C 8

```
DDDDDDDDDDDD     RRRRRRRRRRRR        IIIIIIIII     VVV         VVV  EEEEEEEEEEEEEEE  RRRRRRRRRRRR
DDDDDDDDDDDD     RRRRRRRRRRRR        IIIIIIIII     VVV         VVV  EEEEEEEEEEEEEEE  RRRRRRRRRRRR
DDDDDDDDDDDD     RRRRRRRRRRRR        IIIIIIIII     VVV         VVV  EEEEEEEEEEEEEEE  RRRRRRRRRRRR
DDD         DDD  RRR         RRR        III        VVV         VVV  EEE              RRR         RRR
DDD         DDD  RRR         RRR        III        VVV         VVV  EEE              RRR         RRR
DDD         DDD  RRR         RRR        III        VVV         VVV  EEE              RRR         RRR
DDD         DDD  RRR         RRR        III        VVV         VVV  EEE              RRR         RRR
DDD         DDD  RRR         RRR        III        VVV         VVV  EEE              RRR         RRR
DDD         DDD  RRR         RRR        III        VVV         VVV  EEE              RRR         RRR
DDD         DDD  RRRRRRRRRRRR           III        VVV         VVV  EEEEEEEEEEEE     RRRRRRRRRRRR
DDD         DDD  RRRRRRRRRRRR           III        VVV         VVV  EEEEEEEEEEEE     RRRRRRRRRRRR
DDD         DDD  RRRRRRRRRRRR           III        VVV         VVV  EEEEEEEEEEEE     RRRRRRRRRRRR
DDD         DDD  RRR   RRR              III        VVV         VVV  EEE              RRR   RRR
DDD         DDD  RRR   RRR              III        VVV         VVV  EEE              RRR   RRR
DDD         DDD  RRR   RRR              III        VVV         VVV  EEE              RRR   RRR
DDD         DDD  RRR      RRR           III           VVV   VVV     EEE              RRR      RRR
DDD         DDD  RRR      RRR           III           VVV   VVV     EEE              RRR      RRR
DDD         DDD  RRR      RRR           III           VVV   VVV     EEE              RRR      RRR
DDDDDDDDDDDD     RRR         RRR     IIIIIIIII           VVV        EEEEEEEEEEEEEEE  RRR         RRR
DDDDDDDDDDDD     RRR         RRR     IIIIIIIII           VVV        EEEEEEEEEEEEEEE  RRR         RRR
DDDDDDDDDDDD     RRR         RRR     IIIIIIIII           VVV        EEEEEEEEEEEEEEE  RRR         RRR
```

FILEID**PAMONIT

```
PPPPPPPP      AAAAAA    MM      MM    000000    NN      NN    IIIIII    TTTTTTTTTT
PPPPPPPP      AAAAAA    MM      MM    000000    NN      NN    IIIIII    TTTTTTTTTT
PP      PP  AA      AA  MMMM  MMMM  00      00  NN      NN      II          TT
PP      PP  AA      AA  MMMM  MMMM  00      00  NN      NN      II          TT
PP      PP  AA      AA  MM  MM  MM  00      00  NNNN    NN      II          TT
PP      PP  AA      AA  MM  MM  MM  00      00  NNNN    NN      II          TT
PPPPPPPP    AA      AA  MM      MM  00      00  NN  NN  NN      II          TT
PPPPPPPP    AA      AA  MM      MM  00      00  NN  NN  NN      II          TT
PP          AAAAAAAAAA  MM      MM  00      00  NN    NNNN      II          TT
PP          AAAAAAAAAA  MM      MM  00      00  NN    NNNN      II          TT
PP          AA      AA  MM      MM  00      00  NN      NN      II          TT          ....
PP          AA      AA  MM      MM  00      00  NN      NN      II          TT          ....
PP          AA      AA  MM      MM    000000    NN      NN    IIIIII        TT          ....
PP          AA      AA  MM      MM    000000    NN      NN    IIIIII        TT          ....

LL            IIIIII      SSSSSSSS
LL            IIIIII      SSSSSSSS
LL              II      SS
LL              II      SS
LL              II      SS
LL              II      SS
LL              II        SSSSSS
LL              II        SSSSSS
LL              II              SS
LL              II              SS
LL              II              SS
LL              II              SS
LLLLLLLLLL    IIIIII    SSSSSSSS
LLLLLLLLLL    IIIIII    SSSSSSSS
```

```
0000         .TITLE  PAMONIT
0000         .IDENT  'V04-000'
0000
0000  ;****************************************************************************
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0000  ;*                                                                          *
0000  ;*                                                                          *
0000  ;****************************************************************************
0000  ;
0000  ;++
0000  ;
0000  ; FACILITY:
0000  ;
0000  ;       VAX/VMS EXECUTIVE, I/O DRIVERS
0000  ;
0000  ; ABSTRACT:
0000  ;
0000  ; AUTHOR:  N. KRONENBERG,  MAY 1981
0000  ;
0000  ; MODIFIED BY:
0000  ;
0000  ;       V03-004 NPK3029         N. Kronenberg           22-Jul-1983
0000  ;               Eliminate copy of interval count register (for time
0000  ;               stamp) in trace buffer entries in favor of logging
0000  ;               PDT address.
0000  ;
0000  ;       V03-003 NPK3024         N. Kronenberg           19-Apr-1983
0000  ;               Modified queue checker to check header soft interlock
0000  ;               on every element check and to put a code into R1
0000  ;               to show time of failure for other than maximum number
0000  ;               of entries found on queue.  Codes are: -1/-2/-3 for
0000  ;               back link to previous entry broken/structure type
0000  ;               wrong/soft link cleared respectively.
0000  ;               Increased maximum number of queue entries tolerated
0000  ;               to 64.
0000  ;               Removed LRP identification and address checks to allow
0000  ;               variable network header sizes.
0000  ;
0000  ;       V03-002 NPK2016         N. Kronenberg           18-Mar-1982
0000  ;               Fixed .TITLE
```

```
    0000     58 ;
    0000     59 ;--
    0000     60
00000000     61          .PSECT  $$$115_DRIVER,LONG
    0000     62
    0000     63
    0000     64          $DYNDEF
    0000     65          $PDTDEF
    0000     66          $PAPDTDEF
    0000     67          $PAREGDEF
    0000     68          $PPDDEF
    0000     69
    0000     70
    0000     71
    0000     72
    0000     73
    0000     74
```

```
                 0000     76           .SBTTL  INTERLOCKED QUEUE MONITOR ROUTINES
                 0000     77           .SBTTL  QUEUE MONITOR CONTROL FLAGS
                 0000     78
                 0000     79 ;+
                 0000     80 ; MON$FLAGS is a bit mask of control flags.
                 0000     81 ;-
                 0000     82
                 0000     83 MON$FLAGS::
                 0000     84
        00000001 0000     85           .LONG   1                        ; Default is queue checks disabled
                 0004     86
                 0004     87 ;
                 0004     88 ; Flag definitions:
                 0004     89 ;
                 0004     90
        00000001 0004     91 MON$M_QCHK = 1
        00000000 0004     92 MON$V_QCHK = 0
```

```
0004          .SBTTL  -       CHKQ MACRO AND CONTROL
0004          .SBTTL  -       FLAGS LONGWORD
0004
0004  ;+
0004  ; Macro CHKQ generates inline code for checking a relative queue.
0004  ;
0004  ; Inputs:
0004  ;
0004  ;       R3                          -Addr of Q header or entry
0004  ;
0004  ; Outputs:
0004  ;
0004  ;       R0-R2,R5                            -Destroyed
0004  ;-
0004
0004          .MACRO  CHKQ,?LOOP,?ERR,?OK,?LOCK,?LOWERIPL,?TYPOK,?ERR1,?ERR2,?ERR3
0004
0004           MOVL   R3,R2                       ; Get copy of listhd addr
0004           CLRL   R1                          ; Zero entry counter
0004           DSBINT                             ; Disable interrupts
0004
0004  LOCK:
0004           BBSSI  #0,(R3),LOCK                ; Lock queue before reading
0004
0004  LOOP:
0004           MOVL   R2,R5                       ; Save addr of this entry
0004
0004           MOVL   (R2),R0                     ; Get offset to next entry
0004           BICL   #1,R0                       ; Clear interlock bit
0004           MOVAB  (R2)[R0],R2                 ; Get addr of next entry
0004           MOVL   4(R2),R0                    ; Get back link from this entry
0004           MOVAB  (R2)[R0],R0                 ; Compute prev entry addr
0004           CMPL   R0,R5                       ; Computed addr = saved?
0004           BNEQ   ERR1                        ; Branch if not
0004           CMPL   R2,R3                       ; Back at start?
0004           BEQL   OK                          ; Branch if so
0004           CMPB   PPD$B_TYPE(R2),#DYN$C_CIDG  ; CI dg?
0004           BEQL   TYPOK                           ; Branch if so
0004           CMPB   PPD$B_TYPE(R2),#DYN$C_CIMSG ; CI msg?
0004           BNEQ   ERR2                            ; Branch if not
0004  TYPOK:   BBC    #0,(R3),ERR3                ; Branch if somebody grabbed soft
0004                                              ;  interlock while we had it
0004           AOBLSS #63,R1,LOOP                 ; Else check max count and continue
0004           BRB    ERR                         ; Branch if max count expired
0004
0004  ERR1:    MNEGL  #1,R1                       ; Set error code to bad blink
0004           BRB    ERR                         ; Join common error handling
0004
0004  ERR2:    MNEGL  #2,R1                       ; Set error code to bad struc type
0004           BRB    ERR                         ; Join common error handling
0004
0004  ERR3:    MNEGL  #3,R1                       ; Set error code to broken soft lock
0004
0004  ERR:
0004           MOVL   #1,@PDT$L_PMC(R4)           ; Min port to prevent further queue
0004                                              ;  operations by port
0004           BUGCHECK  BADQHDR                  ; Notify debugger
```

```
0004   151
0004   152 OK:                                            ; Check succeeded
0004   153          BBCCI  #0,(R3),LOWERIPL                        ; Unlock queue for port
0004   154
0004   155 LOWERIPL:
0004   156          ENBINT                                ; Enable interrupts again
0004   157
0004   158
0004   159         .ENDM   CHKQ
0004   160
0004   161
0004   162         .SHOW
0004   163
0004   164
0004   165
```

```
                    0004          .SBTTL  -       MON$CHKQ,       CHECK ALL Q'S ON THE PORT
                    0004
                    0004  ;+
                    0004  ; Checks all port queues (designed to be fast rather than short).
