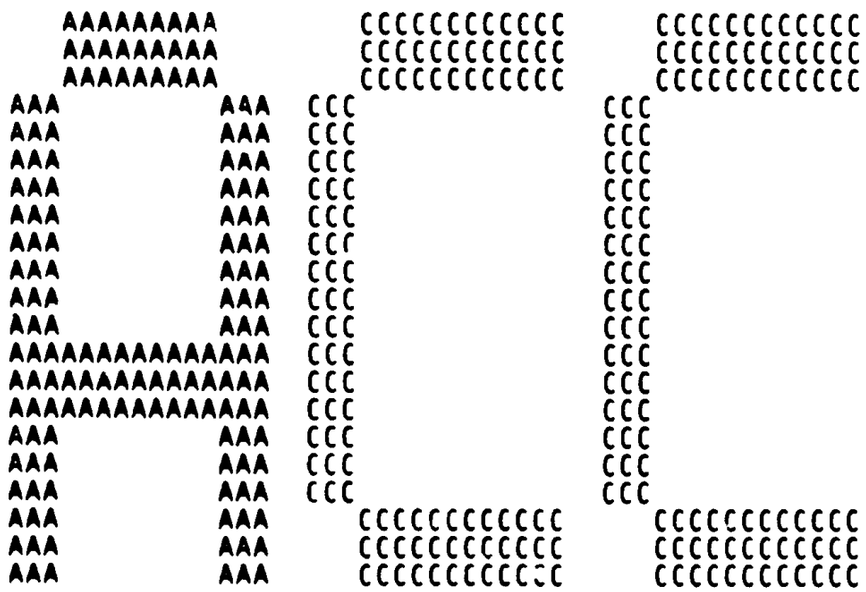
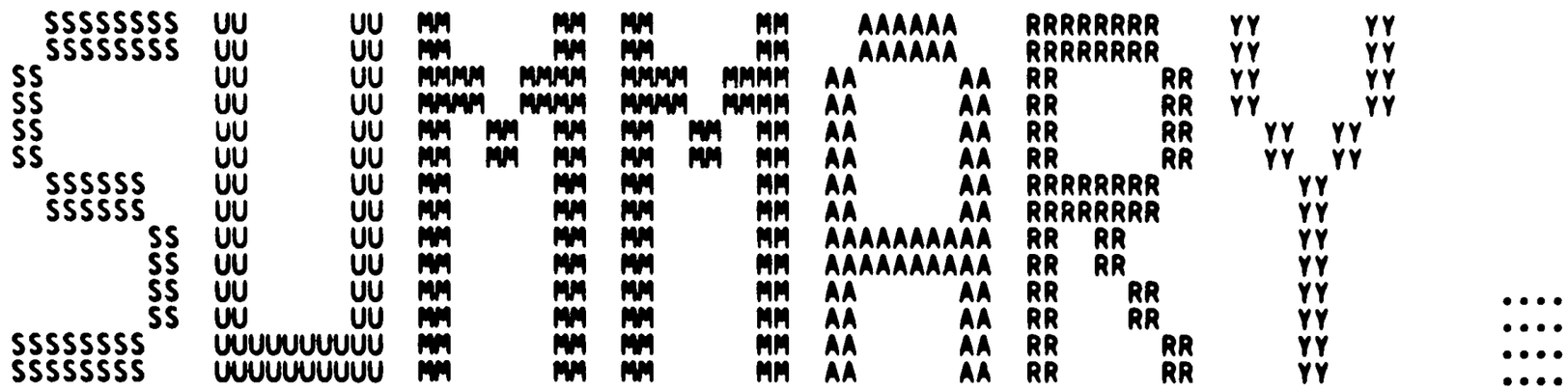
TITLE1**AH-Bi13A-BE
TITLE2**VAX/VMS V4.0
FICHENUMBER**1



FILEID**SUMMARY



```
;    1          0001  0 MODULE
;    2          0002  0 SUMMARY (IDENT = 'V04-000') =
;    3          0003  1 BEGIN
;    4          0004  1
;    5          0005  1 !
;    6          0006  1 !*****************************************************************************
;    7          0007  1 !*                                                                           *
;    8          0008  1 !*  COPYRIGHT (c) 1978, 1980, 1982, 1984 BY                                 *
;    9          0009  1 !*  DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS.                   *
;   10          0010  1 !*  ALL RIGHTS RESERVED.                                                     *
;   11          0011  1 !*                                                                           *
;   12          0012  1 !*  THIS SOFTWARE IS FURNISHED UNDER A LICENSE AND MAY BE USED AND COPIED   *
;   13          0013  1 !*  ONLY IN ACCORDANCE WITH THE TERMS OF SUCH LICENSE AND WITH THE          *
;   14          0014  1 !*  INCLUSION OF THE ABOVE COPYRIGHT NOTICE. THIS SOFTWARE OR ANY OTHER     *
;   15          0015  1 !*  COPIES THEREOF MAY NOT BE PROVIDED OR OTHERWISE MADE AVAILABLE TO ANY   *
;   16          0016  1 !*  OTHER PERSON. NO TITLE TO AND OWNERSHIP OF THE SOFTWARE IS HEREBY       *
;   17          0017  1 !*  TRANSFERRED.                                                             *
;   18          0018  1 !*                                                                           *
;   19          0019  1 !*  THE INFORMATION IN THIS SOFTWARE IS SUBJECT TO CHANGE WITHOUT NOTICE     *
;   20          0020  1 !*  AND SHOULD NOT BE CONSTRUED AS A COMMITMENT BY DIGITAL EQUIPMENT         *
;   21          0021  1 !*  CORPORATION.                                                             *
;   22          0022  1 !*                                                                           *
;   23          0023  1 !*  DIGITAL ASSUMES NO RESPONSIBILITY FOR THE USE OR RELIABILITY OF ITS     *
;   24          0024  1 !*  SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DIGITAL.                  *
;   25          0025  1 !*                                                                           *
;   26          0026  1 !*                                                                           *
;   27          0027  1 !*****************************************************************************
;   28          0028  1
;   29          0029  1 !++
;   30          0030  1 ! FACILITY:  ACC, Account file dumper
;   31          0031  1 !
;   32          0032  1 ! ABSTRACT:
;   33          0033  1 !
;   34          0034  1 !       This module contains routines used to build and manipulate
;   35          0035  1 !       sort and summarization keys as well as routines to accumulate
;   36          0036  1 !       and report summarization totals and general totals.
;   37          0037  1 !
;   38          0038  1 ! ENVIRONMENT:
;   39          0039  1 !
;   40          0040  1 !       VAX/VMS operating system. unprivileged user mode.
;   41          0041  1 !
;   42          0042  1 ! AUTHOR:  Greg Robert and Steve Forgey, January 1982
;   43          0043  1 !
;   44          0044  1 ! Modified by:
;   45          0045  1 !
;   46          0046  1 !       V03-005 DAS0002         David Solomon   12-Jan-1984
;   47          0047  1 !               Get ACCDEF.REQ from SRC$, not MSRC$.
;   48          0048  1 !
;   49          0049  1 !       V03-004 DAS0001         David Solomon   03-Jan-1984
;   50          0050  1 !               Change references to messages from ACC_ to ACC$_. Use new
;   51          0051  1 !               literal for summation symbol table number. In RELEASE_TO_SORT,
;   52          0052  1 !               get key table index number from new table, SORT_INDEX_TABLE, not
;   53          0053  1 !               from key start position word in key description in SORT_TABLE.
;   54          0054  1 !
;   55          0055  1 !       V03-003 SPF0082         Steve Forgey    Feb-11-1982
;   56          0056  1 !               Don't write records rejected by SORT if the /REJECTED
;   57          0057  1 !               qualifier was not present.
```

```
;    58          0058  1 !
;    59          0059  1 !       V03-002 SPF0081         Steve Forgey    Feb-06-1982
;    60          0060  1 !               Output delta times in "!20L !%T" format.
;    61          0061  1 !
;    62          0062  1 !       V03-001 SPF0071         Steve Forgey    Jan-23-1982
;    63          0063  1 !               Include report item name in bar chart reports.
;    64          0064  1 !
;    65          0065  1 !--
;    66          0066  1
;    67          0067  1 !++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
;    68          0068  1 !                                                                                                    :
;    69          0069  1 !                                       INCLUDE  FILES                                               :
;    70          0070  1 !                                                                                                    :
;    71          0071  1 !++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
;    72          0072  1
;    73          0073  1 REQUIRE 'SRC$:ACCDEF';          ! Common ACC definitions
```

```
;    75          0912  1 !----------------------------------------------------------------------
;    76          0913  1 !
;    77          0914  1 !                          TABLE  OF  CONTENTS
;    78          0915  1 !
;    79          0916  1 !----------------------------------------------------------------------
;    80          0917  1
;    81          0918  1 UNDECLARE
;    82          0919  1         RELEASE_TO_SORT,
;    83          0920  1         SUMMARIZE,
;    84          0921  1         WRITE_SUMMARY,
;    85          0922  1         FIND_WATERMARK,
;    86          0923  1         WRITE_BAR_GRAPH,
;    87          0924  1         WRITE_TOTALS;
;    88          0925  1
;    89          0926  1 FORWARD ROUTINE
;    90          0927  1         RELEASE_TO_SORT,                ! Build keys and release to sort
;    91          0928  1         SUMMARIZE,                      ! Summation main control loop
;    92          0929  1         BUILD_SUMMARY,                  ! Builds a summarization key
;    93          0930  1         FIND_SUMMARY,                   ! Locates and allocates summary buckets
;    94          0931  1         ACCUMULATE_SUMMARY,             ! Accumulates summary totals
;    95          0932  1         WRITE_SUMMARY,                  ! Output summary at end of file
;    96          0933  1         FIND_WATERMARK,                 ! Determine peak values
;    97          0934  1         WRITE_BAR_GRAPH,                ! Output bar graphs
;    98          0935  1         SETUP_GRAPH,                    ! Prepare to do bar graph
;    99          0936  1         WRITE_TOTALS;                   ! Output totals at end of program
;   100          0937  1
```

```
;  102          0938  1 !----------------------------------------------------------------------+
;  103          0939  1 !                                                                      |
;  104          0940  1 !                          GENERAL  STORAGE  DEFINITIONS               |
;  105          0941  1 !                                                                      |
;  106          0942  1 !----------------------------------------------------------------------+
;  107          0943  1
;  108          0944  1 OWN
;  109          0945  1         hwm_bucket: ref vector [],      ! Pointer to high watermark bucket
;  110          0946  1         lwm_bucket: ref vector [],      ! Pointer to low watermark bucket
;  111          0947  1         key_desc: bblock [dsc$k_d_bln]  ! Dynamic key symbol descriptor
;  112          0948  1                 preset([dsc$b_class] = dsc$k_class_d),
;  113          0949  1         bar_fao: bblock [dsc$k_d_bln]   ! Dynamic work descriptor
;  114          0950  1               preset([dsc$b_class] = dsc$k_class_d),
;  115          0951  1         bar_char: bblock [dsc$k_d_bln]  ! Dynamic work descriptor
;  116          0952  1               preset([dsc$b_class] = dsc$k_class_d),
;  117          0953  1         desc: bblock [dsc$k_d_bln]      ! Dynamic work descriptor
;  118          0954  1               preset([dsc$b_class] = dsc$k_class_d),
;  119          0955  1         wdesc: bblock [dsc$k_d_bln]     ! Dynamic work descriptor
;  120          0956  1               preset([dsc$b_class] = dsc$k_class_d);
;  121          0957  1
;  122          0958  1
```

```
;  124     0959  1 GLOBAL ROUTINE RELEASE_TO_SORT ( NPUT, KEYS, TABLE, OUTPUT) =
;  125     0960  1
;  126     0961  1 !----
;  127     0962  1 !
;  128     0963  1 ! Functional description
;  129     0964  1 !
;  130     0965  1 !       This routine builds a concatenated key string using standard
;  131     0966  1 !       sort key descriptors. And then release the record to the sort
;  132     0967  1 !       package.
;  133     0968  1 !
;  134     0969  1 ! Input parameters
;  135     0970  1 !
;  136     0971  1 !       INPUT   = Address of the input record
;  137     0972  1 !       KEYS    = Address of a key descriptor list head
;  138     0973  1 !       TABLE   = Address of key table
;  139     0974  1 !
;  140     0975  1 ! Output parameters
;  141     0976  1 !
;  142     0977  1 !       OUTPUT  = Address of a buffer to recieve the concatenated key
;  143     0978  1 !       Any errors encountered are RETURNed immediately.
;  144     0979  1 !       TRUE is returned on a normal exit.
;  145     0980  1 !
;  146     0981  1 !----
;  147     0982  1
;  148     0983  2 BEGIN
;  149     0984  2
;  150     0985  2 EXTERNAL
;  151     0986  2         selected,                       ! Selected record count
;  152     0987  2         rejected_rab,                   ! Rejected record output file RAB
;  153     0988  2         version,                        ! Record format version
;  154     0989  2         sort_index_table: vector [max_sort+1, byte];
;  155     0990  2                                         ! Sort key index table.
;  156     0991  2
;  157     0992  2 MAP
;  158     0993  2     input: ref bblock,
;  159     0994  2     keys: ref blockvector [,quad,byte],  ! Key descriptors
;  160     0995  2     table: ref blockvector [,3];         ! Key table
;  161     0996  2
;  162     0997  2 LOCAL
;  163     0998  2         index,                          ! Key table index
;  164     0999  2         srcptr,                         ! Source string pointer
;  165     1000  2         srclen,                         ! Source string length
;  166     1001  2         desc:   vector [2, long];       ! Temporary string descriptor
;  167     1002  2
;  168     1003  2 !
;  169     1004  2 !INITIALIZE THE DESCRIPTOR --
;  170     1005  2 !       Initialize a descriptor with the address and size of the
;  171     1006  2 !       sort record including keys.
;  172     1007  2 !
;  173     1008  2
;  174     1009  2 SELECTONEU .version of
;  175     1010  2         SET
;  176     1011  2         [acr$k_version2]:
;  177     1012  2                 desc [0] = .input + .input [acc$w_msgsiz] - .output;
;  178     1013  2         [acr$k_version3t, acr$k_version3]:
;  179     1014  2                 desc [0] = .input + .input [acr$w_length] - .output;
;  180     1015  2         TES;
```

```
;  181          1016  2
;  182          1017  2 desc [1] = .output;
;  183          1018  2
;  184          1019  2 Incr i to .(.keys-2)<0,8> do
;  185          1020  3         BEGIN
;  186          1021  3         index = .sort_index_table [.i];         ! Key table index
;  187          1022  3         srclen = .(.table [.index, sort_desc]); ! Source string length
;  188          1023  3         if      .srclen eql 0
;  189          1024  4         then    BEGIN
;  190          1025  4                 selected = .selected - 1;
;  191          1026  5                 if      PRESENT (REJECTED)
;  192          1027  4                 then    perform (write_binary (.input, rejected_rab));
;  193          1028  4                 return true;
;  194          1029  3                 END;
;  195          1030  3         srcptr = .(.table [.index, sort_desc] + 4);! Source string address
;  196          1031  3         output = ch$copy ( .srclen, .srcptr,
;  197          1032  3                 0,                              ! Fill character
;  198          1033  3                 .keys [.i, key_w_length],       ! Destination length
;  199          1034  3                 .output);                       ! Destination address
;  200          1035  2         END;
;  201          1036  2
;  202          1037  2 !
;  203          1038  2 ! RELEASE TO SORT --
;  204          1039  2 !       Release the record to the sort package.
;  205          1040  2 !
;  206          1041  2
;  207          1042  2 Return sor$release_rec (desc);
;  208          1043  2
;  209          1044  1 END;
```

