00031 1$:  BLBS    LIB$GL_CTLMSK+2, 4$                 ; 1566
                     12          04   A3   E8 00035      BLBS    LIB$GL_CTLMSK+4, 4$                 ; 1567
        0D      04   A3               01   E0 00039      BBS     #1, LIB$GL_CTLMSK+4, 4$             ;
                                 01   A3   95 0003E      TSTB    LIB$GL_CTLMSK+1                     ; 1568
                                      03   19 00041      BLSS    3$                                  ;
                                    0152   31 00043 2$:  BRW     23$                                 ;
                                 02   A3   95 00046 3$:  TSTB    LIB$GL_CTLMSK+2                     ; 1569
                                      F8   19 00049      BLSS    2$                                  ;
                04   AE          80   8F   9B 0004B 4$:  MOVZBW  #128, HDRDESC                       ; 1575
                08   AE          0C   AE   9E 00050      MOVAB   HEADER, HDRDESC+4                   ; 1576
                                      5E   DD 00055      PUSHL   SP                                  ; 1579
                                 08   AE   9F 00057      PUSHAB  HDRDESC                             ;
                                 08   AC   DD 0005A      PUSHL   TXTRFA                              ;
                              0000G   CF   9F 0005D      PUSHAB  LIB$GL_LIBCTL                       ;
           00000000G 00               04   FB 00061      CALLS   #4, LBR$SET_MODULE                  ;
                     18               50   E8 00068      BLBS    STATUS, 5$                          ;
                                      65   DD 0006B      PUSHL   LBR$GL_RMSSTV                       ;
                                      50   DD 0006D      PUSHL   STATUS                              ;
        7E    0000G  CF               10   C1 0006F      ADDL3   #16, LIB$GL_LIBFDB, -(SP)           ;
                                 04   AC   DD 00075      PUSHL   KEYDESC                             ;
                                      02   DD 00078      PUSHL   #2                                  ;
                          00000000G   8F   DD 0007A      PUSHL   #LIB$_MHDERR                        ;
                     66               06   FB 00080      CALLS   #6, LIB$SIGNAL                      ;
```

```
                                 05        04  A3  E8 00083 5$:    BLBS    LIB$GL_CTLMSK+4, 6$                      ; 1581
              0E           04    A3            01  E1 00087        BBC     #1, LIB$GL_CTLMSK+4, 7$                  ;
                                           14  AE  9F 0008C 6$:    PUSHAB  HEADER+8                                 ; 1583
                       0000V     CF            01  FB 0008F        CALLS   #1, CHECK_DATE                           ;
                                 03            50  E8 00094        BLBS    R0, 7$                                   ;
                                             0196  31 00097        BRW     32$                                      ;
                                 03        02  A3  E8 0009A 7$:    BLBS    LIB$GL_CTLMSK+2, 8$                      ; 1585
                                             00FB  31 0009E        BRW     24$                                      ;
              29                 63            05  E1 000A1 8$:    BBC     #5, LIB$GL_CTLMSK, 9$                    ; 1587
                           D8    AD            1F  B0 000A5        MOVW    #31, SHRGSDESC                           ; 1589
                           DC    AD        E1  AD  9E 000A9        MOVAB   SHRGSTRING+1, SHRGSDESC+4                ; 1590
   7E        1E   AE             18            00  EF 000AE        EXTZV   #0, #24, HEADER+18, -(SP)                ; 1593
                                 7E        25  AE  9A 000B4        MOVZBL  HEADER+21, -(SP)                         ; 1592
                                           D8  AD  9F 000B8        PUSHAB  SHRGSDESC                                ; 1591
                                           D8  AD  9F 000BB        PUSHAB  SHRGSDESC                                ;
                                        0000'  CF  9F 000BE        PUSHAB  FAO_GSMATCH                              ;
                   00000000G     00            05  FB 000C2        CALLS   #5, SYS$FAO                              ;
                           E0    AD        D8  AD  90 000C9        MOVB    SHRGSDESC, SHRGSTRING                    ; 1594
   51        02   A3             01            07  EF 000CE 9$:    EXTZV   #7, #1, LIB$GL_CTLMSK+2, R1              ; 1606
                  38       03    A3            01  E0 000D4        BBS     #1, LIB$GL_CTLMSK+3, 15$                 ; 1596
                                           01  A3  95 000D9        TSTB    LIB$GL_CTLMSK+1                          ; 1598
                                               07  18 000DC        BGEQ    10$                                      ;
                                 52     0000'  CF  9E 000DE        MOVAB   FAO_FULOBJHDR5, FAOSTR                   ;
                                               05  11 000E3        BRB     11$                                      ;
                                 52     0000'  CF  9E 000E5 10$:   MOVAB   FAO_FULOBJHDR, FAOSTR                    ;
                                 0F        04  BC  B1 000EA 11$:   CMPW    @KEYDESC, #15                            ; 1601
                                               06  1A 000EE        BGTRU   12$                                      ;
                                 0F        1D  AE  91 000F0        CMPB    HEADER+17, #15                           ; 1602
                                               11  1B 000F4        BLEQU   14$                                      ;
                                           01  A3  95 000F6 12$:   TSTB    LIB$GL_CTLMSK+1                          ; 1603
                                               07  18 000F9        BGEQ    13$                                      ;
                                 52     0000'  CF  9E 000FB        MOVAB   FAO_FULOBJHDR6, FAOSTR                   ;
                                               05  11 00100        BRB     14$                                      ;
                                 52     0000'  CF  9E 00102 13$:   MOVAB   FAO_FULOBJHDR2, FAOSTR                   ;
                                 25            51  E9 00107 14$:   BLBC    R1, 18$                                  ; 1606
                                 52     0000'  CF  9E 0010A        MOVAB   FAO_OLDOBJFUL, FAOSTR                    ; 1607
                                               1E  11 0010F        BRB     18$                                      ; 1596
                                 52     0000'  CF  9E 00111 15$:   MOVAB   FAO_FULOBJHDR3, FAOSTR                   ; 1610
                                 0F        04  BC  B1 00116        CMPW    @KEYDESC, #15                            ; 1611
                                               06  1A 0011A        BGTRU   16$                                      ;
                                 0F        1D  AE  91 0011C        CMPB    HEADER+17, #15                           ; 1612
                                               05  1B 00120        BLEQU   17$                                      ;
                                 52     0000'  CF  9E 00122 16$:   MOVAB   FAO_FULOBJHDR4, FAOSTR                   ; 1613
                                 05            51  E9 00127 17$:   BLBC    R1, 18$                                  ; 1614
                                 52     0000'  CF  9E 0012A        MOVAB   FAO_OLDOBJFUL2, FAOSTR                   ; 1615
                                 50        08  AC  D0 0012F 18$:   MOVL    TXTRFA, R0                               ; 1624
                                 30            51  E8 00133        BLBS    R1, 21$                                  ;
                                 7E        04  A0  3C 00136        MOVZWL  4(R0), -(SP)                             ;
                                 7E        04  A0  3C 0013A        MOVZWL  4(R0), -(SP)                             ;
                                           08  BC  DD 0013E        PUSHL   @TXTRFA                                  ;
              7E           1C    AE            01  C3 00141        SUBL3   #1, HEADER+4, -(SP)                      ;
                                           24  AE  9F 00146        PUSHAB  HEADER+8                                 ;
              06                 63            05  E1 00149        BBC     #5, LIB$GL_CTLMSK, 19$                   ;
                                 50        E0  AD  9E 0014D        MOVAB   SHRGSTRING, R0                           ;
                                               04  11 00151        BRB     20$                                      ;
                                 50        31  AE  9E 00153 19$:   MOVAB   HEADER+17, R0                            ;
                                               50  DD 00157 20$:   PUSHL   R0                                       ;
```