                    0004  ;
                    0004  ; Inputs:
                    0004  ;
                    0004  ;       R4                      -Addr of PDT
                    0004  ;
                    0004  ; Outputs:
                    0004  ;
                    0004  ;       R0, condition codes     -Destroyed
                    0004  ;-
                    0004
                    0004          .ENABL  LSB
                    0004
                    0004  MON$CHKQ::
        00      E0  0004          BBS     #MON$V_QCHK,-           ; Branch if checking queues
   03 F8 AF         0006                  MON$FLAGS,CHKQ_ALT      ;  is enabled
      021D      31  0009          BRW     20$                     ; Else skip whole chedk
                    000C
                    000C  CHKQ_ALT:                               ; Entry for MON$CHKQ_POST
        55      DD  000C          PUSHL   R5                      ; Save registers...
        53      DD  000E          PUSHL   R3                      ;
        52      DD  0010          PUSHL   R2                      ;
        51      DD  0012          PUSHL   R1                      ;
53   01E0 C4    DE  0014          MOVAL   PDT$Q_COMQL(R4),R3      ; Get addr of 1st command Q
                    0019          CHKQ                            ; Verify
                    0019
   52   53      D0  0019            MOVL    R3,R2                 ; Get copy of listhd addr
        51      D4  001C            CLRL    R1                    ; Zero entry counter
                    001E            DSBINT                        ; Disable interrupts
                    001E                    .IF B
   7E   00'     DB  001E                    MFPR    S^#PR$_IPL,-(SP)
                    0021                    .IFF
                    0021                    MFPR    S^#PR$_IPL,
                    0021                    .ENDC
                    0021                    .IF B
   00'  1F      DA  0021                    MTPR    #31,S^#PR$_IPL
                    0024                    .IFF
                    0024                    MTPR    ,S^#PR$_IPL
                    0024                    .ENDC
                    0024
                    0024
                    0024          30003$:
 FC 63  00      E6  0024            BBSSI   #0,(R3),30003$        ; 30003$ queue before reading
                    0028
                    0028          30000$:
   55   52      D0  0028            MOVL    R2,R5                 ; Save addr of this entry
                    002B
   50   62      D0  002B            MOVL    (R2),R0               ; Get offset to next entry
   50   01      CA  002E            BICL    #1,R0                 ; Clear interlock bit
 52   6240      9E  0031            MOVAB   (R2)[R0],R2           ; Get addr of next entry
50   04 A2      D0  0035            MOVL    4(R2),R0              ; Get back link from this entry
 50   6240      9E  0039            MOVAB   (R2)[R0],R0           ; Compute prev entry addr
   55   50      D1  003D            CMPL    R0,R5                 ; Computed addr = saved?
        1B      12  0040            BNEQ    30006$                ; Branch if not
      53  52   D1  0042              CMPL    R2,R3                       ; Back at start?
          2F   13  0045              BEQL    30002$                      ; Branch if so
   3B  0A A2   91  0047              CMPB    PPD$B_TYPE(R2),#DYN$C_CIDG  ; CI dg?
          06   13  004B              BEQL    30005$                      ; Branch if so
   3C  0A A2   91  004D              CMPB    PPD$B_TYPE(R2),#DYN$C_CIMSG ; CI msg?
          0F   12  0051              BNEQ    30007$                      ; Branch if not
   10 63  00   E1  0053     30005$:  BBC     #0,(R3),30008$              ; Branch if somebody grabbed soft
                   0057                                                  ;  interlock while we had it
   CD 51  3F   F2  0057              AOBLSS  #63,R1,30000$               ; Else check max count and continue
          0D   11  005B              BRB     30001$                      ; Branch if max count expired
                   005D
      51  01   CE  005D     30006$:  MNEGL   #1,R1                       ; Set error code to bad blink
          08   11  0060              BRB     30001$                      ; Join common error handling
                   0062
      51  02   CE  0062     30007$:  MNEGL   #2,R1                       ; Set error code to bad struc type
          03   11  0065              BRB     30001$                      ; Join common error handling
                   0067
      51  03   CE  0067     30008$:  MNEGL   #3,R1                       ; Set error code to broken soft 30003$
                   006A
                   006A     30001$:
 00E8 D4  01   D0  006A              MOVL    #1,@PDT$L_PMC(R4)           ; Min port to prevent further queue
                   006F                                                  ;  operations by port
                   006F              BUGCHECK  BADQHDR                   ; Notify debugger
                   006F              .IF     IDN ,NONFATAL
                   006F              BSBW    ERR$BUGCHECKNF
                   006F              BUG_CHECK BADQHDR
                   006F              .IFF
          FF8E'  30  006F              BSBW    ERR$BUGCHECK
                   0072              BUG_CHECK BADQHDR,TYPE=FATAL
              FEFF 0072                      .WORD   ^XFEFF
              00[illegible] 0074                      .IIF IDN <FATAL>,<FATAL> , .WORD        BUG$_BADQHDR!4
                   0076                      .IIF DIF <FATAL>,<FATAL> , .WORD        BUG$_BADQHDR
                   0076
                   0076              .ENDC
                   [illegible]
                   0076
                   0076     30002$:                                      ; Check succeeded
   00 63  00   E7  0076              BBCCI   #0,(R3),30004$              ; Unlock queue for port
                   007A
                   007A     30004$:
                   007A              ENBINT                              ; Enable interrupts again
                   007A                      .IF B
      00'  8E  DA  007A                      MTPR    (SP)+,S^#PR$_IPL
                   007D                      .IFF
                   007D                      MTPR    ,S^#PR$_IPL
                   007D                      .ENDC
                   007D
                   007D
                   007D
                   007D
      53  08   C0  007D             ADDL    #8,R3                        ; Step to 2nd command Q
                   0080             CHKQ                                 ; Verify
                   0080
      52  53   D0  0080              MOVL    R3,R2                       ; Get copy of listhd addr
          51   D4  0083              CLRL    R1                          ; Zero entry counter
                   0085              DSBINT                              ; Disable interrupts
                   0085                      .IF B
```

```
        7E   00'  DB  0085                   MFPR    S^#PR$_IPL,-(SP)
                      0088                   .IFF
                      0088                   MFPR    S^#PR$_IPL,
                      0088                   .ENDC
                      0088                   .IF B
       00'   1F   DA  0088                   MTPR    #31,S^#PR$_IPL
                      008B                   .IFF
                      008B                   MTPR    ,S^#PR$_IPL
                      008B                   .ENDC
                      008B
                      008B
                      008B         30012$:
     FC 63   00   E6  008B               BBSSI   #0,(R3),30012$           ; 30012$ queue before reading
                      008F
                      008F         30009$:
        55   52   D0  008F               MOVL    R2,R5                    ; Save addr of this entry
                      0092
        50   62   D0  0092               MOVL    (R2),R0                  ; Get offset to next entry
        50   01   CA  0095               BICL    #1,R0                    ; Clear interlock bit
      52   6240   9E  0098               MOVAB   (R2)[R0],R2              ; Get addr of next entry
     50   04 A2   D0  009C               MOVL    4(R2),R0                 ; Get back link from this entry
      50   6240   9E  00A0               MOVAB   (R2)[R0],R0              ; Compute prev entry addr
        55   50   D1  00A4               CMPL    R0,R5                    ; Computed addr = saved?
             1B   12  00A7               BNEQ    30015$                   ; Branch if not
        53   52   D1  00A9               CMPL    R2,R3                    ; Back at start?
             2F   13  00AC               BEQL    30011$                   ; Branch if so
     3B   0A A2   91  00AE               CMPB    PPD$B_TYPE(R2),#DYN$C_CIDG  ; CI dg?
             06   13  00B2               BEQL    30014$                      ; Branch if so
     3C   0A A2   91  00B4               CMPB    PPD$B_TYPE(R2),#DYN$C_CIMSG ; CI msg?