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

                                .PSECT  DATA,NOEXE,2

                    00000 HWM_BUCKET:
                                .BLKB   4
                    00004 LWM_BUCKET:
                                .BLKB   4
                00# 00008 KEY_DESC:
                                .BYTE   0[3]                            ;
                02  0000B          .BYTE   2                           ;
                    0000C          .BLKB   4
                00# 00010 BAR_FAO:.BYTE   0[3]                          ;
                02  00013          .BYTE   2                           ;
                    00014          .BLKB   4
                00# 00018 BAR_CHAR:
                                .BYTE   0[3]                            ;
                02  0001B          .BYTE   2                           ;
                    0001C          .BLKB   4
                00# 00020 DESC:   .BYTE   0[3]                          ;
                02  00023          .BYTE   2                           ;
                    00024          .BLKB   4
                00# 00028 WDESC:  .BYTE   0[3]                          ;
                02  0002B          .BYTE   2                           ;
                    0002C          .BLKB   4
```

```
                        .EXTRN  ACC$_INVACCREC, ACC$_TOTAL
                        .EXTRN  ACC$_MERGE, ACC$_INPUT
                        .EXTRN  ACC$_TITLETRUNC
                        .EXTRN  ADD_SYMBOL, ALLOCATE
                        .EXTRN  FIND_WATERMARK, HANDLER
                        .EXTRN  LIB$ADDX, LIB$CVT_DTB
                        .EXTRN  LIB$CVT_HTB, LIB$CVT_TIME
                        .EXTRN  LIB$DAY, LIB$FILE_SCAN
                        .EXTRN  LIB$ICHAR, LIB$LOOKUP_KEY
                        .EXTRN  LIB$SUBX, LIB$SYS_ASCTIM
                        .EXTRN  LIB$SYS_FAO, LIB$SYS_FAOL
                        .EXTRN  LIB$TPARSE, LOG_FILENAME
                        .EXTRN  LOOKUP_SYMBOL, MAP_QUALIFIERS
                        .EXTRN  PARSE_OUTPUT_FILES
                        .EXTRN  RELEASE_TO_SORT
                        .EXTRN  SCAN_SYMBOLS, SHOW_RECORD
                        .EXTRN  SOR$END_SORT, SOR$INIT_SORT
                        .EXTRN  SOR$RELEASE_REC
                        .EXTRN  SOR$RETURN_REC, SOR$SORT_MERGE
                        .EXTRN  STR$APPEND, STR$COMPARE
                        .EXTRN  STR$DUPL_CHAR, STR$LEFT
                        .EXTRN  STR$PREFIX, STR$REPLACE
                        .EXTRN  STR$RIGHT, STRIP_NEGATOR
                        .EXTRN  STRIP_TRAIL, SUMMARIZE
                        .EXTRN  SYS$NUMTIM, TRANSLATE_STATUS
                        .EXTRN  WRITE_BAR_GRAPH
                        .EXTRN  WRITE_BINARY, WRITE_SUMMARY
                        .EXTRN  WRITE_TOTALS, SELECTED
                        .EXTRN  REJECTED_RAB, VERSION
                        .EXTRN  SORT_INDEX_TABLE
                        .EXTRN  QUALIFIERS

                        .PSECT  CODE,NOWRT,2

                    0FFC 00000          .ENTRY  RELEASE_TO_SORT, Save R2,R3,R4,R5,R6,R7,R8,-; 0959
                                                R9,R10,R11
                 5E         08  C2 00002      SUBL2   #8, SP                                 ;
                 50 00000000G   00  D0 00005      MOVL    VERSION, R0                         ; 1009
                                05  13 00008      BEQL    1$                                  ; 1011
                 02             50  D1 0000A      CMPL    R0, #2                              ; 1013
                                10  1A 0000D      BGTRU   2$                                  ;
                 51         04  AC  D0 00010  1$:  MOVL    INPUT, R1                           ; 1014
                 50         02  A1  3C 00014      MOVZWL  2(R1), R0                           ;
                 50             51  C0 00018      ADDL2   R1, R0                              ;
              6E 50         10  AC  C3 0001B      SUBL3   OUTPUT, R0, DESC                    ;
           04    AE         10  AC  D0 0001F  2$:  MOVL    OUTPUT, DESC+4                      ; 1017
                 58         08  AC  D0 00024      MOVL    KEYS, R8                            ; 1019
                 5A         FE  A8  9A 00028      MOVZBL  -2(R8), R10                         ;
                 57             01  CE 0002C      MNEGL   #1, I                               ; 1022
                                51  11 0002F      BRB     6$                                  ;
                 56 G0000000G0047   9A 00031  3$:  MOVZBL  SORT_INDEX_TABLE[I], INDEX         ; 1021
              50 56             0C  C5 00035      MULL3   #12, INDEX, R0                      ; 1022
                 50         0C  AC  C0 00039      ADDL2   TABLE, R0                           ;
                 52         04  A0  D0 0003D      MOVL    4(R0), R2                           ;
                 59             62  D0 00041      MOVL    (R2), SRCLEN                        ;
                                25  12 00044      BNEQ    5$                                  ; 1023
```

```
                                00000000G  00    D7 0004E                DECL    SELECTED                                        ; 1025
                13 00000000G    00          02  E1 00054                BBC     #2, QUALIFIERS+2, 4$                            ; 1026
                                00000000G   00  9F 0005C                PUSHAB  REJECTED_RAB                                    ; 1027
                                      04    AC  DD 00062                PUSHL   INPUT                                           ;
                   00000000G    00          02  FB 00065                CALLS   #2, WRITE_BINARY                                ;
                                24          50  E9 0006C                BLBC    STATUS, 7$                                      ;
                                50          01  D0 0006F 4$:            MOVL    #1, R0                                          ; 1028
                                            04  00072                    RET                                                     ;
                                5B      04  A2  D0 00073 5$:            MOVL    4(R2), SRCPTR                                   ; 1030
                                        06 A847 7F 00077                PUSHAQ  6(R8)[I]                                        ; 1034
          9E        00          6B          59  2C 0007B                MOVC5   SRCLEN, (SRCPTR), #0, @(SP)+, @OUTPUT           ;
                                      10    BC  00080                                                                           ;
                          10    AC          53  D0 00082                MOVL    R3, OUTPUT                                      ;
                    AB          57          5A  F3 00086 6$:            AOBLEQ  R10, I, 3$                                      ; 1019
                                            5E  DD 0008A                PUSHL   SP                                              ; 1042
                   00000000G    00          01  FB 0008C                CALLS   #1, SOR$RELEASE_REC                             ;
                                            04  00093 7$:               RET                                                     ; 1044

; Routine Size:  148 bytes,    Routine Base:  CODE + 0000
```

```
;  211     1045  1 GLOBAL ROUTINE SUMMARIZE (BUFFER) =
;  212     1046  1
;  213     1047  1 !----
;  214     1048  1 !
;  215     1049  1 ! Functional description
;  216     1050  1 !
;  217     1051  1 !       This routine is part of summarization logic.  It is the main
;  218     1052  1 !       control routine.  It is entered when a record is selected and
;  219     1053  1 !       the user has specified /SUMMARY.
;  220     1054  1 !
;  221     1055  1 !       A symbol is constructed from the record which uniquely identifies
;  222     1056  1 !       the summarization 'bucket' to which this record belongs.  The
;  223     1057  1 !       construction is driven by the list of summarization keys supplied
;  224     1058  1 !       by the user.
;  225     1059  1 !
;  226     1060  1 !       Example:  If the user specified:
;  227     1061  1 !
;  228     1062  1 !                       ACC /SUMMARY=(DAY, USER, ACCOUNT)
;  229     1063  1 !
;  230     1064  1 !       then a symboi (key) would be build out of a date string, username,
;  231     1065  1 !       and account name from the record:
;  232     1066  1 !
;  233     1067  1 !                       YYYY MM DD USER---- ACCOUNT-----
;  234     1068  1 !                       1980 10 21 ROBERT   VMS
;  235     1069  1 !
;  236     1070  1 !       Next the summarization bucket for the key is located.  If not found
;  237     1071  1 !       then a new bucket is allocated and intialized.
;  238     1072  1 !
;  239     1073  1 !       Finally the bucket is updated with the contents of the record.  Only
;  240     1074  1 !       those fields requested by the user via the /REPORT qualifier are
;  241     1075  1 !       summed.  Note that some fields are summed, some are mazimized, and
;  242     1076  1 !       some are averaged.
;  243     1077  1 !
;  244     1078  1 ! Input parameters
;  245     1079  1 !
;  246     1080  1 !       BUFFER  =       Address of a record to be summed
;  247     1081  1 !
;  248     1082  1 ! Output parameters
;  249     1083  1 !
;  250     1084  1 !       Any errors encountered are RETURNed immediately.
;  251     1085  1 !
;  252     1086  1 !----
;  253     1087  1
;  254     1088  2 BEGIN
;  255     1089  2
;  256     1090  2 LOCAL
;  257     1091  2         bucket;                         ! Receives address of summation bucket
;  258     1092  2
;  259     1093  2 Perform (build_summary (.buffer, key_desc));    ! Build a summarization key
;  260     1094  2
;  261     1095  2 Perform (find_summary (key_desc, bucket));      ! Locate the summary bucket
;  262     1096  2
;  263     1097  2 Perform (accumulate_summary (.buffer, .bucket));! Merge this record
;  264     1098  2
;  265     1099  2
;  266     1100  2 return true;
;  267     1101  1 END;
```

```
                                    0004 00000          .ENTRY  SUMMARIZE, Save R2                                  ; 1045
                          52 00000000'  EF  9E 00002    MOVAB   KEY_DESC, R2                                       ;
                          5E            04  C2 00009    SUBL2   #4, SP                                             ;
                                        52  DD 0000C    PUSHL   R2                                                 ; 1093
                                    04  AC  DD 0000E    PUSHL   BUFFER                                             ;
                    0000V CF            02  FB 00011    CALLS   #2, BUILD_SUMMARY                                  ;
                          1C            50  E9 00016    BLBC    STATUS, 1$                                         ;
                                4004    8F  BB 00019    PUSHR   #^M<R2,SP>                                         ; 1095
                    0000V CF            02  FB 0001D    CALLS   #2, FIND_SUMMARY                                   ;
                          10            50  E9 00022    BLBC    STATUS, 1$                                         ;
                                        6E  DD 00025    PUSHL   BUCKET                                             ; 1097
                                    04  AC  DD 00027    PUSHL   BUFFER                                             ;
                    0000V CF            02  FB 0002A    CALLS   #2, ACCUMULATE_SUMMARY                             ;
                          03            50  E9 0002F    BLBC    STATUS, 1$                                         ;
                          50            01  D0 00032    MOVL    #1, R0                                             ; 1100
                                        04  00035 1$:    RET                                                        ; 1101

