```
PPPPPPPPPPPP        AAAAAAAAA     TTTTTTTTTTTTTTT     CCCCCCCCCCC   HHH         HHH
PPPPPPPPPPPP        AAAAAAAAA     TTTTTTTTTTTTTTT     CCCCCCCCCCC   HHH         HHH
PPPPPPPPPPPP        AAAAAAAAA     TTTTTTTTTTTTTTT     CCCCCCCCCCC   HHH         HHH
PPP         PPP  AAA         AAA        TTT        CCC              HHH         HHH
PPP         PPP  AAA         AAA        TTT        CCC              HHH         HHH
PPP         PPP  AAA         AAA        TTT        CCC              HHH         HHH
PPP         PPP  AAA         AAA        TTT        CCC              HHH         HHH
PPP         PPP  AAA         AAA        TTT        CCC              HHH         HHH
PPP         PPP  AAA         AAA        TTT        CCC              HHH         HHH
PPPPPPPPPPPP     AAA         AAA        TTT        CCC              HHHHHHHHHHHHHHH
PPPPPPPPPPPP     AAA         AAA        TTT        CCC              HHHHHHHHHHHHHHH
PPPPPPPPPPPP     AAA         AAA        TTT        CCC              HHHHHHHHHHHHHHH
PPP              AAAAAAAAAAAAAAA        TTT        CCC              HHH         HHH
PPP              AAAAAAAAAAAAAAA        TTT        CCC              HHH         HHH
PPP              AAAAAAAAAAAAAAA        TTT        CCC              HHH         HHH
PPP              AAA         AAA        TTT        CCC              HHH         HHH
PPP              AAA         AAA        TTT        CCC              HHH         HHH
PPP              AAA         AAA        TTT        CCC              HHH         HHH
PPP              AAA         AAA        TTT           CCCCCCCCCCC   HHH         HHH
PPP              AAA         AAA        TTT           CCCCCCCCCCC   HHH         HHH
PPP              AAA         AAA        TTT           CCCCCCCCCCC   HHH         HHH
```

```
**FILE**ID**PATINT                                   E 15



PPPPPPPP      AAAAAA    TTTTTTTTTT    IIIIII    NN      NN  TTTTTTTTTT
PPPPPPPP      AAAAAA    TTTTTTTTTT    IIIIII    NN      NN  TTTTTTTTTT
PP      PP  AA      AA      TT          II      NN      NN      TT
PP      PP  AA      AA      TT          II      NN      NN      TT
PP      PP  AA      AA      TT          II      NNNN    NN      TT
PP      PP  AA      AA      TT          II      NNNN    NN      TT
PPPPPPPP    AA      AA      TT          II      NN  NN  NN      TT
PPPPPPPP    AA      AA      TT          II      NN  NN  NN      TT
PP          AAAAAAAAAA      TT          II      NN    NNNN      TT
PP          AAAAAAAAAA      TT          II      NN    NNNN      TT
PP          AA      AA      TT          II      NN      NN      TT          ....
PP          AA      AA      TT          II      NN      NN      TT          ....
PP          AA      AA      TT        IIIIII    NN      NN      TT          ....
PP          AA      AA      TT        IIIIII    NN      NN      TT          ....

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
```

PAT
V04

```
  0 MODULE PATINT (                                                         ! RST interface routines for PATCH
L 0                   %IF %VARIANT EQL 1
  0                   %THEN
  0                           ADDRESSING_MODE (EXTERNAL = LONG_RELATIVE, NONEXTERNAL = LONG_RELATIVE),
  0                   %FI
  0                   IDENT = 'V04-000'
  0                   ) =
  1 BEGIN
  1
  1 !
  1 !****************************************************************************
  1 !*                                                                          *
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  1 !*                                                                          *
  1 !****************************************************************************
  1 !
  1
  1 !++
  1 ! FACILITY:       PATCH
  1 !
  1 ! ABSTRACT:       This is  the RST/DST/PATCH interface module.
  1 !                  This module exists because the DST/RST
  1 !                  module simply declares how it wants to see
  1 !                  the world, and leaves it up to this module
  1 !                  to interface to PATCH to make things look
  1 !                  that way.
  1 !
  1 !         This module defines the interface between the
  1 !         PATCH RST builder/manipulator and the LINKER-produced
  1 !         DST.  The former would like to show as little
  1 !         concern for where DST records are actually stored as
  1 !         possible.  The latter would like to provide this facility,
  1 !         but it must do so simply, (because we don't want to
  1 !         re-invent the world), efficiently, and in such
  1 !         as way as to allow us to do radically different
  1 !         things about where the DST actually exists.
  1 !
  1 !         Essentially what we do to solve this is to restrict the
  1 !         DST user to requesting records before he uses them,
  1 !         (probably) saying something about how long he wants
```

```
1 !             to use them (or, equivalently, when he is willing to give
1 !             them up), and using them given that they exist at the
1 !             address he is told they are currently at.  This means that
1 !             he can never make any assumptions about where a record is at.
1 !             To get around this we introduce the concept of "Record Ids",
1 !             which are simply identifiers by which the two sides of the
1 !             interface agree to call records.  The first time you
1 !             get a record, the interface tells you how you must
1 !             henceforth refer to it.
1 !
1 !             The other aspect of the interface concerns so-called
1 !             RST-pointers.  These pointers are used throught the
1 !             RST module to access various (all) records.  The code
1 !             uses these pointers implicitly, knowing nothing
1 !             about what they actually are, and leaves it up to this
1 !             interface to define them.  This is done by
1 !             having a special storage allocator for the RST
1 !             module.  It uses whatever kind of pointer this
1 !             allocator returns, and leaves it up to
1 !             the definition of the RST structures (RST_NT,
1 !             RST_MC, etc.  see PATRST.REQ) to make
1 !             sure that these RST-pointers do the job.
1 !
1 !
1 ! ENVIRONMENT:  This module runs on VAX under STARLET, user mode, non-AST level.
1 !
1 ! AUTHOR:       Kevin Pammett, CREATION DATE: 12 JULY 77
1 !
1 ! MODIFIED BY:
1 !
1 !     V03-005 MCN0157         Maria del C. Nasr       20-Mar-1984
1 !             Remove any references to OLDRAB since it is not used.
1 !
1 !     V03-004 MCN0151         Maria del C. Nasr       13-Feb-1984
1 !             Add qualifier VOLATILE to local variable GL_SYM_COUNT to
1 !             informational messages from the compiler.
1 !
1 !     V03-003 MTR0017         Mike Rhodes             15-Nov-1982
1 !             Correct the 'next entry point' address computations for
1 !             GSD$C_EPM and GSD$C_PRO type symbol definitions in routine
1 !             PAT$GET_NXT_GST.
1 !
1 !     V03-002 MTR0012         Mike Rhodes             16-Aug-1982
1 !             Modify file names to remove duplicate file name useage
1 !             between code and require files.
1 !
1 !     V03-001 MTR0007         Mike Rhodes             14-Jun-1982
1 !             Use shared system messages.  Affected modules include:
1 !             DYNMEM.B32, PATBAS.B32, PATCMD.B32, PATIHD.B32, PATINT.B32,
1 !             PATIO.B32, PATMAI.B32, PATMSG.MSG, PATWRT.B32, and PATSPA.B32.
1 !
1 !             The shared messages are defined by DYNMEM.B32's invocation of
1 !             SHRMSG.REQ and we simply link against these symbols.  They are
1 !             declared as external literals below.
1 !
1 !     V02-017 MTR0002         Mike Rhodes             30-Nov-1981
1 !             Modify routine PAT$GET_NXT_GST to skip global symbol
```

```
1 !                  definitions for PSECT definition in shareable images.
1 !
1 !          V02-016 MTR0001          Mike Rhodes                 14-Oct-1981
1 !                  Modify routine PAT$FIND_DST to allow the create and map
1 !                  section system service to do expand region calls, instead
1 !                  of trying to remember the last mapped address in P0 space.
1 !                  The last mapped address array is updated within the calls.
1 !
1 !          V02-015 PCG0001          Peter George                02-FEB-1981
1 !                  Add require statement for LIB$:PATDEF.REQ
1 !
1 !   NO     DATE                 PROGRAMMER                 PURPOSE
1 !   --     ----                 ----------                 -------
1 !
1 !   00     13-DEC-77            K.D. MORSE                 ADAPT VERSION 19 FOR PATCH.
1 !   01     2-JAN-78             K.D. MORSE                 ALLOW NO GST IN IMAGE.
1 !   02     23-JAN-78            K.D. MORSE                 ADD CODE FOR MORE SPECIFIC
1 !                                                        ERROR MESSAGES. (20)
1 !   03     28-FEB-78            K.D. MORSE                 SAVE_SCOPE NOW DOES A SET
1 !                                                        MODULE ON THE SCOPE'S MODULE.
1 !   04     06-APR-78            K.D. MORSE                 PAT$FIND_DST now maps the GST
1 !                                                        instead of reading it.(22)  Added
1 !                                                        routine POSITION_GST to chain
1 !                                                        through the mapped GST.  Also
1 !                                                        the logic in DBG$GET_NXT_GST
1 !                                                        now calls POSITION_GST. (23)
1 !                                                        Bug fix in FIND_DST to skip the
1 !                                                        first 2 GST records OK. (24)
1 !                                                        Bug fix in POSITION_GST - round
1 !                                                        up a record byte count. (24)
1 !                                                        GSR_NEXT_ADDR is now a REF VECTOR[,byte]. (24)
1 !                                                        Added code to BUILD_PATH to check
1 !                                                        for DEFine symbols before
1 !                                                        consulting the RST.  BUILD_PATH
1 !                                                        has the final word on whether
1 !                                                        a symbol has a value or not. (25)
1 !                                                        None for vers 26.
1 !   05     25-APR-78            K.D. MORSE                 CONVERT TO NATIVE COMPILER.
1 !   06     17-MAY-78            K.D. MORSE                 ERROR MESSGES FROM GST/DST INIT.
1 !                                                        ARE NOW INFOR SEVERITY. (27)
1 !                                                        POSITION_GST CHECKS FOR NO GST (27).
1 !                                                        NO CHANGES FOR VERS 28.
1 !                                                        DELETE_PATH IS GLOBAL AND HAS NO
1 !                                                        FORMAL INPUT AND ALWAYS ZEROS
1 !                                                        THE PATH_VEC_PTR. (29)
1 !                                                        BETTER ERROR MSG IN SAVE_SCOPE (30).
1 !   07     18-MAY-78            K.D. MORSE                 CANCEL THE SCOPE IF THE MODULE
1 !                                                        IT POINTS TO IS CANCELLED. (31)
1 !                                                        POSITION_GST NOW SEES GST AS 3
1 !                                                        RECORDS LESS THAN HEADER SAYS
1 !                                                        NOT 2. (32)
1 !                                                        NOTE THE "ROUND UP" IN GET_NXT_GST
1 !                                                        TO RECOGNIZE END OF GST RECORD. (32)
1 !                                                        NO CHANGES FOR VERS 33.
1 !   08     24-MAY-78            K.D. MORSE                 ADD GSD TYPE 3 - PROCEDURE
1 !                                                        DEFINITION WITH FORMAL ARGUMENT
1 !                                                        DESCRIPTIONS.
```

```
;    1 !  09   25-MAY-78        K.D. MORSE                   ADD SIGNAL FLAG PARAMETER TO
;    1 !                                                     PAT$BUILD_PATH FOR FORWARD
;    1 !                                                     REFERENCED SYMBOLS.
;    1 !  10   13-JUN-78        K.D. MORSE                   ADD FAO COUNT TO SIGNALS.
;    1 !  11   20-JUN-78        K.D. MORSE                   NO CHANGES FOR VERS 34-36.
;    1 !  12   28-JUN-78        K.D. MORSE                   NO CHANGES FOR 37-38.
;    1 !                                                     PAT$FIND_MODULE HAS NEW ARG
;    1 !                                                     INDICATING WHETHER OR NOT TO
;    1 !                                                     SIGNAL IF MODULE IS NOT FOUND (39).
;    1 !  13   29-JUN-78        K.D. MORSE                   NO CHANGES FOR VERS 40.
;    1 !  14   07-JUL-78        K.D. MORSE                   NO CHANGES FOR VERS 41.
;    1 !
;    1 !--
;  186      0185  1 !
;  187      0186  1 ! TABLE OF CONTENTS:
;  188      0187  1 !
;  189      0188  1
;  190      0189  1 FORWARD ROUTINE
;  191      0190  1         PAT$SAVE_SCOPE,                             ! Store away the current scope position
;  192      0191  1                                                     ! (CSP) vector.
;  193      0192  1         PAT$BUILD_PATH,                             ! Collect symbol pathnames and eventually
;  194      0193  1                                                     !  try to evaluate them.
;  195      0194  1         PAT$DELETE_PATH : NOVALUE,                  ! Throw away a pathvector.
;  196      0195  1         PAT$FIND_MODULE,                            ! Scan MC for a given module name.
;  197      0196  1         PAT$RST_FREEZ,                              ! Storage allocator for anything which
;  198      0197  1                                                     !  which is accessed via RST-pointers.
;  199      0198  1         PAT$RST_RELEASE : NOVALUE,                  ! Storage deallocator for anything which
;  200      0199  1                                                     !  which is allocated by PAT$RST_FREEZ.
;  201      0200  1         PAT$FIND_DST : NOVALUE,                     ! Find the DST and make it available.
;  202      0201  1         PAT$GET_DST_REC,                            ! Make a certain DST record available.
;  203      0202  1         PAT$POSITON_DST,                            ! Make a certain DST record available
;  204      0203  1                                                     ! and set up for PAT$GET_NXT_DST
;  205      0204  1         POSITION_GST,                               ! Make a certain GST record available
;  206      0205  1         PAT$GET_NXT_DST,                            ! Make the next DST record available.
;  207      0206  1         PAT$GET_NXT_GST;                            ! Make the next GST record available
;  208      0207  1
;  209      0208  1
;  210      0209  1 !
;  211      0210  1 ! INCLUDE FILES:
;  212      0211  1 !
;  213      0212  1
;  214      0213  1 LIBRARY 'SYS$LIBRARY:LIB.L32';
;  215      0214  1 REQUIRE 'SRC$:PATPCT.REQ';
;  216      0254  1 REQUIRE 'LIB$:PATDEF.REQ';                 ! Defines literals
;  217      0308  1 REQUIRE 'LIB$:PATMSG.REQ';
;  218      0482  1 REQUIRE 'SRC$:IMGDEF.REQ';
;  219      0549  1 REQUIRE 'SRC$:PATGEN.REQ';
;  220      0771  1 REQUIRE 'SRC$:BSTRUC.REQ';
;  221      0847  1 REQUIRE 'SRC$:LISTEL.REQ';
;  222      0889  1 REQUIRE 'SRC$:DLLNAM.REQ';
;  223      0947  1 REQUIRE 'SRC$:PATRTS.REQ';
;  224      2043  1 REQUIRE 'SRC$:VXSMAC.REQ';
;  225      2108  1 REQUIRE 'SRC$:SYSSER.REQ';
```

```
SWITCHES LIST (SOURCE);

EXTERNAL ROUTINE
        PAT$fao_out;            ! formats a line and outputs to the terminal
```

```
1 REQUIRE 'SRC$:SYSLIT.REQ';
1 REQUIRE 'SRC$:PREFIX.REQ';
1 REQUIRE 'SRC$:PATPRE.REQ';
1
1 !
1 ! MACROS:
1 !
1
1 !
1 ! EQUATED SYMBOLS:
1 !
1 !
1 ! OWN STORAGE:
1 !
1
1 OWN
1         PATH_VEC_PTR : REF PATHNAME_VECTOR INITIAL( 0 ),         ! Pointer to the pathname vector we are
1                                                                  ! currently building.  If 0, no such vector
1                                                                  ! is under construction.
1         DST_BEGIN_ADDR,                                          ! virtual address where DST begins.
1                                                                  ! 0 => no DST.  Initially we do not
1                                                                  ! want to assume this.
1         DST_END_ADDR,                                            ! Virtual address of last byte in DST.
1         DST_NEXT_ADDR,                                           ! Virtual address where 'next' DST record be
1
1         !++
1         ! Now GST symbols corresponding to the above DST symbols.
1         !--
1         GSR_BEGIN_ADDR,                                          ! Virtual address where GST begins (0=no GST
1         GSR_NEXT_ADDR : REF VECTOR[,WORD],                       ! Virtual address where 'next' GST record be
1         GST_BEGIN_ADDR : REF GST_RECORD,                         ! Virtual address of current GST record (use
1         GSD_REC_COUNT;                                           ! Count-down of GSD records.
1
1 !
1 ! EXTERNAL REFERENCES:
1 !
1 EXTERNAL ROUTINE
1         PAT$PV_TO_CS,                                            ! Encode pathname vectors for printing.
1         PAT$FIND_SYM,                                            ! Lookup DEFine symbols
1         PAT$SET_MODULE : NOVALUE,                                ! Adds module to the RST
1         PAT$SYM_TO_VAL,                                          ! Correspong pathnames and values.
1         PAT$SYM_TO_VALU,                                         ! Sym_to_val + goodies.
1         PAT$INIT_RST : NOVALUE,                                  ! Build all RST data structures.
1         PAT$FREEZ,                                               ! Standard PATCH storage allocator.
1         PAT$FREERELEASE : NOVALUE,                               ! Standard PATCH storage deallocator.
1         LIB$_CREMAPSEC;                                          ! Creates and maps a global section
1
1 EXTERNAL
1         PAT$GB_SYMBOLS,                                          ! Indicator if image contains symbols
1         PAT$GL_IMGHDR : REF BLOCK[,BYTE],                        ! Pointer to image header
1         PAT$GL_OLDNBK : BLOCK[,BYTE],                            ! Name block for input image file
1         PAT$GB_OLDNAME,                                          ! Ascii name of input image file
1         PAT$GL_ISVADDR : VECTOR[,LONG],                          ! Last pair of virtual addresses used
1         PAT$GL_CSP_PTR : REF PATHNAME_VECTOR,                    ! The Current Scope Position (CSP)
1                                                                  ! is defined by a pointer to the
1                                                                  ! pathname vector which is the CSP.
1         PAT$GL_MC_PTR : REF MC_RECORD,                           ! The module chain
```

```
;   1           PAT$GL_RST_BEGN,                        ! Address of start of RST
;   1           PAT$GL_HEAD_LST,                        ! Head of PATCH argument list
;   1           PAT$GL_SYMTBPTR,                        ! Pointer to current symbol table
;   1           PAT$GL_SYMHEAD;                         ! Pointer to user-defined symbol table listh
;   1
;   1   EXTERNAL LITERAL
;   1   !
;   1   ! Define shared message references.  (resolved @ link time)
;   1   !
;   1           PAT$_CLOSEIN,                           ! Error closing input file.
;   1           PAT$_CLOSEOUT,                          ! Error closing output file.
;   1           PAT$_OPENIN,                            ! Error opening input file.
;   1           PAT$_OPENOUT,                           ! Error opening output file.
;   1           PAT$_READERR,                           ! Error reading from file.
;   1           PAT$_SYSERROR,                          ! System Service error.
;   1           PAT$_WRITEERR;                          ! Error writing to file.
;   1
;   1
```

```
1 GLOBAL ROUTINE PAT$BUILD_PATH( SYMBOL_DESC, PASS_BACK_VALUE, SIGNAL_FLAG ) =
1
1 !++
1 ! Functional Description:
1 !
1 !     This routine serves two fairly distinct purposes.
1 !
1 ! 1. If SYMBOL_DESC is a valid string descriptor, (ie not = 0),
1 !     then the call was made to BUILD_PATH so that it could
1 !     accumulate the elements of a pathname in order to
1 !     build up a pathname vector.
1 !
1 ! 2. Otherwise, the 0 SYMBOL_DESC is a flag which signals that
1 !     no more elements are to come and what we have accumulated
1 !     is supposedly a complete pathname.  What we are to do then
1 !     is to simply look up this pathname in the RST data base and
1 !     return the corresponding value via the PASS_BACK_VALUE pointer.
1 !
1 !         When a lookup is done, the following priority is observed:
1 !
1 !         1) a pathname consisting of 1 element may first be:
1 !                 1) a permanent symbol name (e.g. "R0")
1 !                 2) a DEFine symbol
1 !         2) if 1), above, is not the case, or if the pathname
1 !             is longer than 1 element, then the symbol must
1 !             be found in the RST or an error occurs.
1 !
1 ! Calling Sequence:
1 !
1 !         PAT$BUILD_PATH ( SYMBOL_DESC, PASS_BACK_VALUE, SIGNAL_FLAG)
1 !
1 ! Inputs:
1 !
1 !         SYMBOL_DESC      - String descriptor for next peice of pathname or
1 !                            zero indicating accumulated pathname is to be
1 !                            evaluated.
1 !         PASS_BACK_VALUE - Address of where to return the symbol's value
1 !         SIGNAL_FLAG      - Flag indicating whether to signal error message
1 !                            if symbol is undefined. (TRUE=yes, FALSE=no)
1 !
1 ! Implicit Inputs:
1 !
1 !         This routine works from the OWN that is local to this
1 !         module, PATH_VEC_PTR, which points to the current pathname vector
1 !         we are building.  The reason why this is not local to BUILD_PATH
1 !         is so that it can be shared by SAVE_SCOPE.
1 !
1 ! Return Value:
1 !
1 !         On pathname accumulation, we return TRUE unless some error
1 !         like PATCH running out of free storage occurs; then an error is SIGNALed.
1 !
1 !         On symbol evaluation, we return TRUE if the symbol was found
1 !         in the image symbol tables and PAT$K_USER_DEF if the symbol was found
1 !         in the user-defined symbol table.  If the symbol is undefined,
1 !         then depending upon SIGNAL_FLAG either an error message is SIGNALed
1 !         and an UNWIND is done, or PAT$BUILD_PATH returns FALSE.  This is to
```

```
1 !       handle forward references inside symbolic instructions.
1 !--
1
2 BEGIN
2
2 MAP
2         SYMBOL_DESC : REF BLOCK[,BYTE],                                 ! This describes the element of the
2                                                                         ! pathname which we are to add on
2                                                                         ! to our list.
2         PASS_BACK_VALUE : REF VECTOR[,LONG];                            ! This is where we are to pass back
2                                                                         ! the pathname value to.
2
2 OWN
2         PV_INDEX;                                                       ! We use an OWN index into the OWN
2                                                                         ! pathname vector so that on each call
2                                                                         ! we know where we're at.
2
2 LOCAL
2         CS_PTR : CS_POINTER,                                            ! Temp counted string pointer.
2         STATUS;                                                         ! Success/failure indication that we return.
2
2 !++
2 ! Now see whether a pathname translation to symbolic value
2 ! is to occur. This is signaled by the flag SYMBOL_DESC being
2 ! equal to 0.
2 !--
3 IF (.SYMBOL_DESC EQL 0)
2 THEN
3         BEGIN
3         !++
3         ! Evaluate the symbol.  First, for single-element pathnames we give
3         ! priority to the so-called PATCH permanent symbols, and to the symbols
3         ! DEFined by the user at PATCH-time.  No longer pathname could be such
3         ! a thing.
3         !--
3         STATUS = 0;
4         IF (.PATH_VEC_PTR[1] EQL 0)
3         THEN
4                 BEGIN
4                 LOCAL
4                         TEMP_SYM_TBL,
4                         DEF_SYM_DESC : BLOCK[8,BYTE];
4
4                 !++
4                 ! A 1-element pathname may be or a DEFine symbol.  First build
4                 ! a string descriptor for the name (since this is what
4                 ! PAT$FIND_SYM wants).
4                 !--
4                 CS_PTR = .PATH_VEC_PTR[0];
4                 DEF_SYM_DESC[DSC$W_LENGTH] = .CS_PTR[0];
4                 DEF_SYM_DESC[DSC$A_POINTER] = CS_PTR[1];
4
4                 !++
4                 ! The symbol is not a permanent one.  Now lookup it up in the
4                 ! linked list reserved for DEFine symbols.
4                 !--
4                 TEMP_SYM_TBL = .PAT$GL_SYMTBPTR;                        ! Remember curren symbol table
```

```
4                 PAT$GL_SYMTBPTR = .PAT$GL_SYMHEAD;                  ! Use user-defined symbol table
4                 STATUS = PAT$FIND_SYM(DEF_SYM_DESC);
4                 PAT$GL_SYMTBPTR = .TEMP_SYM_TBL;                    ! Restore current symbol table
4
4                 !++
4                 ! If we found something, pass back the associated value
4                 ! and set STATUS to the appropriate success code.
4                 !--
5                 IF (.STATUS NEQ 0)
4                 THEN
5                         BEGIN
5                         PASS_BACK_VALUE[0] = .SYM_VALUE(.STATUS);
5                         STATUS = PAT$K_USER_DEF;
4                         END;
3                 END;
3
3         !++
3         ! Now, if we didn't get something from the DEFine
3         ! or permanent symbol data bases, try the RST.
3         !--
4         IF (NOT .STATUS)
3         THEN
3                 STATUS = PAT$SYM_TO_VAL( .PATH_VEC_PTR, .PASS_BACK_VALUE);
3
3         !++
3         ! If no translation can be found, Check whether to SIGNAL an error
3         ! and cause an UNWIND or return FALSE.
3         !--
4         IF (NOT .STATUS)
3         THEN
4                 BEGIN
4                 LOCAL MESSAGE_BUF : VECTOR[TTY_OUT_WIDTH,BYTE];
4
4                 !++
4                 ! Encode the pathname into a counted
4                 ! string, and output the associated message.
4                 !--
4                 PAT$PV_TO_CS( .PATH_VEC_PTR, MESSAGE_BUF );
4                 PAT$DELETE_PATH();
4                 PATH_VEC_PTR = 0;
4
4                 !++
4                 ! Check if this might be a forward reference and therefore
4                 ! should not be signaled as an error.
4                 !--
5                 IF (NOT .SIGNAL_FLAG)
4                 THEN
5                         RETURN(FALSE)
4                 ELSE
4                         SIGNAL(PAT$_NOSYMBOL, 1, MESSAGE_BUF ); ! no return
3                 END;
3
3         !++
3         ! If the evaluation succeeded, discard the pathname vector and
3         ! return success.
3         !--
3         PAT$DELETE_PATH();
```

```
;  473          2834  3             RETURN(.STATUS);
;  474          2835  2             END;
;  475          2836  2
;  476          2837  2 !++
;  477          2838  2 ! A real string descriptor is supposed to pass on to us another pathname
;  478          2839  2 ! element to accumulate.
;  479          2840  2 !
;  480          2841  2 ! If this is the first call for a new pathname, we must allocate the storage
;  481          2842  2 ! we will need for the vector of pointers to the element strings.
;  482          2843  2 !--
;  483          2844  3 IF (.PATH_VEC_PTR EQL 0)
;  484          2845  2 THEN
;  485          2846  3         BEGIN
;  486          2847  4         IF ((PATH_VEC_PTR = PAT$freez(RST_UNITS(%SIZE(PATHNAME_VECTOR)))) EQL 0)
;  487          2848  3         THEN
;  488          2849  3                 SIGNAL(PAT$_NOFREE);                            ! No more storage.
;  489          2850  3
;  490          2851  3         !++
;  491          2852  3         ! The storage manager zeros out the pathname vector for us, so we only
;  492          2853  3         ! have to set up the right pathname vector index.
;  493          2854  3         !--
;  494          2855  3         PV_INDEX = 0;
;  495          2856  2         END;
;  496          2857  2
;  497          2858  2 !++
;  498          2859  2 ! Now we need space for the element name itself, (including the count! ).
;  499          2860  2 !--
;  500          2861  3 IF ((CS_PTR = PAT$freez(RST_UNITS(.SYMBOL_DESC[DSC$W_LENGTH]+1))) EQL 0)
;  501          2862  2 THEN
;  502          2863  2         SIGNAL(PAT$_NOFREE);                                    ! No more storage.
;  503          2864  2
;  504          2865  2 !++
;  505          2866  2 ! Copy the string into the allocated storage. Note that we must make up a counted
;  506          2867  2 ! string because this is what pathname vector pointers are defined to point to.
;  507          2868  2 !--
;  508          2869  2 CS_PTR[0] = .SYMBOL_DESC[DSC$W_LENGTH];
;  509          2870  2 CH$MOVE( .SYMBOL_DESC[DSC$W_LENGTH], .SYMBOL_DESC[DSC$A_POINTER], CS_PTR[1] );
;  510          2871  2
;  511          2872  2 !++
;  512          2873  2 ! Now store the address of this counted string in  the 'next' slot in the
;  513          2874  2 ! pathname vector.
;  514          2875  2 !--
;  515          2876  2 PATH_VEC_PTR[.PV_INDEX] = .CS_PTR;
;  516          2877  2
;  517          2878  2 !++
;  518          2879  2 ! And set up so that the next call to this routine stores the CS pointer into the
;  519          2880  2 ! next slot.
;  520          2881  2 !--
;  521          2882  3 IF ((PV_INDEX = .PV_INDEX +1) GTR MAX_PATH_SIZE)
;  522          2883  2 THEN
;  523          2884  3         BEGIN
;  524          2885  3         SIGNAL (PAT$_PATHTLONG);
;  525          2886  3         RETURN(FALSE);
;  526          2887  2         END;
;  527          2888  2 RETURN(TRUE);
;  528          2889  1 END;
```

