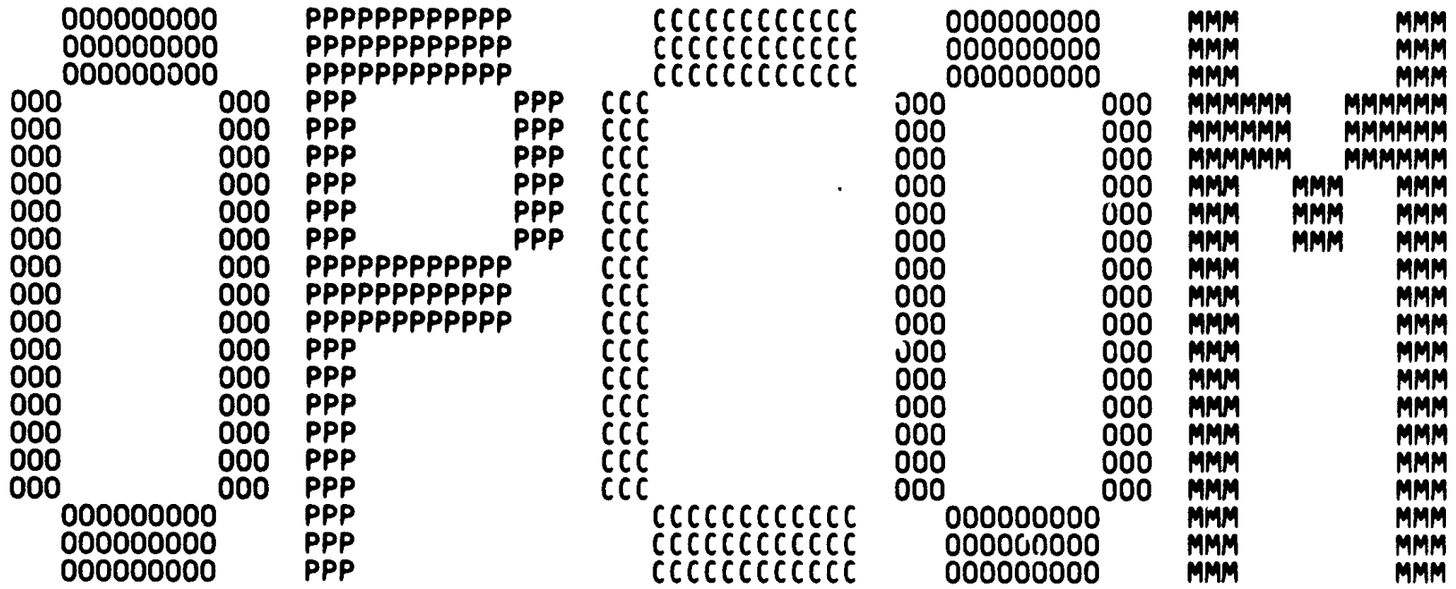

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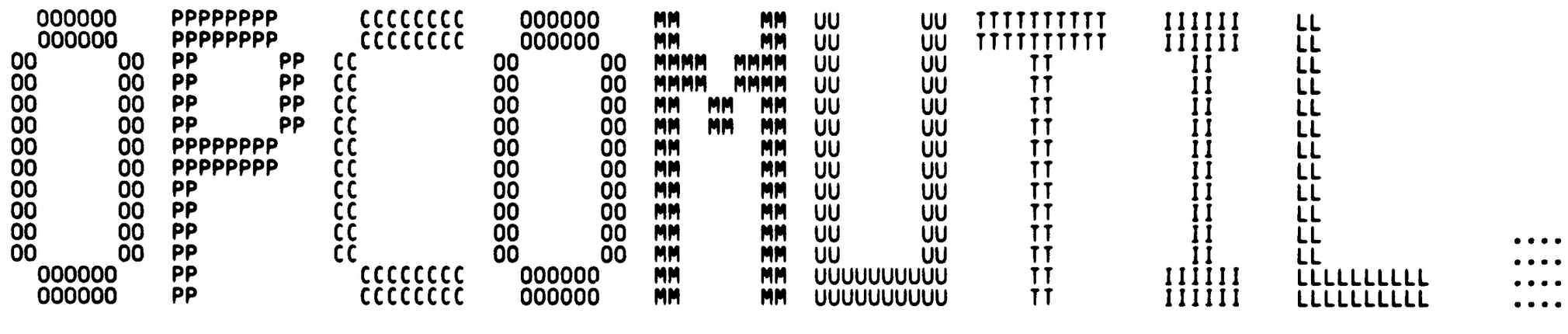