             0F   12  00B8               BNEQ    30016$                      ; Branch if not
     10 63   00   E1  00BA         30014$: BBC   #0,(R3),30017$           ; Branch if somebody grabbed soft
                      00BE                                                ;  interlock while we had it
     CD 51   3F   F2  00BE               AOBLSS #63,R1,30009$             ; Else check max count and continue
             0D   11  00C2               BRB     30010$                   ; Branch if max count expired
                      00C4
        51   01   CE  00C4         30015$: MNEGL #1,R1                    ; Set error code to bad blink
             08   11  00C7               BRB     30010$                   ; Join common error handling
                      00C9
        51   02   CE  00C9         30016$: MNEGL #2,R1                    ; Set error code to bad struc type
             03   11  00CC               BRB     30010$                   ; Join common error handling
                      00CE
        51   03   CE  00CE         30017$: MNEGL #3,R1                    ; Set error code to broken soft 30012$
                      00D1
                      00D1         30010$:
   00E8 D4   01   D0  00D1               MOVL    #1,@PDT$L_PMC(R4)        ; Min port to prevent further queue
                      00D6                                                ;  operations by port
                      00D6               BUGCHECK  BADQHDR                ; Notify debugger
                      00D6               .IF     IDN ,NONFATAL
                      00D6               BSBW    ERR$BUGCHECKNF
                      00D6               BUG_CHECK BADQHDR
                      00D6               .IFF
         FF27'   30   00D6               BSBW    ERR$BUGCHECK
                      00D9               BUG_CHECK BADQHDR,TYPE=FATAL
               FEFF   00D9                       .WORD   ^XFEFF
              0004'   00DB                       .IIF IDN <FATAL>,<FATAL> , .WORD       BUG$_BADQHDR!4
                      00DD                       .IIF DIF <FATAL>,<FATAL> , .WORD       BUG$_BADQHDR
                      00DD
```

```
                            00DD                  .ENDC
                            00DD
                            00DD
                            00DD        30011$:                                   ; Check succeeded
          00 63    00   E7  00DD              BBCCI  #0,(R3),30013$               ; Unlock queue for port
                            00E1
                            00E1        30013$:
                            00E1              ENBINT                              ; Enable interrupts again
                            00E1                     .IF B
             00'   8E   DA  00E1                     MTPR     (SP)+,S^#PR$_IPL
                            00E4                     .IFF
                            00E4                     MTPR     ,S^#PR$_IPL
                            00E4                     .ENDC
                            00E4
                            00E4
                            00E4
                            00E4
             53    18   C0  00E4             ADDL   #24,R3                       ; Step to response Q
                            00E7             CHKQ                                ; Verify
                            00E7
             52    53   D0  00E7              MOVL   R3,R2                        ; Get copy of listhd addr
                   51   D4  00EA              CLRL   R1                           ; Zero entry counter
                            00EC              DSBINT                              ; Disable interrupts
                            00EC                     .IF B
             7E    00'  DB  00EC                     MFPR     S^#PR$_IPL,-(SP)
                            00EF                     .IFF
                            00EF                     MFPR     S^#PR$_IPL,
                            00EF                     .ENDC
                            00EF                     .IF B
             00'   1F   DA  00EF                     MTPR     #31,S^#PR$_IPL
                            00F2                     .IFF
                            00F2                     MTPR     ,S^#PR$_IPL
                            00F2                     .ENDC
                            00F2
                            00F2
                            00F2        30021$:
          FC 63    00   E6  00F2              BBSSI  #0,(R3),30021$               ; 30021$ queue before reading
                            00F6
                            00F6        30018$:
             55    52   D0  00F6              MOVL   R2,R5                        ; Save addr of this entry
                            00F9
             50    62   D0  00F9              MOVL   (R2),R0                      ; Get offset to next entry
             50    01   CA  00FC              BICL   #1,R0                        ; Clear interlock bit
          52    6240    9E  00FF              MOVAB  (R2)[R0],R2                  ; Get addr of next entry
          50   04 A2    D0  0103              MOVL   4(R2),R0                     ; Get back link from this entry
           50   6240    9E  0107              MOVAB  (R2)[R0],R0                  ; Compute prev entry addr
             55    50   D1  010B              CMPL   R0,R5                        ; Computed addr = saved?
                   1B   12  010E              BNEQ   30024$                       ; Branch if not
             53    52   D1  0110              CMPL   R2,R3                        ; Back at start?
                   2F   13  0113              BEQL   30020$                       ; Branch if so
          3B    0A A2   91  0115              CMPB   PPD$B_TYPE(R2),#DYN$C_CIDG   ; CI dg?
                   06   13  0119              BEQL   30023$                         ; Branch if so
          3C    0A A2   91  011B              CMPB   PPD$B_TYPE(R2),#DYN$C_CIMSG  ; CI msg?
                   0F   12  011F              BNEQ   30025$                         ; Branch if not
          10 63    00   E1  0121        30023$: BBC  #0,(R3),30026$               ; Branch if somebody grabbed soft
                            0125                                                  ;  interlock while we had it
          CD 51    3F   F2  0125              AOBLSS #63,R1,30018$                ; Else check max count and continue
```

```
                 0D    11  0129                    BRB     30019$                  ; Branch if max count expired
                           012B
           51    01    CE  012B        30024$:     MNEGL   #1,R1                   ; Set error code to bad blink
                 08    11  012E                    BRB     30019$                  ; Join common error handling
                           0130
           51    02    CE  0130        30025$:     MNEGL   #2,R1                   ; Set error code to bad struc type
                 03    11  0133                    BRB     30019$                  ; Join common error handling
                           0135
           51    03    CE  0135        30026$:     MNEGL   #3,R1                   ; Set error code to broken soft 30021$
                           0138
                           0138        30019$:
      00E8 D4    01    D0  0138                    MOVL    #1,@PDT$L_PMC(R4)       ; Min port to prevent further queue
                           013D                                                    ;  operations by port
                           013D                    BUGCHECK  BADQHDR               ; Notify debugger
                           013D                    .IF     IDN ,NONFATAL
                           013D                    BSBW    ERR$BUGCHECKNF
                           013D                    BUG_CHECK BADQHDR
                           013D                    .IFF
              FEC0'    30  013D                    BSBW    ERR$BUGCHECK
                           0140                    BUG_CHECK BADQHDR,TYPE=FATAL
                   FEFF    0140                            .WORD   ^XFEFF
                   0004'   0142                            .IIF IDN <FATAL>,<FATAL> , .WORD        BUG$_BADQHDR!4
                           0144                            .IIF DIF <FATAL>,<FATAL> , .WORD        BUG$_BADQHDR
                           0144
                           0144                    .ENDC
                           0144
                           0144
                           0144        30020$:                                     ; Check succeeded
        00 63    00    E7  0144                    BBCCI   #0,(R3),30022$          ; Unlock queue for port
                           0148
                           0148        30022$:
                           0148                    ENBINT                          ; Enable interrupts again
                           0148                            .IF B
           00'   8E    DA  0148                            MTPR    (SP)+,S^#PR$_IPL
                           014B                            .IFF
                           014B                            MTPR    ,S^#PR$_IPL
                           014B                            .ENDC
                           014B
                           014B
                           014B
                           014B
      53   0208 C4     D0  014B                  MOVL    PDT$L_DFQHDR(R4),R3       ; Get addr of dg free Q
                           0150                  CHKQ                              ; Verify
                           0150
           52    53    D0  0150                    MOVL    R3,R2                   ; Get copy of listhd addr
                 51    D4  0153                    CLRL    R1                      ; Zero entry counter
                           0155                    DSBINT                          ; Disable interrupts
                           0155                            .IF B
           7E    00'   DB  0155                            MFPR    S^#PR$_IPL,-(SP)
                           0158                            .IFF
                           0158                            MFPR    S^#PR$_IPL,
                           0158                            .ENDC
                           0158                            .IF B
           00'   1F    DA  0158                            MTPR    #31,S^#PR$_IPL
                           015B                            .IFF
                           015B                            MTPR    ,S^#PR$_IPL
                           015B                            .ENDC
```

```
                         015B
                         015B
                         015B          30030$:
       FC 63    00   E6  015B                     BBSSI  #0,(R3),30030$         ; 30030$ queue before reading
                         015F
                         015F          30027$:
          55    52   D0  015F                     MOVL   R2,R5                  ; Save addr of this entry
                         0162
          50    62   D0  0162                     MOVL   (R2),R0                ; Get offset to next entry
          50    01   CA  0165                     BICL   #1,R0                  ; Clear interlock bit
        52    6240   9E  0168                     MOVAB  (R2)[R0],R2            ; Get addr of next entry
       50     04 A2  D0  016C                     MOVL   4(R2),R0               ; Get back link from this entry
        50    6240   9E  0170                     MOVAB  (R2)[R0],R0            ; Compute prev entry addr
          55    50   D1  0174                     CMPL   R0,R5                  ; Computed addr = saved?
                1B   12  0177                     BNEQ   30033$                 ; Branch if not
          53    52   D1  0179                     CMPL   R2,R3                  ; Back at start?
                2F   13  017C                     BEQL   30029$                 ; Branch if so
       3B     0A A2  91  017E                     CMPB   PPD$B_TYPE(R2),#DYN$C_CIDG  ; CI dg?
                06   13  0182                     BEQL   30032$                 ; Branch if so
       3C     0A A2  91  0184                     CMPB   PPD$B_TYPE(R2),#DYN$C_CIMSG ; C. msg?