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

                                                .PSECT  _PAT$OWN,NOEXE,2

                      00000000  00000 PATH_VEC_PTR:
                                                .LONG   0                                                   ;
                                00004 DST_BEGIN_ADDR:
                                                .BLKB   4
                                00008 DST_END_ADDR:
                                                .BLKB   4
                                0000C DST_NEXT_ADDR:
                                                .BLKB   4
                                00010 GSR_BEGIN_ADDR:
                                                .BLKB   4
                                00014 GSR_NEXT_ADDR:
                                                .BLKB   4
                                00018 GST_BEGIN_ADDR:
                                                .BLKB   4
                                0001C GSD_REC_COUNT:
                                                .BLKB   4
                                00020 PV_INDEX:
                                                .BLKB   4

                                      ISE$C_SIZE==        20
                                      TXT$C_SIZE==        4
                                      PAL$C_SIZE==        16
                                      ASD$C_SIZE==        9
                                      FWR$C_SIZE==        24
                                                .EXTRN  PAT$FAO_OUT, PAT$PV_TO_CS
                                                .EXTRN  PAT$FIND_SYM, PAT$SET_MODULE
                                                .EXTRN  PAT$SYM_TO_VAL, PAT$SYM_TO_VALU
                                                .EXTRN  PAT$INIT_RST, PAT$FREEZ
                                                .EXTRN  PAT$FREERELEASE
                                                .EXTRN  LIB$_CREMAPSEC, PAT$GB_SYMBOLS
                                                .EXTRN  PAT$GL_IMGHDR, PAT$GL_OLDNBK
                                                .EXTRN  PAT$GB_OLDNAME, PAT$GL_ISVADDR
                                                .EXTRN  PAT$GL_CSP_PTR, PAT$GL_MC_PTR
                                                .EXTRN  PAT$GL_RST_BEGN
                                                .EXTRN  PAT$GL_HEAD_LST
                                                .EXTRN  PAT$GL_SYMTBPTR
                                                .EXTRN  PAT$GL_SYMHEAD, PAT$_CLOSEIN
                                                .EXTRN  PAT$_CLOSEOUT, PAT$_OPENIN
                                                .EXTRN  PAT$_OPENOUT, PAT$_READERR
                                                .EXTRN  PAT$_SYSERROR, PAT$_WRITEERR
                                                .WEAK   ACCESS_CHECK

                                                .PSECT  _PAT$CODE,NOWRT,2

                     0FFC 00000                 .ENTRY  PAT$BUILD_PATH, Save R2,R3,R4,R5,R6,R7,R8,-  ; 2663
                                                        R9,R10,R11                                    ;
 5B 00000000G   EF   9E 00002                   MOVAB   PAT$FREEZ, R11                                ;
 5A 00000000V   EF   9E 00009                   MOVAB   PAT$DELETE_PATH, R10                          ;
 59 00000000G   EF   9E 00010                   MOVAB   PAT$GL_SYMTBPTR, R9                           ;
 58 00000000G   00   9E 00017                   MOVAB   LIB$SIGNAL, R8                                ;
 57 00000000'   EF   9E 0001E                   MOVAB   PATH_VEC_PTR, R7                              ;
```

```
                     5E       FF7C  CE  9E 00025            MOVAB   -132(SP), SP                                   ;
                     52         04  AC  D0 0002A            MOVL    SYMBOL_DESC, R2                                ; 2746
                                79  12 0002E                BNEQ    3$                                             ;
                                54  D4 00030                CLRL    STATUS                                         ; 2755
                     50         67  D0 00032                MOVL    PATH_VEC_PTR, R0                               ; 2756
                          04    A0  D5 00035                TSTL    4(R0)                                          ;
                                32  12 00038                BNEQ    1$                                             ;
                     56         60  D0 0003A                MOVL    (R0), CS_PTR                                   ; 2768
                  7C AE         66  9B 0003D                MOVZBW  (CS_PTR), DEF_SYM_DESC                         ; 2769
                  FC AD   01    A6  9E 00041                MOVAB   1(R6), DEF_SYM_DESC+4                          ; 2770
                     53         69  D0 00046                MOVL    PAT$GL_SYMTBPTR, TEMP_SYM_TBL                  ; 2776
                     69 00000000G   EF  D0 00049            MOVL    PAT$GL_SYMHEAD, PAT$GL_SYMTBPTR                ; 2777
                          7C    AE  9F 00050                PUSHAB  DEF_SYM_DESC                                   ; 2778
             00000000G EF       01  FB 00053                CALLS   #1, PAT$FIND_SYM                               ;
                     54         50  D0 0005A                MOVL    R0, STATUS                                     ;
                     69         53  D0 0005D                MOVL    TEMP_SYM_TBL, PAT$GL_SYMTBPTR                  ; 2779
                                54  D5 00060                TSTL    STATUS                                         ; 2785
                                08  13 00062                BEQL    1$                                             ;
                  08 BC   08    A4  D0 00064                MOVL    8(STATUS), @PASS_BACK_VALUE                    ; 2788
                     54         03  D0 00069                MOVL    #3, STATUS                                     ; 2789
                     33         54  E8 0006C 1$:            BLBS    STATUS, 2$                                     ; 2797
                          08    AC  DD 0006F                PUSHL   PASS_BACK_VALUE                                ; 2799
                                67  DD 00072                PUSHL   PATH_VEC_PTR                                   ;
             00000000G EF       02  FB 00074                CALLS   #2, PAT$SYM_TO_VAL                             ;
                     54         50  D0 0007B                MOVL    R0, STATUS                                     ;
                     21         54  E8 0007E                BLBS    STATUS, 2$                                     ; 2805
                                5E  DD 00081                PUSHL   SP                                             ; 2814
                                67  DD 00083                PUSHL   PATH_VEC_PTR                                   ;
             00000000G EF       02  FB 00085                CALLS   #2, PAT$PV_TO_CS                               ;
                     6A         00  FB 0008C                CALLS   #0, PAT$DELETE_PATH                            ; 2815
                                67  D4 0008F                CLRL    PATH_VEC_PTR                                   ; 2816
                     78   0C    AC  E9 00091                BLBC    SIGNAL_FLAG, 8$                                ; 2822
                                5E  DD 00095                PUSHL   SP                                             ; 2826
                                01  DD 00097                PUSHL   #1                                             ;
                       006D8090 8F  DD 00099                PUSHL   #7176336                                       ;
                     68         03  FB 0009F                CALLS   #3, LIB$SIGNAL                                 ;
                     6A         00  FB 000A2 2$:            CALLS   #0, PAT$DELETE_PATH                            ; 2833
                     50         54  D0 000A5                MOVL    STATUS, R0                                     ; 2834
                                    04 000A8                RET                                                    ;
                                67  D5 000A9 3$:            TSTL    PATH_VEC_PTR                                   ; 2844
                                16  12 000AB                BNEQ    5$                                             ;
                                0B  DD 000AD                PUSHL   #11                                            ; 2847
                     6B         01  FB 000AF                CALLS   #1, PAT$FREEZ                                  ;
                     67         50  D0 000B2                MOVL    R0, PATH_VEC_PTR                               ;
                                09  12 000B5                BNEQ    4$                                             ;
                       006D8112 8F  DD 000B7                PUSHL   #7176466                                       ; 2849
                     68         01  FB 000BD                CALLS   #1, LIB$SIGNAL                                 ;
                          20    A7  D4 000C0 4$:            CLRL    PV_INDEX                                       ; 2855
                     50         62  3C 000C3 5$:            MOVZWL  (R2), R0                                       ; 2861
                     50         04  C0 000C6                ADDL2   #4, R0                                         ;
          7E         50         04  C7 000C9                DIVL3   #4, R0, -(SP)                                  ;
                     6B         01  FB 000CD                CALLS   #1, PAT$FREEZ                                  ;
                     56         50  D0 000D0                MOVL    R0, CS_PTR                                     ;
                                09  12 000D3                BNEQ    6$                                             ;
                       006D8112 8F  DD 000D5                PUSHL   #7176466                                       ; 2863
                     68         01  FB 000DB                CALLS   #1, LIB$SIGNAL                                 ;
                     66         62  90 000DE 6$:            MOVB    (R2), (CS_PTR)                                 ; 2869
```