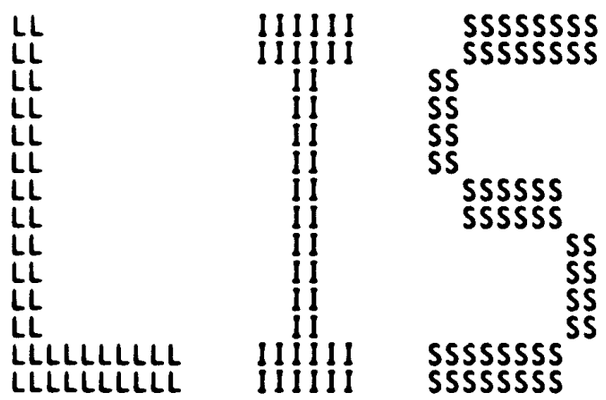

OP
VO

```
;     1          0001  0 MODULE  OPC$OPCOMUTIL   (
;     2          0002  0                         LANGUAGE (BLISS32),
;     3          0003  0                         IDENT = 'V04-000'
;     4          0004  0                        ) =
;     5          0005  0
;     6          0006  0 !*****************************************************************************
;     7          0007  0 !*                                                                           *
;     8          0008  0 !*  COPYRIGHT (c) 1978, 1980, 1982, 1984 BY                                 *
;     9          0009  0 !*  DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS.                   *
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;    18          0018  0 !*                                                                           *
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;    20          0020  0 !*  AND  SHOULD  NOT  BE  CONSTRUED AS  A COMMITMENT BY DIGITAL EQUIPMENT   *
;    21          0021  0 !*  CORPORATION.                                                             *
;    22          0022  0 !*                                                                           *
;    23          0023  0 !*  DIGITAL ASSUMES NO RESPONSIBILITY FOR THE USE  OR  RELIABILITY OF ITS   *
;    24          0024  0 !*  SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DIGITAL.                  *
;    25          0025  0 !*                                                                           *
;    26          0026  0 !*                                                                           *
;    27          0027  0 !*****************************************************************************
;    28          0028  0
;    29          0029  0 !++
;    30          0030  0 ! FACILITY:
;    31          0031  0 !
;    32          0032  0 !       OPCOM
;    33          0033  0 !
;    34          0034  0 ! ABSTRACT:
;    35          0035  0 !
;    36          0036  0 !       This module contains all the various and sundry general
;    37          0037  0 !       purpose utility routines used by OPCOM's request handlers.
;    38          0038  0 !
;    39          0039  0 ! Environment:
;    40          0040  0 !
;    41          0041  0 !       VAX/VMS operating system.
;    42          0042  0 !
;    43          0043  0 ! Author:
;    44          0044  0 !
;    45          0045  0 !       Steven T. Jeffreys
;    46          0046  0 !
;    47          0047  0 ! Creation date:
;    48          0048  0 !
;    49          0049  0 !       March 10, 1981
;    50          0050  0 !
;    51          0051  0 ! Revision history:
;    52          0052  0 !
;    53          0053  0 !       V03-006 CWH3169         CW Hobbs                        5-May-1984
;    54          0054  0 !               Second pass for cluster-wide OPCOM:
;    55          0055  0 !                - Take BYPASS privilege to write to the user's mailbox,
;    56          0056  0 !                  don't let strange protections get in the way.
;    57          0057  0 !                - Add conditional assembly code to dump messages which
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;    58          0058  0 !                   are going back to the operator.
;    59          0059  0 !
;    60          0060  0 !       V03-005 RSH0116         R. Scott Hanna                  14-Mar-1984
;    61          0061  0 !               FORMAT_MESSAGE / Replace the use of the local literal
;    62          0062  0 !               MESSAGE_LENGTH with the symbol OPC$K_MAXMESSAGE.
;    63          0063  0 !
;    64          0064  0 !       V03-004 CWH3004         CW Hobbs                        30-Oct-1983
;    65          0065  0 !               Remove linefeed at front of message, magtape ACP doesn't
;    66          0066  0 !               recognize the replies.
;    67          0067  0 !
;    68          0068  0 !       V03-003 CWH3003         CW Hobbs                        16-Sep-1983
;    69          0069  0 !               Fix accvio caused by appending the final line-feed as a
;    70          0070  0 !               longword.  Use jacket routines for VM calls.
;    71          0071  0 !
;    72          0072  0 !       V03-002 CWH3001         CW Hobbs                        30-Jul-1983
;    73          0073  0 !               Various and sundry things to make OPCOM distributed
;    74          0074  0 !               across the cluster.
;    75          0075  0 !
;    76          0076  0 ! V03-001       STJ51320        Steven T. Jeffreys,     01-Dec-1982
;    77          0077  0 !               Fix message length problem in SEND_REPLY.
;    78          0078  0 !
;    79          0079  0 ! V02-004       STJ0159         Steven T. Jeffreys,     08-Feb-1982
;    80          0080  0 !               Include a 'bell' character in front of each message
;    81          0081  0 !               that is formatted.  Care must be taken to insure that
;    82          0082  0 !               the 'bell' is not output to the log file.
;    83          0083  0 !
;    84          0084  0 ! V02-003       STJ0091         Steven T. Jeffreys,     13-Aug-1981
;    85          0085  0 !               Suppress facility code for INITAPE and BLANKTAPE.
;    86          0086  0 !
;    87          0087  0 ! V02-002       STJ0044         Steven T. Jeffreys,     23-May-1981
;    88          0088  0 !               Modify FORMAT_MESSAGE to suppress facility code for
;    89          0089  0 !               RQSTCMPLTE, RQSTABORT, and RQSTPEND messages.  This
;    90          0090  0 !               is necessary to enable existing code to parse the
;    91          0091  0 !               operator reply messages.
;    92          0092  0 !
;    93          0093  0 !--
;    94          0094  0
;    95          0095  1 BEGIN                                           ! Start of OPCOMUTIL
;    96          0096  1
;    97          0097  1 LIBRARY 'SYS$LIBRARY:LIB.L32';
;    98          0098  1 LIBRARY 'LIB$:OPCOMLIB';
;    99          0099  1
;   100          0100  1 FORWARD ROUTINE
;   101          0101  1         CHECK_REQUEST,                  ! Common sanity checks
;   102          0102  1         FIND_OCD,                       ! Find an OCD with a given UIC or SCOPE
;   103          0103  1         FORMAT_MESSAGE,                 ! Format an OPCOM message for output
;   104          0104  1         INTERPRET_MASK,                 ! Interpret an attention mask
;   105          0105  1         SEND_REPLY,                     ! Send a reply to a requestor
;   106          0106  1         TRIM_LENGTH,                    ! Length of text of blank padded string
;   107          0107  1
;   108          0108  1 BUILTIN
;   109          0109  1
;   110          0110  1         INSQUE,                         ! Insert entry onto a queue
;   111          0111  1         REMQUE;                         ! Remove entry from a queue
;   112          0112  1
```

```
;  114     0113  1 GLOBAL ROUTINE CHECK_REQUEST (BUFFER_DESC, BLOCK) =
;  115     0114  1
;  116     0115  1 !++
;  117     0116  1 ! Functional description:
;  118     0117  1 !
;  119     0118  1 !       None.
;  120     0119  1 !
;  121     0120  1 ! Input:
;  122     0121  1 !
;  123     0122  1 !       BUFFER_DESC     : Address of a quadword buffer descriptor that
;  124     0123  1 !                         points to the buffer containing the request
;  125     0124  1 !                         read from the operator mailbox.
;  126     0125  1 !
;  127     0126  1 ! Implicit Input:
;  128     0127  1 !
;  129     0128  1 !       None.
;  130     0129  1 !
;  131     0130  1 ! Output:
;  132     0131  1 !
;  133     0132  1 !       RQCB            : Address of longword to receive the
;  134     0133  1 !                         address of an RQCB block.
;  135     0134  1 !
;  136     0135  1 ! Implict output:
;  137     0136  1 !
;  138     0137  1 !       None.
;  139     0138  1 !
;  140     0139  1 ! Side effects:
;  141     0140  1 !
;  142     0141  1 !       The RQCB block is partially filled in.
;  143     0142  1 !
;  14.     0143  1 ! Routine value:
;  145     0144  1 !
;  146     0145  1 !       TRUE            : The request passed the sanity checks
;  147     0146  1 !       <anything else> : The request failed a sanity check
;  148     0147  1 !--
;  149     0148  1
;  150     0149  2 BEGIN                                           ! Start of CHECK_REQUEST
;  151     0150  2
;  152     0151  2 MAP
;  153     0152  2         BUFFER_DESC     : $ref_bblock;          ! Buffer descriptor
;  154     0153  2
;  155     0154  2 EXTERNAL ROUTINE
;  156     0155  2         ALLOCATE_DS;                            ! Allocate a data structure
;  157     0156  2
;  158     0157  2 EXTERNAL LITERAL
;  159     0158  2         RQCB_K_TYPE,                            ! RQCB structure type
;  160     0159  2         MIN_SCOPE,                              ! Minimum scope value
;  161     0160  2         MAX_SCOPE;                              ! Maximum scope value
;  162     0161  2
;  163     0162  2 LOCAL
;  164     0163  2         RQCB            : $ref_bblock,          ! RQCB structure
;  165     0164  2         MSG             : $ref_bblock,          ! Pointer to request
;  166     0165  2         STATUS          : LONG;
;  167     0166  2
;  168     0167  2 .BLOCK = 0;                                     ! Assume the request will fail
;  169     0168  2 !
;  170     0169  2 ! Create a pointer to the request independent data within the message buffer.
```

```
;  171          0170  2 !
;  172          0171  2 MSG = .BUFFER_DESC [DSC$A_POINTER] + OPC$K_COMHDRSIZ;
;  173          0172  2 !
;  174          0173  2 ! If the SCOPE is bogus, then ignore the request.
;  175          0174  2 !
;  176          0175  3 IF (.MSG [OPC$B_SCOPE] LSS MIN_SCOPE) OR (.MSG [OPC$B_SCOPE] GTR MAX_SCOPE)
;  177          0176  2 THEN
;  178          0177  2     RETURN (SS$_BADPARAM);
;  179          0178  2 !
;  180          0179  2 ! Allocate an RQCB
;  181          0180  2 !
;  182          0181  3 IF NOT (STATUS = ALLOCATE_DS (RQCB_K_TYPE,RQCB))
;  183          0182  2 THEN
;  184          0183  2     RETURN (.STATUS);
;  185          0184  2 !
;  186          0185  2 ! Copy the request independent data to the RQCB.
;  187          0186  2 !
;  188          0187  2 CH$MOVE ((SBYTEOFFSET(RQCB_L_MCB) - SBYTEOFFSET(RQCB_W_MSGTYPE)),
;  189          0188  2          .BUFFER_DESC [DSC$A_POINTER],
;  190          0189  2          RQCB [RQCB_W_MSGTYPE]
;  191          0190  2         );
;  192          0191  2 !
;  193          0192  2 ! Set the lengths of the blank-padded strings
;  194          0193  2 !
;  195          0194  2 RQCB [RQCB_W_USERNAMELEN] = TRIM_LENGTH (RQCB_S_USERNAME, RQCB [RQCB_T_USERNAME]);
;  196          0195  2 RQCB [RQCB_W_ACCOUNTLEN] = TRIM_LENGTH (RQCB_S_ACCOUNT, RQCB [RQCB_T_ACCOUNT]);
;  197          0196  2 !
;  198          0197  2 ! Default the UIC to the sender's UIC.
;  199          0198  2 !
;  200          0199  2 IF .RQCB [RQCB_L_UIC] EQL 0
;  201          0200  2 THEN
;  202          0201  2     RQCB [RQCB_L_UIC] = .RQCB [RQCB_L_SENDERUIC];          ! Set UIC
;  203          0202  2
;  204          0203  2 .BLOCK = .RQCB;                                 ! Set RQCB address
;  205          0204  2 RETURN (TRUE);                                  ! If we get this far, it's ok.
;  206          0205  1 END;                                            ! End of CHECK_REQUEST


                                                                        .TITLE  OPC$OPCOMUTIL
                                                                        .IDENT  \V04-000\

                                                                        .EXTRN  ALLOCATE_DS, RQCB_K_TYPE
                                                                        .EXTRN  MIN_SCOPE, MAX_SCOPE

                                                                        .PSECT  $CODE$,NOWRT,2

                                                 007C 00000             .ENTRY  CHECK_REQUEST, Save R2,R3,R4,R5,R6      ; 0113
                                              5E 04 C2 00002            SUBL2   #4, SP                                  ;
                                           08 BC D4 00005               CLRL    @BLOCK                                  ; 0167
                                              52 04 AC D0 00008         MOVL    BUFFER_DESC, R2                         ; 0171
                                        50 04 A2 26 C1 0000C            ADDL3   #38, 4(R2), MSG                         ;
00000000G 8F    01 A0          08       00 ED 00011                     CMPZV   #0, #8, 1(MSG), #MIN_SCOPE              ; 0175
                                         0C 19 0001B                    BLSS    1$                                      ;
00000000G 8F    01 A0          08       00 ED 0001D                     CMPZV   #0, #8, 1(MSG), #MAX_SCOPE              ;
                                         04 15 00027                    BLEQ    2$                                      ;
                                     50  14 D0 00029 1$:                MOVL    #20, R0                                 ; 0177
                                         04 0002C                       RET                                             ;
```

```
                                                5E  DD 0002D 2$:    PUSHL   SP                                      ; 0181
                                 00000000G      8F  DD 0002F        PUSHL   #RQCB_K_TYPE
                          0000G  CF             02  FB 00035        CALLS   #2, ALLOCATE_DS                         ;
                                 38             50  E9 0003A        BLBC    STATUS, 4$                              ;
                                 56             6E  D0 0003D        MOVL    RQCB, R6                                ; 0189
                    2C    A6       04   B2      0040  8F  28 00040  MOVC3   #64, @4(R2), 44(R6)                    ;
                                                 3C  A6  9F 00048  PUSHAB  60(R6)                                  ; 0194
                                                 0C  DD  0004B     PUSHL   #12                                     ;