```
                                  04   AC   DD 00159         PUSHL   KEYDESC                          :
                                  F8   A4   9F 0015C         PUSHAB  OUTDESC                          :
                                       14   BB 0015F         PUSHR   #^M<R2,R4>                       :
                           67          0A   FB 00161         CALLS   #10, LIB_FAOL                    :
                                       1C   11 00164         BRB     22$                              :
                           7E     04   A0   3C 00166 21$:    MOVZWL  4(R0), -(SP)                     : 1628
                           7E     04   A0   3C 0016A         MOVZWL  4(R0), -(SP)                     :
                                  08   BC   DD 0016E         PUSHL   @TXTRFA                          :
                                  20   AE   9F 00171         PUSHAB  HEADER+8                         :
                                  2D   AE   9F 00174         PUSHAB  HEADER+17                        :
                                  04   AC   DD 00177         PUSHL   KEYDESC                          :
                                  F8   A4   9F 0017A         PUSHAB  OUTDESC                          :
                                       14   BB 0017D         PUSHR   #^M<R2,R4>                       :
                           67          09   FB 0017F         CALLS   #9, LIB_FAOL                     :
                           55          50   E9 00182 22$:    BLBC    STATUS, 28$                      :
                           0F     1C   AE   E9 00185         BLBC    HEADER+16, 23$                   : 1629
                                  F8   A4   9F 00189         PUSHAB  OUTDESC                          : 1633
                                       54   DD 0018C         PUSHL   R4                               :
                               0000'   CF   9F 0018E         PUSHAB  FAO_SELSRC                       :
                           67          03   FB 00192         CALLS   #3, LIB_FAOL                     :
                           42          50   E9 00195         BLBC    STATUS, 28$                      :
                           41     02   A3   E8 00198 23$:    BLBS    LIB$GL_CTLMSK+2, 29$             : 1639
                           52  0000'   CF   9E 0019C 24$:    MOVAB   FAO_MODHDR, FAOSTR               : 1641
                                  01   A3   95 001A1         TSTB    LIB$GL_CTLMSK+1                  : 1642
                                       05   18 001A4         BGEQ    25$                              :
                           52  0000'   CF   9E 001A6         MOVAB   FAO_MODNAMHDR, FAOSTR            : 1643
          11          03   A3          01   E1 001AB 25$:    BBC     #1, LIB$GL_CTLMSK+3, 27$         : 1644
                                  01   A3   95 001B0         TSTB    LIB$GL_CTLMSK+1                  : 1645
                                       07   18 001B3         BGEQ    26$                              :
                           52  0000'   CF   9E 001B5         MOVAB   FAO_MODNAMHDR2, FAOSTR           :
                                       05   11 001BA         BRB     27$                              :
                           52  0000'   CF   9E 001BC 26$:    MOVAB   FAO_MODHDR2, FAOSTR              :
                           50     08   AC   D0 001C1 27$:    MOVL    TXTRFA, R0                       : 1650
                           7E     04   A0   3C 001C5         MOVZWL  4(R0), -(SP)                     :
                           7E     04   A0   3C 001C9         MOVZWL  4(R0), -(SP)                     :
                                       60   DD 001CD         PUSHL   (R0)                             :
                                  04   AC   DD 001CF         PUSHL   KEYDESC                          :
                                  F8   A4   9F 001D2         PUSHAB  OUTDESC                          :
                                       14   BB 001D5         PUSHR   #^M<R2,R4>                       :
                           67          07   FB 001D7         CALLS   #7, LIB_FAOL                     :
                           56          50   E9 001DA 28$:    BLBC    STATUS, 33$                      :
                                  01   A3   95 001DD 29$:    TSTB    LIB$GL_CTLMSK+1                  : 1652
                                       4E   18 001E0         BGEQ    32$                              :
     DC   A4          10   AE          01   C3 001E2         SUBL3   #1, HEADER+4, G OBALCOUNT        : 1653
                                       46   13 001E8         BEQL    32$                              :
                               0000V   CF   9F 001EA         PUSHAB  DISPLAY_GLOBALS                  : 1666
                                  08   AC   DD 001EE         PUSHL   TXTRFA                           : 1667
                               0000G   CF   9F 001F1         PUSHAB  LIB$GL_OBJGSDIX                  : 1666
                               0000G   CF   9F 001F5         PUSHAB  LIB$GL_LIBCTL                    :
            00000000G      00          04   FB 001F9         CALLS   #4, LBR$SEARCH                   :
                           19          50   E8 00200         BLBS    LOC_STATUS, 30$                  :
                                       50   D5 00203         TSTL    LOC_STATUS                       : 1669
                                       15   13 00205         BEQL    30$                              :
                                       65   DD 00207         PUSHL   LBR$GL_RMSSTV                    : 1671
                                       50   DD 00209         PUSHL   LOC_STATUS                       :
          7E       0000G   CF          10   C1 0020B         ADDL3   #16, LIB$GL_LIBFDB, -(SP)        : 1670
                                       01   DD 00211         PUSHL   #1                               :
```

```
                    00000000G  8F  DD 00213          PUSHL   #LIB$_INDEXERR                          ;
                           66  05  FB 00219          CALLS   #5, LIB$SIGNAL                         ;
                               64  D5 0021C 30$:     TSTL    OUTSIZE                                ; 1674
                               08  13 0021E          BEQL    31$                                    ;
                0000V          CF  00  FB 00220      CALLS   #0, OUTPUT_LISTLINE                    ; 1675
                               0B  50  E9 00225      BLBC    STATUS, 33$                            ;
                0000V          CF  00  FB 00228 31$: CALLS   #0, OUTPUT_LISTLINE                    ; 1676
                               03  50  E9 0022D      BLBC    STATUS, 33$                            ;
                               50  01  D0 00230 32$: MOVL    #1, R0                                 ; 1678
                                   04 00233 33$:     RET                                            ; 1679

; Routine Size:  564 bytes,    Routine Base:  $CODE$ + 0218
```

```
;  531          1680  1 ROUTINE display_macro (keydesc, txtrfa) =
;  532          1681  2 BEGIN
;  533          1682  2 !
;  534          1683  2 ! This routine lists one macro module
;  535          1684  2 !
;  536          1685  2 MAP
;  537          1686  2     keydesc : REF BBLOCK [dsc$c_s_bln],          !String descriptor
;  538          1687  2     txtrfa  : REF BBLOCK [rfa$c_length];
;  539          1688  2 LOCAL
;  540          1689  2     faoptr,
;  541          1690  2     header : BBLOCK [lbr$c_maxhdrsiz];
;  542          1691  2
;  543          1692  2 IF NOT .header_listed
;  544          1693  2 THEN perform (list_header ());                  !List header if not done yet
;  545          1694  2 IF .lib$gl_ctlmsk [lib$v_full]
;  546          1695  2 OR .lib$gl_ctlmsk [lib$v_before] OR .lib$gl_ctlmsk ['ib$v_since]
;  547          1696  3 THEN BEGIN
;  548          1697  3     LOCAL
;  549          1698  3         hdrdesc : BBLOCK [dsc$c_s_bln],
;  550          1699  3         hdrlen;
;  551          1700  3
;  552          1701  3     hdrdesc [dsc$w_length] = lbr$c_maxhdrsiz;
;  553          1702  3     hdrdesc [dsc$a_pointer] = header;
;  554        P 1703  3     rms_perform (lbr$set_module (lib$gl_libctl, .txtrfa, hdrdesc, hdrlen),
;  555        P 1704  3                  lib$_mhderr, .lbr$gl_rmsstv, 2, .keydesc,
;  556          1705  3                  lib$gl_libfdb [fdb$l_namdesc]);
;  557          1706  3
;  558          1707  3     IF .lib$gl_ctlmsk [lib$v_before] OR .lib$gl_ctlmsk [lib$v_since]
;  559          1708  3     THEN                                  ! if dates don't match, give up
;  560          1709  3         IF NOT check_date ( header [mhd$l_datim] ) THEN RETURN true;
;  561          1710  3
;  562          1711  3     IF NOT .lib$gl_ctlmsk [lib$v_address]
;  563          1712  4     THEN BEGIN
;  564          1713  4         faoptr = fao_fulmodhdr;
;  565          1714  4         IF .keydesc [dsc$w_length] GTR 15
;  566          1715  4                 THEN faoptr = fao_fulmodhdr2;
;  567          1716  4         IF .lib$gl_ctlmsk [lib$v_oldlib]
;  568          1717  4                 THEN faoptr = fao_oldmacful;
;  569          1718  4         END
;  570          1719  4     ELSE BEGIN
;  571          1720  4         faoptr = fao_fulmodhdr3;
;  572          1721  4         IF .keydesc [dsc$w_length] GTR 15
;  573          1722  4                 THEN faoptr = fao_fulmodhdr4;
;  574          1723  4         IF .lib$gl_ctlmsk [lib$v_oldlib]
;  575          1724  4                 THEN faoptr = fao_oldmacful2;
;  576          1725  3         END;
;  577        P 1726  3     perform (lib_faol (.faoptr, outsize, outdesc,
;  578        P 1727  3                  .keydesc, header [mhd$l_datim], .txtrfa [rfa$l_vbn],
;  579          1728  3                  .txtrfa [rfa$w_offset], .txtrfa [rfa$w_offset]));
;  580          1729  3     END
;  581          1730  3 ELSE BEGIN
;  582          1731  3     faoptr = fao_modhdr;
;  583          1732  3     IF .lib$gl_ctlmsk [lib$v_address]
;  584          1733  3         THEN faoptr = fao_modhdr2;
;  585        P 1734  3     perform (lib_faol (.faoptr, outsize, outdesc, .keydesc,
;  586        P 1735  3         .txtrfa [rfa$l_vbn], .txtrfa [rfa$w_offset],
;  587          1736  3         .txtrfa [rfa$w_offset]));
```