```
                01   A6     04   B2         62  28 000E1          MOVC3   (R2), @4(R2), 1(CS_PTR)                         ; 2870
                                 50     20  A7  D0 000E7          MOVL    PV_INDEX, R0                                    ; 2876
                            00 B740         56  D0 000EB          MOVL    CS_PTR, @PATH_VEC_PTR[R0]                       ;
                     50     20   A7         01  C1 000F0          ADDL3   #1, PV_INDEX, R0                                ; 2882
                            20   A7         50  D0 000F5          MOVL    R0, PV_INDEX                                    ;
                                 0A         50  D1 000F9          CMPL    R0, #10                                         ;
                                            0B  15 000FC          BLEQ    7$                                              ;
                                   006D8152 8F  DD 000FE          PUSHL   #7176530                                        ; 2885
                                 68         01  FB 00104          CALLS   #1, LIB$SIGNAL                                  ;
                                            04  11 00107          BRB     8$                                              ; 2886
                                 50         01  D0 00109 7$:      MOVL    #1, R0                                          ; 2888
                                                04 0010C          RET                                                     ;
                                            50  D4 0010D 8$:      CLRL    R0                                              ; 2889
                                                04 0010F          RET                                                     ;

; Routine Size:  272 bytes,    Routine Base:  _PAT$CODE + 0000
```

```
1 GLOBAL ROUTINE PAT$DELETE_PATH : NOVALUE =
1
1 !++
1 ! Functional Description:
1 !
1 !       Delete the pathname vector we are passed a pointer to by the OWN,
1 !       PATH_VEC_PTR, which several routines in this module work from.  Also,
1 !       zero out this pointer so that the next call to BUILD_PATH knows
1 !       there is no 'current' pathname vector being built.
1 !
1 ! Formal Parameters:
1 !
1 !       none
1 !
1 ! Implicit Inputs:
1 !
1 !       PATH_VEC_PTR - See above.
1 !
1 ! Return Value:
1 !
1 !       NOVALUE - because the only thing which can go wrong
1 !                 is a free storage error and in that
1 !                 case the manager itself SIGNALs its way out.
1 !
1 !--
1
2 BEGIN
2
2 LOCAL
2       CS_PTR : CS_POINTER;                            ! Each element of the pathname vector
2                                                       ! is a pointer to a counted string.
2
2 !++
2 ! Now see if there is really a pathname vector currently pointed to by the
2 ! pointer, PATH_VEC_PTR.
2 !--
3 IF (.PATH_VEC_PTR EQLA 0)
2 THEN
2       RETURN;
2
2 !++
2 ! Simply throw away the storage which we allocated
2 ! for each element of the vector.
2 !-
2 INCR I FROM 0 TO MAX_PATH_SIZE
2 DO
2       !++
2       ! The first 0 entry ends the vector.
2       !--
3       IF ((CS_PTR = .PATH_VEC_PTR[.I]) EQL 0)
2       THEN
2               EXITLOOP
2       ELSE
2               PAT$FREERELEASE( .CS_PTR, RST_UNITS(.CS_PTR[0]+1) );
2
2 !++
2 ! Then throw away the vector itself.
```

```
;  587          2947  2 !--
;  588          2948  2 PAT$FREERELEASE( .PATH_VEC_PTR, RST_UNITS( %SIZE(PATHNAME_VECTOR) ));
;  589          2949  2
;  590          2950  2 !++
;  591          2951  2 ! Zero out the pointer so that subsequent re-uses know there is no longer
;  592          2952  2 ! one there.
;  593          2953  2 !--
;  594          2954  2 PATH_VEC_PTR = 0;
;  595          2955  2
;  596          2956  1 END;



                                   003C 00000           .ENTRY  PAT$DELETE_PATH, Save R2,R3,R4,R5                       ; 2890
                 55 00000000G   EF   9E 00002           MOVAB   PAT$FREERELEASE, R5                                     ;
                 54 00000000'   EF   9E 00009           MOVAB   PATH_VEC_PTR, R4                                        ;
                                64   D5 00010           TSTL    PATH_VEC_PTR                                            ; 2926
                                25   13 00012           BEQL    3$                                                      ;
                                52   D4 00014           CLRL    I                                                       ; 2934
                 53       00 B442    D0 00016 1$:       MOVL    @PATH_VEC_PTR[I], CS_PTR                                ; 2939
                                13   13 0001B           BEQL    2$                                                      ;
                 50             63   9A 0001D           MOVZBL  (CS_PTR), R0                                            ; 2943
                 50             04   C0 00020           ADDL2   #4, R0                                                  ;
        7E       50             04   C7 00023           DIVL3   #4, R0, -(SP)                                           ;
                                53   DD 00027           PUSHL   CS_PTR                                                  ;
                 65             02   FB 00029           CALLS   #2, PAT$FREERELEASE                                     ;
        E6       52             0A   F3 0002C           AOBLEQ  #10, I, 1$                                              ; 2939
                                0B   DD 00030 2$:       PUSHL   #11                                                     ; 2948
                                64   DD 00032           PUSHL   PATH_VEC_PTR                                            ;
                 65             02   FB 00034           CALLS   #2, PAT$FREERELEASE                                     ;
                                64   D4 00037           CLRL    PATH_VEC_PTR                                            ; 2954
                                     04 00039 3$:       RET                                                             ; 2956

; Routine Size:  58 bytes,    Routine Base:  _PAT$CODE + 0110
```

```
1 GLOBAL ROUTINE PAT$SAVE_SCOPE( SET_SCOPE_FLAG ) =
1
1 !++
1 ! Functional Description:
1 !
1 !     This routine serves two fairly distinct purposes.
1 !
1 ! 1. If SET_SCOPE_FLAG is ON, then this routine was
1 !     called to SET the new current scope position (CSP).
1 !     In this case we delete the storage taken by the old
1 !     CSP, if there was any, and install the new CSP
1 !     having checked its validity.
1 !         SET SCOPE also implies SET MODULE.
1 !
1 ! 2. If SET_SCOPE_FLAG is OFF, then the call was made to simply
1 !     install a null CSP vector.  This happens as a result of the user
1 !     cancelling scope, or cancelling a module whose name is the same as what the
1 !     CSP pathname begins with.  The latter avoids the 'dangling scope' problem.
1 !
1 ! Implicit Inputs:
1 !
1 !         This routine works from the OWN that is local to this
1 !         module, PATH_VEC_PTR, which points to the current pathname vector
1 !         which was (presumably) built by BUILD_PATH.  We store
1 !         away this pathname vector pointer, and then zero out the
1 !         one that BUILD_PATH uses so that it 'forgets' completely
1 !         about having built it.
1 !
1 ! Return Value:
1 !
1 ! TRUE, if we are simply throwing away the old CSP,
1 !         or if we installed a new one which was acceptable,
1 ! FALSE, otherwise.  (we were asked to install one which was invalid).
1 !
1 !--
1
2 BEGIN
2
2 LOCAL
2         NEW_CSP_PTR : REF PATHNAME_VECTOR,
2         MC_PTR : REF MC_RECORD,                                 ! Used to chain along the MC.
2         CS_PTR : CS_POINTER,                                    ! Temp counted string pointer.
2         STATUS;                                                 ! Success/failure indication that we return.
2
2 !++
2 ! The gross structure of this routine just implements the two-function logic.
2 !--
3 IF (.SET_SCOPE_FLAG)
2 THEN
3         BEGIN
3         !++
3         ! Install a new CSP vector. Check that the CSP we were given is valid.
3         ! First, see if the beginning element of the pathvector (which must be
3         ! MODULE) is in the MC.  Note that we don't consider the first entry in
3         ! the MC since it is used for globals only and hence is nameless.
3         !--
3         CS_PTR = .PATH_VEC_PTR[0];
```

```
3       MC_PTR = .PAT$GL_MC_PTR;
4       WHILE ((MC_PTR = .MC_PTR [MC_NEXT]) NEQ 0)
3       DO
4               BEGIN
5               IF (CH$EQL(.MC_PTR[MC_NAME_CS], MC_PTR[MC_NAME_ADDR],
5                               .CS_PTR[0], CS_PTR[1]))
4               THEN
4                       EXITLOOP                                        ! Found.  Continue on to do further checking
3               END;
3
3       !++
3       ! If the module name was not found, we must not accept the CSP.
3       !--
4       IF (.MC_PTR EQL 0)
3       THEN
4               BEGIN
4               !++
4               ! This is an error.  Note that if there was previous to this
4               ! call a valid CSP, it is not affected by this error.  ALso note
4               ! that the storage for the CSP we just found to be invalid is
4               ! discarded by the end-of-line processing AFTER the SIGNAL
4               ! produces the message.
4               !--
4               SIGNAL(PAT$_NOSUCHMODU,1,.CS_PTR);
4               RETURN(FALSE);
3               END;
3
3       !++
3       ! Make sure that the indicated module is in the RST so that
3       ! further checking can be done and because a "set scope" implies a
3       ! "SET MODULE" command.
3       !--
3       IF NOT .MC_PTR[MC_IN_RST]
3       THEN
3               PAT$SET_MODULE(.MC_PTR);                                ! IF THIS FAILS, THERE IS NOT RETURN FROM TH
3
3       !++
3       ! The module name is valid and in the RST.  Any further checking depends
3       ! on whether the given CSP is any longer than simply "module".  If this
3       ! is the case, we've done all the validating we can.
3       !--
4       IF (.PATH_VEC_PTR[1] NEQ 0)
3       THEN
4               BEGIN
4               !++
4               ! Further checking is RST-dependent.
4               !--
4               LOCAL
4                       VAL_DESC : VALU_DESCRIPTOR,
4                       NT_PTR : REF NT_RECORD;
4
4               !++
4               ! For initialized modules, we can do a complete check.
4               ! This means that we effectively do a lookup, and then
4               ! make sure that the path leads to a symbol of type
4               ! ROUTINE.
4               !--
```

```
;  712      3071  5                         IF (NOT PAT$SYM_TO_VALU( .PATH_VEC_PTR, VAL_DESC))
;  713      3072  4                         THEN
;  714      3073  5                                 BEGIN
;  715      3074  5                                 !++
;  716      3075  5                                 ! Encode the pathname into a counted string and output
;  717      3076  5                                 ! the associated message.
;  718      3077  5                                 !--
;  719      3078  5                                 LOCAL MESSAGE_BUF : VECTOR[TTY_OUT_WIDTH, BYTE];
;  720      3079  5
;  721      3080  5                                 PAT$PV_TO_CS(.PATH_VEC_PTR, MESSAGE_BUF);
;  722      3081  5                                 SIGNAL(PAT$_NOSYMBOL, 1, MESSAGE_BUF);  ! No return
;  723      3082  5                                 RETURN(FALSE);                         !****** THIS SHOULDN'T BE NEEDED
;  724      3083  5                                 END;
;  725      3084  4
;  726      3085  4                         !++
;  727      3086  4                         ! Now we simply have to see that the valid path leads
;  728      3087  4                         ! to ROUTINE.  First we pick up the pointer to this
;  729      3088  4                         ! symbol's name table record.
;  730      3089  4                         !--
;  731      3090  4                         NT_PTR = .VAL_DESC [VALU_NT_PTR];
;  732      3091  5                         IF (NOT .NT_PTR[NT_TYPE] EQL DSC$K_DTYPE_RTN)
;  733      3092  4                         THEN
;  734      3093  5                                 BEGIN
;  735      3094  5                                 !++
;  736      3095  5                                 ! A valid path, but we can't accept it as a CSP
;  737      3096  5                                 ! because perpending it to any symbol would
;  738      3097  5                                 ! never result in a valid path.
;  739      3098  5                                 !--
;  740      3099  5                                 SIGNAL(PAT$_BADCSP);
;  741      3100  5                                 RETURN(FALSE);
;  742      3101  4                                 END;
;  743      3102  3                         END;
;  744      3103  3                 !++
;  745      3104  3                 ! The CSP we are to SET has been checked out OK.
;  746      3105  3                 !--
;  747      3106  3                 NEW_CSP_PTR = .PATH_VEC_PTR;
;  748      3107  2                 END;
;  749      3108  2
;  750      3109  2         !++
;  751      3110  2         ! If we get this far, the new CSP will be accepted. First, we have to release
;  752      3111  2         ! the storage we used up in accumulating the pathname elements of the  old CSP,
;  753      3112  2         ! if there was one.
;  754      3113  2         !--
;  755      3114  3         IF ((PATH_VEC_PTR = .PAT$GL_CSP_PTR) NEQ 0)
;  756      3115  2         THEN
;  757      3116  3                 BEGIN
;  758      3117  3                 PAT$DELETE_PATH();
;  759      3118  2                 END;
;  760      3119  2         !++
;  761      3120  2         ! If we were only throwing away the old vector, then we must be done.
;  762      3121  2         !--
;  763      3122  3         IF (NOT .SET_SCOPE_FLAG)
;  764      3123  2         THEN
;  765      3124  3                 BEGIN
;  766      3125  3                 PAT$GL_CSP_PTR = 0;
;  767      3126  3                 RETURN(TRUE);
;  768      3127  2                 END;
;  769      3128  2
;  770      3129  2 !++
;  771      3130  2 ! Installing a new CSP is simply a matter of saving away the pointer to the
;  772      3131  2 ! PATHNAME_VECTOR.  We must also zero out the pointer to the vector which
;  773      3132  2 ! BUILD_PATH uses to deal with these vectors, since we have effectively taken
;  774      3133  2 ! this one away.
;  775      3134  2 !--
;  776      3135  2 PAT$GL_CSP_PTR = .NEW_CSP_PTR;
;  777      3136  2 PATH_VEC_PTR = 0;
;  778      3137  2
;  779      3138  2 RETURN(TRUE);
;  780      3139  1 END;



                                        03FC 00000          .ENTRY  PAT$SAVE_SCOPE, Save R2,R3,R4,R5,R6,R7,R8,- ; 2957
                                                                    R9                                           ;
                    59 00000000G  00  9E 00002          MOVAB   LIB$SIGNAL, R9                               ;
                    58 00000000G  EF  9E 00009          MOVAB   PAT$GL_CSP_PTR, R8                           ;
                    57 00000000G  EF  9E 00010          MOVAB   PAT$GL_RST_BEGN, R7                          ;
                    56 00000000'  EF  9E 00017          MOVAB   PATH_VEC_PTR, R6                             ;
                    5E      FF74  CE  9E 0001E          MOVAB   -140(SP), SP                                 ;
                    03        04  AC  E8 00023          BLBS    SET_SCOPE_FLAG, 1$                           ; 3004
                            0098  31 00027          BRW     9$                                           ;
                    55        00  B6  D0 0002A 1$:      MOVL    @PATH_VEC_PTR, CS_PTR                        ; 3013
                    54 00000000G  EF  D0 0002E          MOVL    PAT$GL_MC_PTR, MC_PTR                        ; 3014
          50        54            67  C1 00035 2$:      ADDL3   PAT$GL_RST_BEGN, MC_PTR, R0                  ; 3015
                    54            60  3C 00039          MOVZWL  (R0), MC_PTR                                 ;
                                  15  13 0003C          BEQL    3$                                           ;
          50        54            67  C1 0003E          ADDL3   PAT$GL_RST_BEGN, MC_PTR, R0                  ; 3018
                    52        0C  A0  9A 00042          MOVZBL  12(R0), R2                                   ;
                    51            65  9A 00046          MOVZBL  (CS_PTR), R1                                 ; 3019
  51        00        0D  A0            52  2D 00049          CMPC5   R2, 13(R0), #0, R1, 1(CS_PTR)                ;
                              01  A5     0004F                                                               ;
                                  E2  12 00051          BNEQ    2$                                           ;
                                  54  D5 00053 3$:      TSTL    MC_PTR                                       ; 3027
                                  0C  12 00055          BNEQ    4$                                           ;
                                  55  DD 00057          PUSHL   CS_PTR                                       ; 3037
                                  01  DD 00059          PUSHL   #1                                           ;
                        006D8080  8F  DD 0005B          PUSHL   #7176320                                     ;
                                  3E  11 00061          BRB     6$                                           ;
          50        54            67  C1 00063 4$:      ADDL3   PAT$GL_RST_BEGN, MC_PTR, R0                  ; 3046
          09        03  A0            01  E0 00067          BBS     #1, 3(R0), 5$                                ;
                                  54  DD 0006C          PUSHL   MC_PTR                                       ; 3048
              00000000G  EF            01  FB 0006E          CALLS   #1, PAT$SET_MODULE                           ;
                        50            66  D0 00075 5$:      MOVL    PATH_VEC_PTR, R0                             ; 3055
                              04  A0  D5 00078          TSTL    4(R0)                                        ;
                                  42  13 0007B          BEQL    8$                                           ;
                              F8  AD  9F 0007D          PUSHAB  VAL_DESC                                     ; 3071
                                  50  DD 00080          PUSHL   R0                                           ;
              00000000G  EF            02  FB 00082          CALLS   #2, PAT$SYM_TO_VALU                          ;
                        1A            50  E8 00089          BLBS    R0, 7$                                       ;
                                  5E  DD 0008C          PUSHL   SP                                           ; 3080
                                  66  DD 0008E          PUSHL   PATH_VEC_PTR                                 ;
              00000000G  EF            02  FB 00090          CALLS   #2, PAT$PV_TO_CS                             ;
```