; Routine Size:  54 bytes,    Routine Base:  CODE + 0094
```

```
;  269          1102  1 ROUTINE BUILD_SUMMARY (BUFFER, KEY) =
;  270          1103  1
;  271          1104  1 !----
;  272          1105  1 !
;  273          1106  1 ! Functional description
;  274          1107  1 !
;  275          1108  1 !       This routine is part of summarization logic.  A summation key is
;  276          1109  1 !       built for the record contained in BUFFER.  The user has supplied
;  277          1110  1 !       a list of summation keys via the /SUMMARY=(key1, key2, ...) syntax.
;  278          1111  1 !       A string is built by appending the values associated with each key
;  279          1112  1 !       for this particular record.
;  280          1113  1 !
;  281          1114  1 ! Input parameters
;  282          1115  1 !
;  283          1116  1 !       BUFFER  =       Address of a record
;  284          1117  1 !       KEY     =       Address of a dynamic descriptor to receive symbol
;  285          1118  1 !
;  286          1119  1 ! Output parameters
;  287          1120  1 !
;  288          1121  1 !       A summary key is built in the output key buffer.
;  289          1122  1 !       Any errors encountered are RETURNed immediately.
;  290          1123  1 !
;  291          1124  1 !----
;  292          1125  1
;  293          1126  2 BEGIN
;  294          1127  2
;  295          1128  2 EXTERNAL
;  296          1129  2         sum_key_fao,            ! FAO describing key
;  297          1130  2         sum_key_value;          ! Values matching FAO
;  298          1131  2 !
;  299          1132  2 ! SUM_KEY_FAO is a descriptor of the desired key value.  It is built out
;  300          1133  2 ! of the individual descriptors associated with each possible summation key.
;  301          1134  2 !
;  302          1135  2 ! SUM_KEY_VALUE is a table of addresses of values suitable for a FAOL call.
;  303          1136  2 ! This table matches the set of FAO directives in SUM_KEY_FAO and is built
;  304          1137  2 ! in a similar way.
;  305          1138  2 !
;  306          1139  2 ! For construction details see PARSE_KEYS.
;  307          1140  2 !
;  308          1141  2
;  309          1142  2 perform (lib$sys_faol (sum_key_fao, 0, .key, sum_key_value));
;  310          1143  2
;  311          1144  2 return true;
;  312          1145  1 END;


                                                .EXTRN  SUM_KEY_FAO, SUM_KEY_VALUE

                                0000 00000 BUILD_SUMMARY:
                                                .WORD   Save nothing                    ; 1102
                     00000000G  00  9F 00002    PUSHAB  SUM_KEY_VALUE                  ; 1142
                           08   AC  DD 00008    PUSHL   KEY                            ;
                                7E  D4 0000B    CLRL    -(SP)                          ;
                     00000000G  00  9F 0000D    PUSHAB  SUM_KEY_FAO                    ;
          00000000G  00         04  FB 00013    CALLS   #4, LIB$SYS_FAOL               ;
                     03         50  E9 0001A    BLBC    STATUS, 1$                     ;
```

```
                        50          01  D0 0001D          MOVL    #1, R0                          ; 1144
                                        04 00020 1$:      RET                                     ; 1145

; Routine Size:  33 bytes,    Routine Base:  CODE + 00CA
```

```
;  314          1146  1 ROUTINE FIND_SUMMARY (KEY, BUCKET_ADR) =
;  315          1147  1
;  316          1148  1 !----
;  317          1149  1 !
;  318          1150  1 ! Functional description
;  319          1151  1 !
;  320          1152  1 !       This routine is part of summarization logic.  Given a summation
;  321          1153  1 !       key, this routine locates the matching summation bucket.  If no
;  322          1154  1 !       match is found, then a new bucket is allocated and a entry is
;  323          1155  1 !       made in the symbol table for this key.  The value associated with
;  324          1156  1 !       the symbol is the address of the summation bucket.
;  325          1157  1 !
;  326          1158  1 ! Input parameters
;  327          1159  1 !
;  328          1160  1 !       KEY             =       Address of descriptor or summation key
;  329          1161  1 !       BUCKET_ADR      =       Address of longword to recieve bucket address
;  330          1162  1 !
;  331          1163  1 ! Output parameters
;  332          1164  1 !
;  333          1165  1 !       BUCKET_ADR is loaded with the address of the summation bucket.
;  334          1166  1 !       Any errors encountered are RETURNed immediately.
;  335          1167  1 !
;  336          1168  1 !----
;  337          1169  1
;  338          1170  2 BEGIN
;  339          1171  2
;  340          1172  2 EXTERNAL
;  341          1173  2         bucket_size;                    ! Bucket size to allocate in bytes
;  342          1174  2
;  343          1175  2
;  344          1176  2 If not lookup_symbol (summation_table, .key, .bucket_adr)       ! New symbol?
;  345          1177  3 then    BEGIN
;  346          1178  3         perform (allocate (.bucket_size, .bucket_adr));         ! Y, get bucket
;  347          1179  3         ch$fill (0, .bucket_size, ..bucket_adr);                ! Zero it
;  348        P 1180  3         perform (add_symbol
;  349          1181  3                 (summation_table, .key, ..bucket_adr));         ! Enter symbol
;  350          1182  2         END;
;  351          1183  2
;  352          1184  2 return true;
;  353          1185  2
;  354          1186  1 END;


                                                        .EXTRN  BUCKET_SIZE

                                        00FC 00000 FIND_SUMMARY:
                                                        .WORD   Save R2,R3,R4,R5,R6,R7          ; 1146
                        57 00000000G    00   9E 00002           MOVAB   BUCKET_SIZE, R7         ;
                        7E        04    AC   7D 00009           MOVQ    KEY, -(SP)              ; 1176
                                        3F   DD 0000D           PUSHL   #63                     ;
              00000000G 00              03   FB 0000F           CALLS   #3, LOOKUP_SYMBOL       ;
                        2A              50   E8 00016           BLBS    R0, 1$                  ;
                                  08    AC   DD 00019           PUSHL   BUCKET_ADR              ; 1178
                                        67   DD 0001C           PUSHL   BUCKET_SIZE             ;
              00000000G 00              02   FB 0001E           CALLS   #2, ALLOCATE            ;
                        1E              50   E9 00025           BLBC    STATUS, 2$              ;
```

```
                        56      08  BC  D0 00028          MOVL    @BUCKET_ADR, R6                                 ; 1179
          67            00      6E      00  2C 0002C      MOVC5   #0, (SP), #0, BUCKET_SIZE, (R6)                 ;
                                          66      00031                                                         ;
                                          56  DD  00032      PUSHL   R6                                          ; 1181
                                      04  AC  DD  00034      PUSHL   KEY                                         ;
                                          3F  DD  00037      PUSHL   #63                                         ;
                    00000000G     00        03  FB  00039      CALLS   #3, ADD_SYMBOL                            ;
                                  03        50  E9  00040      BLBC    STATUS, 2$                                  ;
                                  50        01  D0  00043 1$:  MOVL    #1, R0                                      ; 1184
                                            04  00046 2$:  RET                                                     ; 1186

; Routine Size:  71 bytes,    Routine Base:  CODE + 00EB
```

```
;  356          1187  1 ROUTINE ACCUMULATE_SUMMARY (BUFFER, BUCKET) =
;  357          1188  1
;  358          1189  1 !----
;  359          1190  1 !
;  360          1191  1 ! Functional description
;  361          1192  1 !
;  362          1193  1 !       This routine is part of summarization logic.  It is called to
;  363          1194  1 !       merge a given record into its summation bucket.  The values to
;  364          1195  1 !       be merged are determined by the list of values to be reported
;  365          1196  1 !       given with the /REPORT=(val1, val2, ...) syntax, plus some
;  366          1197  1 !       standard values that are always summarized.
;  367          1198  1 !
;  368          1199  1 !       Summation bucket elements may be manipulated in any of the
;  369          1200  1 !       following ways:
;  370          1201  1 !
;  371          1202  1 !               Addition        (e.g. connect time)
;  372          1203  1 !               Integration     (e.g. CPUTIM * WSPEAK)
;  373          1204  1 !               Incrementing    (e.g. counting records)
;  374          1205  1 !               Maximizing      (e.g. generating a watermark)
;  375          1206  1 !
;  376          1207  1 ! Input parameters
;  377          1208  1 !
;  378          1209  1 !       BUFFER  =       Address of a record to be summed
;  379          1210  1 !       BUCKET  =       Address of a summation bucket
;  380          1211  1 !
;  381          1212  1 ! Output parameters
;  382          1213  1 !
;  383          1214  1 !       Any errors encountered are RETURNed immediately.
;  384          1215  1 !
;  385          1216  1 !----
;  386          1217  1
;  387          1218  2 BEGIN
;  388          1219  2
;  389          1220  2 EXTERNAL
;  390          1221  2         report_items,                   ! Number of report items
;  391          1222  2         report_value: vector [];        ! Table of pointers to offsets
;  392          1223  2
;  393          1224  2 MAP
;  394          1225  2         bucket: ref vector [],          ! Summary array
;  395          1226  2         buffer: ref bblock [];          ! Record buffer
;  396          1227  2
;  397          1228  2 LOCAL
;  398          1229  2         index;                          ! Index to summation bucket item
;  399          1230  2
;  400          1231  2 !
;  401          1232  2 ! Using the report_value table build by parse_keys accumulate data
;  402          1233  2 ! in the summary array.  Each entry in the report_value vector contains
;  403          1234  2 ! the address of a structure that describes a report item.
;  404          1235  2 !
;  405          1236  2
;  406          1237  2 Index = 1;                              ! First bucket_item reserved
;  407          1238  2
;  408          1239  2 Incr i to .report_items - 1 do
;  409          1240  3   BEGIN
;  410          1241  3   BIND rep_item = .report_value [.i]: vector [];
;  411          1242  3   case .rep_item [sum_ent_type] from 0 to 5 of
;  412          1243  3     SET
```

```
;  413          1244  3      [sum_type_add]:
;  414          1245  3          bucket [.index]  = .bucket [.index] + ..rep_item [sum_ent_adr];
;  415          1246  3
;  416          1247  3      [sum_type_addx]:
;  417        P 1248  3          perform (lib$addx (
;  418        P 1249  3                  bucket [.index], .rep_item [sum_ent_adr],
;  419          1250  3                  bucket [.index], rep_item [sum_ent_bsize]));
;  420          1251  3
;  421          1252  3      [sum_type_peak]:
;  422          1253  3          bucket [.index] = maxu (.bucket [.index], ..rep_item [sum_ent_adr]);
;  423          1254  3
;  424          1255  3      [sum_type_incr]:
;  425          1256  3          bucket [.index] = .bucket [.index] + 1;
;  426          1257  3
;  427          1258  3      [sum_type_type]:
;  428          1259  3          if .buffer [acc$w_msgtyp] eqlu .rep_item [sum_ent_adr]
;  429          1260  3          then bucket [.index] = .bucket [.index] + 1;
;  430          1261  3
;  431          1262  3      [sum_type_elap]:
;  432          1263  3          0;
;  433          1264  3
;  434          1265  3      TES;
;  435          1266  3     index = .index + .rep_item [sum_ent_bsize];
;  436          1267  2     END;
;  437          1268  2
;  438          1269  2 return true;
;  439          1270  1 END;


                                                .EXTRN  REPORT_ITEMS, REPORT_VALUE

                                    003C 00000 ACCUMULATE_SUMMARY:
                                                .WORD   Save R2,R3,R4,R5                ;  1187
                                52              MOVL    #1, INDEX                       ;  1237
                                55 00000000G    MOVL    REPORT_ITEMS, R5                ;  1239
                                54              MNEGL   #1, I
                                                BRB     10$
                                53 00000000G    MOVL    REPORT_VALUE[I], R3             ;  1241
                             05 00              CASEL   (R3), #0, #5                    ;  1242
                        004C 002D       0014    000C    0001D 2$:       .WORD   3$-2$,-
                                        0050    0043    00025                   4$-2$,-
                                                                                5$-2$,-
                                                                                8$-2$,-
                                                                                7$-2$,-
                                                                                9$-2$
                                08 BC42     04  B3  C0 00029 3$:       ADDL2   @4(R3), @BUCKET[INDEX]     ;  1245
                                                3C  11 0002F           BRB     9$
                                            08  A3  9F 00031 4$:       PUSHAB  8(R3)                       ;  1250
                                08 BC42     08  BC42 DF 00034          PUSHAL  @BUCKET[INDEX]
                                            04  A3  DD 00038          PUSHL   4(R3)
                                08 BC42     08  BC42 DF 0003B          PUSHAL  @BUCKET[INDEX]
                          00000000G 00              04  FB 0003F      CALLS   #4, LIB$ADDX
                                    24              50  E8 00046      BLBS    STATUS, 9$
                                                    04  00049         RET
                                    50      08  BC42    D0 0004A 5$:   MOVL    @BUCKET[INDEX], R0       ;  1253
                                04  B3              50  D1 0004F      CMPL    R0, @4(R3)
```