                          0000V  CF              02  FB  0004D     CALLS   #2, TRIM_LENGTH                         ;
                            74   A6              50  B0  00052     MOVW    R0, 116(R6)                             ;
                                                 48  A6  9F 00056  PUSHAB  72(R6)                                  ; 0195
                                                 08  DD  00059     PUSHL   #8                                      ;
                          0000V  CF              02  FB  0005B     CALLS   #2, TRIM_LENGTH                         ;
                            76   A6              50  B0  00060     MOVW    R0, 118(R6)                             ;
                                                 68  A6  D5 00064  TSTL    104(R6)                                 ; 0199
                                                 05  12  00067     BNEQ    3$                                      ;
                            68   A6       38     A6  D0  00069     MOVL    56(R6), 104(R6)                         ; 0201
                            08   BC              56  D0  0006E 3$: MOVL    R6, @BLOCK                              ; 0203
                                 50              01  D0  00072     MOVL    #1, R0                                  ; 0204
                                                     04  00075 4$:  RET                                             ; 0205

; Routine Size:  118 bytes,    Routine Base:  $CODE$ + 0000
```

```
;  208          0206  1 GLOBAL ROUTINE FIND_OCD (SCOPE, UIC, BLOCK) =
;  209          0207  1
;  210          0208  1 !++
;  211          0209  1 ! Functional description:
;  212          0210  1 !
;  213          0211  1 !       This routine will scan through the OCD data base and locate the
;  214          0212  1 !       OCD described by the given SCOPE and UIC.
;  215          0213  1 !
;  216          0214  1 ! Input:
;  217          0215  1 !
;  218          0216  1 !       SCOPE   : The SCOPE of the target OCD.
;  219          0217  1 !       UIC     : The UIC of the target OCD.
;  220          0218  1 !
;  221          0219  1 ! Implicit Input:
;  222          0220  1 !
;  223          0221  1 !       None.
;  224          0222  1 !
;  225          0223  1 ! Output:
;  226          0224  1 !
;  227          0225  1 !       BLOCK   : Address of a longword to receive the address of the OCD.
;  228          0226  1 !                 If the OCD is not found, then the address will be zero.
;  229          0227  1 !
;  230          0228  1 ! Implict output:
;  231          0229  1 !
;  232          0230  1 !       None.
;  233          0231  1 !
;  234          0232  1 ! Side effects:
;  235          0233  1 !
;  236          0234  1 !       None.
;  237          0235  1 !
;  238          0236  1 ! Routine value:
;  239          0237  1 !
;  240          0238  1 !       TRUE    : If the OCD is found
;  241          0239  1 !       FALSE   : If the OCD is not found
;  242          0240  1 !--
;  243          0241  1
;  244          0242  2 BEGIN                                           ! Start of FIND_OCD
;  245          0243  2
;  246          0244  2 MAP
;  247          0245  2         UIC             : $ref_bblock;                  ! Target UIC
;  248          0246  2
;  249          0247  2 EXTERNAL LITERAL
;  250          0248  2         MIN_SCOPE,                              ! Minimum (most privileged) scope
;  251          0249  2         MAX_SCOPE;                              ! Maximum (least privileged) scope
;  252          0250  2
;  253          0251  2 EXTERNAL
;  254          0252  2         OCD_VECTOR      : VECTOR;               ! Pointers to OCD list heads
;  255          0253  2
;  256          0254  2 LOCAL
;  257          0255  2         OCD             : $ref_bblock,          ! OCd data structure
;  258          0256  2         OCD_COUNT       : LONG,                 ! Count of OCDs in the OCD list
;  259          0257  2         FOUND           : LONG;                 ! Used as loop control and routine value holder
;  260          0258  2
;  261          0259  2 !
;  262          0260  2 ! Seach through the specified list of OCDs to locate
;  263          0261  2 ! an OCD that matches the specified UIC.  The OCD list
;  264          0262  2 ! scanned depends on the SCOPE.
```

```
;  265     0263  2 !
;  266     0264  2 .BLOCK = 0;                                     ! Zero address
;  267     0265  2 SELECTONE .SCOPE OF
;  268     0266  2     SET
;  269     0267  3     [OPC$K_SYSTEM]      : BEGIN
;  270     0268  3                           !
;  271     0269  3                           ! The SYSTEM OCD list is a special case, as the list
;  272     0270  3                           ! length will either be 1 or 0.  Get the address of
;  273     0271  3                           ! the OCD list header, and return the list count as
;  274     0272  3                           ! the routine value.
;  275     0273  3                           !
;  276     0274  3                           .BLOCK = .OCD_VECTOR [(.SCOPE - 1)*2];
;  277     0275  3                           FOUND = .OCD_VECTOR [(.SCOPE - 1)*2+1];
;  278     0276  2                           END;
;  279     0277  2
;  280     0278  3     [OPC$K_GROUP]       : BEGIN
;  281     0279  3                           !
;  282     0280  3                           ! Scan through the GROUP OCD list seaching for an OCD
;  283     0281  3                           ! with a UIC group field that matched the one specified.
;  284     0282  3                           !
;  285     0283  3                           OCD = .OCD_VECTOR [(.SCOPE - 1)*2];           ! Get address of first OCD in list
;  286     0284  3                           OCD_COUNT = .OCD_VECTOR [(.SCOPE - 1)*2+1];   ! Get # of OCDs in the list
;  287     0285  3                           FOUND = FALSE;                                ! Assume not found
;  288     0286  3                           WHILE (.OCD_COUNT GTR 0) AND (NOT .FOUND) DO
;  289     0287  3                               IF .UIC [0,16,16,0] EQL .OCD [$BYTEOFFSET (OCD_L_UIC),16,16,0]
;  290     0288  3                               THEN
;  291     0289  4                                    BEGIN                                ! We found it
;  292     0290  4                                    .BLOCK = .OCD;                       ! Save addres of OCD
;  293     0291  4                                    FOUND = TRUE;                        ! Note that we found it
;  294     0292  4                                    END
;  295     0293  3                               ELSE
;  296     0294  4                                    BEGIN
;  297     0295  4                                    OCD_COUNT = .OCD_COUNT - 1;          ! Decrement OCD count
;  298     0296  4                                    OCD = .OCD [OCD_L_FLINK];            ! Get address of next OCD
;  299     0297  3                                    END;
;  300     0298  2                           END;
;  301     0299  2
;  302     0300  3     [OPC$K_USER]        : BEGIN
;  303     0301  3                           !
;  304     0302  3                           ! Scan through the list of USER OCDs looking for an
;  305     0303  3                           ! OCD with the SAME UIC as the specified UIC.
;  306     0304  3                           !
;  307     0305  3                           OCD = .OCD_VECTOR [(.SCOPE - 1)*2];           ! Get address of first OCD in list
;  308     0306  3                           OCD_COUNT = .OCD_VECTOR [(.SCOPE - 1)*2+1];   ! Get # of OCDs in the list
;  309     0307  3                           FOUND = FALSE;                                ! Assume not found
;  310     0308  3                           WHILE (.OCD_COUNT GTR 0) AND (NOT .FOUND) DO
;  311     0309  3                               IF .UIC EQL .OCD [OCD_L_UIC]
;  312     0310  3                               THEN
;  313     0311  4                                    BEGIN                                ! We found it
;  314     0312  4                                    .BLOCK = .OCD;                       ! Save addres of OCD
;  315     0313  4                                    FOUND = TRUE;                        ! Note that we found it
;  316     0314  4                                    END
;  317     0315  3                               ELSE
;  318     0316  4                                    BEGIN
;  319     0317  4                                    OCD_COUNT = .OCD_COUNT - 1;          ! Decrement OCD count
;  320     0318  4                                    OCD = .OCD [OCD_L_FLINK];            ! Get address of next OCD
;  321     0319  3                                    END;
```

```
;  322     0320  2                        END;
;  323     0321  2
;  324     0322  2      [OTHERWISE]         : FOUND = FALSE;                                ! Bogus SCOPE
;  325     0323  2      TES;
;  326     0324  2
;  327     0325  2 RETURN (.FOUND);
;  328     0326  2
;  329     0327  1 END;                                                 ! End of FIND_OCD


                                                        .EXTRN  OCD_VECTOR

                                                001C 00000      .ENTRY  FIND_OCD, Save R2,R3,R4                 ; 0206
                                          54    0000G  CF  9E 00002     MOVAB   OCD_VECTOR-8, R4
                                                  0C   BC  D4 00007     CLRL    @BLOCK                          ; 0264
                                          51      04   AC  D0 0000A     MOVL    SCOPE, R1                       ; 0265
                                          01            51  D1 0000E     CMPL    R1, #1                          ; 0267
                                                        10  12 00011     BNEQ    1$
                                    50    51            01  78 00013     ASHL    #1, R1, R0                      ; 0274
                                                6440    D0 00017        MOVL    OCD_VECTOR-8[R0], @BLOCK
                                    0C    BC      A440  D0 0001C        MOVL    OCD_VECTOR-4[R0], FOUND         ; 0275
                                                  6B  11 00021        BRB     8$                              ; 0265
                                          02            51  D1 00023 1$:  CMPL    R1, #2                          ; 0278
                                                        32  12 00026     BNEQ    4$
                                    50    51            01  78 00028     ASHL    #1, R1, R0                      ; 0283
                                          51        6440  D0 0002C        MOVL    OCD_VECTOR-8[R0], OCD
                                          52    04  A440  D0 00030        MOVL    OCD_VECTOR-4[R0], OCD_COUNT     ; 0284
                                                        53  D4 00035     CLRL    FOUND                           ; 0285
                                                        52  D5 00037 2$:  TSTL    OCD_COUNT                       ; 0286
                                                        53  15 00039     BLEQ    8$
                                          50            53  E8 0003B     BLBS    FOUND, 8$
                                          50        26  A1  3C 0003E     MOVZWL  38(OCD), R0                     ; 0287
                          50        08    BC          10  ED 00042     CMPZV   #16, #16, @UIC, R0
                                                        09  12 00048     BNEQ    3$
                                                0C  BC      51  D0 0004A     MOVL    OCD, @BLOCK                     ; 0290
                                          53            01  D0 0004E     MOVL    #1, FOUND                       ; 0291
                                                        E4  11 00051     BRB     2$                              ; 0287
                                                        52  D7 00053 3$:  DECL    OCD_COUNT                       ; 0295
                                          51            61  D0 00055     MOVL    (OCD), OCD                      ; 0296
                                                        DD  11 00058     BRB     2$                              ; 0287
                                          03            51  D1 0005A 4$:  CMPL    R1, #3                          ; 0300
                                                        2D  12 0005D     BNEQ    7$
                                    50    51            01  78 0005F     ASHL    #1, R1, R0                      ; 0305
                                          51        6440  D0 00063        MOVL    OCD_VECTOR-8[R0], OCD
                                          52    04  A440  D0 00067        MOVL    OCD_VECTOR-4[R0], OCD_COUNT     ; 0306
                                                        53  D4 0006C     CLRL    FOUND                           ; 0307
                                                        52  D5 0006E 5$:  TSTL    OCD_COUNT                       ; 0308
                                                        1C  15 00070     BLEQ    8$
                                          19            53  E8 00072     BLBS    FOUND, 8$
                                                24  A1  08  AC  D1 00075     CMPL    UIC, 36(OCD)                    ; 0309
                                                        09  12 0007A     BNEQ    6$
                                                0C  BC      51  D0 0007C     MOVL    OCD, @BLOCK                     ; 0312
                                          53            01  D0 00080     MOVL    #1, FOUND                       ; 0313
                                                        E9  11 00083     BRB     5$                              ; 0309
                                                        52  D7 00085 6$:  DECL    OCD_COUNT                       ; 0317
                                          51            61  D0 00087     MOVL    (OCD), OCD                      ; 0318
```

```
                                E2  11 0008A          BRB     5$                              ; 0309
                                53  D4 0008C 7$:      CLRL    FOUND                           ; 0322