```
;  588        1737  2      END;
;  589        1738  2 RETURN true
;  590        1739  1 END;


                                            001C 00000 DISPLAY_MACRO:
                                                               .WORD   Save R2,R3,R4                              ; 1680
                    54      0000'   CF   9E 00002              MOVAB   OUTDESC, R4                                ;
                    53      0000G   CF   9E 00007              MOVAB   LIB$GL_CTLMSK, R3                          ;
                    5E      FF74    CE   9E 0000C              MOVAB   -140(SP), SP                               ;
                    09        E8    A4   E8 00011              BLBS    HEADER_LISTED, 1$                          ; 1692
             0000V  CF               00  FB 00015              CALLS   #0, LIST_HEADER                            ; 1693
                    01               50  E8 0001A              BLBS    STATUS, 1$                                 ;
                                         04 0001D              RET                                                ;
                    52        08    AC   D0 0001E 1$:          MOVL    TXTRFA, R2                                 ; 1728
                    0C        02    A3   E8 00022              BLBS    LIB$GL_CTLMSK+2, 2$                        ; 1694
                    08        04    A3   E8 00026              BLBS    LIB$GL_CTLMSK+4, 2$                        ; 1695
    03        04    A3               01  E0 0002A              BBS     #1, LIB$GL_CTLMSK+4, 2$                    ;
                                   00B1  31 0002F              BRW     10$                                        ;
              04    AE        80    8F   9B 00032 2$:          MOVZBW  #128, HDRDESC                              ; 1701
              08    AE        0C    AE   9E 00037              MOVAB   HEADER, HDRDESC+4                          ; 1702
                                    5E   DD 0003C              PUSHL   SP                                         ; 1705
                              08    AE   9F 0003E              PUSHAB  HDRDESC                                    ;
                              08    AC   DD 00041              PUSHL   TXTRFA                                     ;
                            0000G   CF   9F 00044              PUSHAB  LIB$GL_LIBCTL                              ;
         00000000G  00               04  FB 00048              CALLS   #4, LBR$SET_MODULE                         ;
                    20               50  E8 0004F              BLBS    STATUS, 3$                                 ;
                        00000000G   00   DD 00052              PUSHL   LBR$GL_RMSSTV                              ;
                                    50   DD 00058              PUSHL   STATUS                                     ;
    7E      0000G   CF               10  C1 0005A              ADDL3   #16, LIB$GL_LIBFDB, -(SP)                  ;
                              04    AC   DD 00060              PUSHL   KEYDESC                                    ;
                                    02   DD 00063              PUSHL   #2                                         ;
                        00000000G   8F   DD 00065              PUSHL   #LIB$_MHDERR                               ;
         00000000G  00               06  FB 0006B              CALLS   #6, LIB$SIGNAL                             ;
                    05        04    A3   E8 00072 3$:          BLBS    LIB$GL_CTLMSK+4, 4$                        ; 1707
    0E        04    A3               01  E1 00076              BBC     #1, LIB$GL_CTLMSK+4, 5$                    ;
                              14    AE   9F 0007B 4$:          PUSHAB  HEADER+8                                   ; 1709
             0000V  CF               01  FB 0007E              CALLS   #1, CHECK_DATE                             ;
                    03               50  E8 00083              BLBS    R0, 5$                                     ;
                                   0086  31 00086              BRW     13$                                        ;
    1C        03    A3               01  E0 00089 5$:          BBS     #1, LIB$GL_CTLMSK+3, 7$                    ; 1711
                    50      0000'   CF   9E 0008E              MOVAB   FAO_FULMODHDR, FAOPTR                      ; 1713
                    0F        04    BC   B1 00093              CMPW    @KEYDESC, #15                              ; 1714
                                    05   1B 00097              BLEQU   6$                                         ;
                    50      0000'   CF   9E 00099              MOVAB   FAO_FULMODHDR2, FAOPTR                     ; 1715
                              02    A3   95 0009E 6$:          TSTB    LIB$GL_CTLMSK+2                            ; 1716
                                    21   18 000A1              BGEQ    9$                                         ;
                    50      0000'   CF   9E 000A3              MOVAB   FAO_OLDMACFUL, FAOPTR                      ; 1717
                                    1A   11 000A8              BRB     9$                                         ; 1711
                    50      0000'   CF   9E 000AA 7$:          MOVAB   FAO_FULMODHDR3, FAOPTR                     ; 1720
                    0F        04    BC   B1 000AF              CMPW    @KEYDESC, #15                              ; 1721
                                    05   1B 000B3              BLEQU   8$                                         ;
                    50      0000'   CF   9E 000B5              MOVAB   FAO_FULMODHDR4, FAOPTR                     ; 1722
                              02    A3   95 000BA 8$:          TSTB    LIB$GL_CTLMSK+2                            ; 1723
```

```
                                05 18 000BD           BGEQ    9$                                ;
                  50    0000'   CF 9E 000BF           MOVAB   FAO_OLDMACFUL2, FAOPTR            ; 1724
                  7E      04    A2 3C 000C4 9$:       MOVZWL  4(R2), -(SP)                      ; 1728
                  7E      04    A2 3C 000C8           MOVZWL  4(R2), -(SP)                      ;
                          08    BC DD 000CC           PUSHL   @TXTRFA                           ;
                          20    AE 9F 000CF           PUSHAB  HEADER+8                          ;
                          04    AC DD 000D2           PUSHL   KEYDESC                           ;
                                54 DD 000D5           PUSHL   R4                                ;
                          08    A4 9F 000D7           PUSHAB  OUTSIZE                           ;
                                50 DD 000DA           PUSHL   FAOPTR                            ;
            0000V  CF           08 FB 000DC           CALLS   #8, LIB_FAOL                      ;
                                29 11 000E1           BRB     12$                               ;
                  50    0000'   CF 9E 000E3 10$:      MOVAB   FAO_MODHDR, FAOPTR                ; 1731
    05       03   A3            01 E1 000E8           BBC     #1, LIB$GL_CTLMSK+3, 11$          ; 1732
                  50    0000'   CF 9E 000ED           MOVAB   FAO_MODHDR2, FAOPTR               ; 1733
                  7E      04    A2 3C 000F2 11$:      MOVZWL  4(R2), -(SP)                      ; 1736
                  7E      04    A2 3C 000F6           MOVZWL  4(R2), -(SP)                      ;
                          08    BC DD 000FA           PUSHL   @TXTRFA                           ;
                          04    AC DD 000FD           PUSHL   KEYDESC                           ;
                                54 DD 00100           PUSHL   R4                                ;
                          08    A4 9F 00102           PUSHAB  OUTSIZE                           ;
                                50 DD 00105           PUSHL   FAOPTR                            ;
            0000V  CF           07 FB 00107           CALLS   #7, LIB_FAOL                      ;
                   03           50 E9 0010C 12$:      BLBC    STATUS, 14$                       ;
                   50           01 D0 0010F 13$:      MOVL    #1, R0                            ; 1738
                                   04 00112 14$:      RET                                       ; 1739