```
                                        04  1E 00053          BGEQU   6$                                      ;
                                     50 04  B3 D0 00055          MOVL    @4(R3), R0                           ;
                                  08 BC42   50 D0 0C059 6$:      MOVL    R0, @BUCKET[INDEX]                   ;
                                            0D 11 0005E          BRB     9$                                   ;
      04    A3        04    BC          10  00 ED 00060 7$:      CMPZV   #0, #16, @BUFFER, 4(R3)              ; 1259
                                            04 12 00067          BNEQ    9$                                   ;
                                  08 BC42   D6 00069 8$:         INCL    @BUCKET[INDEX]                       ; 1260
                                     52 08  A3 C0 0006D 9$:      ADDL2   8(R3), INDEX                         ; 1266
                                  9C 54     55 F2 00071 10$:     AOBLSS  R5, I, 1$                            ; 1239
                                     50     01 D0 00075          MOVL    #1, R0                               ; 1269
                                            04 00078             RET                                          ; 1270

; Routine Size:  121 bytes,    Routine Base:  CODE + 0132
```

```
;   441          1271  1 GLOBAL ROUTINE WRITE_SUMMARY (key, data) =
;   442          1272  1
;   443          1273  1 !----
;   444          1274  1 !
;   445          1275  1 ! Functional description
;   446          1276  1 !
;   447          1277  1 !       This routine is called to output summarization lines.
;   448          1278  1 !       These lines are accumulated and totals lines are output
;   449          1279  1 !       each time a key break occurs
;   450          1280  1 !
;   451          1281  1 ! Input parameters
;   452          1282  1 !
;   453          1283  1 !       KEY     = Address of descriptor of symbol .
;   454          1284  1 !       DATA    = Address of a summation bucket
;   455          1285  1 !
;   456          1286  1 !
;   457          1287  1 ! Output parameters
;   458          1288  1 !
;   459          1289  1 !       Any errors encountered are RETURNed immediately.
;   460          1290  1 !
;   461          1291  1 !----
;   462          1292  1
;   463          1293  2 BEGIN
;   464          1294  2
;   465          1295  2 EXTERNAL
;   466          1296  2         report_items,
;   467          1297  2         report_value: vector [],
;   468          1298  2         report_hdr1_fao,                ! Report header 1 FAO string
;   469          1299  2         report_hdr2_fao,                ! Report header 2 FAO string
;   470          1300  2         report_det_fao;                 ! Report detail FAO string
;   471          1301  2
;   472          1302  2 OWN
;   473          1303  2         title_desc:bblock [dsc$k_d_bln] ! Allocate dynamic descriptor
;   474          1304  2                 preset([dsc$b_class] = dsc$k_class_d),
;   475          1305  2         first: initial (true),          ! First time switch
;   476          1306  2         fao_list: VECTOR [MAX_REPORT+2];
;   477          1307  2
;   478          1308  2 LOCAL
;   479          1309  2         index_src,
;   480          1310  2         index_dst;
;   481          1311  2
;   482          1312  2 MAP
;   483          1313  2         report_hdr1_fao: bblock,        ! Upper report header
;   484          1314  2         report_hdr2_fao: bblock,        ! Lower report header
;   485          1315  2         key:  ref bblock [2],           ! Symbol descriptor
;   486          1316  2         data: ref vector [];            ! Summation record
;   487          1317  2
;   488          1318  2 If .first then
;   489          1319  3     BEGIN
;   490          1320  3     EXTERNAL first_date, last_date;
;   491          1321  3     LITERAL date1_size = 23, date2_size = 21;   ! Length of date strings
;   492          1322  3     LOCAL fill;
;   493          1323  3
;   494          1324  3     First = false;                          ! Clear switch
;   495          1325  3     SET_SCROLL (5, SCREEN (length));        ! Only effects Vt100's
;   496          1326  3     ERASE_PAGE ();                          ! Erase entire screen
;   497          1327  3
```

```
;  498          1328  3      GET_VALUE ('TITLE', title_desc);                ! Get the title
;  499          1329  3      fill = SCREEN (width) - 2                       ! Compute available title area
;  500          1330  3          - date1_size - date2_size;
;  501          1331  3      if .title_desc [dsc$w_length] gtru .fill        ! If title is too long
;  502          1332  4          then BEGIN
;  503          1333  4              signal (acc$_titletrunc,1, .fill);      ! -- then warn user
;  504          1334  4              title_desc [dsc$w_length] = .fill;      ! -- truncate title
;  505          1335  4              END;
;  506          1336  3
;  507          1337  3      fill = .fill - .title_desc [dsc$w_length] + 2;
;  508          1338  3
;  509        P 1339  3      WRITE_LINE (XFAO (AD ('From: !17%D!#* !AS!#* To: !17%D'),
;  510        P 1340  3          first_date,                                 !  -"From" date
;  511        P 1341  3          .fill/2,                                    !  -fill to title
;  512        P 1342  3          title_desc,                                 !  -title
;  513        P 1343  3          .fill/2 + .fill mod 2,                      !  -fill after title
;  514          1344  3          last_date));                                !  -"To" Date
;  515          1345  3
;  516          1346  3      WRITE_LINE (XFAO (report_hdr1_fao));            ! Write report header 1
;  517          1347  3      WRITE_LINE (XFAO (report_hdr2_fao));            ! Write report header 2
;  518        P 1348  3      WRITE_LINE (XFAO (AD ('!#*-'),                  ! Underline them
;  519          1349  3          .report_hdr1_fao [dsc$w_length]));
;  520          1350  2      END;
;  521          1351  2
;  522          1352  2  fao_list [0] = .key;                               ! Store address of symbol desc
;  523          1353  2                                                     ! as first data item
;  524          1354  2  index_src = 1;
;  525          1355  2  index_dst = 1;
;  526          1356  2  Incr i to .report_items - 1 do
;  527          1357  3    BEGIN
;  528          1358  3    BIND rep_item = .report_value [.i]: vector [];
;  529          1359  3
;  530          1360  3  !
;  531          1361  3  ! Check the field length.  If 1 then copy the summation value. Else copy the
;  532          1362  3  ! summation value address.
;  533          1363  3  !
;  534          1364  3
;  535          1365  3    if .rep_item [sum_ent_bsize] eql 1
;  536          1366  3    then  fao_list [.index_dst] = .data [.index_src]
;  537          1367  4    else  BEGIN
;  538          1368  4          BUILTIN emul;
;  539          1369  4          lib$day (data [.index_src + 2], data [.index_src], data [.index_src]);
;  540          1370  4          emul (%ref(100000), data [.index_src], %ref(0), data [.index_src]);
;  541          1371  4          fao_list [.index_dst] = .data [.index_src + 2];
;  542          1372  4          index_dst = .index_dst + 1;
;  543          1373  4          fao_list [.index_dst] = data [.index_src];
;  544          1374  3          END;
;  545          1375  3    index_src = .index_src + .rep_item [sum_ent_bsize];
;  546          1376  3    index_dst = .index_dst + 1;
;  547          1377  2    END;
;  548          1378  2
;  549          1379  2  Write_line (XFAOL (report_det_fao, fao_list [0]));      ! Output a detail line
;  550          1380  2
;  551          1381  2  return true;
;  552          1382  1  END;
```

```
                                                                .PSECT  DATA,NOEXE,2

                                                        00# 00030 TITLE_DESC:
                                                                .BYTE   0[3]                                    ;
                                                        02  00033          .BYTE   2                           ;
                                                            00034          .BLKB   4                           ;
                                                 00000001   00038 FIRST:   .LONG   1                           ;
                                                            0003C FAO_LIST:
                                                                .BLKB   128

                                                                .PSECT  CODE,NOWRT,2

                                                            001AB          .BLKB   1
                                  00  00  00  45  4C  54  49  54  001AC P.AAB:   .ASCII  \TITLE\<0><0><0>          ;
                                                     00000005   001B4 P.AAA:   .LONG   5                         ;
                                                     00000000'  001B8          .ADDRESS P.AAB                  ;
20  2A  23  21  44  25  37  31  21  20  3A  6D  6F  72  46  001BC P.AAD:   .ASCII  \From: !17%D!#* !AS!#* To: !17%D\<0>  ;
25  37  31  21  20  3A  6F  54  20  2A  23  21  53  41  21  001CB                                                 ;
                                                        00  44  001DA                                           ;
                                                     0000001F   001DC P.AAC:   .LONG   31                        ;
                                                     00000000'  001E0          .ADDRESS P.AAD                  ;
                                              2D  2A  23  21  001E4 P.AAF:   .ASCII  \!#*-\                     ;
                                                     00000004   001E8 P.AAE:   .LONG   4                         ;
                                                     00000000'  001EC          .ADDRESS P.AAF                  ;

                                                                .EXTRN  REPORT_HDR1_FAO
                                                                .EXTRN  REPORT_HDR2_FAO
                                                                .EXTRN  REPORT_DET_FAO, FIRST_DATE
                                                                .EXTRN  LAST_DATE, SCR$SET_SCROLL
                                                                .EXTRN  SCREEN_CHAR, SCR$ERASE_PAGE
                                                                .EXTRN  CLI$GET_VALUE, SCR$PUT_LINE

                                                    0FFC 00000  .ENTRY  WRITE_SUMMARY, Save R2,R3,R4,R5,R6,R7,R8,-  ; 1271
                                                                        R9,R10,R11
                                  5B 00000000G  00  9E 00002    MOVAB   LIB$SYS_FAO, R11                        ;
                                  5A 00000000G  00  9E 00009    MOVAB   SCR$PUT_LINE, R10                       ;
                                  59 00000000'  EF  9E 00010    MOVAB   TITLE_DESC, R9                          ;
                                  5E      FDF8  CE  9E 00017    MOVAB   -520(SP), SP                            ;
                                  03        08  A9  E8 0001C    BLBS    FIRST, 1$                               ; 1318
                                            014A  31  00020    BRW     7$                                      ; 1324
                                        08      A9  D4 00023 1$:  CLRL    FIRST                                   ; 1325
                                  7E 00000000G  00  3C 00026    MOVZWL  SCREEN_CHAR+6, -(SP)                    ;
                                                05  DD 0002D    PUSHL   #5                                      ;
                00000000G         00            02  FB 0002F    CALLS   #2, SCR$SET_SCROLL                      ;
                                  52            50  D0 00036    MOVL    R0, STATUS                              ;
                                  0E            52  E9 00039    BLBC    STATUS, 2$                              ;
                                                01  DD 0003C    PUSHL   #1                                      ; 1326
                                                01  DD 0003E    PUSHL   #1                                      ;
                00000000G         00            02  FB 00040    CALLS   #2, SCR$ERASE_PAGE                      ;
                                  52            50  D0 00047    MOVL    R0, STATUS                              ;
                                  7C            52  E9 0004A 2$:  BLBC    STATUS, 4$                              ; 1328
                                                59  DD 0004D    PUSHL   R9                                      ;
                                        FF71    CF  9F 0004F    PUSHAB  P.AAA                                   ;
                00000000G         00            02  FB 00053    CALLS   #2, CLI$GET_VALUE                       ; 1330
                                  52 00000000G  00  3C 0005A    MOVZWL  SCREEN_CHAR+4, FILL                     ;
                                  52            2E  C2 00061    SUBL2   #46, FILL                               ;
```