                          50    53  D0 0008E 8$:      MOVL    FOUND, R0                       ; 0325
                                    04 00091          RET                                     ; 0327

; Routine Size:  146 bytes,    Routine Base:  $CODE$ + 0076
```

```
;  331     0328  1 GLOBAL ROUTINE FORMAT_MESSAGE (RQCB, MESSAGE_VECTOR) =
;  332     0329  1
;  333     0330  1 !++
;  334     0331  1 ! Functional description:
;  335     0332  1 !
;  336     0333  1 !       Given an RQCB address and a message code, this routine will
;  337     0334  1 !       format the message and build an MCB to describe the message.
;  338     0335  1 !
;  339     0336  1 ! Input:
;  340     0337  1 !
;  341     0338  1 !       RQCB            : Address of an RQCB.
;  342     0339  1 !       MESSAGE_VECTOR  : Address of a longword vector
;  343     0340  1 !
;  344     0341  1 ! Implicit Input:
;  345     0342  1 !
;  346     0343  1 !       The format of the message vector is as follows:
;  347     0344  1 !
;  348     0345  1 !               +--------------------------------+
;  349     0346  1 !               |          message number        |
;  350     0347  1 !               +--------------------------------+
;  351     0348  1 !               |          arguement count       |
;  352     0349  1 !               +--------------------------------+
;  353     0350  1 !               |          first arguement       |
;  354     0351  1 !               +--------------------------------+
;  355     0352  1 !               |                .
;  356     0353  1 !                              .
;  357     0354  1 !                              .
;  358     0355  1 !               |          Nth arguement         |
;  359     0356  1 !               +--------------------------------+
;  360     0357  1 !
;  361     0358  1 ! Output:
;  362     0359  1 !
;  363     0360  1 !       None.
;  364     0361  1 !
;  365     0362  1 ! Implict output:
;  366     0363  1 !
;  367     0364  1 !       None.
;  368     0365  1 !
;  369     0366  1 ! Side effects:
;  370     0367  1 !
;  371     0368  1 !       None.
;  372     0369  1 !
;  373     0370  1 ! Routine value:
;  374     0371  1 !
;  375     0372  1 !       TRUE            : If the message was formatted and an MCB created
;  376     0373  1 !       <anything else> : The message could not be formatted and an MCB created.
;  377     0374  1 !--
;  378     0375  1
;  379     0376  2 BEGIN
;  380     0377  2
;  381     0378  2 MAP
;  382     0379  2         MESSAGE_VECTOR  : REF VECTOR,                   ! Message info
;  383     0380  2         RQCB            : $ref_bblock;                  ! RQCB data structure
;  384     0381  2
;  385     0382  2 EXTERNAL ROUTINE
;  386     0383  2         ALLOCATE_DS,                                    ! Allocate a data structure
;  387     0384  2         DEALLOCATE_DS;                                  ! Deallocate a data structure
```

```
;  388          0385  2
;  389          0386  2 EXTERNAL LITERAL
;  390          0387  2         RQCB_K_TYPE,
;  391          0388  2         MCB_K_TYPE;
;  392          0389  2
;  393          0390  2 LITERAL
;  394          0391  2         ASCII_BELL      = 7,                    ! ASCII 'bell' character
;  395          0392  2         LINE_FEED       = 10,                   ! ASCII line feed
;  396          0393  2         MSG_FLAGS1      = 9,                    ! Get message facility and text.
;  397          0394  2         MSG_FLAGS2      = 1,                    ! Get message text only.
;  398          0395  2         TEXT_LENGTH     = 256;                  ! Max VMS message text size
;  399          0396  2
;  400          0397  2 OWN
;  401          0398  2         HEADER_BUF      : VECTOR [100],         ! Buffer to hold header FAO string
;  402          0399  2         HEADER_DESC     : VECTOR [2, LONG]      ! Descriptor for header string
;  403          0400  2                         PRESET ([1] = HEADER_BUF);
;  404          0401  2
;  405          0402  2 LOCAL
;  406          0403  2         OUT_LENGTH      : LONG,                 ! Message text length
;  407          0404  2         OUT_ARRAY       : LONG,                 ! Output for $GETMSG
;  408          0405  2         TEXT_DESC       : $desc_block,          ! Message text descriptor
;  409          0406  2         TEXT_BUFFER     : $bblock [TEXT_LENGTH],! Maximum message size
;  410          0407  2         TEXT_BUFFER2    : $bblock [TEXT_LENGTH+100],! Reformatted message ctrstr
;  411          0408  2         MESSAGE_DESC    : $desc_block,          ! Formatted message descriptor
;  412          0409  2         MESSAGE_BUFFER  : $bblock [OPC$K_MAXMESSAGE],! Formatted message buffer
;  413          0410  2         BUFFER_POINTER  : $ref_bvector,         ! Holds address of a VM block
;  414          0411  2         MCB             : $ref_bblock,          ! MCB data structure
;  415          0412  2         BLOCK           : $ref_bblock,          ! VM block for message
;  416          0413  2         STATUS          : LONG;
;  417          0414  2 !
;  418          0415  2 ! Set up buffer descriptors
;  419          0416  2 !
;  420          0417  2 TEXT_DESC [0,0,32,0] = TEXT_LENGTH;             ! Set text buffer size
;  421          0418  2 TEXT_DESC [DSC$A_POINTER] = TEXT_BUFFER;        ! Set text buffer address
;  422          0419  2 MESSAGE_DESC [0,0,32,0] = OPC$K_MAXMESSAGE;    ! Clear message size
;  423          0420  2 MESSAGE_DESC [DSC$A_POINTER] = MESSAGE_BUFFER; ! Set message buffer address
;  424          0421  2
;  425          0422  2 !
;  426          0423  2 ! Get the message text via $GETMSG.
;  427          0424  2 !
;  428        P 0425  3 IF NOT (STATUS = $GETMSG (MSGID  = .MESSAGE_VECTOR [0],
;  429        P 0426  3                           MSGLEN =  OUT_LENGTH,
;  430        P 0427  3                           BUFADR =  TEXT_DESC,
;  431        P 0428  3                           FLAGS  =  (IF .MESSAGE_VECTOR [0] EQL OPC$_RQSTCMPLTE
;  432        P 0429  3                                      OR .MESSAGE_VECTOR [0] EQL OPC$_RQSTABORT
;  433        P 0430  3                                      OR .MESSAGE_VECTOR [0] EQL OPC$_RQSTPEND
;  434        P 0431  3                                      OR .MESSAGE_VECTOR [0] EQL OPC$_BLANKTAPE
;  435        P 0432  3                                      OR .MESSAGE_VECTOR [0] EQL OPC$_INITAPE
;  436        P 0433  3                                      THEN
;  437        P 0434  3                                          MSG_FLAGS2
;  438        P 0435  3                                      ELSE
;  439        P 0436  3                                          MSG_FLAGS1
;  440        P 0437  3                                     ),
;  441        P 0438  3                           OUTADR =  OUT_ARRAY
;  442          0439  3                          ))
;  443          0440  2 THEN
;  444          0441  2     $signal_stop (.STATUS);
```

```
;  445          0442  2 TEXT_DESC [DSC$W_LENGTH] = .OUT_LENGTH;
;  446          0443  2 !
;  447          0444  2 ! If the message control string starts with "%OPCOM, %D%", then perform a little substitution
;  448          0445  2 !
;  449          0446  2 IF CH$EQL (11, UPLIT BYTE ('%OPCOM, %D%'), MINU (11, .OUT_LENGTH), TEXT_BUFFER, 0)
;  450          0447  2 THEN
;  451          0448  3     BEGIN
;  452          0449  3     LOCAL
;  453          0450  3         ADJ;
;  454          0451  3     !
;  455          0452  3     ! On the first reference, get the header text from the message file
;  456          0453  3     !
;  457          0454  3     IF .HEADER_DESC [0] EQL 0
;  458          0455  3     THEN
;  459          0456  4         BEGIN
;  460          0457  4         HEADER_DESC [0] = 100;
;  461          0458  5         IF NOT (STATUS = $GETMSG (MSGID=OPC$_HEADER, MSGLEN=HEADER_DESC, BUFADR=HEADER_DESC, FLAGS=1))
;  462          0459  4         THEN
;  463          0460  4             $signal_stop (.STATUS);
;  464          0461  3         END;
;  465          0462  3     ADJ = .HEADER_DESC [0] - 11;
;  466          0463  3     CH$COPY (.HEADER_DESC [0], .HEADER_DESC [1],
;  467          0464  3              .OUT_LENGTH-11, TEXT_BUFFER+11, 0, .OUT_LENGTH + .ADJ, TEXT_BUFFER2);
;  468          0465  3     TEXT_DESC [DSC$W_LENGTH] = .OUT_LENGTH + .ADJ;
;  469          0466  3     TEXT_DESC [DSC$A_POINTER] = TEXT_BUFFER2;
;  470          0467  2     END;
;  471          0468  2 !
;  472          0469  2 ! Format the message via FAOL.
;  473          0470  2 !
;  474          0471  2 OUT_LENGTH = 0;
;  475        P 0472  3 IF NOT (STATUS = $FAOL  (CTRSTR = TEXT_DESC,
;  476        P 0473  3                          OUTLEN = OUT_LENGTH,
;  477        P 0474  3                          OUTBUF = MESSAGE_DESC,
;  478        P 0475  3                          PRMLST = MESSAGE_VECTOR [1]
;  479          0476  3                         ))
;  480          0477  2 THEN
;  481          0478  2     $signal_stop (.STATUS);
;  482          0479  2 MESSAGE_DESC [DSC$W_LENGTH] = .OUT_LENGTH;
;  483          0480  2
;  484          0481  2 !
;  485          0482  2 ! Allocate a block of memory to hold the formatted message text,
;  486          0483  2 ! and copy the message text to it.  Tack a 'bell' onto
;  487          0484  2 ! the front of the message.  Add an extra line feed to the end.
;  488          0485  2 !
;  489          0486  2 OUT_LENGTH = .OUT_LENGTH + 2;
;  490          0487  3 IF NOT (STATUS = OPC$GET_VM (OUT_LENGTH, BUFFER_POINTER))
;  491          0488  2 THEN
;  492          0489  2     RETURN (.STATUS);
;  493          0490  2 BUFFER_POINTER [0] = ASCII_BELL;
;  494          0491  2 CH$MOVE (.OUT_LENGTH-2, .MESSAGE_DESC [DSC$A_POINTER], .BUFFER_POINTER+1);
;  495          0492  2 BUFFER_POINTER [.OUT_LENGTH-1] = LINE_FEED;
;  496          0493  2
;  497          0494  2 !
;  498          0495  2 ! Allocate an MCB for the message.
;  499          0496  2 ! If one is already present on the RQCB, then
;  500          0497  2 ! deallocate it and allocate a new one.
;  501          0498  2 ! Fill in the required MCB fields and attach it
```

```
;  502          0499  2 ! to the RQCB.  If the allocate fails, then free
;  503          0500  2 ! the message buffer block that was just allocated.
;  504          0501  2 !
;  505          0502  2 IF .RQCB [RQCB_L_MCB] NEQ 0
;  506          0503  2 THEN
;  507          0504  2     DEALLOCATE_DS (.RQCB [RQCB_L_MCB]);
;  508          0505  2
;  509          0506  3 IF NOT (STATUS = ALLOCATE_DS (MCB_K_TYPE, MCB))
;  510          0507  2 THEN
;  511          0508  2     RETURN (.STATUS);
;  512          0509  2 MCB [MCB_L_MSGID] = .MESSAGE_VECTOR [0];        ! Set message code
;  513          0510  2 MCB [MCB_L_TEXTLEN] = .OUT_LENGTH;              ! Set the message length
;  514          0511  2 MCB [MCB_L_TEXTPTR] = .BUFFER_POINTER;          ! Set message address
;  515          0512  2 MCB [MCB_L_RQCB] = RQCB [HDR_L_FLINK];          ! Set RQCB address
;  516          0513  2 RQCB [RQCB_L_MCB] = .MCB;                       ! Set MCB address
;  517          0514  2
;  518          0515  2 RETURN (TRUE);
;  519          0516  2
;  520          0517  1 END;                                            ! End of FORMAT_MESSAGE


                                                        .PSECT  $PLIT$,NOWRT,NOEXE,2
                25 44 25 20 2C 4D 4F 43 50 4F 25  00000 P.AAA:  .ASCII  \%OPCOM, %D%\                          ;

                                                        .PSECT  $OWN$,NOEXE,2

                                                  00000 HEADER_BUF:
                                                        .BLKB   400
                                                  00# 00190 HEADER_DESC:
                                                        .BYTE   0[4]                                          ;
                                            00000000' 00194     .ADDRESS HEADER_BUF                           ;

                                                        .EXTRN  DEALLOCATE_DS, MCB_K_TYPE
                                                        .EXTRN  SYS$GETMSG, LIB$STOP
                                                        .EXTRN  SYS$FAOL, OPC$GET_VM

                                                        .PSECT  $CODE$,NOWRT,2

                                                   0FFC 00000     .ENTRY  FORMAT_MESSAGE, Save R2,R3,R4,R5,R6,R7,R8,- ; 0328
                                                                          R9,R10,R11                          ;
                    5B      0000'   CF   9E 00002               MOVAB   HEADER_DESC, R11                    ;
                    5E      F57C    CE   9E 00007               MOVAB   -2692(SP), SP                       ;
                F8  AD      0100    8F   3C 0000C               MOVZWL  #256, TEXT_DESC                     ; 0417
                FC  AD      FEF8    CD   9E 00012               MOVAB   TEXT_BUFFER, TEXT_DESC+4            ; 0418
              FD8C  CD      0800    8F   3C 00018               MOVZWL  #2048, MESSAGE_DESC                 ; 0419
              FD90  CD        10    AE   9E 0001F               MOVAB   MESSAGE_BUFFER, MESSAGE_DESC+4      ; 0420
                                    5E   DD 00025               PUSHL   SP                                  ; 0439
                    50        08    BC   D0 00027               MOVL    @MESSAGE_VECTOR, R0                 ;
          00058029  8F              50   D1 0002B               CMPL    R0, #360489                         ;
                                    24   13 00032               BEQL    1$                                  ;
          0005801C  8F              50   D1 00034               CMPL    R0, #360476                         ;
                                    1B   13 00038               BEQL    1$                                  ;
          00058021  8F              50   D1 0003D               CMPL    R0, #360481                         ;
                                    12   13 00044               BEQL    1$                                  ;
          000581E3  8F              50   D1 00046               CMPL    R0, #360931                         ;
```

```
                                   09 13 0004D       BEQL    1$                                          ;