                0F   12  0188                     BNEQ   30034$                 ; Branch if not
       10 63    00   E1  018A          30032$:    BBC    #0,(R3),30035$         ; Branch if somebody grabbed soft
                         018E                                                   ;  interlock while we had it
       CD 51    3F   F2  018E                     AOBLSS #63,R1,30027$          ; Else check max count and continue
                0D   11  0192                     BRB    30028$                 ; Branch if max count expired
                         0194
          51    01   CE  0194          30033$:    MNEGL  #1,R1                  ; Set error code to bad blink
                08   11  0197                     BRB    30028$                 ; Join common error handling
                         0199
          51    02   CE  0199          30034$:    MNEGL  #2,R1                  ; Set error code to bad struc type
                03   11  019C                     BRB    30028$                 ; Join common error handling
                         019E
          51    03   CE  019E          30035$:    MNEGL  #3,R1                  ; Set error code to broken soft 30030$
                         01A1
                         01A1          30028$:
    00E8 D4     01   D0  01A1                     MOVL   #1,@PDT$L_PMC(R4)      ; Min port to prevent further queue
                         01A6                                                   ;  operations by port
                         01A6                     BUGCHECK  BADQHDR             ; Notify debugger
                         01A6                     .IF    IDN .NONFATAL
                         01A6                     BSBW   ERR$BUGCHECKNF
                         01A6                     BUG_CHECK BADQHDR
                         01A6                     .IFF
            FE57'    30  01A6                     BSBW   ERR$BUGCHECK
                         01A9                     BUG_CHECK BADQHDR,TYPE=FATAL
                  FEFF   01A9                            .WORD   ^XFEFF
                 0004'   01AB                            .IIF IDN <FATAL>,<FATAL> , .WORD        BUG$_BADQHDR!4
                         01AD                            .IIF DIF <FATAL>,<FATAL> , .WORD        BUG$_BADQHDR
                         01AD
                         01AD                     .ENDC
                         01AD
                         01AD
                         01AD
                         01AD          30029$:                                  ; Check succeeded
       00 63    00   E7  01AD                     BBCCI  #0,(R3),30031$         ; Unlock queue for port
                         01B1
                         01B1          30031$:
                         01B1                     ENBINT                        ; Enable interrupts again
                         01B1                            .IF B
```

```
           00'  8E   DA  01B1                  MTPR      (SP)+,S^#PR$_IPL
                         01B4                  .IFF
                         01B4                  MTPR      ,S^#PR$_IPL
                         01B4                  .ENDC
                         01B4
                         01B4
                         01B4
                         01B4
     53   020C C4    D0  01B4             MOVL      PDT$L_MFQHDR(R4),R3        ; Get addr of msg free Q
                         01B9             CHKQ                                 ; Verify
                         01B9
           52   53   D0  01B9              MOVL      R3,R2                     ; Get copy of listhd addr
                51   D4  01BC              CLRL      R1                        ; Zero entry counter
                         01BE              DSBINT                              ; Disable interrupts
                         01BE                  .IF B
           7E   00'  DB  01BE                  MFPR      S^#PR$_IPL,-(SP)
                         01C1                  .IFF
                         01C1                  MFPR      S^#PR$_IPL,
                         01C1                  .ENDC
                         01C1                  .IF B
           00'  1F   DA  01C1                  MTPR      #31,S^#PR$_IPL
                         01C4                  .IFF
                         01C4                  MTPR      ,S^#PR$_IPL
                         01C4                  .ENDC
                         01C4
                         01C4
                         01C4      30039$:
       FC 63    00   E6  01C4              BBSSI     #0,(R3),30039$            ; 30039$ queue before reading
                         01C8
                         01C8      30036$:
           55   52   D0  01C8              MOVL      R2,R5                     ; Save addr of this entry
                         01CB
           50   62   D0  01CB              MOVL      (R2),R0                   ; Get offset to next entry
           50   01   CA  01CE              BICL      #1,R0                     ; Clear interlock bit
      52    6240     9E  01D1              MOVAB     (R2)[R0],R2               ; Get addr of next entry
      50    04 A2    D0  01D5              MOVL      4(R2),R0                  ; Get back link from this entry
       50   6240     9E  01D9              MOVAB     (R2)[R0],R0               ; Compute prev entry addr
           55   50   D1  01DD              CMPL      R0,R5                     ; Computed addr = saved?
                1B   12  01E0              BNEQ      30042$                    ; Branch if not
           53   52   D1  01E2              CMPL      R2,R3                     ; Back at start?
                2F   13  01E5              BEQL      30038$                    ; Branch if so
      3B    0A A2    91  01E7              CMPB      PPD$B_TYPE(R2),#DYN$C_CIDG  ; CI dg?
                06   13  01EB              BEQL      30041$                      ; Branch if so
      3C    0A A2    91  01ED              CMPB      PPD$B_TYPE(R2),#DYN$C_CIMSG ; CI msg?
                0F   12  01F1              BNEQ      30043$                      ; Branch if not
       10 63    00   E1  01F3      30041$: BBC       #0,(R3),30044$            ; Branch if somebody grabbed soft
                         01F7                                                  ;  interlock while we had it
       CD 51    3F   F2  01F7              AOBLSS    #63,R1,30036$             ; Else check max count and continue
                0D   11  01FB              BRB       30037$                    ; Branch if max count expired
                         01FD
           51   01   CE  01FD      30042$: MNEGL     #1,R1                     ; Set error code to bad blink
                08   11  0200              BRB       30037$                    ; Join common error handling
                         0202
           51   02   CE  0202      30043$: MNEGL     #2,R1                     ; Set error code to bad struc type
                03   11  0205              BRB       30037$                    ; Join common error handling
                         0207
           51   03   CE  0207      30044$: MNEGL     #3,R1                     ; Set error code to broken soft 30039$
```

```
                        020A
                        020A     30037$:
    00E8 D4   01   D0   020A              MOVL    #1,@PDT$L_PMC(R4)       ; Min port to prevent further queue
                        020F                                              ;  operations by port
                        020F              BUGCHECK  BADQHDR               ; Notify debugger
                        020F              .IF     IDN ,NONFATAL
                        020F              BSBW    ERR$BUGCHECKNF
                        020F              BUG_CHECK BADQHDR
                        020F              .IFF
           FDEE'   30   020F              BSBW    ERR$BUGCHECK
                        0212              BUG_CHECK BADQHDR,TYPE=FATAL
                 FEFF   0212                      .WORD   ^XFEFF
                0004'   0214                      .IIF IDN <FATAL>,<FATAL> , .WORD        BUG$_BADQHDR!4
                        0216                      .IIF DIF <FATAL>,<FATAL> , .WORD        BUG$_BADQHDR
                        0216
                        0216              .ENDC
                        0216
                        0216
                        0216     30038$:                                  ; Check succeeded
      00 63   00   E7   0216              BBCCI   #0,(R3),30040$          ; Unlock queue for port
                        021A
                        021A     30040$:
                        021A              ENBINT                          ; Enable interrupts again
                        021A                      .IF B
         00'  8E   DA   021A                      MTPR      (SP)+,S^#PR$_IPL
                        021D                      .IFF
                        021D                      MTPR      ,S^#PR$_IPL
                        021D                      .ENDC
                        021D
                        021D
                        021D
                        021D
              51 8ED0   021D              POPL    R1                      ; Restore registers
              52 8ED0   0220              POPL    R2                      ;
              53 8ED0   0223              POPL    R3                      ;
              55 8ED0   0226              POPL    R5                      ;
                        0229
                   05   0229     20$:     RSB                             ; Return
                        022A
                        022A              .DSABL  LSB
```

```
                     022A  212          .SBTTL  -       MON$CHKQ_POST,  CHECK ALL QUEUES AFTER
                     022A  213          .SBTTL  -                       A QUEUE OPERATION
                     022A  214
                     022A  215 ;+
                     022A  216 ; Checks all queues saving condition codes.  Otherwise, it is the
                     022A  217 ; same as the subroutine MON$CHKQ.
                     022A  218 ;-
                     022A  219
                     022A  220          .ENABL  LSB
                     022A  221
                     022A  222 MON$CHKQ_POST::
                     022A  223
           00    E1  022A  224          BBC     #MON$V_QCHK,-           ; Branch if queue checking
   0C FDD1 CF        022C  225                  MON$FLAGS,20$           ;  is disabled
           7E    DC  0230  226          MOVPSL  -(SP)                   ; Save PSL
    0000023C'EF  DF  0232  227          PUSHAL  20$                     ; Save continuation addr
         FDD1    30  0238  228          BSBW    CHKQ_ALT                ; Verify all queues
                 02  023B  229          REI                             ; Restore condition codes, continue PC
                     023C  230
                 05  023C  231 20$:     RSB                             ; Return to caller
                     023D  232
                     023D  233          .DSABL  LSB
                     023D  234
                     023D  235
                     023D  236
                     023D  237
```

```
                023D           .SBTTL  TRACE FACILITY
                023D           .SBTTL  -       TRACE DEFINITIONS
                023D
                023D    ;
                023D    ; Misc data:
                023D    ;
                023D
                023D    TRC$ENABL::                                     ; Low bit set/clear for
                023D                                                    ;  enable/disable
      00000000  023D           .LONG   0                                ; Default is disabled
                0241
                0241    TRC$BUFFER::                                    ; Addr of trace buffer
                0241
      00000000  0241           .LONG   0                                ;
                0245
                0245    ;
                0245    ; The trace buffer is allocated from pool.  It consists of a header
                0245    ; and a series of fixed length entries.  The occupied entries are
                0245    ; maintained on a doubly linked list, youngest is at the head of the
                0245    ; list and the oldest is on the tail.
                0245    ;
                0245
                0245           $DEFINI TRC,GLOBAL
                0245           .SAVE   LOCAL_BLOCK
                0245           .NOCROSS
                0245           .IIF    DIF <GLOBAL> <GLOBAL>,.ENABLE   SUPPRESSION
                0245           .PSECT  $ABS$,ABS
                0944           $GBLINI GLOBAL
                0944           .IF     IDN <GLOBAL> <GLOBAL>
                0944           .MACRO  $DEF    SYM,ALLOC,SIZ
                0944           .IIF    NB,SYM, SYM::
                0944           .IIF    NB,ALLOC,       ALLOC   SIZ
                0944           .ENDM   $DEF
                0944           .MACRO  $EQU    SYM,VAL
                0944           SYM==VAL
                0944           .ENDM   $EQU
                0944           .MACRO  $VIELD1 MOD,SEP,SYM,SIZ,MSK
                0944           SIZ...=1
                0944           .IIF    NB,SIZ, SIZ...=SIZ
                0944           .IF     NB,SYM
                0944           MOD'SEP'V_'SYM==BIT...
                0944           .IIF    NB,SIZ, MOD'SEP'S_'SYM==SIZ
                0944           .IIF    NB,MSK, MOD'SEP'M_'SYM==<<<1@SIZ...>-1>@BIT...>
                0944           .ENDC
                0944           BIT...=BIT...+SIZ...
                0944           .ENDM   $VIELD1
                0944           .IFF
                0944           .IIF    DIF <GLOBAL> <LOCAL>,.ERROR ;ARG MUST BE "GLOBAL","LOCAL",OR NULL
                0944           .MACRO  $DEF    SYM,ALLOC,SIZ
                0944           .IIF    NB,SYM, SYM:
                0944           .IIF    NB,ALLOC,       ALLOC   SIZ
                0944           .ENDM   $DEF
                0944           .MACRO  $EQU    SYM,VAL
                0944           SYM=VAL
                0944           .ENDM   $EQU
                0944           .MACRO  $VIELD1 MOD,SEP,SYM,SIZ,MSK
                0944           SIZ...=1
                0944         .IIF    NB,SIZ, SIZ...=SIZ
                0944         .IF     NB,SYM
                0944         MOD'SEP'V_'SYM=BIT...
                0944         .IIF    NB,SIZ, MOD'SEP'S_'SYM=SIZ
                0944         .IIF    NB,MSK, MOD'SEP'M_'SYM=<<<1@SIZ...>-1>@BIT...>
                0944         .ENDC
                0944         BIT...=BIT...+SIZ...
                0944         .ENDM   $VIELD1
                0944         .ENDC
                0944
       00000000 0944         .=0
                0000
                0000
                0000         $DEF    TRC$L_NEXTENT   .BLKL   1        ; Addr of next entry to use
                0000         .IIF    NB,TRC$L_NEXTENT,       TRC$L_NEXTENT::
       00000004 0000         .IIF    NB,.BLKL,       .BLKL   1
                0004
                0004
                0004         $DEF    TRC$Q_QHDR      .BLKQ   1        ; Queue header of entries
                0004         .IIF    NB,TRC$Q_QHDR,  TRC$Q_QHDR::
       0000000C 0004         .IIF    NB,.BLKQ,       .BLKQ   1
                000C
                000C
                000C         $DEF    TRC$L_SPR       .BLKL   1        ; Spare longwd
                000C         .IIF    NB,TRC$L_SPR,   TRC$L_SPR::
       00000010 000C         .IIF    NB,.BLKL,       .BLKL   1
                0010
                0010
                0010         $DEF    TRC$C_FIRSTENT                   ; Addr of first entry in table
                0010         .IIF    NB,TRC$C_FIRSTENT,      TRC$C_FIRSTENT::
                0010         .IIF    NB,,
                0010
                0010
                0010         $EQU    TRC$C_ENTSIZ    <96>             ; 96 bytes per entry
       00000060 0010         TRC$C_ENTSIZ==96
                0010
                0010
                0010         $EQU    TRC$C_ENTCNT    <64>             ; Room for 64 entries
       00000040 0010         TRC$C_ENTCNT==64
                0010
                0010
                0010         $EQU    TRC$C_BUFSIZ    <TRC$C_ENTCNT*TRC$C_ENTSIZ+TRC$C_FIRSTENT>
       00001810 0010         TRC$C_BUFSIZ==TRC$C_ENTCNT*TRC$C_ENTSIZ+TRC$C_FIRSTENT
                0010
                0010
                0010                                                  ; Total buffer size
                0010
                0010         $DEFEND TRC
                0010         .MACRO  $TRCDEF A
                0010         .ENDM   $TRCDEF
                0010         .IIF    DIF <> <GLOBAL>,.DISABLE         SUPPRESSION
                0010         .CROSS
           00000245          .RESTORE
                0245
                0245
                0245       ;
                0245       ; Trace entries consist of a common header.  The structure type field
```

```
                 0245    ; contains a type code indicative of the type of data in the entry.
                 0245    ; If the entry type offsets are read into sda, sda should be able to
                 0245    ; format the trace buffer for us.
                 0245    ;
                 0245
                 0245            $DEFINI TRCE,GLOBAL
                 0245            .SAVE   LOCAL_BLOCK
                 0245            .NOCROSS
                 0245            .IIF    DIF <GLOBAL> <GLOBAL>,.ENABLE   SUPPRESSION
                 0245            .PSECT  $ABS$,ABS
                 0944            $GBLINI GLOBAL
                 0944            .IF     IDN <GLOBAL> <GLOBAL>
                 0944            .MACRO  $DEF    SYM,ALLOC,SIZ
                 0944            .IIF    NB,SYM, SYM::
                 0944            .IIF    NB,ALLOC,       ALLOC   SIZ
                 0944            .ENDM   $DEF
                 0944            .MACRO  $EQU    SYM,VAL
                 0944            SYM==VAL
                 0944            .ENDM   $EQU
                 0944            .MACRO  $VIELD1 MOD,SEP,SYM,SIZ,MSK
                 0944            SIZ...=1
                 0944            .IIF    NB,SIZ, SIZ...=SIZ
                 0944            .IF     NB,SYM
                 0944            MOD'SEP'V_'SYM==BIT...
                 0944            .IIF    NB,SIZ, MOD'SEP'S_'SYM==SIZ
                 0944            .IIF    NB,MSK, MOD'SEP'M_'SYM==<<<1@SIZ...>-1>@BIT...>
                 0944            .ENDC
                 0944            BIT...=BIT...+SIZ...
                 0944            .ENDM   $VIELD1
                 0944            .IFF
                 0944            .IIF    DIF <GLOBAL> <LOCAL>,.ERROR ;ARG MUST BE "GLOBAL","LOCAL",OR NULL
                 0944            .MACRO  $DEF    SYM,ALLOC,SIZ
                 0944            .IIF    NB,SYM, SYM:
                 0944            .IIF    NB,ALLOC,       ALLOC   SIZ
                 0944            .ENDM   $DEF
                 0944            .MACRO  $EQU    SYM,VAL
                 0944            SYM=VAL
                 0944            .ENDM   $EQU
                 0944            .MACRO  $VIELD1 MOD,SEP,SYM,SIZ,MSK
                 0944            SIZ...=1
                 0944            .IIF    NB,SIZ, SIZ...=SIZ
                 0944            .IF     NB,SYM
                 0944            MOD'SEP'V_'SYM=BIT...
                 0944            .IIF    NB,SIZ, MOD'SEP'S_'SYM=SIZ
                 0944            .IIF    NB,MSK, MOD'SEP'M_'SYM=<<<1@SIZ...>-1>@BIT...>
                 0944            .ENDC
                 0944            BIT...=BIT...+SIZ...
                 0944            .ENDM   $VIELD1
                 0944            .ENDC
                 0944
        00000000 0944            .=0
                 0000
                 0000
                 0000            $DEF    TRCE$L_FL       .BLKL   1       ; Fwd link
                 0000            .IIF    NB,TRCE$L_FL,   TRCE$L_FL::
        00000004 0000            .IIF    NB,.BLKL,       .BLKL   1
                 0004
```

```
                   0004   291
                   0004   292         $DEF      TRCE$L_BL       .BLKL   1       ; Back link
                   0004               .IIF      NB,TRCE$L_BL,   TRCE$L_BL::
         00000008  0004               .IIF      NB,.BLKL,       .BLKL   1
                   0008
                   0008   293
                   0008   294         $DEF      TRCE$W_SIZE     .BLKW   1       ; Size of an entry
                   0008               .IIF      NB,TRCE$W_SIZE, TRCE$W_SIZE::
         0000000A  0008               .IIF      NB,.BLKW,       .BLKW   1
                   000A
                   000A   295
                   000A   296         $DEF      TRCE$B_TYPE     .BLKB   1       ; Entry type code (struct type)
                   000A               .IIF      NB,TRCE$B_TYPE, TRCE$B_TYPE::
         0000000B  000A               .IIF      NB,.BLKB,       .BLKB   1
                   000B
                   000B   297
                   000B   298         $DEF      TRCE$B_SPR      .BLKB   1       ; Spare byte
                   000B               .IIF      NB,TRCE$B_SPR,  TRCE$B_SPR::
         0000000C  000B               .IIF      NB,.BLKB,       .BLKB   1
                   000C
                   000C   299
                   000C   300         $DEF      TRCE$L_TIME     .BLKL   1       ; Time entry was filled
                   000C               .IIF      NB,TRCE$L_TIME, TRCE$L_TIME::
         00000010  000C               .IIF      NB,.BLKL,       .BLKL   1
                   0010
                   0010   301
                   0010   302         $DEF      TRCE$L_PDT      .BLKL   1       ; Caller's PDT addr (R4)
                   0010               .IIF      NB,TRCE$L_PDT,  TRCE$L_PDT::
         00000014  0010               .IIF      NB,.BLKL,       .BLKL   1
                   0014
                   0014   303
                   0014   304         $DEF      TRCE$C_BASE                     ; Start of type specific data
                   0014               .IIF      NB,TRCE$C_BASE, TRCE$C_BASE::
                   0014               .IIF      NB,,
                   0014
                   0014   305
                   0014   306 ;
                   0014   307 ; Entry type specific formats:
                   0014   308 ;
                   0014   309 ; Message (or datagram) trace:
                   0014   310 ;
                   0014   311
         00000014  0014   312 .=TRCE$C_BASE
                   0014   313
                   0014   314         $EQU      DYN$C_TRCMSG    <^X81>
         00000081  0014               DYN$C_TRCMSG==^X81
                   0014
                   0014   315
                   0014   316         $DEF      TRCE$L_PC       .BLKL   1       ; Caller's PC
                   0014               .IIF      NB,TRCE$L_PC,   TRCE$L_PC::
         00000018  0014               .IIF      NB,.BLKL,       .BLKL   1
                   0018
                   0018   317
                   0018   318         $DEF      TRCE$L_PSL      .BLKL   1       ; Caller's PSL
                   0018               .IIF      NB,TRCE$L_PSL,  TRCE$L_PSL::
         0000001C  0018               .IIF      NB,.BLKL,       .BLKL   1
                   001C
```

```
             001C
             001C            $DEF     TRCE$L_MSGADDR   .BLKL   1        ; Addr of message being traced
             001C            .IIF     NB,TRCE$L_MSGADDR,       TRCE$L_MSGADDR::
   00000020  001C            .IIF     NB,.BLKL,        .BLKL   1
             0020
             0020
             0020            $DEF     TRCE$C_MSGDATA                    ; Start of message data
             0020            .IIF     NB,TRCE$C_MSGDATA,       TRCE$C_MSGDATA::
             0020            .IIF     NB,,
             0020
             0020
             0020      ;
             0020      ; PC trace:
             0020      ;
             0020
   00000014  0020      .=TRCE$C_BASE
             0014
             0014            $EQU     DYN$C_TRCPC      <^X82>
   00000082  0014            DYN$C_TRCPC==^X82
             0014
             0014
   00000018  0014      .=.+4                                            ; Caller's PC
             0018
   0000001C  0018      .=.+4                                            ; Caller's PSL
             001C
             001C            $DEF     TRCE$L_R0        .BLKL   1        ; Caller's R0-R5
             001C            .IIF     NB,TRCE$L_R0,    TRCE$L_R0::
   00000020  001C            .IIF     NB,.BLKL,        .BLKL   1
             0020
             0020            $DEF     TRCE$L_R1        .BLKL   1
             0020            .IIF     NB,TRCE$L_R1,    TRCE$L_R1::
   00000024  0020            .IIF     NB,.BLKL,        .BLKL   1
             0024
             0024            $DEF     TRCE$L_R2        .BLKL   1
             0024            .IIF     NB,TRCE$L_R2,    TRCE$L_R2::
   00000028  0024            .IIF     NB,.BLKL,        .BLKL   1
             0028
             0028            $DEF     TRCE$L_R3        .BLKL   1
             0028            .IIF     NB,TRCE$L_R3,    TRCE$L_R3::
   0000002C  0028            .IIF     NB,.BLKL,        .BLKL   1
             002C
             002C            $DEF     TRCE$L_R4        .BLKL   1
             002C            .IIF     NB,TRCE$L_R4,    TRCE$L_R4::
   00000030  002C            .IIF     NB,.BLKL,        .BLKL   1
             0030
             0030            $DEF     TRCE$L_R5        .BLKL   1
             0030            .IIF     NB,TRCE$L_R5,    TRCE$L_R5::
   00000034  0030            .IIF     NB,.BLKL,        .BLKL   1
             0034
             0034
             0034            $DEFEND TRCE
             0034            .MACRO  $TRCEDEF A
             0034            .ENDM   $TRCEDEF
             0034            .IIF     DIF <> <GLOBAL>,.DISABLE         SUPPRESSION
             0034            .CROSS
         00000245            .RESTORE
             0245
```

```
                          0245              .SBTTL  -       TRACE INITIALIZATION
                          0245
                          0245     ;+
                          0245     ; TRC$INIT allocates the trace buffer from pool, formats the header,
                          0245     ; and saves its address.