```
      52          69          10          00  FD 00064       CMPZV   #0, #16, TITLE_DESC, FILL           ; 1331
                                          14  1B 00069       BLEQU   3$                                  ;
                                          52  DD 0006B       PUSHL   FILL                                ; 1333
                                          01  DD 0006D       PUSHL   #1                                  ;
                              00000000G   8F  DD 0006F       PUSHL   #ACC$_TITLETRUNC                    ;
                00000000G  00             03  FB 00075       CALLS   #3, LIB$SIGNAL                      ;
                           69             52  B0 0007C       MOVW    FILL, TITLE_DESC                    ; 1334
                           50             69  3C 0007F  3$:  MOVZWL  TITLE_DESC, R0                      ; 1337
                  50       52             50  C3 00082       SUBL3   R0, FILL, R0                        ;
                           52        02   A0  9E 00086       MOVAB   2(R0), FILL                         ;
                           7E             01  7D 0008A       MOVQ    #1, -(SP)                           ; 1344
                     08    AE      0200   8F  3C 0008D       MOVZWL  #512, $$BUFFDESC                    ;
                     0C    AE        10   AE  9E 00093       MOVAB   $$BUFFER, $$BUFFDESC+4              ;
                              00000000G   00  9F 00098       PUSHAB  LAST_DATE                           ;
                  50       52             02  C7 0009E       DIVL3   #2, FILL, R0                        ;
      7E          00       52             01  7A 000A2       EMUL    #1, FILL, #0, -(SP)                 ;
      51          51       8E             02  7B 000A7       EDIV    #2, (SP)+, R1, R1                   ;
                                   6140   9F 000AC           PUSHAB  (R1)[R0]                            ;
                                   0201   8F  BB 000AF       PUSHR   #^M<R0,R9>                          ;
                              00000000G   00  9F 000B3       PUSHAB  FIRST_DATE                          ;
                                     1C   AE  9F 000B9       PUSHAB  $$BUFFDESC                          ;
                                     20   AE  9F 000BC       PUSHAB  $$BUFFDESC                          ;
                                   FF29   CF  9F 000BF       PUSHAB  P.AAC                               ;
                           6B             08  FB 000C3       CALLS   #8, LIB$SYS_FAO                     ;
                           52             50  D0 000C6       MOVL    R0, STATUS                          ;
                           67             52  E9 000C9  4$:  BLBC    STATUS, 5$                          ;
                                     08   AE  9F 000CC       PUSHAB  $$BUFFDESC                          ;
                           6A             03  FB 000CF       CALLS   #3, SCR$PUT_LINE                    ;
                           52             50  D0 000D2       MOVL    R0, STATUS                          ;
                           5B             52  E9 000D5       BLBC    STATUS, 5$                          ;
                           7E             01  7D 000D8       MOVQ    #1, -(SP)                           ; 1346
                     08    AE      0200   8F  3C 000DB       MOVZWL  #512, $$BUFFDESC                    ;
                     0C    AE        10   AE  9E 000E1       MOVAB   $$BUFFER, $$BUFFDESC+4              ;
                                     08   AE  9F 000E6       PUSHAB  $$BUFFDESC                          ;
                                     0C   AE  9F 000E9       PUSHAB  $$BUFFDESC                          ;
                              00000000G   00  9F 000EC       PUSHAB  REPORT_HDR1_FAO                     ;
                           6B             03  FB 000F2       CALLS   #3, LIB$SYS_FAO                     ;
                           52             50  D0 000F5       MOVL    R0, STATUS                          ;
                           6C             52  E9 000F8       BLBC    STATUS, 6$                          ;
                                     08   AE  9F 000FB       PUSHAB  $$BUFFDESC                          ;
                           6A             03  FB 000FE       CALLS   #3, SCR$PUT_LINE                    ;
                           52             50  D0 00101       MOVL    R0, STATUS                          ;
                           60             52  E9 00104       BLBC    STATUS, 6$                          ;
                           7E             01  7D 00107       MOVQ    #1, -(SP)                           ; 1347
                     08    AE      0200   8F  3C 0010A       MOVZWL  #512, $$BUFFDESC                    ;
                     0C    AE        10   AE  9E 00110       MOVAB   $$BUFFER, $$BUFFDESC+4              ;
                                     08   AE  9F 00115       PUSHAB  $$BUFFDESC                          ;
                                     0C   AE  9F 00118       PUSHAB  $$BUFFDESC                          ;
                              00000000G   00  9F 0011B       PUSHAB  REPORT_HDR2_FAO                     ;
                           6B             03  FB 00121       CALLS   #3, LIB$SYS_FAO                     ;
                           52             50  D0 00124       MOVL    R0, STATUS                          ;
                           3D             52  E9 00127       BLBC    STATUS, 6$                          ;
                                     08   AE  9F 0012A       PUSHAB  $$BUFFDESC                          ;
                           6A             03  FB 0012D       CALLS   #3, SCR$PUT_LINE                    ;
                           52             50  D0 00130       MOVL    R0, STATUS                          ;
                           31             52  E9 00133  5$:  BLBC    STATUS, 6$                          ;
                           7E             01  7D 00136       MOVQ    #1, -(SP)                           ; 1349
```

```
                 08   AE       0200  8F  3C 00139         MOVZWL  #512, $$BUFFDESC                           ;
                 0C   AE         10  AE  9E 0013F         MOVAB   $$BUFFER, $$BUFFDESC+4                     ;
                      7E 00000000G   00  3C 00144         MOVZWL  REPORT_HDR1_FAO, -(SP)                     ;
                                 0C  AE  9F 0014B         PUSHAB  $$BUFFDESC                                 ;
                                 10  AE  9F 0014E         PUSHAB  $$BUFFDESC                                 ;
                               FEA3  CF  9F 00151         PUSHAB  P.AAE                                      ;
                      6B             04  FB 00155         CALLS   #4, LIB$SYS_FAO                            ;
                      52             50  D0 00158         MOVL    R0, STATUS                                 ;
                      09             52  E9 0015B         BLBC    STATUS, 6$                                 ;
                                 08  AE  9F 0015E         PUSHAB  $$BUFFDESC                                 ;
                      6A             03  FB 00161         CALLS   #3, SCR$PUT_LINE                           ;
                      52             50  D0 00164         MOVL    R0, STATUS                                 ;
                      03             52  E8 00167  6$:    BLBS    STATUS, 7$                                 ;
                               009A  31     0016A         BRW     12$                                        ;
                 0C   A9         04  AC  D0 0016D  7$:    MOVL    KEY, FAO_LIST                              ; 1352
                      54             01  D0 00172         MOVL    #1, INDEX_SRC                              ; 1354
                      52             01  D0 00175         MOVL    #1, INDEX_DST                              ; 1355
                      58 00000000G   00  D0 00178         MOVL    REPORT_ITEMS, R8                           ; 1356
                      57             01  CE 0017F         MNEGL   #1, I                                      ; 1366
                                     49  11 00182         BRB     11$                                        ;
                      56 00000000G0047   D0 00184  8$:    MOVL    REPORT_VALUE[I], R6                        ; 1358
                      55         08 BC44 DE 0018C         MOVAL   @DATA[INDEX_SRC], R5                       ; 1366
                      01         08  A6  D1 00191         CMPL    8(R6), #1                                  ; 1365
                                     07  12 00195         BNEQ    9$                                         ;
                 0C A942             65  D0 00197         MOVL    (R5), FAO_LIST[INDEX_DST]                  ; 1366
                                     29  11 0019C         BRB     10$                                        ;
                                     55  DD 0019E  9$:    PUSHL   R5                                         ; 1369
                                     55  DD 001A0         PUSHL   R5                                         ;
                      53         08 BC44 DE 001A2         MOVAL   @DATA[INDEX_SRC], R3                       ;
                                 08  A3  9F 001A7         PUSHAB  8(R3)                                      ;
            00000000G 00             03  FB 001AA         CALLS   #3, LIB$DAY                                ;
    65          00    65 000186A0    8F  7A 001B1         EMUL    #100000, (R5), #0, (R5)                    ; 1370
                 0C A942         08  A3  D0 001BA         MOVL    8(R3), FAO_LIST[INDEX_DST]                 ; 1371
                                     52  D6 001C0         INCL    INDEX_DST                                  ; 1372
                 0C A942             55  D0 001C2         MOVL    R5, FAO_LIST[INDEX_DST]                    ; 1373
                      54         08  A6  C0 001C7  10$:   ADDL2   8(R6), INDEX_SRC                           ; 1375
                                     52  D6 001CB         INCL    INDEX_DST                                  ; 1376
                B3    57             58  F2 001CD  11$:   AOBLSS  R8, I, 8$                                  ; 1356
                      7E             01  7D 001D1         MOVQ    #1, -(SP)                                  ; 1379
                 08   AE       0200  8F  3C 001D4         MOVZWL  #512, $$BUFFDESC                           ;
                 0C   AE         10  AE  9E 001DA         MOVAB   $$BUFFER, $$BUFFDESC+4                     ;
                                 0C  A9  9F 001DF         PUSHAB  FAO_LIST                                   ;
                                 0C  AE  9F 001E2         PUSHAB  $$BUFFDESC                                 ;
                                 10  AE  9F 001E5         PUSHAB  $$BUFFDESC                                 ;
                          00000000G  00  9F 001E8         PUSHAB  REPORT_DET_FAO                             ;
            00000000G 00             04  FB 001EE         CALLS   #4, LIB$SYS_FAOL                           ;
                      52             50  D0 001F5         MOVL    R0, STATUS                                 ;
                      0C             52  E9 001F8         BLBC    STATUS, 12$                                ;
                                 08  AE  9F 001FB         PUSHAB  $$BUFFDESC                                 ;
                      6A             03  FB 001FE         CALLS   #3, SCR$PUT_LINE                           ;
                      52             50  D0 00201         MOVL    R0, STATUS                                 ;
                      0D             52  E8 00204         BLBS    STATUS, 13$                                ;
                                     52  DD 00207  12$:   PUSHL   STATUS                                     ;
            00000000G 00             01  FB 00209         CALLS   #1, LIB$SIGNAL                             ;
                      50             52  D0 00210         MOVL    STATUS, R0                                 ;
                                         04 00213         RET                                                ;
                      50             01  D0 00214  13$:   MOVL    #1, R0                                     ; 1381
```

```
                04 00217        RET                                     ; 1382

; Routine Size:  536 bytes,    Routine Base:  CODE + 01F0
```

```
;  554          1383  1 GLOBAL ROUTINE FIND_WATERMARK (BUFFER, BUCKET) =
;  555          1384  1
;  556          1385  1 !----
;  557          1386  1 !
;  558          1387  1 ! Functional description
;  559          1388  1 !
;  560          1389  1 !       This routine is called to scan the summarization buckets
;  561          1390  1 !       and determine the high watermark for each value.  A new
;  562          1391  1 !       summarization bucket is allocated and filled with the highest
;  563          1392  1 !       value encountered for each bucket item.
;  564          1393  1 !
;  565          1394  1 ! Input parameters
;  566          1395  1 !
;  567          1396  1 !       BUFFER  =       Address of a record to be summed
;  568          1397  1 !       BUCKET  =       Address of a summation bucket
;  569          1398  1 !
;  570          1399  1 ! Output parameters
;  571          1400  1 !
;  572          1401  1 !       Any errors encountered are RETURNed immediately.
;  573          1402  1 !
;  574          1403  1 !----
;  575          1404  1
;  576          1405  2 BEGIN
;  577          1406  2
;  578          1407  2 EXTERNAL
;  579          1408  2         bucket_size,                    ! Size of a summation bucket
;  580          1409  2         report_items,                   ! Number of report items
;  581          1410  2         report_value: vector [];        ! Table of pointers to offsets
;  582          1411  2
;  583          1412  2 MAP
;  584          1413  2         bucket: ref vector [],          ! Summary array
;  585          1414  2         buffer: ref bblock [];          ! Record buffer
;  586          1415  2
;  587          1416  2 LOCAL
;  588          1417  2         index;                          ! Index to bucket items
;  589          1418  2
;  590          1419  2 If .hwm_bucket eql 0                   ! If no bucket allocated yet
;  591          1420  3 then    BEGIN
;  592          1421  3         perform (allocate (.bucket_size, lwm_bucket));  ! Then get low bucket
;  593          1422  3         perform (allocate (.bucket_size, hwm_bucket));  ! and high bucket
;  594          1423  3         ch$fill (15, .bucket_size, .lwm_bucket);        ! Fill with high values
;  595          1424  3         ch$fill (0, .bucket_size, .hwm_bucket);         ! Fill with low values
;  596          1425  2         END;
;  597          1426  2
;  598          1427  2
;  599          1428  2 !
;  600          1429  2 ! For each report item, maximize the value stored in the watermark
;  601          1430  2 ! bucket with itself and the value stored in the current summation bucket.
;  602          1431  2 ! Minimize the value with the one stored in the lowwatermark bucket and
;  603          1432  2 ! store it.
;  604          1433  2 !
;  605          1434  2
;  606          1435  2 Index = 1;                            ! First bucket_item reserved
;  607          1436  2
;  608          1437  2 Incr i to .report_items - 1 do
;  609          1438  3   BEGIN
;  610          1439  3   BIND rep_item = .report_value [.i]: vector [];
```

```
;  611          1440  3
;  612          1441  3 !
;  613          1442  3 ! Check the field length.  If 1 then do a simple MAXU function to
;  614          1443  3 ! determine watermark.  Else assume length is 2 and do a COMPARE_QUAD.
;  615          1444  3 ! Do a MINU or COMPARE_QUAD for the minimum value
;  616          1445  3 !
;  617          1446  3
;  618          1447  3   if .rep_item [sum_ent_bsize] eql 1
;  619          1448  4   then  BEGIN
;  620          1449  4         hwm_bucket [.index] = maxu (.hwm_bucket [.index], .bucket [.index]);
;  621          1450  4         lwm_bucket [.index] = minu (.lwm_bucket [.index], .bucket [.index]);
;  622          1451  4         END
;  623          1452  4   else  BEGIN
;  624          1453  5         if COMPARE_QUAD (bucket [.index], GTRU, hwm_bucket [.index])
;  625          1454  4         then MOVE_QUAD (bucket [.index], hwm_bucket [.index]);
;  626          1455  4
;  627          1456  5         if COMPARE_QUAD (bucket [.index], LSSU, lwm_bucket [.index])
;  628          1457  4         then MOVE_QUAD (bucket [.index], lwm_bucket [.index]);
;  629          1458  3         END;
;  630          1459  3
;  631          1460  3   index = .index + .rep_item [sum_ent_bsize];
;  632          1461  2   END;
;  633          1462  2
;  634          1463  2 return true;
;  635          1464  1 END;