             000581D3  8F          50 D1 0004F       CMPL    R0, #360915                                 ;
                                   04 12 00056       BNEQ    2$                                          ;
                                   01 DD 00058 1$:   PUSHL   #1                                          ;
                                   02 11 0005A       BRB     3$                                          ;
                                   09 DD 0005C 2$:   PUSHL   #9                                          ;
                             F8    AD 9F 0005E 3$:   PUSHAB  TEXT_DESC                                   ;
                             14    AE 9F 00061       PUSHAB  OUT_LENGTH                                  ;
                                   50 DD 00064       PUSHL   R0                                          ;
             00000000G  00         05 FB 00066       CALLS   #5, SYS$GETMSG                              ;
                        5A         50 D0 0006D       MOVL    R0, STATUS                                  ;
                        3C         5A E9 00070       BLBC    STATUS, 5$                                  ;
                   F8   AD    08   AE B0 00073       MOVW    OUT_LENGTH, TEXT_DESC                       ; 0442
                        50    08   AE D0 00078       MOVL    OUT_LENGTH, R0                              ; 0446
                        0B         50 D1 0007C       CMPL    R0, #11                                     ;
                                   03 1B 0007F       BLEQU   4$                                          ;
                        50         0B D0 00081       MOVL    #11, R0                                     ;
  50          00   0000'  CF       0B 2D 00084 4$:   CMPC5   #11, P.AAA, #0, R0, TEXT_BUFFER             ;
                           FEF8    CD    0008B                                                           ;
                                   59 12 0008E       BNEQ    8$                                          ;
                                   6B D5 00090       TSTL    HEADER_DESC                                 ; 0454
                                   1E 12 00092       BNEQ    6$                                          ;
                        6B    64   8F 9A 00094       MOVZBL  #100, HEADER_DESC                           ; 0457
                        7E         01 7D 00098       MOVQ    #1, -(SP)                                   ; 0458
                                   5B DD 0009B       PUSHL   R11                                         ;
                                   5B DD 0009D       PUSHL   R11                                         ;
                         000582B3  8F DD 0009F       PUSHL   #361139                                     ;
             00000000G  00         05 FB 000A5       CALLS   #5, SYS$GETMSG                              ;
                        5A         50 D0 000AC       MOVL    R0, STATUS                                  ;
                        56         5A E9 000AF 5$:   BLBC    STATUS, 9$                                  ;
            50          6B         0B C3 000B2 6$:   SUBL3   #11, HEADER_DESC, ADJ                       ; 0462
            59     08   AE         0B C3 000B6       SUBL3   #11, OUT_LENGTH, R9                         ; 0464
            56          50    08   AE C1 000BB       ADDL3   OUT_LENGTH, ADJ, R6                         ;
                        58         56 D0 000C0       MOVL    R6, R8                                      ;
                        57   FD94  CD 9E 000C3       MOVAB   TEXT_BUFFER2, R7                            ; 0463
  58          00     04 BB         6B 2C 000C8       MOVC5   HEADER_DESC, @HEADER_DESC+4, #0, R8, (R7)   ;
                                   67    000CE                                                           ;
                                   0E 18 000CF       BGEQ    7$                                          ;
                        57         6B C0 000D1       ADDL2   HEADER_DESC, R7                             ;
                        58         6B C2 000D4       SUBL2   HEADER_DESC, R8                             ;
  58          00   FF03  CD        59 2C 000D7       MOVC5   R9, TEXT_BUFFER+11, #0, R8, (R7)            ;
                                   67    000DE                                                           ;
                   F8   AD         56 B0 000DF 7$:   MOVW    R6, TEXT_DESC                               ; 0465
                   FC   AD   FD94  CD 9E 000E3       MOVAB   TEXT_BUFFER2, TEXT_DESC+4                   ; 0466
                             08    AE D4 000E9 8$:   CLRL    OUT_LENGTH                                  ; 0471
            7E     08   AC         04 C1 000EC       ADDL3   #4, MESSAGE_VECTOR, -(SP)                   ; 0476
                           FD8C    CD 9F 000F1       PUSHAB  MESSAGE_DESC                                ;
                             10    AE 9F 000F5       PUSHAB  OUT_LENGTH                                  ;
                             F8    AD 9F 000F8       PUSHAB  TEXT_DESC                                   ;
             00000000G  00         04 FB 000FB       CALLS   #4, SYS$FAOL                                ;
                        5A         50 D0 00102       MOVL    R0, STATUS                                  ;
                        0A         5A E8 00105       BLBS    STATUS, 10$                                 ;
                                   5A DD 00108 9$:   PUSHL   STATUS                                      ; 0478
             00000000G  00         01 FB 0010A       CALLS   #1, LIB$STOP                                ;
                                      04 00111       RET                                                 ;
                 FD8C   CD    08   AE B0 00112 10$:  MOVW    OUT_LENGTH, MESSAGE_DESC                    ; 0479
                   08   AE         02 C0 00118       ADDL2   #2, OUT_LENGTH                              ; 0486
```

```
                                                04 AE  9F 0011C          PUSHAB  BUFFER_POINTER                          ; 0487
                                                0C AE  9F 0011F          PUSHAB  OUT_LENGTH                              ;
                                  0000G   CF            02 FB 00122      CALLS   #2, OPC$GET_VM                          ;
                                          5A            50 D0 00127      MOVL    R0, STATUS                              ;
                                          41            5A E9 0012A      BLBC    STATUS, 12$                             ;
                                          57        04  AE D0 0012D      MOVL    BUFFER_POINTER, R7                      ; 0490
                                          67            07 90 00131      MOVB    #7, (R7)                                ;
                                50        08  AE        02 C3 00134      SUBL3   #2, OUT_LENGTH, R0                      ; 0491
                          01    A7  FD90    DD        50 28 00139      MOVC3   R0, @MESSAGE_DESC+4, 1(R7)              ;
                                50            57    08  AE C1 00140      ADDL3   OUT_LENGTH, R7, R0                      ; 0492
                                  FF        A0        0A 90 00145      MOVB    #10, -1(R0)                             ;
                                          52        04  AC D0 00149      MOVL    RQCB, R2                                ; 0502
                                                    6C  A2 D5 0014D      TSTL    108(R2)                                 ;
                                                        08 13 00150      BEQL    11$                                     ;
                                                    6C  A2 DD 00152      PUSHL   108(R2)                                 ; 0504
                                  0000G   CF            01 FB 00155      CALLS   #1, DEALLOCATE_DS                       ;
                                                    0C  AE 9F 0015A 11$: PUSHAB  MCB                                    ; 0506
                                        00000000G       8F DD 0015D      PUSHL   #MCB_K_TYPE                             ;
                                  0000G   CF            02 FB 00163      CALLS   #2, ALLOCATE_DS                         ;
                                          5A            50 D0 00168      MOVL    R0, STATUS                              ;
                                          04            5A E8 0016B      BLBS    STATUS, 13$                             ;
                                          50            5A D0 0016E 12$: MOVL    STATUS, R0                              ; 0508
                                                        04 00171         RET                                             ;
                                          50        0C  AE D0 00172 13$: MOVL    MCB, R0                                 ; 0509
                                    2C    A0        08  BC D0 00176      MOVL    @MESSAGE_VECTOR, 44(R0)                 ;
                                    30    A0        08  AE D0 0017B      MOVL    OUT_LENGTH, 48(R0)                      ; 0510
                                    34    A0            57 D0 00180      MOVL    R7, 52(R0)                              ; 0511
                                    24    A0            52 D0 00184      MOVL    R2, 36(R0)                              ; 0512
                                    6C    A2            50 D0 00188      MOVL    R0, 108(R2)                             ; 0513
                                          50            01 D0 0018C      MOVL    #1, R0                                  ; 0515
                                                        04 0018F         RET                                             ; 0517

; Routine Size:  400 bytes,    Routine Base:  $CODE$ + 0108
```

```
;  522     0518  1 GLOBAL ROUTINE INTERPRET_MASK (BIT_MASK, STRING_DESC, OUTLEN)  =
;  523     0519  1
;  524     0520  1 !++
;  525     0521  1 ! Functional description:
;  526     0522  1 !
;  527     0523  1 !       This routine will take a 64 bit mask, and format an ASCII string that will name each
;  528     0524  1 !       set bit in the mask.
;  529     0525  1 !
;  530     0526  1 ! Input:
;  531     0527  1 !
;  532     0528  1 !       BIT_MASK        : Address of a 64 element bit vector
;  533     0529  1 !       STRING_DESC     : Address of a string descriptor to receive the output
;  534     0530  1 !                         string that names the bits in the mask.
;  535     0531  1 !
;  536     0532  1 ! Implicit Input:
;  537     0533  1 !
;  538     0534  1 !       None.
;  539     0535  1 !
;  540     0536  1 ! Output:
;  541     0537  1 !
;  542     0538  1 !       OUTLEN          : Address of a longword to receive the length of the
;  543     0539  1 !                         output string.
;  544     0540  1 !
;  545     0541  1 ! Implict output:
;  546     0542  1 !
;  547     0543  1 !       None.
;  548     0544  1 !
;  549     0545  1 ! Side effects:
;  550     0546  1 !
;  551     0547  1 !       None.
;  552     0548  1 !
;  553     0549  1 ! Routine value:
;  554     0550  1 !
;  555     0551  1 !       TRUE            : Successful completion
;  556     0552  1 !       <anything else> : The operation failed
;  557     0553  1 !--
;  558     0554  1
;  559     0555  2 BEGIN                                           ! Start of INTERPRET_MASK
;  560     0556  2
;  561     0557  2 MAP
;  562     0558  2         STRING_DESC     : $ref_bblock,          ! String descriptor
;  563     0559  2         BIT_MASK        : REF VECTOR;           ! Quadword mask
;  564     0560  2
;  565     0561  2 EXTERNAL
;  566     0562  2         OPER_NAME       : VECTOR [, LONG];      ! Names for bits, from OPCOMDATA.MAR
;  567     0563  2
;  568     0564  2 LITERAL
;  569     0565  2         CR              = %X'0D',               ! ASCII carriage return
;  570     0566  2         LF              = %X'0A',               ! ASCII line feed
;  571     0567  2         MSG_FLAGS       = 1,                    ! Only get message text
;  572     0568  2         MAX_NAM_LEN     = 40,                   ! Maximum bit name length
;  573     0569  2         MAX_LINE        = 80;                   ! Maximum length of an in
;  574     0570  2
;  575     0571  2 OWN
;  576     0572  2         SEPARATOR_DESC  : $string_desc (', '),  ! Name separator
;  577     0573  2         NEWLINE_DESC    : $string_desc (%CHAR (',',CR,LF));
;  578     0574  2
```

```
;  579          0575  2 LOCAL
;  580          0576  2         K                   : LONG,                     ! Index
;  581          0577  2         MASK                : BITVECTOR [32],           ! 32 bits of the quadword mask
;  582          0578  2         NAME                : REF VECTOR [, LONG],      ! Pointer to name string
;  583          0579  2         WORK_DESC           : $desc_block,              ! Descriptor of work buffer
;  584          0580  2         WORK_BUF            : $bblock [OPC$K_MAXREAD],! Work buffer
;  585          0581  2         NAME_DESC           : $desc_block,              ! Descriptor for bit name
;  586          0582  2         NAME_BUF            : $bblock [MAX_NAM_LEN],! Buffer for bit name
;  587          0583  2         PTR                 : LONG,                     ! Pointer to current point in buffer
;  588          0584  2         LEN                 : LONG,                     ! Length of current string
;  589          0585  2         STATUS              : LONG;
;  590          0586  2
;  591          0587  2 !
;  592          0588  2 ! Return FALSE if the output buffer descriptor is strange.
;  593          0589  2 !
;  594          0590  3 IF (.STRING_DESC [DSC$W_LENGTH] LEQ 0) OR (.STRING_DESC [DSC$A_POINTER] EQL 0)
;  595          0591  2 THEN
;  596          0592  2     RETURN (FALSE);
;  597          0593  2 !
;  598          0594  2 ! Set up the work buffer descriptor.
;  599          0595  2 !
;  600          0596  2 WORK_DESC [0,0,32,0] = 0;
;  601          0597  2 WORK_DESC [DSC$A_POINTER] = WORK_BUF;
;  602          0598  2 !
;  603          0599  2 ! If the bit mask is not zero, then for each bit set in the mask get the name of that bit from