                          0245     ;
                          0245     ; Inputs:
                          0245     ;
                          0245     ;        IPL                         -Fork IPL or greater
                          0245     ;
                          0245     ; Outputs:
                          0245     ;
                          0245     ;        TRC$BUFFER                  -0 if insufficient memory, else
                          0245     ;                                     addr of start of buffer
                          0245     ;        TRC$ENABL                   -Low bit clear if insufficient memory; else
                          0245     ;                                     unchanged
                          0245     ;        All registers               -Preserved
                          0245     ;-
                          0245
                          0245              .ENABL  LSB
                          0245
                          0245     TRC$INIT::
                          0245
           F9 AF      D5  0245              TSTL    TRC$BUFFER              ; Is there already a buffer (in case
                          0248                                              ;  there are multiple ports)
              46      12  0248              BNEQ    20$                     ; Branch if so
              3F      BB  024A              PUSHR   #^M<R0,R1,R2,R3,R4,R5>  ; Save registers
      51   1820 8F    3C  024C              MOVZWL  #TRC$C_BUFSIZ+16,R1     ; Get total buffer size
  54   00000000'GF    DE  0251              MOVAL   G^EXE$GL_NONPAGED,R4    ; Fiddle with allocate
              64      DD  0258              PUSHL   (R4)                    ;  IPL to allow
  64   00000000'8F    DB  025A              MFPR    #PR$_IPL,(R4)           ;  greater than fork IPL
       00000000'GF    16  0261              JSB     G^EXE$ALONONPAGED       ;  and allocate pool
              64 8ED0     0267              POPL    (R4)                    ; Restore allocate IPL
           06 50      E8  026A              BLBS    R0,5$                   ; Branch if got pool
      CC AF   01      CA  026D              BICL    #1,TRC$ENABL            ; Else disable trace function
              1B      11  0271              BRB     10$                     ;  and return
                          0273
              82      7C  0273     5$:      CLRQ    (R2)+                   ; Clear out header
82   51   00130000 8F C1  0275              ADDL3   #<DYN$C_BUFIO@16>,R1,(R2)+ ; Set size and type
              82      D4  027D              CLRL    (R2)+                   ; Clear out junk
      BE AF   52      D0  027F              MOVL    R2,TRC$BUFFER           ; Save buffer address
      82   10 A2      DE  0283              MOVAL   TRC$C_FIRSTENT(R2),(R2)+ ; Set addr of 1st entry
           62 52      D0  0287              MOVL    R2,(R2)                 ; Set filled entry
      04 A2   52      D0  028A              MOVL    R2,4(R2)                ;  queue to empty
                          028E
              3F      BA  028E     10$:     POPR    #^M<R0,R1,R2,R3,R4,R5>  ; Restore registers
                          0290
                      05  0290     20$:     RSB                             ; Return
                          0291
                          0291              .DSABL  LSB
```

```
                              0291    396           .SBTTL  TRC$LOGMSG,     Log a Message or Datagram
                              0291    397
                              0291    398 ;+
                              0291    399 ; This routine allocates an entry in the trace buffer and fills it with
                              0291    400 ; the PC of the caller, addr of the message, and first few longwords of
                              0291    401 ; the message.
                              0291    402 ;
                              0291    403 ; Inputs:
                              0291    404 ;
                              0291    405 ;       R2                          -Addr of message being traced
                              0291    406 ;       R4                          -PDT addr
                              0291    407 ;
                              0291    408 ; Outputs:
                              0291    409 ;
                              0291    410 ;       All registers, PSL      -Preserved
                              0291    411 ;-
                              0291    412
                              0291    413           .ENABL  LSB
                              0291    414
                              0291    415 TRC$LOGMSG::
                              0291    416
       32 A8 AF    00    E1   0291    417           BBC     #0,TRC$ENABL,10$          ; Branch if trace disabled
                   7E    DC   0296    418           MOVPSL  -(SP)                     ; Save PSL
         000002C8'EF     DF   0298    419           PUSHAL  10$                       ;  and PC of RSB from this routine
                              029E    420           DSBINT                            ; Raise IPL
                              029E                          .IF B
             7E    00'   DB   029E                          MFPR     S^#PR$_IPL,-(SP)
                              02A1                          .IFF
                              02A1                          MFPR     S^#PR$_IPL,
                              02A1                          .ENDC
                              02A1                          .IF B
             00'   1F    DA   02A1                          MTPR     #31,S^#PR$_IPL
                              02A4                          .IFF
                              02A4                          MTPR     ,S^#PR$_IPL
                              02A4                          .ENDC
                              02A4
                   3F    BB   02A4    421           PUSHR   #^M<R0,R1,R2,R3,R4,R5>    ; Save registers
        50      81 8F    9A   02A6    422           MOVZBL  #DYN$C_TRCMSG,R0          ; Get entry type code
                 004F    30   02AA    423           BSBW    TRC$ALLOC_ENT             ; Allocate and init next entry
       14 A1    24 AE    D0   02AD    424           MOVL    <9*4>(SP),TRCE$L_PC(R1)   ; Copy caller's PC
       18 A1    20 AE    D0   02B2    425           MOVL    <8*4>(SP),TRCE$L_PSL(R1)  ;  and PSL
        1C A1      52    D0   02B7    426           MOVL    R2,TRCE$L_MSGADDR(R1)     ; Copy message addr to trace entry
           0040 8F       28   02BB    427           MOVC3   #<TRC$C_ENTSIZ-TRCE$C_MSGDATA>,-
        20 A1      62         02BF    428                   (R2),TRCE$C_MSGDATA(R1)  ; Copy as much message as possible
                   3F    BA   02C2    429           POPR    #^M<R0,R1,R2,R3,R4,R5>    ; Restore registers
                              02C4    430           ENBINT                            ; Lower IPL
                              02C4                          .IF B
             00'   8E    DA   02C4                          MTPR     (SP)+,S^#PR$_IPL
                              02C7                          .IFF
                              02C7                          MTPR     ,S^#PR$_IPL
                              02C7                          .ENDC
                              02C7
                         02   02C7    431           REI                               ; Restore PC, PSL
                              02C8    432
                         05   02C8    433 10$:      RSB                               ; Return
                              02C9    434
                              02C9    435           .DSABL  LSB
```

```
                          02C9            .SBTTL  TRC$LOGPC,      Log PC and Registers
                          02C9
                          02C9      ;+
                          02C9      ; This routine logs the caller's PC, PSL, and R0-R5.