                                03FC 00000          .ENTRY  FIND_WATERMARK, Save R2,R3,R4,R5,R6,R7,R8,-      ; 1383
                                                            R9                                                  ;
                            59 00000000G   00  9E 00002     MOVAB   ALLOCATE, R9                                ;
                            58 00000000G   00  9E 00009     MOVAB   BUCKET_SIZE, R8                             ;
                            57 00000000'   EF  9E 00010     MOVAB   HWM_BUCKET, R7                              ;
                                           67  D5 00017     TSTL    HWM_BUCKET                                  ; 1419
                                           27  12 00019     BNEQ    3$                                          ;
                                     04    A7  9F 0001B     PUSHAB  LWM_BUCKET                                  ; 1421
                                           68  DD 0001E     PUSHL   BUCKET_SIZE                                 ;
                                69         02  FB 00020     CALLS   #2, ALLOCATE                                ;
                                07         50  E9 00023     BLBC    STATUS, 1$                                  ;
                                           57  DD 00026     PUSHL   R7                                          ; 1422
                                           68  DD 00028     PUSHL   BUCKET_SIZE                                 ;
                                69         02  FB 0002A     CALLS   #2, ALLOCATE                                ;
                                01         50  E8 0002D 1$: BLBS    STATUS, 2$                                  ;
                                           04  00030       RET                                                 ;
                                56         68  D0 00031 2$: MOVL    BUCKET_SIZE, R6                             ; 1423
56              0F              6E         00  2C 00034     MOVC5   #0, (SP), #15, R6, @LWM_BUCKET              ;
                                     04    B7  00039                                                           ;
56              00              6E         00  2C 00038     MOVC5   #0, (SP), #0, R6, @HWM_BUCKET               ; 1424
                                     00    B7  00040                                                           ;
                                54         01  D0 00042 3$: MOVL    #1, INDEX                                   ; 1435
                                56         01  CE 00045     MNEGL   #1, I                                       ; 1450
                                           5D  11 00048     BRB     12$                                         ;
                            55 00000000G0046   D0 0004A 4$: MOVL    REPORT_VALUE[I], R5                         ; 1439
                            51       00 B744   DE 00052     MOVAL   @HWM_BUCKET[INDEX], R1                      ; 1449
                            50       08 BC44   DE 00057     MOVAL   @BUCKET[INDEX], R0                          ;
```

```
                    53        04 B744   DE 0005C          MOVAL   @LWM_BUCKET[INDEX], R3                ; 1450
                    01        08   A5   D1 00061          CMPL    8(R5), #1                           ; 1447
                                  1E   12 00065          BNEQ    7$                                  ;
                    52              61   D0 00067          MOVL    (R1), R2                            ; 1449
                    60              52   D1 0006A          CMPL    R2, (R0)                            ;
                                    03   1E 0006D          BGEQU   5$                                  ;
                    52              60   D0 0006F          MOVL    (R0), R2                            ;
                    61              52   D0 00072 5$:      MOVL    R2, (R1)                            ;
                    52              63   D0 00075          MOVL    (R3), R2                            ; 1450
                    60              52   D1 00078          CMPL    R2, (R0)                            ;
                                    03   1B 0007B          BLEQU   6$                                  ;
                    52              60   D0 0007D          MOVL    (R0), R2                            ;
                    63              52   D0 00080 6$:      MOVL    R2, (R3)                            ;
                                    1E   11 00083          BRB     11$                                 ; 1447
                04  A1        04   A0   D1 00085 7$:      CMPL    4(R0), 4(R1)                        ; 1453
                                    03   12 0008A          BNEQ    8$                                  ;
                    61              60   D1 0008C          CMPL    (R0), (R1)                          ;
                                    03   1B 0008F 8$:      BLEQU   9$                                  ;
                    61              60   7D 00091          MOVQ    (R0), (R1)                          ; 1454
                04  A3        04   A0   D1 00094 9$:      CMPL    4(R0), 4(R3)                        ; 1456
                                    03   12 00099          BNEQ    10$                                 ;
                    63              60   D1 0009B          CMPL    (R0), (R3)                          ;
                                    03   1E 0009E 10$:     BGEQU   11$                                 ;
                    63              60   7D 000A0          MOVQ    (R0), (R3)                          ; 1457
                    54        08    A5   C0 000A3 11$:     ADDL2   8(R5), INDEX                        ; 1460
            98      56 00000000G    00   F2 0C0A7 12$:     AOBLSS  REPORT_ITEMS, I, 4$                 ; 1437
                    50              01   D0 000AF          MOVL    #1, R0                              ; 1463
                                         04 000B2          RET                                         ; 1464

; Routine Size:  179 bytes,    Routine Base:  CODE + 0408
```

```
;  637          1465  1 GLOBAL ROUTINE WRITE_BAR_GRAPH (key, data) =
;  638          1466  1
;  639          1467  1 !----
;  640          1468  1 !
;  641          1469  1 ! Functional description
;  642          1470  1 !
;  643          1471  1 !       This routine is called to output summarization totals in
;  644          1472  1 !       the form of a bar graph.  For each invocation it outputs
;  645          1473  1 !       a summarization key and a horizontal bar.
;  646          1474  1 !
;  647          1475  1 !       The length of the bar is based on the number of available
;  648          1476  1 !       columns and the highest value found for the report item.
;  649          1477  1 !       The highest value has been previously obtained by FIND_WATERMARK
;  650          1478  1 !       and is available in a watermark_bucket built by that subroutine.
;  651          1479  1 !
;  652          1480  1 ! Input parameters
;  653          1481  1 !
;  654          1482  1 !       KEY     = Address of descriptor of symbol
;  655          1483  1 !       DATA    = Address of a summation bucket
;  656          1484  1 !
;  657          1485  1 ! Output parameters
;  658          1486  1 !
;  659          1487  1 !       Any errors encountered are RETURNed immediately.
;  660          1488  1 !
;  661          1489  1 !----
;  662          1490  1
;  663          1491  2 BEGIN
;  664          1492  2
;  665          1493  2 EXTERNAL
;  666          1494  2         report_value: vector [],
;  667          1495  2         report_hdr1_fao: bblock [],     ! First header for symbol column
;  668          1496  2         report_hdr2_fao: bblock [];     ! Second header for symbol column
;  669          1497  2
;  670          1498  2 GLOBAL
;  671          1499  2         reset_graph: initial (true);    ! Triggers graph initialization
;  672          1500  2
;  673          1501  2 OWN
;  674          1502  2         title_desc:bblock [dsc$k_d_bln] ! Allocate dynamic descriptor
;  675          1503  2                 preset([dsc$b_class] = dsc$k_class_d);
;  676          1504  2
;  677          1505  2 LOCAL
;  678          1506  2         worth;                          ! Worth of column
;  679          1507  2
;  680          1508  2 MAP
;  681          1509  2         key:  ref bblock [2],           ! Symbol descriptor
;  682          1510  2         data: ref vector [];            ! Summation record
;  683          1511  2
;  684          1512  2 If .reset_graph then
;  685          1513  3    BEGIN
;  686          1514  3    EXTERNAL first_date, last_date;
;  687          1515  3    LITERAL date1_size = 23, date2_size = 21;    ! Length of date strings
;  688          1516  3    LOCAL fill;
;  689          1517  3
;  690          1518  3    reset_graph = false;                        ! Clear switch
;  691          1519  3
;  692        P 1520  3    perform (setup_graph (
;  693        P 1521  3         .lwm_bucket [1],                       ! Minimum value
```

```
;  694        P 1522  3          .hwm_bucket [1],                        ! Maximum value
;  695        P 1523  3          .key [dsc$w_length]+columns_per_group,  ! Reserve left margin
;  696        P 1524  3          worth,                                  ! Receives computed worth
;  697          1525  3          desc);                                  ! Receives header string
;  698          1526  3
;  699          1527  3      GET_VALUE ('BAR_GRAPH', bar_char);           ! Get graphing character
;  700          1528  3
;  701          1529  3      perform (str$append (bar_fao, ad ('!132<!#*')));! Load descriptor
;  702          1530  3      perform (str$append (bar_fao, bar_char));    ! Append to descriptor
;  703          1531  3      perform (str$append (bar_fao, ad ('!>')));   ! Append to descriptor
;  704          1532  3      perform (str$append (report_hdr2_fao, desc));! Append graph header to symhdr
;  705          1533  3
;  706          1534  3      SET_SCROLL (5, SCREEN (length) - 1);         ! Only effects Vt100's
;  707          1535  3
;  708          1536  3      ERASE_PAGE ();                               ! Erase entire screen
;  709          1537  3
;  710          1538  3      GET_VALUE ('TITLE', title_desc);             ! Get the title
;  711          1539  3
;  712          1540  3      fill = SCREEN (width) - 2                    ! Compute available title area
;  713          1541  3           - date1_size - date2_size;
;  714          1542  3
;  715          1543  3      if .title_desc [dsc$w_length] gtru .fill     ! If title is too long
;  716          1544  4           then BEGIN
;  717          1545  4               signal (acc$_titletrunc,1, .fill);  ! -- then warn user
;  718          1546  4               title_desc [dsc$w_length] = .fill;  ! Truncate title if necessary
;  719          1547  4               END;
;  720          1548  3
;  721          1549  3      fill = .fill - .title_desc [dsc$w_length] + 2;
;  722          1550  3
;  723        P 1551  3      WRITE_LINE (XFAO (AD ('From: !17%D!#* !AS!#* To: !17%D'),
;  724        P 1552  3                       first_date,                 !  -"From" date
;  725        P 1553  3                       .fill72,                    !  -fill to title
;  726        P 1554  3                       title_desc,                 !  -title
;  727        P 1555  3                       .fill72 + .fill mod 2,      !  -fill after title
;  728          1556  3                       last_date));                !  -"To" Date
;  729          1557  3
;  730          1558  3      WRITE_LINE (report_hdr1_fao);                ! Write report header 1
;  731          1559  3      WRITE_LINE (report_hdr2_fao);                ! Write report header 2
;  732        P 1560  3      WRITE_LINE (XFAO (AD ('!#*-'),               ! Underline it
;  733          1561  3           .report_hdr2_fao [dsc$w_length]));      !  -Header length
;  734          1562  3
;  735          1563  3      END;
;  736          1564  3
;  737        P 1565  3  Perform (lib$sys_fao (                           ! Build a bar
;  738        P 1566  3                       bar_fao,                    !  -FAO control string
;  739        P 1567  3                       0,                          !  -no output byte count
;  740        P 1568  3                       desc,                       !  -output buffer
;  741          1569  3                       .data [1] / .worth));       !  -length of bar
;  742          1570  3
;  743          1571  3  Incra ptr from .desc [dsc$a_pointer] to
;  744          1572  3          .desc [dsc$a_pointer] + .desc [dsc$w_length] -1 by columns_per_group
;  745          1573  3          do (.ptr)<0,8> = '!';
;  746          1574  3
;  747          1575  3  BEGIN
;  748          1576  3  BIND rep_item = .report_value [0]: vector [];
;  749          1577  3  if .rep_item [sum_ent_bsize] eql 1
;  750          1578  4  then    BEGIN
```

```
;  751        P 1579  4          WRITE_LINE (XFAO (AD ('!#<!AS!9UL !AS!>'),      ! Write detail line
;  752        P 1580  4                  .report_hdr2_fao [dsc$w_length],        !  -maximum line size
;  753        P 1581  4                  .key,                                   !  -key descriptor
;  754        P 1582  4                  .data [1],                              !  -data value
;  755          1583  4                  desc));                                 !  -bar descriptor
;  756          1584  4          END
;  757          1585  4 else    BEGIN
;  758          1586  4          OWN
;  759          1587  4                  day,
;  760          1588  4                  post_midnight: vector [2];
;  761          1589  4          BUILTIN emul;
;  762          1590  4          lib$day (day, data [1], post_midnight);
;  763          1591  4          emul (%ref(100000), post_midnight, %ref(0), post_midnight);
;  764        P 1592  4          WRITE_LINE (XFAO (AD ('!#<!AS!2UL !%T !AS!>'),  ! Write detail line
;  765        P 1593  4                  .report_hdr2_fao [dsc$w_length],        !  -maximum line size
;  766        P 1594  4                  .key,                                   !  -key descriptor
;  767        P 1595  4                  .day,                                   !  -day value
;  768        P 1596  4                  post_midnight,                          !  -time value
;  769          1597  4                  desc));                                 !  -bar descriptor
;  770          1598  3          END;
;  771          1599  2 END;
;  772          1600  2 return true;
;  773          1601  1 END;


                                                        .PSECT  DATA,NOEXE,2

                                        00000001  000BC RESET_GRAPH::
                                                          .LONG   1                                   ;
                                              00# 000C0 TITLE_DESC:
                                                          .BYTE   0[3]                                ;
                                              02  000C3           .BYTE   2                           ;
                                                  000C4           .BLKB   4
                                                  000C8 DAY:      .BLKB   4
                                                  000CC POST_MIDNIGHT:
                                                          .BLKB   8

                                                        .PSECT  CODE,NOWRT,2

                                                  004BB           .BLKB   1
                00  00  00  48  50  41  52  47  5F  52  41  42  004BC P.AAH:  .ASCII  \BAR_GRAPH\<0><0><0>                ;
                                        00000009  004C8 P.AAG:  .LONG   9                             ;
                                        00000000' 004CC          .ADDRESS P.AAH                     ;
                            2A  23  21  3C  32  33  31  21  004D0 P.AAJ:  .ASCII  \!132<!#*\                 ;
                                        00000008  004D8 P.AAI:  .LONG   8                             ;
                                        00000000' 004DC          .ADDRESS P.AAJ                     ;
                                    00  00  3E  21  004E0 P.AAL:  .ASCII  \!>\<0><0>                  ;
                                        00000002  004E4 P.AAK:  .LONG   2                             ;
                                        00000000' 004E8          .ADDRESS P.AAL                     ;
                            00  00  00  45  4C  54  49  54  004EC P.AAN:  .ASCII  \TITLE\<0><0><0>             ;
                                        00000005  004F4 P.AAM:  .LONG   5                             ;
                                        00000000' 004F8          .ADDRESS P.AAN                     ;
20  2A  23  21  44  25  37  31  21  20  3A  6D  6F  72  46  004FC P.AAP:  .ASCII  \From: !17%D!#* !AS!#* To: !17%D\<0>    ;
25  37  31  21  20  3A  6F  54  20  2A  23  21  53  41  21  00508
                                            00  44  0051A
                                        0000001F  0051C P.AAO:  .LONG   31                            ;
```