;  604          0600  2 ! the name vector.  The bit name is obtained by using the bit position as an index into the OPER_NAME
;  605          0601  2 ! vector.  Each entry in the name vector is a longword pointer to a string descriptor for the name.
;  606          0602  2 ! If the name is undefined, the pointer will be zero.
;  607          0603  2 !
;  608          0604  2 PTR = .WORK_DESC [DSC$A_POINTER];
;  609          0605  2 LEN = 0;
;  610          0606  2 INCR I FROM 0 TO 1 DO
;  611          0607  3     BEGIN
;  612          0608  3     !
;  613          0609  3     ! Go through the loop twice, each pass checking 32 bits.
;  614          0610  3     ! As an optimization, avoid the loop if the mask is zero.
;  615          0611  3     !
;  616          0612  3     IF .BIT_MASK [.I] NEQ 0
;  617          0613  3     THEN
;  618          0614  4         BEGIN
;  619          0615  4         MASK = .BIT_MASK [.I];                  ! Get 32 bits to check
;  620          0616  4         INCR J FROM 0 TO 31 DO
;  621          0617  5             BEGIN
;  622          0618  5             IF .MASK [.J]
;  623          0619  5             THEN
;  624          0620  6                 BEGIN
;  625          0621  6                 NAME = .OPER_NAME [((.I * 32) + .J)];   ! Calculate byte position from bit position
;  626          0622  6                 IF .NAME EQL 0                          ! If null, use special name
;  627          0623  6                 THEN
;  628          0624  7                     BEGIN
;  629          0625  7                     NAME_DESC [0,0,32,0] = 1;
;  630          0626  7                     NAME_DESC [DSC$A_POINTER] = UPLIT BYTE ('?');
;  631          0627  7                     END
;  632          0628  6                 ELSE
;  633          0629  7                     BEGIN
;  634          0630  7                     NAME_DESC [0,0,32,0] = .NAME [0];
;  635          0631  7                     NAME_DESC [DSC$A_POINTER] = .NAME [1];
```

```
;  636     0632  6                END;
;  637     0633  6            !
;  638     0634  6            ! If the name will not fit on the line, start a new line.
;  639     0635  6            ! Allow for the ", " that preceeds each new name.  Allow
;  640     0636  6            ! one space at the end of the line to hold a ",".
;  641     0637  6            !
;  642     0638  7            IF (.LEN + .NAME_DESC [DSC$W_LENGTH] + 2) GTR (MAX_LINE - 1)
;  643     0639  6            THEN
;  644     0640  7                BEGIN
;  645     0641  7                CH$MOVE (.NEWLINE_DESC [DSC$W_LENGTH], .NEWLINE_DESC [DSC$A_POINTER], .PTR);
;  646     0642  7                PTR = .PTR + .NEWLINE_DESC [DSC$W_LENGTH];
;  647     0643  7                LEN = 0;
;  648     0644  6                END;
;  649     0645  6            !
;  650     0646  6            ! If not at the beginning of a line, preceed the name with ", ".
;  651     0647  6            !
;  652     0648  6            IF .LEN NEQ 0
;  653     0649  6            THEN
;  654     0650  7                BEGIN
;  655     0651  7                CH$MOVE (.SEPARATOR_DESC [DSC$W_LENGTH], .SEPARATOR_DESC [DSC$A_POINTER], .PTR);
;  656     0652  7                PTR = .PTR + .SEPARATOR_DESC [DSC$W_LENGTH];
;  657     0653  7                LEN = .LEN + .SEPARATOR_DESC [DSC$W_LENGTH];
;  658     0654  6                END;
;  659     0655  6            !
;  660     0656  6            ! Append the name to the end of the work buffer.
;  661     0657  6            !
;  662     0658  6            CH$MOVE (.NAME_DESC [DSC$W_LENGTH], .NAME_DESC [DSC$A_POINTER], .PTR);
;  663     0659  6            PTR = .PTR + .NAME_DESC [DSC$W_LENGTH];
;  664     0660  6            LEN = .LEN + .NAME_DESC [DSC$W_LENGTH];
;  665     0661  5            END;
;  666     0662  4        END;
;  667     0663  3        END;
;  668     0664  3    !
;  669     0665  3    ! Determine how much text was copied to the work buffer.
;  670     0666  3    !
;  671     0667  3    WORK_DESC [DSC$W_LENGTH] = .PTR - .WORK_DESC [DSC$A_POINTER];
;  672     0668  2    END;
;  673     0669  2 !
;  674     0670  2 ! If no bits were named, then return a special message.
;  675     0671  2 !
;  676     0672  2 IF .WORK_DESC [DSC$W_LENGTH] EQL 0
;  677     0673  2 THEN
;  678     0674  3     BEGIN
;  679     0675  3     WORK_DESC [DSC$W_LENGTH] = OPC$K_MAXREAD;
;  680     0676  4     IF NOT (STATUS = $GETMSG (MSGID=OPC$_NOTENABLED, MSGLEN=WORK_DESC, BUFADR=WORK_DESC, FLAGS=MSG_FLAGS))
;  681     0677  3     THEN
;  682     0678  3         RETURN (.STATUS);
;  683     0679  2     END;
;  684     0680  2 !
;  685     0681  2 ! Copy the work buffer to the output buffer.  If the output
;  686     0682  2 ! buffer is not large enough, fill the output buffer and return
;  687     0683  2 ! SS$_BUFFEROVF to indicate a buffer overflow.
;  688     0684  2 !
;  689     0685  2 STATUS = TRUE;                                  ! Assume success
;  690     0686  2 IF .STRING_DESC [DSC$W_LENGTH] LSS .WORK_DESC [DSC$W_LENGTH]
;  691     0687  2 THEN
;  692     0688  3     BEGIN
```

```
;  693          0689  3     WORK_DESC [DSC$W_LENGTH] = .STRING_DESC [DSC$W_LENGTH];
;  694          0690  3     STATUS = SS$_BUFFEROVF;
;  695          0691  2     END;
;  696          0692  2 CH$MOVE (.WORK_DESC [DSC$W_LENGTH], .WORK_DESC [DSC$A_POINTER], .STRING_DESC [DSC$A_POINTER]);
;  697          0693  2 .OUTLEN = .WORK_DESC [DSC$W_LENGTH];
;  698          0694  2 RETURN (.STATUS);
;  699          0695  2
;  700          0696  1 END;                                    ! End of INTERPRET_MASK


                                        .PSECT  $PLIT$,NOWRT,NOEXE,2

                              20  2C  0000B P.AAB:   .ASCII  \, \                                    ;
                           0A 0D  2C  0000D P.AAC:   .ASCII  \,\<13><10>                            ;
                                 3F  00010 P.AAD:   .ASCII  \?\                                    ;

                                        .PSECT  $OWN$,NOEXE,2

                                0002  00198 SEPARATOR_DESC:
                                            .WORD   2                                             ;
                                  01  0E  0019A             .BYTE   14, 1                         ;
                                00000000' 0019C             .ADDRESS P.AAB                        ;
                                0003  001A0 NEWLINE_DESC:
                                            .WORD   3                                             ;
                                  01  0E  001A2             .BYTE   14, 1                         ;
                                00000000' 001A4             .ADDRESS P.AAC                        ;

                                        .EXTRN  OPER_NAME

                                        .PSECT  $CODE$,NOWRT,2

                                      0FFC 00000            .ENTRY  INTERPRET_MASK, Save R2,R3,R4,R5,R6,R7,R8,- ; 0518
                                                                    R9,R10,R11                    ;
                                5E      F5BC    CE  9E 00002        MOVAB   -2628(SP), SP         ;
                                5B        08    AC  D0 00007        MOVL    STRING_DESC, R11      ; 0590
                                              6B  B5 0000B        TSTW    (R11)                 ;
                                              03  13 0000D        BEQL    1$                    ;
                                        04    AB  D5 0000F        TSTL    4(R11)                ;
                                              03  12 00012 1$:    BNEQ    2$                    ;
                                          00E9  31 00014        BRW     14$                   ;
                                          F8    AD  D4 00017 2$:    CLRL    WORK_DESC             ; 0596
                                  FC    AD      3C  AE 9E 0001A     MOVAB   WORK_BUF, WORK_DESC+4 ; 0597
                                5A        FC    AD  D0 0001F        MOVL    WORK_DESC+4, PTR      ; 0604
                                              56  7C 00023        CLRQ    I                     ; 0612
                                50        04 BC46  D0 00025 3$:    MOVL    @BIT_MASK[I], R0      ;
                                              7F  13 0002A        BEQL    10$                   ;
                                08    AE        50  D0 0002C        MOVL    R0, MASK              ; 0615
                                        04    AE  D4 00030        CLRL    J                     ; 0616
                           6D   08    AE        04  AE E1 00033 4$:    BBC     J, MASK, 9$           ; 0618
                           50           56      05  78 00039        ASHL    #5, I, R0             ; 0621
                                        50    04  AE  C0 0003D        ADDL2   J, R0                 ;
                                        6E    0000GCF40  D0 00041     MOVL    OPER_NAME[R0], NAME   ;
                                              0C  12 00047        BNEQ    5$                    ; 0622
                                34    AE        01  D0 00049        MOVL    #1, NAME_DESC         ; 0625
                                38    AE  0000' CF  9E 0004D        MOVAB   P.AAD, NAME_DESC+4    ; 0626
                                              0D  11 00053        BRB     6$                    ; 0622
```

```
                                34   AE        00   BE   D0 00055 5$:     MOVL    @NAME, NAME_DESC                                        ; 0630
                            50  6E                04   C1 0005A         ADDL3   #4, NAME, R0                                            ; 0631
                                38   AE             60   D0 0005E         MOVL    (R0), NAME_DESC+4                                       ;
                                58        34   AE   3C 00062 6$:     MOVZWL  NAME_DESC, R8                                           ; 0638
                                50        02 A847   9E 00066         MOVAB   2(R8)[LEN], R0                                          ;
                           0000004F   8F             50   D1 0006B         CMPL    R0, #79                                                 ;
                                                     12   15 00072         BLEQ    7$                                                      ;
                            6A  0000'  DF   0000'     CF   28 00074         MOVC3   NEWLINE_DESC, @NEWLINE_DESC+4, (PTR)                    ; 0641
                                50   0000'     CF   3C 0007C         MOVZWL  NEWLINE_DESC, R0                                        ; 0642
                                5A             50   C0 00081         ADDL2   R0, PTR                                                 ;
                                               57   D4 00084         CLRL    LEN                                                     ; 0643
                                               57   D5 00086 7$:     TSTL    LEN                                                     ; 0648
                                               11   13 00088         BEQL    8$                                                      ;
                                59   0000'     CF   3C 0008A         MOVZWL  SEPARATOR_DESC, R9                                      ; 0651
                            6A  0000'  DF             59   28 0008F         MOVC3   R9, @SEPARATOR_DESC+4, (PTR)                            ;
                                5A             59   C0 00095         ADDL2   R9, PTR                                                 ; 0652
                                57             59   C0 00098         ADDL2   R9, LEN                                                 ; 0653
                            6A  38   BE           58   28 0009B 8$:     MOVC3   R8, @NAME_DESC+4, (PTR)                                 ; 0658
                                5A             58   C0 000A0         ADDL2   R8, PTR                                                 ; 0659
                                57             58   C0 000A3         ADDL2   R8, LEN                                                 ; 0660
                            88  04   AE           1F   F3 000A6 9$:     AOBLEQ  #31, J, 4$                                              ; 0616
                        F8  AD             5A        FC   AD A3 000AB 10$:    SUBW3   WORK_DESC+4, PTR, WORK_DESC                     ; 0667
                    FF6E    56             01             01   F1 000B1         ACBL    #1, #1, I, 3$                                   ; 0606
                                                    F8   AD B5 000B7         TSTW    WORK_DESC                                               ; 0672
                                                         22 12 000BA         BNEQ    11$                                                     ;
                                           F8   AD   0A00   8F B0 000BC         MOVW    #2560, WORK_DESC                                        ; 0675
                                           7E             01   7D 000C2         MOVQ    #1, -(SP)                                               ; 0676
                                                    F8   AD 9F 000C5         PUSHAB  WORK_DESC                                               ;
                                                    F8   AD 9F 000C8         PUSHAB  WORK_DESC                                               ;
                                               000580F3   8F DD 000CB         PUSHL   #360691                                                 ;
                                  00000000G    00             05   FB 000D1         CALLS   #5, SYS$GETMSG                                  ;
                                               57             50   D0 000D8         MOVL    R0, STATUS                                      ;
                                               1E             57   E9 000DB         BLBC    STATUS, 13$                                     ;
                                               57             01   D0 000DE 11$:     MOVL    #1, STATUS                                      ; 0685