```
                                        5E  DD 00097        PUSHL   SP                                            ; 3081
                                        01  DD 00099        PUSHL   #1                                            ;
                            006D8090    8F  DD 0009B        PUSHL   #7176336                                      ;
                      69                03  FB 000A1  6$:   CALLS   #3, LIB$SIGNAL                                ;
                                        37  11 000A4        BRB     13$                                           ; 3082
                      50          F8    AD  3C 000A6  7$:   MOVZWL  VAL_DESC, NT_PTR                              ; 3090
                      50                67  C0 000AA        ADDL2   PAT$GL_RST_BEGN, R0                           ; 3091
                BE    8F          02    A0  91 000AD        CMPB    2(R0), #190                                   ;
                                        0B  13 000B2        BEQL    8$                                            ;
                            006D8060    8F  DD 000B4        PUSHL   #7176288                                      ; 3099
                      69                01  FB 000BA        CALLS   #1, LIB$SIGNAL                                ;
                                        1E  11 000BD        BRB     13$                                           ; 3100
                      52                66  D0 000BF  8$:   MOVL    PATH_VEC_PTR, NEW_CSP_PTR                     ; 3106
                      66                68  D0 000C2  9$:   MOVL    PAT$GL_CSP_PTR, PATH_VEC_PTR                  ; 3114
                                        05  13 000C5        BEQL    10$                                           ;
              FEFA    CF                00  FB 000C7        CALLS   #0, PAT$DELETE_PATH                           ; 3117
                      04          04    AC  E8 000CC  10$:  BLBS    SET_SCOPE_FLAG, 11$                           ; 3122
                                        68  D4 000D0        CLRL    PAT$GL_CSP_PTR                                ; 3125
                                        05  11 000D2        BRB     12$                                           ; 3126
                      68                52  D0 000D4  11$:  MOVL    NEW_CSP_PTR, PAT$GL_CSP_PTR                   ; 3135
                                        66  D4 000D7        CLRL    PATH_VEC_PTR                                  ; 3136
                      50                01  D0 000D9  12$:  MOVL    #1, R0                                        ; 3138
                                            04 000DC        RET                                                   ;
                                        50  D4 000DD  13$:  CLRL    R0                                            ; 3139
                                            04 000DF        RET                                                   ;

; Routine Size:  224 bytes,    Routine Base:  _PAT$CODE + 014A
```

```
1 GLOBAL ROUTINE PAT$FIND_MODULE( MOD_NAME_DESC, SIGNAL_FLAG ) =
1
1 !++
1 ! Functional Description:
1 !
1 !         Search the MC to see if the given module is there.
1 !
1 ! Formal Parameters:
1 !
1 !         MOD_NAME_DESC    -a string descriptor for the supposed
1 !                           module name.
1 !         SIGNAL_FLAG      -indicator whether or not this routine should
1 !                           SIGNAL if the module is not found
1 !
1 ! Implicit Inputs:
1 !
1 !         none.
1 !
1 ! Implicit Outputs:
1 !
1 !         none
1 !
1 ! Returned Value:
1 !
1 !         0 - if the module is not found,
1 !         an MC_PTR (non-zero) to the indicated MC record, otherwise.
1 !
1 ! Side Effects:
1 !
1 !         none
1 !--
1
2 BEGIN
2 MAP
2         MOD_NAME_DESC : REF BLOCK[,BYTE];                       ! The supposed module name is
2                                                                 ! described via an SRM string descriptor.
2
2 LOCAL
2         MODU_CS_NAME : VECTOR[SYM_MAX_LENGTH+1, BYTE],          ! COPY OF MODULE NAME FOR NOSUCHMODU ERROR M
2         MC_PTR : REF MC_RECORD;                                 ! We chain along the MC via this temp pointe
2
2 !++
2 ! Scan along the MC comparing the given string with the module name stored
2 ! therein.  Note that we skip the first MC record because it is reserved for
2 ! globals and is therefore nameless.
2 !--
2 MC_PTR = .PAT$GL_MC_PTR;
3 WHILE ((MC_PTR = .MC_PTR [MC_NEXT]) NEQ 0)
2 DO
3         BEGIN
4         IF (CH$EQL(.MC_PTR[MC_NAME_CS],MC_PTR[MC_NAME_ADDR],
4                    .MOD_NAME_DESC[DSC$W_LENGTH],.MOD_NAME_DESC[DSC$A_POINTER] ))
3         THEN
4                 BEGIN
4                 !++
4                 ! Found.  Internally in PATCH we agree that the 'value' of a
4                 ! module string will be the RST address of its MC record.
```

```
;  839        3197  4                     !--
;  840        3198  4                     RETURN(.MC_PTR);
;  841        3199  3                     END;
;  842        3200  2             END;
;  843        3201  2
;  844        3202  2  !++
;  845        3203  2  ! If we fall out of the above loop, then the given module name was not found.
;  846        3204  2  ! Therefore if a SIGNAL is allowed, then construct a COUNTED_STRING pointer and
;  847        3205  2  ! pass it as the error message argument.
;  848        3206  2  !--
;  849        3207  2  IF .SIGNAL_FLAG
;  850        3208  2  THEN
;  851        3209  3             BEGIN
;  852        3210  3             MODU_CS_NAME[0] = .MOD_NAME_DESC[DSC$W_LENGTH];
;  853        3211  3             CH$MOVE (.MODU_CS_NAME[0], .MOD_NAME_DESC[DSC$A_POINTER], MODU_CS_NAME[1]);
;  854        3212  3             SIGNAL(PAT$_NOSUCHMODU, 1, MODU_CS_NAME[0]);              ! No return
;  855        3213  2             END;
;  856        3214  2
;  857        3215  2  RETURN (0);
;  858        3216  1  END;



                                                          007C 00000          .ENTRY   PAT$FIND_MODULE, Save R2,R3,R4,R5,R6    ; 3140
                                         56 00000000G   EF  9E 00002          MOVAB    PAT$GL_RST_BEGN, R6                     ;
                                         5E             20  C2 00009          SUBL2    #32, SP                                 ;
                                         54 00000000G   EF  D0 0000C          MOVL     PAT$GL_MC_PTR, MC_PTR                   ; 3186
                                         55        04   AC  D0 00013          MOVL     MOD_NAME_DESC, R5                       ; 3191
                           50            54             66  C1 00017  1$:     ADDL3    PAT$GL_RST_BEGN, MC_PTR, R0             ; 3187
                                         54             60  3C 0001B          MOVZWL   (R0), MC_PTR                            ;
                                                        17  13 0001E          BEQL     2$                                      ;
                           50            54             66  C1 00020          ADDL3    PAT$GL_RST_BEGN, MC_PTR, R0             ; 3190
                                         51        0C   A0  9A 00024          MOVZBL   12(R0), R1                              ;
       04   BC             00       0D   A0             51  2D 00028          CMPC5    R1, 13(R0), #0, @MOD_NAME_DESC, @4(R5)  ;
                                                   04   B5     0002F                                                           ;
                                                        E4  12 00031          BNEQ     1$                                      ;
                                         50             54  D0 00033          MOVL     MC_PTR, R0                              ; 3198
                                                            04 00036          RET                                              ;
                                         1E        08   AC  E9 00037  2$:     BLBC     SIGNAL_FLAG, 3$                         ; 3207
                                         6E        04   BC  90 0003B          MOVB     @MOD_NAME_DESC, MODU_CS_NAME            ; 3210
                                         50             6E  9A 0003F          MOVZBL   MODU_CS_NAME, R0                        ; 3211
                     01    AE       04   B5             50  28 00042          MOVC3    R0, @4(R5), MODU_CS_NAME+1              ;
                                                        5E  DD 00048          PUSHL    SP                                      ; 3212
                                                        01  DD 0004A          PUSHL    #1                                      ;
                                            006D8080    8F  DD 0004C          PUSHL    #7176320                                ;
                              00000000G  00             03  FB 00052          CALLS    #3, LIB$SIGNAL                          ;
                                                        50  D4 00059  3$:     CLRL     R0                                      ; 3215
                                                            04 0005B          RET                                              ; 3216

; Routine Size:  92 bytes,    Routine Base:  _PAT$CODE + 022A
```

```
1 GLOBAL ROUTINE PAT$FIND_DST : NOVALUE =
1
1 !++
1 ! FUNCTIONAL DESCRIPTION:
1 !
1 !       Find out where the DST begins and make it available for
1 !       PAT$GET_NXT_DST and PAT$GET_DST_REC.
1 !       (or make it so that these routines return EOF if no DST exists).
1 !       Then do the same for the GST.
1 !
1 ! Calling Sequence:
1 !
1 !       PAT$FIND_DST()
1 !
1 ! FORMAL PARAMETERS:
1 !
1 !       none
1 !
1 ! IMPLICIT INPUTS:
1 !
1 !       The image header has been read and PAT$GL_IMGHDR points to it.
1 !       The old image file is open and ready to read the DST and GST.
1 !       The variables pointing to the file are:
1 !               PAT$GL_OLDFAB, AND PAT$GL_OLDNAME.
1 !
1 ! IMPLICIT OUTPUTS:
1 !
1 !       none
1 !
1 ! COMPLETION CODES:
1 !       none
1 !
1 ! SIDE EFFECTS:
1 !
1 !       The notion of 'next' DST record is initialized
1 !       here so that a call to PAT$GET_NXT_DST made after
1 !       a call to this routine will fetch the first record.
1 !
1 !       The begin and end address of the DST are also established,
1 !       but only for the purposes of the interface routines.
1 !       There is no explicit requirement for this from the RST's
1 !       viewpoint - so long as the interface can somehow
1 !       know when the last record has been passed on.
1 !
1 !       If anything goes wrong during the GST/DST initializations,
1 !       (can't EXPREG, etc.), we output the corresponding message forcing
1 !       the severity to -I-, and then continue on without the GST or DST.
1 !       The exceptions to this are that there must be symbol table info in
1 !       the header (even if what's there is simply a pointer to say that
1 !       there is no DST or GST).
1 !--
1
2 BEGIN
2
2 BIND
2       SYM_TBL_DATA = .PAT$GL_IMGHDR + .PAT$GL_IMGHDR [IHD$W_SYMDBGOFF]
2                                       : BLOCK [, BYTE],
;  917      3274  2          EXESECNAM = UPLIT BYTE (%ASCIC 'DST'),
;  918      3275  2          GSTSECNAM = UPLIT BYTE (%ASCIC 'GST');
;  919      3276  2
;  920      3277  2 LITERAL
;  921      3278  2          GL_OVERHEAD_REC = 2,                                ! GST overhead records from Linker
;  922      3279  2          SYMS_PER_GLREC  = 28,                               ! Average GSTs per GST record.
;  923      3280  2          START_ADDRESS   = 0,                                ! Starting address offset
;  924      3281  2          END_ADDRESS     = 1;                                ! Ending address offset
;  925      3282  2
;  926      3283  2 LOCAL
;  927      3284  2          STATUS : BLOCK[%UPVAL, BYTE],
;  928      3285  2          GLOBAL_RECORD : BLOCK [A_PAGE, BYTE],
;  929      3286  2          EXESECNAM_DESC : VECTOR [2, LONG],
;  930      3287  2          EXEFILNAM_DESC : VECTOR [2, LONG],
;  931      3288  2          GL_SYM_COUNT : VOLATILE;
;  932      3289  2
;  933      3290  2 !++
;  934      3291  2 ! Check if this .EXE file has symbols at all.  There are two kinds of checks
;  935      3292  2 ! which we make.  First, we see if the image header is consistent.
;  936      3293  2 ! There are two checks for this - one which is always relevant, and one which
;  937      3294  2 ! is relevant only if we have already determined that there will be DSTs.
;  938      3295  2 !--
;  939      3296  3 IF (.PAT$GL_IMGHDR [IHD$W_SYMDBGOFF] EQL 0)
;  940      3297  2 THEN
;  941      3298  3          BEGIN
;  942      3299  3          GST_BEGIN_ADDR = 0;
;  943      3300  3          DST_BEGIN_ADDR = 0;
;  944      3301  3          PAT$GB_SYMBOLS = FALSE;                             ! Indicate image has no symbols
;  945      3302  3          SIGNAL(PAT$_NOGBL+MSG$K_INFO);
;  946      3303  3          SIGNAL(PAT$_NOLCL+MSG$K_INFO);
;  947      3304  3          RETURN;
;  948      3305  3          END
;  949      3306  2 ELSE
;  950      3307  2          PAT$GB_SYMBOLS = TRUE;                              ! Indicate image has symbols
;  951      3308  2
;  952      3309  2 !++
;  953      3310  2 ! Then we see if this is a simple case of there legitimately not being a DST.
;  954      3311  2 ! (i.e. the modules were simply not compiled with /DEBUG on).
;  955      3312  2 !--
;  956      3313  3 IF ((DST_BEGIN_ADDR = .SYM_TBL_DATA[IHS$W_DSTBLKS]) EQL 0)
;  957      3314  2 THEN
;  958      3315  3          BEGIN
;  959      3316  3          !++
;  960      3317  3          ! Check that the VBN of the DST is also zero.  If it is not,
;  961      3318  3          ! then the image header is contradictory.  Therefore, inform the
;  962      3319  3          ! user and fix the header by setting the DST fields to zero.
;  963      3320  3          ! This should only be an informational message.
;  964      3321  3          !--
;  965      3322  4          IF (.SYM_TBL_DATA[IHS$L_DSTVBN] NEQ 0)
;  966      3323  3          THEN
;  967      3324  3                  SIGNAL(PAT$_INVIMGHDR+MSG$K_INFO);
;  968      3325  3          SIGNAL(PAT$_NOLCL+MSG$K_INFO);
;  969      3326  3          DST_BEGIN_ADDR = 0;
;  970      3327  3          SYM_TBL_DATA[IHS$L_DSTVBN] = 0;
;  971      3328  3          SYM_TBL_DATA[IHS$W_DSTBLKS] = 0;
;  972      3329  3          END
;  973      3330  2 ELSE
```

```
2               !++
2               ! Check that the VBN is legal.  If not, then this is an inconsistent
2               ! header.  Inform the user that it is invalid and
2               ! fix up the header, ignoring the symbols that might be there.
2               !--
2               IF (.SYM_TBL_DATA[IHS$L_DSTVBN] LEQ 2) OR
3                  (.SYM_TBL_DATA[IHS$W_DSTBLKS] LSS 0)
2               THEN
3                       BEGIN
3                       SIGNAL(PAT$_INVIMGHDR+MSG$K_INFO);
3                       SIGNAL(PAT$_NOLCL+MSG$K_INFO);
3                       DST_BEGIN_ADDR = 0;
3                       SYM_TBL_DATA[IHS$L_DSTVBN] = 0;
3                       SYM_TBL_DATA[IHS$W_DSTBLKS] = 0;
2                       END;
2
2       !++
2       ! Check that a GST exists.  If not, set an indicator.  Also make a valid image
2       ! header.  This insures PAT$WRTIMG will work correctly.
2       !--
3       IF ((GST_BEGIN_ADDR = .SYM_TBL_DATA[IHS$W_GSTRECS]) EQL 0)
2       THEN
3               BEGIN
3               !++
3               ! Check that the VBN of the GST is also zero.  If it is not,
3               ! then the image header is contradictory.  Therefore, inform the
3               ! user and fix the header by setting the GST fields to zero.
3               ! This should only be an informational message.
3               !--
4               IF (.SYM_TBL_DATA[IHS$L_GSTVBN] NEQ 0)
3               THEN
3                       SIGNAL(PAT$_INVIMGHDR+MSG$K_INFO);
3               SIGNAL(PAT$_NOGBL+MSG$K_INFO);
3               GST_BEGIN_ADDR = 0;
3               SYM_TBL_DATA[IHS$L_GSTVBN] = 0;
3               SYM_TBL_DATA[IHS$W_GSTRECS] = 0;
3               END
2       ELSE
2               !++
2               ! Check that the VBN is legal.  If not, then this is an inconsistent
2               ! header.  Inform the user that it is invalid and
2               ! fix up the header, ignoring the symbols that might be there.
2               !--
2               IF (.SYM_TBL_DATA[IHS$L_GSTVBN] LEQ 2) OR
3                  (.SYM_TBL_DATA[IHS$W_GSTRECS] LSS 0)
2               THEN
3                       BEGIN
3                       SIGNAL(PAT$_INVIMGHDR+MSG$K_INFO);
3                       SIGNAL(PAT$_NOGBL+MSG$K_INFO);
3                       GST_BEGIN_ADDR = 0;
3                       SYM_TBL_DATA[IHS$L_GSTVBN] = 0;
3                       SYM_TBL_DATA[IHS$W_GSTRECS] = 0;
2                       END;
2
2       !++
2       ! Don't try to create and map the DST if there is not one in the .EXE file to map in.
2       !--
```

```
3 IF (.DST_BEGIN_ADDR NEQ 0)
2 THEN
3         BEGIN
3         PAT$GL_ISVADDR [START_ADDRESS] = 200;                         ! Set the address vectors to point to the
3         PAT$GL_ISVADDR [END_ADDRESS] = 200;                           !   first available addresses in P0 space.
3         EXESECNAM_DESC [0] = 3;
3         EXESECNAM_DESC [1] = EXESECNAM;
3         EXEFILNAM_DESC [0] = .PAT$GL_OLDNBK[NAM$B_RSL];
3         EXEFILNAM_DESC [1] = PAT$GB_OLDNAME;
3
4         IF NOT (STATUS = LIB$_CREMAPSEC (PAT$GL_ISVADDR
4                                         , PAT$GL_ISVADDR
4                                         , SEC$M_EXPREG
4                                         , EXESECNAM_DESC
4                                         , 0
4                                         , EXEFILNAM_DESC
4                                         , .SYM_TBL_DATA [IHS$W_DSTBLKS]
4                                         , .SYM_TBL_DATA [IHS$L_DSTVBN]))
3         THEN
4                 BEGIN
4                 !++
4                 ! Unconditionally make the severity level informational so
4                 ! that the message will be produced with no side effects.
4                 !--
4 !               STATUS[STS$V_SEVERITY] = SYS$K_INFO;
4                 STATUS[STS$V_SEVERITY] = 3;
4                 DST_BEGIN_ADDR =0;
4                 SIGNAL(PAT$_SYSERROR-MSG$K_FATAL+MSG$K_INFO, 0, .STATUS);
4                 SIGNAL(.STATUS);
4                 END
3         ELSE
3                 !++
3                 ! Now load up the addresses of the beginning
3                 ! and end of the DST.
3                 !--
4                 BEGIN
4                 DST_BEGIN_ADDR = .PAT$GL_ISVADDR [START_ADDRESS];
4                 DST_END_ADDR = .PAT$GL_ISVADDR [END_ADDRESS];
4                 DST_NEXT_ADDR = .DST_BEGIN_ADDR;
3                 END;
2         END;                                                          ! For no DSTs.
2
2 !++
2 ! Now map in the GST in the same way we did the DST.  Don't try to create and
2 ! map the GST if there is not one in the .exe file to map in.
2 !--
3 IF (.GST_BEGIN_ADDR NEQ 0)
2 THEN
3         BEGIN
3         LOCAL
3                 GST_REC_PTR : REF VECTOR[,WORD];
3
3         !++
3         ! Find the last mapped address used and compute the addresses into
3         ! which the GST will be mapped.
3         !--
3         PAT$GL_ISVADDR[START_ADDRESS] = 200;                          ! Set the address vectors to point to the
```