; Routine Size:  275 bytes,    Routine Base:  $CODE$ + 044C
```

```
;  592     1740  1 ROUTINE check_date (date) =
;  593     1741  1 !----
;  594     1742  1 !
;  595     1743  1 ! Functional description
;  596     1744  1 !
;  597     1745  1 !       This routine checks a single date against the /SINCE and /BEFORE
;  598     1746  1 !       qualifiers and returns whether it matches the date specification
;  599     1747  1 !       or not.
;  600     1748  1 !
;  601     1749  1 ! Input parameters
;  602     1750  1 !
;  603     1751  1 !       date            - Address of date to check
;  604     1752  1 !       lib$before_date - Date specified on /BEFORE qualifier
;  605     1753  1 !       lib$since_date  - Date specified on /SINCE qualifier
;  606     1754  1 !
;  607     1755  1 ! Routine value
;  608     1756  1 !
;  609     1757  1 !       True if dates match, else false.
;  610     1758  1 !
;  611     1759  1 !----
;  612     1760  2 BEGIN
;  613     1761  2
;  614     1762  2 MAP
;  615     1763  2     date:       REF BBLOCK;             ! Date to check against
;  616     1764  2
;  617     1765  2 LOCAL
;  618     1766  2     earlier,                            ! Boolean, says /BEFORE was true
;  619     1767  2     later;                              ! Boolean, says /SINCE was true
;  620     1768  2
;  621     1769  2 MACRO
;  622     1770  2     high_date   = 4, 0, 32, 0%,         ! High-bits in specified date
;  623     1771  2     low_date    = 0, 0, 32, 0%;         ! Low-bits in specified date
;  624     1772  2
;  625     1773  2 earlier = NOT .lib$gl_ctlmsk [lib$v_before];    ! Assume no matches
;  626     1774  2 later = NOT .lib$gl_ctlmsk [lib$v_since];       ! for both /BEFORE and /SINCE.
;  627     1775  2
;  628     1776  2 !
;  629     1777  2 ! If the user said /BEFORE, and the date is previous to the specified date,
;  630     1778  2 ! then set Boolean indicator that /BEFORE was satisfied.
;  631     1779  2 !
;  632     1780  2
;  633     1781  2 IF .lib$gl_ctlmsk [lib$v_before]                ! If /BEFORE was specified,
;  634     1782  2 THEN
;  635     1783  3     IF (.date [high_date]                   ! and dates are LSSU
;  636     1784  3             LSSU .lib$before_date [high_date])
;  637     1785  4         OR ((.date [high_date]
;  638     1786  4             EQLU .lib$before_date [high_date])
;  639     1787  4             AND (.date [low_date]
;  640     1788  3             LSSU .lib$before_date [low_date]))
;  641     1789  2         THEN
;  642     1790  2             earlier = TRUE;             ! Set /BEFORE satisfed.
;  643     1791  2
;  644     1792  2 !
;  645     1793  2 ! If the user said /SINCE, and the date is later than the specified date, then
;  646     1794  2 ! set the Boolean indicator that /SINCE was satisifed.
;  647     1795  2 !
;  648     1796  2
```

```
;  649        1797  2 IF .lib$gl_ctlmsk [lib$v_since]         . If /SINCE was specified,
;  650        1798  2 THEN
;  651        1799  3     IF (.date [high_date]               ! and dates are GTRU
;  652        1800  3         GTRU .lib$since_date [high_date])
;  653        1801  4       OR ((.date [high_date]
;  654        1802  4         EQLU .lib$since_date [high_date])
;  655        1803  4         AND (.date [low_date]
;  656        1804  3         GTRU .lib$since_date [low_date]))
;  657        1805  2       THEN
;  658        1806  2         later = TRUE;                   ! Set /SINCE satisfied.
;  659        1807  2
;  660        1808  2 RETURN .earlier and .later;             ! True only if both true
;  661        1809  2
;  662        1810  1 END;



                                       000C 00000 CHECK_DATE:
                                                          .WORD   Save R2,R3                              ; 1740
                      53      0000G  CF   9E 00002        MOVAB   LIB$GL_CTLMSK+4, R3                     ;
    50        63      01             00   EF 00007        EXTZV   #0, #1, LIB$GL_CTLMSK+4, EARLIER        ; 1773
                      50             50   D2 0000C        MCOML   EARLIER, EARLIER                        ;
    52        63      01             01   EF 0000F        EXTZV   #1, #1, LIB$GL_CTLMSK+4, LATER          ; 1774
                      52             52   D2 00014        MCOML   LATER, LATER                            ;
                      18             63   E9 00017        BLBC    LIB$GL_CTLMSK+4, 2$                     ; 1781
                      51        04   AC   D0 0001A        MOVL    DATE, R1                                ; 1783
              0000G   CF        04   A1   D1 0001E        CMPL    4(R1), LIB$BEFORE_DATE+4                ; 1784
                      09             1F      00024        BLSSU   1$                                      ;
                      0A             12      00026        BNEQ    2$                                      ; 1786
              0000G   CF             61   D1 00028        CMPL    (R1), LIB$BEFORE_DATE                   ; 1788
                      03             1E      0002D        BGEQU   2$                                      ;
                      50             01   D0 0002F 1$:    MOVL    #1, EARLIER                             ; 1790
              18      63             01   E1 00032 2$:    BBC     #1, LIB$GL_CTLMSK+4, 4$                 ; 1797
                      51        04   AC   D0 00036        MOVL    DATE, R1                                ; 1799
              0000G   CF        04   A1   D1 0003A        CMPL    4(R1), LIB$SINCE_DATE+4                 ; 1800
                      09             1A      00040        BGTRU   3$                                      ;
                      0A             12      00042        BNEQ    4$                                      ; 1802
              0000G   CF             61   D1 00044        CMPL    (R1), LIB$SINCE_DATE                    ; 1804
                      03             1B      00049        BLEQU   4$                                      ;
                      52             01   D0 0004B 3$:    MOVL    #1, LATER                               ; 1806
                      51             52   D2 0004E 4$:    MCOML   LATER, R1                               ; 1808
                      50             51   CA 00051        BICL2   R1, R0                                  ;
                                          04 00054        RET                                             ; 1810

; Routine Size:  85 bytes,    Routine Base:  $CODE$ + 055F
```

```
;  664          1811  1 ROUTINE list_header =
;  665          1812  2 BEGIN
;  666          1813  2 !
;  667          1814  2 ! This routine displays the module header
;  668          1815  2 !
;  669          1816  2 BIND
;  670          1817  2     header = .lbr$gl_control[lbr$l_hdrptr] : BBLOCK;
;  671          1818  2
;  672          1819  2 LOCAL
;  673          1820  2     headary : BBLOCK [lbr$c_pagesize];
;  674          1821  2
;  675          1822  2 header_listed = true;                                  !Flag header listed
;  676          1823  2 IF .lib$gl_ctlmsk [lib$v_oldlib]                       !If old library
;  677          1824  2 THEN RETURN list_old_lib ();                          !Then go do that
;  678        P 1825  2 perform (lbr$get_header (lib$gl_libctl, headary),      !Get the library header
;  679          1826  2                 [lib$_indexerr, T, lib$gl_libfdb [fdb$l_namdesc]);
;  680          1827  2 lib$gl_type = .headary [lhi$l_type];
;  681        P 1828  2 perform (lib_faol (fao_dirnamtyp, outsize, outdesc,    !Format the line
;  682        P 1829  2         .lib$al_typnames [.headary [lhi$l_type]],
;  683          1830  2         lib$gl_libfdb [fdb$l_namdesc], 0));            ! include now date and time
;  684          1831  2 !
;  685          1832  2 ! List data from header
;  686          1833  2 !
;  687        P 1834  2 perform (lib_faol (fao_line1, outsize, outdesc,
;  688          1835  2         headary [lhi$l_credat], headary [lhi$t_lbrver]));
;  689          1836  2
;  690        P 1837  2 perform (lib_faol (fao_line2, outsize, outdesc,
;  691        P 1838  2         headary [lhi$l_updtim], .headary [lhi$l_majorid],
;  692          1839  2         .headary [lhi$l_minorid]));
;  693          1840  2
;  694        P 1841  2 perform (lib_faol (fao_line3, outsize, outdesc,
;  695          1842  2         .headary [lhi$l_modcnt], .lib$gl_keysize));
;  696          1843  2
;  697        P 1844  2 perform (lib_faol (fao_line4, outsize, outdesc,
;  698        P 1845  2         .headary [lhi$l_idxcnt] - .headary [lhi$l_modcnt],
;  699          1846  2         .headary [lhi$l_hipreal] - 1));
;  700          1847  2
;  701        P 1848  2 perform (lib_faol (fao_line5, outsize, outdesc,
;  702          1849  2         .headary [lhi$l_freeblk], .headary [lhi$l_idxblks]));
;  703          1850  2
;  704        P 1851  2 perform (lib_faol (fao_line6, outsize, outdesc,
;  705          1852  2         .headary [lhi$l_maxluhrec], .headary [lhi$l_numluhrec]));
;  706          1853  2
;  707          1854  2 IF .header[lhd$l_dcxmapvbn] NEQ 0
;  708          1855  2 THEN
;  709          1856  2     perform (lib_faol (fao_line7, outsize, outdesc, 0));
;  710          1857  2
;  711          1858  2 perform (output_listline ());                         !Blank line at the end
;  712          1859  2 RETURN true
;  713          1860  1 END;                                                  !Of list_header