                                           F8   AD             6B   B1 000E1         CMPW    (R11), WORK_DESC                                ; 0686
                                                               09   1E 000E5         BGEQU   12$                                             ;
                                           F8   AD             6B   B0 000E7         MOVW    (R11), WORK_DESC                                ; 0689
                                               57         0601   8F   3C 000EB         MOVZWL  #1537, STATUS                           ; 0690
                                04   BB         FC   BD     F8   AD   28 000F0 12$:     MOVC3   WORK_DESC, @WORK_DESC+4, @4(R11)        ; 0692
                                           0C   BC     F8   AD   3C 000F7         MOVZWL  WORK_DESC, @OUTLEN                              ; 0693
                                               50             57   D0 000FC 13$:     MOVL    STATUS, R0                                      ; 0694
                                                               04   00FF         RET                                                     ;
                                                               50   D4 00100 14$:     CLRL    R0                                              ; 0696
                                                                    04 00102         RET                                                     ;

; Routine Size:  259 bytes,    Routine Base:  $CODE$ + 0298
```

```
;  702     0697  1 GLOBAL ROUTINE SEND_REPLY (RQCB) =
;  703     0698  1
;  704     0699  1 !++
;  705     0700  1 ! Functional description:
;  706     0701  1 !
;  707     0702  1 !       This routine will send a reply to a specified mailbox.
;  708     0703  1 !
;  709     0704  1 !
;  710     0705  1 ! Input:
;  711     0706  1 !
;  712     0707  1 !       RQCB            : Address of an RQCB data structure
;  713     0708  1 !
;  714     0709  1 !
;  715     0710  1 ! Implicit Input:
;  716     0711  1 !
;  717     0712  1 !       There is an MCB attached to the RQCB.
;  718     0713  1 !
;  719     0714  1 ! Outpu::
;  720     0715  1 !
;  721     0716  1 !       None.
;  722     0717  1 !
;  723     0718  1 ! Implict output:
;  724     0719  1 !
;  725     0720  1 !       A formatted message is sent to the mailbox specified by the RQCB.
;  726     0721  1 !
;  727     0722  1 ! Side effects:
;  728     0723  1 !
;  729     0724  1 !       None.
;  730     0725  1 !
;  731     0726  1 ! Routine value:
;  732     0727  1 !
;  733     0728  1 !       TRUE    : If a reply was sent.
;  734     0729  1 !       FALSE   : If a reply could not be sent.
;  735     0730    !--
;  736     0731  1
;  737     0732  2 BEGIN                                           ! Start of SEND_REPLY
;  738     0733  2
;  739     0734  2 MAP
;  740     0735  2         RQCB            : $ref_bblock;          ! RQCB data structure
;  741     0736  2
;  742     0737  2 EXTERNAL LITERAL
;  743     0738  2         MCB_K_TYPE;                             ! MCB structure type
;  744     0739  2
;  745     0740  2 EXTERNAL
;  746     0741  2         BYPASS_PRIV     : $bblock,              ! Mask with BYPASS priv set
;  747     0742  2         MBX_FAO         : $bblock,              ! FAO control string descriptor
;  748     0743  2         GLOBAL_STATUS : BITVECTOR [32],
;  749     0744  2         LCL_NOD : $ref_bblock,
;  750     0745  2         LCL_CSID;
;  751     0746  2
;  752     0747  2 EXTERNAL ROUTINE
;  753     0748  2         CLUSUTIL_SYSTEMID_EQUAL : JSB_R0R1,
;  754     0749  2         DUMP_LOG_FILE : NOVALUE,
;  755     0750  2         SHARE_FAO_BUFFER,
;  756     0751  2         WRITE_LOG_FILE : NOVALUE;
;  757     0752  2
;  758     0753  2 LOCAL
```

```
;  759          0754  2          MCB             : $ref_bblock,          ! MCB data structure
;  760          0755  2          IO_STATUS       : $bblock [8],          ! I/O status block
;  761          0756  2          MSG_SIZE        : WORD,                 ! Size of reply message
;  762          0757  2          MSG_BUF         : $bblock [OPC$K_MAXREAD],! Message buffer
;  763          0758  2          MBX_CHAN        : WORD,                 ! Channel to reply mailbox
;  764          0759  2          MBX_NAME        : $bblock [MAX_DEV_NAM],! Mailbox device name buffer
;  765          0760  2          MBX_DESC        : $desc_block,          ! Mailbox name descriptor
;  766          0761  2          DEV_CHAR        : $bblock [DIB$K_LENGTH],! Device characteristics buffer
;  767          0762  2          DEV_DESC        : $desc_block,          ! Dev. char. buffer descriptor
;  768          0763  2          STATUS          : LONG;
;  769          0764  2
;  770          0765  2      !
;  771          0766  2      ! If operator is on another node, return success
;  772          0767  2      !
;  773          0768  2      IF .GLOBAL_STATUS [GBLSTS_K_IN_VAXcluster]
;  774          0769  2      THEN
;  775          0770  2          IF NOT CLUSUTIL_SYSTEMID_EQUAL (RQCB [RQCB_T_SYSTEMID], LCL_NOD [NOD_T_NODE_SYSTEMID])
;  776          0771  2          THEN
;  777          0772  2              RETURN TRUE;
;  778          0773  2      !
;  779          0774  2      ! If no reply mailbox is specified, then return success.
;  780          0775  2      !
;  781          0776  2      IF .RQCB [RQCB_W_REPLYMBX] EQL 0
;  782          0777  2      THEN
;  783          0778  2          RETURN (FALSE);
;  784          0779  2      !
;  785          0780  2      ! Check for a valid MCB.  If none, then return false.
;  786          0781  2      !
;  787          0782  2      MCB = .RQCB [RQCB_L_MCB];
;  788          0783  3      IF (.MCB EQL 0) OR (.MCB [MCB_B_TYPE] NEQ MCB_K_TYPE)
;  789          0784  2      THEN
;  790          0785  2          RETURN (FALSE);
;  791          0786  2      !
;  792          0787  2      ! Format the reply mailbox name.
;  793          0788  2      !
;  794          0789  2      MBX_DESC [0,0,32,0] = MAX_DEV_NAM;
;  795          0790  2      MBX_DESC [DSC$A_POINTER] = MBX_NAME;
;  796          0791  3      IF NOT $FAO (MBX_FAO, MBX_DESC, MBX_DESC, .RQCB [RQCB_W_REPLYMBX])
;  797          0792  2      THEN
;  798          0793  2          RETURN (FALSE);
;  799          0794  2      !
;  800          0795  2      ! Enable BYPASS privilege, so that we will be able to access the user's
;  801          0796  2      ! mailbox regardless of whatever strange protection he might have decided
;  802          0797  2      ! to give it.
;  803          0798  2      !
;  804          0799  3      IF NOT (STATUS = $SETPRV (ENBFLG=1, PRVADR=BYPASS_PRIV))
;  805          0800  2      THEN
;  806          0801  2          $signal_stop (.STATUS);
;  807          0802  2      !
;  808          0803  2      ! Declare a loop now that we have enabled the privs.  We will use this
;  809          0804  2      ! as a device to make sure that we disable the enhanced privs on any error.
;  810          0805  2      !
;  811          0806  2      WHILE 1
;  812          0807  2      DO
;  813          0808  3          BEGIN
;  814          0809  3          !
;  815          0810  3          ! Create a buffer descriptor for the device characteristics,
```

```
;  816          0811  3      ! and call $GETDEV to get the device characteristics.
;  817          0812  3      !
;  818          0813  3      DEV_DESC [0,0,32,0] = DIB$K_LENGTH;
;  819          0814  3      DEV_DESC [DSC$A_POINTER] = DEV_CHAR;
;  820          0815  4      IF NOT (STATUS = $GETDEV (DEVNAM=MBX_DESC, PRIBUF=DEV_DESC))
;  821          0816  3      THEN
;  822          0817  3          EXITLOOP;
;  823          0818  3      !
;  824          0819  3      ! Build the reply message.
;  825          0820  3      !
;  826          0821  3      MSG_BUF [OPC$B_MS_TYPE] = MSG$_OPREPLY;                    ! Set message type code
;  827          0822  3      MSG_BUF [OPC$W_MS_STATUS] = .MCB [MCB_L_MSGID];            ! Set reply status
;  828          0823  3      MSG_BUF     [OPC$[_MS_RPLYID] = .RQCB [RQCB_L_RQSTID];     ! Set user request id
;  829          0824  3      MSG_SIZE = $BYTEOFFSET (OPC$L_MS_TEXT);
;  830          0825  3      IF (.MCB [MCB_L_TEXTLEN]-1) GTR 0
;  831          0826  3      THEN
;  832          0827  4          BEGIN
;  833          0828  4          CH$MOVE (.MCB [MCB_L_TEXTLEN]-1,                       ! Copy reply text to buffer
;  834          0829  4                   .MCB [MCB_L_TEXTPTR]+1,                    ! but do not copy the
;  835          0830  4                   MSG_BUF [OPC$L_MS_TEXT]                    ! 'bell' character.
;  836          0831  4                  );
;  837          0832  4          MSG_SIZE = .MSG_SIZE + (.MCB [MCB_L_TEXTLEN]-1);
;  838          0833  3          END;
;  839          0834  3      !
;  840          0835  3      ! Check the mailbox size against the reply message size.
;  841          0836  3      ! If the mailbox is too small to accomodate the entire message,
;  842          0837  3      ! truncate the message to the mailbox size.
;  843          0838  3      !
;  844          0839  4      IF (.MSG_SIZE GTR .DEV_CHAR [DIB$W_DEVBUFSIZ])
;  845          0840  3      THEN
;  846          0841  3          MSG_SIZE = .DEV_CHAR [DIB$W_DEVBUFSIZ];
;  847          0842  3      !
;  848          0843  3      ! Assign a channel to the mailbox.
;  849          0844  3      !
;  850          0845  4      IF NOT (STATUS = $ASSIGN (DEVNAM=MBX_DESC, CHAN=MBX_CHAN))
;  851          0846  3      THEN
;  852          0847  3          EXITLOOP;
;  853          0848  3      !
;  854          0849  3      ! If debugging, check the logical and maybe write the message into the log file
;  855          0850  3      !
;  856        L 0851  3      %IF %VARIANT NEQ 0
;  857        U 0852  3      %THEN
;  858        U 0853  3          BEGIN
;  859        U 0854  3          LOCAL
;  860        U 0855  3              DBG_BUF      : $BVECTOR [16],
;  861        U 0856  3              DBG_DSC      : VECTOR [2, LONG];
;  862        U 0857  3          DBG_DSC [0] = 16;
;  863        U 0858  3          DBG_DSC [1] = DBG_BUF;
;  864        U 0859  3          IF ($TRNLOG (LOGNAM=%ASCID 'OPC$DUMP_MAILBOX', RSLBUF=DBG_DSC) EQL SS$_NORMAL)
;  865        U 0860  3          THEN
;  866        U 0861  3              BEGIN
;  867        U 0862  3              DBG_DSC [0] = .MSG_SIZE;
;  868        U 0863  3              DBG_DSC [1] = MSG_BUF;
;  869        U 0864  3              DUMP_LOG_FILE (DBG_DSC, %ASCID '-  Sending reply message to user mailbox');
;  870        U 0865  3              END;
;  871        U 0866  3          END;
;  872          0867  3      %FI
```

```
;  873          0868  3     !
;  874          0869  3     ! Send the message to the mailbox.
;  875          0870  3     !
;  876        P 0871  4     IF (STATUS = $QIOW (FUNC = (IO$_WRITEVBLK OR IO$M_NOW),
;  877        P 0872  4                         CHAN = .MBX_CHAN,
;  878        P 0873  4                         IOSB = IO_STATUS,
;  879        P 0874  4                         P1   = MSG_BUF,
;  880        P 0875  4                         P2   = .MSG_SIZE
;  881          0876  4                        ))
;  882          0877  3     THEN
;  883          0878  3         STATUS = .IO_STATUS [0,0,16,0];         ! Get I/O status
;  884          0879  3     !
;  885          0880  3     ! Display the status if debugging
;  886          0881  3     !
;  887        L 0882  3     %IF %VARIANT NEQ 0
;  888        U 0883  3     %THEN
;  889        U 0884  3         BEGIN
;  890        U 0885  3         LOCAL
;  891        U 0886  3             DBG_BUF      : $BVECTOR [16],
;  892        U 0887  3             DBG_DSC      : VECTOR [2, LONG];
;  893        U 0888  3         DBG_DSC [0] = 16;
;  894        U 0889  3         DBG_DSC [1] = DBG_BUF;
;  895        U 0890  3         IF (%STRNLOG (LOGNAM=%ASCID 'OPC$DUMP_MAILBOX', RSLBUF=DBG_DSC) EQL SS$_NORMAL)
;  896        U 0891  3         THEN
;  897        U 0892  3             WRITE_LOG_FILE (SHARE_FAO_BUFFER (%ASCID 'status from qio to user mailbox !XL', .status));
;  898        U 0893  3         END;
;  899          0894  3     %FI
;  900          0895  3     !
;  901          0896  3     ! Now, exit the loop anyway
;  902          0897  3     !
;  903          0898  3     EXITLOOP;
;  904          0899  2     END;
;  905          0900  2 !
;  906          0901  2 ! Deassign the channel to the mailbox.
;  907          0902  2 !
;  908          0903  2 $DASSGN (CHAN = .MBX_CHAN);
;  909          0904  2 !
;  910          0905  2 ! Remove bypass privilege
;  911          0906  2 !
;  912          0907  2 $SETPRV (ENBFLG=0, PRVADR=BYPASS_PRIV);
;  913          0908  2 !
;  914          0909  2 ! Return the I/O status as the return value.
;  915          0910  2 !
;  916          0911  2 RETURN (.STATUS);
;  917          0912  2
;  918          0913  1 END;                                    ! End of SEND_REPLY


                                .EXTRN  BYPASS_PRIV, MBX_FAO
                                .EXTRN  GLOBAL_STATUS, LCL_NOD
                                .EXTRN  LCL_CSID, CLUSUTIL_SYSTEMID_EQUAL
                                .EXTRN  DUMP_LOG_FILE, SHARE_FAO_BUFFER
                                .EXTRN  WRITE_LOG_FILE, SYS$FAO
                                .EXTRN  SYS$SETPRV, SYS$GETDEV
                                .EXTRN  SYS$ASSIGN, SYS$QIOW
                                .EXTRN  SYS$DASSGN
```

```
                                                 OFFC 00000          .ENTRY  SEND_REPLY, Save R2,R3,R4,R5,R6,R7,R8,R9,-      ; 0697
                                                                             R10,R11
                                              5B 00000000G   00  9E 00002    MOVAB   SYS$SETPRV, R11                        ;
                                              5E      F530   CE  9E 00009    MOVAB   -2768(SP), SP                          ;
                                              19      0000G  CF  E9 0000E    BLBC    GLOBAL_STATUS+1, 1$                    ; 0768
                                        51          0000G  CF  8F C1 00013    ADDL3   #80, LCL_NOD, R1                       ; 0770
                                        50            04   AC  1C C1 0001D    ADDL3   #28, RQCB, R0                          ;