```
3          PAT$GL_ISVADDR[END_ADDRESS] = 200;                              ! first available addresses in P0 space.
3          EXESECNAM_DESC [0] = 3;
3          EXESECNAM_DESC [1] = GSTSECNAM;
3          EXEFILNAM_DESC [0] = .PAT$GL_OLDNBK[NAM$B_RSL];
3          EXEFILNAM_DESC [1] = PAT$GB_OLDNAME;
3
4          IF NOT (STATUS = LIB$_CREMAPSEC (PAT$GL_ISVADDR
4                                         , PAT$GL_ISVADDR
4                                         , SEC$M_EXPREG
4                                         , EXESECNAM_DESC
4                                         , 0
4                                         , EXEFILNAM_DESC
4                                         , .SYM_TBL_DATA [IHS$W_GSTRECS]
4                                         , .SYM_TBL_DATA [IHS$L_GSTVBN]
4                                         ))
3          THEN
4                  BEGIN
4                  !++
4                  ! Unconditionally make the severity level informational so
4                  ! that the message will be produced with no side effects.
4                  !--
4 !                STATUS[STS$V_SEVERITY] = SYS$K_INFO;
4                  STATUS[STS$V_SEVERITY] = 3;
4                  GST_BEGIN_ADDR =0;
4                  GSR_BEGIN_ADDR =0;
4                  SIGNAL (PAT$_SYSERROR-MSG$K_FATAL+MSG$K_INFO, 0, .STATUS);
4                  SIGNAL(.STATUS);
4                  END
3          ELSE
4                  BEGIN
4                  !++
4                  ! Now skip the first two records because they
4                  ! are module header and module sub-header, respectively.
4                  ! NOTE: this builds in the knowledge of how these
4                  ! usually-RMS records are formatted.
4                  !--
4                  GST_REC_PTR = .PAT$GL_ISVADDR[START_ADDRESS];
4
4                  !++
4                  ! Get to the next record by adding the rounded-up
4                  ! record byte count to the previous beginning
4                  ! virtual address, then adding on 2 because the count
4                  ! field is 2 bytes long.
4                  !--
4                  GST_REC_PTR = .GST_REC_PTR + 2 + ((.GST_REC_PTR[0] +1)/2)*2;
4
4                  !++
4                  ! Now skip the sub-module header.
4                  !--
4                  GST_REC_PTR = .GST_REC_PTR + 2 + ((.GST_REC_PTR[0] +1)/2)*2;
4
4                  !++
4                  ! And this is the address we wanted.  Both the first, and, at this
4                  ! point, the 'next' records, start at this address.
4                  !--
4                  GSR_BEGIN_ADDR = .GST_REC_PTR;
4                  GSR_NEXT_ADDR = .GSR_BEGIN_ADDR;
```

```
; 1145       3502 4
; 1146       3503 4              !++
; 1147       3504 4              ! Tell the inner mechanism how many GST records there will be.
; 1148       3505 4              ! This number is the number that the LINKer gave us, -3,
; 1149       3506 4              ! because of the 2 records we just skipped over, PLUS the
; 1150       3507 4              ! module-end record at the end of the GST.
; 1151       3508 4              !--
; 1152       3509 4              POSITION_GST( .SYM_TBL_DATA[IHS$W_GSTRECS] - 3 );
; 1153       3510 3              END;
; 1154       3511 2       END;                                                  ! For no GSTs.
; 1155       3512 2
; 1156       3513 2 PAT$INIT_RST (.GL_SYM_COUNT);
; 1157       3514 1 END;



                                                                .PSECT  _PAT$PLIT,NOWRT,NOEXE,0

                                       54 53 44 03 00000 P.AAA: .ASCII  <3>\DST\                                    ;
                                       54 53 47 03 00004 P.AAB: .ASCII  <3>\GST\                                    ;

                                                         EXESECNAM=          P.AAA
                                                         GSTSECNAM=          P.AAB


                                                                .PSECT  _PAT$CODE,NOWRT,2

                                              0FFC 00000        .ENTRY  PAT$FIND_DST, Save R2,R3,R4,R5,R6,R7,R8,R9,-; 3217
                                                                        R10,R11                                     ;
                                5B 00000000G EF 9E 00002        MOVAB   LIB$_CREMAPSEC, R11                         ;
                                5A 00000000G EF 9E 00009        MOVAB   PAT$GB_OLDNAME, R10                         ;
                                59 00000000G EF 9E 00010        MOVAB   PAT$GL_OLDNBK+3, R9                         ;
                                58 00000000G EF 9E 00017        MOVAB   PAT$GB_SYMBOLS, R8                          ;
                                57 00000000G EF 9E 0001E        MOVAB   PAT$GL_ISVADDR, R7                          ;
                                56 00000000G 00 9E 00025        MOVAB   LIB$SIGNAL, R6                              ;
                                55 00000000' EF 9E 0002C        MOVAB   DST_BEGIN_ADDR, R5                          ;
                                5E      FDEC CE 9E 00033        MOVAB   -532(SP), SP                                ;
                                50 00000000G EF D0 00038        MOVL    PAT$GL_IMGHDR, R0                           ; 3272
                                51        04 A0 3C 0003F        MOVZWL  4(R0), R1                                   ;
                    52          51           50 C1 00043        ADDL3   R0, R1, R2                                  ;
                                          04 A0 B5 00047        TSTW    4(R0)                                       ; 3296
                                             1A 12 0004A        BNEQ    1$                                          ;
                                          14 A5 D4 0004C        CLRL    GST_BEGIN_ADDR                              ; 3299
                                             65 D4 0004F        CLRL    DST_BEGIN_ADDR                              ; 3300
                                             68 D4 00051        CLRL    PAT$GB_SYMBOLS                              ; 3301
                                    006D81D3 8F DD 00053        PUSHL   #7176659                                    ; 3302
                                66           01 FB 00059        CALLS   #1, LIB$SIGNAL                              ;
                                    006D81CB 8F DD 0005C        PUSHL   #7176651                                    ; 3303
                                66           01 FB 00062        CALLS   #1, LIB$SIGNAL                              ;
                                                04 00065        RET                                                 ; 3298
                                68           01 D0 00066 1$:    MOVL    #1, PAT$GB_SYMBOLS                          ; 3307
                                65        08 A2 3C 00069        MOVZWL  8(R2), DST_BEGIN_ADDR                       ; 3313
                                             06 12 0006D        BNEQ    2$                                          ;
                                             62 D5 0006F        TSTL    (R2)                                        ; 3322
                                             07 12 00071        BNEQ    3$                                          ;
                                             0E 11 00073        BRB     4$                                          ; 3325
                                02           62 D1 00075 2$:    CMPL    (R2), #2                                    ; 3336
```

```
                                         19   14 00078          BGTR    5$                                        ;
                              006D8243   8F   DD 0007A 3$:      PUSHL   #7176771                                  ; 3340
                           66            01   FB 00080          CALLS   #1, LIB$SIGNAL                            ;
                              006D81CB   8F   DD 00083 4$:      PUSHL   #7176651                                  ; 3341
                           66            01   FB 00089          CALLS   #1, LIB$SIGNAL                            ;
                                         65   D4 0008C          CLRL    DST_BEGIN_ADDR                            ; 3342
                                         62   D4 0008E          CLRL    (R2)                                      ; 3343
                                    08   A2   B4 00090          CLRW    8(R2)                                     ; 3344
                       14  A5       0A   A2   3C 00093 5$:      MOVZWL  10(R2), GST_BEGIN_ADDR                    ; 3351
                                         0A   12 00098          BNEQ    6$                                        ;
                       54           04   A2   9E 0009A          MOVAB   4(R2), R4                                 ; 3360
                                         64   D5 0009E          TSTL    (R4)                                      ;
                                         0B   12 000A0          BNEQ    7$                                        ;
                                         12   11 000A2          BRB     8$                                        ; 3363
                       54           04   A2   9E 000A4 6$:      MOVAB   4(R2), R4                                 ; 3374
                       02                64   D1 000A8          CMPL    (R4), #2                                  ;
                                         1A   14 000AB          BGTR    9$                                        ;
                              006D8243   8F   DD 000AD 7$:      PUSHL   #7176771                                  ; 3378
                           66            01   FB 000B3          CALLS   #1, LIB$SIGNAL                            ;
                              006D81D3   8F   DD 000B6 8$:      PUSHL   #7176659                                  ; 3379
                           66            01   FB 000BC          CALLS   #1, LIB$SIGNAL                            ;
                                    14   A5   D4 000BF          CLRL    GST_BEGIN_ADDR                            ; 3380
                                         64   D4 000C2          CLRL    (R4)                                      ; 3381
                                    0A   A2   B4 000C4          CLRW    10(R2)                                    ; 3382
                                         65   D5 000C7 9$:      TSTL    DST_BEGIN_ADDR                            ; 3388
                                         60   13 000C9          BEQL    11$                                       ;
                           67       C8   8F   9A 000CB          MOVZBL  #200, PAT$GL_ISVADDR                      ; 3391
                       04  A7       C8   8F   9A 000CF          MOVZBL  #200, PAT$GL_ISVADDR+4                    ; 3392
                       0C  AE            03   D0 000D4          MOVL    #3, EXESECNAM_DESC                        ; 3393
                       10  AE 00000000'  EF   9E 000D8          MOVAB   EXESECNAM, EXESECNAM_DESC+4               ; 3394
                       04  AE            69   9A 000E0          MOVZBL  PAT$GL_OLDNBK+3, EXEFILNAM_DESC           ; 3395
                       08  AE            6A   9E 000E4          MOVAB   PAT$GB_OLDNAME, EXEFILNAM_DESC+4          ; 3396
                                         62   DD 000E8          PUSHL   (R2)                                      ; 3405
                           7E       08   A2   3C 000EA          MOVZWL  8(R2), -(SP)                              ; 3404
                                    0C   AE   9F 000EE          PUSHAB  EXEFILNAM_DESC                            ; 3398
                                         7E   D4 000F1          CLRL    -(SP)                                     ;
                                    1C   AE   9F 000F3          PUSHAB  EXESECNAM_DESC                            ;
                              00020000   8F   DD 000F6          PUSHL   #131072                                   ;
                                         57   DD 000FC          PUSHL   R7                                        ;
                                         57   DD 000FE          PUSHL   R7                                        ;
                           6B            08   FB 00100          CALLS   #8, LIB$_CREMAPSEC                        ;
                           53            50   D0 00103          MOVL    R0, STATUS                                ;
                           1B            53   E8 00106          BLBS    STATUS, 10$                               ;
53            03                    00   03   F0 00109          INSV    #3, #0, #3, STATUS                        ; 3413
                                         65   D4 0010E          CLRL    DST_BEGIN_ADDR                            ; 3414
                                         53   DD 00110          PUSHL   STATUS                                    ; 3415
                                         7E   D4 00112          CLRL    -(SP)                                     ;
                              00000000G  8F   DD 00114          PUSHL   #PAT$_SYSERROR-1                          ;
                           66            03   FB 0011A          CALLS   #3, LIB$SIGNAL                            ;
                                         53   DD 0011D          PUSHL   STATUS                                    ; 3416
                           66            01   FB 0011F          CALLS   #1, LIB$SIGNAL                            ;
                                         07   11 00122          BRB     11$                                       ; 3398
                           65            67   7D 00124 10$:     MOVQ    PAT$GL_ISVADDR, DST_BEGIN_ADDR            ; 3424
                       08  A5            65   D0 00127          MOVL    DST_BEGIN_ADDR, DST_NEXT_ADDR             ; 3426
                                    14   A5   D5 0012B 11$:     TSTL    GST_BEGIN_ADDR                            ; 3434
                                         5B   13 0012E          BEQL    12$                                       ;
                           67       C8   8F   9A 00130          MOVZBL  #200, PAT$GL_ISVADDR                      ; 3444
```

```
                                    04   A7         C8   8F  9A 00134        MOVZBL  #200, PAT$GL_ISVADDR+4                          ; 3445
                                    0C   AE                03  D0 00139        MOVL    #3, EXESECNAM_DESC                              ; 3446
                                    10   AE  00000000'   EF  9E 0013D        MOVAB   GSTSECNAM, EXESECNAM_DESC+4                     ; 3447
                                    04   AE                69  9A 00145        MOVZBL  PAT$GL_OLDNBK+3, EXEFILNAM_DESC                 ; 3448
                                    08   AE                6A  9E 00149        MOVAB   PAT$GB_OLDNAME, EXEFILNAM_DESC+4                ; 3449
                                                           64  DD 0014D        PUSHL   (R4)                                            ; 3458
                                         7E         0A   A2  3C 0014F        MOVZWL  10(R2), -(SP)                                   ; 3457
                                                    0C   AE  9F 00153        PUSHAB  EXEFILNAM_DESC                                  ; 3451
                                                         7E  D4 00156        CLRL    -(SP)                                           ;
                                                    1C   AE  9F 00158        PUSHAB  EXESECNAM_DESC                                  ;
                                               00020000  8F  DD 0015B        PUSHL   #131072                                         ;
                                                         57  DD 00161        PUSHL   R7                                              ;
                                                         57  DD 00163        PUSHL   R7                                              ;
                                         6B              08  FB 00165        CALLS   #8, LIB$_CREMAPSEC                              ;
                                         53              50  D0 00168        MOVL    R0, STATUS                                      ;
                                         1F              53  E8 0016B        BLBS    STATUS, 13$                                     ;
            53            03             00              03  F0 0016E        INSV    #3, #0, #3, STATUS                              ; 3467
                                                    14   A5  D4 00173        CLRL    GST_BEGIN_ADDR                                  ; 3468
                                                    0C   A5  D4 00176        CLRL    GSR_BEGIN_ADDR                                  ; 3469
                                                         53  DD 00179        PUSHL   STATUS                                          ; 3470
                                                         7E  D4 0017B        CLRL    -(SP)                                           ;
                                              00000000G  8F  DD 0017D        PUSHL   #PAT$_SYSERROR-1                                ;
                                         66              03  FB 00183        CALLS   #3, LIB$SIGNAL                                  ;
                                                         53  DD 00186        PUSHL   STATUS                                          ; 3471
                                         66              01  FB 00188        CALLS   #1, LIB$SIGNAL                                  ;
                                                         34  11 0018B 12$:   BRB     14$                                             ; 3451
                                         51              67  D0 0018D 13$:   MOVL    PAT$GL_ISVADDR, GST_REC_PTR                     ; 3481
                                         50              61  3C 00190        MOVZWL  (GST_REC_PTR), R0                               ; 3489
                                                         50  D6 00193        INCL    R0                                              ;
                                         50              02  C6 00195        DIVL2   #2, R0                                          ;
                                         51         02 A140  3E 00198        MOVAW   2(GST_REC_PTR)[R0], GST_REC_PTR                 ;
                                         50              61  3C 0019D        MOVZWL  (GST_REC_PTR), R0                               ; 3494
                                                         50  D6 001A0        INCL    R0                                              ;
                                         50              02  C6 001A2        DIVL2   #2, R0                                          ;
                                         51         02 A140  3E 001A5        MOVAW   2(GST_REC_PTR)[R0], GST_REC_PTR                 ;
                                    0C   A5              51  D0 001AA        MOVL    GST_REC_PTR, GSR_BEGIN_ADDR                     ; 3500
                                    10   A5         0C   A5  D0 001AE        MOVL    GSR_BEGIN_ADDR, GSR_NEXT_ADDR                   ; 3501
                                         7E         0A   A2  3C 001B3        MOVZWL  10(R2), -(SP)                                   ; 3509
                                         6E              03  C2 001B7        SUBL2   #3, (SP)                                        ;
                             00000000V   EF              01  FB 001BA        CALLS   #1, POSITION_GST                                ;
                                                         6E  DD 001C1 14$:   PUSHL   GL_SYM_COUNT                                    ; 3513
                             00000000G   EF              01  FB 001C3        CALLS   #1, PAT$INIT_RST                                ;
                                                             04 001CA        RET                                                     ; 3514

; Routine Size:  459 bytes,    Routine Base:  _PAT$CODE + 0286
```

```
1 GLOBAL ROUTINE PAT$GET_DST_REC ( REC_ID ) =
1
1 !++
1 ! FUNCTIONAL DESCRIPTION:
1 !
1 !       Make the indicated DST record available.
1 !
1 ! FORMAL PARAMETERS:
1 !
1 !       REC_ID  - The ID of the record we are to fetch.
1 !                 This ID must be one which was previously returned
1 !                 by a call to PAT$GET_NXT_DST.
1 !
1 ! IMPLICIT INPUTS:
1 !
1 !       NONE
1 !
1 ! IMPLICIT OUTPUTS:
1 !
1 !       NONE
1 !
1 ! COMPLETION CODES:
1 !
1 !       0, if the indicated record does not exist,
1 !       the address of where is can now be referenced, otherwise.
1 !
1 ! SIDE EFFECTS:
1 !
1 !       The DST record is made available.
1 !
1 !--
1
2 BEGIN
2
2 BIND
2       DST_RECRD = .REC_ID : DST_RECORD;
2
2 !++
2 ! If there is no DST, simply return as though we were asked to read one
2 ! past the last one. (The interface's notion of EOF).
2 !--
3 IF (.DST_BEGIN_ADDR EQL 0)
2 THEN
2       RETURN(0);
2
2 !++
2 ! The record ID is the same as the virtual address at which it can be
2 ! referenced.  The next record, then, is simply the one which is virtually
2 ! contiguous to this one, excepting for the case of the last record.
2 ! Here we are lenient - we say that the DST ended OK if one asks for a
2 ! record which is past the end marker, OR, if the count field
2 ! for a supposed 'next' record is 0.
2 !--
3 IF (.REC_ID EQL .DST_END_ADDR +1)
2 THEN
2       RETURN(0);
2
```