                        001C 00000 LIST_HEADER:
                                    .WORD   Save R2,R3,R4                    ; 1811
```

```
                54      0000V   CF   9E 00002         MOVAB   LIB_FAOL, R4                                ;
                53      0000'   CF   9E 00007         MOVAB   OUTDESC, R3                                 ;
                5E      FE00    CE   9E 0000C         MOVAB   -512(SP), SP                                ;
                50 00000000G    00   D0 00011         MOVL    LBR$GL_CONTROL, R0                          ; 1817
                52        0A    A0   D0 00018         MOVL    10(R0), R2                                  ;
             E8 A3              01   D0 0001C         MOVL    #1, HEADER_LISTED                           ; 1822
                     0000G      CF   95 00020         TSTB    LIB$GL_CTLMSK+2                             ; 1823
                                06   18 00024         BGEQ    1$                                          ;
          0000V CF              00   FB 00026         CALLS   #0, LIST_OLD_LIB                            ; 1824
                                04   00028         RET                                                 ;
                                5E   DD 0002C 1$:     PUSHL   SP                                          ; 1826
                     0000G      CF   9F 0002E         PUSHAB  LIB$GL_LIBCTL                               ;
    00000000G 00                02   FB 00032         CALLS   #2, LBR$GET_HEADER                          ;
              17                50   E8 00039         BLBS    STATUS, 2$                                  ;
                                50   DD 0003C         PUSHL   STATUS                                      ;
7E       0000G CF               10   C1 0003E         ADDL3   #16, LIB$GL_LIBFDB, -(SP)                   ;
                                01   DD 00044         PUSHL   #1                                          ;
                00000000G       8F   DD 00046         PUSHL   #LIB$_INDEXERR                              ;
    00000000G 00                04   FB 0004C         CALLS   #4, LIB$SIGNAL                              ;
              50                6E   D0 00053 2$:     MOVL    HEADARY, R0                                 ; 1827
          0000G CF              50   D0 00056         MOVL    R0, LIB$GL_TYPE                             ;
                                7E   D4 0005B         CLRL    -(SP)                                       ; 1830
7E       0000G CF               10   C1 0005D         ADDL3   #16, LIB$GL_LIBFDB, -(SP)                   ;
                     0000GCF    40   DD 00063         PUSHL   LIB$AL_TYPNAMES[R0]                         ;
                                53   DD 00068         PUSHL   R3                                          ;
                          08    A3   9F 0006A         PUSHAB  OUTSIZE                                     ;
                     0000'      CF   9F 0006D         PUSHAB  FAO_DIRNAMTYP                               ;
                64              06   FB 00071         CALLS   #6, LIB_FAOL                                ;
                6F              50   E9 00074         BLBC    STATUS, 3$                                  ;
                          10    AE   9F 00077         PUSHAB  HEADARY+16                                  ; 1835
                          34    AE   9F 0007A         PUSHAB  HEADARY+48                                  ;
                                53   DD 0007D         PUSHL   R3                                          ;
                          08    A3   9F 0007F         PUSHAB  OUTSIZE                                     ;
                     0000'      CF   9F 00082         PUSHAB  FAO_LINE1                                   ;
                64              05   FB 00086         CALLS   #5, LIB_FAOL                                ;
                6F              50   E9 00089         BLBC    STATUS, 4$                                  ;
                          0C    AE   DD 0008C         PUSHL   HEADARY+12                                  ; 1839
                          0C    AE   DD 0008F         PUSHL   HEADARY+8                                   ;
                          40    AE   9F 00092         PUSHAB  HEADARY+56                                  ;
                                53   DD 00095         PUSHL   R3                                          ;
                          08    A3   9F 00097         PUSHAB  OUTSIZE                                     ;
                     0000'      CF   9F 0009A         PUSHAB  FAO_LINE2                                   ;
                64              06   FB 0009E         CALLS   #6, LIB_FAOL                                ;
                7C              50   E9 000A1         BLBC    STATUS, 6$                                  ;
                     0000G      CF   DD 000A4         PUSHL   LIB$GL_KEYSIZE                              ; 1842
                          70    AE   DD 000A8         PUSHL   HEADARY+108                                 ;
                                53   DD 000AB         PUSHL   R3                                          ;
                          08    A3   9F 000AD         PUSHAB  OUTSIZE                                     ;
                     0000'      CF   9F 000B0         PUSHAB  FAO_LINE3                                   ;
                64              05   FB 000B4         CALLS   #5, LIB_FAOL                                ;
                66              50   E9 000B7         BLBC    STATUS, 6$                                  ;
7E          60  AE              01   C3 000BA         SUBL3   #1, HEADARY+96, -(SP)                       ; 1846
7E          6C  AE        70    AE   C3 000BF         SUBL3   HEADARY+108, HEADARY+104, -(SP)             ;
                                53   DD 000C5         PUSHL   R3                                          ;
                          08    A3   9F 000C7         PUSHAB  OUTSIZE                                     ;
                     0000'      CF   9F 000CA         PUSHAB  FAO_LINE4                                   ;
                64              05   FB 000CE         CALLS   #5, LIB_FAOL                                ;
```

```
                  4C            50  E9 000D1          BLBC    STATUS, 6$                                        ;
                          64    AE  DD 000D4          PUSHL   HEADARY+100                                       ; 1849
                          4C    AE  DD 000D7          PUSHL   HEADARY+72                                        ;
                                53  DD 000DA          PUSHL   R3                                                ;
                          08    A3  9F 000DC          PUSHAB  OUTSIZE                                           ;
                        0000'   CF  9F 000DF          PUSHAB  FAO_LINE5                                         ;
                  64            05  FB 000E3          CALLS   #5, LIB_FAOL                                      ;
                  37            50  E9 000E6 3$:      BLBC    STATUS, 6$                                        ;
                          78    AE  DD 000E9          PUSHL   HEADARY+120                                       ; 1852
                          78    AE  DD 000EC          PUSHL   HEADARY+116                                       ;
                                53  DD 000EF          PUSHL   R3                                                ;
                          08    A3  9F 000F1          PUSHAB  OUTSIZE                                           ;
                        0000'   CF  9F 000F4          PUSHAB  FAO_LINE6                                         ;
                  64            05  FB 000F8          CALLS   #5, LIB_FAOL                                      ;
                  22            50  E9 000FB 4$:      BLBC    STATUS, 6$                                        ;
                        008C    C2  D5 000FE          TSTL    140(R2)                                           ; 1854
                                11  13 00102          BEQL    5$                                                ;
                                7E  D4 00104          CLRL    -(SP)                                             ; 1856
                                53  DD 00106          PUSHL   R3                                                ;
                          08    A3  9F 00108          PUSHAB  OUTSIZE                                           ;
                        0000'   CF  9F 0010B          PUSHAB  FAO_LINE7                                         ;
                  64            04  FB 0010F          CALLS   #4, LIB_FAOL                                      ;
                  0B            50  E9 00112          BLBC    STATUS, 6$                                        ;
          0000V   CF            00  FB 00115 5$:      CALLS   #0, OUTPUT_LISTLINE                               ; 1858
                  03            50  E9 0011A          BLBC    STATUS, 6$                                        ;
                  50            01  D0 0011D          MOVL    #1, R0                                            ; 1859
                                    04 00120 6$:      RET                                                       ; 1860

; Routine Size:  289 bytes,    Routine Base:  $CODE$ + 05B4
```

```
;  715          1861  1 ROUTINE list_old_lib =
;  716          1862  2 BEGIN
;  717          1863  2 !
;  718          1864  2 ! This routine lists an old (VMS R1) format library
;  719          1865  2 !
;  720          1866  2 LOCAL
;  721          1867  2     deletedbytes;
;  722          1868  2
;  723          1869  2 BIND
;  724          1870  2     header = .lbr$gl_control [lbr$l_hdrptr] : BBLOCK,
;  725          1871  2     delbytes = header [ohd$l_delbytes] : VECTOR [,WORD],
;  726          1872  2     lastupdate = header [ohd$t_linstim] : VECTOR [,WORD];
;  727          1873  2
;  728          1874  2 lib$gl_type = .header [lhd$b_type];
;  729        P 1875  2 perform (lib_faol (fao_dirnamtyp, outsize, outdesc,
;  730        P 1876  2                 .lib$al_typnames [.lib$gl_type],
;  731          1877  2                 lib$gl_libfdb  [fdb$l_namdesc]));
;  732        P 1878  2 perform (lib_faol (fao_oldcredat, outsize, outdesc,
;  733          1879  2                 ofl$c_libverlng, header [ohd$t_libver]));
;  734        P 1880  2 perform (lib_faol (fao_oldlstupd, outsize, outdesc,
;  735        P 1881  2                 .lastupdate [2], .lib$al_months [.lastupdate [1]-1] , .lastupdate [0],
;  736          1882  2                 .lastupdate [3], .lastupdate [4], .lastupdate [5]));
;  737        P 1883  2 perform (lib_faol (fao_oldmnt, outsize, outdesc,
;  738        P 1884  2                 .header [ohd$w_mntallo],
;  739        P 1885  2                 .header [ohd$w_mntallo] - .header [ohd$w_mntaval],
;  740          1886  2                 .header [ohd$w_mntaval]));
;  741          1887  2 IF .header [ohd$w_gstallo] NEQ 0
;  742        P 1888  2 THEN perform (lib_faol (fao_oldgst, outsize, outdesc,
;  743        P 1889  2                 .header [ohd$w_gstallo],
;  744        P 1890  2                 .header [ohd$w_gstallo] - .header [ohd$w_gstaval],
;  745          1891  2                 .header [ohd$w_gstaval]));
;  746          1892  2 deletedbytes = .delbytes [1] + .delbytes [0]*%X'10000';
;  747        P 1893  2 perform (lib_faol (fao_oldelspc, outsize, outdesc,
;  748          1894  2                 .deletedbytes));
;  749          1895  2 perform (output_listline ());           !Blank line at the end
;  750          1896  2 RETURN true
;  751          1897  1 END;                                    !Of list_old_lib