                          02C9      ;
                          02C9      ; Inputs:
                          02C9      ;
                          02C9      ;       R4                      -PDT addr
                          02C9      ;
                          02C9      ; Outputs:
                          02C9      ;
                          02C9      ;       All registers, PSL      -Preserved
                          02C9      ;-
                          02C9
                          02C9            .ENABL  LSB
                          02C9
                          02C9      TRC$LOGPC::
                          02C9
  2C FF6F CF    00    E1  02C9            BBC     #0,TRC$ENABL,10$        ; Branch if trace disabled
                7E    DC  02CF            MOVPSL  -(SP)                   ; Save caller's PSL
      000002FB'EF     DF  02D1            PUSHAL  10$                     ; Save addr of RSB
                          02D7            DSBINT                          ; Raise IPL to 31
                          02D7                    .IF B
         7E     00'   DB  02D7                    MFPR    S^#PR$_IPL,-(SP)
                          02DA                    .IFF
                          02DA                    MFPR    S^#PR$_IPL,
                          02DA                    .ENDC
                          02DA                    .IF B
         00'    1F    DA  02DA                    MTPR    #31,S^#PR$_IPL
                          02DD                    .IFF
                          02DD                    MTPR    ,S^#PR$_IPL
                          02DD                    .ENDC
                          02DD
                3F    BB  02DD            PUSHR   #^M<R0,R1,R2,R3,R4,R5>  ; Save registers
      50      82 8F   9A  02DF            MOVZBL  #DYN$C_TRCPC,R0         ; Get trace entry type code
              0016    30  02E3            BSBW    TRC$ALLOC_ENT           ; Allocate and init next entry
   14 A1      24 AE   D0  02E6            MOVL    <9*4>(SP),TRCE$L_PC(R1) ; Copy caller's PC
   18 A1      20 AE   D0  02EB            MOVL    <8*4>(SP),TRCE$L_PSL(R1) ;  and caller's PSL
         6E     18    28  02F0            MOVC3   #<6*4>,(SP),-           ; Copy registers from stack to
              1C A1       02F3                    TRCE$L_R0(R1)           ;  to trace entry
                3F    BA  02F5            POPR    #^M<R0,R1,R2,R3,R4,R5>  ; Restore registers
                          02F7            ENBINT                          ; Lower IPL
                          02F7                    .IF B
         00'    8E    DA  02F7                    MTPR    (SP)+,S^#PR$_IPL
                          02FA                    .IFF
                          02FA                    MTPR    ,S^#PR$_IPL
                          02FA                    .ENDC
                          02FA
                      02  02FA            REI                             ; Restore PC, PSL
                          02FB
                      05  02FB      10$:  RSB                             ; Return to caller
                          02FC
                          02FC            .DSABL  LSB
```

```
                             02FC              .SBTTL  TRC$ALLOC_ENT,  ALLOCATE TRACE ENTRY
                             02FC
                             02FC      ;+
                             02FC      ; This routine allocates the next trace entry.  If the new entry is currently
                             02FC      ; the oldest entry on the queue (if it's on the tail), it is removed from the
                             02FC      ; queue and inserted on the head of the queue, making it the youngest entry.
                             02FC      ; The standard information is set in the entry:
                             02FC      ;
                             02FC      ;       size = TRC$C_ENTSIZ
                             02FC      ;       type = specified by caller
                             02FC      ;       time = read from interval count register (usec accuracy)
                             02FC      ;       PDT  = R4
                             02FC      ;
                             02FC      ; Inputs:
                             02FC      ;
                             02FC      ;       R0                      -Structure/trace entry type code
                             02FC      ;
                             02FC      ; Outputs:
                             02FC      ;
                             02FC      ;       R1                      -Addr of trace entry
                             02FC      ;       R5                      -Destroyed
                             02FC      ;       Other registers         -Preserved
                             02FC      ;-
                             02FC
                             02FC              .ENABL  LSB
                             02FC
                             02FC      TRC$ALLOC_ENT::
                             02FC
         55   FF41 CF   D0   02FC              MOVL    TRC$BUFFER,R5           ; Get addr of trace buffer
                51   65   D0   0301              MOVL    (R5),R1                 ; Get addr of next entry
            08 A5   51   D1   0304              CMPL    R1,TRC$Q_QHDR+4(R5)     ; Is it on the tail?
                     04   12   0308              BNEQ    10$                     ; Branch if not
          51    08 B5   0F   030A              REMQUE  @TRC$Q_QHDR+4(R5),R1    ; Remove the entry from the tail
                             030E
            04 A5   61   0E   030E      10$:    INSQUE  (R1),TRC$Q_QHDR(R5)     ; Put entry on head of queue
              0060 8F   3C   0312              MOVZWL  #TRC$C_ENTSIZ,-         ; Set structure size
                 08 A1        0316                      TRCE$W_SIZE(R1)         ;
            0A A1   50   90   0318              MOVB    R0,TRCE$B_TYPE(R1)      ;  and type
        00000000'GF       D0   031C              MOVL    G^EXE$GQ_SYSTIME,-      ; Time stamp entry
                 0C A1        0322                      TRCE$L_TIME(R1)         ;
            10 A1   54   D0   0324              MOVL    R4,TRCE$L_PDT(R1)       ; Save PDT addr
          65    60 A1   DE   0328              MOVAL   TRC$C_ENTSIZ(R1),(R5)   ; Step to addr of next entry
  50    55  00001810 8F   C1   032C              ADDL3   #TRC$C_BUFSIZ,R5,R0     ; Compute end of buffer
                50   65   D1   0334              CMPL    (R5),R0                 ; Next entry at end of past it?
                     04   19   0337              BLSS    20$                     ; Branch if not
          65    10 A5   DE   0339              MOVAL   TRC$C_FIRSTENT(R5),(R5) ; Else cycle to top of buffer
                             033D                                              ;  for next entry.
                             033D
                          05   033D      20$:    RSB                             ; Return
                             033E
                             033E              .DSABL  LSB
                             033E              .END
```

```
$$$CURSIZ                       = 000001C4                  PDT$L_DFQHDR                    00000208
$$$NEWSIZ                       = 000001D0                  PDT$L_DGHDRSZ                   00000190
BUG$_BADQHDR                      ********    X     01      PDT$L_DGNETHD                   00000194
CHKQ_ALT                          0000000C R        01      PDT$L_DQELOGOUT                 000002E0
DYN$C_BUFIO                     = 00000013                  PDT$L_GPTBASE                   0000022C
DYN$C_CIDG                      = 0000003B                  PDT$L_GPTLEN                    00000230
DYN$C_CIMSG                     = 0000003C                  PDT$L_LBDG                      00000184
DYN$C_TRCMSG                    = 00000081  G               PDT$L_MFQ                       00000100
DYN$C_TRCPC                     = 00000082  G               PDT$L_MFQHDR                    0000020C
ERR$BUGCHECK                      ********    X     01      PDT$L_MQELOGOUT                 00000320
EXE$ALONONPAGED                   ********    X     01      PDT$L_MTC                       00000104
EXE$GL_NONPAGED                   ********    X     01      PDT$L_PFAR                      00000108
EXE$GQ_SYSTIME                    ********    X     01      PDT$L_PMC                       000000E8
MON$CHKQ                          00000004 RG       01      PDT$L_POLLERDUE                 0000018C
MON$CHKQ_POST                     0000022A RG       01      PDT$L_POOLDUE                   00000188
MON$FLAGS                         00000000 RG       01      PDT$L_PPR                       0000010C
MON$M_QCHK                      = 00000001                  PDT$L_PS                        000000EC
MON$V_QCHK                      = 00000000                  PDT$L_PSR                       000000F8
PA_CNF                            00000000                  PDT$L_SPTBASE                   00000224
PA_CQ0                            00000908                  PDT$L_SPTLEN                    00000228
PA_CQ1                            0000090C                  PDT$L_VBDT                      0000021C
PA_CQ2                            00000910                  PDT$L_VPQB                      00000218
PA_CQ3                            00000914                  PDT$Q_COMQ2                     000001F0
PA_DFQ                            00000928                  PDT$Q_COMQ3                     000001F8
PA_MADR                           00000014                  PDT$Q_COMQBASE                  000001E0