```
; 1216          3572  2 !++
; 1217          3573  2 ! Now that it is safe, check for 0-length records.
; 1218          3574  2 !--
; 1219          3575  3 IF (.DST_RECRD [DSTR_SIZE] EQL 0)
; 1220          3576  2 THEN
; 1221          3577  2         RETURN(0);
; 1222          3578  2
; 1223          3579  2 !++
; 1224          3580  2 ! Then check that the ID is valid.
; 1225          3581  2 !--
; 1226          3582  3 IF (.REC_ID LSSA .dst_begin_addr)   OR    (.REC_ID GTRA .dst_end_addr)
; 1227          3583  2 THEN
; 1228          3584  3         BEGIN
; 1229          3585  3         !++
; 1230          3586  3         ! This should not happen - we check and report
; 1231          3587  3         ! errors here only to help us while debugging.
; 1232          3588  3         !--
; 1233          3589  3         SIGNAL (PAT$_INVDSTREC);                                    ! Severe error
; 1234          3590  3         RETURN(0);
; 1235          3591  2         END;
; 1236          3592  2
; 1237          3593  2 RETURN( .REC_ID );
; 1238          3594  1 END;



                                        000C 00000          .ENTRY  PAT$GET_DST_REC, Save R2,R3                        ; 3515
                         53 00000000'  EF   9E 00002          MOVAB   DST_END_ADDR, R3                                   ;
                         52       04   AC   D0 00009          MOVL    REC_ID, R2                                         ; 3550
                         51       FC   A3   D0 0000D          MOVL    DST_BEGIN_ADDR, R1                                 ; 3556
                                       2A   13 00011          BEQL    3$                                                 ;
              50         63            01   C1 00013          ADDL3   #1, DST_END_ADDR, R0                               ; 3568
                         50            52   D1 00017          CMPL    R2, R0                                             ;
                                       21   13 0001A          BEQL    3$                                                 ;
                                       62   95 0001C          TSTB    (R2)                                               ; 3575
                                       1D   13 0001E          BEQL    3$                                                 ;
                         51            52   D1 00020          CMPL    R2, R1                                             ; 3582
                                       05   1F 00023          BLSSU   1$                                                 ;
                         63            52   D1 00025          CMPL    R2, DST_END_ADDR                                   ;
                                       0F   1B 00028          BLEQU   2$                                                 ;
                            006D80E2   8F   DD 0002A 1$:      PUSHL   #7176418                                           ; 3589
                 00000000G  00         01   FB 00030          CALLS   #1, LIB$SIGNAL                                     ;
                                       04   11 00037          BRB     3$                                                 ; 3590
                         50            52   D0 00039 2$:      MOVL    R2, R0                                             ; 3593
                                            04 0003C          RET                                                        ;
                                       50   D4 0003D 3$:      CLRL    R0                                                 ; 3594
                                            04 0003F          RET                                                        ;

; Routine Size:  64 bytes,    Routine Base:  _PAT$CODE + 0451
```

```
1 GLOBAL ROUTINE PAT$POSITON_DST ( REC_ID ) =
1
1 !++
1 ! FUNCTIONAL DESCRIPTION:
1 !
1 !        Make the indicated DST record available in such
1 !        a way that PAT$GET_NXT_DST's idea of 'next' is
1 !        defined to be the one after this routine fetches.
1 !
1 ! FORMAL PARAMETERS:
1 !
1 !        REC_ID  - The ID of the record we are to fetch.
1 !                  This ID must be one which was previously returned
1 !                  by a call to PAT$GET_NXT_DST.
1 !
1 ! IMPLICIT INPUTS:
1 !
1 !        NONE
1 !
1 ! IMPLICIT OUTPUTS:
1 !
1 !        NONE
1 !
1 ! COMPLETION CODES:
1 !
1 !        0, if the indicated record does not exist,
1 !        the address of where is can now be referenced, otherwise.
1 !
1 ! SIDE EFFECTS:
1 !
1 !        The DST record is made available.
1 !        The 'next' DST record is henceforth defined to
1 !        be the one after the one fetched by this call.
1 !
1 !--
1
2 BEGIN
2
2 LOCAL
2        REC_ADDR : REF DST_RECORD;
2
2 !++
2 ! PAT$GET_DST_REC does most of the work -
2 ! we just include the above-described side effect.
2 !--
3 IF ((REC_ADDR = PAT$GET_DST_REC( .REC_ID )) EQL 0 )
2 THEN
2        RETURN(0);
2
2 !++
2 ! RE-initialize INT's notion of 'next' DST record.
2 !--
2 DST_NEXT_ADDR = .REC_ADDR + .REC_ADDR [DSTR_SIZE] +1;
2 RETURN( .REC_ADDR );
1 END;
```

```
                                   0000 00000           .ENTRY  PAT$POSITON_DST, Save nothing                       ; 3595
                          04    AC   DD 00002           PUSHL   REC_ID                                              ; 3640
          B7   AF               01   FB 00005           CALLS   #1, PAT$GET_DST_REC                                 ;
                                50   D5 00009           TSTL    REC_ADDR                                            ;
                                0D   13 0000B           BEQL    1$                                                  ;
               51               60   9A 0000D           MOVZBL  (REC_ADDR), R1                                      ; 3647
    00000000'  EF        01 A140     9E 00010           MOVAB   1(R1)[REC_ADDR], DST_NEXT_ADDR                      ;
                                     04 00019           RET                                                         ; 3648
                                50   D4 0001A 1$:       CLRL    R0                                                  ; 3649
                                     04 0001C           RET                                                         ;

; Routine Size:  29 bytes,    Routine Base:  _PAT$CODE + 0491
```

```
1 ROUTINE POSITION_GST ( GST_REC_COUNT ) =
1
1 !++
1 ! FUNCTIONAL DESCRIPTION:
1 !
1 !       This routine, if called with a positive value initializes its OWN
1 !       storage to remember the number of RMS-type records in the GST.
1 !       If it is called with a negative or zero value, it returns the address
1 !       of the next RMS-type record in the GST.  A negative value also causes
1 !       the pointers to be positioned at the start of the GST.
1 !
1 ! FORMAL PARAMETERS:
1 !
1 !       GST_REC_COUNT   - The number of RMS records in the GST.
1 !                         (negative value) re-position to start and return
1 !                         address of first GLOBAL.
1 !                         (zero) return address of the next GLOBAL.
1 !
1 ! IMPLICIT INPUTS:
1 !
1 !       GSR_BEGIN_ADDR  - Holds the starting address of the GST.
1 !                         If the value is not GTR 0 or 1, then the GST
1 !                         has not been mapped in so this routine returns 0.
1 !
1 ! IMPLICIT OUTPUTS:
1 !
1 !       GSR_NEXT_ADDR   - Holds the address of the next RMS record in the GST
1 !                         or the GST was not mapped in.
1 !
1 ! ROUTINE VALUE:
1 !
1 !       0               - If there are no more records in the GST.
1 !       non-zero        - The address of the next GST RMS record.
1 !
1 ! SIDE EFFECTS:
1 !
1 !       The next GST record can now be accessed, and an OWN pointer to the next
1 !       one is maintained.  The number of GST records yet to go is also updated
1 !       so that the end of the GST can be detected.
1 !
1 !--
1
2 BEGIN
2
2 OWN
2       TOTAL_RECORDS,
2       RECORDS_LEFT;
2
2 LOCAL
2       BLOCK_ADDR;
2
2 !++
2 ! If there is no mapped GST, then return 0, no atter why this routine
2 ! was called.
2 !--
3 IF (NOT .GSR_BEGIN_ADDR GTRA 1)
2 THEN
```

```
; 1353          3707  2             RETURN(0);
; 1354          3708  2
; 1355          3709  3     IF (.GST_REC_COUNT GTR 0)
; 1356          3710  2     THEN
; 1357          3711  3             BEGIN
; 1358          3712  3             TOTAL_RECORDS = .GST_REC_COUNT;
; 1359          3713  3             RETURN (0);
; 1360          3714  2             END;
; 1361          3715  2
; 1362          3716  3     IF (.GST_REC_COUNT NEQ 0)
; 1363          3717  2     THEN
; 1364          3718  3             BEGIN
; 1365          3719  3             GSR_NEXT_ADDR = .GSR_BEGIN_ADDR;
; 1366          3720  3             RECORDS_LEFT  = .TOTAL_RECORDS;
; 1367          3721  2             END;
; 1368          3722  2
; 1369          3723  2     !++
; 1370          3724  2     ! Stop the following from faulting if some caller ignores the end condition and
; 1371          3725  2     ! effectively causes us to 'run off the end' of the mapped GST.
; 1372          3726  2     !--
; 1373          3727  3     IF (NOT .RECORDS_LEFT GEQ 1)
; 1374          3728  2     THEN
; 1375          3729  2             RETURN(0);
; 1376          3730  2
; 1377          3731  2     !++
; 1378          3732  2     ! Pick up the address of the current record, and update the pointer to the
; 1379          3733  2     ! subsequent one.
; 1380          3734  2     !--
; 1381          3735  2     BLOCK_ADDR = .GSR_NEXT_ADDR + 2;
; 1382          3736  2     GSR_NEXT_ADDR = .GSR_NEXT_ADDR + 2 + ((.GSR_NEXT_ADDR[0] +1)/2)*2;
; 1383          3737  2     RECORDS_LEFT = .RECORDS_LEFT - 1;
; 1384          3738  2     RETURN (.BLOCK_ADDR);
; 1385          3739  1     END;


                                                           .PSECT  _PAT$OWN,NOEXE,2

                                          00024 TOTAL_RECORDS:
                                                           .BLKB   4
                                          00028 RECORDS_LEFT:
                                                           .BLKB   4


                                                           .PSECT  _PAT$CODE,NOWRT,2

                                     000C 00000 POSITION_GST:
                                                           .WORD   Save R2,R3                                  ; 3650
              53 00000000'   EF  9E 00002                 MOVAB   GSR_NEXT_ADDR, R3                           ;
              01         FC  A3  D1 00009                 CMPL    GSR_BEGIN_ADDR, #1                          ; 3705
                             34  1B 0000D                 BLEQU   3$                                          ;
              50         04  AC  D0 0000F                 MOVL    GST_REC_COUNT, R0                           ; 3709
                             06  15 00013                 BLEQ    1$                                          ;
         10   A3             50  D0 00015                 MOVL    R0, TOTAL_RECORDS                           ; 3712
                             28  11 00019                 BRB     3$                                          ; 3713
                             09  13 0001B 1$:             BEQL    2$                                          ; 3716
              63      FC   A3  D0 0001D         MOVL    GSR_BEGIN_ADDR, GSR_NEXT_ADDR         ; 3719
        14    A3      10   A3  D0 00021         MOVL    TOTAL_RECORDS, RECORDS_LEFT           ; 3720
                      14   A3  D5 00026  2$:    TSTL    RECORDS_LEFT                          ; 3727
                           18  15 00029         BLEQ    3$                                    ;
              52           63  D0 0002B         MOVL    GSR_NEXT_ADDR, R2                     ; 3735
              50      02   A2  9E 0002E         MOVAB   2(R2), BLOCK_ADDR                     ;
              51           62  3C 00032         MOVZWL  (R2), R1                              ; 3736
                           51  D6 00035         INCL    R1                                    ;
              51           02  C6 00037         DIVL2   #2, R1                                ;
              63      02 A241  3E 0003A         MOVAW   2(R2)[R1], GSR_NEXT_ADDR              ;
                      14   A3  D7 0003F         DECL    RECORDS_LEFT                          ; 3737
                               04 00042         RET                                           ; 3738
                           50  D4 00043  3$:    CLRL    R0                                    ; 3739
                               04 00045         RET                                           ;

; Routine Size:  70 bytes,    Routine Base:  _PAT$CODE + 04AE
; 1387          3740  1 GLOBAL ROUTINE PAT$GET_NXT_DST ( REC_ID_PTR ) =
; 1388          3741  1
; 1389          3742  1 !++
; 1390          3743  1 ! FUNCTIONAL DESCRIPTION:
; 1391          3744  1 !
; 1392          3745  1 !       Make the next DST record available,
; 1393          3746  1 !       and return both a pointer to where it
; 1394          3747  1 !       can now be referenced, as well as an ID
; 1395          3748  1 !       for it so that we can ask for it later.
; 1396          3749  1 !
; 1397          3750  1 ! FORMAL PARAMETERS:
; 1398          3751  1 !
; 1399          3752  1 !       REC_ID_PTR - the address of where this routine will
; 1400          3753  1 !                    stuff the ID it wants subsequent calls
; 1401          3754  1 !                    to PAT$GET_DST_REC to use to refer
; 1402          3755  1 !                    to the record fetched by this call.
; 1403          3756  1 !
; 1404          3757  1 ! IMPLICIT INPUTS:
; 1405          3758  1 !
; 1406          3759  1 !       To be defined.
; 1407          3760  1 !       (whatever context these routines work from).
; 1408          3761  1 !
; 1409          3762  1 ! IMPLICIT OUTPUTS:
; 1410          3763  1 !
; 1411          3764  1 !       none
; 1412          3765  1 !
; 1413          3766  1 ! COMPLETION CODES:
; 1414          3767  1 !
; 1415          3768  1 !       0, if the indicated record does not exist,
; 1416          3769  1 !       the address of where is can now be referenced, otherwise.
; 1417          3770  1 !
; 1418          3771  1 ! SIDE EFFECTS:
; 1419          3772  1 !
; 1420          3773  1 !       The DST record after the last one fetched is made available.
; 1421          3774  1 !       If no record has yet been fetched, the first record in
; 1422          3775  1 !       the DST is made available.
; 1423          3776  1 !
; 1424          3777  1 !--
; 1425          3778  1
; 1426          3779  2 BEGIN
; 1427          3780  2
; 1428          3781  2 MAP
; 1429          3782  2       REC_ID_PTR : REF VECTOR[,LONG];
; 1430          3783  2
; 1431          3784  2 !++
; 1432          3785  2 ! Since for us record IDs are the same as their virtual addresses, we can get
; 1433          3786  2 ! the next one the same way we can get ANY one.  The only detail to fill in is
; 1434          3787  2 ! passing back the ID for this next one.
; 1435          3788  2 !--
; 1436          3789  2 RETURN(REC_ID_PTR[0] = PAT$POSITON_DST( .DST_NEXT_ADDR ));
; 1437          3790  1 END;


                                       0000 00000        .ENTRY  PAT$GET_NXT_DST, Save nothing              ; 3740
```

```
                              00000000'   EF  DD 00002         PUSHL   DST_NEXT_ADDR                              ; 3789
                  91    AF                01  FB 00008         CALLS   #1, PAT$POSITON_DST                        ;
                  04    BC                50  D0 0000C         MOVL    R0, @REC_ID_PTR                            ;
                                              04 00010         RET                                                ; 3790

; Routine Size:  17 bytes,    Routine Base:  _PAT$CODE + 04F4
```

```
GLOBAL ROUTINE PAT$GET_NXT_GST (ACCESS_FLAG) =

!++
! Functional description:
!
!       This routine returns the address of a fixed length record that
!       contains a global symbol name and its associated value. This
!       routine expects to be called repeatedly until each global symbol
!       has been returned to the caller.
!
!       Before this routine is ever called, the location of the GST in
!       the image file is found, and it is mapped into PATCH's image.
!       The address of this buffer is held in the OWN variable GST_BEGIN_ADDR.
!       This routine analyzes the GST record, and moves through the buffer,
!       returning the buffer address of each global symbol entry as it is seen.
!       When the buffer is exhausted, this routine reads in the next GST record.
!       It halts at end of file and returns a value of zero to the caller.
!
!       This routine keeps the variable GST_BEGIN_ADDR up to date.
!
!       The format of one of these concatenated records is a single
!       leading byte containing the value 1, indicating that the record
!       is indeed a GSD record. The variable GST_BEGIN_ADDR addresses
!       the byte following this leading byte.
!
!       Each entry in the record has a fixed number of overhead
!       bytes followed by a symbol name that is a variable number of
!       bytes. The entries we are interested in processing are the
!       global symbol definitions, entry point symbol and mask
!       definitions, and procedure definitions with formal argument descriptions.
!       The other defined type, PSECT definition, is noted only because it
!       must be successfully passed over.  The format of each of these types is
!       illustrated below:
!
!
!       Global symbol definition:
!
!                   -----------------
!       0           !  GSD type 1   !
!                   -----------------
!       1           !  data type    !       ignored for now
!                   -----------------
!       2           !     flag      !       bit 1 set means that this is
!       3           !     bytes     !       a definition. ignore bit 0.
!                   -----------------
!       4           ! psect index   !       ignored.
!                   -----------------
!       5           !               !
!                   !     value     !       4 bytes
!                   !               !
!                   -----------------
!       9           !               !
!                   !    symbol     !       stock counted character
!                   !     name      !       string.
!                   !               !
!                   -----------------
!
```