                                 007C 00000 LIST_OLD_LIB:
                                                  .WORD    Save R2,R3,R4,R5,R6                 ; 1861
          56      0000V   CF   9E 00002           MOVAB    LIB_FAOL, R6                        ;
          55      0000'   CF   9E 00007           MOVAB    OUTDESC, R5                         ;
          50  00000000G   00   D0 0000C           MOVL     LBR$GL_CONTROL, R0                  ; 1870
          53         0A   A0   D0 00013           MOVL     10(R0), R3                          ;
          54         22   A3   9E 00017           MOVAB    34(R3), R4                          ; 1871
          52         06   A3   9E 0001B           MOVAB    6(R3), R2                           ; 1872
     0000G   CF          63   9A 0001F           MOVZBL   (R3), LIB$GL_TYPE                   ; 1874
7E   0000G   CF          10   C1 00024           ADDL3    #16, LIB$GL_LIBFDB, -(SP)           ; 1877
          50      0000G   CF   D0 0002A           MOVL     LIB$GL_TYPE, R0                     ;
               0000GCF40       DD 0002F           PUSHL    LIB$AL_TYPNAMES[R0]                 ;
                          55   DD 00034           PUSHL    R5                                  ;
                  08      A5   9F 00036           PUSHAB   OUTSIZE                             ;
               0000'      CF   9F 00039           PUSHAB   FAO_DIRNAMTYP                       ;
```

```
                66               05  FB 0003D          CALLS   #5, LIB_FAOL
                5F               50  E9 00040          BLBC    STATUS, 1$
                      02         A3  9F 00043          PUSHAB  2(R3)                           1879
                                 04  DD 00046          PUSHL   #4
                                 55  DD 00048          PUSHL   R5
                      08         A5  9F 0004A          PUSHAB  OUTSIZE
                    0000'        CF  9F 0004D          PUSHAB  FAO_OLDCREDAT
                66               05  FB 00051          CALLS   #5, LIB_FAOL
                6E               50  E9 00054          BLBC    STATUS, 2$
                7E         0A    A2  3C 00057          MOVZWL  10(R2), -(SP)                   1882
                7E         08    A2  3C 0005B          MOVZWL  8(R2), -(SP)
                7E         06    A2  3C 0005F          MOVZWL  6(R2), -(SP)
                7E               62  3C 00063          MOVZWL  (R2), -(SP)
                50         02    A2  3C 00066          MOVZWL  2(R2), R0
                      0000GCF40  DD  0006A             PUSHL   LIB$AL_MONTHS-4[R0]
                7E         04    A2  3C 0006F          MOVZWL  4(R2), -(SP)
                                 55  DD 00073          PUSHL   R5
                      08         A5  9F 00075          PUSHAB  OUTSIZE
                    0000'        CF  9F 00078          PUSHAB  FAO_OLDLSTUPD
                66               09  FB 0007C          CALLS   #9, LIB_FAOL
                70               50  E9 0007F          BLBC    STATUS, 4$
                7E         20    A3  3C 00082          MOVZWL  32(R3), -(SP)                   1886
                50         1E    A3  3C 00086          MOVZWL  30(R3), R0
                51         20    A3  3C 0008A          MOVZWL  32(R3), R1
          7E    50               51  C3 0008E          SUBL3   R1, R0, -(SP)
                7E         1E    A3  3C 00092          MOVZWL  30(R3), -(SP)
                                 55  DD 00096          PUSHL   R5
                      08         A5  9F 00098          PUSHAB  OUTSIZE
                    0000'        CF  9F 0009B          PUSHAB  FAO_OLDMNT
                66               06  FB 0009F          CALLS   #6, LIB_FAOL
                4D               50  E9 000A2  1$:       BLBC    STATUS, 4$
                50         16    A3  3C 000A5          MOVZWL  22(R3), R0                      1887
                                 1D  13 000A9          BEQL    3$
                7E         18    A3  3C 000AB          MOVZWL  24(R3), -(SP)                   1891
                51         18    A3  3C 000AF          MOVZWL  24(R3), R1
          7E    50               51  C3 000B3          SUBL3   R1, R0, -(SP)
                                 50  DD 000B7          PUSHL   R0
                                 55  DD 000B9          PUSHL   R5
                      08         A5  9F 000BB          PUSHAB  OUTSIZE
                    0000'        CF  9F 000BE          PUSHAB  FAO_OLDGST
                66               06  FB 000C2          CALLS   #6, LIB_FAOL
                2A               50  E9 000C5  2$:       BLBC    STATUS, 4$
                50               64  3C 000C8  3$:       MOVZWL  (R4), R0                        1892
          50    50               10  78 000CB          ASHL    #16, R0, R0
                51         02    A4  3C 000CF          MOVZWL  2(R4), R1
                50               51  C0 000D3          ADDL2   R1, DELETEDBYTES
                                 50  DD 000D6          PUSHL   DELETEDBYTES                    1894
                                 55  DD 000D8          PUSHL   R5
                      08         A5  9F 000DA          PUSHAB  OUTSIZE
                    0000'        CF  9F 000DD          PUSHAB  FAO_OLDELSPC
                66               04  FB 000E1          CALLS   #4, LIB_FAOL
                0B               50  E9 000E4          BLBC    STATUS, 4$
          0000V CF               00  FB 000E7          CALLS   #0, OUTPUT_LISTLINE             1895
                03               50  E9 000EC          BLBC    STATUS, 4$
                50               01  D0 000EF          MOVL    #1, R0                          1896
                                 04  000F2  4$:       RET                                     1897
```

; Routine Size: 243 bytes,   Routine Base: $CODE$ + 06D5

```
;  753        1898  1 ROUTINE display_globals (keydesc) =
;  754        1899  2 BEGIN
;  755        1900  2 !
;  756        1901  2 ! This routine is called by the library processor for each
;  757        1902  2 ! global symbol name when /NAMES is specified.
;  758        1903  2 !
;  759        1904  2 MA,
;  760        1905  2     keydesc : REF BBLOCK [dsc$c_s_bln];
;  761        1906  2
;  762        1907  2 IF (.outsize + .lib$gl_keysize + 2) GTRU .line_width     !enough line left?
;  763        1908  2 THEN perform (output_listline ());                       !output the line
;  764        1909  2 CH$MOVE (.keydesc [dsc$w_length], .keydesc [dsc$a_pointer], !copy name into buffer
;  765        1910  2                 .outdesc [dsc$a_pointer]);
;  766        1911  2 outdesc [dsc$w_length] = .outdesc [dsc$w_length] -
;  767        1912  2                 .lib$gl_keysize - 2;                          !update descriptor
;  768        1913  2 outdesc [dsc$a_pointer] = .outdesc [dsc$a_pointer] +
;  769        1914  2                 .lib$gl_keysize + 2;
;  770        1915  2 outsize = .outsize + .lib$gl_keysize + 2;                  !and length of line used
;  771        1916  2 globalcount = .globalcount - 1;
;  772        1917  3 RETURN (.globalcount NEQ 0)
;  773        1918  1 END;                                       !Of display_globals