```
                                                00000000'  00520          .ADDRESS P.AAP
                                            2D  2A  23  21  00524 P.AAR:   .ASCII  \!#*-\
                                                00000004   00528 P.AAQ:   .LONG   4
                                                00000000'  0052C          .ADDRESS P.AAR
21  53  41  21  20  4C  55  39  21  53  41  21  3C  23  21  00530 P.AAT:   .ASCII  \!#<!AS!9UL !AS!>\
                                                        3E  00539
                                                00000010   00540 P.AAS:   .LONG   16
                                                00000000'  00544          .ADDRESS P.AAT
20  54  25  21  20  4C  55  32  21  53  41  21  3C  23  21  00548 P.AAV:   .ASCII  \!#<!AS!2UL !%T !AS!>\
                                                    3E  21  53  41  21  00557
                                                00000014   0055C P.AAU:   .LONG   20
                                                00000000'  00560          .ADDRESS P.AAV


                                                    07FC  00000          .ENTRY  WRITE_BAR_GRAPH, Save R2,R3,R4,R5,R6,R7,R8,-  1465
                                                                                 R9,R10
                                    5A  00000000G   00  9E  00002          MOVAB   LIB$SIGNAL, R10
                                    59  00000000G   00  9E  00009          MOVAB   CLI$GET_VALUE, R9
                                    58  00000000G   00  9E  00010          MOVAB   STR$APPEND, R8
                                    57      FF49    CF  9E  00017          MOVAB   P.AAG, R7
                                    56  00000000G   00  9E  0001C          MOVAB   SCR$PUT_LINE, R6
                                    55  00000000G   00  9E  00023          MOVAB   LIB$SYS_FAO, R5
                                    54  00000000G   00  9E  0002A          MOVAB   REPORT_HDR2_FAO, R4
                                    53  00000000'   EF  9E  00031          MOVAB   DESC, R3
                                    5E      FDF4    CE  9E  00038          MOVAB   -524(SP), SP
                                    03      009C    C3  E8  0003D          BLBS    RESET_GRAPH, 1$                                  1512
                                                0163    31  00042          BRW     8$
                                            009C    C3  D4  00045 1$:      CLRL    RESET_GRAPH                                      1518
                                                    53  DD  00049          PUSHL   R3                                               1525
                                                04  AE  9F  0004B          PUSHAB  WORTH
                                        7E      04  BC  3C  0004E          MOVZWL  @KEY, -(SP)
                                        6E          0F  C0  00052          ADDL2   #15, (SP)
                                        50      E0  A3  D0  00055          MOVL    HWM_BUCKET, R0
                                                04  A0  DD  00059          PUSHL   4(R0)
                                        50      E4  A3  D0  0005C          MOVL    LWM_BUCKET, R0
                                                04  A0  DD  00060          PUSHL   4(R0)
                                0000V   CF          05  FB  00063          CALLS   #5, SETUP_GRAPH
                                        33          50  E9  00068          BLBC    STATUS, 2$
                                            F8  A3  9F  0006B          PUSHAB  BAR_CHAR                                         1527
                                                57  DD  0006E          PUSHL   R7
                                        6C          02  FB  00070          CALLS   #2, CLI$GET_VALUE
                                            10  A7  9F  00073          PUSHAB  P.AAI                                            1529
                                            F0  A3  9F  00076          PUSHAB  BAR_FAO
                                        68          02  FB  00079          CALLS   #2, STR$APPEND
                                        1F          50  E9  0007C          BLBC    STATUS, 2$
                                            F8  A3  9F  0007F          PUSHAB  BAR_CHAR                                         1530
                                            F0  A3  9F  00082          PUSHAB  BAR_FAO
                                        68          02  FB  00085          CALLS   #2, STR$APPEND
                                        13          50  E9  00088          BLBC    STATUS, 2$
                                            1C  A7  9F  0008B          PUSHAB  P.AAK                                            1531
                                            F0  A3  9F  0008E          PUSHAB  BAR_FAO
                                        68          02  FB  00091          CALLS   #2, STR$APPEND
                                        07          50  E9  00094          BLBC    STATUS, 2$
                                                    53  DD  00097          PUSHL   R3                                               1532
                                                    54  DD  00099          PUSHL   R4
                                        68          02  FB  0009B          CALLS   #2, STR$APPEND
```

```
                                01              50  E8 0009E 2$:    BLBS    STATUS, 3$                                      ;
                                                    04 000A1        RET                                                     ;
                                7E 00000000G    00  3C 000A2 3$:    MOVZWL  SCREEN_CHAR+6, -(SP)                            ; 1534
                                                6E  D7 000A9        DECL    (SP)                                            ;
                                                05  DD 000AB        PUSHL   #5                                              ;
                        00000000G 00            02  FB 000AD        CALLS   #2, SCR$SET_SCROLL                              ;
                                  52            50  D0 000B4        MOVL    R0, STATUS                                      ;
                                  0E            52  E9 000B7        BLBC    STATUS, 4$                                      ;
                                                01  DD 000BA        PUSHL   #1                                              ; 1536
                                                01  DD 000BC        PUSHL   #1                                              ;
                        00000000G 00            02  FB 000BE        CALLS   #2, SCR$ERASE_PAGE                              ;
                                  52            50  D0 000C5        MOVL    R0, STATUS                                      ;
                                  7C            52  E9 000C8 4$:    BLBC    STATUS, 6$                                      ;
                                        00A0    C3  9F 000CB        PUSHAB  TITLE_DESC                                      ; 1538
                                          2C    A7  9F 000CF        PUSHAB  P.AAM                                           ;
                                  69            02  FB 000D2        CALLS   #2, CLI$GET_VALUE                               ;
                                  52 00000000G  00  3C 000D5        MOVZWL  SCREEN_CHAR+4, FILL                             ; 1541
                                  52            2E  C2 000DC        SUBL2   #46, FILL                                       ;
        52      00A0    C3                  10  00  ED 000DF        CMPZV   #0, #16, TITLE_DESC, FILL                       ; 1543
                                                12  1B 000E6        BLEQU   5$                                              ;
                                                52  DD 000E8        PUSHL   FILL                                            ; 1545
                                                01  DD 000EA        PUSHL   #1                                              ;
                                    00000000G   8F  DD 000EC        PUSHL   #ACC$_TITLETRUNC                                ;
                                  6A            03  FB 000F2        CALLS   #3, LIB$SIGNAL                                  ;
                            00A0  C3            52  B0 000F5        MOVW    FILL, TITLE_DESC                                ; 1546
                                  50      00A0  C3  3C 000FA 5$:    MOVZWL  TITLE_DESC, R0                                  ; 1549
                        50        52            50  C3 000FF        SUBL3   R0, FILL, R0                                    ;
                                  52        02  A0  9E 00103        MOVAB   2(R0), FILL                                     ;
                                  7E            01  7D 00107        MOVQ    #1, -(SP)                                       ; 1556
                                0C  AE      0200  8F  3C 0010A        MOVZWL  #512, $$BUFFDESC                                ;
                                10  AE        14  AE  9E 00110        MOVAB   $$BUFFER, $$BUFFDESC+4                          ;
                                    00000000G   00  9F 00115        PUSHAB  LAST_DATE                                       ;
                        50        52            02  C7 0011B        DIVL3   #2, FILL, R0                                    ;
        7E              00        52            01  7A 0011F        EMUL    #1, FILL, #0, -(SP)                             ;
        51              51        8E            02  7B 00124        EDIV    #2, (SP)+, R1, R1                               ;
                                                6140  9F 00129        PUSHAB  (R1)[R0]                                        ;
                                        00A0    C3  9F 0012C        PUSHAB  TITLE_DESC                                      ;
                                                50  DD 00130        PUSHL   R0                                              ;
                                    00000000G   00  9F 00132        PUSHAB  FIRST_DATE                                      ;
                                          20    AE  9F 00138        PUSHAB  $$BUFFDESC                                      ;
                                          24    AE  9F 0013B        PUSHAB  $$BUFFDESC                                      ;
                                          54    A7  9F 0013E        PUSHAB  P.AAO                                           ;
                                  65            08  FB 00141        CALLS   #8, LIB$SYS_FAO                                 ;
                                  52            50  D0 00144        MOVL    R0, STATUS                                      ;
                                  58            52  E9 00147 6$:    BLBC    STATUS, 7$                                      ;
                                          0C    AE  9F 0014A        PUSHAB  $$BUFFDESC                                      ;
                                  66            03  FB 0014D        CALLS   #3, SCR$PUT_LINE                                ;
                                  52            50  D0 00150        MOVL    R0, STATUS                                      ;
                                  4C            52  E9 00153        BLBC    STATUS, 7$                                      ;
                                  7E            01  7D 00156        MOVQ    #1, -(SP)                                       ; 1558
                                    00000000G   00  9F 00159        PUSHAB  REPORT_HDR1_FAO                                 ;
                                  66            03  FB 0015F        CALLS   #3, SCR$PUT_LINE                                ;
                                  52            50  D0 00162        MOVL    R0, STATUS                                      ;
                                  3A            52  E9 00165        BLBC    STATUS, 7$                                      ;
                                  7E            01  7D 00168        MOVQ    #1, -(SP)                                       ; 1559
                                                54  DD 0016B        PUSHL   R4                                              ;
                                  66            03  FB 0016D        CALLS   #3, SCR$PUT_LINE                                ;
```

```
                52              50  D0 00170          MOVL    R0, STATUS                                      ;
                2C              52  E9 00173          BLBC    STATUS, 7$                                      ;
                7E              01  7D 00176          MOVQ    #1, -(SP)                                       ; 1561
             0C AE        0200  8F  3C 00179          MOVZWL  #512, $$BUFFDESC                                ;
             10 AE          14  AE  9E 0017F          MOVAB   $$BUFFER, $$BUFFDESC+4                          ;
                7E              64  3C 00184          MOVZWL  REPORT_HDR2_FAO, -(SP)                          ;
                              10  AE  9F 00187          PUSHAB  $$BUFFDESC                                      ;
                              14  AE  9F 0018A          PUSHAB  $$BUFFDESC                                      ;
                              60  A7  9F 0018D          PUSHAB  P.AAQ                                           ;
                65                04  FB 00190          CALLS   #4, LIB$SYS_FAO                                 ;
                52                50  D0 00193          MOVL    R0, STATUS                                      ;
                09                52  E9 00196          BLBC    STATUS, 7$                                      ;
                              0C  AE  9F 00199          PUSHAB  $$BUFFDESC                                      ;
                66                03  FB 0019C          CALLS   #3, SCR$PUT_LINE                                ;
                52                50  D0 0019F          MOVL    R0, STATUS                                      ;
                03                52  E8 001A2 7$:       BLBS    STATUS, 8$                                      ;
                              00BC  31  001A5          BRW     14$                                             ;
                52          08    AC  D0 001A8 8$:      MOVL    DATA, R2                                        ; 1569
          7E    04          A2      6E  C7 001AC        DIVL3   WORTH, 4(R2), -(SP)                             ;
                              53  DD 001B1          PUSHL   R3                                              ;
                              7E  D4 001B3          CLRL    -(SP)                                           ;
                              F0  A3  9F 001B5          PUSHAB  BAR_FAO                                         ;
                65                04  FB 001B8          CALLS   #4, LIB$SYS_FAO                                 ;
                01                50  E8 001BB          BLBS    STATUS, 9$                                      ;
                                  04  001BE          RET                                                     ;
                50                63  3C 001BF 9$:       MOVZWL  DESC, R0                                        ; 1572
                50          04    A3  C0 001C2          ADDL2   DESC+4, R0                                      ;
                50                D7  001C6          DECL    R0                                              ;
                51          04    A3  D0 001C8          MOVL    DESC+4, PTR                                     ; 1571
                                  07  11 001CC          BRB     11$                                             ;
                81              7C  8F  90 001CE 10$:      MOVB    #124, (PTR)+                                    ; 1573
                51                0E  C0 001D2          ADDL2   #14, PTR                                        ;
                50                51  D1 001D5 11$:      CMPL    PTR, R0                                         ;
                                  F4  1B 001D8          BLEQU   10$                                             ;
                50  00000000G     00  D0 001DA          MOVL    REPORT_VALUE, R0                                ; 1576
             04 AE        0200  8F  3C 001E1          MOVZWL  #512, $$BUFFDESC                                ; 1583
                01          08  A0  D1 001E7          CMPL    8(R0), #1                                       ; 1577
                                  21  12 001EB          BNEQ    12$                                             ;
                7E                01  7D 001ED          MOVQ    #1, -(SP)                                       ; 1583
             10 AE          14  AE  9E 001F0          MOVAB   $$BUFFER, $$BUFFDESC+4                          ;
                                  53  DD 001F5          PUSHL   R3                                              ;
                              04  A2  DD 001F7          PUSHL   4(R2)                                           ;
                              04  AC  DD 001FA          PUSHL   KEY                                             ;
                7E                64  3C 001FD          MOVZWL  REPORT_HDR2_FAO, -(SP)                          ;
                              1C  AE  9F 00200          PUSHAB  $$BUFFDESC                                      ;
                              20  AE  9F 00203          PUSHAB  $$BUFFDESC                                      ;
                              78  A7  9F 00206          PUSHAB  P.AAS                                           ;
                65                07  FB 00209          CALLS   #7, LIB$SYS_FAO                                 ;
                                  44  11 0020C          BRB     13$                                             ;
                            00AC  C3  9F 0020E 12$:      PUSHAB  POST_MIDNIGHT                                   ; 1590
                              04  A2  9F 00212          PUSHAB  4(R2)                                           ;
                            00A8  C3  9F 00215          PUSHAB  DAY                                             ;
             00000000G          00  03  FB 00219          CALLS   #3, LIB$DAY                                     ;
00AC C3         00     00AC  C3  000186A0  8F  7A 00220          EMUL    #100000, POST_MIDNIGHT, #0, POST_MIDNIGHT       ; 1591
                7E                01  7D 0022D          MOVQ    #1, -(SP)                                       ; 1597
             10 AE          14  AE  9E 00230          MOVAB   $$BUFFER, $$BUFFDESC+4                          ;
                                  53  DD 00235          PUSHL   R3                                              ;
```