```
1 !     The entry point symbol and mask definition entry is identical to
1 !     the global symbol definition illustrated above, with the
1 !     addition of a two byte field for the procedure's register save
1 !     mask. This two byte field is located after the symbol value
1 !     field (which is an entry point address).
1 !
1 !             -----------------
1 !     0       !   GSD type 2  !
1 !             -----------------
1 !     1       !   data type   !       ignored for now
1 !             -----------------
1 !     2       !     flag      !       not relevant for
1 !     3       !     bytes     !       entry point def.
1 !             -----------------
1 !     4       !  psect index  !       ignored
1 !             -----------------
1 !             !               !
1 !     5       !     value     !       4 bytes
1 !             !               !
1 !             -----------------
1 !     9       !   register    !       ignored,
1 !     10      !   save mask   !       2 bytes
1 !             -----------------
1 !     11      !               !
1 !             !    symbol     !       stock counted character
1 !             !     name      !       string
1 !             !               !
1 !             -----------------
1 !
1 !     The procedure definition with formal argument descriptions is
1 !     identical to the entry point with mask definition above, save
1 !     that it has some additional fields.  There is a minimum number
1 !     of arguments byte and a maximum number of arguments byte.  These
1 !     are followed by a formal argument description for each possible
1 !     argument (i.e., the maximum number).  The formal argument descriptions
1 !     consist of an argument value control byte and a remaining count byte.
1 !     The remaining count byte tells the number of bytes in the detailed
1 !     argument description (from 0 to 255).
1 !
1 !             -----------------
1 !     0       !   GSD type 3  !
1 !             -----------------
1 !     1       !   data type   !       ignored for now
1 !             -----------------
1 !     2       !     flag      !       bit 1 set means that this is
1 !     3       !     bytes     !       a definition. ignore bit 0.
1 !             -----------------
1 !     4       !  psect index  !       ignored
1 !             -----------------
1 !             !               !
1 !     5       !     value     !       4 bytes
1 !             !               !
1 !             -----------------
1 !     9       !   register    !       ignored,
1 !     10      !   save mask   !       2 bytes
1 !             -----------------
1 !     11      !               !
```

```
1 !                     !    symbol      !      stock counted character
1 !                     !     name       !      string
1 !                     !                !
1 !                     ------------------
1 !                     ! min # act arg  !      1 byte
1 !                     ------------------
1 !                     ! max # act arg  !      1 byte
1 !                     ------------------
1 !                     ! formal arg #1  !
1 !                     !  description   !
1 !                     ------------------
1 !                     !       .        !
1 !                     !       .        !
1 !                     !       .        !
1 !                     ------------------
1 !                     ! formal arg #n  !
1 !                     !  description   !
1 !                     ------------------
1 !
1 !          Each formal argument description has the following format:
1 !
1 !                     ------------------
1 !          0          ! arg. val. ctl.!       1 byte
1 !                     ------------------
1 !          1          ! rem. byte cnt.!       1 byte
1 !                     ------------------
1 !                     !    detailed    !      anywhere
1 !                     !    argument    !      from 0-255
1 !                     !  description   !      bytes
1 !                     ------------------
1 !
1 !          PSECT definition:
1 !
1 !                     ------------------
1 !          0          !   GSD type 0   !
1 !                     ------------------
1 !          1          !   alignment    !
1 !                     ------------------
1 !          2          !      flag      !
1 !          3          !     bytes      !
1 !                     ------------------
1 !          4          !                !
1 !                     !   allocation   !      4 bytes
1 !                     !                !
1 !                     ------------------
1 !          8          !                !
1 !                     !    symbol      !      stock counted character
1 !                     !     name       !      string.
1 !                     !                !
1 !                     ------------------
1 !
1 !
1 !          PSECT definition in a Shareable Image:
1 !
1 !                     ------------------
1 !          0          !   GSD type 0   !
1 !                     ------------------
```

```
; 1610          3962  1 !         1       !   alignment    !
; 1611          3963  1 !                 ------------------
; 1612          3964  1 !         2       !      flag      !
; 1613          3965  1 !         3       !     bytes      !
; 1614          3966  1 !                 ------------------
; 1615          3967  1 !         4       !                !
; 1616          3968  1 !                 !   allocation   !        4 bytes
; 1617          3969  1 !                 !                !
; 1618          3970  1 !                 ------------------
; 1619          3971  1 !         8       !  base address  !
; 1620          3972  1 !                 ! within Share-  !        4 bytes
; 1621          3973  1 !                 !  able Image    !
; 1622          3974  1 !                 ------------------
; 1623          3975  1 !         12      !                !
; 1624          3976  1 !                 !     symbol     !        stock counted character
; 1625          3977  1 !                 !      name      !        string.
; 1626          3978  1 !                 !                !
; 1627          3979  1 !                 ------------------
; 1628          3980  1 !
; 1629          3981  1 ! Calling sequence:
; 1630          3982  1 !
; 1631          3983  1 !       CALLS #0, PAT$GET_NXT_GST
; 1632          3984  1 !
; 1633          3985  1 ! Inputs:
; 1634          3986  1 !
; 1635          3987  1 !       none
; 1636          3988  1 !
; 1637          3989  1 ! Implicit inputs:
; 1638          3990  1 !
; 1639          3991  1 !       GST_BEGIN_ADDR  - Current address of record buffer
; 1640          3992  1 !
; 1641          3993  1 ! Outputs:
; 1642          3994  1 !
; 1643          3995  1 !       The address of the next global symbol entry, or 0, if EOF.
; 1644          3996  1 !
; 1645          3997  1 ! Implicit outputs:
; 1646          3998  1 !
; 1647          3999  1 !       GST_BEGIN_ADDR is updated to address the next entry.
; 1648          4000  1 !
; 1649          4001  1 ! Routine value:
; 1650          4002  1 !
; 1651          4003  1 !       An address or 0
; 1652          4004  1 !
; 1653          4005  1 ! Side effects:
; 1654          4006  1 !
; 1655          4007  1 !       Another record may be read in.
; 1656          4008  1 !--
; 1657          4009  1
; 1658          4010  2 BEGIN
; 1659          4011  2
; 1660          4012  2 LOCAL
; 1661          4013  2         OLD_ADDRESS : REF BLOCK [, BYTE];
; 1662          4014  2
; 1663          4015  2 LABEL
; 1664          4016  2         GET_RECORD;
; 1665          4017  2
; 1666          4018  3 IF (.ACCESS_FLAG NEQ 0)
```

```
2 THEN
3         BEGIN
4         IF ((GST_BEGIN_ADDR = POSITION_GST(-1)) EQL 0)
3         THEN
3                 GST_BEGIN_ADDR = %X'FFFFFFFF';
3         RETURN(0);
2         END;
2
2 !++
2 ! See whether the current buffer address is beyond the
2 ! end of the last GST record we looked at.  Note that we
2 ! rounded up GSR_NEXT_ADDR when calculating where the next
2 ! GST record will begin.  Therefore we must temporarily round
2 ! it down again when comparing it with GST_BEGIN_ADDR since it
2 ! may point to the last unused byte in a GST record.
2 !--
2 REPEAT
2 GET_RECORD:
3         BEGIN
3         !++
3         ! First check that there is a GST in this image.
3         !--
4         IF (.GST_BEGIN_ADDR EQL 0)
3         THEN
3                 RETURN(0);
3
4         IF (.GST_BEGIN_ADDR GEQA .GSR_NEXT_ADDR-1)
3         THEN
4                 BEGIN
4                 !++
4                 ! Record was finished.  Check that there are more records.
4                 ! If so, then get another record.
4                 !--
5                 IF ((GST_BEGIN_ADDR = POSITION_GST(0)) EQL 0)
4                 THEN
5                         RETURN(0)
4                 ELSE
5                         BEGIN
5                         !++
5                         ! If the next record is a GST record, then initialize
5                         ! the variable GST_BEGIN_ADDR to point to the first
5                         ! global symbol definition block in this record.
5                         !--
5                         LOCAL
5                                 BUFFER_ADDRESS : REF VECTOR [, BYTE];
5
5                         BUFFER_ADDRESS = .GST_BEGIN_ADDR;
5                         IF .BUFFER_ADDRESS [GST_RECORD_TYPE] EQL GST_TYPE
5                         THEN
5                                 GST_BEGIN_ADDR = .GST_BEGIN_ADDR + 1
5                         ELSE
6                                 BEGIN
6                                 !++
6                                 ! This record is not a GST record.
6                                 ! Go on to the next.
6                                 !--
6                                 GST_BEGIN_ADDR = %X'FFFFFFFF';
```

```
; 1724         4076   6                         LEAVE GET_RECORD;
; 1725         4077   5                         END;
; 1726         4078   4                 END;
; 1727         4079   4         END
; 1728         4080   3 ELSE
; 1729         4081   4         BEGIN
; 1730         4082   4         !++
; 1731         4083   4         ! This is a global symbol. Save its address.
; 1732         4084   4         ! Then update the variable GST_BEGIN_ADDR to
; 1733         4085   4         ! point to the next symbol.
; 1734         4086   4         !--
; 1735         4087   4         OLD_ADDRESS = .GST_BEGIN_ADDR;
; 1736         4088   4         CASE .OLD_ADDRESS [ENTRY_TYPE] FROM GSD$C_PSC TO GSD$C_SPSC OF
; 1737         4089   4
; 1738         4090   4                 SET
; 1739         4091   4
; 1740         4092   4                 [GSD$C_PSC]:
; 1741         4093   5                         BEGIN
; 1742         4094   5                         GST_BEGIN_ADDR = .OLD_ADDRESS +
; 1743         4095   6                                         (OLD_ADDRESS[GPS$T_NAME] - OLD_ADDRESS[GPS$T_START])
; 1744         4096   5                                         + .OLD_ADDRESS [GPS$B_NAMLNG];
; 1745         4097   4                         END;
; 1746         4098   4
; 1747         4099   4
; 1748         4100   4                 [GSD$C_SYM]:
; 1749         4101   5                         BEGIN
; 1750         4102   5                         GST_BEGIN_ADDR = .OLD_ADDRESS +
; 1751         4103   6                                         (OLD_ADDRESS[SDF$T_NAME] - OLD_ADDRESS[SDF$T_START])
; 1752         4104   5                                         + .OLD_ADDRESS [SDF$B_NAMLNG];
; 1753         4105   5                         RETURN .OLD_ADDRESS
; 1754         4106   4                         END;
; 1755         4107   4
; 1756         4108   4
; 1757         4109   4                 [GSD$C_EPM]:
; 1758         4110   5                         BEGIN
; 1759         4111   5                         GST_BEGIN_ADDR = .OLD_ADDRESS +
; 1760         4112   6                                         (OLD_ADDRESS[EPM$T_NAME] - OLD_ADDRESS[EPM$T_START])
; 1761         4113   5                                         + .OLD_ADDRESS [EPM$B_NAMLNG];
; 1762         4114   5                         RETURN .OLD_ADDRESS
; 1763         4115   4                         END;
; 1764         4116   4
; 1765         4117   4
; 1766         4118   4                 [GSD$C_PRO]:
; 1767         4119   5                         BEGIN
; 1768         4120   5                         LOCAL
; 1769         4121   5                                 NUM_ARGS;               ! Max formal args
; 1770         4122   5                         GST_BEGIN_ADDR = .OLD_ADDRESS +
; 1771         4123   6                                         (OLD_ADDRESS[EPM$T_NAME] - OLD_ADDRESS[EPM$T_START])
; 1772         4124   5                                         + .OLD_ADDRESS [EPM$B_NAMLNG];
; 1773         4125   5                         NUM_ARGS = .GST_BEGIN_ADDR[GST_P_MAX_ARG];
; 1774         4126   5                         GST_BEGIN_ADDR = .GST_BEGIN_ADDR + MINMAX_OVERHEAD;
; 1775         4127   6                         WHILE (.NUM_ARGS GTR 0)
; 1776         4128   5                         DO
; 1777         4129   6                                 BEGIN
; 1778         4130   6                                 GST_BEGIN_ADDR = .GST_BEGIN_ADDR +
; 1779         4131   6                                                  .GST_BEGIN_ADDR[GST_P_REM_CNT] + ARGDSC_OVERHEAD;
; 1780         4132   6                                 NUM_ARGS = .NUM_ARGS - 1;
; 1781          4133  5                                         END;
; 1782          4134  5                                 RETURN .OLD_ADDRESS
; 1783          4135  4                                 END;
; 1784          4136  4
; 1785          4137  4
; 1786          4138  4                         [GSD$C_SPSC]:
; 1787          4139  5                                 BEGIN
; 1788          4140  5                                 GST_BEGIN_ADDR = .OLD_ADDRESS +
; 1789          4141  6                                                 (OLD_ADDRESS[SGPS$T_NAME] - OLD_ADDRESS[SGPS$T_START])
; 1790          4142  5                                                         + .OLD_ADDRESS [SGPS$B_NAMLNG];
; 1791          4143  4                                 END;
; 1792          4144  4
; 1793          4145  4
; 1794          4146  4                         [INRANGE]:
; 1795          4147  5                                 BEGIN
; 1796          4148  5                                 GST_BEGIN_ADDR = %X'FFFFFFFF';
; 1797          4149  4                                 END;
; 1798          4150  4
; 1799          4151  4                         [OUTRANGE]:
; 1800          4152  5                                 BEGIN
; 1801          4153  5                                 GST_BEGIN_ADDR = %X'FFFFFFFF';
; 1802          4154  4                                 END;
; 1803          4155  4
; 1804          4156  4                         TES;
; 1805          4157  4
; 1806          4158  3                 END;
; 1807          4159  2         END;
; 1808          4160  1 END;
; INFO#212              L1:4025
; Null expression appears in value-required context




                              003C 00000          .ENTRY  PAT$GET_NXT_GST, Save R2,R3,R4,R5                    ; 3791
       55        A4   AF   9E 00002          MOVAB   POSITION_GST, R5                                      ;
       54 00000000'   EF   9E 00006          MOVAB   GST_BEGIN_ADDR, R4                                    ;
                 04   AC   D5 0000D          TSTL    ACCESS_FLAG                                           ; 4018
                      11   13 00010          BEQL    2$                                                    ;
       7E             01   CE 00012          MNEGL   #1, -(SP)                                             ; 4021
       65             01   FB 00015          CALLS   #1, POSITION_GST                                      ;
       64             50   D0 00018          MOVL    R0, GST_BEGIN_ADDR                                    ;
                      03   12 0001B          BNEQ    1$                                                    ;
       64             01   CE 0001D          MNEGL   #1, GST_BEGIN_ADDR                                    ; 4023
                    00D2   31 00020 1$:      BRW     15$                                                   ; 4024
       50             64   D0 00023 2$:      MOVL    GST_BEGIN_ADDR, R0                                    ; 4041
                      F8   13 00026          BEQL    1$                                                    ;
 51       FC   A4     01   C3 00028          SUBL3   #1, GSR_NEXT_ADDR, R1                                 ; 4045
       51             50   D1 0002D          CMPL    R0, R1                                                ;
                      16   1F 00030          BLSSU   3$                                                    ;
                      7E   D4 00032          CLRL    -(SP)                                                 ; 4052
       65             01   FB 00034          CALLS   #1, POSITION_GST                                      ;
       64             50   D0 00037          MOVL    R0, GST_BEGIN_ADDR                                    ;
                      E4   13 0003A          BEQL    1$                                                    ;
       50             64   D0 0003C          MOVL    GST_BEGIN_ADDR, BUFFER_ADDRESS                        ; 4065
       01             60   91 0003F          CMPB    (BUFFER_ADDRESS), #1                                  ; 4066
```

```
                                                        25 12 00042       BNEQ    5$                                      ;
                                                        64 D6 00044       INCL    GST_BEGIN_ADDR                          ; 4068
                                                        DB 11 00046       BRB     2$                                      ;
                                          52            50 D0 00048 3$:   MOVL    R0, OLD_ADDRESS                         ; 4087
                          0C              00            62 8F 0004B       CASEB   (OLD_ADDRESS), #0, #12                  ; 4088
        0059            0045            0031          001D    0004F 4$:   .WORD   6$-4$,-                                 ;
        00A1            00A1            00A1          00A1    00057               8$-4$,-                                 ;
        00A1            00A1            00A1          00A1    0005F               9$-4$,-                                 ;
                                                      008D    00067               10$-4$,-                                ;
                                                                                  14$-4$,-                                ;
                                                                                  14$-4$,-                                ;
                                                                                  14$-4$,-                                ;
                                                                                  14$-4$,-                                ;
                                                                                  14$-4$,-                                ;
                                                                                  14$-4$,-                                ;
                                                                                  14$-4$,-                                ;
                                                                                  14$-4$,-                                ;
                                                                                  13$-4$                                  ;
                                                      0084 31 00069 5$:   BRW     14$                                     ; 4153
                          50              52            52 C3 0006C 6$:   SUBL3   OLD_ADDRESS, OLD_ADDRESS, R0            ; 4095
                                          50            52 C0 00070       ADDL2   OLD_ADDRESS, R0                         ; 4094
                                          51      08    A2 9A 00073       MOVZBL  8(OLD_ADDRESS), R1                      ; 4096
                                          50            51 C0 00077       ADDL2   R1, R0                                  ;
                                          64      09    A0 9E 0007A       MOVAB   9(R0), GST_BEGIN_ADDR                   ;
                                                        A3 11 0007E 7$:   BRB     2$                                      ; 4088
                          50              52            52 C3 00080 8$:   SUBL3   OLD_ADDRESS, OLD_ADDRESS, R0            ; 4103
                                          50            52 C0 00084       ADDL2   OLD_ADDRESS, R0                         ; 4102
                                          51      09    A2 9A 00087       MOVZBL  9(OLD_ADDRESS), R1                      ; 4104
                                          50            51 C0 0008B       ADDL2   R1, R0                                  ;
                                          64      0A    A0 9E 0008E       MOVAB   10(R0), GST_BEGIN_ADDR                  ;
                                                        44 11 00092       BRB     12$                                     ; 4105
                          50              52            52 C3 00094 9$:   SUBL3   OLD_ADDRESS, OLD_ADDRESS, R0            ; 4112
                                          50            52 C0 00098       ADDL2   OLD_ADDRESS, R0                         ; 4111
                                          51      0B    A2 9A 0009B       MOVZBL  11(OLD_ADDRESS), R1                     ; 4113
                                          50            51 C0 0009F       ADDL2   R1, R0                                  ;
                                          64      0C    A0 9E 000A2       MOVAB   12(R0), GST_BEGIN_ADDR                  ;
                                                        30 11 000A6       BRB     12$                                     ; 4114
                          50              52            52 C3 000A8 10$:  SUBL3   OLD_ADDRESS, OLD_ADDRESS, R0            ; 4123
                                          50            52 C0 000AC       ADDL2   OLD_ADDRESS, R0                         ; 4122
                                          51      0B    A2 9A 000AF       MOVZBL  11(OLD_ADDRESS), R1                     ; 4124
                                          50            51 C0 000B3       ADDL2   R1, R0                                  ;
                                          64      0C    A0 9E 000B6       MOVAB   12(R0), GST_BEGIN_ADDR                  ;
                                          50            64 D0 000BA       MOVL    GST_BEGIN_ADDR, R0                      ; 4125
                                          53      01    A0 9A 000BD       MOVZBL  1(R0), NUM_ARGS                         ;
                                          64            02 C0 000C1       ADDL2   #2, GST_BEGIN_ADDR                      ; 4126
                                                        53 D5 000C4 11$:  TSTL    NUM_ARGS                                ; 4127
                                                        10 15 000C6       BLEQ    12$                                     ;
                                          51            64 D0 000C8       MOVL    GST_BEGIN_ADDR, R1                      ; 4130
                                          50      01    A1 9A 000CB       MOVZBL  1(R1), R0                               ; 4131
                                          64      02  A140 9E 000CF       MOVAB   2(R1)[R0], GST_BEGIN_ADDR               ;
                                                        53 D7 000D4       DECL    NUM_ARGS                                ; 4132
                                                        EC 11 000D6       BRB     11$                                     ; 4127
                                          50            52 D0 000D8 12$:  MOVL    OLD_ADDRESS, R0                         ; 4134
                                                           04 000DB       RET                                             ;
                          50              52            52 C3 000DC 13$:  SUBL3   OLD_ADDRESS, OLD_ADDRESS, R0            ; 4141
                                          50            52 C0 000E0       ADDL2   OLD_ADDRESS, R0                         ; 4140
                                          51      0C    A2 9A 000E3       MOVZBL  12(OLD_ADDRESS), R1                     ; 4142
```