                                  007C 00000 DISPLAY_GLOBALS:
                                                  .WORD   Save R2,R3,R4,R5,R6                    ; 1898
                   56       0000'  CF  9E 00002   MOVAB   OUTSIZE, R6                            ;
      50           66       0000G  CF  C1 00007   ADDL3   LIB$GL_KEYSIZE, OUTSIZE, R0            ; 1907
                   50              02  C0 0000D   ADDL2   #2, R0                                 ;
             D8    A6              50  D1 00010   CMPL    R0, LINE_WIDTH                         ;
                                   08  1B 00014   BLEQU   1$                                     ;
          0000V    CF              00  FB 00016   CALLS   #0, OUTPUT_LISTLINE                    ; 1908
                   39              50  E9 0001B   BLBC    STATUS, 2$                             ;
                   50       04     AC  D0 0001E 1$:  MOVL    KEYDESC, R0                         ; 1909
   FC  B6          04       B0     60  28 00022   MOVC3   (R0), @4(R0), @OUTDESC+4               ; 1910
                   51       0000G  CF  D0 00028   MOVL    LIB$GL_KEYSIZE, R1                     ; 1912
                   50       F8     A6  3C 0002D   MOVZWL  OUTDESC, R0                            ;
                   50              51  C2 00031   SUBL2   R1, R0                                 ;
   F8  A6          50              02  A3 00034   SUBW3   #2, R0, OUTDESC                        ;
       50          51       FC     A6  C1 00039   ADDL3   OUTDESC+4, R1, R0                      ; 1914
             FC    A6       02     A0  9E 0003E   MOVAB   2(R0), OUTDESC+4                       ;
      50           66              51  C1 00043   ADDL3   R1, OUTSIZE, R0                        ; 1915
                   66       02     A0  9E 00047   MOVAB   2(R0), OUTSIZE                         ;
                            DC     A6  D7 0004B   DECL    GLOBALCOUNT                            ; 1916
                                   50  D4 0004E   CLRL    R0                                     ; 1917
                            DC     A6  D5 00050   TSTL    GLOBALCOUNT                            ;
                                   02  13 00053   BEQL    2$                                     ;
                                   50  D6 00055   INCL    R0                                     ;
                                       04 00057 2$:  RET                                         ; 1918

; Routine Size:  88 bytes,    Routine Base:  $CODE$ + 07C8
```

```
  1 ROUTINE listselectdmods =
  2 BEGIN
  2 !
  2 ! Routine to list only selected modules from the library
  2 !
  2 LOCAL
  2     txtrfa : BBLOCK [dsc$c_s_bln],
  2     lnblk : REF BBLOCK,
  2     status,
  2     keydesc : BBLOCK [dsc$c_s_bln];
  2
  2 BUILTIN
  2     REMQUE;
  2
  2 WHILE NOT REMQUE (.lib$gl_modlisl, lnblk)
  3 DO BEGIN
  3     keydesc [dsc$w_length] = .lnblk [lnb$b_namlng];
  3     keydesc [dsc$a_pointer] = lnblk [lnb$t_name];
  3     curmatchdesc = keydesc;
  3     IF NOT CH$FAIL (CH$FIND_CH (.lnblk [lnb$b_namlng], lnblk [lnb$t_name], !If wildcard
  3                                 %ASCII '%'))
  3         OR NOT CH$FAIL (CH$FIND_CH (.lnblk [lnb$b_namlng], lnblk [lnb$t_name],
  3                                 %ASCII '*'))
  4         THEN BEGIN
  4             status = lbr$get_index (lib$gl_libctl, lib$gl_modnamix,     !Then check whole index
  4                         .lis_dispatch [.lib$gl_type], keydesc);
  4             IF .status EQL lbr$_nomtchfou
  4                 THEN SIGNAL (lib$_nomtchfou, 1, keydesc)
  4                 ELSE IF NOT .status
  4                     THEN SIGNAL (lib$_indexerr, 1, lib$gl_libfdb [fdb$l_namdesc],
  4                             .status, .lbr$gl_rmsstv);
  4             END
  4         ELSE BEGIN
P 4             rms_perform (lbr$lookup_key (lib$gl_libctl, keydesc, txtrfa),
P 4                 lib$_lookuperr, .lbr$gl_rmsstv,
  4                 2, keydesc, lib$gl_libfdb [fdb$l_namdesc]);
  4             (.lis_dispatch [.lib$gl_type]) (keydesc, txtrfa);            !List it
  3             END;
  3     lib_free_mem (lnb$c_fixedsize+.lnblk [lnb$b_namlng], .lnblk);
  2     END;
  2 RETURN true
  1 END;


                                003C 00000 LISTSELECTDMODS:
                                                   .WORD   Save R2,R3,R4,R5                 ; 1919
       55 00000000G   00    9E 00002              MOVAB   LBR$GL_RMSSTV, R5                ;
       54 00000000G   00    9E 00009              MOVAB   LIB$SIGNAL, R4                   ;
       5E             10    C2 00010              SUBL2   #16, SP                          ;
       52      0000G  DF    0F 00013 1$:          REMQUE  @LIB$GL_MODLISL, LNBLK           ; 1933
                      03    1C 00018              BVC     2$                               ;
                    00D1    31 0001A              BRW     10$                              ;
       6E        09   A2    9B 0001D 2$:          MOVZBW  9(LNBLK), KEYDESC                ; 1935
  04   AE        0A   A2    9E 00021              MOVAB   10(LNBLK), KEYDESC+4             ; 1936
```

```
                0000'  CF              6E  9E 00026        MOVAB   KEYDESC, CURMATCHDESC          ; 1937
                       50        09    A2  9A 0002B        MOVZBL  9(LNBLK), R0                   ; 1938
   0A    A2            50              25  3A 0002F        LOCC    #37, R0, 10(LNBLK)             ;
                                       02  12 00034        BNEQ    3$                             ;
                                       51  D4 00036        CLRL    R1                             ;
                                       51  D5 00038 3$:    TSTL    R1                             ; 1939
                                       11  12 0003A        BNEQ    5$                             ;
                       50        09    A2  9A 0003C        MOVZBL  9(LNBLK), R0                   ; 1940
   0A    A2            50              2A  3A 00040        LOCC    #42, R0, 10(LNBLK)             ;
                                       02  12 00045        BNEQ    4$                             ;
                                       51  D4 00047        CLRL    R1                             ;
                                       51  D5 00049 4$:    TSTL    R1                             ; 1941
                                       50  13 0004B        BEQL    7$                             ;
                                       5E  DD 0004D 5$:    PUSHL   SP                             ; 1943
                       50      0000G   CF  D0 0004F        MOVL    LIB$GL_TYPE, R0                ; 1944
                               0000'CF40   DD 00054        PUSHL   LIS_DISPATCH[R0]               ;
                               0000G   CF  9F 00059        PUSHAB  LIB$GL_MODNAMIX                ; 1943
                               0000G   CF  9F 0005D        PUSHAB  LIB$GL_LIBCTL                  ;
          00000000G    00              04  FB 00061        CALLS   #4, LBR$GET_INDEX              ;
                       53              50  D0 00068        MOVL    R0, STATUS                     ;
          00000000G    8F              53  D1 0006B        CMPL    STATUS, #LBR$_NOMTCHFOU        ; 1945
                                       0F  12 00072        BNEQ    6$                             ;
                                       5E  DD 00074        PUSHL   SP                             ; 1946
                                       01  DD 00076        PUSHL   #1                             ;
                           00000000G   8F  DD 00078        PUSHL   #LIB$_NOMTCHFOU                ;
                       64              03  FB 0007E        CALLS   #3, LIB$SIGNAL                 ;
                                       5A  11 00081        BRB     9$                             ;
                       57              53  E8 00083 6$:    BLBS    STATUS, 9$                     ; 1947
                                       65  DD 00086        PUSHL   LBR$GL_RMSSTV                  ; 1949
                                       53  DD 00088        PUSHL   STATUS                         ;
         7E     0000G  CF              10  C1 0008A        ADDL3   #16. LIB$GL_LIBFDB, -(SP)      ; 1948
                                       01  DD 00090        PUSHL   #1                             ;
                           00000000G   8F  DD 00092        PUSHL   #LIB$_INDEXERR                 ;
                       64              05  FB 00098        CALLS   #5, LIB$SIGNAL                 ;
                                       40  11 0009B        BRB     9$                             ; 1938
                                 08    AE  9F 0009D 7$:    PUSHAB  TXTRFA                         ; 1954
                                 04    AE  9F 000A0        PUSHAB  KEYDESC                        ;
                               0000G   CF  9F 000A3        PUSHAB  LIB$GL_LIBCTL                  ;
          00000000G    00              03  FB 000A7        CALLS   #3, LBR$LOOKUP_KEY             ;
                       18              50  E8 000AE        BLBS    STATUS, 8$                     ;
                                       65  DD 000B1        PUSHL   LBR$GL_RMSSTV                  ;
                                       50  DD 000B3        PUSHL   STATUS                         ;
         7E     0000G  CF              10  C1 000B5        ADDL3   #16, LIB$GL_LIBFDB, -(SP)      ;
                                 0C    AE  9F 000BB        PUSHAB  KEYDESC                        ;
                                       02  DD 000BE        PUSHL   #2                             ;
                           00000000G   8F  DD 000C0        PUSHL   #LIB$_LOOKUPERR                ;
                       64              06  FB 000C6        CALLS   #6, LIB$SIGNAL                 ;
                       50      0000G   CF  D0 000C9 8$:    MOVL    LIB$GL_TYPE, R0                ; 1955
                       50      0000'CF40   D0 000CE        MOVL    LIS_DISPATCH[R0], R0           ;
                                 08    AE  9F 000D4        PUSHAB  TXTRFA                         ;
                                 04    AE  9F 000D7        PUSHAB  KEYDESC                        ;
                       60              02  FB 000DA        CALLS   #2, (R0)                       ;
                                       52  DD 000DD 9$:    PUSHL   LNBLK                          ; 1957
                       7E        09    A2  9A 000DF        MOVZBL  9(LNBLK), -(SP)                ;
                       6E              0A  C0 000E3        ADDL2   #10, (SP)                      ;
                0000G  CF              02  FB 000E6        CALLS   #2, LIB_FREE_MEM               ;
                                     FF25  31 000EB        BRW     1$                             ; 1933
```