```
                00AC   C3  9F 00237          PUSHAB  POST_MIDNIGHT                                                    ;
                00A8   C3  DD 0023B          PUSHL   DAY                                                             ;
                  04   AC  DD 0023F          PUSHL   KEY                                                             ;
          7E          64  3C 00242          MOVZWL  REPORT_HDR2_FAO, -(SP)                                          ;
                  20   AE  9F 00245          PUSHAB  $$BUFFDESC                                                      ;
                  24   AE  9F 00248          PUSHAB  $$BUFFDESC                                                      ;
                0094   C7  9F 0024B          PUSHAB  P.AAU                                                           ;
          65          08  FB 0024F          CALLS   #8, LIB$SYS_FAO                                                 ;
          52          50  D0 00252 13$:      MOVL    R0, STATUS                                                      ;
          0C          52  E9 00255          BLBC    STATUS, 14$                                                     ;
                  0C   AE  9F 00258          PUSHAB  $$BUFFDESC                                                      ;
          66          03  FB 0025B          CALLS   #3, SCR$PUT_LINE                                                ;
          52          50  D0 0025E          MOVL    R0, STATUS                                                      ;
          09          52  E8 00261          BLBS    STATUS, 15$                                                     ;
                      52  DD 00264 14$:      PUSHL   STATUS                                                          ;
          6A          01  FB 00266          CALLS   #1, LIB$SIGNAL                                                  ;
          50          52  D0 00269          MOVL    STATUS, R0                                                      ;
                          04 0026C          RET                                                                     ;
          50          01  D0 0026D 15$:      MOVL    #1, R0                                                          ;  1600
                          04 00270          RET                                                                     ;  1601

; Routine Size:  625 bytes,    Routine Base:  CODE + 0564
```

```
;  775     1602  1 ROUTINE SETUP_GRAPH (MINVAL, MAXVAL, RESERVE, WORTH, DESC) =
;  776     1603  1
;  777     1604  1 !----
;  778     1605  1 !
;  779     1606  1 ! Functional description
;  780     1607  1 !
;  781     1608  1 !       This routine calculates the worth of a column for a bar
;  782     1609  1 !       graph and prepares a header line to go over the graph.
;  783     1610  1 !
;  784     1611  1 ! Input parameters
;  785     1612  1 !
;  786     1613  1 !       MINVAL  = Minimum value to be graphed
;  787     1614  1 !       MAXVAL  = Maximum value to be graphed
;  788     1615  1 !       RESERVE = Number of columns to reserve for symbols
;  789     1616  1 !
;  790     1617  1 ! Output parameters
;  791     1618  1 !
;  792     1619  1 !       WORTH   = Address of a longword to receive worth of a column
;  793     1620  1 !       DESC    = Address of a dynamic descriptor to receive header
;  794     1621  1 !
;  795     1622  1 !       Any errors encountered are RETURNed immediately.
;  796     1623  1 !
;  797     1624  1 !----
;  798     1625  1
;  799     1626  2 BEGIN
;  800     1627  2
;  801     1628  2 LOCAL
;  802     1629  2         min,                            ! Holds local minimum value
;  803     1630  2         width,                          ! Width of output device
;  804     1631  2         range,                          ! maxval - minval
;  805     1632  2         numgrp;                         ! Number of groups
;  806     1633  2
;  807     1634  2
;  808     1635  2 Width = SCREEN (width) - .reserve;              ! Calc useable space
;  809     1636  2
;  810     1637  2 Width = (.width/columns_per_group) *            ! Use integral number of groups
;  811     1638  2         columns_per_group;
;  812     1639  2
;  813     1640  2 If .minval lssu (.maxval/4) then min = 0
;  814     1641  2    else min = .minval;                         ! Only offset if significant
;  815     1642  2
;  816     1643  2 Range = maxu (.maxval - .min, 1);               ! Compute range of graph
;  817     1644  2
;  818     1645  2 .Worth = (.range+.width)/.width;               ! Calc worth of column
;  819     1646  2
;  820     1647  2 Numgrp = .width / columns_per_group;            ! Calc number of groups
;  821     1648  2
;  822     1649  2 Perform (str$dupl_char (.desc, 0));            ! Zero result descriptor
;  823     1650  2
;  824     1651  2 Incru i to .width by columns_per_group do      ! For each group
;  825     1652  3    BEGIN
;  826   P 1653  3    perform (lib$sys_fao (                      ! Create a detail header
;  827   P 1654  3          ad ('!#<!UL!>'),                      !  -control string
;  828   P 1655  3          0,                                    !  -no result length needed
;  829   P 1656  3          wdesc,                                !  -output buffer
;  830   P 1657  3          columns_per_group,                    !  -width of a column group
;  831     1658  3          .min + (.i * ..worth)));              !  -group value
```

```
;  832          1659  3
;  833        P 1660  3      perform (str$append (                        ! Concatenate with header
;  834        P 1661  3           .desc,                                  !  -destination
;  835          1662  3           wdesc));                                !  -source
;  836          1663  3      END;
;  837          1664  3
;  838          1665  2  Perform (str$left (.desc, .desc, width));        ! Limit max string size
;  839          1666  2
;  840          1667  2  Return true;
;  841          1668  1  END;


                                                007D5                   .BLKB   3
                     3E  21  4C  55  21  3C  23  21  007D8 P.AAX:        .ASCII  \!#<!UL!>\                              ;
                                   00000008     007E0 P.AAW:        .LONG   8                                       ;
                                   00000000'    007E4               .ADDRESS P.AAX                                  ;


                                                001C 00000 SETUP_GRAPH:
                                                                    .WORD   Save R2,R3,R4                           ; 1602
                         54 00000000'   EF   9E 00002               MOVAB   WDESC, R4                               ;
                         50 000000000G  00   3C 00009               MOVZWL  SCREEN_CHAR+4, R0                       ; 1635
                7E             50       0C   AC  C3 00010          SUBL3   RESERVE, R0, WIDTH                      ;
                50             6E            0F  C7 00015          DIVL3   #15, WIDTH, R0                          ; 1637
                6E             50            0F  C5 00019          MULL3   #15, R0, WIDTH                          ;
                50       08    AC            04  C7 0001D          DIVL3   #4, MAXVAL, R0                          ; 1640
                         50        04   AC   D1  00022              CMPL    MINVAL, R0                              ;
                                        04   1E  00026              BGEQU   1$                                      ;
                                        53   D4  00028              CLRL    MIN                                     ;
                                        04   11  0002A              BRB     2$                                      ;
                         53        04   AC   D0  0002C  1$:         MOVL    MINVAL, MIN                             ; 1641
                50       08    AC            53  C3  00030  2$:     SUBL3   MIN, MAXVAL, R0                         ; 1643
                                        03   12  00035              BNEQ    3$                                      ;
                         50             01   D0  00037              MOVL    #1, R0                                  ;
                         50             6E   C0  0003A  3$:         ADDL2   WIDTH, R0                               ; 1645
            10   BC       50            6E   C7  0003D              DIVL3   WIDTH, R0, @WORTH                       ;
                50             6E            0F  C7  00042          DIVL3   #15, WIDTH, NUMGRP                      ; 1647
                                        7E   D4  00046              CLRL    -(SP)                                   ; 1649
                                   14   AC   DD  00048              PUSHL   DESC                                    ;
                    00000000G   00            02  FB  0004B          CALLS   #2, STR$DUPL_CHAR                       ;
                                48            50  E9  00052          BLBC    STATUS, 6$                              ;
                                              52  D4  00055          CLRL    I                                       ; 1651
                                              2D  11  00057          BRB     5$                                      ;
                50             52        10   BC  C5  00059  4$:     MULL3   @WORTH, I, R0                           ; 1658
                                        6043   9F  0005E              PUSHAB  (R0)[MIN]                               ;
                                        0F   DD  00061              PUSHL   #15                                     ;
                                        54   DD  00063              PUSHL   R4                                      ;
                                        7E   D4  00065              CLRL    -(SP)                                   ;
                                   8E   AF   9F  00067              PUSHAB  P.AAW                                   ;
                    00000000G   00            05  FB  0006A          CALLS   #5, LIB$SYS_FAO                         ;
                                2C            50  E9  00071          BLBC    STATUS, 6$                              ;
                                              54  DD  00074          PUSHL   R4                                      ; 1662
                                   14   AC   DD  00076              PUSHL   DESC                                    ;
                    00000000G   00            02  FB  00079          CALLS   #2, STR$APPEND                          ;
                                1D            50  E9  00080          BLBC    STATUS, 6$                              ;
```

```
                                52              0F  C0 00083          ADDL2   #15, I                                  ; 1651
                                6E              52  D1 00086 5$:     CMPL    I, WIDTH                                ;
                                                CE  1B 00089          BLEQU   4$                                      ;
                                                5E  DD 0008B          PUSHL   SP                                      ; 1665
                                        14      AC  DD 0008D          PUSHL   DESC                                    ;
                                        14      AC  DD 00090          PUSHL   DESC                                    ;
                        00000000G       00          03  FB 00093          CALLS   #3, STR$LEFT                        ;
                                        03          50  E9 0009A          BLBC    STATUS, 6$                          ;
                                        50          01  D0 0009D          MOVL    #1, R0                              ; 1667
                                                    04  000A0 6$:         RET                                         ; 1668

; Routine Size:  161 bytes,    Routine Base:  CODE + 07E8
```

```
;  843          1669  1 GLOBAL ROUTINE WRITE_TOTALS  =
;  844          1670  1
;  845          1671  1 !----
;  846          1672  1 !
;  847          1673  1 ! Functional description
;  848          1674  1 !
;  849          1675  1 !       This routine is called when a totals page is required.  A
;  850          1676  1 !       totals page contains statistics accumlated during the running
;  851          1677  1 !       of the program, such as number of records read.
;  852          1678  1 !
;  853          1679  1 ! Input parameters
;  854          1680  1 !
;  855          1681  1 !
;  856          1682  1 ! Output parameters
;  857          1683  1 !
;  858          1684  1 !       Any errors encountered are RETURNed immediately.
;  859          1685  1 !
;  860          1686  1 !----
;  861          1687  1
;  862          1688  2 BEGIN
;  863          1689  2 return true;
;  864          1690  1 END;


                                0000 00000          .ENTRY  WRITE_TOTALS, Save nothing                      ; 1669
                     50   01    D0 00002          MOVL    #1, R0                                          ; 1689
                                04 00005          RET                                                     ; 1690

; Routine Size:  6 bytes,    Routine Base:  CODE + 0889
```

```
;  866          1691  1 END
;  867          1692  0 ELUDOM



                                                        .EXTRN  LIB$SIGNAL

;                               PSECT SUMMARY
;
;       Name                    Bytes                   Attributes
;
;  DATA                          212  NOVEC,  WRT,  RD ,NOEXE,NOSHR,  LCL,  REL,  CON,NOPIC,ALIGN(2)
;  CODE                         2191  NOVEC,NOWRT,  RD ,  EXE,NOSHR,  LCL,  REL,  CON,NOPIC,ALIGN(2)


;                           Library Statistics
;
;                                    -------- Symbols --------      Pages       Processing
;       File                         Total    Loaded   Percent      Mapped      Time
;
;  _$255$DUA28:[SYSLIB]STARLET.L32;1   9776        36         0         581        00:01.1
;  _$255$DUA28:[SYSLIB]TPAMAC.L32;1      42         0         0          14        00:00.1



;                                   COMMAND QUALIFIERS

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

; Size:          1934 code + 469 data bytes
; Run Time:         00:41.9
; Elapsed Time:     01:21.8
; Lines/CPU Min:     2420
; Lexemes/CPU-Min:  26755
; Memory Used:  273 pages
; Compilation Complete
```

AEDCLENUP
LIS

SYMBOLS
LIS

UTILITY
LIS

ACLEDTDEF
REQ

ACLEDT

SETSHOACL
MAP

ACLEDT
MAP

AEDLCLDEE
SDL

SUMMARY
LIS

SYMBOLMSG
LIS

AEDDECODE
LIS