```
                               50            51  C0 000E7           ADDL2   R1, R0                                ;
                               64       0D   A0  9E 000EA           MOVAB   13(R0), GST_BEGIN_ADDR                ;
                                             8E  11 000EE           BRB     7$                                    ; 4088
                               64            01  CE 000F0 14$:      MNEGL   #1, GST_BEGIN_ADDR                    ; 4148
                                             89  11 000F3           BRB     7$                                    ; 4025
                                             50  D4 000F5 15$:      CLRL    R0                                    ; 4160
                                                 04 000F7           RET                                           ;

; Routine Size:  248 bytes,    Routine Base:  _PAT$CODE + 0505
; 1810      4161  1 GLOBAL ROUTINE PAT$RST_FREEZ ( UNITS ) =
; 1811      4162  1
; 1812      4163  1 !++
; 1813      4164  1 ! FUNCTIONAL DESCRIPTION:
; 1814      4165  1 !
; 1815      4166  1 !       Isolate storage allocation for the RST builder/manipulator.
; 1816      4167  1 !       i.e. Do exactly what PAT$FREEZ does for the rest of
; 1817      4168  1 !       PATCH, but take care of any differences (which may
; 1818      4169  1 !       or may not exits), when it is the RST interface
; 1819      4170  1 !       which wants the storage.
; 1820      4171  1 !
; 1821      4172  1 !       For now, there IS a difference - an RST-pointer is
; 1822      4173  1 !       returned, NOT the usual longword pointer.  RST-pointers
; 1823      4174  1 !       are something internal to the RST builder/manipulator,
; 1824      4175  1 !       and it doesn't want to ever see anything but RST-pointers
; 1825      4176  1 !       (even if someday RST-pointers are the same thing as
; 1826      4177  1 !       virtual addresses).  This is really the motivation for
; 1827      4178  1 !       having PAT$RST_FREEZ.
; 1828      4179  1 !
; 1829      4180  1 ! Formal Parameters:
; 1830      4181  1 !
; 1831      4182  1 !       UNITS - the number of units of storage which are
; 1832      4183  1 !               required.  This unit will remain whatever
; 1833      4184  1 !               unit PAT$FREEZ knows about.
; 1834      4185  1 !
; 1835      4186  1 ! Implicit Inputs:
; 1836      4187  1 !
; 1837      4188  1 !       See PAT$FREEZ
; 1838      4189  1 !
; 1839      4190  1 ! Implicit Outputs:
; 1840      4191  1 !
; 1841      4192  1 !       See PAT$FREEZ
; 1842      4193  1 !
; 1843      4194  1 ! Routine Value:
; 1844      4195  1 !
; 1845      4196  1 !       0, if something goes wrong, an RST-pointer to the
; 1846      4197  1 !       allocated storage, otherwise.
; 1847      4198  1 !
; 1848      4199  1 ! Side Effects:
; 1849      4200  1 !
; 1850      4201  1 !       See PAT$FREEZ
; 1851      4202  1 !--
; 1852      4203  1
; 1853      4204  2 BEGIN
; 1854      4205  2 LOCAL
; 1855      4206  2         STORAGE_PTR;
; 1856      4207  2
; 1857      4208  2 STORAGE_PTR = PAT$FREEZ( .UNITS );
; 1858      4209  2
; 1859      4210  2 !++
; 1860      4211  2 ! Currently an RST-pointer is just like a virtual
; 1861      4212  2 ! address except that the top 16 bits are 0 in the
; 1862      4213  2 ! former, and hex 7FFF0000 in the latter.
; 1863      4214  2 ! NOTE:  THIS IS ONLY TRUE IF THE DEBUGGER INDICATOR IS TURNED OFF IN
; 1864      4215  2 ! PAT$FREE_INIT.  IF IT IS TURNED ON, THEN THE STORAGE IS OWN STORAGE, NOT
; 1865      4216  2 ! CONTAINED IN SYSTEM SPACE.
; 1866      4217  2 !--
; 1867        4218  2 RETURN( .STORAGE_PTR - .PAT$GL_RST_BEGN );
; 1868        4219  2
; 1869        4220  1 END;



                                          0000 00000        .ENTRY  PAT$RST_FREEZ, Save nothing                      ; 4161
                                04    AC  DD 00002          PUSHL   UNITS                                            ; 4208
                    00000000G  EF     01  FB 00005          CALLS   #1, PAT$FREEZ                                    ;
                          50 00000000G  EF  C2 0000C        SUBL2   PAT$GL_RST_BEGN, R0                              ; 4218
                                          04 00013          RET                                                      ; 4220

; Routine Size:  20 bytes,    Routine Base:  _PAT$CODE + 05FD
```

```
1 GLOBAL ROUTINE PAT$RST_RELEASE ( RST_PTR, SIZE ) : NOVALUE =
1
1 !++
1 ! FUNCTIONAL DESCRIPTION:
1 !
1 !       Isolate storage deallocation for all storage which
1 !       is accessed via RST-pointers.
1 !
1 !       i.e. Do exactly what PAT$FREERELEASE does for the rest of
1 !       PATCH, but take care of any differences (which may
1 !       or may not exits), when it is the RST interface
1 !       which wants to free up this special-access storage.
1 !
1 !       For now, there IS a difference - an RST-pointer is
1 !       given to indicate which storage to free up.  This makes
1 !       PAT$RST_RELEASE the inverse of PAT$RST_FREEZ, just
1 !       as is true for the standard PATCH storage primitives.
1 !
1 ! Formal Parameters:
1 !
1 !  RST_PTR - this indicates which storage
1 !               is to be freed.  This must be the same as
1 !               one which was returned by DBG$RST_FREEZ.
1 !  SIZE        -The number of units which corresponds
1 !               to the storage to be freed.
1 !
1 ! Implicit Inputs:
1 !
1 !       See PAT$FREEZ
1 !
1 ! Implicit Outputs:
1 !
1 !       See PAT$FREEZ
1 !
1 ! Routine Value
1 !
1 !       NOVALUE
1 !
1 ! Side Effects:
1 !
1 !       See PAT$FREEZ
1 !--
1
2 BEGIN
2
2 !++
2 ! Currently an RST-pointer is just like a virtual
2 ! address except that the top 16 bits are 0 in
2 ! in the former and hex 7FFF0000 in the latter.
2 !--
2 PAT$FREERELEASE( .RST_PTR + .PAT$GL_RST_BEGN, .SIZE );
1 END;
```

```
                                         0000 00000          .ENTRY  PAT$RST_RELEASE, Save nothing               ; 4221
                                08   AC    DD 00002          PUSHL   SIZE                                        ; 4271
              7E        04   AC 00000000G  EF    C1 00005          ADDL3   PAT$GL_RST_BEGN, RST_PTR, -(SP)             ;
                 00000000G   EF              02    FB 0000E          CALLS   #2, PAT$FREERELEASE                         ;
                                              04 00015          RET                                                 ; 4272

; Routine Size:  22 bytes,    Routine Base:  _PAT$CODE + 0611
; 1924          4273  1 END                                          ! End of module
; 1925          4274  0 ELUDOM



                                                          .EXTRN  LIB$SIGNAL

;                               PSECT SUMMARY
;
;       Name                     Bytes                     Attributes
;
;    _PAT$OWN                       44  NOVEC,  WRT,  RD ,NOEXE,NOSHR,  LCL,  REL,  CON,NOPIC,ALIGN(2)
;    _PAT$CODE                    1575  NOVEC,NOWRT,  RD ,  EXE,NOSHR,  LCL,  REL,  CON,NOPIC,ALIGN(2)
;    _ ABS  .                        0  NOVEC,NOWRT,NORD ,NOEXE,NOSHR,  LCL,  ABS,  CON,NOPIC,ALIGN(0)
;    _PAT$PLIT                       8  NOVEC,NOWRT,  RD ,NOEXE,NOSHR,  LCL,  REL,  CON,NOPIC,ALIGN(0)




;                           Library Statistics
;
;                                          -------- Symbols --------     Pages      Processing
;       File                               Total    Loaded  Percent      Mapped     Time
;
;    _$255$DUA28:[SYSLIB]LIB.L32;1         18619       32         0      1000         00:01.8




; Information:  1
; Warnings:     0
; Errors:       0



;                               COMMAND QUALIFIERS

;       BLISS/CHECK=(FIELD,INITIAL,OPTIMIZE)/VARIANT:1/LIS=LIS$:PATINT/OBJ=OBJ$:PATINT MSRC$:PATINT/UPDATE=(ENH$:PATINT)

; Size:           1575 code + 52 data bytes
; Run Time:          00:47.7
; Elapsed Time:      02:43.1
; Lines/CPU Min:       5378
; Lexemes/CPU-Min: 30094
; Memory Used:  252 pages
; Compilation Complete
```

0301 AH-BT13A-SE
VAX/VMS V4.0

DIGITAL EQUIPMENT CORPORATION
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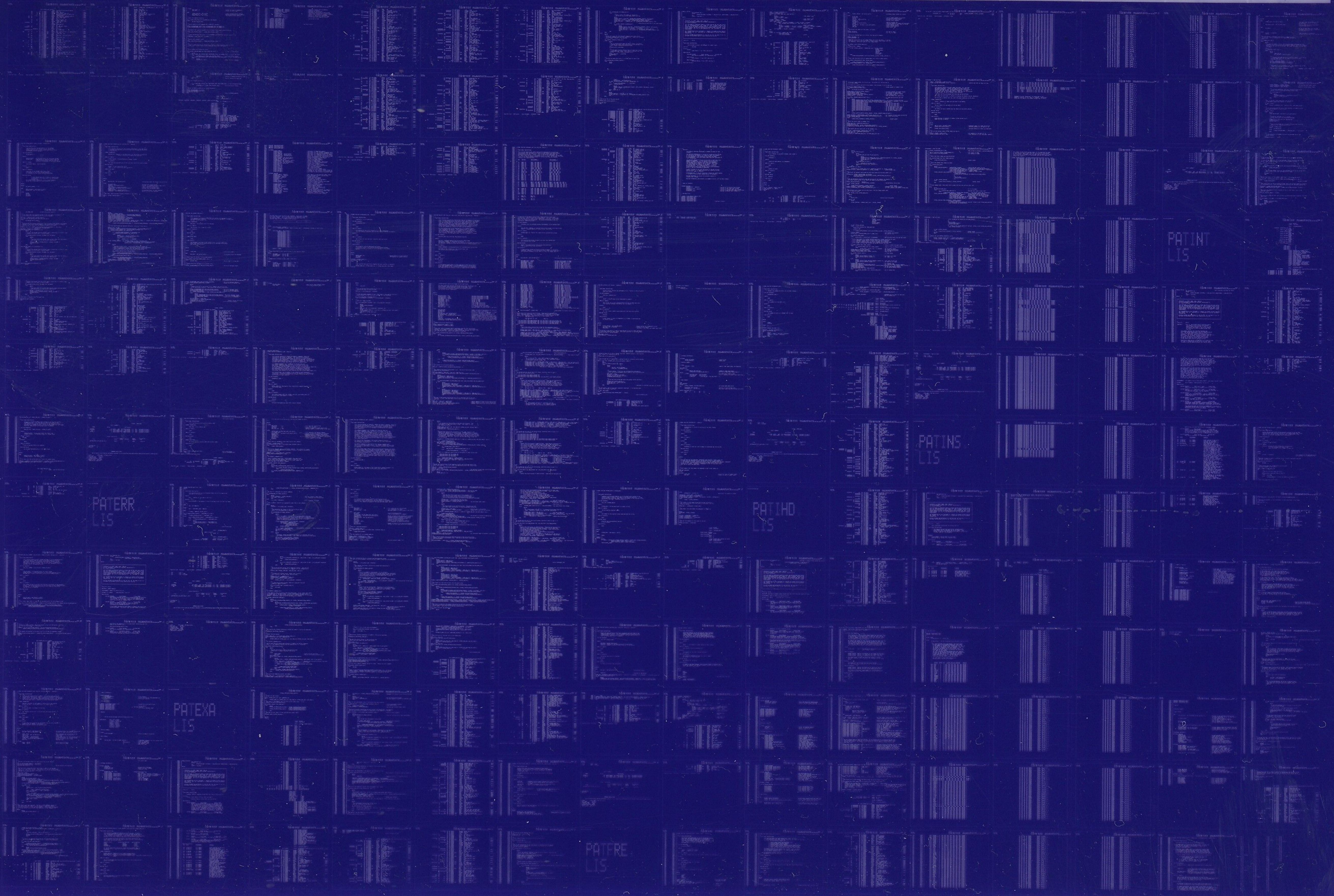

PATINT
LIS

PATINS
LIS

PATERR
LIS

PATIHD
LIS

PATEXA
LIS

PATFRE
LIS

0302 AH-BT13A-SE
VAX/VMS V4.0

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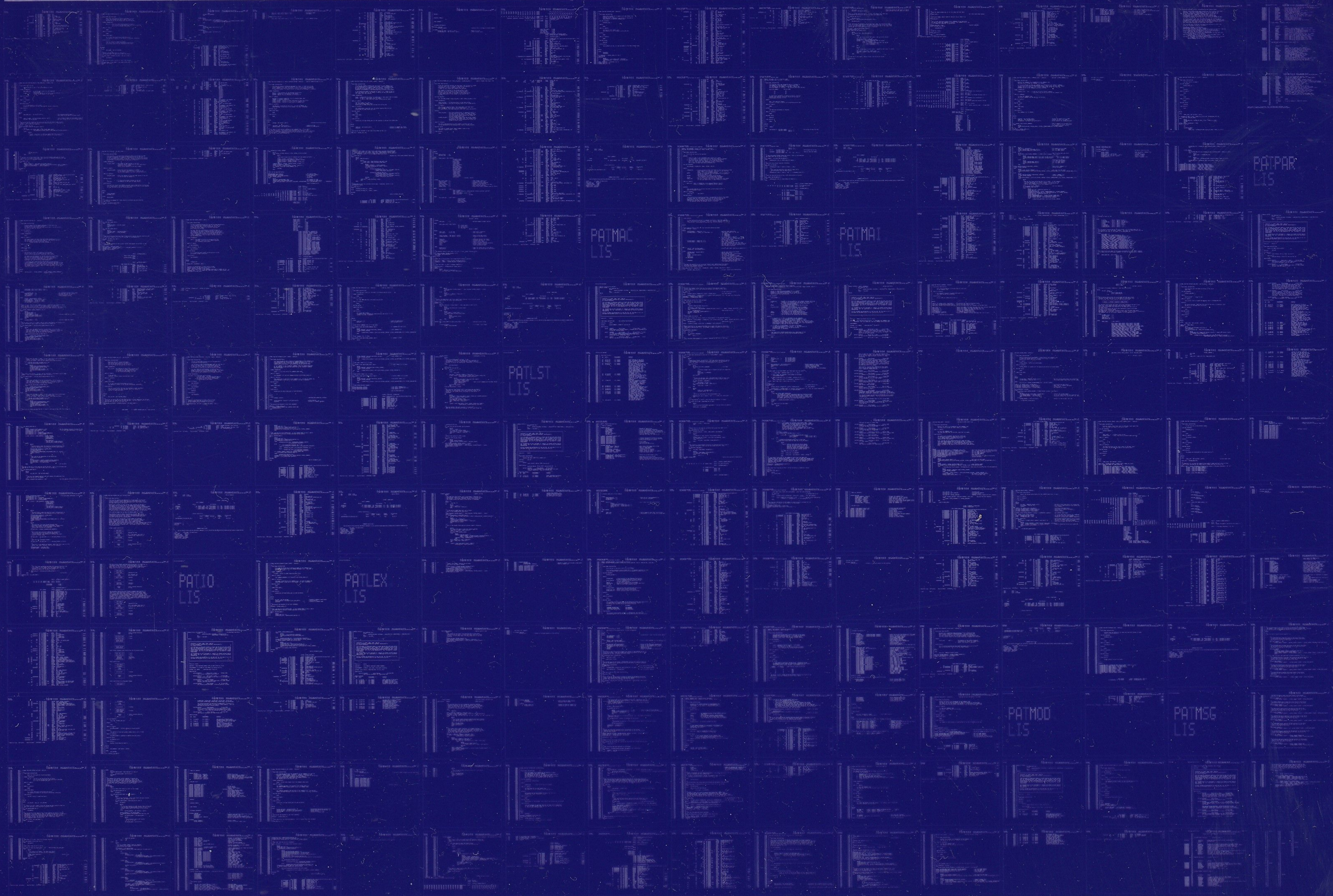

PATPAR
LIS

PATMAC
LIS

PATMAI
LIS

PATLST
LIS

PATIO
LIS

PATLEX
LIS

PATMOD
LIS

PATMSG
LIS