```
                        50          01  D0 000EE 10$:   MOVL    #1, R0                          ; 1959
                                        04 000F1        RET                                     ; 1960

; Routine Size:  242 bytes,    Routine Base:  $CODE$ + 0820
```

```
;  818        1961  1 ROUTINE lib_faol (control_string, out_length, out_desc, param_list) =
;  819        1962  2 BEGIN
;  820        1963  2 !
;  821        1964  2 ! This routine formats an ascii line with error handling
;  822        1965  2 ! It also outputs the line to the listing file
;  823        1966  2 !
;  824      P 1967  2 perform (SYS$FAOL (.control_string, .out_length, .out_desc, param_list),
;  825        1968  2                 lib$_faofail, 0);
;  826        1969  2 perform (output_listline ());
;  827        1970  2 RETURN true
;  828        1971  1 END;                                  !Of lib_faol


                                         0000 00000 LIB_FAOL:
                                                              .WORD   Save nothing                    ; 1961
                               10   AC  9F 00002              PUSHAB  PARAM_LIST                      ; 1968
                    7E         08   AC  7D 00005              MOVQ    OUT_LENGTH, -(SP)               ;
                               04   AC  DD 00009              PUSHL   CONTROL_STRING                  ;
          00000000G 00              04  FB 0000C              CALLS   #4, SYS$FAOL                    ;
                    11              50  E8 00013              BLBS    STATUS, 1$                      ;
                                    50  DD 00016              PUSHL   STATUS                          ;
                                    7E  D4 00018              CLRL    -(SP)                           ;
                          00000000G 8F  DD 0001A              PUSHL   #LIB$_FAOFAIL                   ;
          00000000G 00              03  FB 00020              CALLS   #3, LIB$SIGNAL                  ;
              0000V CF              00  FB 00027 1$:          CALLS   #0, OUTPUT_LISTLINE             ; 1969
                    03              50  E9 0002C              BLBC    STATUS, 2$                      ;
                    50              01  D0 0002F              MOVL    #1, R0                          ; 1970
                                        04 00032 2$:          RET                                     ; 1971

; Routine Size:  51 bytes,    Routine Base:  $CODE$ + 0912
```

```
;  830          1972  1 ROUTINE output_listline =
;  831          1973  2 BEGIN
;  832          1974  2 !
;  833          1975  2 ! output the listing line
;  834          1976  2 !
;  835          1977  2 lib$al_rab [rab$w_rsz] = .outsize;              !Set record size
;  836          1978  2 lib$al_rab [rab$l_rbf] = .outputbuffer;         !and address
;  837          1979  2 !
;  838          1980  2 ! Delete trailing spaces
;  839          1981  2 !
;  840          1982  2 IF .lib$al_rab [rab$w_rsz] NEQ 0
;  841          1983  3 THEN BEGIN
;  842          1984  3     LOCAL
;  843          1985  3         ptr;
;  844          1986  3
;  845          1987  3     ptr = .lib$al_rab [rab$l_rbf] + .lib$al_rab [rab$w_rsz];
;  846          1988  4     WHILE (
;  847          1989  4             ptr = .ptr - 1;
;  848          1990  4             CH$RCHAR (.ptr) EQL %ASCII ' '
;  849          1991  4           )
;  850          1992  3         DO lib$al_rab [rab$w_rsz] = .lib$al_rab [rab$w_rsz] - 1;
;  851          1993  2     END;
;  852        P 1994  2 rms_perform ($PUT (RAB = lib$al_rab),           !write the record
;  853        P 1995  2             lib$_writeerr,
;  854          1996  2             .lib$al_rab [rab$l_stv], 1, lib$gl_lisfdb [fdb$l_namdesc]);
;  855          1997  2 outsize = 0;
;  856          1998  2 outdesc [dsc$w_length] = lib$c_lisreclng;
;  857          1999  2 outdesc [dsc$a_pointer] = .outputbuffer;
;  858          2000  2 CH$FILL (%ASCII ' ', lib$c_lisreclng, .outputbuffer);
;  859          2001  2 RETURN true
;  860          2002  1 END;                                    !Of output_listline


                                                .EXTRN  SYS$PUT

                                    00FC 00000 OUTPUT_LISTLINE:
                                                .WORD   Save R2,R3,R4,R5,R6,R7          ; 1972
                    57      0000'   CF  9E 00002            MOVAB   OUTPUTBUFFER, R7    ;
                    56      0000G   CF  9E 00007            MOVAB   LIB$AL_RAB+34, R6   ;
                    66        FC    A7  B0 0000C            MOVW    OUTSIZE, LIB$AL_RAB+34  ; 1977
                06  A6                67  D0 00010            MOVL    OUTPUTBUFFER, LIB$AL_RAB+40 ; 1978
                    50                66  3C 00014            MOVZWL  LIB$AL_RAB+34, R0   ; 1982
                                      0D  13 00017            BEQL    2$                  ;
                    50        06      A6  C0 00019            ADDL2   LIB$AL_RAB+40, PTR  ; 1987
                    20                70  91 0001D 1$:         CMPB    -(PTR), #32         ; 1990
                                      04  12 00020            BNEQ    2$                  ;
                                      66  B7 00022            DECW    LIB$AL_RAB+34       ; 1992
                                      F7  11 00024            BRB     1$                  ;
                              DE      A6  9F 00026 2$:        PUSHAB  LIB$AL_RAB          ; 1996
                00000000G     00        01  FB 00029            CALLS   #1, SYS$PUT         ;
                              1A        50  E8 00030            BLBS    STATUS, 3$          ;
                              EA      A6  DD 00033            PUSHL   LIB$AL_RAB+12       ;
                                      50  DD 00036            PUSHL   STATUS              ;
              7E      0000G   CF        10  C1 00038            ADDL3   #16, LIB$GL_LISFDB, -(SP)   ;
                                      01  DD 0003F            PUSHL   #1                  ;
                                008610D2  8F  DD 00040        PUSHL   #8786130            ;
```

```
          00000000G  00             05  FB 00046       CALLS   #5, LIB$SIGNAL                          ;
                              FC    A7  D4 0004D 3$:   CLRL    OUTSIZE                                 ; 1997
                   F4     A7  84    8F  9B 00050       MOVZBW  #132, OUTDESC                           ; 1998
                   F8     A7        67  D0 00055       MOVL    OUTPUTBUFFER, OUTDESC+4                 ; 1999
  0084   8F        20     6E        00  2C 00059       MOVC5   #0, (SP), #32, #132, @OUTPUTBUFFER      ; 2000
                              00    B7     00060                                                       ;
                          50        01  D0 00062       MOVL    #1, R0                                  ; 2001
                                        04 00065       RET                                             ; 2002

; Routine Size:  102 bytes,    Routine Base:  $CODE$ + 0945

;  861          2003  1 END                            ! Of module
;  862          2004  0 ELUDOM

                                                       .EXTRN  LIB$SIGNAL

;                            PSECT SUMMARY
;
;       Name                  Bytes                     Attributes
;
;   $OWN$                        48  NOVEC,  WRT,  RD ,NOEXE,NOSHR,  LCL,  REL,  CON,NOPIC,ALIGN(2)
;   $PLIT$                     1992  NOVEC,NOWRT,  RD ,NOEXE,NOSHR,  LCL,  REL,  CON,NOPIC,ALIGN(2)
;   $CODE$                     2475  NOVEC,NOWRT,  RD ,  EXE,NOSHR,  LCL,  REL,  CON,NOPIC,ALIGN(2)


;                         Library Statistics
;
;                                         -------- Symbols --------      Pages      Processing
;       File                              Total    Loaded   Percent      Mapped     Time
;
;   _$255$DUA28:[SYSLIB]STARLET.L32;1      9776       51        0         581        00:01.0



;                             COMMAND QUALIFIERS

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

; Size:          2475 code + 2040 data bytes
; Run Time:         00:54.1
; Elapsed Time:     01:35.9
; Lines/CPU Min:     2221
; Lexemes/CPU-Min: 31338
; Memory Used:  336 pages
; Compilation Complete
```