                                                           0000G 30 00022    BSBW    CLUSUTIL_SYSTEMID_EQUAL                ;
                                              04              50  E8 00025    BLBS    R0, 1$                                 ;
                                              50              01  D0 00028    MOVL    #1, R0                                 ; 0772
                                                              04  0002B    RET                                            ;
                                              57          04  AC  D0 0002C 1$: MOVL    RQCB, R7                               ; 0776
                                                          2E  A7  B5 00030    TSTW    46(R7)                                 ;
                                                              12  13 00033    BEQL    2$                                     ;
                                              56          6C  A7  D0 00035    MOVL    108(R7), MCB                           ; 0782
                                                              0C  13 00039    BEQL    2$                                     ; 0783
00000000G  8F       0A  A6                    08                00  ED 0003B    CMPZV   #0, #8, 10(MCB), #MCB_K_TYPE           ;
                                                                  03  13 00045    BEQL    3$                                     ;
                                                                0OF5  31 00047 2$: BRW     8$                                     ;
                                                    0080  CE      40  8F 9A 0004A 3$: MOVZBL  #64, MBX_DESC                  ; 0789
                                                    0084  CE  0088  CE  9E 00050    MOVAB   MBX_NAME, MBX_DESC+4           ; 0790
                                                          7E    2E  A7  3C 00057    MOVZWL  46(R7), -(SP)                  ; 0791
                                                              0084  CE  9F 0005B    PUSHAB  MBX_DESC                       ;
                                                              0088  CE  9F 0005F    PUSHAB  MBX_DESC                       ;
                                                              0000G CF  9F 00063    PUSHAB  MBX_FAO                        ;
                                                   00000000G  00        04  FB 00067    CALLS   #4, SYS$FAO                    ;
                                                              D6        50  E9 0006E    BLBC    R0, 2$                         ;
                                                                        7E  7C 00071    CLRQ    -(SP)                          ; 0799
                                                              0000G CF  9F 00073    PUSHAB  BYPASS_PRIV                    ;
                                                                        01  DD 00077    PUSHL   #1                             ;
                                                                    6B  04  FB 00079    CALLS   #4, SYS$SETPRV                 ;
                                                                    59  50  D0 0007C    MOVL    R0, STATUS                     ;
                                                                    0A  59  E8 0007F    BLBS    STATUS, 4$                     ;
                                                                        59  DD 00082    PUSHL   STATUS                         ; 0801
                                                   00000000G  00        01  FB 00084    CALLS   #1, LIB$STOP                   ;
                                                                        04  0008B    RET                                    ;
                                                        04    AE    74  8F 9A 0008C 4$: MOVZBL  #116, DEV_DESC                 ; 0813
                                                        08    AE    0C  AE 9E 00091    MOVAB   DEV_CHAR, DEV_DESC+4           ; 0814
                                                                        7E 7C 00096    CLRQ    -(SP)                          ; 0815
                                                              0C    AE  9F 00098    PUSHAB  DEV_DESC                       ;
                                                                        7E  D4 0009B    CLRL    -(SP)                          ;
                                                              0090  CE  9F 0009D    PUSHAB  MBX_DESC                       ;
                                                   00000000G  00        05  FB 000A1    CALLS   #5, SYS$GETDEV                 ;
                                                                    59  50  D0 000A8    MOVL    R0, STATUS                     ;
                                                                    78  59  E9 000AB    BLBC    STATUS, 7$                     ;
                                                        00C8  CE        09  90 000AE    MOVB    #9, MSG_BUF                    ; 0821
                                                        00CA  CE    2C  A6  B0 000B3    MOVW    44(MCB), MSG_BUF+2             ; 0822
                                                        00CC  CE    64  A7  D0 000B9    MOVL    100(R7), MSG_BUF+4             ; 0823
                                                                    5A  08  B0 000BF    MOVW    #8, MSG_SIZE                   ; 0824
                                                                    01  30  A6  D1 000C2    CMPL    48(MCB), #1            ; 0825
                                                                            13  15 000C6    BLEQ    5$                             ;
                                                  58        30    A6      01  C3 000C8    SUBL3   #1, 48(MCB), R8        ; 0828
                                                                    50  34  A6  D0 000CD    MOVL    52(MCB), R0            ; 0829
                                              00D0  CE      01    A0      58  28 000D1    MOVC3   R8, 1(R0), MSG_BUF+8   ; 0830
                                                                    5A      58  A0 000D8    ADDW2   R8, MSG_SIZE           ; 0832
                                                        12    AE        5A  B1 000DB 5$: CMPW    MSG_SIZE, DEV_CHAR+6           ; 0839
```

```
                                04  1B 000DF          BLEQU   6$                                          ;
                             5A    12   AE  B0 000E1          MOVW    DEV_CHAR+6, MSG_SIZE                ; 0841
                                7E  7C 000E5 6$:       CLRQ    -(SP)                                       ; 0845
                                 08   AE  9F 000E7          PUSHAB  MBX_CHAN                            ;
                              008C    CE  9F 000EA          PUSHAB  MBX_DESC                            ;
                  00000000G   00        04  FB 000EE          CALLS   #4, SYS$ASSIGN                      ;
                              59        50  D0 000F5          MOVL    R0, STATUS                          ;
                              2B        59  E9 000F8          BLBC    STATUS, 7$                          ;
                                    7E  7C 000FB          CLRQ    -(SP)                                   ; 0876
                                    7E  7C 000FD          CLRQ    -(SP)                                   ;
                              7E        5A  3C 000FF          MOVZWL  MSG_SIZE, -(SP)                     ;
                              00DC      CE  9F 00102          PUSHAB  MSG_BUF                             ;
                                    7E  7C 00106          CLRQ    -(SP)                                   ;
                                 F8   AD  9F 00108          PUSHAB  IO_STATUS                           ;
                              7E    70   8F  9A 0010B          MOVZBL  #112, -(SP)                         ;
                              7E    28   AE  3C 0010F          MOVZWL  MBX_CHAN, -(SP)                     ;
                                    7E  D4 00113          CLRL    -(SP)                                   ;
                  00000000G   00        0C  FB 00115          CALLS   #12, SYS$QIOW                       ;
                              59        50  D0 0011C          MOVL    R0, STATUS                          ;
                              04        59  E9 0011F          BLBC    STATUS, 7$                          ;
                              59     F8   AD  3C 00122          MOVZWL  IO_STATUS, STATUS                   ; 0878
                              7E        6E  3C 00126 7$:       MOVZWL  MBX_CHAN, -(SP)                     ; 0903
                  00000000G   00        01  FB 00129          CALLS   #1, SYS$DASSGN                      ;
                                    7E  7C 00130          CLRQ    -(SP)                                   ; 0907
                              0000G     CF  9F 00132          PUSHAB  BYPASS_PRIV                         ;
                                    7E  D4 00136          CLRL    -(SP)                                   ;
                              6B        04  FB 00138          CALLS   #4, SYS$SETPRV                      ;
                              50        59  D0 0013B          MOVL    STATUS, R0                          ; 0911
                                        04 0013E          RET                                         ;
                                    50  D4 0013F 8$:       CLRL    R0                                  ; 0913
                                        04 00141          RET                                         ;

; Routine Size:  322 bytes,    Routine Base:  $CODE$ + 039B
```

```
;  920     0914  1 GLOBAL ROUTINE TRIM_LENGTH (IN_LEN, IN_PTR : REF VECTOR [,BYTE]) =
;  921     0915  1
;  922     0916  1 !++
;  923     0917  1 ! Functional description:
;  924     0918  1 !
;  925     0919  1 !       Return the length of a string without trailing blanks or nulls
;  926     0920  1 !
;  927     0921  1 ! Input:
;  928     0922  1 !
;  929     0923  1 !       IN_LEN  : Length of the string
;  930     0924  1 !       IN_PTR  : Address of the string
;  931     0925  1 !
;  932     0926  1 ! Implicit Input:
;  933     0927  1 !
;  934     0928  1 !       None.
;  935     0929  1 !
;  936     0930  1 ! Output:
;  937     0931  1 !
;  938     0932  1 !       None.
;  939     0933  1 !
;  940     0934  1 ! Implict output:
;  941     0935  1 !
;  942     0936  1 !       None.
;  943     0937  1 !
;  944     0938  1 ! Side effects:
;  945     0939  1 !
;  946     0940  1 !       None.
;  947     0941  1 !
;  948     0942  1 ! Routine value:
;  949     0943  1 !
;  950     0944  1 !       Return the length of a string without trailing blanks.
;  951     0945  1 !--
;  952     0946  1
;  953     0947  2 BEGIN                                           ! Start of TRIM_LENGTH
;  954     0948  2 LOCAL
;  955     0949  2     IDX;
;  956     0950  2
;  957     0951  2 IDX = .IN_LEN - 1;                              ! Vectors indexed 0:n-1
;  958     0952  2 WHILE .IDX GEQ 0
;  959     0953  2 DO
;  960     0954  3     BEGIN
;  961     0955  3     IF .IN_PTR [.IDX] NEQ %C' '
;  962     0956  3      AND
;  963     0957  3         .IN_PTR [.IDX] NEQ 0
;  964     0958  3     THEN
;  965     0959  3         EXITLOOP;
;  966     0960  3     IDX = .IDX - 1;
;  967     0961  2     END;
;  968     0962  2
;  969     0963  2 RETURN .IDX+1;
;  970     0964  1 END;                                            ! End of TRIM_LENGTH


                        0000 00000          .ENTRY  TRIM_LENGTH, Save nothing                   ; 0914
```

```
                50      04  AC          01  C3 00002          SUBL3   #1, IN_LEN, IDX                 ; 0951
                                        11  19 00007 1$:      BLSS    3$                              ; 0952
                        20      08 BC40 91  00009              CMPB    @IN_PTR[IDX], #32               ; 0955
                                    06  13  0000E              BEQL    2$                              ;
                                08 BC40 95  00010              TSTB    @IN_PTR[IDX]                    ; 0957
                                    04  12  00014              BNEQ    3$                              ;
                                    50  D7  00016 2$:          DECL    IDX                             ; 0960
                                    ED  11  00018              BRB     1$                              ; 0952
                                    50  D6  0001A 3$:          INCL    R0                              ; 0963
                                        04  0001C              RET                                     ; 0964

; Routine Size:  29 bytes,    Routine Base:  $CODE$ + 04DD
```

```
;  972          0965  1 END
;  973          0966  0 ELUDOM                    ! End of OPCOMUTIL
```

```
;                                  PSECT SUMMARY
;
;      Name                    Bytes                          Attributes
;
;  $CODE$                       1274  NOVEC,NOWRT,  RD ,  EXE,NOSHR,  LCL,  REL,  CON,NOPIC,ALIGN(2)
;  $OWN$                         424  NOVEC,  WRT,  RD ,NOEXE,NOSHR,  LCL,  REL,  CON,NOPIC,ALIGN(2)
;  $PLIT$                         17  NOVEC,NOWRT,  RD ,NOEXE,NOSHR,  LCL,  REL,  CON,NOPIC,ALIGN(2)
```

```
;                              Library Statistics
;                                        -------- Symbols --------      Pages       Processing
;      File                              Total    Loaded   Percent      Mapped      Time
;
;  _$255$DUA28:[SYSLIB]LIB.L32;1          18619        37         0        1000        00:01.8
;  _$255$DUA28:[OPCOM.OBJ]OPCOMLIB.L32;1    633        41         6          43        00:00.8
```

```
;                                   COMMAND QUALIFIERS

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

; Size:          1274 code + 441 data bytes
; Run Time:         00:27.2
; Elapsed Time:     01:17.7
; Lines/CPU Min:     2134
; Lexemes/CPU-Min: 21354
; Memory Used:  162 pages
; Compilation Complete
```

LOGFILE
LIS

OPCOMDEF
LIS

OPCOMDATA
LIS

OPCOMINI
LIS

OPCOMUTIL
LIS

OPCOMLIB
LIS

OPCDEFTMP
LIS

OPCOMMAIN
LIS

OPCOMOLD
LIS

OPCOMRPLY
LIS

OPCCRASH
LIS

OPERUTIL
LIS

OPCOMROST
LIS