PA_MDATR                          00000018                  PDT$Q_COMQH                     000001E8
PA_MFQ                            0000092C                  PDT$Q_COMQL                     000001E0
PA_MTC                            00000930                  PDT$Q_DFREEQ                    000001D0
PA_MTEC                           00000934                  PDT$Q_FORMPB                    00000174
PA_PDC                            00000920                  PDT$Q_MFREEQ                    000001D8
PA_PEC                            0000091C                  PDT$Q_RSPQ                      00000200
PA_PESR                           0000093C                  PDT$Q_TEMP_RSPQ                 0000019C
PA_PFAR                           00000938                  PDT$W_BDTLEN                    00000220
PA_PIC                            00000924                  PDT$W_DQELEN                    00000210
PA_PMC                            00000004                  PDT$W_LPORT_STS                 00000110
PA_PPR                            00000940                  PDT$W_MQELEN                    00000214
PA_PQBBR                          00000904                  PDT$W_PBCOUNT                   00000112
PA_PS                             00000900                  PDT$W_STDGDYN                   00000198
PA_PSR                            00000918                  PDT$W_STDGUSED                  0000019A
PDT$B_DQIMAP                      00000154                  PPD$B_DEF_ST                    0000001C
PDT$B_HSHUT_DG                    000001B0                  PPD$B_FLAGS                     0000000F
PDT$B_MAX_PORT                    0000017C                  PPD$B_HWVERS                    00000034
PDT$B_NXT_PORT                    0000017E                  PPD$B_LBDATA                    00000012
PDT$B_P0_LBSTS                    00000180                  PPD$B_LCB_0                     00000012
PDT$B_P1_LBSTS                    00000181                  PPD$B_LCB_LPORT                 00000010
PDT$B_PLOGMAP                     00000134                  PPD$B_LCB_NPORT                 0000000F
PDT$B_PORTMAP                     00000114                  PPD$B_LCB_OPC                   00000011
PDT$B_PORT_NUM                    0000017D                  PPD$B_LCB_PORT                  0000000E
PDT$B_REQIDPS                     0000017F                  PPD$B_OPC                       0000000E
PDT$C_LENGTH                    = 000000E4                  PPD$B_PORT                      0000000C
PDT$C_PAREGBASE                   000000E4                  PPD$B_PROTOCOL                  0000001A
PDT$C_PAREGEND                    00000110                  PPD$B_RSTATE                    00000025
PDT$C_PQB                       = 000001E0                  PPD$B_RST_PORT                  00000024
PDT$L_CNF                         000000E4                  PPD$B_STATUS                    0000000D
PDT$L_CQ0                         000000F0                  PPD$B_SWFLAG                    0000000B
PDT$L_CQ1                         000000F4                  PPD$B_SYSTEMID                  00000014
PDT$L_DFQ                         000000FC                  PPD$B_TYPE                      0000000A
```

```
PPD$C_LB_LENGTH                 00000046                    TRCE$B_TYPE                 0000000A  G
PPD$C_LCB_DATA                  00000013                    TRCE$C_BASE                 00000014  G
PPD$C_LENGTH                    00000012                    TRCE$C_MSGDATA              00000020  G
PPD$C_MIN_DGSIZ                 00000050                    TRCE$L_BL                   00000004  G
PPD$K_LB_LENGTH                 00000046                    TRCE$L_FL                   00000000  G
PPD$K_LENGTH                    00000012                    TRCE$L_MSGADDR              0000001C  G
PPD$L_BLINK                     00000004                    TRCE$L_PC                   00000014  G
PPD$L_DG_DISC                   00000028                    TRCE$L_PDT                  00000010  G
PPD$L_FLINK                     00000000                    TRCE$L_PSL                  00000018  G
PPD$L_IN_VCD                    00000018                    TRCE$L_R0                   0000001C  G
PPD$L_LBCRC                     00000042                    TRCE$L_R1                   00000020  G
PPD$L_P0_ACK                    00000010                    TRCE$L_R2                   00000024  G
PPD$L_P0_NAK                    00000014                    TRCE$L_R3                   00000028  G
PPD$L_P0_NRSP                   00000018                    TRCE$L_R4                   0000002C  G
PPD$L_P1_ACK                    0000001C                    TRCE$L_R5                   00000030  G
PPD$L_P1_NAK                    00000020                    TRCE$L_TIME                 0000000C  G
PPD$L_P1_NRSP                   00000024                    TRCE$W_SIZE                 00000008  G
PPD$L_REC_BOFF                  00000028
PPD$L_REC_NAME                  00000024
PPD$L_RPORT_FCN                 00000020
PPD$L_RPORT_REV                 0000001C
PPD$L_RPORT_TYP                 00000018
PPD$L_SND_BOFF                  00000020
PPD$L_SND_NAME                  0000001C
PPD$L_ST_ADDR                   00000018
PPD$L_XCT_LEN                   00000018
PPD$Q_CURTIME                   00000048
PPD$Q_NODENAME                  00000040
PPD$Q_SWINCARN                  00000028
PPD$Q_XCT_ID                    00000010
PPD$T_HWTYPE                    00000030
PPD$T_SWTYPE                    00000020
PPD$T_SWVERS                    00000024
PPD$W_LCB_LEN7                  0000000C
PPD$W_LENGTH                    00000010
PPD$W_MASK                      00000010
PPD$W_MAXDG                     0000001C
PPD$W_MAXMSG                    0000001E
PPD$W_MTYPE                     00000012
PPD$W_M_VAL                     00000014
PPD$W_SIZE                      00000008
PR$_IPL                         ********     X   01
SIZ...                        = 00000001
TRC$ALLOC_ENT                   000002FC RG      01
TRC$BUFFER                      00000241 RG      01
TRC$C_BUFSIZ                  = 00001810  G
TRC$C_ENTCNT                  = 00000040  G
TRC$C_ENTSIZ                  = 00000060  G
TRC$C_FIRSTENT                  00000010  G
TRC$ENABL                       0000023D RG      01
TRC$INIT                        00000245 RG      01
TRC$LOGMSG                      00000291 RG      01
TRC$LOGPC                       000002C9 RG      01
TRC$L_NEXTENT                   00000000  G
TRC$L_SPR                       0000000C  G
TRC$Q_QHDR                      00000004  G
TRCE$B_SPR                      0000000B  G
```

```
                                     +----------------+
                                     ! Psect synopsis !
                                     +----------------+

PSECT name                 Allocation          PSECT No.  Attributes
----------                 ----------          ---------  ----------
.  ABS  .                  00000000  (    0.)  00 (  0.)  NOPIC   USR   CON   ABS   LCL NOSHR NOEXE NORD   NOWRT NOVEC BYTE
$$$115_DRIVER              0000033E  (  830.)  01 (  1.)  NOPIC   USR   CON   REL   LCL NOSHR   EXE   RD     WRT NOVEC LONG
$ABS$                      00000944  ( 2372.)  02 (  2.)  NOPIC   USR   CON   ABS   LCL NOSHR   EXE   RD     WRT NOVEC BYTE

                                   +------------------------+
                                   ! Performance indicators !
                                   +------------------------+

Phase                    Page faults    CPU Time       Elapsed Time
-----                    -----------    --------       ------------
Initialization                   36    00:00:00.04    00:00:01.17
Command processing              132    00:00:00.41    00:00:03.98
Pass 1                          313    00:00:06.69    00:00:27.04
Symbol table sort                 0    00:00:00.70    00:00:01.80
Pass 2                          185    00:00:01.70    00:00:11.59
Symbol table output              22    00:00:00.11    00:00:00.29
Psect synopsis output             2    00:00:00.01    00:00:00.01
Cross-reference output            0    00:00:00.00    00:00:00.00
Assembler run totals            692    00:00:09.67    00:00:45.89

The working set limit was 1650 pages.
66128 bytes (130 pages) of virtual memory were used to buffer the intermediate code.
There were 40 pages of symbol table space allocated to hold 652 non-local and 54 local symbols.
525 source lines were read in Pass 1, producing 16 object records in Pass 2.
23 pages of virtual memory were used to define 19 macros.

                                  +--------------------------+
                                  ! Macro library statistics !
                                  +--------------------------+

Macro library name                        Macros defined
------------------                        --------------
_$255$DUA28:[DRIVER.OBJ]PALIB.MLB;1                    4
_$255$DUA28:[SYS.OBJ]LIB.MLB;1                         5
_$255$DUA28:[SYSLIB]STARLET.MLB;2                      4
TOTALS (all libraries)                                13

844 GETS were required to define 13 macros.

There were no errors, warnings or information messages.

MACRO/LIS=LIS$:PAMONIT/OBJ=OBJ$:PAMONIT MSRC$:PAMONIT/UPDATE=(ENH$:PAMONIT)+EXECML$/LIB+LIB$:PALIB.MLB/LIB
```

0114 AH-BT13A-SE
VAX/VMS V4.0

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PAINIT
LIS

PAFPCALL
LIS

PAMONIT
LIS

PAINTR
LIS

0115 AH-BT13A-SE
VAX/VMS V4.0

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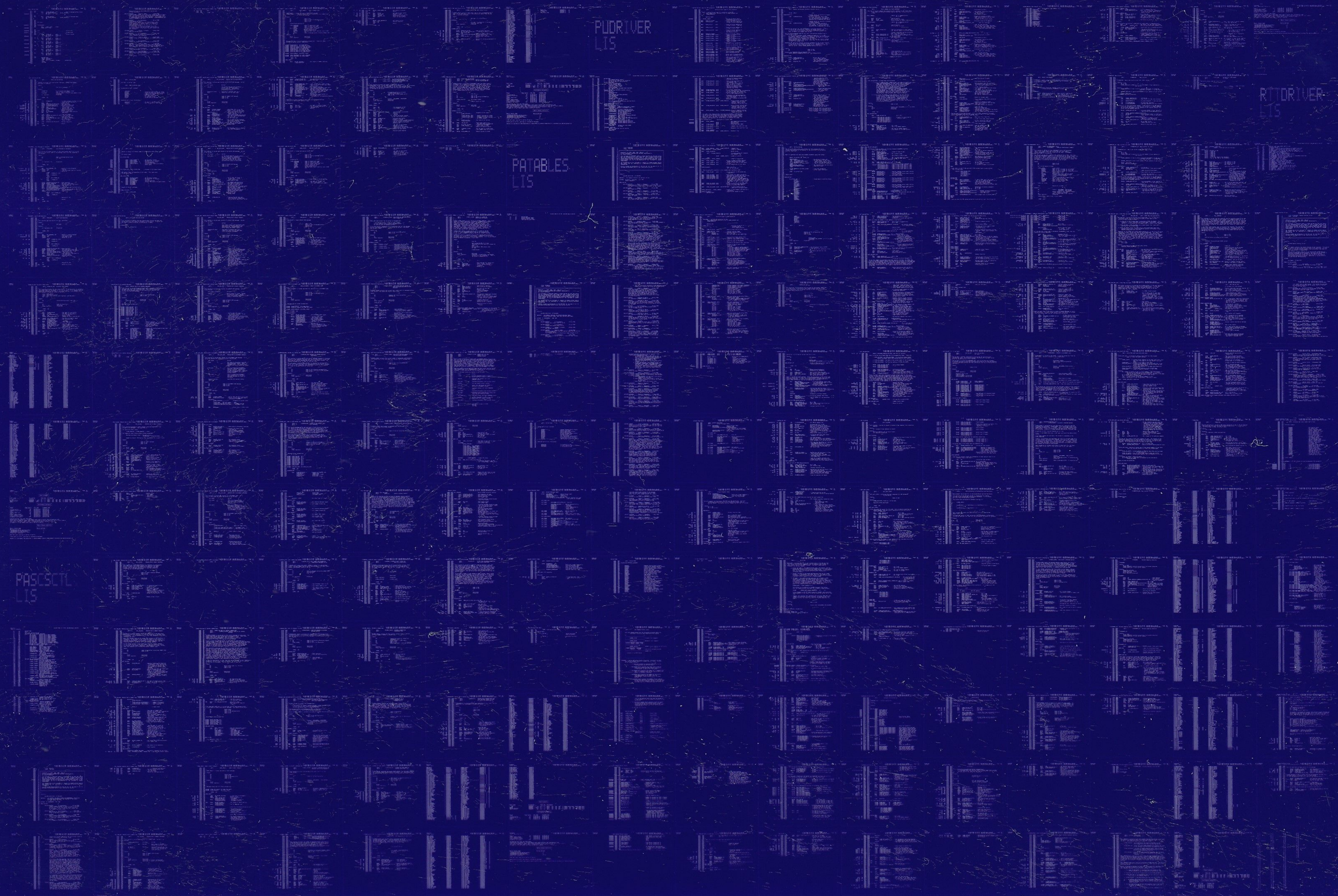
PUDRIVER
LIS

RTTDRIVER
LIS

PATABLES
LIS

PASCSCTL
LIS